

City of Cambridge

Executive Department

LOUIS A. DePASQUALE
City Manager

April 7, 2022

To the Honorable, the City Council:

I am writing to provide you with an update on the MassAve4 project and am asking for your approval for the approach and timeline for implementing separated bike lanes on these critical segments of Massachusetts Avenue, as outlined in the attached report and summarized below.

The Cycling Safety Ordinance (CSO) identified four segments of Massachusetts Avenue where installing separated bike lanes is challenging due to unique complicating factors, which include the MBTA's overhead bus wires, the median and major bus stops. The four segments are collectively referred to as the MassAve4. The CSO requires that the City Manager and City Council approve a recommended approach and timeline by May 1, 2022 or separated bike lanes are required to be installed via quick-build methods.

Recommendation – The recommendation is to implement separated bike lanes through **partial construction for the segments of Massachusetts Avenue with the overhead MBTA bus wires and median (Segments A and B) and full construction for the Harvard Square bus stops (Segments C and D)**. These recommendations were developed through an extensive community engagement process including two well-attended virtual meetings, five in person pop-up events, an on-line survey and review meetings with the City's Bike, Pedestrian and Transit Advisory Committees. City staff, including the Economic Development Division, have also been meeting with local businesses, business groups, the Commission for Persons with Disabilities and neighborhood associations to review the Cycling Safety Ordinance. A full summary of the community engagement is included in the attached report.



Through the community engagement process, city staff heard strong support for the small businesses that are a key piece of what makes this corridor so special. The recommended construction approach removes the median and allows the separated bike lanes to be implemented and maintain one side of parking (if the MBTA overhead bus wires are also removed). This ability to maintain 40 to 50% of curb uses such as accessible parking, customer parking, loading, and outdoor dining is one of the key drivers behind the recommendation to move forward with construction and was strongly supported by the community.



Recommended Approach

Segments A & B

Partial Construction is recommended for Segments A & B, as it best meets the needs of the community while also offering a shorter implementation timeline than full construction.

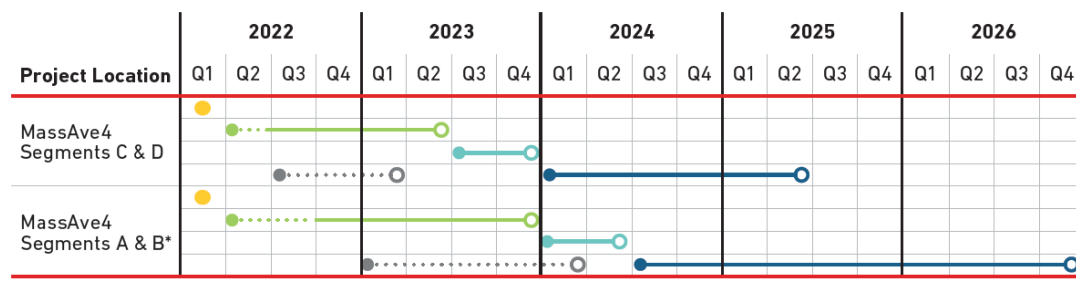
Some small segments in constrained areas may require full construction such as the Walden Street intersection, which has been considered in the proposed cost and timeline estimates.

Segments C & D

Full Construction is recommended between Plympton Street and Garden Street to provide safe and comfortable facilities for all users through these high volume bus stop areas.



Estimated Implementation Timeline



*Construction timeline may involve multiple contracts, with phasing to be informed by scope of construction and impacts to the community

Pending City Council approval, the MassAve4 segments will proceed into the design stage to determine the design specifics for each segment. The community will have multiple ways to provide feedback on the segment designs through engagement opportunities such as pop-up events and community meetings. Implementation will be phased along with other major construction projects in the city to reduce disruptions during construction.

The schedule and cost estimates provided in this report are based on the information available at this time. Detailed construction phasing will be further developed as the design progresses and we understand more about the scope of the improvements and impacts on utilities.

The timeline for completion of the improvements is based on the best available information. As we work with the community to develop the detailed designs, we will have more information on the full scope of the projects and also develop a strategy for how best to phase the improvements to mitigate the impacts of construction. The estimated budget for these projects (\$40M for Segments A & B and \$15M for Segments C & D) is being included in the recommended budget that will be forwarded to City Council in May.

Status of MBTA Overhead Bus Wires – The MBTA has discontinued the electric trolley buses, de-energized the overhead bus wires, and appropriated \$25,000,000 for the renovations of the bus facility at Trolley Square to support the Battery Electric Buses (BEBs) that will be replacing the electric trolley buses. As part of these renovations, the MBTA has committed to removing the entirety of the overhead system (wires, poles and electrical conduit), but is currently scoping the work to determine what portions will be completed with in-house crews and what portions will need to be contracted out. Staff is meeting regularly with the MBTA to coordinate on our various projects, however, the timeline for the removal of the system is not yet finalized.

Annual Updates – Beginning in 2023, city staff will provide an annual update on the status of the MassAve4 projects as part of the annual report to City Council on the implementation of the Cycling Safety Ordinance.

Very truly yours,

Louis A. DePasquale
City Manager

LAD/mec



MassAve4

Recommendation for Implementation of Separated Bike Lanes

City of Cambridge, Massachusetts



April 2022

Overview

The Cycling Safety Ordinance identifies four segments of Massachusetts Avenue where installing separated bike lanes is challenging due to unique complicating factors, which include significant underground utilities, major bus stops, a center median, and the MBTA's overhead bus wires.

The four segments, collectively referred to as the MassAve4 project, are defined as follows:

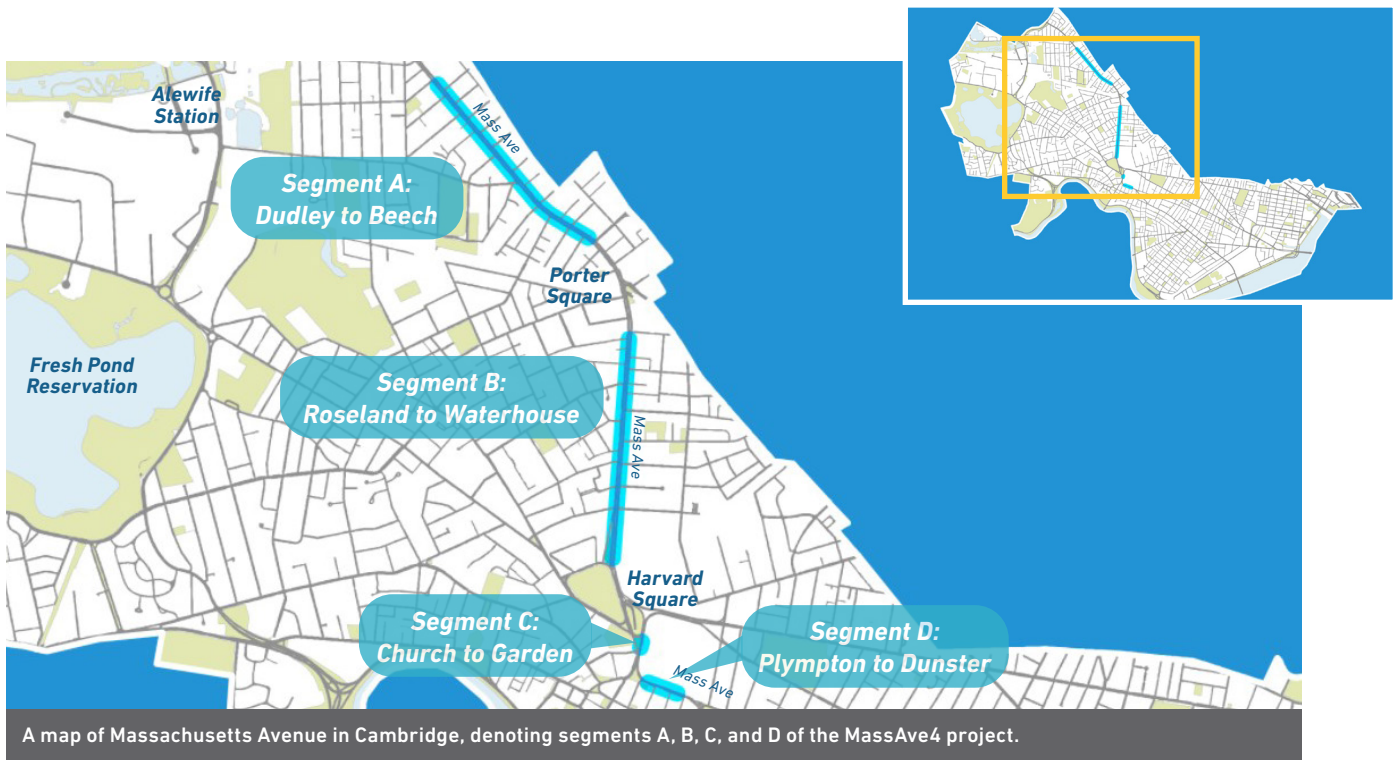
- Dudley Street to Beech Street (A);
- Roseland Street to Waterhouse Street (B);
- Church Street to Garden Street (C); and
- Plympton Street to Dunster Street (D).

The City published an impact analysis on the MassAve4 project in April 2021. This City Council report summarizes the continued analysis and community engagement completed since the initial MassAve4 impact analysis. It evaluates potential street layouts, and the resulting recommendations, estimated costs, and proposed timelines for implementation. The Cycling Safety Ordinance (CSO) requires the City Council to approve the recommended approach and timeline by May 1, 2022.

Mass Ave Segments

Segments A & B include overhead wires that power trolley buses and provide access to the MBTA's bus facility at the north end of the study area. These overhead wires cause access issues for the Fire Department, as separated bike lanes with parking would no longer allow fire trucks to set up under the wires as they do today. The existence of a center median in these segments also presents challenges for emergency response vehicles traveling down the corridor and limits the ability for travel lanes to be removed in order to provide parking regardless of whether the overhead wires are removed.

Segments C & D include busy bus stop areas in Harvard Square where several MBTA bus routes, as well as Harvard and MASCO shuttles, pick up and drop off passengers. Several buses also need to layover or wait between their last stop and first stop at these locations. As a result, the typical quick build solutions used at less busy bus stops are not appropriate.



A map of Massachusetts Avenue in Cambridge, denoting segments A, B, C, and D of the MassAve4 project.

Mass Ave: Segments A & B

Dudley Street to Beech Street (A) & Roseland Street to Waterhouse Street (B)

In Segments A and B, Mass Ave generally features two travel lanes in each direction, painted bike lanes, parking, and a concrete median. These segments also include overhead bus wires that provide power to trolley buses that travel Mass Ave to access the MBTA bus facility at Dudley Street. In order to allow for construction activity for projects in Cambridge and Watertown, the MBTA has de-energized the overhead wires along Mass Ave and other streets for five years. Strategies are currently under development to ultimately remove the wires and replace the trolley buses with battery electric buses, however, the timeline for the removal of the wires is not yet finalized.

Mass Ave is an important multimodal street for regional, commercial, and local trips. Approximately 1,100 bicyclists use the Mass Ave corridor during peak periods. Currently, these segments of Mass Ave serve three bus routes, providing service to up to 5,700 weekday passengers. These routes experience significant delay during peak hours, as well as during other hours of the day. Several intersections along

these segments of Mass Ave feature traffic signals to help facilitate pedestrian crossings and movements from side streets. Many of these traffic signals are located on the median. There are also crosswalks that are controlled by pedestrian activated flashing beacons, where the median serves as a crossing island, providing a safe place for pedestrians to wait after crossing two lanes of traffic. Some intersections also provide dedicated vehicle turn lanes where additional vehicular capacity may be required.

The curb lane serves different purposes along the corridor, including parking, commercial loading, bus stops, and outdoor dining. These existing curbside uses support the small businesses along Mass Ave as well as the surrounding neighborhood. Mass Ave is also a critical utility corridor, providing services for residents and businesses along Mass Ave and the broader neighborhood and community. Construction impacts associated with different design alternatives and opportunities for utility improvements were explored at a high level to help evaluate options.



Fire access constraints due to overhead wires.

Mass Ave: Segments A & B

Dudley Street to Beech Street (A) & Roseland Street to Waterhouse Street (B)

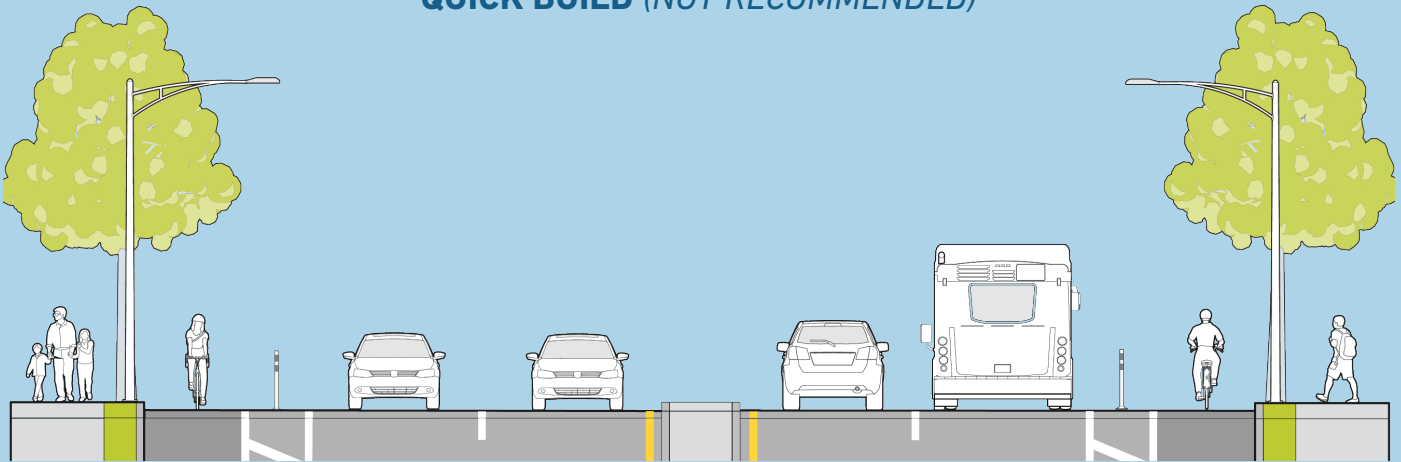
Three levels of construction were evaluated for Segments A & B of Mass Ave. **Quick build** maintains all existing sidewalks and medians, and implements separated bike lanes with paint and flex post barriers. **Partial construction** would remove the center median – except at key pedestrian crossing locations – and sidewalks would remain as they are today. **Full construction** involves reconstructing all of the street infrastructure, including sidewalks and underground utilities, and provides the opportunity to construct sidewalk level separated bike lanes, where feasible.

If the median and overhead wires are removed, parking could be provided on one side of the corridor, but there is not enough space to provide parking

on both sides while maintaining two travel lanes in each direction. Parking could change sides along the corridor where needed. The exact location of parking, commercial loading, and outdoor dining will be determined in later stages of design. Opportunities to provide additional parking on side streets will also be explored during future project stages.

Potential impacts related to utilities, signals, and curbside uses were examined at a high level for each construction scenario to help compare and evaluate options. A summary of the three construction scenarios and their impacts is provided below.

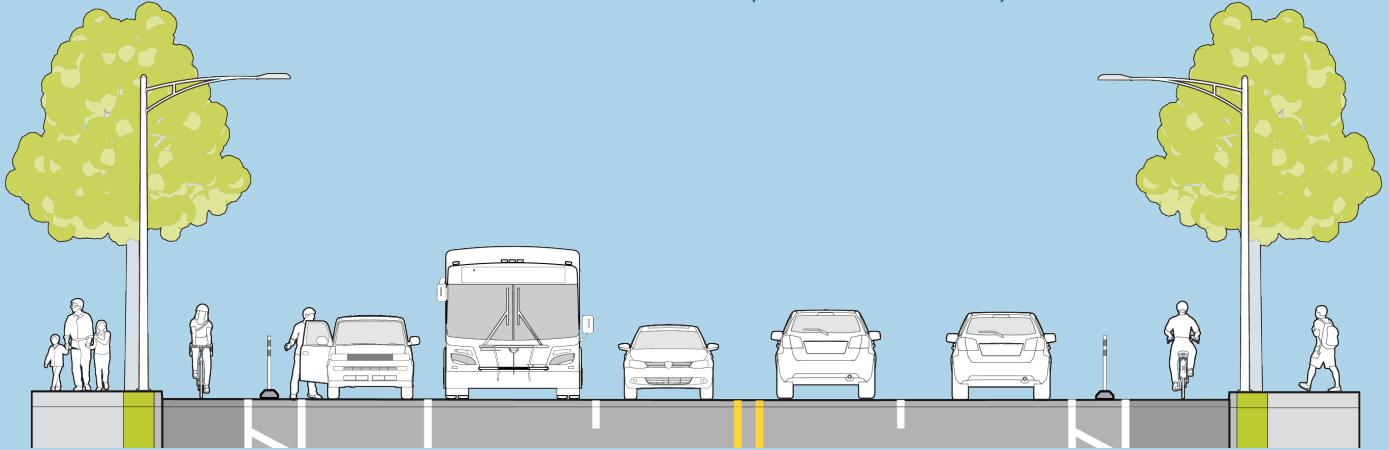
QUICK BUILD (NOT RECOMMENDED)



- Flex-post bike lane separation
- 0-5% parking maintained (accessible spaces only)
- Can accommodate dedicated bus lanes

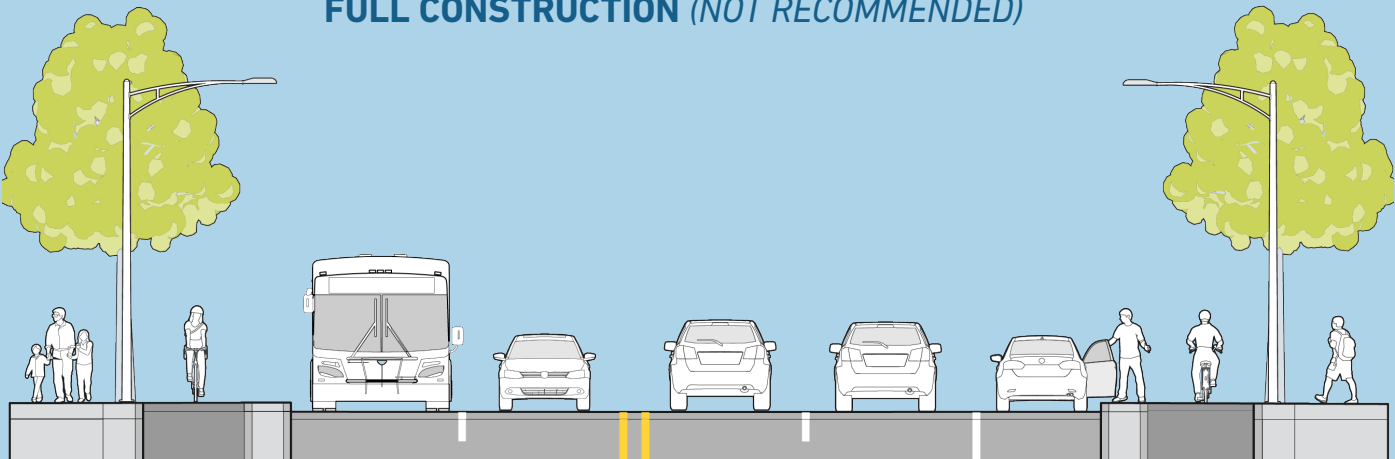
- Lowest impact on utilities
- Shorter implementation timeline (1-2 years)
- Lower overall cost (< \$2 million)

PARTIAL CONSTRUCTION (RECOMMENDED)



- Flex post or curbed bike lane separation
- Median removed, but upgraded at pedestrian crossings
- Can accommodate dedicated bus lanes and improvements at bus stops
- Upgrades to affected utilities
- No sidewalk upgrades or reconstruction, except for accessible curb ramps
- 40-50% parking possible to maintain on one side of the street if overhead wires are removed
- Medium implementation timeline (4-6 years)
- Medium cost (approximately \$40 million)

FULL CONSTRUCTION (NOT RECOMMENDED)



- Opportunity to provide raised separated bike lanes
- Median removed but upgraded at pedestrian crossings
- Sidewalk reconstruction and new plantings/amenities
- Can accommodate dedicated bus lanes and other transit improvements
- Major utility upgrades
- 40-50% parking possible to maintain on one side of the street if overhead wires are removed
- Longer design and implementation timeline (up to 10 years)
- Higher cost (\$100s of millions)

Mass Ave: Segments C & D

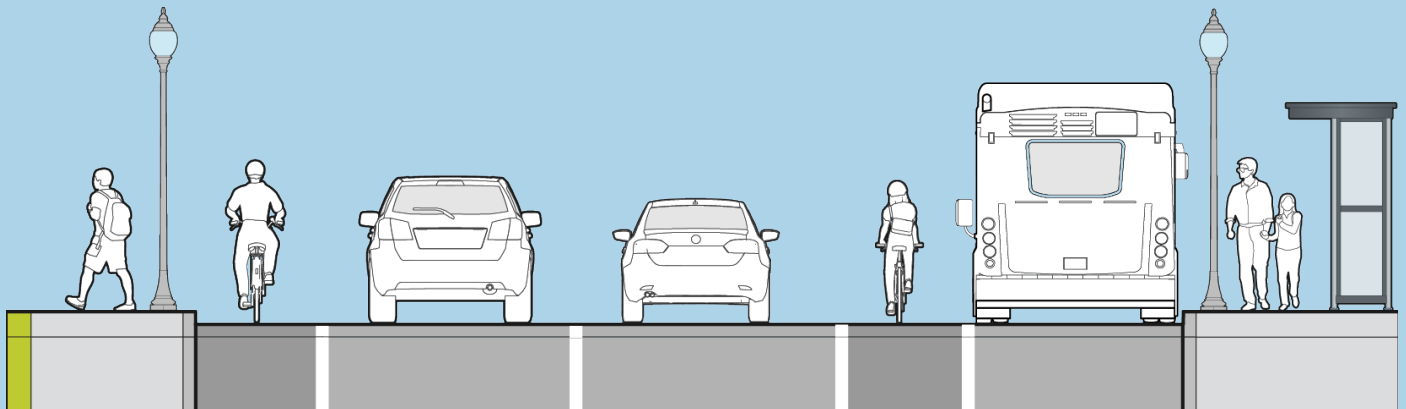
Church Street to Garden Street (C) & Plympton Street to Dunster Street (D)

Several MBTA bus routes and shuttles servicing Harvard and the Longwood Medical Area use the existing stops at Johnston Gate and Holyoke Street. Over 2,800 MBTA bus riders use the Holyoke stop on weekdays. The majority of riders exit the bus here, while bus operators wait to start return trips to Kendall, Lechmere, or Nubian Square in Boston. Approximately 800 passengers use the Johnston Gate stop daily, most of whom are using this stop to board the bus. The existing bike lanes in this area are located between the travel lanes and the areas where buses pull over to service stops.

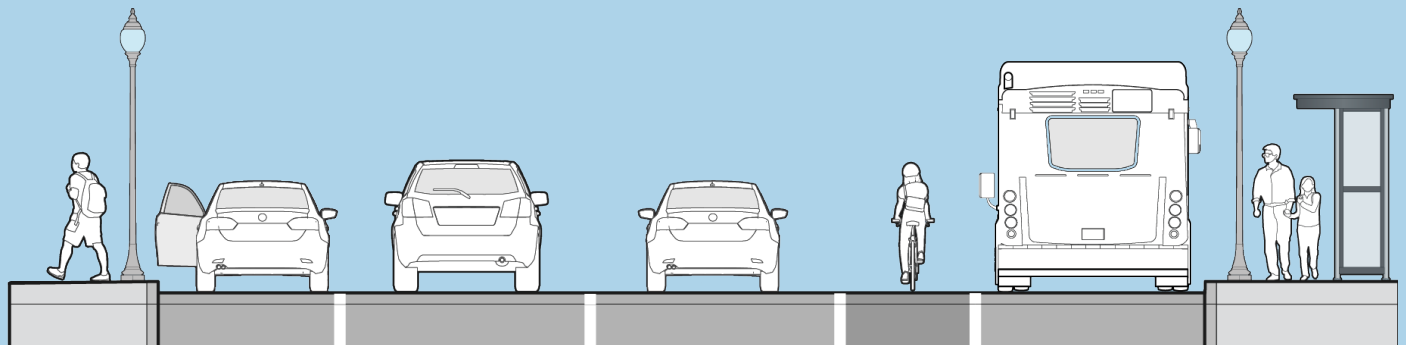
Two levels of construction were evaluated for Segments C & D of Mass Ave. **Quick build** bike lanes use paint and flex posts to provide separation,

however, buses share space with bikes at bus stops. Options to utilize temporary bus islands to expand bus stop areas past the curb present accessibility and maintenance challenges and would not accommodate the high number of bus riders and bicyclists in these areas. They may also conflict with existing utilities and are therefore not preferred.

Full construction will allow for bike lanes to be raised to sidewalk level and for bus stop islands to be placed next to the curb to reduce conflicts between bicyclists and boarding or alighting passengers at each stop.



Existing Conditions: Church Street to Garden Street



Existing Conditions: Plympton Street to Dunster Street

Mass Ave: Segments C & D

Church Street to Garden Street (C) & Plympton Street to Dunster Street (D)

Due to heavy bus stop activity and the need for bus layovers, quick build bike lanes are not recommended for Segments C & D. **Full construction is recommended for Mass Ave between Plympton Street and Garden Street**, as highlighted below, to ensure

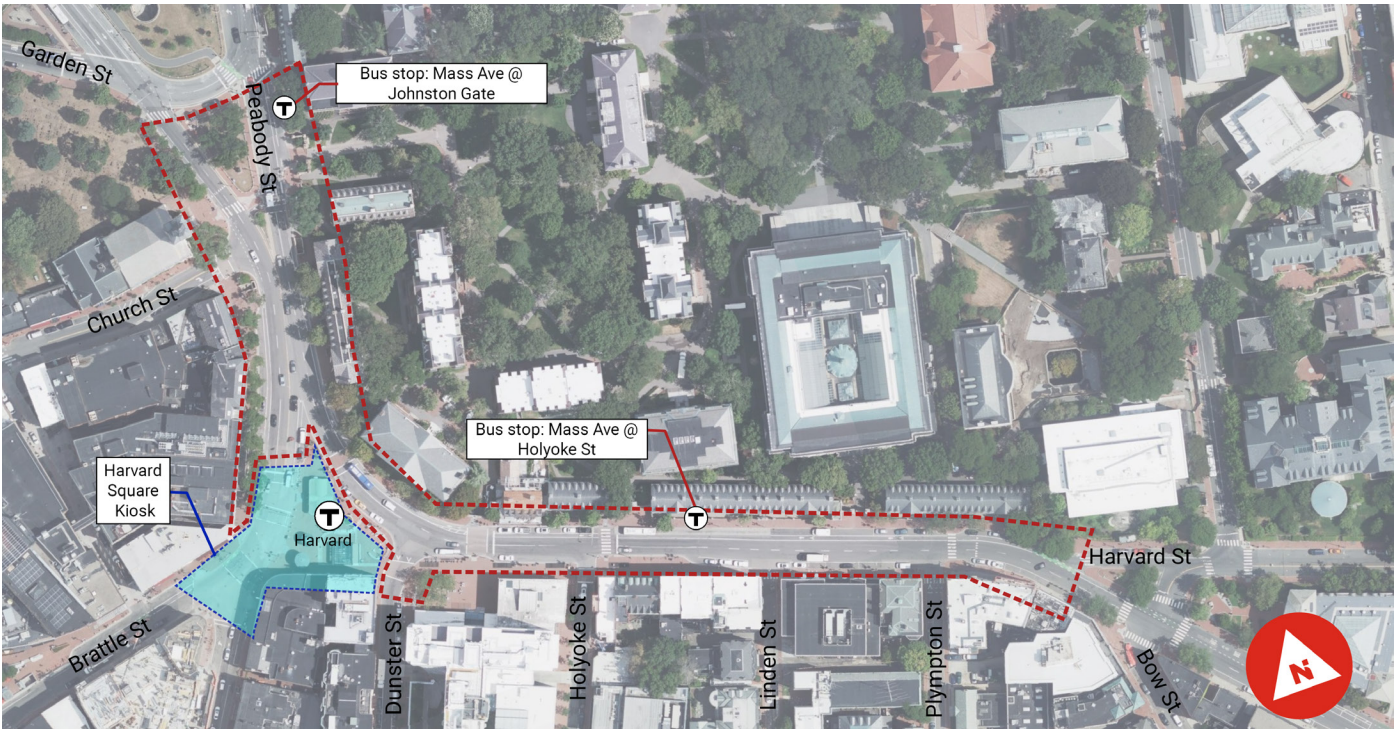
continuity between the bus stops and to provide safe and comfortable facilities for all users. This is estimated to cost approximately \$15 million.



An example of a quick-build shared bike lane and bus stop. (Not Recommended)



An example of a full construction bus boarding island with raised bike lane. (Recommended)



The proposed Segment C & D project area, highlighting the Harvard Square Kiosk, a major civic space, and key bus stops.

Community Engagement & Feedback

Public Engagement - Phase 1

To provide information and obtain feedback on Segments A&B of the MassAve4, the City used a multi-pronged strategy involving both digital and in-person outreach in November 2021.

Project Summary Video

Four In-Person Pop-Up Events

Online Survey

Questions/Comments via Email

Common themes and topics of interest from the community included:

- Expand separated bike lanes on Mass Ave;
- Provide short-term and customer parking for businesses;
- Remove the center median to provide additional design flexibility; and
- Improve the experience for people walking and taking the bus.

“Crossing Mass Ave is extremely frightening”

“Please... retain parking to help small businesses survive”

“I love all the shops and restaurants”

“Consider the needs of ... elderly and disabled in the area”

“I love seeing people walk around and eat outside”

“Bike travel is much more dangerous than it should be”

“We need separated bike lanes”

“Parking for us will be challenging if taken away”



November 2021 Pop-Up Engagement Event

Public Engagement - Phase 2

Draft recommendations were shared with the community for all four segments of MassAve4 in March 2022 to gather additional feedback and gauge support for the proposed design direction.

Presentation to Joint Bike, Ped, Transit Committees

Two Virtual Community Meetings

In-Person Pop-Up Event

Online Survey

Questions/Comments via Email

Across multiple engagement formats, the following emerged as common themes:

- Public support for the draft recommendations, as they:
 1. Meet the goals of the Cycling Safety Ordinance
 2. Improve multimodal safety
 3. Preserve loading and short-term parking for local businesses
- Specific design concerns will be addressed in the next project phase. The public emphasized the importance of the following elements:
 1. Providing parking to support local businesses
 2. Improving bike and pedestrian infrastructure
 3. Balancing the needs of all modes of travel when implementing separated bike lanes



March 2022 Pop-Up Engagement Event

Recommended Approach

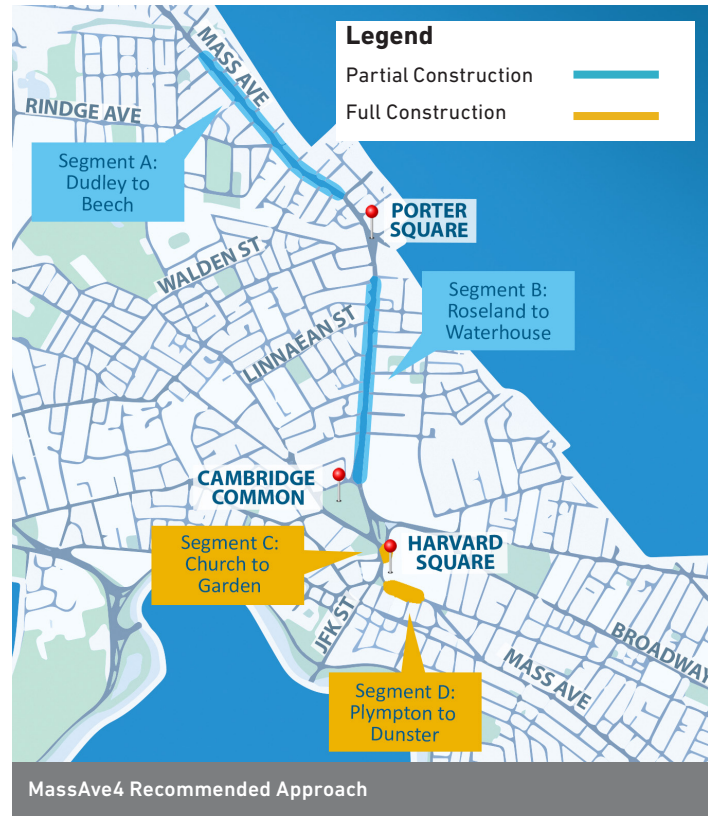
Segments A & B

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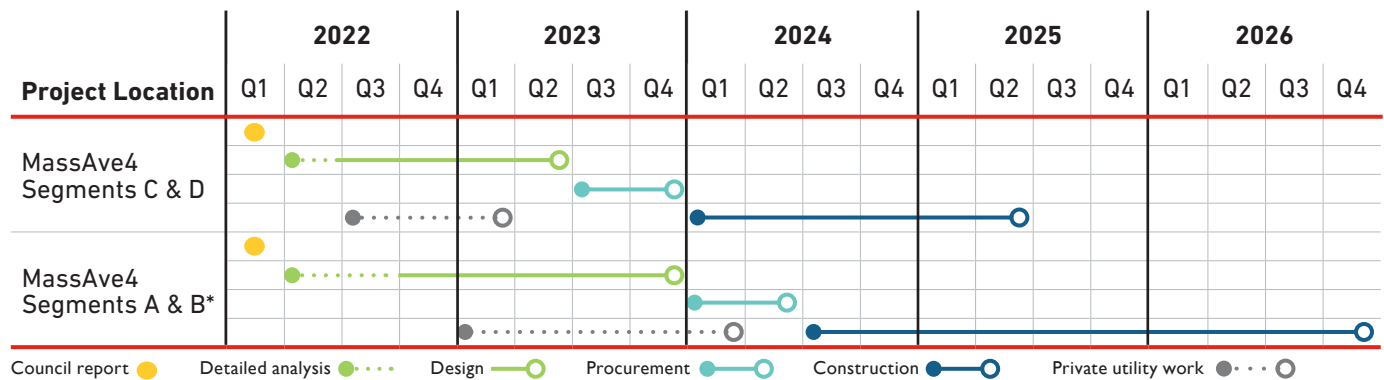
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Attachments

1. **NOVEMBER 2021 - PROJECT SUMMARY VIDEO SLIDE DECK (SEGMENTS A & B)**
2. **NOVEMBER 2021 - ENGAGEMENT SUMMARY**
3. **MARCH 3, 2022 - PUBLIC MEETING SLIDE DECK (SEGMENTS A & B)**
4. **MARCH 10, 2022 - PUBLIC MEETING SLIDE DECK (SEGMENTS C & D)**
5. **MARCH 2022 - ENGAGEMENT SUMMARY**