



**CITY OF
CAMBRIDGE**

Department of
Transportation

Brattle Street Safety Improvement Project

Historical Commission Presentation

December 2025

Project Overview

The City's Cycling Safety Ordinance (2019/2020) required the addition of separated bike lanes on approximately 25 miles of streets in the City within a five-to-seven-year time span.

- Separated bicycle lanes are physically separated from vehicle lanes, typically by elevation or vertical elements, such as flexible delineator posts, curbs, etc.
- The location of these facilities is informed by both the 2020 Cambridge Bicycle Network Vision and specific requirements listed in the Ordinance.
- Brattle Street was identified as needing to have separated bicycle lanes by November 2026.
- The existing "quick build" lanes were installed in two phases: late 2022 and mid-2023.



From Cambridge Bicycle Network Vision.
'Greater Separation' streets shown in magenta.

Project Overview

Photos by Kyle Klein



Prior Reviews

We came before the Historical Commission in 2022 and 2023 to discuss the two phases of the project prior to implementation. We obtained two temporary Certificates of Appropriateness which are due to expire in November 2025.

- Case 4836 – November 9, 2022
 1. Install two-way separated bike lanes on Brattle Street from Mason Street to Craigie Street. The bike lanes shall be separated from the automotive travel lane with flexible delineator posts and concrete curbing.
 2. Modify the curbs and pedestrian ramps at Longfellow Park and at the corner of Willard Street.

- Case 4906 – February 22, 2023
 1. Install separated bike lanes on Brattle Street from Sparks Street to Fresh Pond Parkway. The bike lanes shall be separated from the automotive travel lane with flexible delineator posts and concrete curbing.
 2. Modify curbs and pedestrian ramps.
 3. Remove the existing pedestrian crossing island at Sparks Street.
 4. Install new pedestrian crossing islands at Brattle Street near Appleton, Lowell, Channing, Fayerweather and Lexington Streets.

What we're here to discuss

There were three main aspects of the initial applications:

1. Bicycle Lane Separation

- Flexible delineator posts
- Precast concrete curbing

2. Curbing Changes

- Pedestrian crossing island removed at Sparks Street
- Curb extensions reduced at Longfellow Park and at Willard Street
- Pedestrian crossing islands constructed at Brattle Street near Appleton Street, Lowell Street, Channing Street, Fayerweather Street, and Lexington Street.

3. Traffic Signal Infrastructure

- Not installed as part of this project, but included as potential future options
 - Flashing crosswalk beacons (RRFBs) at Brattle/Sparks, Brattle/Craigie, and/or Brattle/Lexington if deemed necessary by engineering study in the future.

1. Bicycle Lane Separation

The Commission asked us to minimize the use of flexible delineator posts to the greatest extent possible. In response, we chose Brattle Street as a test location for precast concrete curbing, a separation option that was already being used in Boston. Here's what we said initially:

1. Precast Concrete Curbs

- Reduce visual clutter
- More durable material

2. Flexible Delineator Posts

- Higher visibility
- Installed at driveways, side-streets, **bends in the roadway**
- Provide clarity to road users, plow operators
- **Additional flex-posts may be needed based on ongoing operations needs**



Rendering of Brattle Street using both flexible delineator posts and precast concrete curbing

1. Bicycle Lane Separation – Brattle Street Update

Observations and adjustments since installation:

- Reflective tape was installed on both ends of every precast curb for greater visibility at night.
- Additional flex posts were installed as needed at tapers/bends in roadway to increase visibility of the precast curbs.
 - Willard Street and Longfellow Park
- Minimal movement/dislodgment of precast curbs.
 - Only 2 of 211 needed to be reset in three years.
- Not enough snowfall for full DPW assessment, but anything more than 6" makes seeing curbing difficult without frequent vertical elements.
- Some drivers don't realize they're driving next to the precast curbing and end up scuffing the sides of the barriers and/or damaging tires and rims.



A precast curb was dislodged near Fresh Pond Parkway where there was a missing delineator post. (2025)



Extra posts installed (every 20ft) near Longfellow Park where the lane curves around a curb extension. (2024)

1. Bicycle Lane Separation – General Criteria

In general, we're looking for separation devices that:

- Are designed and tested for roadway use
- Are visible to road users so that they avoid colliding with them (height, reflectivity, visible heft, etc.)
- Keep drivers out areas designated for bicycle travel
- Are durable and cost efficient
- Are readily available for installation and replacement
- Are non-proprietary (have alternatives that are “equal”)
- Do not impede roadway maintenance (street cleaning, plowing, etc.)

Brattle Street provided an opportunity to test alternatives to flexible delineators that:

- Reduce visual clutter by having fewer upright elements vs. standard spacing
- Reduce maintenance needs by being more durable
- Further deter motorist incursion into the bike lane



A separated bike lane on Mass Ave near Central Square. (2021)



A section of precast curbing on Brattle Street on installation day. (2023)

1. Bicycle Lane Separation – Alternatives

~~**STRIPED BUFFER**
1.5 ft. additional width; \$8k-\$16k per lane-mile~~

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	⦿	⦿	⦿	⦿	⦿
AESTHETICS	⦿	⦿	⦿	⦿	⦿

PARKING STOPS
6 in. additional width; \$20k-\$40k per lane-mile

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	⦿	⦿	⦿	⦿	⦿
AESTHETICS	⦿	⦿	⦿	⦿	⦿

~~**RIGID BOLLARDS**
2 ft. additional width; \$100k-\$200k per lane-mile~~

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	⦿	⦿	⦿	⦿	⦿
AESTHETICS	⦿	⦿	⦿	⦿	⦿

DELINEATOR POSTS
1.5 ft. additional width; \$15k-\$30k per lane-mile

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	⦿	⦿	⦿	⦿	⦿
AESTHETICS	⦿	⦿	⦿	⦿	⦿

LINEAR BARRIERS
6 in. additional width; \$25k-\$75k per lane-mile

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	⦿	⦿	⦿	⦿	⦿
AESTHETICS	⦿	⦿	⦿	⦿	⦿

~~**CAST IN PLACE CURB**
12 in. additional width; \$25k-\$40k per lane-mile~~

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	⦿	⦿	⦿	⦿	⦿
AESTHETICS	⦿	⦿	⦿	⦿	⦿

TURTLE BUMPS
1.5 ft. additional width; \$15k-\$30k per lane-mile

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	⦿	⦿	⦿	⦿	⦿
AESTHETICS	⦿	⦿	⦿	⦿	⦿

~~**PARKED CARS**
11 ft. for parking + buffer; \$8k-\$16k per lane-mile~~

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	⦿	⦿	⦿	⦿	⦿
AESTHETICS	⦿	⦿	⦿	⦿	⦿

12" PRECAST CURB
1.5 ft. additional width; \$400k-\$600k per lane-mile

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	⦿	⦿	⦿	⦿	⦿
AESTHETICS	⦿	⦿	⦿	⦿	⦿

LARGE BUMPS
1.5 ft. additional width; \$15k-\$30k per lane-mile

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	⦿	⦿	⦿	⦿	⦿
AESTHETICS	⦿	⦿	⦿	⦿	⦿

JERSEY BARRIERS
2 ft. additional width; \$80k-\$160k per lane-mile

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	⦿	⦿	⦿	⦿	⦿
AESTHETICS	⦿	⦿	⦿	⦿	⦿

~~**RAISED BIKEWAY**
No additional width; \$8m-\$26m per lane-mile~~

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	⦿	⦿	⦿	⦿	⦿
AESTHETICS	⦿	⦿	⦿	⦿	⦿

OBLONG LOW BUMPS
1.5 ft. additional width; \$10k-\$20k per lane-mile

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	⦿	⦿	⦿	⦿	⦿
AESTHETICS	⦿	⦿	⦿	⦿	⦿

~~**PLANTERS**
3 ft. additional width; \$80k-\$400k per lane-mile~~

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	⦿	⦿	⦿	⦿	⦿
AESTHETICS	⦿	⦿	⦿	⦿	⦿

Key:
 Currently used on Brattle Street
X Does not meet ordinance or requires large-scale construction

1. Bicycle Lane Separation – Alternatives cont'd

These types of separation did not have a tall enough vertical element when used alone.



TURTLE BUMPS
1.5 ft. additional width; \$15k-\$30k per lane-mile

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	☹	☹	☹	☹	☹
AESTHETICS	☹	☹	☹	☹	☹



LARGE BUMPS
1.5 ft. additional width; \$15k-\$30k per lane-mile

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	☹	☹	☹	☹	☹
AESTHETICS	☹	☹	☹	☹	☹



OBLONG LOW BUMPS
1.5 ft. additional width; \$10k-\$20k per lane-mile

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	☹	☹	☹	☹	☹
AESTHETICS	☹	☹	☹	☹	☹



LINEAR BARRIERS
6 in. additional width; \$25k-\$75k per lane-mile

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	☹	☹	☹	☹	☹
AESTHETICS	☹	☹	☹	☹	☹

These types of separation were not durable enough.



PARKING STOPS
6 in. additional width; \$20k-\$40k per lane-mile

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	☹	☹	☹	☹	☹
AESTHETICS	☹	☹	☹	☹	☹



RIGID BOLLARDS
2 ft. additional width; \$100k-\$200k per lane-mile

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	☹	☹	☹	☹	☹
AESTHETICS	☹	☹	☹	☹	☹

This type of separation prevented maintenance access.



JERSEY BARRIERS
2 ft. additional width; \$80k-\$160k per lane-mile

PROTECTION LEVEL	+	+	+	+	+
INSTALLATION COST	\$	\$	\$	\$	\$
DURABILITY	☹	☹	☹	☹	☹
AESTHETICS	☹	☹	☹	☹	☹

This is not an exhaustive list of how these alternatives fared against all aspects of our general criteria.

1. Bicycle Lane Separation – Recommendations

The Department of Transportation seeks general placement criteria for bicycle lane separation within the historic district. Flexibility is required to ensure traffic safety issues can be addressed promptly as they arise without continued Commission review of individual post and curb locations.

Proposed placement criteria:

- Precast concrete curbing placed maximum of 20ft apart within runs of curb.
- Flexible delineator posts placed at the start/stop of each run of curb.
- Flexible delineator posts placed minimum of every 40ft within runs of curb.
 - Standard spacing on projects without precast curbs is every 15ft.
 - Option to use black posts if preferred (see photos at right)
- Flexible delineator posts placed minimum of 20ft apart at sharp bends in roadway or at intersections where turning drivers may have issues judging the location of curbs.
- Yellow flexible delineator posts placed on bicycle lane centerline at driveways and intersections to prevent vehicle intrusions. (seasonal, removed for winter maintenance).

The Department may need to make minor modifications to the physical characteristics of the separation elements due to issues such as changes in availability, updated manufacturer specifications, supply chain, discontinued items, etc.



Example: Black flexible delineator posts are an option instead of white if they still have white reflective tape.

2. Curbing Changes

- Pedestrian crossing island removed at Sparks Street
- Curb extensions reduced at Longfellow Park and at Willard Street
- Pedestrian crossing islands constructed at Brattle Street near Appleton Street, Lowell Street, Channing Street, Fayerweather Street, and Lexington Avenue.

Photos by Kyle Klein



Photo: Crossing island at Fayerweather Street intersection.



Photo: Crossing island at Lexington Avenue intersection.

2. Curbing Changes – Sparks St/Craigie St

- We removed the existing crossing island at Brattle St and Sparks St
- This crossing island was installed in 2010 as part of a previous project
- We will replace the island with painted asphalt



Before and after of crossing island removal



Photo: The crossing island that was removed

2. Curbing Changes – Curb Extensions

- We reduced the curb extensions at Willard St and Longfellow Park to widen the roadway enough to fit proper separation and maintain minimum roadway widths at these two pinch points.
- These locations are “bends” in the roadway and have additional flex posts for curbing visibility.



Photo: Curb Extension at Willard Street reduced



Photo: Curb Extension at Longfellow Park reduced

2. Curbing Changes – Crossing Islands

- We constructed raised pedestrian crossing islands at Appleton St, Lowell St, Channing St, Fayerweather St, and Lexington Ave.
- Crossing islands have granite and brick per Commission feedback
- Provide more separation from traffic, slowing vehicle turning speeds
- Reduce conflicts between people biking, walking, and driving
- Provide refuge area for pedestrians to wait and look for drivers first, then people biking and vice versa

Photo: Completed crossing island at Fayerweather St, by Kyle Klein



Photo: Former flush crossing island, which does not protect people from traffic



Rendering: Crossing island provides a protected place to wait to cross

3. Traffic Signal Infrastructure

- Not installed as part of this project, but included in the prior applications as potential future options
 - Flashing crosswalk beacons (RRFBs):
 - Brattle St at Sparks St
 - Brattle St at Craigie St
 - Brattle St at Lexington St
 - Engineering study would deem whether these units are appropriate for installation in the future.
 - Typically the Commission requests as few posts as possible and black-coated signal poles.



Photo: Example of an RRFB on Mass Ave.