

# Storrow Drive/Mugar Way Bicycle Route Feasibility Review

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*July 2023*

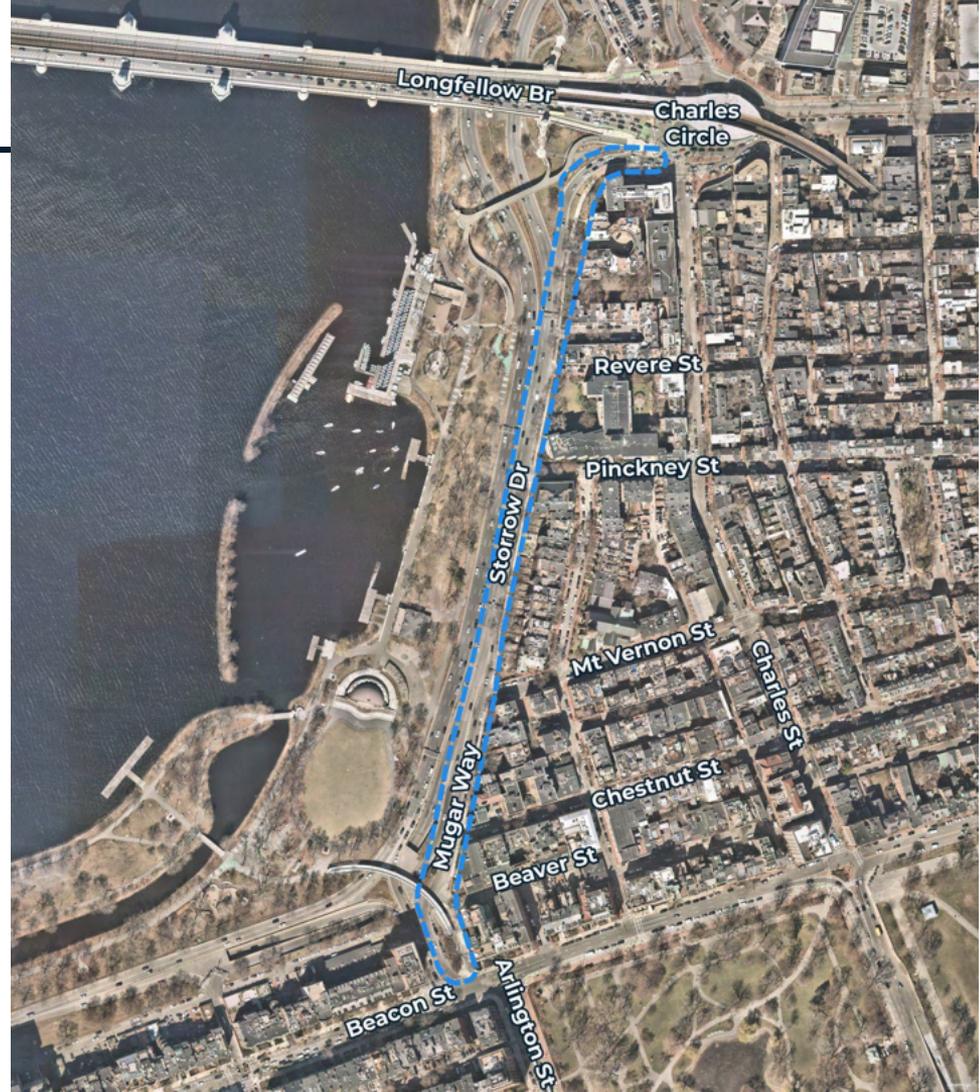
# Introduction

As part of the project [Slow, Safe Charles Street](#), the Boston Transportation Department (BTD) was asked by Beacon Hill community members to evaluate the feasibility of a bicycle route on the east side of Storrow Drive/Mugar Way.

This analysis focuses on the section between Beacon Street and Charles Circle. We considered:

- ▶ Is Storrow/Mugar feasible as a bicycle route under its current conditions?
- ▶ If not, what would it take make it a bike route?

BTD reviewed existing conditions, relevant design standards, and considered possible next steps. This is a summary of our findings.



# Limitations

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The sidewalks and roadways in the study area are assets under the jurisdiction of the Department of Conservation and Recreation (DCR). Therefore, the City of Boston is limited to making a high-level assessment of its suitability as a bicycle route as requested by Beacon Hill residents.

Any decisions about changing its use and design are solely under DCR's purview.

The contents and analysis in this feasibility review are solely those of Boston Transportation Department and have not been specifically endorsed or reviewed by DCR.

# Executive Summary

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Boston Transportation Department staff reviewed existing physical conditions, collected data on pedestrian, bicycle, and vehicle volumes, and reviewed applicable design guidelines.

People are already walking and biking on the sidewalk along Storrow Drive and Mugar Way between Beacon Street and Charles Circle. The existing sidewalk is between 5 - 7 ft. Because of the existing user mix, any changes would need to accommodate both pedestrians and bicyclists.

Based on existing conditions, the sidewalk along Storrow Drive and Mugar Way does not meet the minimum dimensions needed for either a bi-directional shared use path or a one-way northbound bike lane and parallel sidewalk; the minimum necessary dimension is 10' for both. A northbound route using the roadway from Beacon Street to Charles Street is not feasible because vehicle volumes on Storrow Drive are too high to put a bike lane in the roadway.

Storrow Drive/Mugar Way could eventually be a useful shared use path connection. It would be a multi-year project requiring significant reconstruction and impacts including tree removal and utility relocation. Our review is not conclusive of the feasibility of a shared use path even with full reconstruction. While this new path could be a useful part of the regional multimodal path network, it does not negate the need for safe bike routes on City of Boston streets.

DCR would need to lead on a multi-year feasibility, planning, permitting, and construction project to transform this into a shared use path that meets minimum standards. Starting this process would be a decision at the state level, not one the City of Boston can make. Residents are responsible for any championing of the idea with relevant State authorities.

# Existing physical conditions

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# Sidewalk conditions

There is a sidewalk along the east side of Mugar Way and Storrow Drive between Beacon Street and Charles Circle.

1. From Beacon Street to Beaver Place, there is a **33'** wide plaza area at the landing of the Arthur Fiedler Footbridge.
2. Between Beaver Place and Mount Vernon Street, the sidewalk is **7'** wide with utilities and signposts along the edge.
3. Just north of Mount Vernon Street, there are two pinch points of **4'** due to a streetlight post and a low clearance sign.
4. Parallel to Storrow Drive, the sidewalk is **5'** wide next to a **7'** grass buffer strip with trees, utility poles, and signage.
5. Just south of West Hill Place, the sidewalk widens to a typical width of **8'**, which continues to Charles Circle.

Most of the sidewalk is concrete except for a brick section approaching Charles Circle and at the corner of Beaver Place. The surface condition is generally fair to good.



Above left: pedestrians walking on the 7' wide sidewalk between Mount Vernon Street and Chestnut Street.

Above right: a person walking on the 5' sidewalk next to Storrow Drive.

# Road conditions

There are three main roadway sections in the study area:

1. Between Beacon Street and Mount Vernon Street, Mugar Way functions as a frontage road and onramp to Storrow Drive. This section has a typical width of 24', one general purpose lane, and parking along the east side.
2. About 120' north of Mount Vernon Street, Mugar Way merges into Storrow Drive eastbound. After merging into Storrow Drive, the roadway is 39.5' wide and has three general purpose lanes.
3. North of Charles River Square, the roadway becomes an exit from Storrow Drive to Charles Circle. This section is 26' and carries two general purpose lanes.



# Existing trees, streetlights, and signs

There are 16 mature trees in the study area

- ▶ 7 between Beacon Street and Beaver Place
- ▶ 7 between Mount Vernon Street and Charles Circle located in the grass buffer between the sidewalk and Storrow Drive eastbound
- ▶ 2 between Mount Vernon Street and Charles Circle located in the grass buffer between the sidewalk and brick privacy wall

There are 15 streetlights and utility poles in the study area. On the section parallel to Storrow Drive eastbound, they are located in the grass buffer between the roadway and sidewalk.

There are also several highway-scale signs with posts on the sidewalk or grass buffer between the roadway and sidewalk. Numerous smaller signs are also posted along the edge of the sidewalk or in the grass buffer.



# Existing usage patterns

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# Data collection

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We collected turning movement count data for motor vehicles, pedestrians, and bicyclists at:

- ▶ Mugar Way at Mount Vernon Street
- ▶ Storrow Drive at Revere Street

Data were collected on the following dates and with the following weather conditions:

- ▶ Wednesday, June 7, 2023
  - High 65F, Low 56F, mostly cloudy
- ▶ Thursday, June 8, 2023
  - High 65F, Low 56F, mostly cloudy
- ▶ Saturday, June 17, 2023
  - High 67F, Low 58F, cloudy with periods of light to heavy rain

For this analysis, we reviewed data collected on Wednesday, June 7, 2023 as indicative of typical weekday conditions.

Abnormalities were noted for Thursday, June 8, 2023 related to a traffic detour on Storrow Drive.

Data collected on Saturday, June 17, 2023 may not show typical pedestrian and bicycle volumes due to periods of heavy rain.

# Walking and biking on Storrow/Mugar

People are walking and biking on the sidewalk on Storrow Drive and Mugar Way.

- ▶ **273-362** pedestrians per day
- ▶ **109-151** bicyclists per day
  - About **70%** were going northbound
  - It is possible some bicyclists are already using it as a northbound alternative to Charles Street
- ▶ On the same date (6/7/23), we counted **11,177** pedestrian movements and **667** bicyclists at the Charles Street/Revere Street intersection.



# Vehicle volumes are *high*

Over **57,500** vehicles per day used Storrow Drive, just in the eastbound direction.

- ▶ The volume of traffic would require separation from the roadway to create a safe, comfortable bike route.

**6,240** vehicles per day used Mugar Way northbound approaching Mount Vernon Street. As a state-owned street, it may be subject to meeting the [MassDOT recommended threshold](#) for bike lanes separated from traffic.

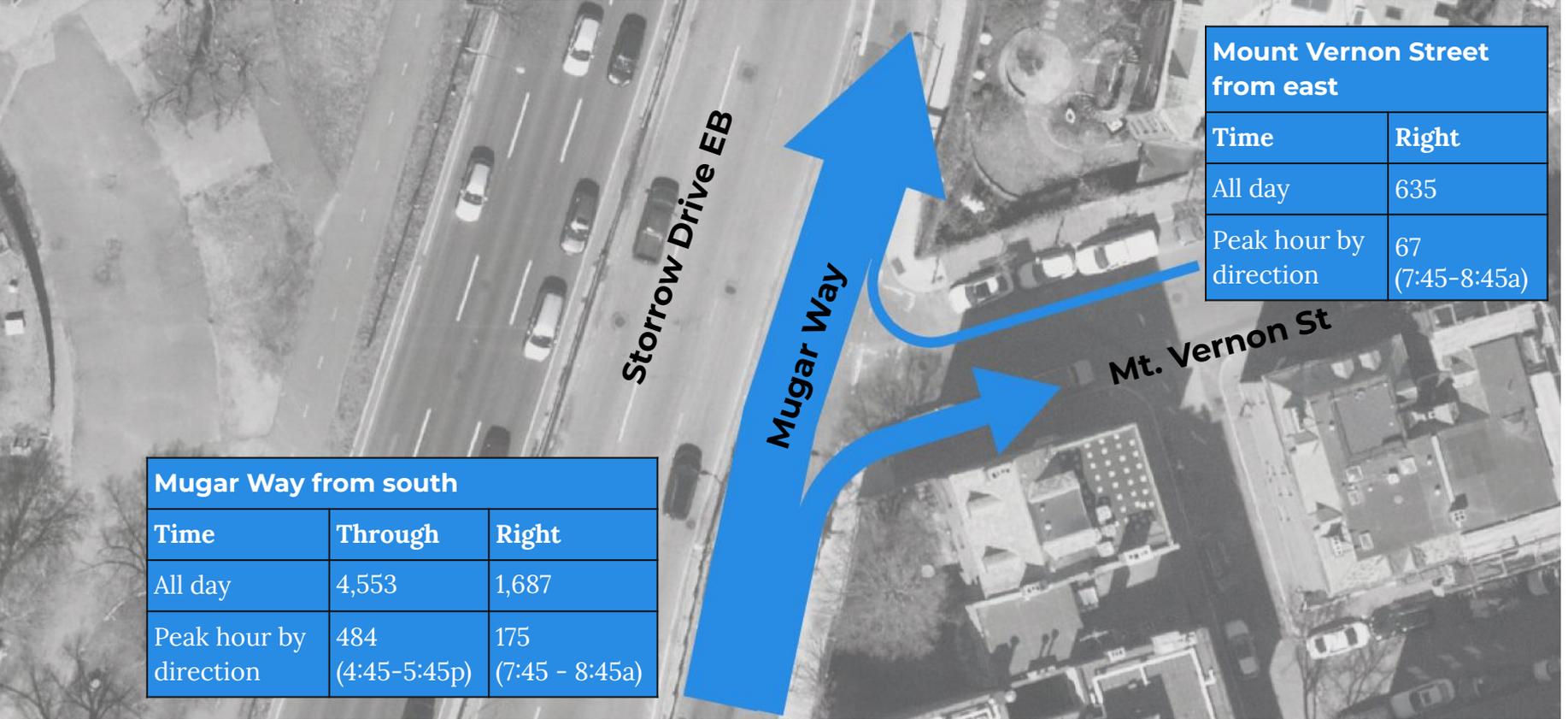
- ▶ As noted by the community, this could be accommodated by restricting parking on Mugar Way.

Special design attention would be needed to mitigate high numbers of conflicts between turning vehicles and bicyclists:

- ▶ **251** right-turning vehicles during peak hour from Storrow Drive to Revere Street
- ▶ **175** right-turning vehicles during peak hour from Mugar Way to Mount Vernon Street



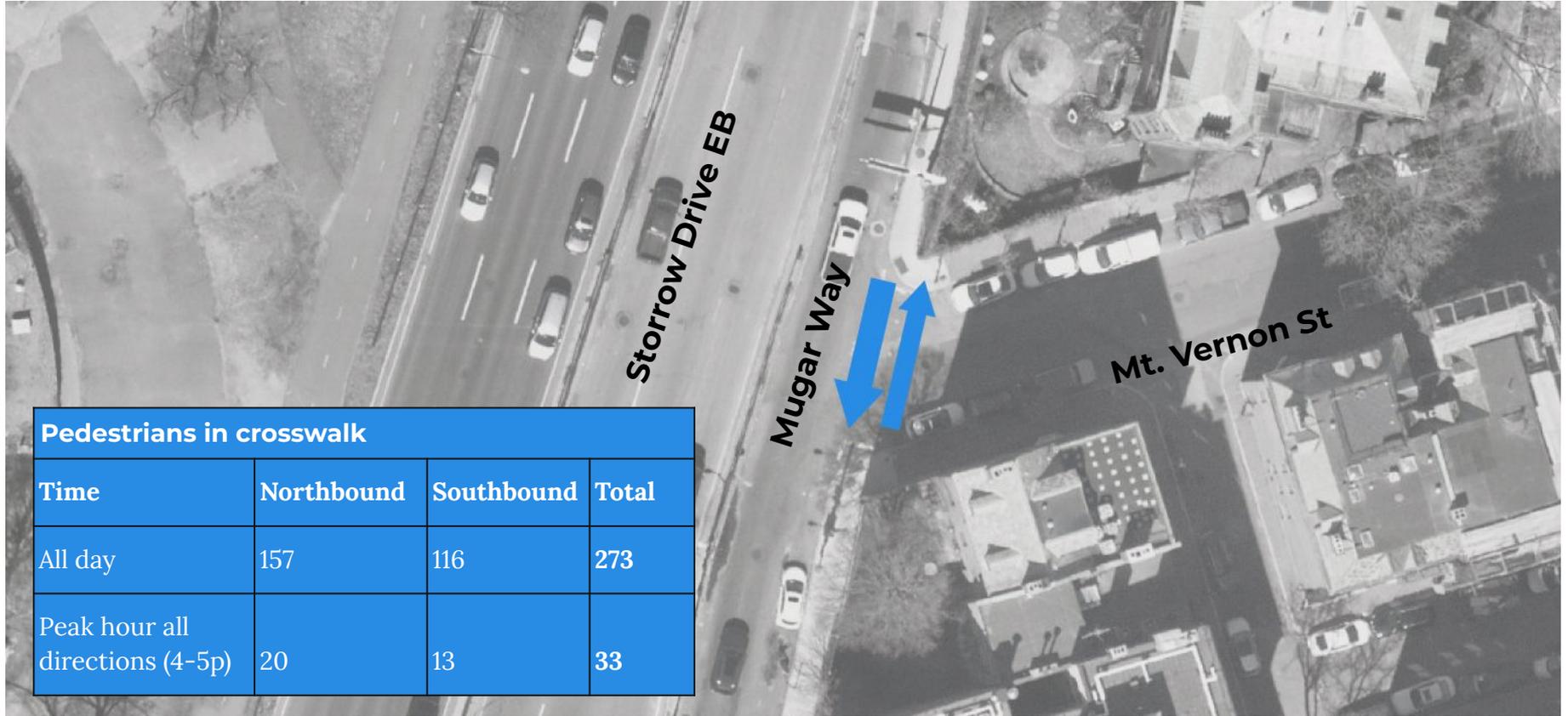
# Mugar at Mt. Vernon: Motor vehicles



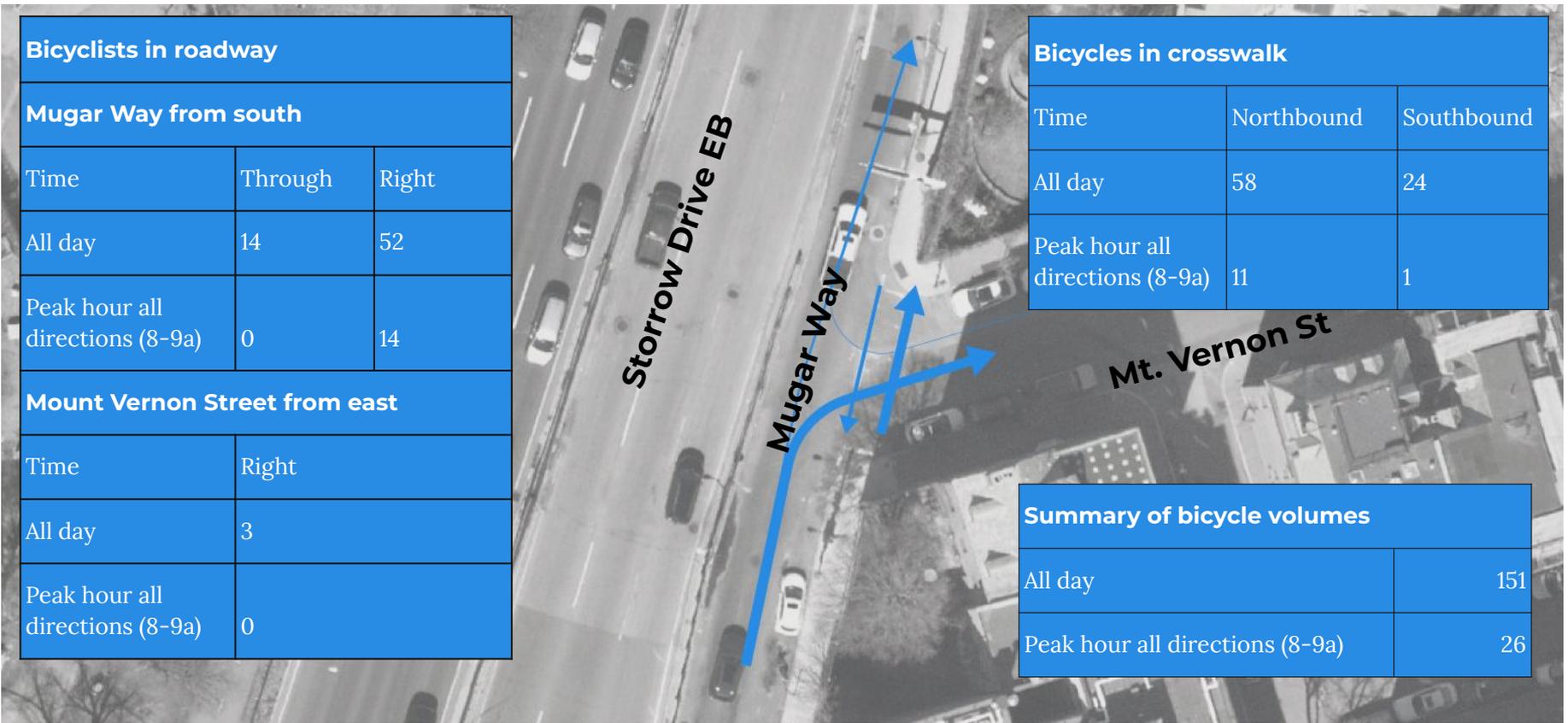
Mugar Way from south		
Time	Through	Right
All day	4,553	1,687
Peak hour by direction	484 (4:45-5:45p)	175 (7:45 - 8:45a)

Mount Vernon Street from east	
Time	Right
All day	635
Peak hour by direction	67 (7:45-8:45a)

# Mugar at Mt. Vernon: Pedestrians



# Mugar at Mt. Vernon: Bicyclists



## Bicyclists in roadway

### Mugar Way from south

Time	Through	Right
All day	14	52
Peak hour all directions (8-9a)	0	14

### Mount Vernon Street from east

Time	Right
All day	3
Peak hour all directions (8-9a)	0

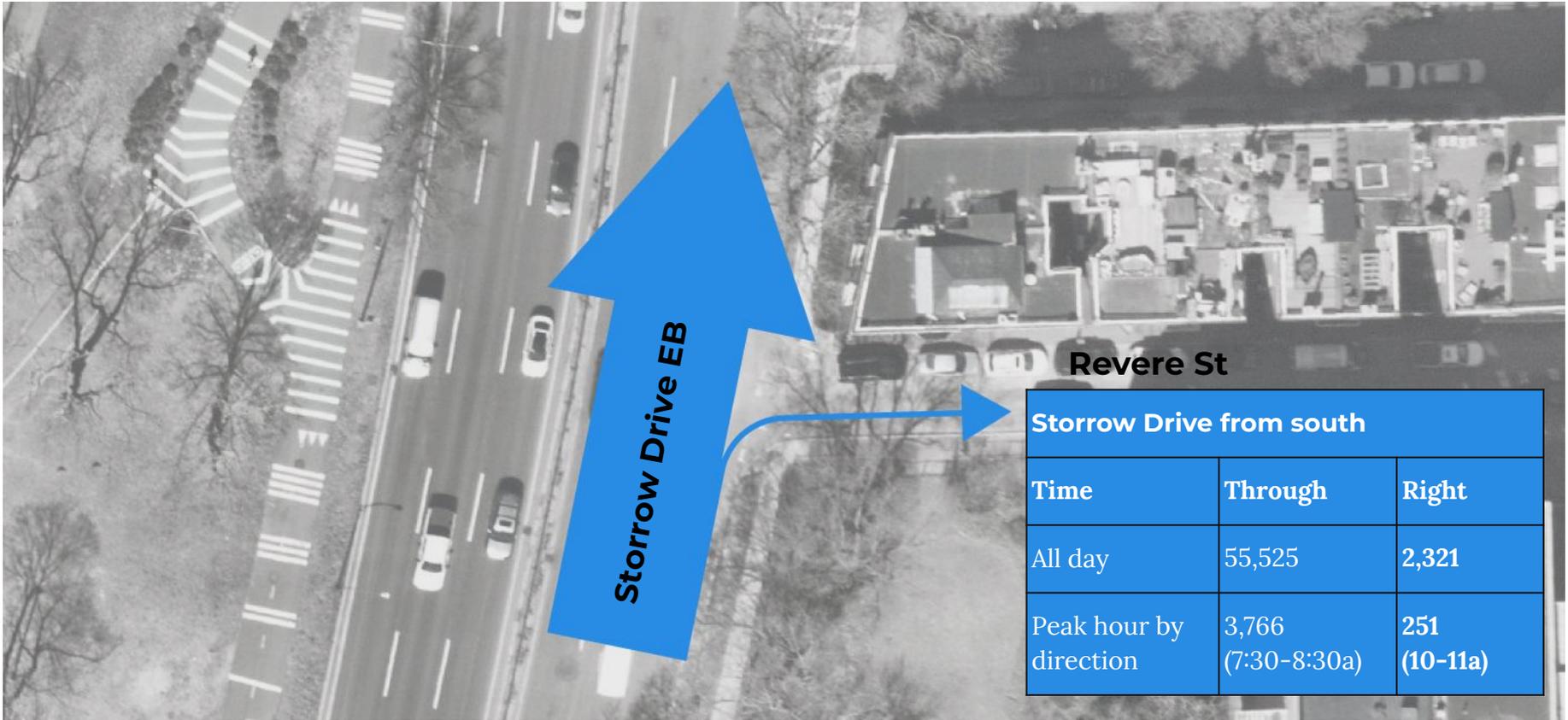
## Bicycles in crosswalk

Time	Northbound	Southbound
All day	58	24
Peak hour all directions (8-9a)	11	1

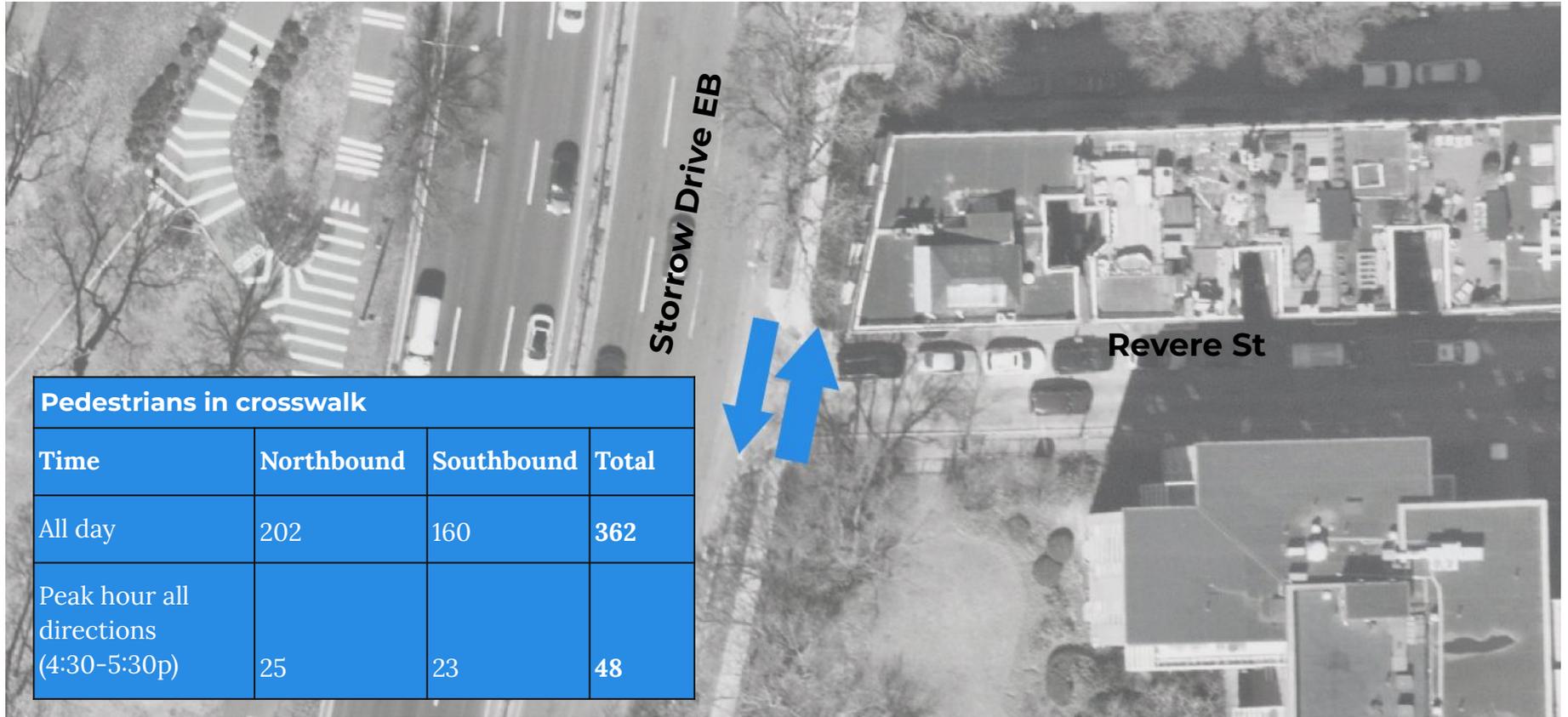
## Summary of bicycle volumes

All day	151
Peak hour all directions (8-9a)	26

# Storrow at Revere: Motor vehicles

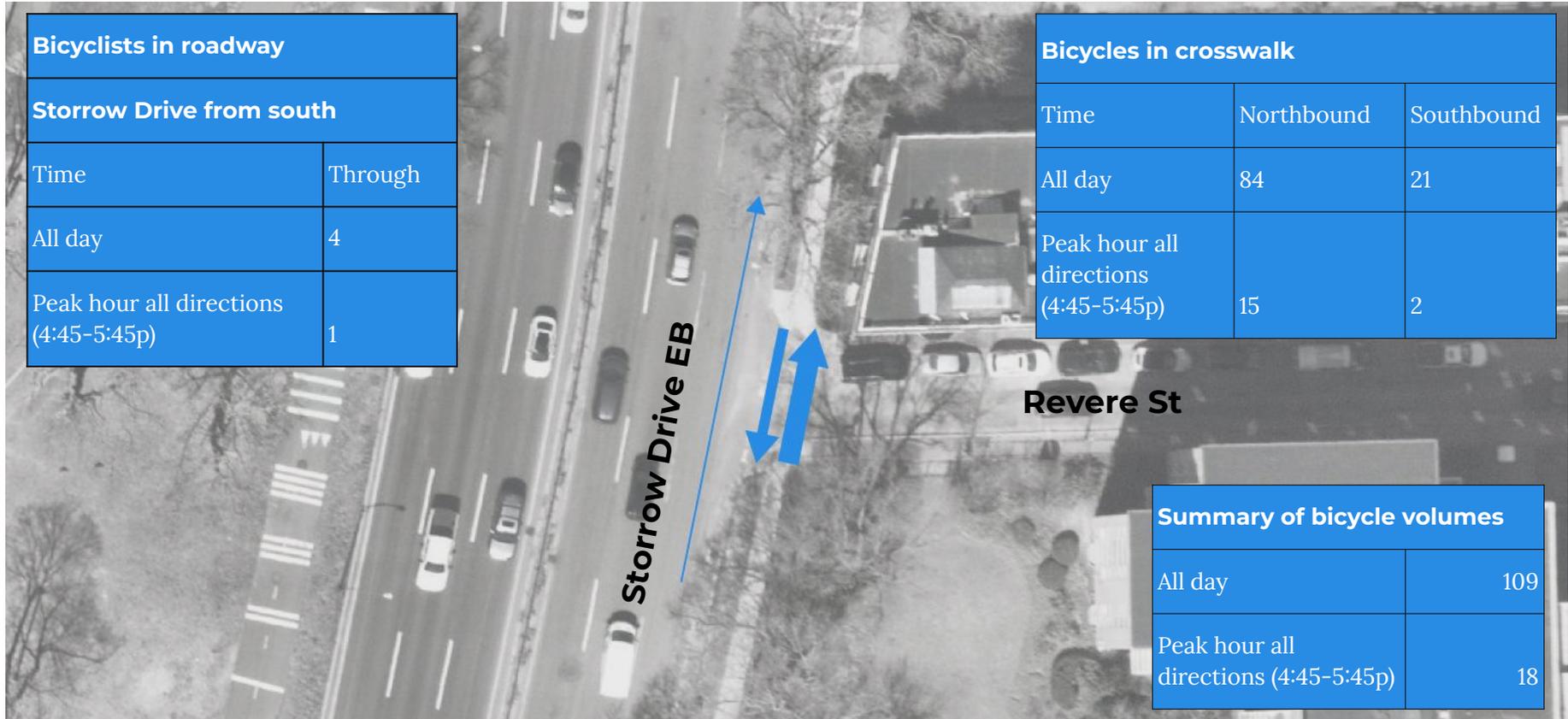


# Storrow at Revere: Pedestrians



Pedestrians in crosswalk			
Time	Northbound	Southbound	Total
All day	202	160	362
Peak hour all directions (4:30-5:30p)	25	23	48

# Storrow at Revere: Bicyclists



# Feasibility as a bicycle path

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# Applicable design standards

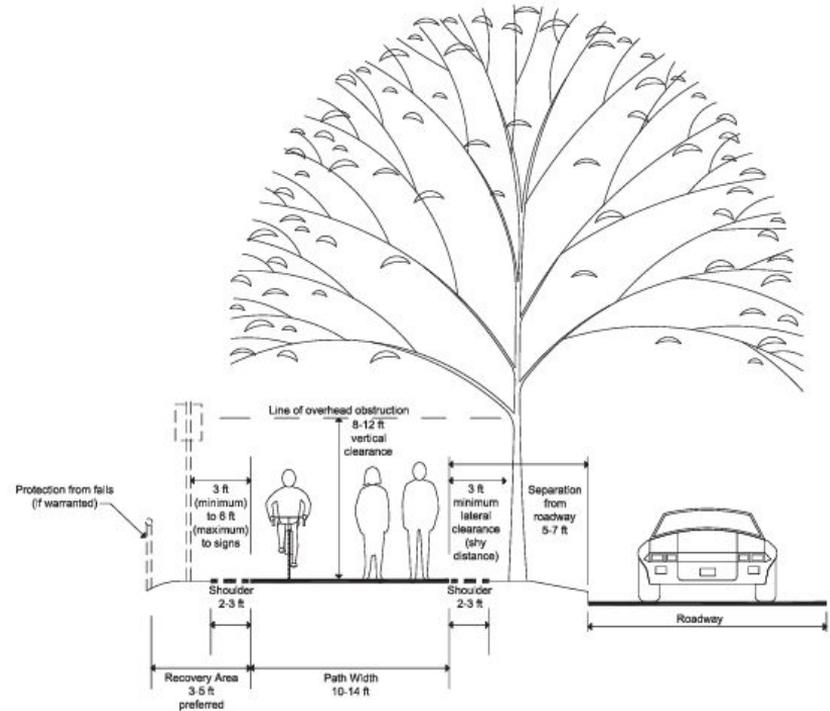
Transportation engineers follow certain design standards issued by relevant local, state, and federal authorities.

**We are using these standards to evaluate existing facilities for use changes (e.g., designating an existing sidewalk for shared pedestrian and bicycle use).**

Based on design standards from American Association of State Highway and Transportation Officials (AASHTO) and the Massachusetts Department of Transportation (MassDOT) for bi-directional shared use paths:

- ▶ A shared use path should be **10' wide** at minimum
- ▶ The path should have **3'** of clearance from the edge of the path to signs, trees, and fences
- ▶ And at least **5'** of distance from the edge of a roadway shoulder

Exhibit 11-2  
Shared Use Path Dimensions



# Route directionality

We were asked to explore if the Storrow/Mugar sidewalk could be a *one-way northbound only* route for bicyclists.

For this to be the case, it would need to meet these minimum requirements:

- ▶ 5' minimum for walking, plus
- ▶ 5' minimum for biking

Examples of such facilities exist and are called a sidewalk next to a one-way separated bike lane or “dual pathway.” Other considerations include:

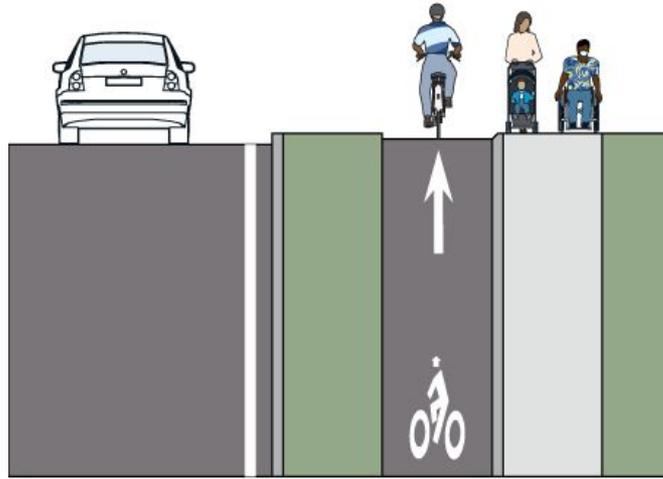
- ▶ There would need to be clear delineation between pedestrian and bicycle space, typically through different surface materials.
- ▶ For accessibility, a detectable edge would be needed between the sidewalk and bike lane.



Above: example of a sidewalk next to a separated bike lane in South Burlington, VT. The bike lane is paved in asphalt and the sidewalk is paved in concrete.

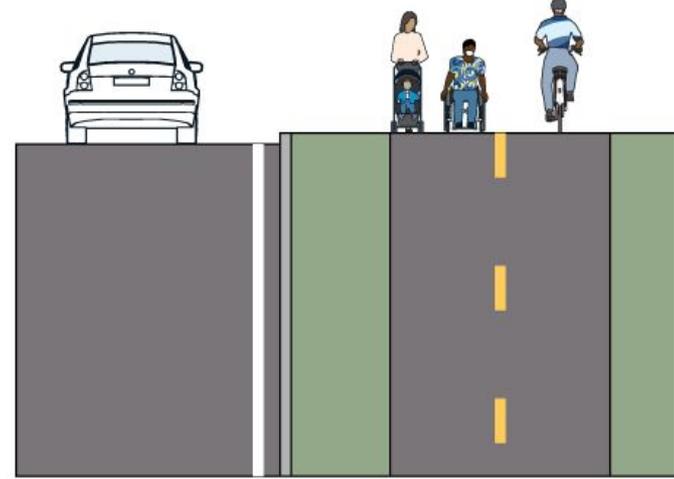
# Minimum space needs

Sidewalk and one-way separated bike lane



10'  
minimum

Bi-directional shared use path



10'  
minimum

Either configuration **requires 10' minimum** to meet minimum design standards. The space is needed to allow for safe, comfortable passing.

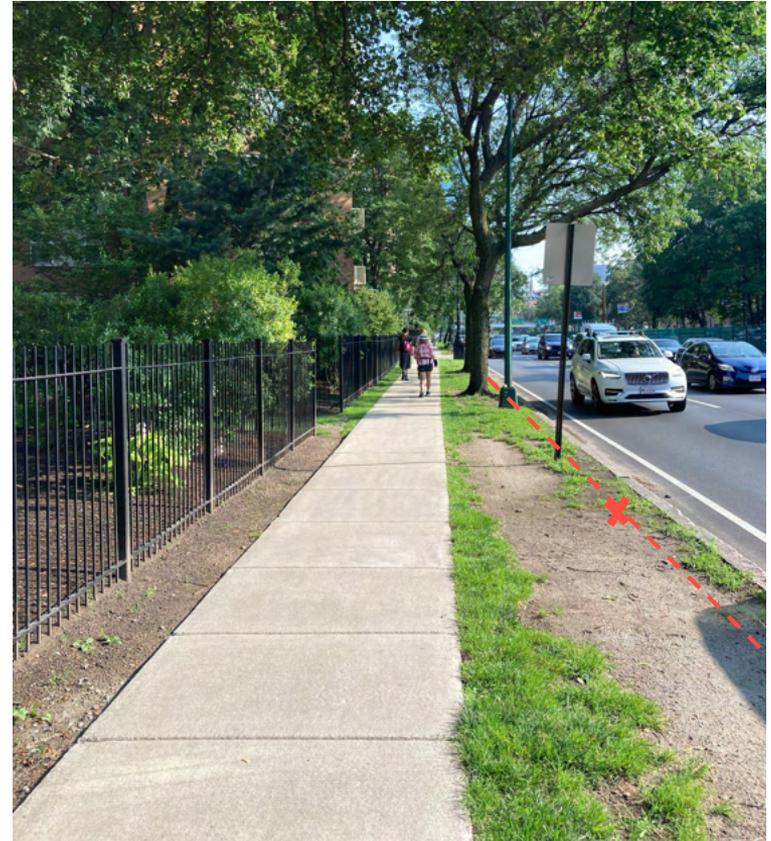
# Sidewalk width constraints

The typical sidewalk width in this section is 5', with several narrower pinch points.

While this width is acceptable for a sidewalk, **it's half of the 10' needed for a shared use path or a side-by-side sidewalk/one-way separated bike lane.**

Other challenges:

- ▶ Areas with poor visibility due to brick privacy walls exist along the route.
- ▶ Curb ramps are narrower than 10' wide



Above: a red "x" shows where the approximate edge of a 10 foot wide path would be.

# Pedestrian/bicycle conflicts

The narrowness of the sidewalk would create conflicts between pedestrians and bicyclists.

- ▶ BTD has consistently heard from Beacon Hill residents about negative interactions between pedestrians and bicyclists.
- ▶ Encouraging people to bike on the Storrow Drive/Mugar Way sidewalk would be inconsistent with our shared goal of reducing user conflicts.

Well-designed streets and shared use paths can help ease conflicts by providing adequate width for different users and setting expectations.



# Beacon Street to Mugar Way

The City is planning to [realign the intersection at Beacon/Arlington/Mugar](#). This is an opportunity to improve the bike connection to Mugar Way.

The large plaza area is busy with pedestrians, though. DCR would need to clarify expectations through markings, a change in surface material, and/or signage.

- ▶ If done well, fewer people may choose to bike over the Fiedler.



# Mugar Way to Mount Vernon Street

On Mugar Way between Beacon Street and Mount Vernon Street, separated bike lanes would be recommended given daily vehicle volumes and desire to minimize conflicts between people walking and those bicycling.

- ▶ DCR prefers full construction to separate bike lanes from vehicle lanes. The Boston Public Works and Transportation Departments could be asked to maintain the bike lane.
- ▶ Sixteen parking spaces would be removed. We understand that residents and DCR would likely be supportive of this trade-off.



Above: red dashed lines shows the approximate location of where a constructed median might go.

# Onramp changes at Mount Vernon Street

To transition from an in-street bike lane to a shared use path, the on-ramp at Mt. Vernon Street would need to be realigned.

Today, the ramp and sidewalk are squeezed to 23' between the edge of the onramp and a brick privacy wall. This space also contains a streetlight and overhead signpost.

Changes to the Storrow Drive retaining wall and angle of onramp are likely necessary to provide an accessible path.



Above: a red dashed line shows where the approximate edge of a 10 foot wide path would be. A blue solid line shows the narrowest constrained dimension in the Storrow onramp area.

# Storrow would need a bike path separate from the roadway

Adding a bike lane to the Storrow Drive eastbound roadway is infeasible.

- ▶ Given high volumes, separation with a minimum buffer distance of 5' from the roadway would be needed to achieve safe, comfortable bicycling.

While it would be possible to have a partial in-road bicycle route on Mugar Way south of Mount Vernon Street, **it is not possible to have a continuous northbound bike route using the roadway.**



# Curb realignment on Storrow Drive eastbound

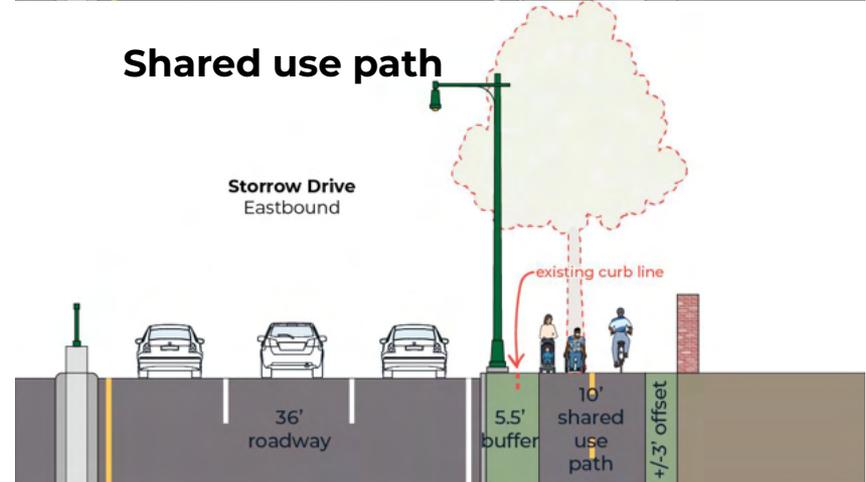
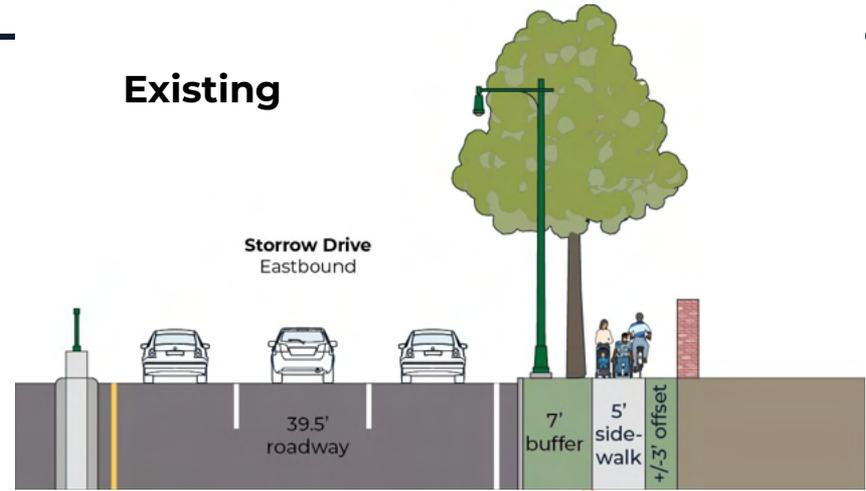
Meeting the state's minimum design standards would require reconstruction.

For example, on the section parallel to Storrow Drive eastbound, the curb would have to be moved at least 3.5' to achieve a minimum shared use path width of 10'.

- ▶ A 5.5' buffer to the roadway is recommended to also accommodate the 3' offset to street lights.
- ▶ A fence and/or new tree plantings are possible.

This would also require narrowing the travel lanes on Storrow Drive. **We are not sure if this would be acceptable or not; DCR engineers would need to make this determination.**

**Mature trees would need to be removed: our review suggests 7-9 removed trees.** Street lights, signs, and other street furniture would need to be relocated.



# Storrow Drive to Charles Circle

The route would end in busy sidewalk/plaza space at Charles Circle, setting up conflicts with pedestrians.

Additional changes to material, pavement markings, and signage is necessary to connect the new shared-use path to sidewalks and streets.



# Conclusions

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# Potential as a future bicycle route

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Storrow Drive/Mugar Way could eventually be a useful shared use path connection. It may shift people heading north on bikes away from the Fiedler, where cycling is prohibited, to the Appleton Bridge. However, it would be a multi-year project requiring significant reconstruction and impacts including tree removal and utility relocation.

**Our review is not conclusive of the feasibility of a shared use path even with full reconstruction.** The City of Boston took on this review at the request of residents in Boston. The Massachusetts Department of Recreation and Conservation (DCR) owns most of the assets discussed in this review. DCR would need to perform its own assessment of this route as a potential addition to its network of off-street paths.

DCR has not reviewed nor endorsed this report nor its findings.

# Probable steps for a DCR planning process:

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- ▶ Storrow/Mugar is not part of the [DCR Parkways Master Plan](#): it would be a new project, requiring new funding.
- ▶ Residents and representatives of the City of Boston would need to champion this new project with relevant State authorities.
- ▶ [Storrow Drive is a historic parkway, listed in 1978](#). This means additional oversight and approvals from multiple agencies in order to make the changes necessary. DCR's project team would need to confer with their legal team to map out this process and confirm key approvals.
- ▶ Construction may require temporary and/or permanent easements from private property owners abutting Mugar Way and Storrow Drive. DCR would need to work through right-of-way issues with abutters.

# Our team's conclusions

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- ▶ Storrow Drive/Mugar Way cannot function as a bicycle route in its current physical condition.
- ▶ **DCR would need to lead on a multi-year feasibility, planning, permitting, and construction project to transform this into a shared use path that meets minimum standards.**
  - Starting this process would be a decision at the state level, not one the City of Boston can make alone.
- ▶ While this new path could be a useful part of the regional multimodal path network, it does not negate the need for safe bike routes on City of Boston streets.