CITY OF CAMBRIDGE

TRAFFIC, PARKING, + TRANSPORTATION

Garden Street Safety Improvement Project Report on Two-Way Traffic Alternatives

To: Yi-An Huang, City Manager

From: Brooke McKenna, Commissioner

Date: March 26, 2025

Subject: Awaiting Report 2024-68

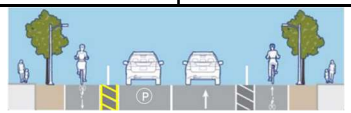
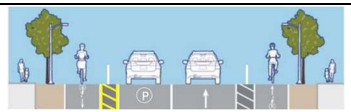
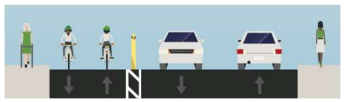
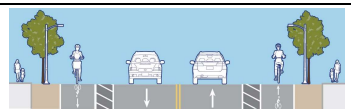
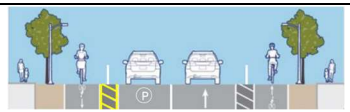
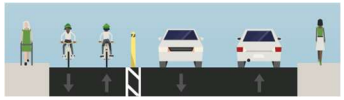
In response to Awaiting Report 24-68 requesting that the City Manager work with the Traffic, Parking, and Transportation Department and Harvard University to restore Garden Street to two-way automobile traffic while preserving two-way protected bike lanes, preserving as much parking on and/or near Garden Street as possible and identifying potential areas for resident parking on neighboring streets and communicating the changes to the affected neighborhood, we report the following:

Executive Summary

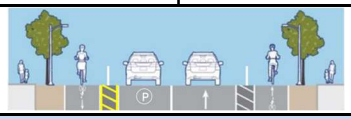
This report summarizes three previously contemplated layouts for Garden Street along with an additional option that includes a full two-way street for drivers for the length of the project area, stretching from Huron Avenue to Mason Street. Included towards the end of the report, there are considerations for the City Council to weigh as they review and discuss these options. As with most street design projects, there are trade-offs when new elements are added – which in this case was separated bike lanes – because width of our streets is limited. The options reviewed range from keeping the existing configuration that includes as much parking and loading as possible, to a two-way vehicle travel option with no parking or loading at all. Two other options consist of a mix of the parking and vehicle travel direction trade-offs. Overall, preserving or increasing the parking supply and restoring two-way traffic represent competing needs.

The following pages summarizes the four options reviewed as part of this report. For simplicity, we do not include a discussion of Garden Street between Concord Avenue and Mason Street, as none of the alternatives considered would make changes to that area.

✓ Meets Goal
◑ Goal Partially Met
✕ Does Not Meet Goal

	Section A Huron Ave to Linnaean St	Section B Linnaean St to Shepard St	Section C Shepard St to Concord Ave	Policy Order Goals 2-way driving	 2-way biking	 Parking/ loading
Option 1 (current)				✕	✓	✓
Biking	One-way (both sides)					
Driving	One-way travel (EB)					
Option 2				◑	✓	✓
Biking	Two-way (south side)	One-way (both sides)				
Driving	Two-way travel	One-way travel (EB)				
Option 3				◑	✓	◑
Biking	Two-way (south side)	One-way (both sides)				
Driving	Two-way travel		One-way travel (EB)			
Option 4				✓	✓	✕
Biking	Two-way (south side)					
Driving	Two-way travel					

✓ Meets Goal
◑ Goal Partially Met
✕ Does Not Meet Goal

	Section A Huron Ave to Linnaean St	**Section B** Linnaean St to Shepard St	**Section C** Shepard St to Concord Ave	**Policy Order Goals** 2-way driving	2-way biking	Parking/ loading
Option 1 (current)				✕	✓	✓
Biking	One-way (both sides)					
Driving	One-way travel (EB)					

Option 1 keeps Garden Street as it is today. This consists of one-way vehicle traffic from Huron Avenue to Concord Avenue, with one-way bike lanes on both sides of the street. There is parking and loading access on one side of the street between Linnaean Street and Concord Avenue.

Goal 1. *Restore two-way vehicle traffic*

- Does not meet goal. This option does not meet this policy order goal and instead maximizes parking and loading access.

Goal 2. *Preserve two-way protected bike lanes*

- Meets goal. This option would require no changes to ensure bi-directional bicycle access as it is in effect today.
- The community process favored the current setup of one-way bike lanes on both sides of the street.

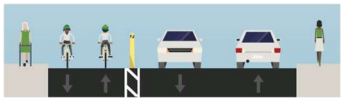
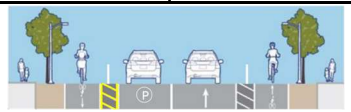
Goal 3. *Preserve parking/loading*

- Meets goal. This option (along with Option 2) provides the most parking and loading access.
- Of the 67 parking spaces between Linnaean Street and Concord Avenue before the project was installed, this option maintains 52 of them.

Cost and Timeline Estimates

- Cost: $25,000. Timeline: Summer 2025
- Restoring aspects of the project that were disturbed by recent construction and paving are covered by a combination of the contractor (Eversource) restoration activities and the City through maintenance contracts.

✓ Meets Goal
◑ Goal Partially Met
✕ Does Not Meet Goal

	Section A Huron Ave to Linnaean St	Section B Linnaean St to Shepard St	Section C Shepard St to Concord Ave	Policy Order Goals 2-way driving	 2-way biking	 Parking/ loading
Option 2				◑	✓	✓
Biking	Two-way (south side)	One-way (both sides)				
Driving	Two-way travel	One-way travel (EB)				

Option 2 adds two-way vehicle travel between Huron Avenue and Linnaean Street alongside a two-way separated bike lane on the south side of the street. From Linnaean Street to Concord Avenue, there would remain one-way vehicle traffic, with one-way bike lanes on both sides of the street. There is parking and loading access on one side of the street between Linnaean Street and Concord Avenue.

Goal 1. *Restore two-way vehicle traffic*

- Goal partially met. This option restores a section of Garden Street to two-way traffic between Huron Avenue and Linnaean Street, but keeps the one-way between Linnaean Street and Concord Avenue.
- This change could allow some drivers who are currently using Raymond Street to instead return to using Linnaean Street to Garden Street when heading to the north.
- This could potentially reintroduce additional vehicle trips to Linnaean Street, which had experienced a decline in vehicle trips after the project was completed.

Goal 2. *Preserve two-way protected bike lanes*

- Meets goal. This option includes a two-way separated bike lane on the south side of the street between Huron Avenue and Linnaean Street and one-way separated bike lanes on both sides of the street between Linnaean Street and Concord Avenue.
- The community process favored one-way bike lanes on both sides of the street and this option has that layout between Linnaean Street and Concord Avenue. The two-way section between Huron Avenue and Linnaean Street is in a lower vehicular volume section with fewer connecting side streets, which may mitigate some of the concerns about two-way bike lanes.
- This option requires changes to the Huron Avenue and Linnaean Street traffic signals to reintroduce two-way traffic and to cross people biking over to the other side of the road. This may increase delay for drivers.

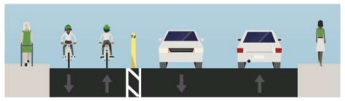
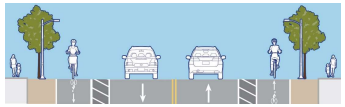
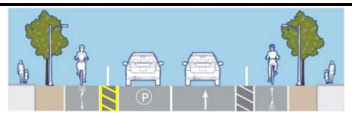
Goal 3. *Preserve parking*

- Meets goal. This option (along with Option 1) provides the most parking and loading access.
- Of the 67 parking spaces between Linnaean Street and Concord Avenue before the project was installed, this option maintains 52 of them.

Cost and Timeline Estimates

- Cost: $87,000. Timeline: Fall 2025
- Aspects of the project that were disturbed by recent construction and paving would be restored in a temporary Option 1 layout by contractor (Eversource).
- The City would pay for design, installation, and outreach costs associated with changing a portion of the project.

✓ Meets Goal
◑ Goal Partially Met
✕ Does Not Meet Goal

	Section A Huron Ave to Linnaean St	Section B Linnaean St to Shepard St	Section C Shepard St to Concord Ave	Policy Order Goals 2-way driving	 2-way biking	 Parking/ loading
Option 3				◑	✓	◑
Biking	Two-way (south side)	One-way (both sides)				
Driving	Two-way travel		One-way travel (EB)			

Option 3 adds two-way vehicle traffic between Huron Avenue and Shepard Street. From Shepard Street to Concord Avenue, there would remain one-way vehicle traffic. There would be a two-way bike lane on the south side of the street between Huron Avenue and Linnaean Street and one-way bike lanes on both sides of the street between Linnaean Street and Concord Avenue. There is parking and loading access on one side of the street between Shepard Street and Concord Avenue.

Goal 1. *Restore two-way vehicle traffic*

- Goal partially met. This option restores a section of Garden Street to two-way traffic between Huron Avenue and Shepard Street, but keeps the one-way between Shepard Street and Concord Avenue.
- This change could allow some drivers who are currently using Raymond Street to instead return to using Linnaean Street to Garden Street when heading to the north.
- This could potentially reintroduce additional vehicle trips to Linnaean Street and Shepard Street, both of which had experienced a decline in vehicle trips after the project was completed.

Goal 2. *Preserve two-way protected bike lanes*

- Meets goal. This option includes a two-way separated bike lane on the south side of the street between Huron Avenue and Linnaean Street and one-way separated bike lanes on both sides of the street between Linnaean Street and Concord Avenue.
- The community process favored the one-way bike lanes on both sides of the street and this option has that setup between Linnaean Street and Concord Avenue. The two-way section between Huron Avenue and Linnaean Street is in a lower vehicular volume section with fewer connecting side streets, which may mitigate some of the concerns about two-way bike lanes.
- This option requires changes to the Huron Avenue and Linnaean Street traffic signals to reintroduce two-way traffic and to cross people biking over to the other side of the road. This may increase delay for drivers.

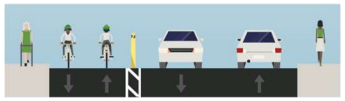
Goal 3. *Preserve parking*

- Goal partially met. This option provides parking and loading access only between Shepard Street and Concord Avenue. It would remove the 29 parking and loading spaces between Linnaean Street and Shepard Street.
- Of the 67 parking spaces between Linnaean Street and Concord Avenue before the project was installed, this option maintains 23 of them.

Cost and Timeline Estimates

- Cost: $120,000. Timeline: Spring 2026
- Aspects of the project that were disturbed by recent construction and paving would be restored in a temporary Option 1 layout by contractor (Eversource).
- The City would pay for design, installation, and outreach costs associated with changing a portion of the project.

✓ Meets Goal
◑ Goal Partially Met
✕ Does Not Meet Goal

	Section A Huron Ave to Linnaean St	Section B Linnaean St to Shepard St	Section C Shepard St to Concord Ave	Policy Order Goals 2-way driving	 2-way biking	 Parking/ loading
Option 4				✓	✓	✕
Biking	Two-way (south side)					
Driving	Two-way travel					

Option 4 returns two-way vehicle traffic to all of Garden Street and provides a two-way bike lane on the south side of the street between Huron Avenue and Concord Avenue. There is no parking and loading access provided.

Goal 1. *Restore two-way vehicle traffic*

- Meets goal. This option restores Garden Street to two-way traffic between Huron Avenue and Concord Avenue.

Goal 2. *Preserve two-way protected bike lanes*

- Meets goal. This option includes a two-way separated bike lane on the south side of the street between Huron Avenue and Concord Avenue.
- The community process favored one-way bike lanes on both sides of the street and this option instead provides a two-way bike lane. This may impact connectivity to surrounding bicycle routes and is less intuitive for drivers at crossing points and intersections.
- This option requires changes to the Huron Avenue, Linnaean Street, and Concord Avenue traffic signals to reintroduce two-way traffic and to cross people biking over to the other side of the road. This may increase delay for drivers.

Goal 3. *Preserve parking*

- Does not meet goal. This option provides no parking or loading access on Garden Street between Huron Avenue and Chauncy Street. It would remove the 59 parking and loading spaces between Linnaean Street and Chauncy Street.
- There is also no ability to support short-term needs such as pick-up and drop-off, access for people with disabilities, loading and unloading of groceries, deliveries, and ride share, nor is there space for moving permits and contractor access for work on nearby residences
- Of the 67 parking spaces between Linnaean Street and Concord Avenue before the project was installed, this option maintains 8 of them (only at Arsenal Sq).

Cost and Timeline Estimates

- Cost: $137,000. Timeline: Summer 2026
- Aspects of the project that were disturbed by recent construction and paving would be restored in a temporary Option 1 layout by contractor (Eversource).
- The City would pay for design, installation, and outreach costs associated with changing a portion of the project.

Background and Context

Following the 2019 Cycling Safety Ordinance (CSO), the City Council passed an amendment in 2020 that mandated separated bike lanes on four streets, including Garden Street. In October 2022, the City of Cambridge installed quick-build separated bike lanes on a portion of Garden Street between Huron Avenue and Mason Street to align with this directive. To accommodate separated bike lanes on each side of the street and retain some parking where it was requested by community members, the City changed the operation of Garden Street between Huron Avenue and Concord Avenue from a two-way road to an eastbound one-way for vehicles. Work also included new traffic signal indications and phasing, updated metal street signs, road markings, bicycle stencil markings, and flex posts.

Project Planning and Public Involvement

The decision to include the one-way conversion of Garden Street came from the input of the members of the community who took part in the public process in advance of the project's implementation. As part of design development and community outreach, we held community meetings on May 24, July 12, August 9, and September 20, 2022, as well as an in-person open house along Garden Street on September 22, 2022. The conversion to one-way was appealing both to residents who prioritized retaining parking and to residents who bike, who preferred one-way bike lanes on each side of the street. Removing one of the two travel lanes provided enough space to both retain parking in the areas most-requested by the community and to add the one-way separated bike lanes on each side. Once this alternative gained traction with the community, we scaled up the outreach process to include additional areas of the neighborhood that would be impacted by the change. This included postcards mailed to addresses within the impacted areas and the addition of the fourth community meeting on September 20, 2022 to talk through the magnitude of the change. The materials from all past meetings (including the slides and recordings) are available on the project's webpage.

Reaction to the Project

After completion of the work, some residents of the area surrounding Garden Street reported seeing an increase in vehicle traffic on their street. In response, we counted vehicle volumes on 12 streets to understand if and where it was happening.

The "after project" counts were conducted in December 2022 and January, February, and March of 2023. We compared these new counts with the "before project" counts from October 2022. A chart showing daily counts can be found in the appendix.

We found that traffic volume on most of the 12 streets stayed about the same between October 2022 and March 2023. The exceptions were Linnaean Street and Bond Street, where volumes dropped, and increases on some others. We counted about 800 (32%) more vehicles over the course of the day on Raymond Street and 600 on both Madison Street (43%) and Huron Avenue (16%). These higher volumes, however, were similar to counts obtained in 2018 on both Raymond Street and Huron Avenue. Concord Avenue, the most convenient parallel route to Garden Street, saw the largest increase of 2,500 (24%) vehicles per day.

In March 2023, about six months after installation, we reported back to the community on the longer-lasting impacts and made recommendations for additional measures to address resident concerns. These were outlined in a report titled “Garden Street Safety Improvement Project Local Traffic Analysis”, submitted to the City Council on March 30, 2023. Among the changes implemented prior to the report and thereafter, we added “no left turn” signs on Walker Street at Linnaean Street and at Garden Street at Robinson Street for peak hours to reduce traffic volume on Raymond Street, we retimed the Garden/ Huron/ Sherman traffic signal at Taylor Square to add new phasing sequences and timings that responded better to the new vehicle volumes, we added warning signs for large trucks using Walker Street, and we installed “wrong way” signs for cyclists who were reported to be biking the wrong way in the new bike lanes.

Garden Street Today

Garden Street currently has one-way separated bike lanes on each side of the street and an eastbound-only travel lane for vehicles from Huron Avenue to Concord Avenue. Where space permits, there is also parking and loading access, which is located between the travel lane and bike lane (“floating parking”). Between Concord Avenue and Mason Street, Garden Street accommodates two-way vehicle travel.

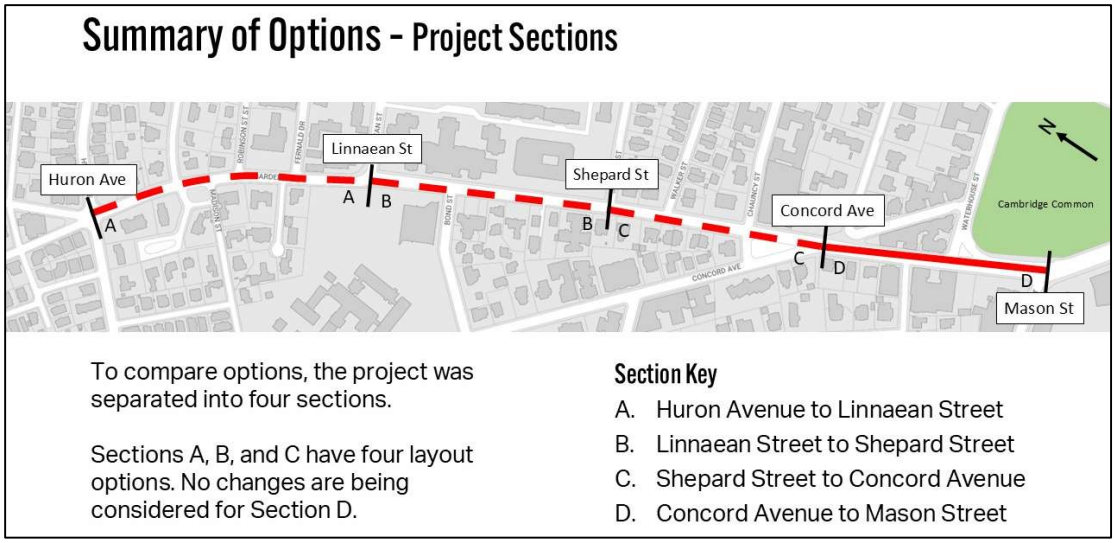
Current Layout on Garden Street

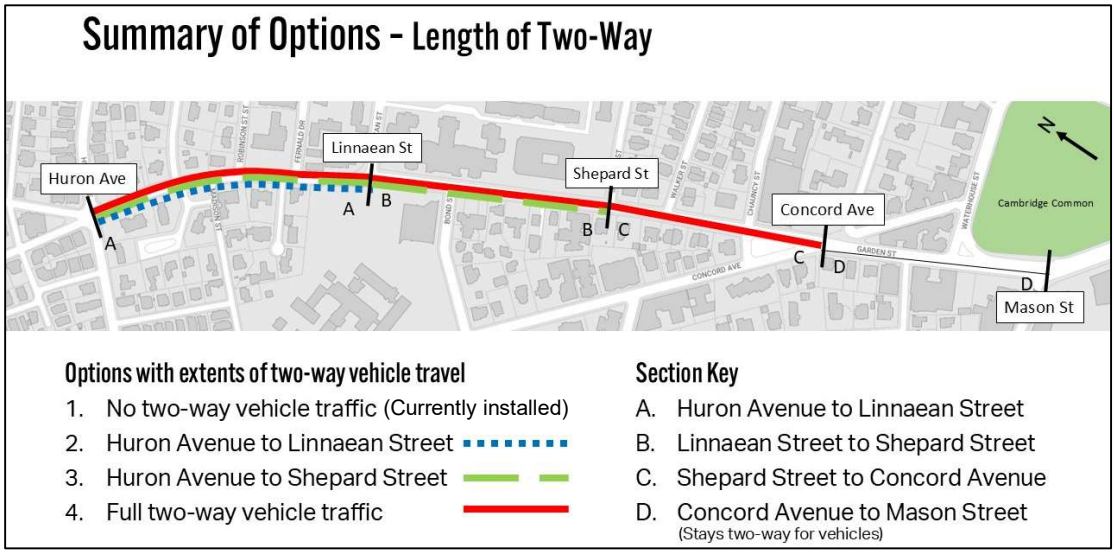
Policy Order Design Goals

The Policy Order asked for a review of the following aspects with regard to the design of the street:

1. *Restoring Garden Street to two-way automobile traffic*
2. *Preserving two-way protected bike lanes*
3. *Preserving as much parking on and/or near Garden Street as possible*

In the following section we will discuss how four design options might meet these goals to varying extents. All four design options provide bike lanes that are separated from motor vehicle travel, which is mandated by the CSO, and they are either split by direction or operate as a two-way bicycle facility. Since the width of Garden Street varies along the project's length, it is possible for a design outcome to include a mix of cross section options. For example, the current layout has no parking near the Huron Avenue end, but Garden Street widens at Linnaean Street and can therefore fit parking for the rest of its length towards Concord Avenue with one-way vehicular traffic. With two-way vehicular traffic, only the short block between Concord Avenue and Chauncy Street can accommodate any parking/loading.





Summary of Options - By Section

Sections A, B, and C (Huron Avenue to Concord Avenue)

Option 1 (currently installed)

- One-way vehicle traffic eastbound
- One-way separated bike lanes on both sides

Option 2

- Two-way vehicle traffic (Huron Avenue – Linnaean Street)
- One-way vehicle traffic eastbound (Linnaean Street – Concord Avenue)
- Two-way separated bike lane on the south side (Huron Avenue – Linnaean Street)
- One-way separated bike lanes on both sides (Linnaean Street – Concord Avenue)

Option 3

- Two-way vehicle traffic (Huron Avenue – Shepard Street)
- One-way vehicle traffic eastbound (Shepard Street – Concord Avenue)
- Two-way separated bike lane on the south side (Huron Avenue – Linnaean Street)
- One-way separated bike lanes on both sides (Linnaean Street – Concord Avenue)

Option 4

- Two-way vehicle traffic
- Two-way separated bike lane on the south side

Summary of Options - Parking Impacts

Permit Parking

* Currently installed

"Current' numbers show the permit parking spaces that exists today.

"Potential" numbers show what is possible with each layout option.

	Section A Huron to Linnaean		Section B Linnaean to Shepard		Section C Shepard to Concord		Section D Concord to Mason		Overall		
	Current	Potential	Current	Potential	Current	Potential	Current	Potential	Current	Potential	Change
Option 1*	0	0	31	31	21	21	13	13	65	65	0
Option 2	0	0	31	31	21	21	13	13	65	65	0
Option 3	0	0	31	0	21	23	13	13	65	36	-29
Option 4	0	0	31	3	21	5	13	13	65	21	-44

No option has space for parking in this section

Option 4's three spaces are at the Linnaean St intersection along Radcliffe Quad

Option 3 gains two spaces from making Arsenal Sq one-way. Option 4's five spaces are between Chauncy St and Concord Ave

No changes are proposed in this section

Option 2 (two-way Huron Ave to Linnaean St only) is neutral and results in no changes to parking and loading access.

How Options Relate to Policy Order Goals

Goal 1. *Restore two-way vehicle traffic*

Only Option 4 provides two-way vehicle travel for the full length of the project area. Options 2 and 3 provide two-way vehicle travel for shorter sections and continue to allow some parking and loading access. Option 1, the current condition, does not meet this policy order goal.

Trade-offs:

- Option 1 (currently installed) does not meet this policy order goal and instead maximizes parking and loading access.
- Option 2 adds two-way vehicle travel between Huron Avenue and Linnaean Street and makes no changes to parking and loading access within the Garden Street project limits.
- Option 3 provides two-way vehicle travel between Huron Avenue and Shepard Street and keeps the one-way vehicle travel from Shepard Street to Concord Avenue. This option would remove parking and loading access between Linnaean Street and Shepard Street, but parking and loading access could continue to be provided between Shepard Street and Chauncy Street.
- Option 4 restores two-way vehicle travel for drivers between Huron Avenue and Concord Avenue, but it does not have space for any parking or loading access between Huron Avenue and Chauncy Street.

Goal 2. *Preserve two-way protected bike lanes*

All four options provide bicycle facilities that serve both directions and are separated from motor vehicles.

Trade-offs: Transitions from one-direction bike lanes to a two-way facility can be awkward and require changes to traffic signal equipment and operation. If these transitions occur at busy intersections, they may cause additional delays for some or all road users.

- Option 1 (currently installed) would require no changes as it is in effect today.
- Options 2 and 3 require signal changes at Huron Avenue and at Linnaean Street. The Linnaean Street changes would be easier to accommodate due to a lower volume of vehicles using this intersection when compared to volumes at the Concord Avenue intersection (in Option 4).
- Option 4 requires signal changes at complex intersections at Huron Avenue and at Concord Avenue to be able to cross people biking back onto the other side of the street.

Goal 3. *Preserve parking*

Only Options 1, 2, and 3 include parking and loading access and this is only available in Sections B (Linnaean Street to Shepard Street) and C (Shepard Street to Concord Avenue). It is not feasible for Garden Street to have parking

and loading access in Section A (Huron Avenue to Linnaean Street) in any of the options considered.

Trade-offs:

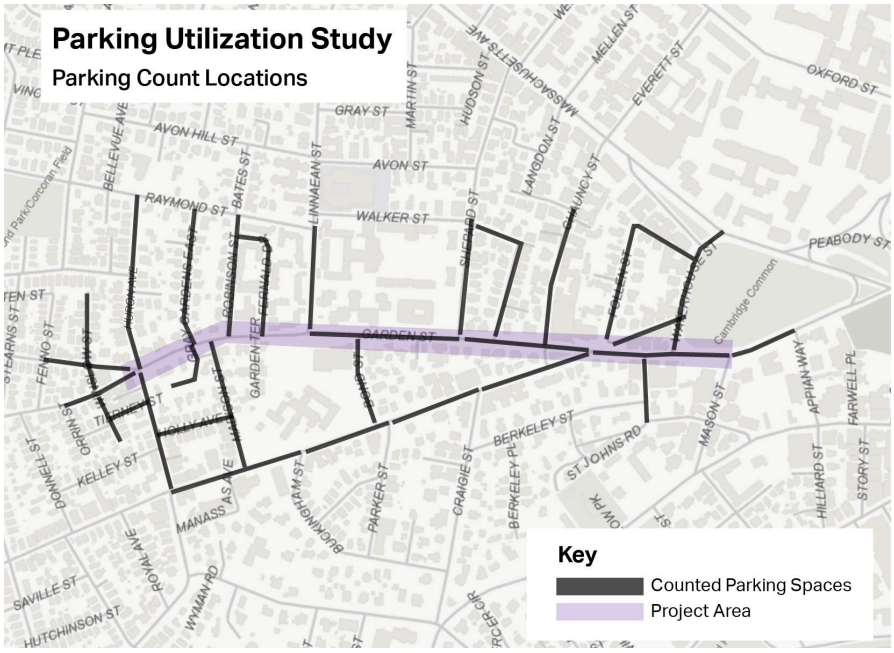
- Options 1 and 2 have parking and loading access between Linnaean Street and Concord Avenue.
- Option 3 has parking and loading access between Shepard Street and Concord Avenue.
- Option 4 (two-way vehicle travel for the entire length) has no parking or loading access at all.

The policy order also asked for two other items:

Goal 4. *Identify potential areas for resident parking on neighboring streets.*

Streets in the area surrounding Garden Street are nearly all designated as Permit Parking today. Our parking inventory showed that there are no areas where additional permit parking spaces can be added, nor were there areas currently signed for other parking or no parking that could be repurposed for new parking areas.

The following figure shows the streets that we reviewed for the parking utilization study that was included in the March 2023 "Garden Street Safety Improvement Project Local Traffic Analysis" report.



Parking Utilization Study locations from March 2023 report.

Goal 5. *Communicate the changes to the affected neighborhood.*

Department public outreach staff will create and execute an outreach plan that will summarize these findings and publicize the resulting Council action.

Considerations

Safety of the Bicycle Facility

At the first community meeting for the Garden Street project on May 24, 2022, we discussed the trade-offs between two design options for bike lanes: one-way separated bike lanes on each side of the street, or a two-way separated bike lane on one side of the street. For this initial discussion, it was assumed that the roadway would remain two-way for vehicles (similar to Option 4). Separated bike lanes on each side of the street provide access to destinations on both sides of the roadway, keep bikes moving in the same direction as vehicles, and create predictable interactions with people walking and driving. A two-way separated bike lane on one side of the street uses less roadway width, provides more space to pass slower riders, and has the potential for fewer conflict points with driveways or cross streets.

During our review, we reviewed options for the two-way bike lane located on either the north or south side of the street. There are few high-volume side streets on the south side of Garden Street, but there are also fewer destinations for people biking served by this side. A two-way separated bike lane on the south side of Garden Street would require users seeking north-side destinations to have to cross the street, potentially more than once (to arrive at their destination and to depart). It would however provide an easier eastbound connection for people biking towards Berkeley Street and Harvard Square. If it were on the north side instead, the two-way lane would have to interact with traffic at the Linnaean Street, Chauncy Street, and Shepard Street intersections, which experience high volumes of vehicles turning on and/or off Garden Street. Many people biking are also looking for access to north-side destinations and routes, including Radcliffe Quad or connections to Little Concord Avenue and Cambridge Common, and bicycle accommodations on the north side would provide this access to these popular destinations.

During the question and feedback period of the meeting and through subsequent correspondence and outreach, we heard from community members representing many viewpoints (residents, people who ride bikes, people who don't or can't ride bikes, etc.) that there was a strong preference for separated bike lanes on each side of the street due to their familiarity, ease of use, and the resulting increase in safety for users. The implemented design with one-way separated bike lanes on each side of the street simplifies the interactions of people driving and biking through higher-volume intersections. It also does not establish a preference for specific routes, allowing better access by bike to all uses and destinations on both sides of the street.

Parking, Loading, and Accessibility

We heard that parking, loading, and accessibility was very important for residents in the eastern (Harvard Square) end of the project where there are fewer driveways. Turning Garden Street into a one-way for vehicles either maintained or provided additional parking and loading opportunities for that end of the project area, depending on which section became one-way (as seen in Options 1, 2, and 3). Discussions with community members involved in the public process inspired the current design: a one-way road for vehicles and one-way separated bike lanes on both sides of the street (Option 1). This

option maximized parking and loading access to the greatest extent while also ensuring a consistent biking experience.

In addition to the ability to park, we heard that short-term needs such as pick-up and drop-off, access for people with disabilities, loading and unloading of groceries, deliveries, ride share, and contractor access for work on nearby residences should be accommodated in some way. A two-way Garden Street for vehicles without any space for a vehicle to stop for the full length of the project area (Option 4) did not accommodate these activities and was initially dismissed as nonviable.

Parking Utilization

We had conducted a parking utilization study for the March 2023 report to understand where there may be high demand for on-street parking and where there may be excess capacity for parking within the Garden Street project area. The data collected and analysis that followed was used to inform the City on what areas may be suitable to add parking and to help residents identify where they may be able to find parking within the existing signed areas. Please refer to the March 2023 report for more detailed analysis, including graphs and figures. Parking in the context of this review did not look at loading access, accessible pick up and drop off, or other related short term needs, but rather if there was space available for residents to park.

The results of the parking study indicated ample parking availability along Garden Street and within the larger study area. Best practices for parking management set the optimal target for parking utilization at 85%. Occupancy rates below 85% indicate that someone searching for a parking space is likely to find one nearby their destination. The parking study showed that midday parking occupancy in the study area averaged 72% and overnight parking occupancy averaged 74%.

The Garden Street project prioritized keeping parking in the eastern end of the project area, closest to Harvard Square and Cambridge Common, where most residents do not have driveways. The results of the study showed high utilization in that immediate area during both midday (80% at 10 a.m.) and overnight (83% at 10 p.m.). However, these are under the 85% target utilization rate, and there are opportunities to find spaces nearby on side streets or abutting street segments.

Overall, higher utilization is found in the eastern end of the project area during both the midday (80%) and overnight (83%) time periods, but with opportunities to find spaces nearby on side streets or abutting street segments. Whereas there remained excess parking capacity in the western end of the project, an area that experienced the largest removal of permit parking as part of the project.

Costs and Installation Timelines

The existing project has already been designed and installed, and the costs to date have amounted to at least $75,000 in analysis and design costs and $130,000 in installation costs.

Restoring aspects of the project that were disturbed by recent construction and paving are covered by a combination of the contractor (Eversource) restoration activities and the City through maintenance contracts. Pursuing a new layout for Garden Street would

require a substantial new investment in engineering and implementation costs. If a completely new layout were identified by the City Council, it would take approximately 6 months for the design work to be completed by the design consultant. During that time, we'd also have to restore the existing layout of Garden Street for the safety of the traveling public. Following design engineering and development, the new Garden Street layout would have to be implemented at full cost to the City and would consist of traffic signal changes, markings, signage, flex posts, and outreach materials at a minimum.

Regardless of the option selected, Garden Street would need to be restored to an Option 1 layout this spring/summer using either permanent materials (summarized in the table below) or using temporary materials (temporary paint, cones, etc. funded by Eversource) until the design, engineering, and outreach are concluded for an alternative option. It is unclear whether we would be able to make any substantial changes to the street this calendar year given the lead times for design, community outreach, and implementation. Those timeline estimates are also included in the table as well. If large-scale changes were to be made to Garden Street, staff time would also need to be taken from other ongoing CSO projects, potentially leading to delays with those projects' implementation timelines.

The following table outlines estimated costs associated with each option and an estimated installation timeline. Option 1 (keep Garden Street as-is) has costs associated with routine maintenance this year following upcoming city paving work.

	Design & Engineering	Installation	Estimated Total	Installation Timeline
Option 1	$0.00	$25,000.00	$25,000.00	Summer 2025
Option 2	$12,000.00	$75,000.00	$87,000.00	Fall 2025
Option 3	$20,000.00	$100,000.00	$120,000.00	Spring 2026
Option 4	$27,000.00	$110,000.00	$137,000.00	Summer 2026

Depending on the level of community outreach and budget constraints, these timelines may be longer.

Signalized Intersections

The intersection of Huron Avenue, Garden Street, and Sherman Street has heavy traffic flows from many directions. The conversion of Garden Street to one-way for vehicles simplified the intersection to some extent and allowed us to allocate extra green time in the signal cycle to specific approaches to help mitigate congestion. This congestion was one of the main concerns immediately after project implementation, when we heard many reports of gridlock on Huron Avenue, extending back and onto Concord Avenue. We made changes and installed new equipment to address the concerns to the greatest extent possible. Converting Garden Street back to two-way for vehicles on the eastern leg of this intersection would introduce additional delay with limited ability for it to be mitigated.

There are two significant changes to the intersection that would need to occur to accommodate the reintroduction of westbound Garden Street traffic. We would need to modify the traffic signal timing to accommodate the return of westbound Garden Street traffic and add a mechanism to facilitate the movement of bicycles into and out of the two-way separated bike lane. At present, the lack of a westbound Garden Street approach allows the westbound bicycle lane to proceed on green at the same time as

the eastbound Garden Street (vehicle/bicycle shared lane) approach. The changes to the signal to accommodate the Garden Street project were largely a reallocation of green times to reflect changes in traffic volumes. To reintroduce two-way vehicle travel on Garden Street alongside a two-way bicycle lane, a new bike-only phase would need to be added to address an otherwise conflicting new movement through the intersection.

Option 2 (two-way between Linnaean Street and Huron Avenue only), Option 3 (two-way between Linnaean Street and Shepard Street only), and Option 4 (two-way vehicles the whole way) would experience this potential increased congestion issue; however, Options 2 and 3 have the potential to self-mitigate some of the volume demand. This is because some of the trips entering the intersection from Huron Avenue (via Raymond Street) may instead arrive from Garden Street (via Linnaean Street or via Shepard Street), thus freeing up some of the green time allocated to other streets at the intersection. In Option 4, this occurs too, but Garden Street would also get all of the trips back that are currently rerouted to Concord Avenue, causing the intersection to need to accommodate more trips overall.

The intersection of Garden Street and Concord Avenue at Follen Street and Little Concord Avenue would also need to be redesigned to accommodate two-way traffic on Garden Street on the west approach. Regardless of whether there would be a one-way separated bike lane on each side or a two-way bike lane on one side, additional user delay would result from the required changes.

Linnaean Street and Graham and Parks School

Making Garden Street a one-way for vehicles reduced volumes on Linnaean Street, with volumes decreasing by more than 9% from 4,486 in October 2022 to 4,078 in March 2023. During the design process, we heard support for increasing the accessibility of Graham and Parks School for people who are not driving. Linnaean Street is identified in the Cambridge Bicycle Network Vision as a future low-volume and low-speed street, comfortable for people of all ages and abilities to use the roadway while biking without the need for dedicated infrastructure. Reducing volumes to the extent this project has is a small but important step toward aligning with this vision. Fewer vehicles during drop-off and pick-up times creates a safer atmosphere for walking and biking. Restoring any section of Garden Street to two-way vehicle travel in any option would likely restore some or all of these vehicle trips back to Linnaean Street.

Alignment with the Cambridge Bicycle Plan

The City does not plan to add separated bike lanes to Garden Street west of Huron Avenue. To the west of Huron Avenue, Garden Street is designated as a low-volume and low-speed street in the Bicycle Network Vision, similar to Linnaean Street. During the design process, we spoke about how by removing westbound traffic from Garden Street, we are de-emphasizing the street as an attractive alternative for cut-through traffic wishing to bypass Concord Avenue. This project has thus far reduced volumes on Garden Street near Ivy Street from 4,405 to 4,136 vehicles, or just over 6%, helping us align with the vision for lower volumes. Restoring Garden Street to two-way vehicle travel for the length of the project would likely restore these vehicle trips back to this section of Garden Street.

Raymond Street is also included in the Bicycle Network Vision as a low-volume and low-speed street. Options 2, 3, and 4 provide additional options for drivers to avoid using Raymond Street. The existing condition, Option 1, has the potential to align with the network vision by encouraging through-trips to keep on the periphery of the neighborhood instead of traveling through it.

For Linnaean Street, Raymond Street, and the western end of Garden Street, more substantial traffic calming to reduce vehicle speeds and further discourage through-trips would be required to fully realize these roadways as low-volume and low-speed, however, progress can and should be made to attain these goals when opportunities arise.

Reopening of the Vassal Lane Upper School/Tobin Montessori School

The reopening of the expanded Vassal Lane Upper School and Tobin Montessori School campus will bring additional vehicle trips to the neighborhood. A full traffic analysis outlining the changes and impacts of this expansion titled *Traffic Assessment* was submitted to the City in early 2021. We've attached sheets 105 through 110 as an appendix to this report to serve as a quick summary that shows anticipated arrivals and departures from the school at various times of day. Overall, the analysis goes into great detail about what was experienced at the time of the study and what could be anticipated once the school reopens.

The report shows approximately 400 trips to the school campus over two hours in the morning (approx. 7-9am) and 270 trips from the school largely between 1:30 P.M. and 3:15 P.M. in the afternoon, with low volume preschool pickups extending until 6 P.M. As the hours of the three entities that use the campus (Tobin, Vassal, preschool) vary, their impacts are spread out throughout the drop off and pick up time periods. Most observed traffic near the Garden Street project occurs in the afternoon commute period (after 5 P.M.), unaffected by most school activities.

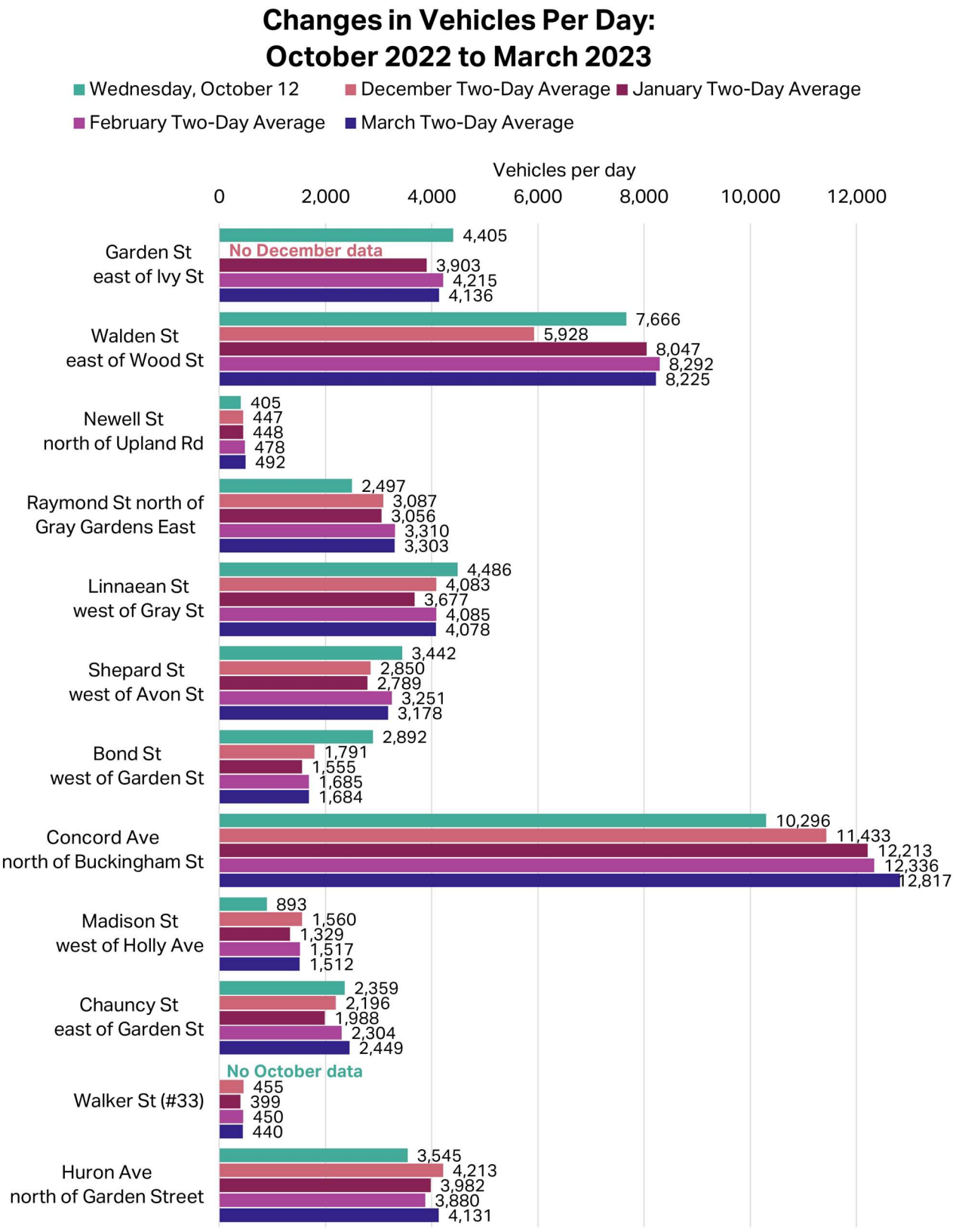
Conclusion

As with most street design projects in a dense environment like Cambridge, there are trade-offs when new elements are added–which in this case was separated bike lanes–because width on our streets is limited. Two of this policy's goals–increase parking supply and restore two-way traffic–represent competing needs that cannot both be accommodated. Option 1, the existing configuration, maximizes parking/loading supply while Option 4, the full two-way option, provides for two-way vehicle travel for the entire length of Garden Street. Any change from the current layout carries a substantial cost and cannot be implemented until design and outreach work is completed. Partial changes (Options 2 and 3) could be implemented as soon as later this year or early next year, while a full two-way (Option 4) would not be feasible for installation until Summer 2026. In contrast, Option 1, which retains the existing layout, carries minimal cost to restore.

Appendices

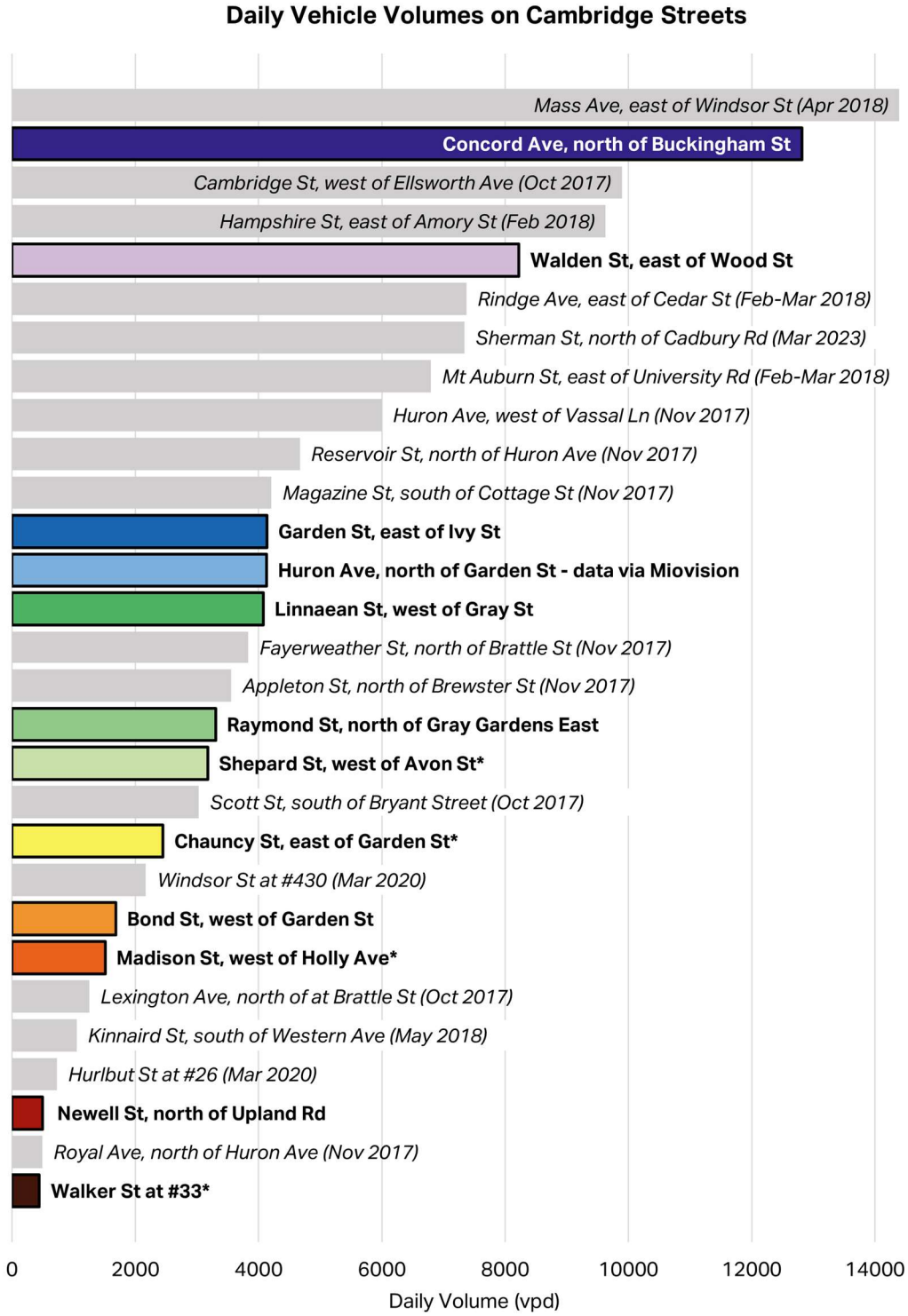
- Daily traffic counts from the 12 streets included in the March 2023 report
- Comparison graph showing the Garden Street project area daily traffic counts in March 2023 as they related to other streets in Cambridge.
- Sheets 105 through 110 from the *Traffic Assessment* of the Vassal Lane Upper School/Tobin Montessori School.
- A letter from the Cambridge Bicycle Committee concerning this Policy Order. The committee is a body of community members established by the City Council whose main duties include reviewing plans for road construction and commenting on pending bicycle-related ordinances.

Daily traffic counts on the 12 streets over the five count periods.



Traffic counts on Cambridge streets, in vehicles per day. March 2023 counts from the project area are in color with a bold outline. Comparison streets are in grey.

** Streets marked with an asterisk are one-way*



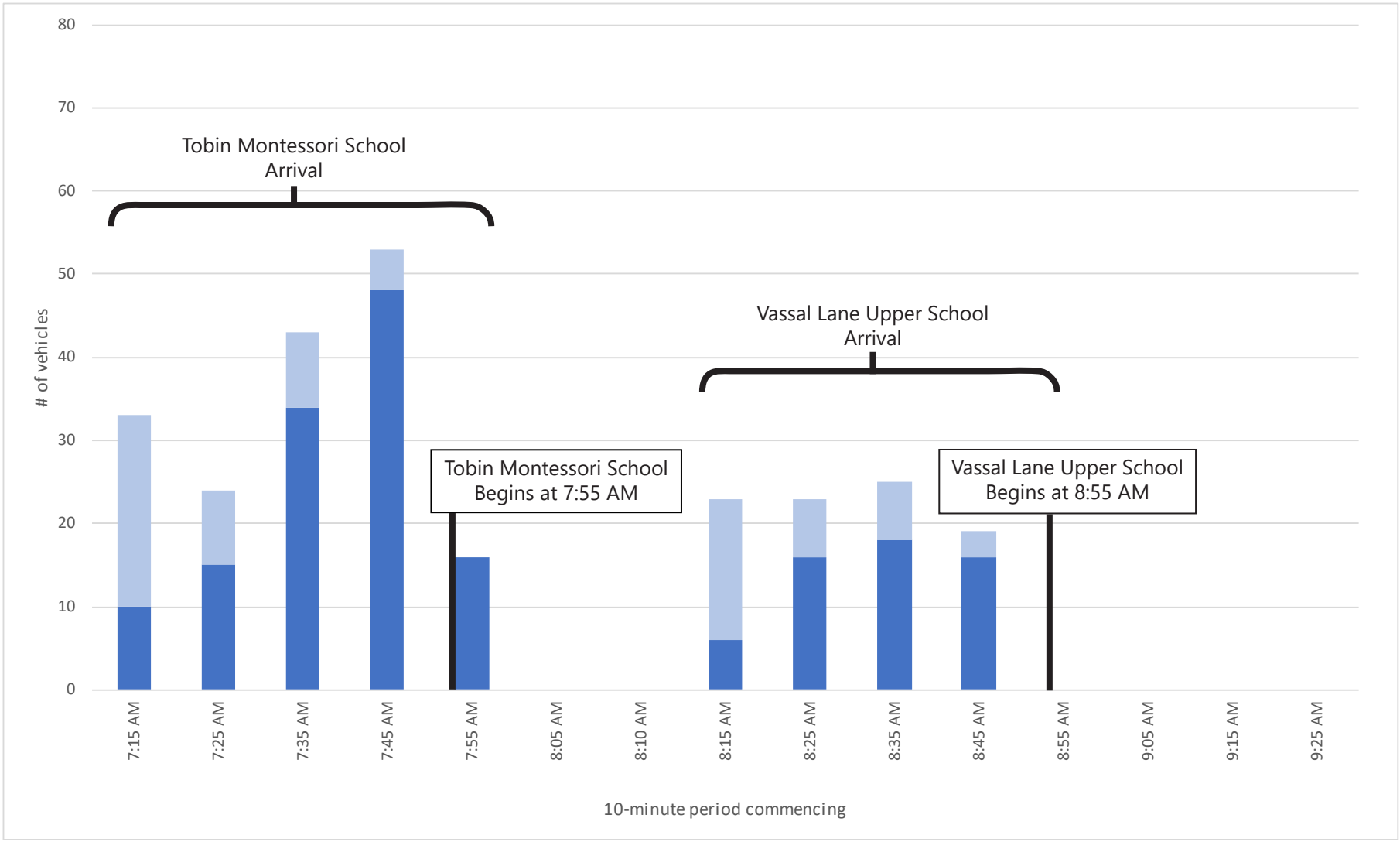
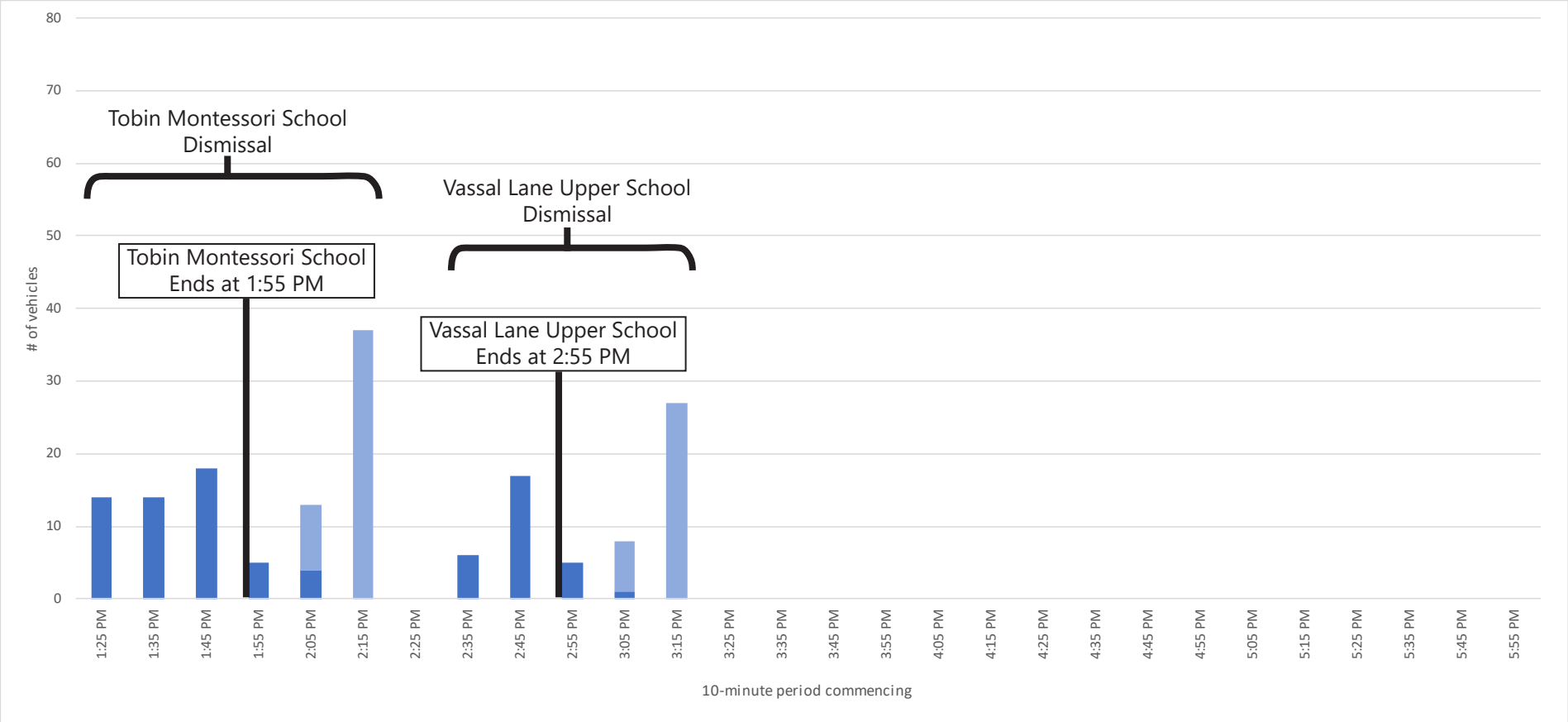


Figure 2.f.1

Existing Vehicular School Arrival
Morning Arrival

Tobin Montessori + Vassal Lane Upper School
Cambridge, Massachusetts



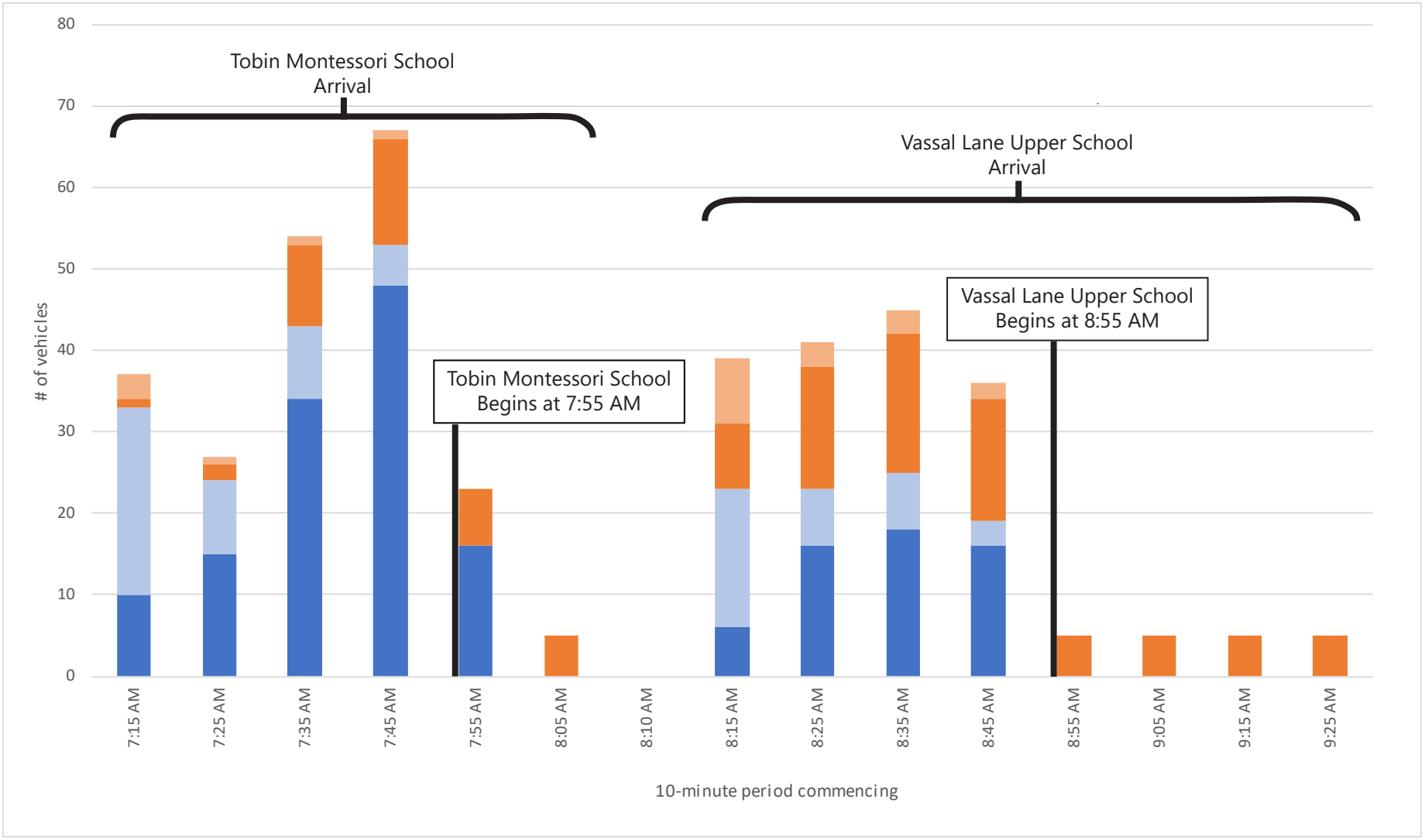
Existing Staff Vehicles

Existing Parent and Bus Pick-up

Figure 2.f.2

Existing Vehicular School Dismissal
Afternoon/Evening Dismissal

Tobin Montessori + Vassal Lane Upper School
Cambridge, Massachusetts



Existing Staff Vehicles

Existing Parent and Bus Drop-off

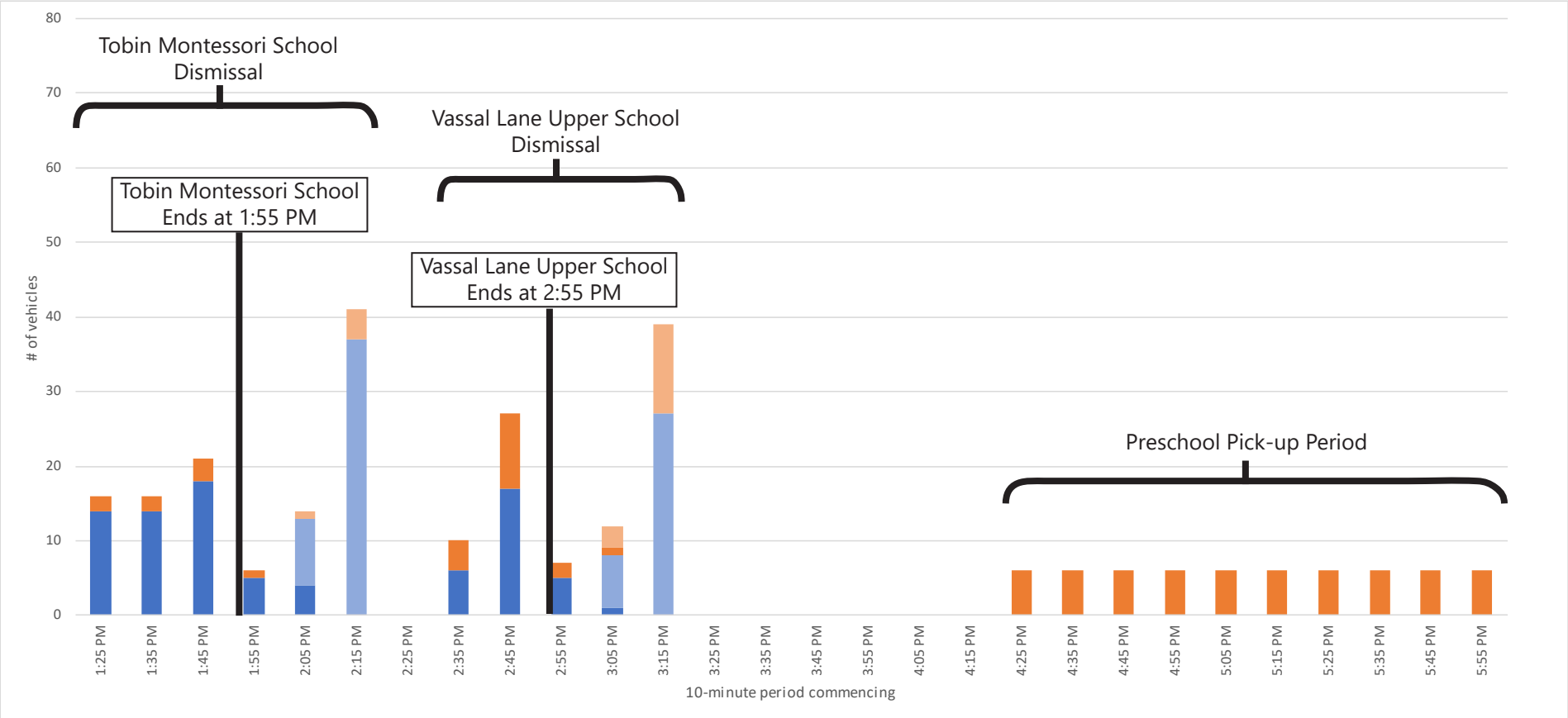
Proposed Net-Increase of Parent and Bus Drop-off Vehicles

Proposed Net-Increase of Staff Vehicles

Figure 3.b.1

Future Vehicular School Arrival
Morning Arrival

Tobin Montessori + Vassal Lane Upper School
Cambridge, Massachusetts



Existing Staff Vehicles

Existing Parent and Bus Pick-up

Proposed Net-Increase of Parent and Bus Pick-up Vehicles

Proposed Net-Increase of Staff Vehicles

Figure 3.b.2

Future Vehicular School Dismissal
Afternoon/Evening Dismissal

Tobin Montessori + Vassal Lane Upper School
Cambridge, Massachusetts

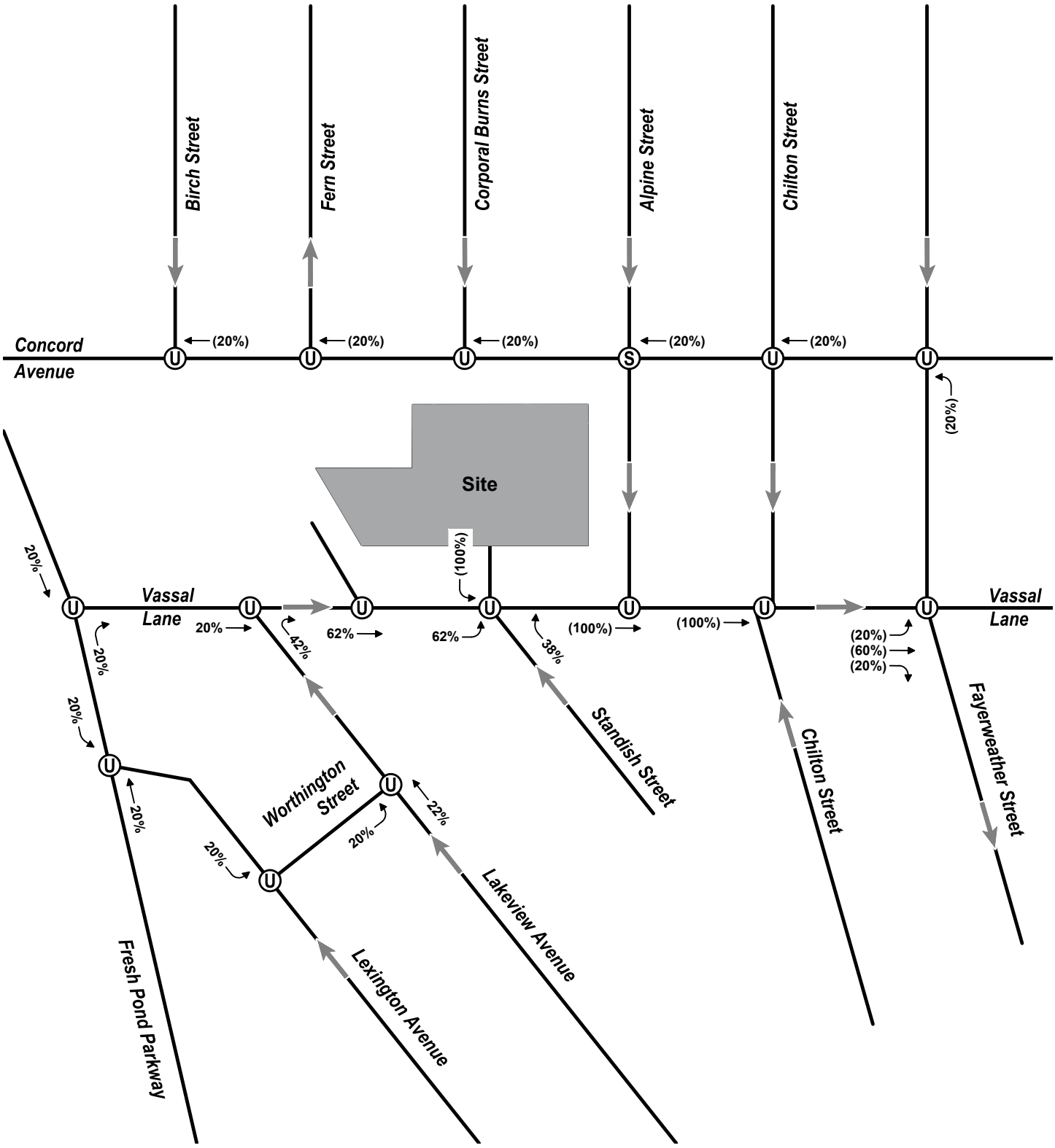


Figure 3.d.1
Parent / Student Trip Distribution

Tobin Montessori + Vassal Lane Upper School
Cambridge, Massachusetts

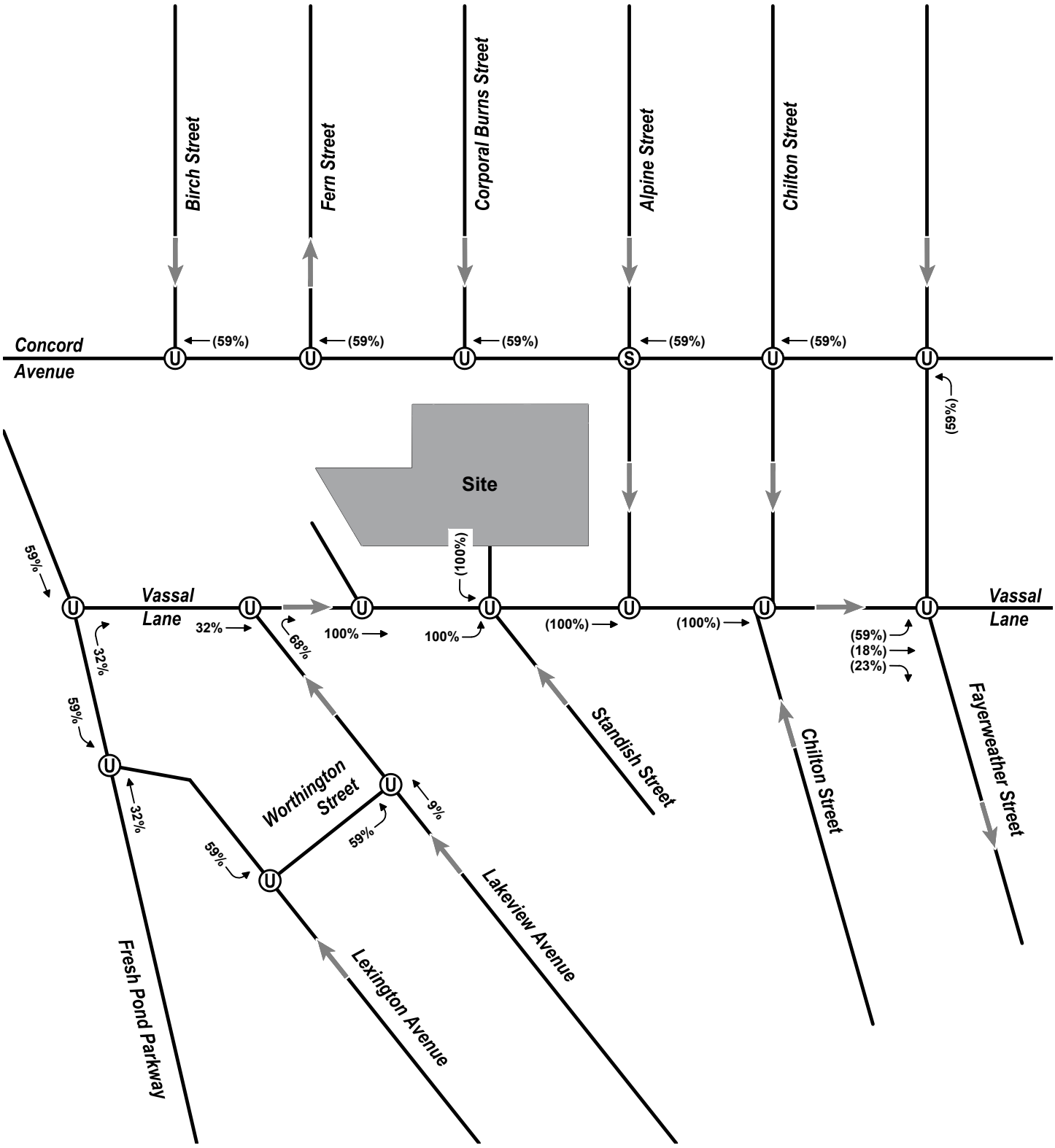


Figure 3.d.2
Staff Trip Distribution

Tobin Montessori + Vassal Lane Upper School
Cambridge, Massachusetts

Yi-An Huang, City Manager
795 Massachusetts Ave., 1st Floor
Cambridge, MA 02139
By email to: citymanager@cambridgema.gov

cc: Melissa Peters, Acting Assistant City Manager of Community Development
Brooke McKenna, Transportation Commissioner
Kathy Watkins, DPW Commissioner
Nick Schmidt, CDD Transportation Program Manager
Cambridge City Clerk

From: Richard Freierman, Chair, on behalf of the Cambridge Bicycle Committee

February 20, 2025

Dear City Manager Huang,

The City Council has requested a report from the City regarding Garden St and the surrounding streets (POR 2024 #153). Garden Street was converted to a one way street for automobile traffic with separated bike lanes on either side as a Cycling Safety Ordinance project, with the street segment specifically identified for safety improvements to better connect Cambridge Rindge and Latin High School to the athletic fields at Danehy Park and Russell Field used by the school's sports teams. The Garden Street bike lanes have seen significant use by CRLS students, as well as Harvard students from the Radcliffe Quad dorms, families heading to Graham & Parks on Linnaean Street, and many bikers heading to Harvard Square and connecting to Cambridge Street and Broadway.

The Bicycle Committee would like to go on record as opposing any recommendation for the restoration of two-way motor vehicle traffic on Garden street for the following reasons:

1. Two-way traffic creates a much wider motor vehicle pathway, in which crossing the center line is easy. This encourages excessive speed, often far in excess of the 20 MPH city speed limit. As speed increases, the risk of serious injury or death to pedestrians and cyclists in the event of a crash increases exponentially.
2. The current one-way configuration allows for parking protected bike lanes in some sections, providing a physical barrier that makes the bike lane safer.
3. City staff are currently engaged in a number of very important safety improvement projects around the city, including on Mass Ave., Cambridge Street, Broadway, and Main Street. Any effort to reconfigure Garden Street would delay these essential safety projects and risk unnecessary crashes on those unfinished portions of the bicycle network.

4. The Eversource work on Garden Street is complete, and further delay in repaving will result in failing to correct numerous safety issues, including poor roadway surfaces and lack of proper striping and flexpost installations.

5. There is no clear evidence that the Garden Street design is the cause of increased traffic on nearby side streets. There is a long history of resident concerns with traffic, far pre-dating the Garden Street conversion to one way traffic (see below for details). Also, it's generally acknowledged that traffic overall throughout the region has increased in recent years, with no evidence that local issues are due to bike lanes.

The City arrived at the current Garden Street design after extensive public process and design review. This included a standard three public meeting process for projects like these through the spring and summer of 2022. During the presentations, the public feedback was clear that the community desired saving more parking and was willing to sacrifice a direction of automobile travel. After the second public meeting, the staff generated some new alternatives that took this feedback into account. At the third and final scheduled meeting, the community overwhelmingly preferred the one way concept. As this design was less developed and constituted a major roadway change, the City scheduled a fourth public meeting and open house, conducted more extensive engineering analysis, and increased community outreach. At the added fourth public meeting, the community reiterated their preference for the one-way concept and the City responded to committing to the design for the implementation.

The impetus for POR 2024 #153 focuses on concerns about traffic increases on surrounding streets, but it's not at all clear that the change to Garden Street is the primary cause. The community has been identifying street safety issues in the neighborhood for many years before the 2022 installation of separated bike lanes on Garden St. As evidence, there are numerous Policy Orders requesting the city install various forms of traffic calming, including on Garden St., Raymond St., Walden St., Richdale Ave, Linnaean St., Sherman St., and Concord Ave. See below for a sample of previous Policy Orders and City Manager Agendas referencing these problems and the desire for solutions.

As part of the analysis and implementation options included in the requested report per POR 2024 #153, the Bicycle Committee believes traffic calming solutions throughout the neighborhood would help directly address many of the complaints referenced in #153 and the numerous previous Policy Orders. These problems have long been identified as safety concerns for bicyclists and pedestrians and the current report is an ideal time to plan to finally address all of the known safety issues in the neighborhood. As evidenced by the preponderance of Policy Orders from before the Garden St Safety Improvement Project implementation, making changes to the Garden Street layout will not directly solve the long-term automobile traffic problems in the neighborhood.

Here are just some of the Policy Orders related to neighborhood traffic concerns:

- POR 2017 #119: Raymond Street and Walden Street traffic calming
- POR 2018 #52: Traffic calming at intersections of Walden Street with Concord Avenue, Garden Street and Sherman Street
- POR 2019 #74: Street safety improvements on and along Garden St
- CMA 2019 #156: Street safety improvements on and along Garden St
- POR 2019 #281: Raymond Street and adjacent streets speed limit reduction
- POR 2019 #356: Raymond Street and Walden Street traffic calming
- POR 2020 #195: Walden Street traffic calming
- CMA 2020 #261: Walden Street, Raymond Street and Richdale Avenue traffic calming
- POR 2020 #203: Concord Ave traffic calming
- POR 2022 #126: Traffic calming requested on Garden Street, Linnaean Street, Sherman Street, Concord Avenue

Thank you,

Richard Freierman,
Chair, Cambridge Bicycle Committee