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TOWN CLERK
BELMONT, MA**

DATE: May 15, 2023
TIME: 9:50 AM

Belmont Transportation Advisory Committee (TAC) Meeting

Minutes for Thursday, 6 April, 2023

Present: David Coleman (Chair), Larry Link (Vice Chair), Heather Barr, Daniel Eldridge, Chip Gaysunas, Ken Lind, Jeffrey Roth (Secretary)

Absent: Richard Hartley, Jane Lappin

Also present:

Town Staff: Glenn Clancy (Belmont Office of Community Development (CD) Director), Sergeant Paul Garabedian (Belmont Police Department (BPD)), Jay Marcotte (Belmont Department of Public Works (DPW)), Roy Epstein (Belmont Office of Select Board)

Town Public Residents: Bill <no last name provided>, Brendan O'Leary, Corinne McCue Olmstead, Diana Shaginian, James Nager, Jason Redi (16 Ridge Rd.), Jeff Held, John Chobanian Sanjit Snyl (21 Ridge Rd.), Lydia Kogler, James Piechota

Final minutes, compiled on 3 May 2023; finalized on 4 May 2023.

Announcements

1. Tonight's public meeting occurred online using a zoom video conference forum.

This meeting will be held remotely using Zoom video conferencing technology, as permitted by the Massachusetts Act Relative to Extending Certain State of Emergency Accommodations, that became effective July 16, 2022.

The meeting was called to order at 7:05p by Chairperson David Coleman.

Review and Approval of Minutes (March 2, 2023)

03/02/2023

The Committee reviewed the draft meeting minutes from the TAC meeting on the 2nd of March, 2023. These TAC meeting minutes were reviewed, and minor corrections were requested by Heather Barr and Larry Link.

Heather Barr made a motion to approve the minutes as amended, and Chip Gaysunas seconded the motion. The Committee voted unanimously by roll call in favor of approving the minutes as amended.

Pending Traffic Calming Requests

Ridge Rd. Street Parking — Review of amended plan with residents; Vote on whether to recommend action to Select Board.

David Coleman (TAC Chair) and Glenn Clancy (CD Director) provided background on this topic and discussed the parking options, which were also discussed at the TAC 2 March 2023 meeting. Overall the residents seemed to support the parking layout illustrated in Appendix 1.

David Coleman (TAC Chair) — David Coleman opened the meeting up to comments from the meeting attendees to get feedback on the proposal.

Diana Shaginian — Diana Shaginian discussed the concerns she had with parking due to the narrow width of the roadway.

Larry Link (TAC) — Larry Link asked about sidewalks, and clarified they seem sufficiently wide.

Daniel Eldridge (TAC) — Asked about adding signs and paint options to demarcate the available car-parking spaces.

Chip Gaysunas (TAC) — Chip Gaysunas asked to confirm if we were looking at a total of 15 spaces, and possibly extra ones on the entrance to Ridge Rd. He also asked if there were no restrictions currently.

Glenn Clancy (CD Director) — Glenn Clancy confirmed the numbers, and that they would only include one side of car parking. He confirmed that no such restrictions yet, except for a small number of limited “No-Parking” signs, but that these are often ignored.

Sanjit Snyl (21 Ridge Rd.) — Sanjit Snyl said we could consider extending parking down to the adjacent utility pole near his house, but still there would be no parking on the rest of the road south to Belmont St. This could update the plan to include three spots for cars there instead of only two.

Glenn Clancy (CD Director) — Glenn Clancy said this likely would be possible, and that he would confirm these details later on.

Voting Motion — **David Coleman (TAC Chair)** suggested we make a motion to recommend to the Select Board approval of parking restrictions on Ridge Rd. based on the plan drawn up by Glenn Clancy (shown in the diagram in Appendix 1.), and revised based on tonight’s feedback from the abutters and from two recent site visits. In addition, the plan would clarify the one-sided parking along the street as discussed. Chip Gaysunas moved this motion forward, and Ken Lind seconded the motion.

Vote by Roll-Call — A roll-call vote was held. All members voted in favor of this motion, and it therefore passed unanimously.

Winter St - Speed Tables; Section of Winter St. between Marsh and Belmont Country Club — Review of recommendations and vote on whether to recommend action to Select Board.

Glenn Clancy (CD Director) — Glenn Clancy provided an overview of the proposed locations for the speed tables and signs in Appendix 2. He said that the northern speed table would be intended to slow down traffic coming from Rt. 2. He also explained that these

speed tables are designed for 20-mph speeds, and so would be consistent with this speed zone.

Ken Lind (TAC) — Ken Lind asked if there were any signs that would be included to alert people when approaching these speed tables.

Glenn Clancy (CD Director) — Glenn Clancy said features include markings are on the roadway, using thermo-plastic which is visible in the dark. He said that signs are not usually included, though this could be augmented with them.

David Coleman (TAC Chair) — David Coleman said that the placement of these speed tables would help for maintenance workers of the golf course whom are often hazardedly affected by the speeding traffic on Winter St.

Daniel Eldridge (TAC) — Daniel Eldridge asked about whether there were street lights and enough visibility at night along this section of roadway for people to see the speed tables.

Glenn Clancy (CD Director) — Glenn Clancy said we could add signs there to enhance the visibility at night.

Heather Barr (TAC) — Heather Barr asked about the origin of the flashing electronic speed signs there. She also asked about the dynamics and interplay between the existing electronic sign and the proposed speed tables, and how they work together.

Glenn Clancy (CD Director) — Glenn Clancy said that electronic signs were donated by the golf club, and that the electronic sign is further away and therefore not tightly coupled to this proposed design. In addition, he said that the speed of vehicles is still high, even after those signs were installed about a year or two ago. Therefore, Glenn said that the speed tables should be more effective in helping with slowing down car traffic. He said that the hope is that regular commuters will see all these signs and traffic-calming features and drive more slowly through this area.

Chip Gaysunas (TAC) — Chip Gaysunas asked whether overuse of signs might be a concern if more signs are added. He also asked about feedback from the pre-existing speed tables down near Marsh St.

Glenn Clancy (CD Director) — Glenn Clancy responded that there has been only anecdotal feedback so far from the ones near Marsh St., but has at least received several positive responses so far by the residents there.

Daniel Eldridge (TAC) — Daniel Eldridge asked if the golf club had been consulted about this proposal. In addition, he asked if they might be able to help to fund this.

Sergeant Paul Garabedian (BPD) — Paul Garabedian said that the golf club was consulted and shown the plan assembled from Glenn Clancy, and that they are very supportive of the proposal.

Glenn Clancy (CD Director) — Glenn Clancy responded to the funding question, and said that the Town's pavement management plan would be the intended funding source for this project.

Larry Link (TAC) — Larry Link asked about whether the electronic signs maintained persistent storage of data on the car speeds, or if they only flashed out speed temporarily.

Daniel Eldridge (TAC) — Daniel Eldridge suggested that additional marking on the roadway might help with forewarning drivers of the speed tables.

Jeffrey Roth (TAC) — Jeffrey Roth asked about adding another 12” to the spaces on the sides for cyclists, to avoid having to ride over the speed bumps which can be hazardous especially on the downhill sections.

Glenn Clancy (CD Director) — Glenn Clancy responded that he would look into this and try to accommodate a slight narrowing of the speed table to accommodate wider shoulders of flat pavement on each side.

Voting Motion — **After the discussion was complete, David Coleman (TAC Chair) suggested we make a motion that upon reviewing the placement of these two speed tables on the section of Winter St. between Marsh St. and the golf club entrance, as laid out by Glenn Clancy in Appendix 2, the TAC recommends that the Select Board approve these two speed tables and the associated signs.** Daniel Eldridge moved this motion forward, and Larry Link seconded the motion.

Vote by Roll-Call — A roll-call vote was held. All members voted in favor of this motion, and it therefore passed unanimously.

Discussion of Proposed Goden St. Neighborhood Turn Restrictions

David Coleman (TAC Chair) — David Coleman introduced the topic of the proposed turn restrictions around Goden St. These turn restrictions that were discussed are provided in Appendix 3. David mentioned that a trial program of these restrictions would make sense to consider. Also to quantify the impact other nearby roads, speed and volume measurements could be done before and after on the following streets: Bright Rd., Common St., School St., and possibly additional streets running between Common St. and Goden St.

Glenn Clancy (CD Director) — Glenn Clancy said this would ideally be done before the high school seniors are out of school in the spring, to get valid traffic counts this school year. He mentioned that these measurements could then be repeated in the fall if the proposed changes were implemented in the summer.

Sergeant Paul Garabedian (BPD) — Sergeant Paul Garabedian said that the traffic sensors are booked currently, so that it might be a few weeks before he could start such measurements. He said that he should be able to do two of these streets at once.

Glenn Clancy (CD Director) — Glenn Clancy confirmed that the seniors last day is 19 May, so we would want these measurements done before then. The signs could be installed sometime in the summer, so that the restrictions would be in place before the start of the 2023 – 2024 school year. Then Sergeant Garabedian could repeat the measurements in the September or October time-frame, to allow an assessment of the impacts.

Heather Barr (TAC) — Heather Barr tabulated the responses from the 2 March 2023 public forum, and identified those in favor, those opposed, and those whom suggested modifications. These tabulated comments summarized residents who spoke, and noted whether their comments supported, opposed, or were neutral to the left-turn restrictions. Out of the 17 people who commented, there were six no’s, six yes’s, and five people who were neither strongly for nor against.

Heather also asked about restarting the Safe Routes to School initiatives, as a longer-term approach to address these issues. She said this could involve messaging to make the neighborhoods more aware of traffic issues, and could also work with other schools

on awareness. Heather said that in addition we should be thinking about the issue of enforcement regarding these changes.

David Coleman (TAC Chair) — David Coleman said that we could also develop a more holistic process that would look at this area as a region of the Town, rather than going street-by-street and relying on limited enforcement resources. This could involve a larger approach that deals with the overarching issues. David talked about “slow zones” that many communities are adopting to deal with problems caused by excessive car traffic. These approaches modulate the speed of traffic, but do not prohibit traffic. Such approaches might have value here in light of potentially increased speeds when roads become less congested or direction-restricted, as Sam Offei-Addo (BSC Group) said at a previous TAC meeting on this topic.

Heather Barr (TAC) — Heather Barr talked about neighborhood-wide school zones, and about treating the problems more holistically. She said that there is more work to define this, and that she would be interested in taking this on. She would like to communicate with the neighborhoods more on these topics, and does not wish to see the traffic problems pushed to other streets.

Larry Link (TAC) — Larry Link asked about defining success criteria for this effort, and what we want to get from the traffic counts. He asked what an acceptable increase on Bright Rd. would be for example, and what level of reduction on Goden St. we are expecting if this proposal is implemented.

Glenn Clancy (CD Director) — Glenn Clancy said the value of the counts is that we can look at the data to respond to observations or comments, and assess whether increases are significant enough to warrant a rollback or continuation of the restrictions.

David Coleman (TAC Chair) — David Coleman said that there are also both objective metrics versus subjective metrics, in terms of whether people feel safer or not. He said that it can be difficult to measure or quantify the latter.

Larry Link (TAC) — Larry Link discussed how to do enforcement, and asked about other solutions besides staff time and resources, or sensors.

Ken Lind (TAC) — Ken Lind said he strongly agreed with Heather Barr’s comments and suggestions, and supported those approaches. He also said finding ways to do enforcement would be key. Finally, he said that waiting a long time to implement something for this neighborhood will likely detract from the perception of being able to respond quickly to concerns.

David Coleman (TAC Chair) — David Coleman next presented the slides in Appendix 4, which showed that saw-horses and sandwich boards installed for road work projects had traffic-calming effect on Goden St. He discussed the impact these had on traffic, and whether they helped or not. While this construction work was going on, David asked neighbors for feedback, and some remarked that there were very positive changes resulting from these temporary road features. He summarized that these could be simple ways to improve safety of traffic without needing any enforcement. In the briefing slides, David also showed examples from Seattle where these approaches were implemented in more permanent and intentional manners.

Daniel Eldridge (TAC) — Daniel Eldridge asked whether putting anything in the middle of the road is legally possible. He also said that he would be interested in working on this.

Glenn Clancy (CD Director) — Glenn Clancy said that there is no legal prohibition of these approaches, but that one challenge is funding. He said that another challenge would be having enough roadway width to include these features, since many of these roads are fairly narrow.

Heather Barr (TAC) — Heather Barr also said she thinks these ideas are worth pursuing, and would like to also like to be involved in exploring them.

Chip Gaysunas (TAC) — Chip Gaysunas asked about signage needed for these traffic-calming approaches, and whether they might disrupt neighborhood characteristics. He also asked about plowing and maintenance, and if those could be issues.

Glenn Clancy (CD Director) — Glenn Clancy said that we would probably want a double-yellow line (DYL) in the middle of the roadway before these element, and then come out on the other end with a DYL, which would give motorists the visual of where they should be driving. In addition, there would probably need to be signs on each side showing standard “keep right” graphics, to help when there is snow or other things obscuring visibility of the shoulders. Glenn also said that the least-obtrusive approach would probably be to make minimal use of signs. He also added that the MUTCD has a section on schools and school zones, that specifies where signs can be installed. This MUTCD chapter also discusses school walking routes and how to identify them, and the mitigations needed. Glenn said that this framework helps to justify what streets should receive investments in traffic-calming safety improvements.

Public Comments Session

The meeting now moved into a public-comment session on this agenda item.

Corinne McCue Olmstead (Stone Rd.) — Corinne McCue Olmstead asked about solving the car congestion on Goden St., and whether adding the turn restrictions is intended to also avoid traffic on these and other streets. She asked about measurements on Bright Rd., Common St., and School St., and also suggested doing traffic measurements on Goden St. She said that there are many residents on the other streets that could be impacted by these changes.

David Coleman (TAC Chair) — David Coleman responded that it is hard to measure multiple streets at once due to limited resources. He said that we will still likely be able to discern re-routing behaviors from such data collections. He mentioned that investing in more sensors would be helpful, but may not be feasible given budget limitations.

Heather Barr (TAC) — Heather Barr said a conversation with all the schools would be helpful, and it might potentially make sense to delay a decision until such conversations occur. She suggested doing other work in parallel to have an effective study throughout the entire set of neighborhoods.

David Coleman (TAC Chair) — David Coleman said that the 2 March public forum comments summary was based on people who showed up at the public forum, but that we did not have as many comments from other neighborhood groups. He agreed with an earlier point that many of the people that Corinne McCue Olmstead talked with are opposed to the proposal, but did not attend that previous 2 March public forum.

Ken Lind (TAC) — Ken Lind responded that he appreciates how complex this is, and that there would likely be impacts to other streets.

David Coleman (TAC Chair) — David Coleman said that many public comments were received and discussed, and that he wanted to discuss how to proceed from here. He said that we could ask the BPD to do these speed studies now, to at least develop baselines for future comparisons. He also said that we should ask whether the school department will put forth more concerted efforts on reviving SRTS initiatives in Belmont. David remarked that some schools like Wellington Elementary School do not currently have a SRTS liaison. He said that we should aim to identify areas that have specific unaddressed safety issues regarding access to schools.

Ken Lind (TAC) — Ken Lind suggested that this needs to also include the High School and new Upper Middle School. He said that if we want to discuss other traffic-calming ideas, then we should engage these schools, too.

Heather Barr (TAC) — Heather Barr said that she could take the lead on this effort.

David Coleman (TAC Chair) — David Coleman closed out the topic, and said that we would plan to resume discussion of this at the next meeting, and that we could also come up with some ideas on speed-modulation features then. He said that we could invite the Goden St. people to attend another meeting. David finished by saying we would plan on at least having a follow-up discussion on this at the next TAC meeting on 4 May 2023.

Crosswalk Policy: Process and Application

David Coleman (TAC Chair) — David Coleman presented the document in Appendix 5 describing a proposed policy and application process for crosswalk safety improvements. He discussed the flow of the document, and also the path for submitting requests through this program. David also presented two other documents as references, including Crosswalk Design Standards from Amherst, MA in Appendix 6 and Crosswalk Policy and Design Guidelines from Concord, MA in Appendix 7.

Two additional references were also provided on this topic. First, a report recently released by Walk Massachusetts entitled “Fatal Pedestrian Crashes in MA (2022)” summarizes fatal traffic crashes of people walking. Second, a Boston Globe article in Appendix 8 discusses increasing trends in traffic fatalities and how this problem could be addressed.

Topic Discussion

Feedback on the draft crosswalk policy was discussed. On Page 5, it was decided to add that roadway attributes would be assessed within 500 feet of the crosswalk for the survey. Language was also updated for roadway sight conditions for dangerous crossing to specify “if crosswalk length is deemed dangerous.”

Actions from the discussion were to update the document, re-circulate it for the next discussion, and include factors of safety for 200 feet of stopping distance for motor vehicles moving at 30 mph. It was also suggested that we need to add something about what we will use as assessment metrics, and how those thresholds would be met. Then we will be able to agree that there is a problem and TAC would set out to address the problem. There needs to be a simple trigger to establish whether a crosswalk meets a threshold requirement for addressing the reported problems. Glenn Clancy said he would take a closer look at these criteria, dialogue offline about this, and develop a way to say no to criteria if the assessment is clear enough.

It was suggested that all committee members to look at the following types of crosswalk issues and rank them in importance for subsequent discussion:

- (i) Cars don't stop for person walking in crosswalk;
- (ii) Walker spends too much time in roadway;
- (iii) Turning vehicles don't see person walking.

It was discussed that we would fine tune which of these are the most important based on people's assessments of how they rank relative to each other.

Updates on Ongoing Projects

Pleasant St. SRTS Crossing Grant: Acceptance of Site Plan and Schedule

David Coleman (TAC Chair) — David Coleman said the plan for this project has been approved, and it includes some striping further down the roadway. The plan also includes lane narrowing to provide a protection area around the pedestrian refuge, as well as a mid-roadway sign secured to the ground. A solar-powered crossing light that is a brighter version of what is currently on School St. is also part of the design. David said that the bulk of this work is planned for completion by 30 June.

Cross St. Speed Study and Next Steps; Crash History

Glenn Clancy (CD Director) — Glenn Clancy said has has looked at historical crash data for this roadway, and that most crashes were not between Brighton St. and Cross St. He said that he needs to evaluate the location of the proposed crosswalk, and will report back at a future TAC meeting on this.

David Coleman (TAC Chair) — David Coleman said that fog lines used on this type of roadway are often used for car-parking lanes, and that this creates issues with passing cars veering into the oncoming lanes. He said that the shoulders in this area are probably 5-foot wide and the travel lanes are approximately 11 feet wide, so the total roadway width is approximately 33 feet. He said that there is not enough space for bonafide parking lanes, and agreed that the mid-block crosswalk should be looked at further.

Concord Ave. Striping Status After Select Board Confirmation and Next Steps; Post Office Area

David Coleman (TAC Chair) — David Coleman summarized the Select Board discussion on 27 Feb. 2023 where TAC provided a status readout on the new parking-protected bicycle lanes on Concord Ave. The briefing presented there is shown in Appendix 9. David reported that the Select Board asked for further investigation into possible improvements for the Belmont Post Office section, since there were still lingering concerns about the vulnerabilities of people getting out of their cars. He said there was also interest in looking at ways to further modulate speeds of the cars on the west-bound section of the roadway near the Belmont Post Office.

David mentioned that some painted yield symbols are planned for the bicycle lanes, and that signs with graphics are also expected to be added this month. He said that Salem, MA provided some graphics for these new signs. David discussed these striping improvements,

enforcement of the setbacks using bollards, adding cones back out there soon, and ten of the new signs planned for installation.

Daniel Eldridge (TAC) — Daniel Eldridge suggested that we consider reducing the width of the buffer protecting cyclists from the parked cars near the Belmont Post Office. He said that moving the parked cars closer to the bicycle lane there might gain support from people who have opposed the design.

David Coleman (TAC Chair) — David Coleman said there is already some flexibility in how people park, and that reducing the buffer to make the cars closer to the bicycle lane could exacerbate other issues by creating hazards to people getting into or out of their cars on the right as well as hazards to cyclists. It also might be inconsistent with the design standards for these protected bicycle lanes and with the graphics illustrated in the planned signs.

ADJOURNMENT

Dan Eldridge motioned to adjourn tonight's meeting, and Heather Barr seconded the motion. All voted unanimously with this measure, and the meeting adjourned at 10:54p.

These minutes were respectfully submitted by Jeffrey Roth.

Appendix 1: Town Assessment of Numbers of Car Parking Spots on Ridge Rd.



Appendix 2: Proposed Winter Street Traffic Calming Measures



f201
GEJ

Proposed
Speed Table

Proposed
Speed Table

Notes and Comments:

- Driveway curb cuts limit the opportunity to install raised tables between Country Club Lane and Marsh Street
- Existing 25 MPH Thickly Settled sign on Winter Street SB will be relocated to avoid speed limit confusion
- Existing Speed Limit Feedback sign on Winter Street NB near Country Club Lane will be retained
- Yellow 20 MPH speed limit sign will be added to previously installed Traffic Calming Zone sign on Concord Avenue at Winter Street

Plan Showing
Proposed Raised Tables and Signage
Winter Street Belmont, MA
Office of Community Development
Scale as noted March 2, 2023

SCALE
0 400 200 800 -0

Appendix 3: Town of Belmont School Street & Goden Street Neighborhood Traffic Calming Proposal

Town of Belmont School Street & Goden Street Neighborhood Traffic Calming



TOWN OF BELMONT

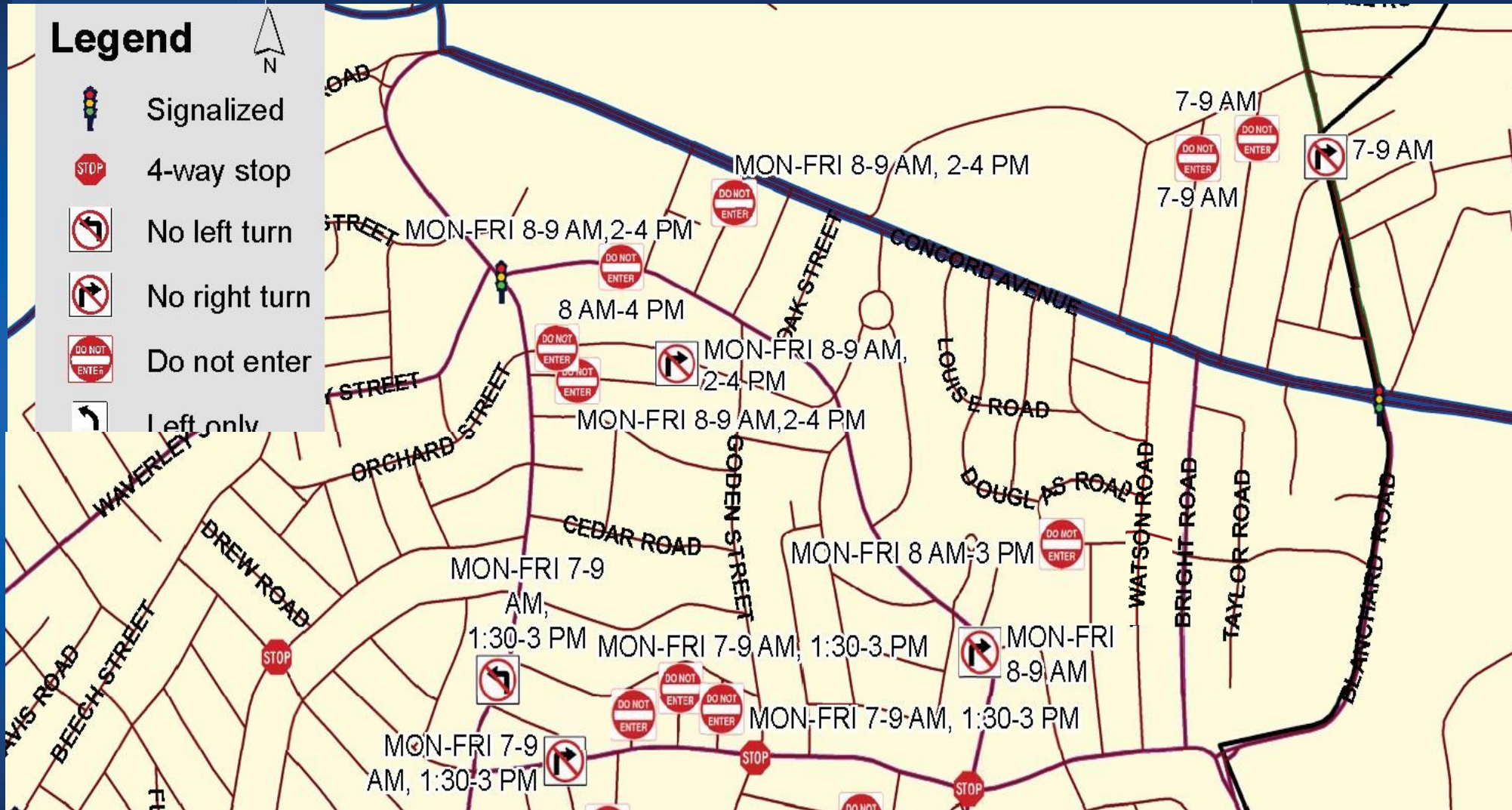
Study Area



Travel Time Runs



Existing Traffic Restrictions



TOWN OF BELMONT

Traffic Restriction Considerations

- Concord Ave Eastbound AM right-turn restrictions
- School Street Westbound PM right-turn restrictions

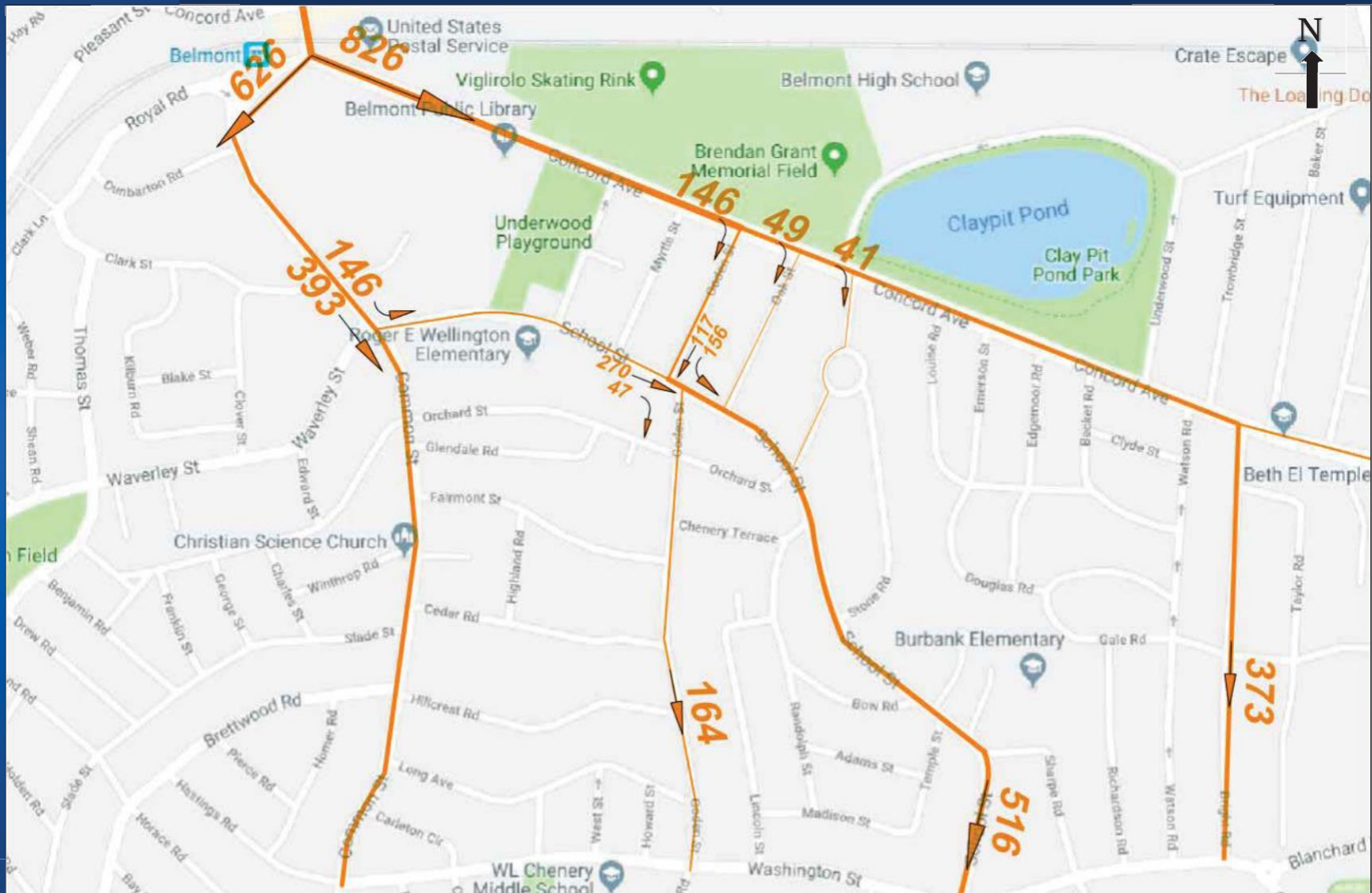


Concord Ave Turn Restriction Considerations

- Concord Ave Eastbound right-turn restrictions
 - Myrtle Street (existing 8-9 AM, 2-4 PM)
 - Goden Street (7-9 AM)
 - Oak Street (7-9 AM)
 - Orchard Street (7-9 AM)
- Pros
 - Reduce commuter cut-through traffic
 - Direct more vehicles towards Bright Road
 - Reduce traffic at Goden Street & School Street intersection
- Cons
 - Possible traffic increases at Common Street & School Street
 - Would impact school-bound traffic from Concord Avenue

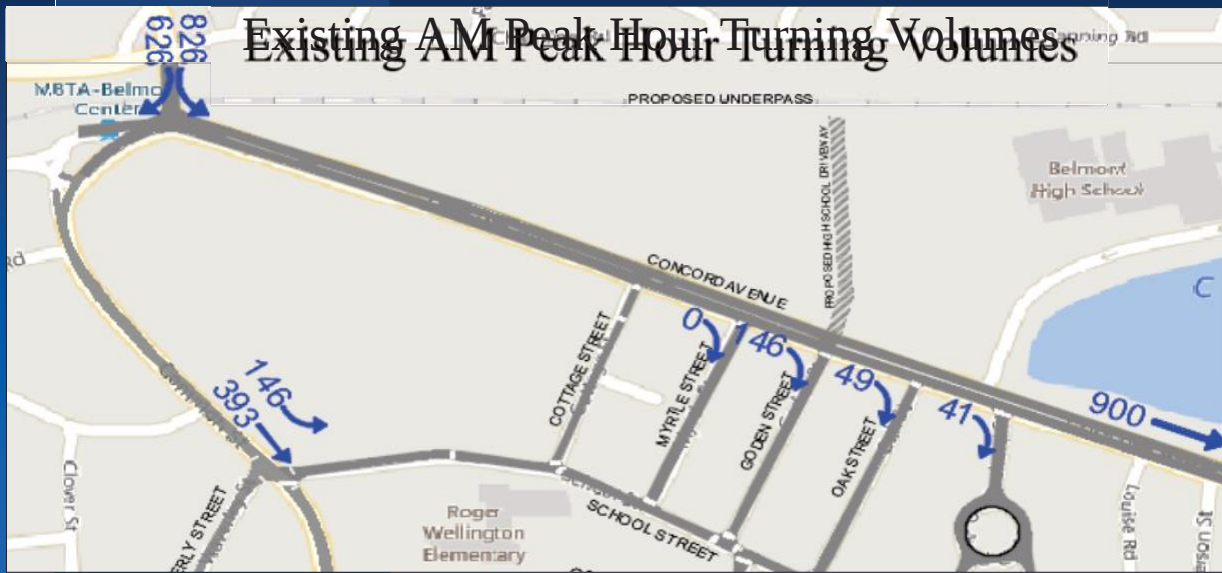


AM Peak Hour Traffic Flow



TOWN OF BELMONT

Concord Ave Turn Restrictions Considerations



- 236 total trips turning right onto Goden Street, Oak Street, Orchard Street during AM peak hour
- 20% redirected from Concord Avenue to Common Street (50 vehicles)
- 80% continue east on Concord Avenue towards Bright Street (186 vehicles)



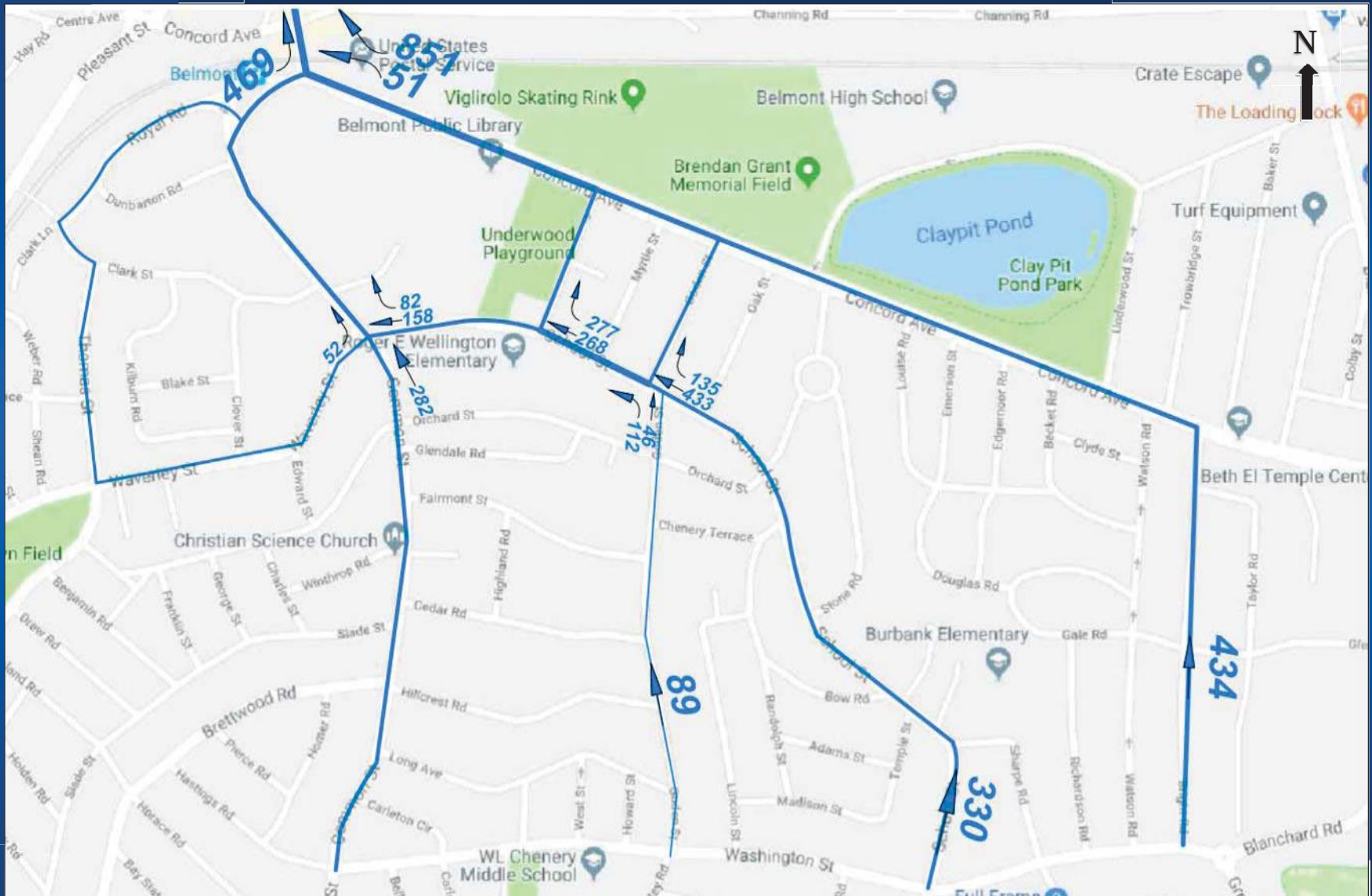
TOWN OF BELMONT

School Street PM Turn Restriction Considerations

- School St westbound right-turn restrictions
 - Goden Street (4-6 PM)
 - Cottage Street (4-6 PM)
- Pros
 - Reduce commuter cut-through traffic
- Cons
 - Possible traffic increases at Common Street & School Street
 - Redirect more traffic towards Waverley St/Thomas St/ Clark St/Royal Rd
 - Would impact high school-bound traffic from study area
 - Increase in U-turns on Concord Ave



PM Peak Hour Traffic Flow



TOWN OF BELMONT

BSC GROUP

Lower Goden Street Improvements



Appendix 4: Utility Traffic Calming on Goden

Utility Traffic Calming on Goden



**Deflection
moderating speed**



**Deflection
working for 2-way
traffic**



Traffic Calming feature in Seattle

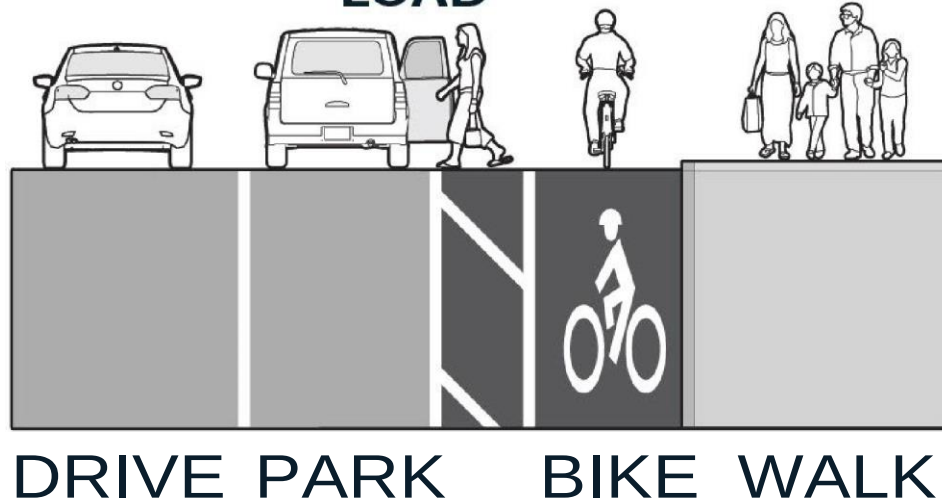


Parked cars outside of the fog
lines on Cross.



NEW STREET LAYOUT

LOAD



Appendix 5: Crosswalk Safety Improvement Policy and Application — DRAFT 2023-04-05

Appendix 1: Crosswalk Safety Improvement Policy and Application – DRAFT

4/5/23

This policy is based on the guidance for unregulated crossings as described by Mass DOT and the Federal Guidance from USDOT. An unregulated crossing is one where there is no existing method of traffic regulation, such as Stop signs and Traffic Lights.

The policy and application structure takes its cue from the traffic calming policy detailed above but is focused on specific intersections and the promotion of pedestrian safety and improving walkability in the town.

Towns approach improving crosswalk safety with both reactive (response to alerts/complaints) and proactive (as a result of planning or project design) methods. The Crosswalk Improvement process is meant to support both methods, making improvements while evolving a plan to make Belmont a safe walking community.

To distinguish a need to address a crosswalk vs a larger traffic calming issue use the following checklist:

1. The issue is with a specific unregulated crossing on a specific street or intersection of streets, not with a length of the street itself.
2. The focus is on improving pedestrian/bicycle safety and supporting walking routes at this crossing.
3. Traffic Calming issues that encompass a larger area might include specific crosswalk issues.

I) Crosswalk Improvement overview and objectives:

The objectives of the Crosswalk Improvement process are:

- a. Increased driver observance of the rights of pedestrians/cyclists in the designated crosswalks.
- b. Decreased stopping time of drivers observing the crosswalk.
- c. Increased use of walking routes in Belmont for residents and visitors by linking safer crossings to make walking/cycling more appealing across the town.

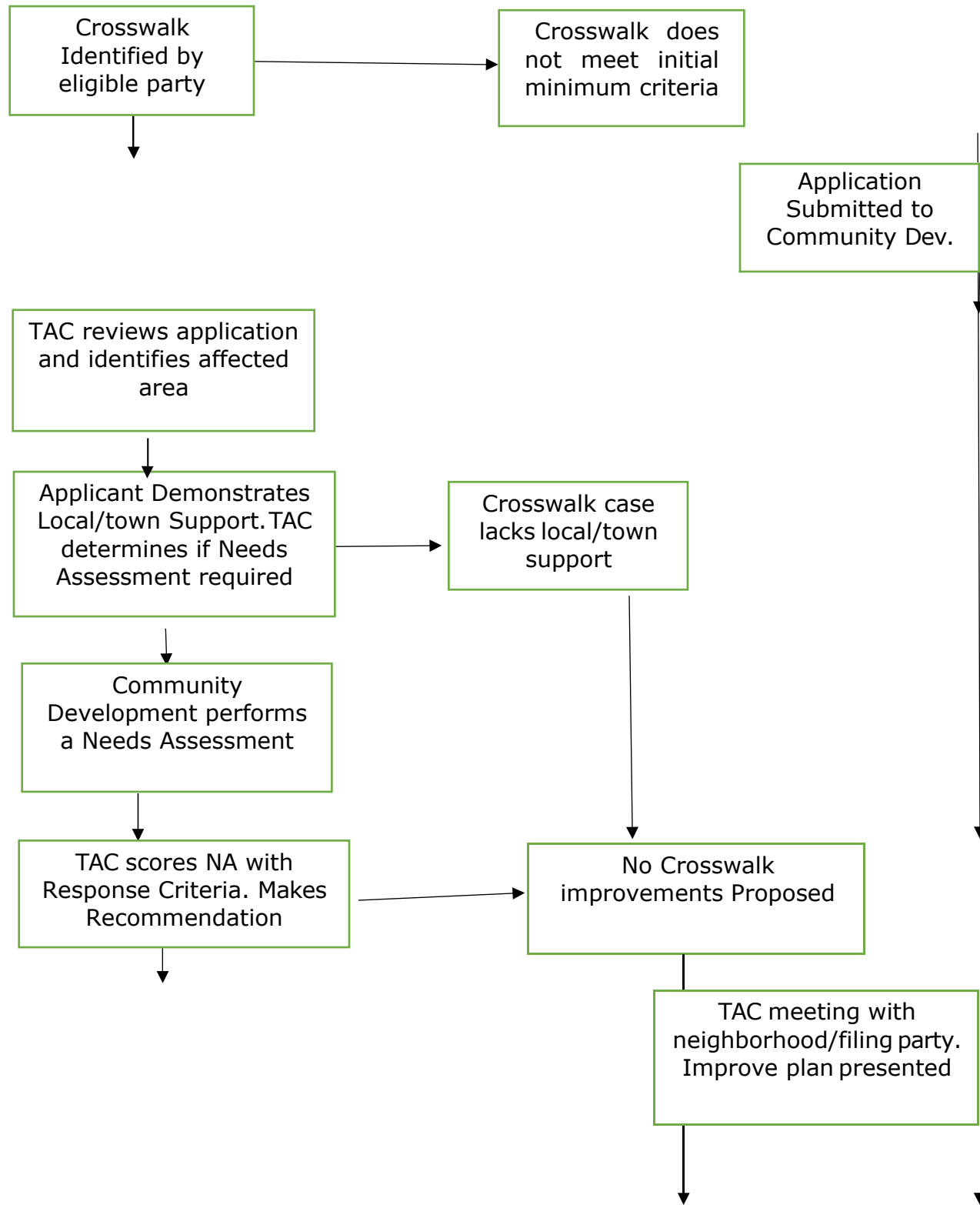
II) Crosswalk Improvement Process Steps

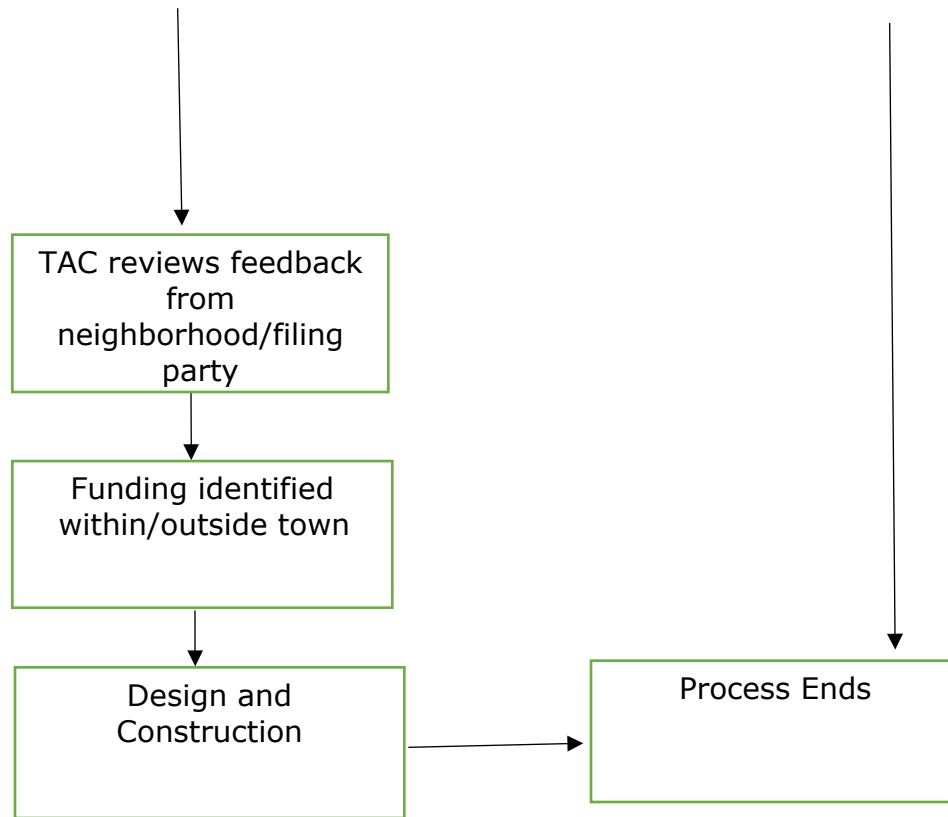
The Crosswalk Improvement process is meant to provide a method for making and managing requests to improve the safety of Crosswalks in Belmont. The steps are

largely the same as in Section III above with some small modifications that are specific to Crosswalks.

Please use the same (edited) request form included in the main Traffic Calming Policy. Check that the issue is a crosswalk. The TAC maintains a spreadsheet of Crosswalks that are of concern or that have pending improvement requests. This can be found on the TAC page of the town website.

The process is summarized in the flow chart below:





III) Crosswalk Improvement Methods:

Examples of Improvement Methods include:

- RRFB lighted crossing signs with on-demand signalization
- Refuge Islands placed in the middle of the road
- Pedestal Pedestrian crossing signs in center of roadway
- Raised crossings
- Narrowing of roadway with striping

IV) Regulated vs Unregulated Crosswalks, Traffic Calming

The emphasis on most crosswalk improvement is on unregulated crossings; crossings that do not have full signalization, as defined by the MUTCD standards, such as traffic lights and stop signs. Crosswalk Improvement may use regulatory measures such as Stop signs and pedestrian activated stop lights.

V) Individuals and Departments/Organizations that may submit Crosswalk Improvement Requests

Crosswalk improvements can be approached in either a bottom-up or a top-down fashion; either through resident complaints, town and school officials or as a result of a town-wide planning process or a design process for a related project. Examples of application submitters include:

- Anyone who lives and/or works on Belmont streets and is concerned about a crosswalk in their neighborhood.
- Town agencies such as the Belmont Police Traffic Sargent, Community Planning, Select Board, Recreation Department, etc....
- Community organizations concerned about pedestrian/cyclist safety in town such as Safe-Routes-to-School, the Beech St. Senior Center, etc...

Groups of individuals should follow the same traffic calming application process and file a (edited) Traffic Calming Request (Section XIII) under the same terms as described in section III. The same terms of process and transparency apply to crosswalk improvements as apply to traffic calming. The application should have the same level of support as a Traffic Calming Request, specifically:

- a. at least five different street addresses or
- b. fifty percent of the abutters in the directly affected area (whichever is less).

Crosswalks that have been the focus of attention by more than one of the groups listed above will move up on the priority list.

Crosswalk improvement can also occur outside of this process as a result of an infrastructure project, such as:

- Recommendations included in town planning documents such as a transportation plan, Complete Streets Prioritization Plan, School/Town construction design documents, etc...
- As part of an intersection or roadway redesign within the town.

VI) Eligible Crosswalks

Eligible Crosswalks must be on roads that are eligible for Traffic Calming, as defined in Section VII above.

VII) Evaluation of Crosswalk Improvement Requests - Evaluation Criteria

Criteria	Criteria Threshold
Initial Crosswalk Safety Score	
Recorded speed of vehicles on roadway	
Recorded number of vehicles on roadway	
Roadway Physical Attributes	
Number and Nature of Anecdotal Complaints; Reported incidents-accidents	
Results of a Walkability Checklist for crosswalk	

Results of TAC Responsivity Survey	
------------------------------------	--

- Initial Crosswalk Safety Score: list of current conditions such as painted crossing bars, basic crosswalk warning signs on the side of the road, Pedestal pedestrian signs in the middle of the road at crosswalk, etc..
- Recorded speed of vehicles on roadway: Speed survey data from the Belmont Police Traffic Division.
- Recorded number of vehicles on roadway: Vehicle counts from the above survey.
- Roadway Physical Attributes: Rated pavement condition, distance to major intersections, quality of lines of sight
- Number and Nature of anecdotal complaints: Number of complaints received by phone, email, social media, etc.. Reported Incidents/Accidents as recorded by the Belmont Police database.
- Results of a Walkability Checklist for Crosswalk: results from the survey tool shown below as example.
- Results of a TAC Responsivity Survey: Recorded # of cars passing with pedestrian waiting in crosswalk ready to cross.

Example of a Walkability Checklist (source: Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations)

Location of walk

Rating Scale:



1. Did you have room to walk?

- ☐ Yes ☐ Some problems:
- ☐ Sidewalks or paths started and stopped
 - ☐ Sidewalks were broken or cracked
 - ☐ Sidewalks were blocked with poles, signs, shrubbery, dumpsters, etc.
 - ☐ No sidewalks, paths, or shoulders
 - ☐ Too much traffic
 - ☐ Something else _____

Rating: (circle one)

1 2 3 4 5 6

Locations of problems:

4. Was it easy to follow safety rules?

Could you and your child...

- ☐ Yes ☐ No Cross at crosswalks or where you could see and be seen by drivers?
- ☐ Yes ☐ No Stop and look left, right and then left again before crossing streets?
- ☐ Yes ☐ No Walk on sidewalks or shoulders facing traffic where there were no sidewalks?
- ☐ Yes ☐ No Cross with the light?

Rating: (circle one)

1 2 3 4 5 6

Locations of problems:

VIII) Crosswalk Needs Assessment:

The TAC will take the data from the Criteria table above in Section VII of the appendix and score the crosswalk:

Criteria	Measure	Score
Initial Crosswalk Safety Score		
Recorded speed of vehicles on roadway	For each 5-mph increment that the 85 th above the 25 mph limit	
Recorded number of vehicles on roadway	For each 100 vehicles in the ADT	
Roadway Physical Attributes		
Number and Nature of Anecdotal Complaints; Reported incidents-accidents		
Results of a Walkability Checklist for crosswalk		
Results of TAC Responsivity Survey	For each	

IX) Review of Needs Assessment Scoring and Final Recommendation

The Town Engineer will present the findings and the TAC will discuss the findings and hear public comment. The TAC and its department liaisons will discuss the need and scheduling for a public forum on the contemplated crosswalk improvement and the meeting date, time, place and agenda will be posted on the TAC page of the town website.

Sources for Crosswalk Safety Improvement Policy/Application Appendix:

- 1) USDOT-FHA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations:
https://safety.fhwa.dot.gov/ped_bike/step/docs/STEP_Guide_for_Improving_Ped_Safety_at_Unsig_Loc_3-2018_07_17-508compliant.pdf
- 2) SRTS Guide: Marking and Signing Crosswalks – Attached
- 3) 2009 MUTCD guidance on Crosswalk Markings – Attached
- 4) Main MUTCD site: <https://mutcd.fhwa.dot.gov/>
- 5) Town of Concord Crosswalk Policy and design Guidelines

Appendix 6: Crosswalk Design Standards for Amherst, MA



Transportation Guidelines: Crosswalk Design Standards

Purpose:

The Amherst Transportation Advisory Committee (TAC) has been tasked to evaluate and establish crosswalk design standards that will encourage safety, accessibility and consistency. This need was identified in the Transportation Plan (2015) and specifically requested by Town officials.

Definitions:

A crosswalk is a portion of a roadway at an intersection or elsewhere designated for pedestrian crossing; whether marked or unmarked, flush or raised. Crosswalks are a critical element of the transportation network by accommodating all pedestrian users, regardless of age or mobility, in crossing a roadway. They also warn drivers of possible conflicts and to prepare to yield to someone entering the crosswalk. Marked crosswalks are any portion of the road outlined by painted markings or a different texture such as imprint, brick, concrete or pavers. Raised crosswalks are elevated above roadway pavement in the form of an elongated speed hump with a flat section in the middle and at-grade with adjacent sidewalks. An unsignalized approach refers to when a crosswalk is not controlled with traffic signals. An uncontrolled approach is when a crosswalk is without any regulatory (i.e.: STOP or YIELD) signs or traffic signals.

Evaluation Process:

The evaluation began with the observation of current crosswalks downtown, around the town and on the higher education campuses. Crosswalk discussion included previous history, existing conditions, safety issues, diversity of users and varying designs and materials. Many of the older installations were noted to be in need of repair with issues including material failures and difficult maintenance.



Examples of previous crosswalk design standards on Kellogg Ave. & N. Pleasant St.

The TAC was educated on the regulatory guidelines for crosswalk markings and signage specifically Chapter 3 of the Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD), Chapter 6 and Addendum of the MassDOT Design Guidelines, and guidance from the National Association of City Transportation Officials (NACTO). Criteria for crosswalk consideration were established as follows:

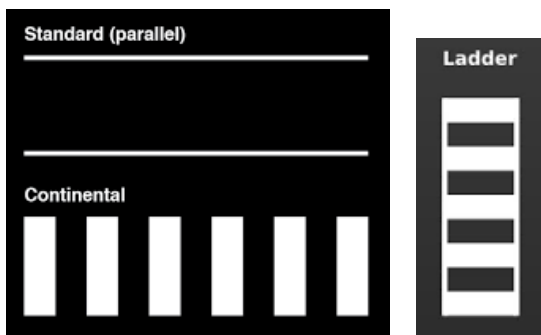
- Safety
- Visibility & Delineation
- Design & Aesthetics including for ADA users
- Durability of Materials
- Ease of Maintenance/Repair
- Construction & Maintenance Costs
- Frequency of Use (Vehicles and Pedestrians)

In addition, various crosswalk construction and marking materials were studied against the criteria for strengths and weaknesses. Particular attention was put into crosswalk trends and best practices being utilized in other historic and/or “college” towns.

Town-Wide Crosswalk Design Standards:

For Town-wide use the following patterns, materials, width, signage and lighting will be used on all Amherst roadway crosswalks:

- 1. Pattern:** The pattern will be the white Standard, Continental and Ladder.



Examples of acceptable patterns

2. Materials: Crosswalks will use one of the following markings materials: water based traffic paint, thermoplastic material and/or epoxy paint.

3. Width (between Standard lines): Crosswalks will be a minimum of 6' with a maximum width of 20'. The goal is to use the widest feasible width.

4. Signage: Will meet the standards and specifications of the MUTCD & MassDOT.

a. At Unsignalized/Uncontrolled Approaches

- Pedestrian in Crosswalk Sign (W11-2) with
- Downward Arrow Plaque (W16-7p)



Example of W11-2 & W16-7p

5. Lighting: Crosswalks shall have sufficient overhead lighting and meet FHWA & MassDOT Lighting requirements.



Examples of Amherst Cobra Streetlights

Optional Enhancements:

A Downtown Crosswalks Options: All standards previously listed under Town Wide Use may be utilized downtown including the following:

1. Pattern: Decorative Running Bond Brick with White Standard and Continental

2. Material: Thermoplastic or Epoxy



Examples: Running Bond Brick Pattern with white Standard & Continental Lines.

3. Width: Crosswalks will be a minimum of 6' with a maximum width of 20'. The goal is to use the widest feasible width.

4. Signage: State Law Yield to Pedestrians Crossing Sign (R1-6)



5. Lighting:

Adequate lighting helps to warn oncoming drivers of pedestrians crossing the street and also helps guide pedestrians across the street at night. The goal is to provide focused downcast lighting for the entire length and width of the crosswalk.

a. Downcast Street Light



Example of new downtown Amherst Streetlight

b. Lighting Pedestrian Crossing Treatments such as Flashing Bollards with pedestrian control buttons



Example of Flashing Bollards at Amherst College

6. Raised Crosswalk/Intersections used at unsignalized/uncontrolled approaches



Example of Jones Library Raised Crosswalk installed in 2016

B. Additional Pedestrian Safety Area Options: Areas possibly utilizing these enhancement tools include village centers, school zones, significantly used pedestrian crossings and other higher speed limit areas as determined by an engineering study.

1. – 3. Same as Town-wide standards

4. Signage: State Law Yield to Pedestrians Crossing Sign (R1-6)

5. Lighting:

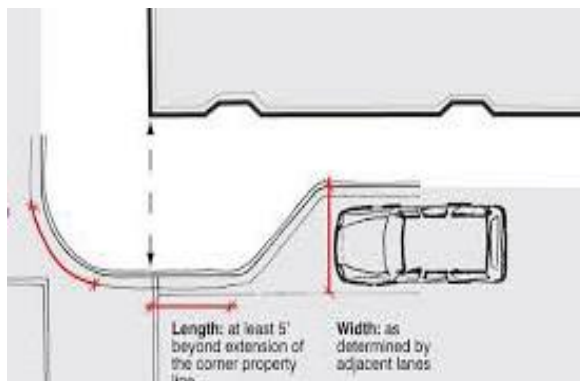
- a. Additional Downcast Street Lighting where needed
- b. Lighting Pedestrian Crossing Treatments including Rectangular Rapid Flashing Beacon (RRFB) and Pedestrian Hybrid Beacon (HAWK)



Pine Street RRFB, RRFB close up, and example of a HAWK Beacon

6. Raised Crosswalk/ Intersections used at unsignalized/uncontrolled approaches

7. Bump-Outs: A curb extension primarily used to extend the sidewalk to reduce the crosswalk length and increase pedestrian/vehicle visibility.



Examples: Bump-Outs at Jones Library and drawing of at an intersection

8. Medians or Pedestrian Safety Islands: The reserved area in a roadway that separates opposing lanes of traffic which acts to slow traffic and in some cases reduce pedestrian's exposure to vehicles.



Examples: Median at Pine Street and Pedestrian Islands at Eastman Roundabout

Notes:

1. A DPW engineering study is required to determine if the criteria and warrants are satisfied for the installation of a crosswalk at a particular location, the level of marking justified, and inclusion of optional enhancements. Design, installation and enhancements will follow MUTCD and MassDOT Design Guidelines.
2. Existing crosswalks will be reviewed periodically to ensure they meet the crosswalk criteria established in these guidelines.

TAC Recommendation: September 12, 2017

SB Approval: _____

Summary Table: Amherst Crosswalk Design Standards

	Town-Wide Standards	Optional Enhancements [^] :	
		A. Downtown:	B. Town-wide:
1. Pattern	White Standard, Continental & Ladder	Decorative Running Bond Brick with White Standard & Continental	
2. Materials	Water based paint Thermoplastic Epoxy paint	Thermoplastic Epoxy	
3. Width	6'–20'(widest feasible)		
4. Signage	Comply with MUTCD* & MassDOT At unsignalized/uncontrolled approaches*: Pedestrian in Crosswalk sign (W11-2) with Downward Arrow Plaque (W16-7p)	Yield Pedestrian Crossing Sign (R1-6)	Yield to Pedestrians Crossing Sign (R1-6)
5. Lighting	Adequate focused downcast lighting	Lighting Pedestrian Crossing Treatments (e.g.: Flashing Bollards)	Lighting Pedestrian Crossing Treatments (e.g.: Flashing Bollards, RRFB & HAWK)*
6. Raised Crosswalks		Raised Crosswalk at unsignalized/uncontrolled approaches*	Raised Crosswalk at unsignalized/uncontrolled approaches*
7. Bump-outs			Bump-outs
8. Medians & Pedestrian Islands			Medians & Pedestrian Islands

Refer to Crosswalk Design Standards document for additional details.

[^]Optional enhancements will be utilized as determined by an engineering study.

*MUTCD: Manual on Uniform Traffic Control Devices by the Federal Highway Administration

*unsignalized approach: when a crosswalk is not controlled with traffic signals

*uncontrolled approach: when a crosswalk is without any regulatory (i.e.: STOP or YIELD) signs or traffic signals.

*RRFB: Rectangular Rapid Flashing Beacon

*HAWK: Pedestrian Hybrid Beacon

Appendix 7: Crosswalk Policy and Design Guidelines for Concord, MA

TOWN OF CONCORD

CROSSWALK POLICY AND DESIGN GUIDELINES



**Concord Public Works
Engineering Division**

Concord Police Department

June 2014

Crosswalk Policy and Design Standards

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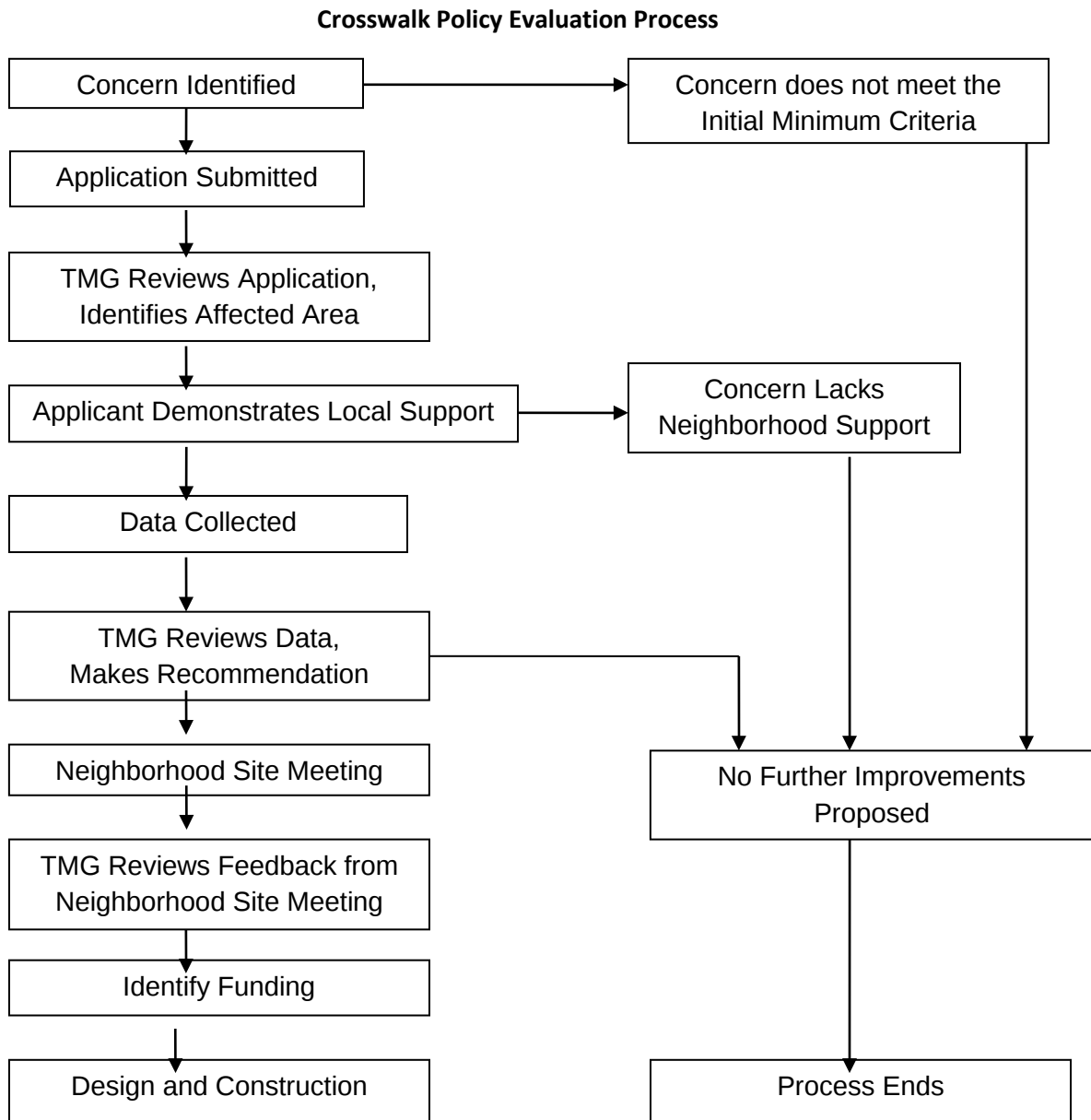
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Crosswalk Policy and Design Guidelines

Preface

This policy has been developed in order to establish a structured process and consistent criteria through which the Town's Traffic Management Group (TMG) can respond to and address residents' requests for the installation of crosswalks on Town maintained intersections and streets. All requests shall be evaluated on a case-by-case basis to determine whether the installation of a crosswalk in the requested location is warranted.

A flow chart of the overall evaluation process can be viewed below, while a description of each step is outlined in the following section:



1.0 Process and Requirements

Step 1 – Report the Problem

If a resident feels that a specific intersection or mid-block crossing location requires a crosswalk, they should request a review of the location to Concord's Community Safety Officer at 978-318-3400 or by email to rhodgson@concordma.gov

Town staff will review the request to verify that it meets the following initial minimum criteria:

- Location of crosswalk must be on a Town maintained roadway
- Location meets the Criteria for Installation (not requiring extensive data collection) based on the crosswalk type, as outlined within the Crosswalk Policy and Design Guidelines (See Section 3.0).

If the initial criteria are met, the resident will be provided a Crosswalk Request Form (a copy of the Request Form is provided in Appendix A).

Once this form is completed and submitted to the Community Safety Officer, a letter will be sent to the Applicant with notification of the upcoming Traffic Management Group (TMG) meeting date.

Step 2 – Traffic Management Group (TMG) Initial Review

The TMG will review the application to determine the limits of the affected area and will require a petition from a representative number of residents in this affected area to promote community involvement in regard to the potential crosswalk location (a blank copy of the petition to be signed is provided in Appendix A). The neighborhood shall identify and list on the petition a resident who will serve as the primary contact with the Town.

A letter will be sent to the Applicant with the petition forms and limits of the affected area.

Step 3 – Neighborhood Support

Once the Applicant submits the petition signed by at least 75% of the residents and/or abutters within the subject area, it will be reviewed by Town staff. A letter will be sent to the Applicant indicating receipt of petition forms and that data will be collected to evaluate the location.

In the event that the Applicant is not able to obtain 75% of the required signatures, the TMG may, at its discretion, continue to move the application on to the next step if it is determined that the potential crosswalk location is beneficial to the Town.

Step 4 – Data Collection and Evaluation

Following the showing of neighborhood support, the TMG will determine the types of data required to evaluate the crosswalk request. This is dependent on the location and existing conditions and is outlined in depth in the Crosswalk Policy and Design Guidelines. If resources allow the Town will collect data, otherwise the applicant will be responsible for the collection of the required data.

Step 5 – TMG Data Review, Evaluation, Recommendation

The TMG reviews and evaluates data. If the data meets all Criteria for Installation based on crosswalk type, as outlined within the Crosswalk Policy and Design Guidelines attached in Section 4.0, the TMG may recommend the installation of the crosswalk at the proposed location. A letter will be sent to the Applicant indicating the TMG's determination.

Step 6 – Neighborhood Site Meeting

A neighborhood site meeting will be organized by TMG and held to present the proposed crosswalk location and any associated signage/infrastructure improvements. This informational meeting will provide a public forum to solicit comments regarding the proposed project. Accommodations for additional comments will be made for those unable to attend.

Step 7 – TMG Review Neighborhood Site Meeting Comments

The TMG will review feedback presented at the neighborhood site meeting and determine the scope of the design and construction of the proposed recommendations.

Step 8 – Identify Funding

Once TMG determines that the proposed location warrants a crosswalk, funding for the proposed improvements will need to be identified and prioritized.

Step 9 – Design and Construction

Once funding is in place, design and construction of the crosswalk will proceed.

Crosswalk Policy and Design Guidelines

2.0 Introduction

2.1 Statement of Policy

It shall be the policy of Traffic Management Group to provide for safe pedestrian crossings of public streets by installing and maintaining marked crosswalks at all locations where there is substantial conflict between vehicle and pedestrian movements, where significant pedestrian concerns occur, where pedestrians could not otherwise recognize the proper place to cross, and where traffic movements are controlled.

A “marked crosswalk” is any crosswalk that is delineated by painted marking placed on the pavement for the purpose of directing pedestrians to use a particular location to cross the street. Crosswalks may be marked at intersections controlled by traffic signals or stop/yield signs (“controlled crossings”), or at locations where traffic is not controlled by signals or stop/yield signs (“uncontrolled crossings”).

2.2 Purpose of Guideline

The purpose of this guideline is to describe the warrants and criteria for the installation of marked crosswalks and the design specifications for crosswalk markings and signage. Compliance with these guidelines will ensure that the pavement markings and signs associated with safe pedestrian crossings are treated consistently throughout the Town of Concord with respect to their placement, design, installation, and maintenance.

This guideline incorporates the guidance and standards contained within the Manual on Uniform Traffic Control Devices (MUTCD), The Massachusetts Amendments to the MUTCD, the MassDOT Project Development & Design Guide and Engineering Directive concerning the standardization of crosswalk markings, the American with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities, and applicable Massachusetts State Law.

2.3 General

Marked crosswalks are useful traffic engineering device for helping pedestrians across complex intersections, channelizing pedestrians to safe crossing locations, and minimizing their exposure to vehicular conflicts, as long as sound engineering judgment is exercised in their location and design.

Marked crosswalks are viewed widely as “safety devices”, and most municipalities give the pedestrian the right-of-way when within them. However, there is strong evidence that these facts prompt many pedestrians to feel overly secure when using a marked crosswalk. As a result, pedestrians will often place themselves in a hazardous position by believing that motorists can and will stop in all cases, even when it may be impossible to do so. It is not unusual for this type

of aggressive pedestrian behavior to contribute to a higher incidence of pedestrian accidents and causes a greater number of rear-end collisions. In contrast, a pedestrian using an unmarked crosswalk generally feels less secure and less certain that the motorist will stop and thereby exercise more caution and waiting for safe gaps in the traffic stream before crossing. The end result is fewer accidents at unmarked crosswalks.

Despite the above safety issues, Crosswalk lines should not be used indiscriminately at mid-block locations away from traffic signals or stop signs. Crosswalks may be marked at mid-block locations, however, if an engineering study determines it is safe to do so, and their presence is necessary to concentrate pedestrian crossing activity at a specific location. A mid-block crosswalk is not likely to be effective if pedestrian crossings occur at random locations within a block and if vehicle volumes are low or moderate (adequate gaps are available).

Crosswalks should also not be marked on 2-lane roadways with ADT greater than 9,000 vehicles per day, or 4-lane roadways with ADT greater than 12,000 vehicles per day, unless other special treatments – such as raised median refuges, curb extensions, overhead lighting, pedestrian-activated signals, or warning lights – are provided, and an engineering study concludes that pedestrian safety will be ensured by the special treatments.

2.4 Traffic Engineering Study

A traffic engineering study is required to determine if the criteria and warrants are satisfied for the installation of a marked crosswalk at a particular location, and to determine the level of marking justified. The components of a traffic engineering study will vary by location, but may include consideration of:

- Speed and volume on the street(s) involved
- Pedestrian volume, age, and level of mobility
- Location of pedestrian origins and destinations and crossing patterns
- Existing sidewalk network and sidewalk ramps
- Adequacy of sight distances (absence of sight obstructions)
- Street characteristics including grade, curvature, pavement widths, number of vehicle and bicycle lanes
- Location of adjacent driveways
- On-street parking
- Street lighting
- Location of drainage structures
- Distance to nearest marked crossing
- Traffic signal progression
- Potential for rear-end accidents

2.5 Crosswalk Maintenance

Crosswalk markings and signs should be maintained in a high state of visibility and meet reflective standards. All crosswalk markings and signs should be inspected at least once a year and be replaced as needed. Markings and signs for crosswalks located in school zones will be inspected by the Community Safety Officer prior to the beginning of the school year and replaced as needed.

3.0 Crosswalk Installation Criteria

3.1 Signalized Intersections

Intersections with a traffic signal timed for concurrent pedestrian movements shall have crosswalks applied on the roadway approaches that have sidewalks on both sides of the approaching street. Crosswalks should not be installed where no sidewalks exist unless adequate shoulders exist for use by pedestrians. The determination of adequate shoulder should be based upon an assessment of traffic volumes, adjacent land uses, and other site-specific considerations.

Intersections with a traffic signal which is not timed to accommodate concurrent or exclusive pedestrian movements, or have traffic heads that cannot be seen by the pedestrian, shall have crosswalks applied only on those approaches which might be used by the pedestrian.

3.2 Unsignalized Intersections – Stop- or Yield-Controlled

A crosswalk may be placed across an approach controlled by a stop or yield sign if a sidewalk exists on both sides of the roadway approach controlled by the stop or yield sign. Crosswalks should not be installed at locations where sidewalks do not exist unless adequate shoulders exist for use by pedestrians. The determination of adequate shoulder should be based upon an assessment of traffic volumes, adjacent land uses, and other site-specific considerations.

In general, the installation of crosswalks across the throat of driveways or minor side roads is not recommended unless there is a high potential for vehicle/pedestrian conflicts that will be mitigated by a marked crosswalk.

3.3 Unsignalized Intersections – Roundabout

A crosswalk may be placed across a roundabout approach if a sidewalk exists on both sides of the approach. Crosswalks should not be installed at locations where sidewalks do not exist unless adequate shoulders exist for use by pedestrians. The determination of adequate shoulder should be based upon an assessment of traffic volumes, adjacent land uses, and other site-specific considerations.

In accordance with the MUTCD, crosswalks that are marked on the approaches to a roundabout shall be placed a minimum of 25 feet in advance of the yield line, or if none, from the edge of the circulating lane.

3.4 Unsignalized Intersection – Uncontrolled Approaches

A crosswalk should not be installed at an intersection on a roadway approach that is not regulated by a traffic signal, a stop sign, or a yield sign unless all of the following criteria are met:

- a. The speed limit is 40 mph or less; and,
- b. There are 20 or more pedestrians using the crossing per hour during the peak AM and PM periods of vehicular traffic (lesser volumes may be considered if a large pedestrian population consists of young, elderly, or disabled pedestrians); and,
- c. The ADT (average daily traffic) for the roadway (both directions combined) exceeds 3,000 vehicles per day; and,
- d. A sidewalk or adequate shoulder for use by pedestrians (as determined by traffic volumes, adjacent land uses, and other site specific considerations) exists on both sides of the roadway approach; and,
- e. There is not another crosswalk within 200 feet of the intersection; and,
- f. Adequate stopping sight distance (equal to or exceeding that for the posted speed) is available in both directions. Because a driver must be able to see either the crosswalk or the pedestrian warning sign, the sight distance should be measured from the driver's perspective to the outer edges of the travel lane so that an approaching driver can see a pedestrian at any point on the crosswalk. The adequacy of stopping sight distance shall be determined in accordance with the guidance contained in the AASHTO "Green Book" – A Policy on the Design of Highways and Streets (2011).

When a crosswalk is proposed in conjunction with a new development, change in land use, or new pedestrian facilities, an engineering study may be used to predict whether or not the above criteria will be met once the development or facility has been constructed and is fully occupied.

Crosswalks should not be marked on 3 or 4 lane roadways with ADT greater than 9,000 vehicles per day unless other safety features – such as raised median refuges, traffic calming measures, or overhead lighting – are provided, and an engineering study concludes that pedestrian safety will be enhanced by their presence.

3.5 Mid-Block Crosswalks

Crosswalk lines should not be used indiscriminately at locations away from traffic signals or stop signs. **Crosswalks may be marked at mid-block locations only if an engineering study**

determines that it is safe to do so and their presence is necessary to concentrate pedestrian crossing activity at a specific location and position pedestrians to be more visible by motorists.

Crosswalks should not be marked on 2-lane roadways with ADT greater than 9,000 vehicles per day, or 4-lane roadways with ADT greater than 12,000 vehicles per day, unless other special treatments – such as raised median refuges, curb extensions, overhead lighting, pedestrian-activated signals or warning lights – are provided, and an engineering study concludes that pedestrian safety will be ensured by the special treatments.

All of the following criteria should be met before installing a crosswalk at an uncontrolled, mid-block location:

- a. The 85th percentile speed of traffic at the marked crosswalk location must be less than 40 mph; and,
- b. The pedestrian volume at the location of the crosswalk must be more than 30 pedestrians per hour (pph) during the peak pedestrian hour (lesser volumes may be considered if a large percentage of the pedestrian population consists of young, elderly, or disabled pedestrians); or 15 pph for each of 4 hours; and,
- c. The ADT (average daily traffic) for the roadway (both directions combined) must exceed 3,000 vehicles per day; or the number of unimpeded vehicle time gaps that equal or exceed the pedestrian crossing times in an average 5-minute period during the peak vehicle hour must be greater than 4;
- d. A sidewalk or adequate shoulder for use by pedestrians, or a distinct pedestrian destination such as a recreation field, must exist on both sides of the roadway approach; and,
- e. Another crosswalk across the same roadway cannot exist within 300 feet of the proposed location; and,
- f. The proposed crosswalk location must have adequate street lighting near the crosswalk already in existence or scheduled for installation; and,
- g. Adequate stopping sight distances (equal to or exceeding that for the posted speed) must be available in both directions. The adequacy of stopping sight distances shall be determined in accordance with the guidance contained in the AASHTO “Green Book” – A Policy on the Design of Highways and Streets (2011).

When a crosswalk is proposed in conjunction with a new development, change in land use, or new pedestrian facilities, an engineering study may be used to predict whether or not the above criteria will be met once the development or facility has been constructed and is fully occupied.

3.6 Mid-Block School Crossings

Crosswalks should be marked at locations on an established routes to a school (if the school has established a school route plan) where there exists a conflict between vehicles and school children, or where school children would not otherwise know the proper place to cross the street. The following guidance applies only to locations adjacent to schools.

All of the following criteria should be met before installing a crosswalk at a mid-block location on an established school route:

- a. The speed limit is 40 mph or less; and'
- b. A sidewalk or adequate shoulder for use by pedestrians (as determined by traffic volumes, adjacent land uses, and other site specific considerations) exists on both sides of the roadway approach; and,
- c. There is not another crosswalk within 200 feet of the intersection; and,
- d. Adequate stopping sight distance (equal to or exceeding that for the posted speed) is available in both directions. Because a driver must be able to see either the crosswalk or the pedestrian warning sign, the sight distance should be measured from the driver's perspective to the outer edges of the travel lane so that an approaching driver can see a pedestrian at any point on the crosswalk. The adequacy of stopping sight distance shall be determined in accordance with the guidance contained in the AASHTO "Green Book" – A Policy on the Design of Highways and Streets (2011).

Crosswalks should not be marked on 2-lane roadways with ADT greater than 9,000 vehicles per day, or 4-lane roadways with ADT greater than 12,000 vehicles per day, unless other special treatments – such as raised median refuges, curb extensions, overhead lighting, pedestrian-activated signals or warning lights – are provided, and an engineering study concludes that pedestrian safety will be ensured by the special treatments.

While there is no minimum pedestrian volume for a school crossing, it is recommended that a trained crossing guard be present whenever there is crossing activity by students.

When a crosswalk is proposed in conjunction with a new development, change in land use, or new pedestrian facilities, an engineering study may be used to predict whether or not the above criteria will be met once the development or facility has been constructed and is fully occupied.

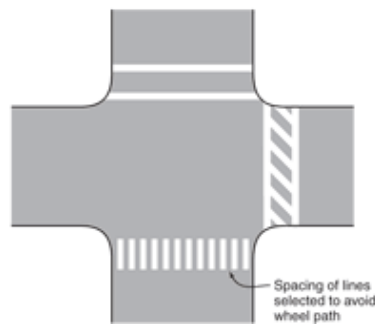
4.0 Design Features of Marked Crosswalks

4.1 Pavement Marking Patterns

The standard crosswalk marking shall consist of twin transverse lines as depicted in the figure below.

For added visibility, the area of the crosswalk may be marked with white diagonal lines at a 45-degree angle to the line of the crosswalk or with white longitudinal lines parallel to traffic flow as shown in the figure below. When diagonal or longitudinal lines are used to mark a crosswalk, the transverse crosswalk lines may be omitted. This type of marking may be used at locations where substantial numbers of pedestrians cross without any other traffic control device, at locations where physical conditions are such that added visibility of the crosswalk is desired, or at places where a pedestrian crosswalk might not be expected.

Figure 3B-19. Examples of Crosswalk Markings



The standard crosswalk markings for new crosswalks shall consist of twin transverse lines. In areas where additional visibility is required a ladder type pattern shall be used.

4.2 Crosswalk Marking Width and Color

All crosswalk markings shall be white. Crosswalk marking lines shall not be less than 12 inches in width. If used diagonal or longitudinal lines shall be 12 to 24 inches wide and separated by gaps of 12 to 60 inches. If transverse lines are used to mark a crosswalk, the gap between the lines should not be less than 6 feet. If diagonal or longitudinal lines are used without transverse lines to mark a crosswalk, the crosswalk should be not less than 6 feet wide

4.3 Crosswalk Marking Materials

Crosswalks shall be marked with paint or thermoplastic meeting the requirements set forth in the MassDOT Standard Specifications for Highways and Bridges Section M7.01 Pavement Markings.

4.4 ADA Compliance

Where a crosswalk connects to a sidewalk, the curb ramp must meet the requirements of the latest edition of the Americans with Disabilities Act Accessibility Guidelines, the Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way, Concord Public Works Design Standards, and Massachusetts Architectural Board regulations.

4.5 Use of Colored and Textured Pavement

The use of colored and textured pavements in crosswalks must comply with section 3G.01 of the MUTCD and MUTCD – Official Ruling 3(09)-24(I) – Application of Colored Pavement.

The use of different colored and textured pavements at crosswalks will be evaluated by the TMG on a case by case basis.

4.6 Pedestrian Warning Signs

4.6.1 At Uncontrolled Crossings

Pedestrian in crosswalk signs (W11A-2 with downward arrow plaque W16-7p) shall be installed at each end of the crosswalk location. The signs shall be placed in advance of the crosswalk adjacent to the travel lane and facing the driver.

Advance pedestrian warning signs (W11-2) shall be installed at a distance of at least 150 feet, but not exceeding 700 feet, in advance of the crosswalk on the approach to the roundabout. No advance warning sign is required within the roundabout. Advance pedestrian warning signs may be accompanied by supplemental plaques with the legend “AHEAD” (W16-9p) or “XXX FEET” (W16-2a).

4.6.2 At Controlled Crossings

In accordance with the MUTCD, no pedestrian crossing signs shall be installed at the location of the marked crosswalks, nor any advance pedestrian warning signs installed at a signalized or at stop/yield-controlled approaches to an intersection.

4.6.3 At School Crossings

A School Crossing Warning Assembly (SCWA) consisting of a School Crossing Sign (S1-1) with a diagonal downward arrow plaque (W16-7p) shall be installed at each end of the crosswalk location. The signs shall be placed in advance of the crosswalk adjacent to the travel lane and facing the driver. The SCWA shall not be used at marked crosswalks other than those adjacent to schools or on established school routes. The SCWA shall not be installed on intersection approaches controlled by traffic signal or stop sign.

A School Advance Warning Assembly consisting of a School Crossing Sign (S1-1) and a supplemental plaque with the legend “AHEAD” (W16-9p) or “XXX FEET” (W16-2a) shall be installed at a distance of at least 150 feet, but not exceeding 700 feet in advance of the crosswalk, in either direction.

4.7 Installation of Stop Lines

4.7.1 At Signalized Intersections

When a crosswalk is installed on the approach to a signalized intersection, a stop line should also be installed. In accordance with MUTCD (Section 3B.16), the stop line should be white in color, have a width of 12 inches, and be marked a minimum of 4 feet

in advance of the nearest crosswalk line, as measured by the gap between the stop bar and closest crosswalk marking.

4.7.2 At Stop or Yield Controlled Intersections

In accordance with the MUTCD, no pedestrian crossing signs shall be installed at the location of the marked crosswalks, nor any advance pedestrian warning signs installed at a signalized or at stop/yield-controlled approaches to an intersection.

4.8 No Parking Zone

In accordance with the MUTCD (Section 3B.18), parking spaces shall not be marked within 20 feet of a marked crosswalk at an intersection, as measured by the gap between the parking space and the closest crosswalk marking.

4.9 Use of Fluorescent Yellow-Green Signs

The 2009 edition of the MUTCD changed the use of fluorescent yellow-green (FYG) background signs in school zones from an option to a requirement. All new school crosswalk signs installed shall be FYG.

The option to use a FYG background for warning signs associated with pedestrians, bicyclists, and playgrounds is retained, and may be used. When a FYG background is used, a systematic approach featuring one background color within a zone or area should be used. The mixing of standard yellow and fluorescent yellow-green backgrounds within a selected site area should be avoided. Within any Historic District in Concord FYG signs shall only be used at school crossings as required by the MUTCD all other signs shall have “traditional yellow” backgrounds

4.10 In-Street Pedestrian Crossing Signs

In-street pedestrian crossing signs may be used at crosswalks as to increase remind road users of the applicable laws. To reflect the legal requirements stated in MGL Ch. 89, Sec. 11, all R1-5, R1-6, and R1-9 series signs installed under the provisions of these sections shall read “Yield To Pedestrians”. Signs indicating “Stop For Pedestrians” shall not be used. R1-6 and R1-9 signs shall include the legend “STATE LAW”. The yellow portion of the sign background shall be fluorescent yellow-green in color.

The signs shall not be used at signalized intersections and may be used seasonally to prevent damage caused by snow plowing operations. In-street pedestrian crossing signs may be installed or removed by the Chief of Police or his designee.

A School Crossing Warning Assembly (SCWA) consisting of a School Crossing Sign (S1-1) with a diagonal downward arrow plaque (W16-7p) shall be installed at each end of the crosswalk location. The signs shall be placed in advance of the crosswalk adjacent to the travel lane and

facing the driver. The SCWA shall not be used at marked crosswalks other than those adjacent to schools or on established school routes. The SCWA shall not be installed on intersection approaches controlled by traffic signal or stop sign.

A School Advance Warning Assembly consisting of a School Crossing Sign (S1-1) and a supplemental plaque with the legend “AHEAD” (W16-9p) or “XXX FEET” (W16-2a) shall be installed at a distance of at least 150 feet, but not exceeding 700 feet in advance of the crosswalk, in either direction.

Appendix A. Request Form and Petition

Attachment 1 – Crosswalk Request Form

This form is used to request the installation of a crosswalk on a Town maintained street. When this form is submitted, Town staff will evaluate the request to determine the potential type of crosswalk, and make sure that the location is a Town maintained street. After the initial report Town staff will explain how residents may put together a petition to promote community involvement in regard to the potential crosswalk location.

1. Contact Information

Name(please print): _____
Address, City, and Zip: _____
Phone Number: _____
Email: _____

2. Please describe the potential crosswalk location. Attach a map or picture if necessary:

3. Please describe the nature of the neighborhood traffic and why it may be beneficial to install a crosswalk (attach additional sheets if necessary): _____

4. Please list locations of existing sidewalks and crosswalks in the immediate area:

Please fill out this form and return to:

Concord Police Department
Community Safety Officer
219 Walden Street
P.O. Box 519
Concord, MA 01742
Fax: 978-369-8420

Attachment 2 – Neighborhood Petition Form (Page 1)

Please fill out this form and return with attached sheets to:

Concord Police Department
Community Safety Officer
219 Walden Street, P.O. Box 519
Concord, MA. 01742
Fax: 978-369-8420

THE UNDERSIGNED AGREE TO THE FOLLOWING:

1. All persons signing this petition do hereby certify that they own property or reside within the following area: _____

2. All persons signing this petition do hereby agree to the following problem in the defined area: _____

3. All persons signing this petition do hereby agree that the following contact person(s) represents the neighborhood in matters pertaining to items 1 and 2 above:

Name of key contact person #1 (please print): _____

Address, City, and Zip Code: _____

Telephone (day): _____ Fax: _____ E-mail: _____

Name of key contact person #2 (optional) (please print): _____

Address, City, and Zip Code: _____

Telephone (day): _____ Fax: _____ E-mail: _____

Please attach additional pages if necessary to discuss the request.

Date Submitted: _____

Attachment 2 – Neighborhood Petition Form (Page 2)

This petition is provided so that residents may work together to promote the installation of a crosswalk in their neighborhood.

Town staff will identify an “area of influence” (AOI) in the neighborhood. The AOI includes properties abutting the street and properties on intersecting streets within a reasonable distance of the proposed crosswalk locations. The Engineering Division will provide a map and addresses for the AOI.

The petition must be signed by at least 75 percent of the owners or residents of properties within the AOI. Each property is entitled to one signature. Valid signatures include those from (1) a property owner or spouse, (2) an adult head of household, or (3) an adult renting the property.

[illegible]

(Additional copies of this page may be used.)

Appendix 8: Boston Globe Article: *Pedestrian deaths are up sharply in Mass. Here are five ways to reduce them* **(2023-03-31)**

Re: Pedestrian deaths are up sharply in Mass. Here are five ways to reduce them - The Boston Globe

From: Dan Eldridge (daniel.eldridge@gmail.com)

To: davycoleman@gmail.com

Cc: jrothim@yahoo.com; jmarcotte@belmont-ma.gov; cag32765@msn.com; ken.lind@gmail.com; pgarabedian@belmontpd.org; ddestefano@belmont-ma.gov; heather_a_barr@hotmail.com; janelappin@gmail.com; rich.hartley@gmail.com; albertlink49@gmail.com; repstein@belmont-ma.gov; gclancy@belmont-ma.gov

Date: Thursday, April 6, 2023, 4:14 PM EDT

Because the Boston Globe has a paywall, here is the complete article in case you need access:

Pedestrian deaths are up sharply in Mass. Here are five ways to reduce them

By [Sonel Cutler](#) and [Tonya Alanez](#) Globe Correspondent and Globe Staff, Updated March 31, 2023, 1:00 p.m.

Massachusetts pedestrian deaths jumped 35 percent last year, a recent study by advocacy group WalkBoston found, increasing from 75 to 101 fatalities between 2021 and 2022.

A majority of the pedestrians were killed in impoverished neighborhoods in some of the state's largest cities, after dark, with senior citizens hit and killed at the highest rate, according to the report.

Of the state's 351 cities and towns, 60 of them experienced fatal pedestrian crashes in 2022, compared with 47 in 2021, the report showed.

Boston surpassed all other cities in the state with 12 pedestrian deaths last year. Worcester had the second most pedestrian deaths with seven. Chicopee had the third most with five, the report showed.

The increase, which WalkBoston's deputy director Brendan Kearney called "extremely troubling," sparked calls from experts and advocates for state and local efforts to improve pedestrian safety.

But what could actually help to reduce fatal pedestrian crashes in the Commonwealth? Here are five possible solutions, according to experts.

De-incentivize SUVs and other heavy vehicles

Experts say SUVs and large cars pose a more deadly threat to pedestrians due to their size and weight, causing more extensive damage in collisions. SUV ownership is increasing rapidly in the United States and the vehicles are unquestionably unsafe for pedestrians, said Peter Furth, a professor of civil and environmental engineering at Northeastern University.

SUVs "hit you so much higher, and that's damaging to your body," Furth said.

"It throws you down to the ground with way more force," he said. "SUVs are killers."

Furth added that SUVs have blind spots that make them more likely to hit pedestrians when turning corners and, though lauded for their safety for occupants, are much more unsafe for people outside of the car.

To stem their popularity and lower fatal pedestrian crashes, Jim Aloisi, a lecturer of transportation policy and planning at Massachusetts Institute of Technology, says legislators can de-incentivize SUV ownership.

"We need to think about how to charge people for the social cost of the heavy weights and the size of vehicles," Aloisi said, adding that both state and federal policies should discourage SUV use. "It's not necessary, and it's hurting people."

Aloisi suggested the state add a proportional size and weight charge to vehicles at the time of an annual inspection and dedicate the revenue to municipalities for street design investments.

Install crossing islands and raised crosswalks

Pedestrian and vehicle collisions are more frequent at intersections where there are no traffic lights, Furth said. Crossing islands, or raised islands in the center of a street dividing two-way traffic, protect pedestrians and make it easier and safer to cross heavily-trafficked roads compared to crosswalks.

"From US statistics, we know that [crossing islands] reduce fatality rates by 36 percent," Furth said. "They're phenomenally effective. They're not expensive."

Crossing islands can make it safer to cross a street by providing a place to stop in the middle, Furth said, and they slow down traffic.

He said thousands of crossing islands could be deployed across the state fairly easily and at low cost if prioritized by the state government.

Similarly, raised crosswalks reduce vehicle speeds by functioning as a type of speed bump, said Stacy Thompson, executive director of LiveableStreets, a

transportation advocacy organization.

"It's the ideal condition," Thompson said. "It forces the car to slow down, otherwise they'll bottom out."

Increase sidewalk width, bike and bus lanes

Dedicating more space on roads exclusively for pedestrian, biker, and bus use simultaneously narrows streets, which experts say helps reduce fatalities by preventing cars from driving straight down roads at dangerous speeds.

"Rather than have the cycling lane in the roadway, take that portion of the roadway and elevate it and then separate it out so that it's at sidewalk level and protected from traffic," Aloisi said. "Give everyone who wants to walk and cycle a better chance to do it safely."

Bike lanes also provide better sightlines for pedestrians and drivers to see each other, according to Thompson.

Jascha Franklin-Hodge, Boston's chief of streets, told the Globe the city aims to beef up public, non-vehicular transport options to increase safety.

"Part of our goal ... is to shift more of our trips out of private automobiles, onto transit, onto bikes, on foot," Franklin-Hodge said. "Part of the effort around safety is really allocating space in a way that makes people feel comfortable with alternatives to driving a car."

Improve speed limit enforcement

According to a Northeastern study conducted by Furth, "if the traffic speed is more than 27 miles an hour, then cars just won't stop" for pedestrians trying to cross the street. Thompson called reduced speed limits in densely populated areas "a good starting point," but Aloisi said decreasing speed limits would not help slow cars without better speed enforcement.

"From a behavior perspective, if someone sees a sign once they pay attention to it, if they drive the same route and see that same sign 10 times, it becomes part of the landscape," Aloisi said. "You need to enforce it."

Automated enforcement can take many different forms, Franklin-Hodge said. Though he added that it shouldn't be the primary way to keep people safe on the street, it can "play a role in helping to reduce the kind of dangerous driving behavior that can result in injuries and fatalities."

When speed cameras detect a violation, he explained, a photo is taken, the license plate is identified, and the car's registered owner receives a ticket in the mail.

"It has an established track record in other parts of the country, when deployed properly, in reducing the incidence of unsafe behavior," Franklin-Hodge said.

Allocate funding for cities and towns' capital projects

One barrier towns and cities face when seeking to add infrastructure to protect pedestrians is funding, Aloisi said.

In Massachusetts, cities and towns "don't have the unfettered ability to raise tax or tax revenues, all the money they need for projects," he said. Instead, they must ask the state Legislature for permission to enact certain changes.

"If we've got enough money that [the state is] offering a series of tax cuts, then it sounds to me like we've got enough money to give cities and towns more funding to protect people's lives by helping them redesign the urban public realm," Aloisi said.

Thompson also urged the Healy-Driscoll administration to allocate additional funding to help municipalities prevent pedestrian fatalities.

"They have the power to provide preventative technical assistance, support, funding, and really set a mandate for the entire state," Thompson said.

Furth argued that the risks pedestrians face on streets can't be fixed on a case-by-case basis.

"The thing about pedestrian deaths is they're not happening in one or two places. It's endemic, they're everywhere," Furth said. "We need systemic solutions."

On Thu, Apr 6, 2023 at 4:02 PM david coleman <davycoleman@gmail.com> wrote:

An article from the Boston Globe on pedestrian fatalities and some of the recommended remedies. Something to motivate tonight's crosswalk discussion.

Dave

Pedestrian deaths are up sharply in Mass. Here are five ways to reduce them - The Boston Globe

<https://www.bostonglobe.com/2023/03/31/metro/here-are-five-ways-mass-could-reduce-pedestrian-deaths-according-experts/>
https://www.bostonglobe.com/2023/03/31/metro/here-are-five-ways-mass-could-reduce-pedestrian-deaths-according-experts/?s_campaign=breakingnews:newsletter

Appendix 9: Concord Ave Striping Progress Report (27 February, 2023)

Concord Ave Striping Progress Report

February 27 2023

- The new striping configuration is performing as designed. A safer bicycle lane has been created with parked cars protecting the lane.
- The narrowed travel lane is helping to reduce traffic speeds closer to the 25 MPH speed limit – Belmont Police.
- One incident of driver driving up onto median after being “surprised” by opening door from parked car – Belmont Police
- No Reported incidents involving people entering/exiting at Post Office

Concord Ave; what needs improvement/enforcement

- When the lane is marked by cones compliance is good. When cones are absent lanes and setbacks are more likely to be violated.



Setback Enforcement is an issue for either the new or old configuration; line of sight issue is the same with new or old if setback blocked or does not exist. Keep and enforce the setbacks.



Add signage and pavement markings to educate the public



- Cyclists are required to yield to pedestrians. Example installation in front of Crosswalk



Add signage and pavement markings to educate the public – proposed artwork

NEW STREET LAYOUT

