

Evaluation of Charles River Road Realignment Concepts on Pedestrians in Watertown Square

The Town of Watertown, working with VHB, is testing different concepts regarding Charles River Road with the goals of improving overall traffic safety and wayfinding, and of enhancing the pedestrian experience in Watertown Square. WalkBoston, funded through the EOPSS Pedestrian Safety Initiative, was asked to provide the Town with additional information on the effects of VHB's realignment concepts on people walking through the Square.

On Wednesday, September 26, 2018, WalkBoston, Watertown town staff, and a traffic engineer from VHB observed vehicular and pedestrian traffic patterns in Watertown Square from 2:00 to 3:30 pm. WalkBoston staff timed pedestrian WAIT times and WALK times across each leg of the Square. The table and map shown in Appendix A shows the WAIT and WALK time associated with each crossing. WAIT time = the time it takes until the WALK sign illuminates after pushing the button. WALK time = the time allotted between the WALK sign and the solid red hand on the pedestrian signal.

We understand that there is an agreement with Athena Health to adjust the WALK time on all traffic signals within the Square to meet current MUTCD standards (3.5 fps). This work will not include altering the phases within the signal cycle (e.g., adding an exclusive phase or adjusting from a 2-stage crossing to a 1-stage crossing). The re-timing work is expected in the short term.

Charles River Road Options

The Charles River Road options consider the implications of realigning Charles River Road to meet up with Riverside Road, and test different vehicular direction options on pedestrian, bicycle and vehicular traffic flows and safety. Options 1-4 realign Charles River Road with Riverside Road, and Options 5 and 6 maintain the existing alignment with minor adjustments to travel lanes and curb lines, and add multi-modal facilities.

All options remove the median on Arsenal Street as it meets North Beacon Street on the eastern approach to the Square and replace it with a left-turn lane. This reallocation will provide more space for cars to stack as they wait to turn left onto Galen Street. People walking will now be able to cross in one stage, rather than two stages, which will reduce overall wait time at this approach. WalkBoston recommends that the travel lanes be narrowed as much as possible to reduce the crossing distance since there will no longer be a pedestrian median. Options 1-5 also remove the right-turn lane from Mount Auburn Street which shortens the crossing distance for people walking.

No matter which option is chosen, WalkBoston recommends inserting additional vehicle clearance time before the pedestrian signal appears. There is blatant disregard for red traffic signals throughout the Square. Pedestrians who rely on the WALK sign to indicate safety may get clipped by drivers running the red light or getting caught as the signal changes. While this change would add time to everyone's wait, it could prevent walker injuries or fatalities. Periodic police enforcement could also decrease bad driving behavior.

Since the effects on the pedestrian experience are essentially the same for Options 1-4, and Options 5 and 6, we will discuss our findings as two groups.

Options 1-4

Moving Charles River Road to align with Riverside Road eliminates a vehicular approach into Watertown Square, and therefore reduces overall wait time for people walking to different destinations around the Square. The land previously dedicated to roadway could be redesigned as park space with the potential for bringing more people to the dock along the Charles River. Increased park space with an adequate pathway network can provide opportunities for people to walk and bike away from vehicular traffic.

The table below summarizes our understanding of the proposed vehicular and pedestrian phasing for traffic signals in the Square in Options 1-4 based on phasing information provided by VHB.

Options 1-4

Vehicular movements	Pedestrian movements	Potential Veh/Ped conflicts
Galen all movements	Cross from Delta to Triangle	No conflicts
Mt Auburn all movements	Cross Main	Right turning traffic from Mt Auburn (same as existing condition)
Main/Arsenal Left turns	Cross from Delta to Triangle	No conflicts
Main/Arsenal Thru/Right	Cross Mt Auburn and Galen	Right turning traffic from Arsenal onto Mt Auburn (same as existing condition)

*Exclusive pedestrian signal needed to cross Arsenal St.

As we understand it, Options 1-4 will require a pedestrian-activated exclusive pedestrian phase for people to cross Arsenal Street. WalkBoston recommends that pedestrians across the Square be given a WALK sign when someone pushes the button to cross Arsenal Street since all traffic will be stopped. People will cross anyway once they understand that all traffic is stopped. Pedestrians would prefer a pedestrian-activated exclusive phase across all intersections touching the Square. The high volumes of vehicular traffic in the Square can be intimidating to people walking. Knowing that all cars are stopped would greatly enhance the safety and confidence of people crossing in the Square.

Options 5,6

Options 5 and 6 maintain the existing Charles River Road (CRR) alignment with minimal changes to the CRR lane widths and median. Option 5 includes additional multi-modal facilities – like bike lanes, wider sidewalks, and shorter crossing distances, while Option 6 does not.

The tables below summarize our understanding of the proposed vehicular and pedestrian phasing for traffic signals in the Square in Options 5 and 6.

Option 5

Vehicular movements	Pedestrian movements	Potential Veh/Ped conflicts
Galen All Movements	Cross from Delta to Triangle; Cross CRR	Right turning traffic from Galen onto CRR
Mt Auburn all movements	Cross Main	Right turning traffic from Mt Auburn (same as existing condition)
Main/Arsenal Left turns	Cross from Delta to Triangle	No conflicts
Main/Arsenal Thru Right	Cross Mt Auburn and Galen	Right turning traffic from Arsenal onto Mt Auburn (same as existing condition)
Charles River Road All	Cross Arsenal	Right turning traffic from CRR (minimal)

Option 6

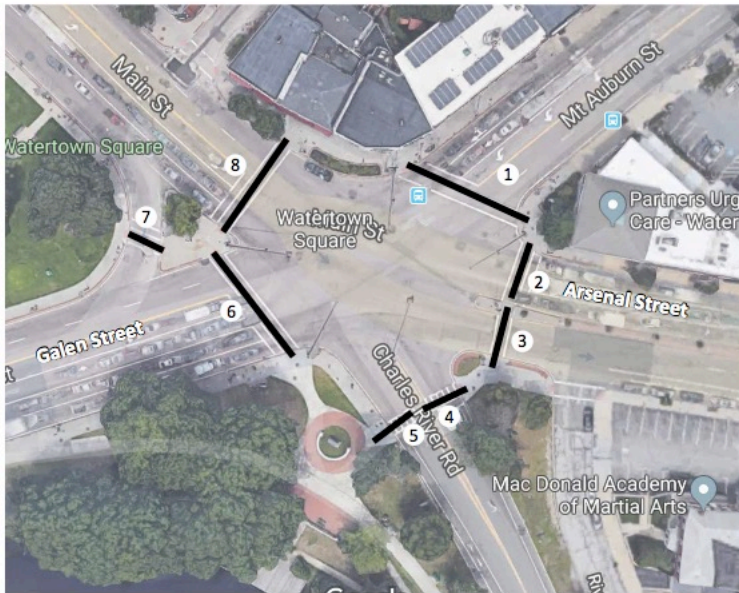
Vehicular movements	Pedestrian crossings	Potential conflicts
Galen/Mt Auburn L	Cross from Delta to Triangle; Cross CRR	Right turning traffic from Galen onto CRR
Galen/Mt Auburn Thru/R	Cross Main	Right turning traffic from Mt Auburn (same as existing condition)
Charles River Road All	Cross Arsenal	Right turning traffic from CRR (minimal)
Main/Arsenal L	Cross from Delta to Triangle	No conflicts
Main/Arsenal Thru/Right	Cross Mt Auburn and Galen	Right turning traffic from Arsenal onto Mt Auburn (same as existing condition)

The proposed changes shown in Options 5 and 6 will require longer wait times to cross Arsenal since the median will be removed and signal phasing will change from a two-stage crossing to a one-stage crossing. The changes also create a minimal conflict with right-turning traffic from CRR. CRR green time would also be extended because it will require more time to walk across Arsenal (longer distance). The additional time might encourage more drivers to avoid Arsenal Street and use CRR due to the potential for shorter wait times to get a green light.

Pedestrians do not have a protected crossing of CRR. Given that the crosswalk is set back from the intersection, drivers may pick up speed and not see people in the crosswalk. Right-turning traffic volumes are not high, but the safety of people crossing CRR need to be considered.

WalkBoston believes that Options 1-4 are better for pedestrians than Options 5 and 6. Since we are not traffic engineers, we do not have expertise in advising on the implications of each of these options on vehicular traffic or on bicycle circulation. As the options continue to be revised, we can provide additional guidance to the Town if desired.

Appendix A. Watertown Square Traffic Signal Wait/Walk Times and Observations



Crossing	Wait and Walk times
1	WAIT – 15.6 sec WALK – 17.3 sec
2	WAIT – 25 sec WALK – 9 sec
3+4	WAIT – 42 sec WALK – 16 sec
5	WAIT – 1 min 27 sec WALK – 16 sec
6	WAIT – 1 min 40 sec WALK – 20 sec
7	WAIT – 1 min 16 sec WALK – 18 sec
8	WAIT – 1 min 40 sec WALK – 18 sec

These times were recorded on September 24, 2008, at 4:30 pm.

Observations:

- The 3/4/5 signals come on at the same time, yet there isn't enough time to make the final connection from Arsenal Street across Charles River Road to the park/riverfront. The wait is another ~1:40 to get across the last lane, so people do not wait.
- The WALK signal for 7 comes on before 8, which is desirable if crossing from the delta to the waterfront park, but not the other way around.
- When drivers going straight on Mt Auburn Street get a green light, traffic from the slip lane has a red light, but walkers at 7 are held. Right turns on red are allowed from the slip lane after drivers stop. Depending on the number of turning movements, consider giving walkers a WALK sign during the vehicular red and prohibiting right turns on red. As it is, people do not wait and cross to the triangle.
- Additional clearance time is needed before the WALK because people driving continue to enter the intersection even after red arrow, adding potential conflicts with walkers.