

WalkBoston Recommendations – CAT Traffic Signals

10/1/2012

A Goal of the Central Artery Project

Reconnecting downtown Boston with its waterfront was one of the two major goals of the Central Artery Project. Large volumes of through traffic would be moved underground and easy pedestrian access would be encouraged at the surface. Accordingly, the assumption underlying these final WalkBoston recommendations for WALK signal timing along the CAT is that good pedestrian access between downtown and the waterfront should be a priority for the City of Boston.

Signalization Policy

Since WalkBoston's founding in 1990, one of our major goals has been retiming of Boston's traffic signals to better serve pedestrians. In 2004, the City of Boston adopted a policy to make WALK signals automatic and concurrent with vehicle green as is the standard in U.S. cities. With underwriting from the Boston Foundation, WalkBoston staff took to the field, assessed conditions, and made recommendations for signal retiming in high pedestrian areas.

The CAT project, then underway, had the potential for new signals installed and timed properly from the outset. To further this goal, WalkBoston members attended 10-20 meetings with CAT and BTD staff and received a commitment to maximize concurrent WALK timing in signals along the CAT corridor. After signals were installed, we undertook extensive fieldwork to assess CAT signal timing and submitted many recommendations to both CAT and the City of Boston.

Observations on Current CAT Signalization

In our review we were dismayed to find that many locations have long waits—up to 75 seconds—for minimal pedestrian WALK/Flashing Don't Walk time, especially crossing the Greenway, even though vehicle volumes except for some rush hour traffic are surprisingly light along the corridor. During weekday observations from 3 pm until 5:45 pm, traffic was fairly light in both directions on the surface streets although some build-up occurred closer to South Station – particularly at the Pearl/Purchase intersection. Also, there is much more green time in signals than needed for north-south vehicle movements. The light vehicle volumes should allow reduction in vehicle green time to free up time for longer WALKs and shorter waits. As one example, the crossings to Haymarket Station are treacherous and waits are very long, a pedestrian's nightmare. These conditions are particularly bad on the Surface Artery Southbound (SASB) side of the Greenway.

WalkBoston had assumed that all signals along the corridor would be automatic WALK, but we found that at several crossings, for example India/SASB/Purchase, pedestrians must push a button to get a WALK signal even at rush hours with heavy pedestrian traffic. It is our understanding that these intersections should be concurrent and that the problem is that the signals are not working properly. We hope they will be corrected.

In the center of the corridor we were surprised and shocked to find protected crossings that have exclusives and very short WALKs even though there are no conflicting vehicle movements, such as State/SASB and Milk/SASB. According to the CAT signal plan, these protected crossings in the heart of the Greenway Corridor should be checked again and timed for concurrent WALK.

Possibly due to long waits, short WALK times, and occasional surprises where it is necessary to push a button to get a WALK, walkers often ignore the signalization and cross during gaps in traffic. At crossings where the WALK is not automatic, confused tourists wait patiently for a WALK that never materializes. Consistency is crucial, even if occasionally vehicles are affected.

At many intersections, Right Turn on Red and Left Turn On Red from SASB into cross streets impedes and sometimes endangers crossing pedestrians because drivers barely slow down.

In general, Atlantic Avenue is more accommodating to pedestrians than the SASB, possibly because it has a parking lane and only 2 travel lanes. Also, there are nicer sidewalks, more walking destinations and better views than along the SASB and Purchase Street. However, even on Atlantic signal phases are too long and WALK times too short.

LOOP Detectors

From our discussions with BTD we understand that pedestrian crossing times cannot be increased because the side street that intersect with Atlantic Avenue have loop detectors and hence pedestrian times have been set at a minimum allowing very short vehicle phases for the streets on the ocean side which carry low volumes of traffic. While this approach may facilitate vehicle movement, it obviously does not serve pedestrians who receive minimal WALK times. The long wait times and minimum WALK do not live up to the promise of the CAT which was to move people not vehicles and to make the surface roadways urban streets. The decision to install loop detectors along the CAT is an unfortunate one and one not easily undone. In the future WalkBoston would like to see loop detectors eliminated from urban roadway designs so pedestrians can be accommodated.

Managed Parking

The map accompanying the STAF plan specified the locations along the CAT for permanent parking and for “managed” parking at non-rush hours. Our observations found that the managed parking is not provided at a number of intended locations. This is especially unfortunate in the central area along the SASB between State and Pearl, where traffic is not heavy. Parking here would narrow the roadway to two lanes and slow traffic, protect pedestrians and shorten their crossing distances and, most important, calm and humanize this roadway. We will send the results of our survey later with the hope that managed parking will be provided where promised.

Recommendations

Overall, in addition to the specifics in the chart below, we recommend that

- (1) Signal timing be adjusted to reflect the CAT signal plan
- (2) Pedestrian recall be extended until 11pm as this tourist and entertainment area does not shut down at 8pm
- (3) Loop detectors gradually be phased out along the CAT corridor as roadway repair work is undertaken

Intersection	HSH Chart	Our Observations	WalkBoston Recommendations	BTD Response WalkBoston Response In BOLD CAPS
Causeway/Haverhill (Not on HSH list)	NA	<p>There are 2 crosswalks across Causeway from both of the Haverhill Street corners to North Station.</p> <p>WALK timing: 8 secW/12FDW. Wait for W light c. 70-75 seconds, much too long for a crossing to T and commuter rail.</p> <p>The next WALK lights are at N.Wash/Causeway and Merrimac/Causeway/Lomasney Way.</p>	<p>Shorten Causeway cycle to allow more frequent WALK.</p> <p>Traffic volumes are light with no backup. Current traffic signal is badly timed for pedestrians.</p>	<p>Not part of CAT or HSH retiming study to date.</p> <p>Xwalks across Causeway short due to side street loop detectors.</p>
Causeway/N. Washington (Not on HSH list)	NA	<p>The wait for a WALK on south crossing of Washington is 140 seconds – much longer than most pedestrians will wait; 4 – 7 seconds of WALK.</p>	<p>Shorten the wait time and lengthen the WALK time.</p>	<p>Not part of CAT or HSH retiming study.</p> <p>Very busy intersection due to split phasing. Operates with a high cycle length. Uses concurrent crossings. This xwalk is only activated when Causeway Street is green. Walk time is 7 due to side street loops.</p>
N. Wash/Cross	Concurrent	Functions fine	No recommendation	OK
N. Wash/Beverly / Cooper	Concurrent	See recommendation	Ped recall should be extended to 11 pm, otherwise okay.	Ped recall currently ends at 8PM. Extend to 11PM? YES PLEASE DO
Beverly/Valenti On HSH list, but no comment	NA	<p>Beverly is one-way SB with 5 second green. Valenti is one way WB with very long green and little traffic--on 2 visits.</p> <p>Only one auto concurrent WALK signal, across N xing of Beverly. Other 3 crossings need to push a button and long waits.</p> <p>Button on NW corner for west xing of Valenti not working.</p>	<p>Shorten Valenti green time time and give more green time to Beverly. Make east & west crossings of Valenti concurrent and simultaneously give Beverly considerably more green time.</p>	<p>There are known issues with this controller. On CAT punchlist. Buttons do not call proper xwalk and some ped overlaps missing. WHEN CONTROLLER IS FIXED, WILL IT HAVE OUR SUGGESTED TIMING?</p>
Valenti Way/N. Washington/ Thacher	Concurrent		No recommendation	OK

Valenti/Haverhill	No Signalization		Crosswalks to North Station entrance should be painted.	Striping issue. WHO WILL DO THIS? WHEN:
New Chardon/SASB	Concurrent		Install a much larger NTOR sign on the SASB.	Signing issue. WHO WILL DO THIS? WHEN?
New Chardon/Market/Merrimac	HSH Note: Concurrent "Phasing Sequence Change Recommended"	Traffic on Merrimac is fairly light. West crossing of New Chardon is concurrent, but the wait is 85 seconds.	Shorten wait time for west crossing of New Chardon. This is a major crossing to Haymarket Station. Merrimac south crossing needs 5 seconds more of WALK time. This could be taken from the vehicle green.	Merrimac Street experiences a burst of heavy traffic between 5 and 6PM. This intersection has many turns for highway access and all ped crossings are concurrent. Due to clearances associated with Gov't Garage entrance, very complicated sequence. All phases are maxed out due to concurrent ped times.
New Sudbury/SASB	Concurrent	Major crossing to Haymarket T Station. Low traffic volumes on both streets, but several RTOR from Sudbury to SASB. Concurrent on both crossings of Sudbury – 7W/5FDW, but could add 30-40 seconds into W. North and south crossings of SASB are 15W/10FDW. Long cycle with long waits – 90 seconds.	Increase concurrent WALK time on both sides of Sudbury.	New Sudbury is major access street to I-93 NB and Cross St. Also has a parking garage with high departure volumes during PM rush. Surface is the side street at this location and is controlled by detectors, hence the short walk.
New Sudbury/Cross	Concurrent	Sudbury west crossing could have more Walk. This crossing is concurrent. 6W/5FDW.	Add 30 seconds WALK time on SW crossing of Sudbury and 10 seconds on the northern crossing of Cross.	Northern crossing of Cross should rest in Walk as associated with coordinated phase. SW crossing of Sudbury is side street and is short due to loop detectors. COULD THE TIMES BE ADDED BY ADJUSTING THE LOOP DETECTORS?
New Sudbury / Congress / Merrimac	Concurrent & Exclusive	Major crossings to Haymarket Station. Pedestrians wait 90 seconds for a WALK and then get 7 WALK and 5 FDW. Need much more time to cross Merrimac in the Exclusive.	Add much more time to the Exclusive crossing of Merrimac. Add 5 seconds to south crossing of Congress. Shorten wait times for WALK signals. Post NTOR at SW corner of Sudbury.	FDW's should be no less than 11 seconds. Current exclusive ped is 22 seconds (7+11+4) according to plan. Busy intersection – requires 100 second cycle during heavy AM and PM volumes. Sudbury concurrent ped not holding - CAT punchlist. IS IT & WHEN WILL IT BE DONE? NTOR is signing issue. WHO TO DO?
Cross/Hanover	Concurrent	All concurrent	Add 15 – 20 sec to all WALKs, for all crosswalks.	X walks across Hanover should rest in walk as associated with coord phase. X walks across Cross are short due to loop detectors. OK

Walk to the Sea ATLANTIC	Exclusive	A 90 second cycle; peds waited 80 seconds for a WALK that was 7W & 5FDW	Reduce wait time for WALK & give longer W. Remove button.	X walk associated with State St for Atlantic xing and Mercantile for xing Surface. Both have short walks due to side street phases that have loop detectors. CHANGE SIGNAL TIMING AT OFF PEAK TO PROVIDE SHORTER WAIT TIME FOR TOURISTS.
Hanover/SASB	Concurrent	All concurrent	Lengthen WALK time for SASB Crossing. Leading Ped Interval here is very commendable.	SASB xings are associated with side streets that have loop detectors.
North St/SASB	Concurrent	C, but could have more WALK on crossings parallel to artery	Add WALK time on crossings parallel to artery.	Xwalks parallel to Surface are associated with side streets that have loop detectors.
North/Cross	C & E	Major crossing between the Greenway and the North End. Signals on N & E xings. No C. E. with 70 second wait for short W/DW	Remove turn arrow so Cross crossing can be concurrent – Cross is a narrow quiet street – low traffic volumes; turn arrow is unwarranted. Add a Leading Pedestrian Indicator of few seconds to allow peds to step out into crosswalk before turning traffic.	CAT punchlist item. X walk across North should be also concurrent during Cross Street phase.
Atlantic/Atlantic/ Cross/Mercantile	E	100 second cycle; WALK time is 10W and 14 FDW – unusual intersection Atlantic makes a 90 degree turn.	Reduce wait time to cross. Do the number of right turns from Atlantic to Atlantic preclude concurrent for this crossing?	Right turns are very high from Atlantic to Atlantic – warrants exclusive ped phase. NTOR was added due to complaints during exclusive. OK
Commercial/Cross	Concurrent	Commercial is a very narrow street. Crossing time is 7W and 5FDW, but could be 15 seconds longer. There is no WALK light across Cross, south crosswalk.	Increase concurrent WALK by 15 seconds.	Xwalk across Commercial should rest in Walk. If no Walk light – this should be verified and repaired. X walk across Cross St associated with side street loop detectors. BEING DONE?
Clinton/SASB	C & E	Were in field @ 3:30 pm (4/7/2011) and saw no right turns over several minutes.	Remove turn arrow so both crossings parallel with Artery can be concurrent.	CAT punchlist item with missing ped overlaps. Right turns can be very heavy with garage entrance during special events and summer/fall.
State/Atlantic	C & E	Timing is 7W and 5FDW across Atlantic. C across State; E for both xings of Atlantic	Increase WALK time across Atlantic.	Ped times across Atlantic associated with side street loop detectors. There is no exclusive here. Concurrent only.
State/SBSA	Exclusive	State Street is a major walking connection between Quincy Market, Financial District,	Convert north crosswalk of SBSA from Exclusive to Concurrent – is a	North crosswalk should be concurrent – CAT punchlist item, South xwalk could be concurrent

		<p>Long Wharf and the Aquarium subway station.</p> <p>The northern crosswalk of SBSA is an exclusive, but it is a completely protected crossing. This crossing should be a concurrent while traffic moving from Atlantic to State and waterfront area moves forward and/or takes a left onto the SBSA. The time allotted for this vehicle movement is fairly brief (approx 14 seconds), but could be increased by 3 – 5 seconds to allow a concurrent WALK.</p> <p>The east crosswalk of State is concurrent.</p>	<p>completely protected crossing. Also make south crossing concurrent. Very few left turns from State onto SASB.</p> <p>Wait for WALK is 75 -80 seconds. Need to reduce waiting time by reducing Green on Atlantic.</p>	<p>as left turns are below 100 vph during both peaks. Right turns from Surface to State are very heavy – xwalk across State on West requires exclusive.</p> <p>WHEN BEING DONE?</p> <p>All xwalks across State currently only with exclusive phase</p>
Milk/Atlantic	E & C	<p>Both Milk crossings are concurrent; Atlantic south crossing is concurrent; north crossing is exclusive. Cars headed west on Milk have a long arrow for right hand turns north unto Atlantic, making concurrent impossible.</p>	<p>Eliminate turn arrow for Milk Street west vehicle movement so WALK can be concurrent. Add 10 – 15 seconds to all concurrent crossings.</p>	<p>Milk Street west phase is for traffic exiting the Aquarium parking lot and can only turn right onto Atlantic. REPLACE TRAFFIC SIGNAL ARROW WITH POSTED ARROW SIGN</p> <p>Green time is less than 20 seconds. No changes needed. A concurrent ped would only extend this phase longer.</p>
Milk/SASB	E & C	<p>As with State/SASB, there is no concurrent on the protected north crosswalk of SBSA while Milk Street traffic is moving forward or turning right. Make this crossing concurrent. Only 5 seconds of WALK & 7 FDW.</p>	<p>Make north crosswalk of SASB concurrent/ is a protected crossing. Provide more WALK time in the exclusive southern crosswalk.</p>	<p>North xwalk should also be concurrent – CAT punchlist. Exclusive walk time should be 8 seconds.</p> <p>WHEN WILL THIS BE DONE?</p>
India/SASB/Purchase	E & C	<p>Walk is not automatic. Need to push button to cross SASB.</p>	<p>Make north crossing concurrent and lengthen India light to facilitate concurrent crossing. Make WALK lights automatic. Should be no push buttons in heart of the CAT corridor.</p>	<p>North xwalk should be concurrent – CAT punchlist. Ped recall is set 9AM to 10PM.</p> <p>DONE?</p>
East India Row/Atlantic	C	<p>All crosswalks are concurrent</p>	<p>Add 15 seconds WALK to both Atlantic crossings.</p>	<p>Atlantic crossings are associated with side streets that have loop detectors.</p>
Broad/Purchase	E & C	<p>This is a major walking route to Rowes Wharf and commuter boats with very little</p>	<p>Make all WALK lights automatic and remove right arrow on Broad.</p>	<p>Ped recall added 9AM to 10PM.</p>

		<p>traffic turning from Broad into SASB. Wait time for a WALK is 65 seconds. At 5:20 pm we saw many pedestrians hurrying walking to catch the commuter boats, not waiting for WALK.</p> <p>Push button only @ south crossing of Purchase. 5 WALK & 5 FDW on north crossing of Purchase.</p> <p>Concurrent on west crossing of Broad. Exclusive with 5W and 5FDW on north crossing of Purchase. Need to push button for south crossing of Purchase with a wait from of 65 seconds. On our visit, lights malfunctioned to give all way red for both vehicles and pedestrians.</p>	<p>Add more WALK time. Peds now receive 5 WALK and 5 FDW.</p> <p>Install a NTOR sign on Broad</p>	<p>Vehicles can only turn right from Broad to Surface. Removing arrow may be unwise. INSTALL ARROW SIGN INSTEAD</p> <p>All walks should be 8 seconds. ARE THEY? HERE AND EVERYWHERE? BEING CHANGED?</p> <p>Missing ped button would be CAT punchlist. WHEN?</p> <p>Installing NTOR sign on Broad may be wise due to exclusive xwalk. WHO DOES?</p>
High/Atlantic	E & C	<p>Major crossing to Rowes Wharf and the Commuter Boats. A 50 second wait for WALK so peds cross with gaps in traffic – roadways here just two lanes across. High crossing is concurrent and is extended into the exclusive crossings of Atlantic. South side of Atlantic has 24W and 6FDW.</p>	<p>Add additional WALK time: 10 seconds on south crossing of Atlantic and more on the north crossing.</p>	<p>Walk times are fine. Exclusives never receive more than 8 seconds WALK. Concurrent overlaps to exclusive and give plenty of WALK as observed.</p>
High/Purchase/ SASB	E & C	<p>Major walking route to Rowes Wharf and the commuter boats. North crossing of Purchase and both crossings of High are concurrent. All way exclusive is 5 WALK & 6 FDW. Wait for Exclusive is 90 seconds. Pedestrians do not wait for WALK, but cross at gaps in traffic.</p>	<p>Increase Exclusive time by shortening High Street green. Traffic on High can turn right on red so limited amount of traffic heads east toward waterfront. Reduce green by 10 seconds and put into Exclusive WALK phase.</p>	<p>Exclusive WALK time should be 8 seconds. North Xwalk should overlap with exclusive – so walk should be plenty. If this is not happening- CAT punchlist. BEING DONE?</p> <p>Right turn volumes exceed 150 vph during peak hours. Converting to concurrent may result in ped complaints. DO OFF PEAK?</p>
Oliver/Purchase	E & C	<p>An important walking route to South Station, but a complicated intersection because of the SB ramp exit. There is no concurrent across Oliver west crossing though almost no right turns into Oliver @ 5:15 pm. The concurrent is poorly coordinated and shorter than it could be across the north crossing of Purchase. Exclusive has 90 second wait for 7W/5FDW.</p>	<p>Make west crossing of Oliver concurrent and improve coordination of concurrent across northern crossing of Purchase.</p> <p>Shorten wait for Exclusive and provide more WALK time.</p>	<p>The vehicles entering Oliver Street during the AM commute warrant the west xwalk to be protected only. DO IN PM PEAK THEN.</p> <p>Coordination on north crosswalk cannot be improved due to off-Ramp and Purchase Street being on during different phases. They are on together during exclusive.</p>

				This intersection is at capacity during AM and PM peaks. No time can be given to exclusive.
Atlantic/Seaport Blvd	E & C	Atlantic south crossing and Seaport Blvd west are concurrent. Atlantic north and Seaport Blvd east are exclusive.	Make Seaport Blvd east crossing concurrent with a leading pedestrian indicator except at rush hours.	LPI cannot be added during only part of the day. It is all or nothing. THEN DO LPI FOR ENTIRE DAY, PLS. The right turns from Atlantic to Seaport during the AM peak warrant the Seaport xwalk to be exclusive only.
Pearl/Purchase	E & C	North crossing of Purchase and east crossing of Pearl are concurrent, but could have much more WALK time. West crossing of Pearl is exclusive. 100 second wait to cross Purchase. South crossing of Purchase is E but could be C. 8W and 8FDW.	Make all concurrent with shorter green time for Purchase and longer WDW. Even the south crossing of Purchase has few left turns.	Both Purchase xwalks should be concurrent. CAT punchlist item. The current concurrent xwalk across Purchase is associated with side street that has detection so short walk required. Pearl St xwalk should rest in Walk during Purchase coord phase. DOES THIS MEAN WE ARE GETTING WHAT WE ASKED FOR?
Pearl/Atlantic	E	None of the crossings at this T intersection are concurrent. Pedestrians need to push a button for light, totaling 10 seconds for W/FDW combined.		This intersection is in Ped Recall – no button needed. It is basically a traffic phase on Atlantic, then an exclusive ped phase. The xwalk across Pearl cannot be concurrent as turns exceed 250 vph. We cannot do a half cycle here because of the volumes coming from Atlantic and Congress Street.
Congress/Purchase	E & C	East crossing of Congress and north crossing of Purchase are concurrent. Heavy vehicle turning movements south from Congress into Purchase @ 5:40 pm. Wait for WALK is 75 seconds. Cars on Congress traveling very fast; some back up, but cars moving. Feels like a major roadway with fumes and noise from cars.	Convert south crossing of Purchase from E to C. Reduce wait time for exclusive WALK.	It is the north and west xwalks that are concurrent. The south xwalk does cross the onramp and turns are extremely high. – it must remain protected. This intersection is a major chokepoint for the whole CAT corridor and cycle length cannot be lowered.
Congress/Atlantic	E & C	Both Congress crossings are concurrent, but WALK could be longer. Only 5W/6FDW and 90 second wait. Atlantic south crossing is concurrent and very long; north crossing is exclusive due to a heavy volume of right turning traffic from Atlantic to Congress.	Lengthen concurrent time for Congress crossings, especially the east crossing.	The Congress crosswalks are associated with Atlantic Ave that is a side street at this intersection and depends on detector loops. HOW CAN THIS MAJOR ARTERY BE A “SIDE STREET?”

Summer/Purchase /SASB		<p>Northern crossing of Summer is concurrent with only total 10 seconds W+FDW. Wait for C is 120-130 sec Vehicles turning right from ramp and Purchase occupy crosswalk during Walk time due to red light at High Street. The WALK light is concurrent with Purchase green but Purchase has 24 seconds of green after W/FDW ends. It should be added into WALK and FDW.</p> <p>This is a major crossing for commuters from South Station, heading to the downtown. It should be possible to figure out how to add Walk time during other cycles.</p> <p>The 2 north crossings over Purchase, one to the building cut-through to High and the other at the intersection. Seem okay.</p>	<p>Increase WALK time for Summer crosswalks. For example, the southern crossing of Summer, now 5W/6FDW could be extended to use full Purchase green time.</p> <p>Increase W time for south xing of Purchase.</p>	<p>The southern xwalk across Summer St is only active during the Summer EB phase (Summer St is split phase due to dual left turn lanes on Summer St WB). There is no other phase to safely run this xwalk. The walk here may be too short and should be investigated. It should be 7 seconds. . (YES, pls investigate short WALK time).</p> <p>This is a very busy intersection serving 4 different traffic movements including an off-ramp from the tunnel.</p>
Atlantic/Summer		<p>Swarms of pedestrians at rush hour; they take over the intersections, but overall works okay.</p>		
Lincoln/SASB		<p>No concurrent across west crossing of Lincoln.</p>		CAT Punchlist item. ??
Essex/SASB		<p>No concurrent across west crossing of Essex.</p>		CAT Punchlist item. ??
Essex/Atlantic		<p>Essex crossing is concurrent; Atlantic south crossing is concurrent 25W/10FDW. Atlantic North crossing is exclusive 10W/5FDW. Could be concurrent because there are very few left turns from Essex to Atlantic. However most people use the southern crossing of Atlantic to access South Station.</p>		<p>The left turns from Essex to Atlantic are very heavy during the AM and PM peaks, therefore the north xwalk require protection. The Southern xwalk has a 'long' walk time because it overlaps from exclusive to concurrent.</p> <p>OK</p>

General comment: Due to concurrent ped signals at key intersections (i.e. Surface/Essex/Lincoln and Merrimac/New Chardon) the minimum cycle length is 90 seconds to process all of the ped phases. In order to achieve progression, the minimum cycle length is 90 seconds off-peak. Due to increased traffic during the AM and PM peaks – the cycle length needs to be increased to 100 seconds.

ah & dh
10/1/12