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Pedestrian-Friendly Traffic Signal Timing Policy Recommendations

Comments by Peter Furth given at the Policy Briefing hosted by Boston City Council's Committee on Parks, Recreation, and Transportation, Dec 6, 2016

In many respects, Boston's signalized intersections follow pedestrian-friendly practices. However, in projects outsourced to design firms and subject to City review, the recent track record has many examples of giving pedestrians very poor service and safety, putting the emphasis instead on automobile capacity and delay. Some examples:

- Mass Ave, South End, implemented 2012: The new signal timing plan has 120 s cycles, with a maximum possible pedestrian delay of 110 s. This leads pedestrians to cross without waiting for the light while at the same time the long cycles promote speeding – a dangerous combination.
- Landmark Interchange, implemented 2016: Pedestrians have a multistage crossings with max delay of 180 s and average ped delay of 120 s. At the first crossing, they wait up to 60 s to cross to an island; then wait 60 s to cross to the next island; and then wait 30 s before they can start the last leg of their crossing. NOBODY is willing to wait that long, and so pedestrians are darting across streets with fast and unpredictable traffic. Meanwhile, the signals are “optimized” so that car delay is around 30 s.
- Huntington Ave at Forsyth Street (at Northeastern University), implemented 2000: Signal timings expect pedestrians to cross to the median and then wait there for the next cycle before completing their crossing. Absurd (and never obeyed). This timing was fortunately changed about 3 years ago.

As a traffic engineer, I know where terrible designs like this come from: not from “bad” engineers, but from the rules and incentives that traffic engineers follow and the software they use. *Synchro*, the standard software they use, is based on minimizing auto delay, and it doesn't even calculate pedestrian delay. “Level of Service” criteria give engineers an incentive to minimize auto delay, often at the expense of pedestrian service (which isn't measured). That's how we get designs with 30 s delay for cars with 120 s delay for pedestrians.

Also, standard traffic engineering rules (from the *Manual on Uniform Traffic Control Devices*) say it's OK to allow only enough time for pedestrians to cross to a median, and wait there for the next cycle to continue crossing. This can be appropriate in some contexts, but certainly not at high volume crossings. Finally, priority is on making green waves for through cars,

*Department of Civil and
Environmental Engineering*
400 Snell Engineering Ctr.
360 Huntington Ave.
Boston, MA 02115
617-373-2444
f 617-373-4419

which on 2-way streets is facilitated by long cycles. There seems to be little understanding that there is a tradeoff involved – that long cycles that are dangerous and inconvenient for pedestrians, and therefore should not be used to achieve a small gain for through traffic.

As I said earlier, standard intersection signal timing software doesn't calculate pedestrian delay. The situation is especially dire for intersections with multi-stage crossings, for which the *Highway Capacity Manual* has no formulas for estimating pedestrian delay. To remedy these gaps, we have developed a tool that traffic engineers can use, the *Northeastern University Ped and Bike Crossing Delay Calculator*. It is freely available on my web site, <http://www.northeastern.edu/peter.furth/delaycalculator/>.

I recommend the City consider the following three policies:

- 1) **Require that any study that reports vehicle delay must also report pedestrian delay.** “Only what’s measured counts,” and so to be sure that pedestrian delay is properly considered in decisions about traffic signal timing, the first step is to require that it’s calculated.
- 2) **A policy preference for short signal cycles.** The City should have a policy favoring short cycle lengths that gives designers an incentive to make cycles as short as possible. It should have a policy not allowing cycles longer than 90 s without approval by the Chief of Streets, with the understanding that such approval would only be given where the designers can show that the public interest served by a longer cycle outweighs the loss to pedestrian convenience and safety.
- 3) **Forbidding pedestrian timings that require multi-stage crossings** without approval by the Chief of Streets, with the understanding that such approval would only be given if the timing plan offers good service to pedestrians by timing the WALK intervals so that pedestrians have only a short wait between stages, or if some other strong and countervailing public interest is served, such as substantially reducing the cycle length. Such a policy would not forbid the provision of median islands that physically divide a crossing into multiple stages, but would require that the pedestrian timing be such that pedestrian beginning at one side of the street within the first 7 seconds of the WALK interval be able to cross the entire street in one continuous movement, rather than being forced to stop and wait at a median island.