

While street design has a tremendous impact on the livability of a city, it would be a mistake to overlook traffic signals and crosswalks, which often provide a quick and relatively inexpensive way to make a downtown more welcoming. This is especially the case in places such as Lowell, where there is considerable room for improvement in the four categories of *Synchronization*, *Cycle Length*, *Signalization Regime*, and *Crosswalk Provision*.

## Synchronization

Synchronization refers to the coordinated timing of traffic signals to allow drivers moving at a reasonable speed to encounter fewer red lights along heavily traveled paths. The proper synchronization of signals in downtown Lowell, particularly along the often-congested Dutton and Bridge Street corridors, has been discussed for many years, perhaps most prominently in the Urban Land Institute downtown study of 2003. Given the relatively minor cost of electronic synchronization when compared to road reconstruction, it is



*The Dutton-Thorndike corridor is often cited as in need of synchronized signalization.*

disappointing that no action has yet been taken on this recommendation. That said, it is also fortunate, as any recent investment in signal patterns would have been made obsolete by the more comprehensive reconfigurations recommended in this Plan.

Some Lowellians have joked that signal synchronization has not been achieved in the past because it is not expensive enough. Certainly, it is sometimes easier to garner public support around bigger, more transformative ideas. The issue is raised again here just so that it is not forgotten as this Plan is implemented. The traffic and signalization recommendations contained herein are somewhat dependent upon the initiation of a properly synchronized system, which will add only marginally to their overall cost.

## Cycle Length

Many of the streets in Lowell, particularly the one-way streets, have traffic signal timing focused on moving large volumes of cars very quickly. This practice has become a common approach to urban mobility throughout North America, and grew in prominence as automobile ownership increased throughout the twentieth century. One tool used to accomplish this goal is the long signal cycle. Increasing the overall cycle length has the advantage of moving large volumes of cars on each approach, especially when multiple signals along one-way streets can be timed in coordination with one another to facilitate

the movement of ‘platoons’ of traffic. By the same token, however, these longer periods of vehicle movement mean longer waits for pedestrians trying to cross a street and longer periods of delay for vehicles who do not have a green light.

Indeed, for pedestrians, long signal timing is more than just an inconvenience. When considered over the scale of an entire walking trip, it significantly reduces the reasonable walking reach of an area within a given frame of time. In some cases, the need to reach a destination quickly may prompt pedestrians to walk against the direction of a signal, creating potential safety problems and conflicts with vehicles.

For the above reasons, it is recommended that signal timing throughout the downtown be calibrated so that no complete cycle lasts longer than 60 seconds.

## Signalization Regime

The two most common crosswalk signalization regimes in cities are known as *concurrent* and *dedicated*. Concurrent signalization describes the system in which crosswalks receive a Walk signal when the cars heading in a parallel direction receive a green light. These systems are the norm in most older, walkable cities like Boston and Chicago. They require turning cars to wait for pedestrians in crosswalks, which only becomes a traffic impediment in areas of pedestrian crowding. Dedicated signalization describes

## Signals & Crosswalks

the system in which pedestrians wait for traffic in both directions to complete their cycle before receiving a signal to cross, typically in either direction. These systems are the norm in more auto-dominated cities like Oklahoma City and Scottsdale, where few people walk, and an avoidance of friction at intersections has been given the highest priority. Unfortunately, this system is also the norm in downtown Lowell.

Pedestrians' preference for concurrent signalization is well founded. Concurrent phasing offers walkers significantly more crossing time than dedicated phasing. In addition, most pedestrian paths across a city are not due north, south, east, or west, but diagonal. With a standard concurrent signalization regime, they can usually keep moving at intersections by crossing in the direction allowed. In contrast, being asked to stand still for long periods is extremely frustrating. Forced to wait longer than they are willing, many pedestrians simply jaywalk. While it may have been invented in part to protect pedestrians, the dedicated crossing signal instead implies that they are second-class citizens.

The same is true of pedestrian push buttons. They are a sign that the automobile dominates, and they cannot be found in significant number in New York, San Francisco, Washington, or anywhere else with a walking culture. Pedestrians should not have to ask to cross a street. But perhaps more significantly, visually disabled pedestrians, more than a few of whom frequent downtown Lowell, find them extremely dangerous. The buttons are often hard to find and, once pushed, do not operate with consistent timing. As a result, the sightless pedestrian cannot know whether the lull in traffic noise she hears is the result of a red light or simply a gap in high-speed traffic.



*Lowell's push-button signalization regime creates an environment of pedestrian inconvenience.*

For all of these reasons, downtown Lowell's current push-button dedicated signalization regime should be replaced in short order with a standard concurrent system. Dedicated phasing will still remain useful in certain auto-dominated locations within Lowell, but none of these can be found within the study area of this Plan.

### Crosswalk Provision

Pedestrians typically have a limited range in which they are willing to move before selecting another travel mode for their trip. Given this limited range, they need significant flexibility in routing and, in a city, this means they need frequent street-crossing opportunities. A standard walkable city block is between 250 and 500 feet in length. Whenever blocks—or crossing opportunities—are further apart than this, pedestrians will either jaywalk or simply abandon

the idea of walking altogether. In downtowns where geographic constraints or historic buildings prevent the introduction of smaller blocks, cities should take pains to create mid-block pedestrian crossings. One key location for such a crossing is on Prescott Street, where Middlesex Community College students must jaywalk across a dangerous traffic flow if they are to move directly between their two campus locations.

Other sites also deserve attention, but it is most effective to have a standard policy in place to introduce a mid-block crosswalk on every downtown street where existing crosswalks are more than 600 feet apart.

On a more fundamental level, many intersections downtown, including some that receive large amounts of pedestrian traffic, are missing crosswalks and signalization. Prescott and Central, for example, both lack key western crosswalks at Merrimack Street. These missing crosswalks, which force some people to cross east in order to then head west, inconveniences pedestrians in order to enhance vehicle flow. This approach has been rejected by cities that have tried it, like New York, due to pedestrian complaints.

In addition, there are a number of pedestrian crossing signals whose timing is simply in error. These should be fixed quickly, in anticipation of system-wide reform. For example, at the intersection with Merrimack Street, pedestrians are not allowed to cross Prescott Street when only Bridge Street has a green light, even though there is no possibility for conflict at that point in the cycle. Finally, as required by law, every pedestrian crossing location downtown demands adequate handicap facilities. Handicap ramps are missing at Central & Warren, French & Bridge, and elsewhere. A full

crosswalk and handicap ramp inventory should be completed in conjunction with the initial implementation of this plan.



*Merrimack's west crosswalk at Central Street is one of several key locations missing pedestrian signals.*

The above modifications represent an improvement that will allow downtown crosswalks to meet a reasonable standard of safety and walkability. However, as more funds are made available, additional modifications could make street crossings even more inviting and safe for pedestrians. The ideal crosswalk is not painted, but constructed of a contrasting material at a level slightly above the road surface, where it causes turning drivers to proceed with greater caution. This type of crosswalk is ideal along (parallel to) a major street like Merrimack, where large volumes of pedestrians cross the intersecting streets of Prescott, Central, Front, etc. Similarly, as they age and become obsolete, all pedestrian signals should be replaced with the latest technology, which currently uses a numerical count-down rather than a flashing hand.

