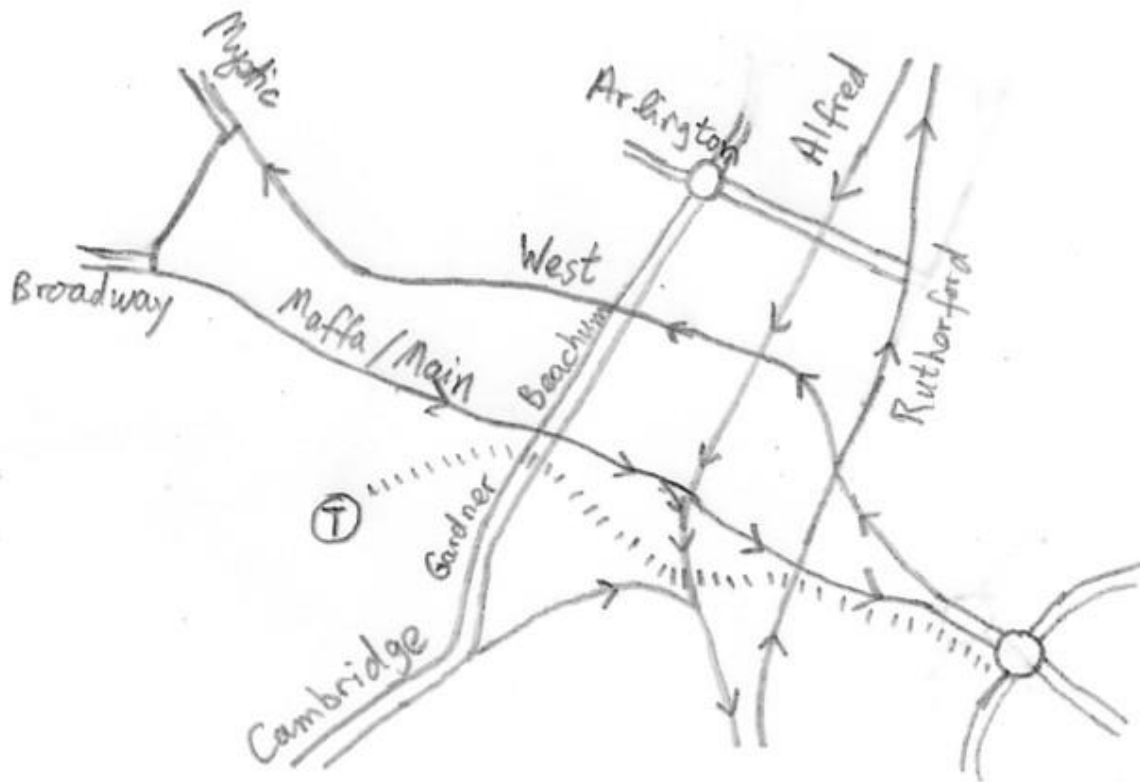


Concept Plan for Sullivan Square as a One-Way Grid

Peter Furth, 6/5/17



Single lines represent one-way streets (which may have multiple lanes); double lines represent two-way streets; and the line with dashes is the walking path from the neighborhood to the T station.

Traffic analysis would be needed to determine how many travel lanes are needed on each road but my guess is as follows:

- Alford and Rutherford: 3 lanes each
- Maffa/Main and West: 2 lanes each (possibly 3 on some blocks)
- Gardner / Beachum: 1 lane per direction (and thus 2 lanes)
- Arlington: 1 lane per direction (and thus 2 lanes)

The key to a one-way grid plan with close intersection spacing is to have a short signal cycle. That, in turn, requires that all the signalized intersections split time only two ways, i.e., one phase for the N-S street, one for the E-W street, with concurrent pedestrian crossings and no left turn phases or all-pedestrian phases. To accommodate pedestrian crossings, the minimum cycle length would be 44 s (22 s per street); to have additional capacity and to account for imbalance in demand, a longer cycle length

will be desirable. I assume 65 s, which would allow one street to have a split as great as 43 s while the other has a split of 22 s.

The blocks surrounded by one-way streets have a circumference of roughly 1300 ft. With a cycle length of 65 s, that allows for traffic progression (green wave) in all four directions (N, S, E, W) at a speed of 20 ft/s, which is 13 mph, a speed that represents a very good balance between the needs of traffic (a short cycle combined with a green wave at 13 mph will give cars very good service) and the needs of pedestrian safety.

(This, by the way, is essentially how downtown Portland, Oregon's traffic circulation works: a one-way grid with square blocks spaced 275 ft on center, giving a block circumference of 900 ft. Signals have 2 phases, with a 70 s cycle, resulting in a progression speed of $900 / 70 = 13$ ft/s or 9 mph.)

Traffic analysis would have to be done to confirm whether turn volumes at each intersection are indeed low enough to permit concurrent pedestrian crossings. In my preliminary scan, I preview that one location (Alford @ Maffa/Main) will have so great a right-turn volume that concurrent pedestrians would not be safe. In the concept sketch, I deal with that right-turn conflict by routing pedestrians to cross instead at a crosswalk about 180 ft south of it, where Cambridge St meets Alfred. The resulting pedestrian detour is part of the path indicated in the figure from the Charlestown neighborhood to the T station.

The concept plan includes two roundabouts, both intended to have a single circulating lane. A roundabout intersection at Arlington and Beachum will help preventing backups onto Alford Street. The other roundabout, at the entry to Charlestown where Main / Bunker Hill / Medford meet, is not critical to the success of the one-way grid, though it would reduce delay for cars and pedestrians and would probably help limit backups to Rutherford Ave.