



Diane Nichols Tradd
Assistant City Manager/DPD Director

Craig Thomas
Deputy Director

MEMORANDUM

TO: Eileen M. Donoghue, City Manager

EMD

FROM: Diane N. Tradd, Assistant City Manager/DPD Director

SUBJECT: MOTION OF 3/5/19 BY COUNCILOR LEAHY
REQUEST CITY MANAGER HAVE TRANSPORTATION ENGINEER REVIEW THE
INTERSECTION AT MONADNOCK AVENUE AND RAYNOR STREET FOR
POSSIBLE 4-WAY STOP SIGN

The Transportation Engineer has visited the site. Vehicles use the street as a cut-through street to avoid the traffic signal at Pine and Westford Streets and to avoid the 4-way stop on Montview and Raynor. When cars are speeding on residential streets, the first inclination is to request a 4-way Stop, in an attempt to slow down traffic. Unfortunately, stop signs do not work as traffic calming devices. When a stop sign is not warranted due to vehicle counts or crashes, per the MUTCD guidelines below, drivers either disregard the stop sign or speed on the blocks between stop signs. There are numerous studies that bear this out. Note that a 4-way stop sign is not warranted at this intersection, per MUTCD guidelines, which are the following:

- A. Where traffic control signals are justified, the multiway stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.
- B. A crash problem, as indicated by 5 or more reported crashes in a 12-month period that are susceptible to correction by a multiway stop installation. Such crashes include right and left turn collisions as well as right angle collisions.
- C. Minimum volumes:
 1. The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day, and
 2. The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour, but
 3. If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the above values.
- D. Where no single criterion is satisfied, but where Criteria B., C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.

There have been three accidents at the above referenced intersection since 2002. Therefore, the crash history does not meet the minimum warrant of five reported accidents per year.

There are traffic calming measures that do work to slow traffic on residential streets. As this is a request that comes to the attention of the Transportation Engineer often, funding for traffic calming projects has been requested in the 2019 Capital plan, with the idea being to install inexpensive 'pop-up' traffic calming measures using pavement markings and flexible posts. Once their efficacy has been proven, permanent measures can be installed. The City will develop a priority list of locations for traffic calming, based on areas where the City will maximize the impact for residents.

Some options that could work well in Lowell neighborhoods, including at this location, include mini-roundabouts, curb extensions/bumpouts with plantings/tress and chicanes. The costs for these measures vary widely. 'Pop-up' type measures, which by definition can be accomplished in a short time period and includes pavement markings, flexible posts and planters, can cost as little as \$300-\$500. Permanent measures which require curbing, concrete or asphalt surfaces, plantings and pavement markings can range from \$2,000 to \$20,000. See below for pictures of implemented traffic calming measures in urban neighborhoods like those in Boston and Baltimore.

Mini-roundabout/neighborhood traffic circle – works to slow traffic by forcing vehicles to navigate around the circle. Needs 15' clearance around the mini-roundabout, which would fit at Monadnock and Rayner. Refer to the attached sketch for a possible option.



Painted Mini-roundabout – a mini-roundabout can also be a low-relief/mountable circular surface with pavement markings to indicate the circular pattern of traffic. These are potentially less expensive and can be installed quickly.



Curb Extensions with plantings or trees – narrowing lanes causes traffic to slow.



Chicanes – this is an artificial curve in the road which slows traffic to improve safety. The examples below show different permanent installations of offset chicanes, as well as a 'pop-up' style chicanes.



NV/ns
Attachment
cc: Natasha Vance, Transportation Engineer



City of Lowell Massachusetts

 Lowell Boundary

 Parcels



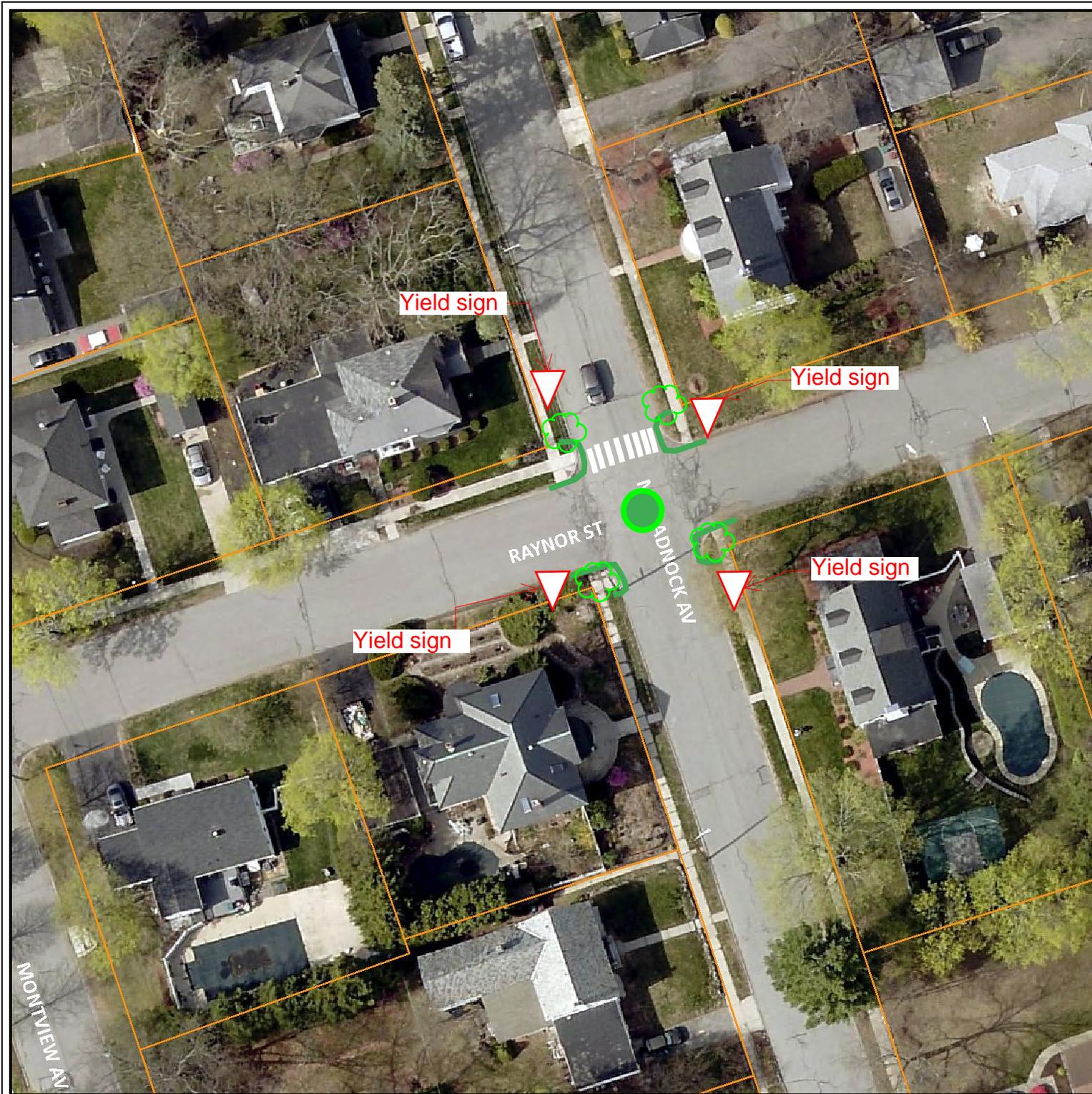
Street Trees



Curb Extensions



Mini-roundabout



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1" = 48 ft

March 15, 2019