

WESTBOUND MASS. AVE. LANE REDUCTION STUDY REPORT OF FINDINGS

BACKGROUND

The Mass Ave./Lockeland Avenue/Highland Avenue Working Group of the TAC has recently completed a study of the lane configuration along Massachusetts Avenue in the vicinity of Lockeland Avenue and Highland Avenue. In particular, we have reviewed the configuration of the existing westbound lane reduction in front of the Stop & Shop in an effort to identify opportunities for improvement. This study was conducted in response to a request by Representative Jim Marzilli received by the TAC in October, 2005. Over the past year, the TAC has performed an investigation of the existing conditions, repaired and adjusted the signal at Lockeland and Mass, recommended minor modifications, and reevaluated the roadway operations to note any changes brought about by these modifications. Issues, Conclusions, and Recommendations are summarized below.

INVESTIGATION

The investigation of this study area focused on three primary sources of data:

- Field observations
- Traffic counts
- Accident data

Field Observations

Numerous field evaluations were conducted over the past year as part of this study. These evaluations focused on general traffic operations and driver behavior, signal timing, lane configurations, parking, and pedestrian facilities. Observations were conducted during the peak weekday and weekend travel times.

Traffic Counts

Traffic counts were conducted in November 2005. These counts included turning movement counts at the intersection of Mass. Ave with Lockeland/Schouler and traffic counts along Mass. Ave just to the west of Bartlett Street. These counts were used as the basis for traffic analysis.

Accident Data

Accident data covering the period from 2000 to 2005 was provided to the TAC by the Arlington Police Department.

OBSERVATIONS

General Roadway Configuration

The portion of Mass. Ave. between Lockeland Ave. and Highland Ave. serves as the transition point from the general four lane (two in each direction) configuration through the Center to the Cambridge line and the two lane configuration west to the Lexington town line. Immediately to the west of its intersection with Lockeland, Mass. Ave. reduces from two to one westbound lane over a distance of 90'. Given the prevailing

speeds through this portion of the roadway, the length of this merge is considered substandard according to MassHighway and AASHTO criteria.

In addition to a substandard westbound lane reduction, this area also contains numerous other movements including left and right turns into and out of the Stop & Shop parking lot, a bus stop just to the west of the lane drop, a horizontal curve on the westbound approach, and the Highland Ave. intersection approximately 300' to the west of the lane drop.

Westbound vehicles generally approach the Mass. Ave./Lockeland intersection in two lanes. Upon proceeding through the intersection, most traffic immediately merges to form a single lane. Although speed measurements were not taken as part of this study, by field observations, it appears that the westbound traffic generally slows as it approaches the study area. This slowing of traffic can be expected given the numerous movements, the horizontal curve, and the appearance of the roadway narrowing with the introduction of buildings closer to the roadway on both sides which encourage drivers to slow down.



Mass. Ave. Lane Reduction (Existing Condition)

Parking on the westbound side of Mass Ave. west of Schouler St. narrowed the effective roadway width in this area, which forced motorists to merge to one lane immediately after the intersection. "No Parking Here To Corner" signs have been installed to prevent parking in this area, which has improved operations.

Traffic Analysis and Crash Data

The traffic data described above was studied in relation to operations at the intersection of Mass. Ave. with Lockeland. The weekday peak periods were identified as 7:30 to 8:30 (AM Peak) and 2:30 to 3:30 (PM Peak). There are approximately 10,300 vehicles per day (vpd) eastbound and 8,300 vpd westbound on this portion of Mass. Ave. It was noted that the traffic signal at this location was timed inefficiently with a heavier than needed green time for Lockeland Ave. Also, the signal appeared to be running on set timing rather than on actuation. It was noted that the existing loop detector appeared to not be working. The defective loop detectors have since been repaired and minor modifications were made to the signal timing. In reviewing possible improvements to this area, the traffic data was analyzed to determine if this intersection requires two westbound through lanes (existing condition) or if it could be reduced to one through and one left turn lane. The analysis showed that the number of westbound through lanes could be reduced with some minor reduction in level of service.

A review of the Crash Data provided by the police showed a total of seven accidents over a five year period (2000-2005). This is only approximately 20% of the number of accidents typically found at similar intersections in the Commonwealth based upon MassHighway's standard of "crashes per million vehicles entering."

CONCLUSIONS

The initial impetus behind this study was safety concerns caused by the lane drop for westbound Mass. Ave. traffic. This study focused on three questions:

- Does this lane drop meet typical roadway design standards?
- If not, does this correlate to a higher than average crash rate?
- Is there a way to reasonably improve the roadway configuration without creating additional negative impacts?

Does this lane drop meet typical roadway design standards?

At 90' long, this lane drop is significantly below the length recommended in current MassHighway and AASHTO design standards. Also, the current location presents problems with numerous vehicle movements as well as traffic backing up from the Mass. Ave./Highland Ave. intersection.

If not, does this correlate to a higher than average crash rate?

Although the lane drop is substandard, this area is far below the average statewide and District 4 MassHighway crash rates. This appears to be counterintuitive given the experience of many drivers as they travel through this area. However, the difficult conditions of this location may actually help make this lane drop safer than normal by forcing driver speeds down. Whether traveling through a green light at the Lockeland intersection or starting to accelerate after being stopped at a red light, vehicles tend to be traveling at a slower and safer speed through this portion of Mass. Ave. than they do further to the east.

Is there a way to reasonably improve the roadway configuration without creating additional negative impacts?

Given the short distance between Lockeland and Highland Avenues, there is insufficient distance to provide the recommended length for a lane drop at this location. Therefore, to meet current standards, the lane drop would have to be shifted to a new location.

A review of the Mass. Ave. corridor from Mill Street to Lockeland Ave. showed that the section of Mass. Ave in front of the high school provides the most beneficial area in which to relocate the lane drop. The roadway through this section is relatively straight while the number of intersecting streets is less than the rest of the corridor. However, there are several significant drawbacks to relocating the lane drop to this location. First, moving the lane drop to this location would require cars to merge while generally traveling at faster speeds than after Lockeland. Although the length of the merge is longer, the higher speeds would likely negate any benefit from lengthening the merge. Second, the merge would generally be controlled through the use of paint striping. The lack of any opposing traffic or fixed obstruction may encourage drivers to continue straight and essentially ignore the merge. The maintenance of the striping through this area would become very important. Lastly, analysis has shown that moving the lane drop further east could create new vehicle queuing that would extend further upstream on Mass Ave, impacting other intersections.

Another way to improve the merge is to provide better lane definition at its existing location. This can be accomplished through the introduction of an edgeline stripe along the westbound Mass. Ave. lanes from the eastern high school entrance to the intersection with Highland Ave. This striping provides additional guidance to drivers and provides a better defined path of travel. Similarly, although the eastbound traffic was not explicitly analyzed as part of this study, it was noted that the eastbound Mass. Ave. lanes could also benefit from the addition of an edgeline similar to the westbound traffic.

RECOMMENDATIONS

Although substandard in length, the accident data shows that the existing merge operates relatively safely. Also, given the higher speeds east of the current merge location, shifting the merge will likely force vehicles to merge at a higher and less desirable speed, and create additional queuing upstream. Therefore, based upon the results of this study, the TAC recommends:

- Maintain the existing lane drop in its existing location without any substantial modifications other than the adjustments to the signal and parking already made.
- Add a solid white edge line along westbound Mass. Ave. from the eastern high school entrance to Highland Ave.
- Add a solid white edge line along eastbound Mass. Ave. from Highland Ave. to Bartlett Street.