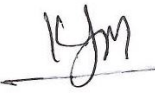




Nicolás H. Bosonetto, P.E.
City Engineer (Interim)

Date: October 4, 2017
TO: Kevin J. Murphy, City Manager 
VIA: Tom Bellegarde, Assistant City Manager/DPW Commissioner
FROM: Nicolás H. Bosonetto, P.E., City Engineer (Interim)

SUBJECT: City Council Motion 9.8. (7/11/17) - C. Milinazzo - Req. City Mgr, in conjunction with the Traffic Engineer, clarify the right of way improvements recommended along Rogers Street, Andover Street, Village Street, Douglas Road and Clark Road in the relocation plan for Lowell high School to the Cawley Site.

A comprehensive five month traffic study was conducted from March to June of 2017. The results of this study were presented in a 624 page report from Bryant Associates and Skanska/Perkins Eastman and summarized in a 12 page motion response from the City's Transportation Engineer. This extensive study included the following data collection and analysis:

- 8-hour turning movement counts at 13 locations
- 24-hour traffic counts at 8 locations
- Trip generation study
- Survey of current students and teacher populations
- Mode choice study
- Intersection Capacity calculations
- Crash data analysis
- Speed data analysis
- Parking analysis
- Improvement cost analysis
- Walkability analysis

Specific findings of the study included:

1. The Cawley site would generate 4,033 new vehicle trips per day;
2. Intersection level of service at Rogers/Douglas, Rogers/Clark, Rogers/Village, Andover/Douglas, Andover/Clark would degrade significantly;
3. At least 46 buses would be required to transport students;
4. There is a lack of sidewalks leading to the school site;

In order to mitigate the impacts of the LHS move to the Cawley site, a list of improvements were recommended for further study. It should be noted that without further engineering, survey and design work these costs are only at the conceptual stage. A full MEPA study needs to be concluded in order to ascertain the total impacts and to gather recommendations from MassDOT and other agencies. The necessary studies and engineering design would cost approximately \$500,000 to \$700,000 to complete.

1. Sidewalks: Construction of sidewalks are recommended along Douglas and Clark Road to assure the safety of students walking to school. Estimated costs are shown in Table 1 below. Drainage improvements will be needed in order to capture the additional stormwater being collected due to the insertion of curb along the roadways. No significant right-of-way acquisition is anticipated for sidewalk construction but at least 55 trees, rock walls and lawns which are within the city right-of-way will need to be removed.

Table 1 - Sidewalk Construction

| | Clark Road | Douglas Road | Village Street | Andover Street |
|-----------------------------|-------------------|---------------------|-----------------------|-----------------------|
| Length (feet) | 3,400 | 5,950 | 450 | 200 |
| Sidewalk & Curb (\$75/foot) | \$255,000 | \$450,000 | \$34,000 | \$15,000 |
| Ramps (\$1,200 each) | \$12,000 | \$16,800 | \$4,800 | \$0 |
| Paving (\$) | Done in 2015 | \$247,900 | \$19,000 | \$0 |
| Trees (qty.) | 50 +/- | 5 +/- | 0 | 0 |
| Drainage Improvements | TBD | TBD | TBD | \$0 |
| Utility Relocation | TBD | TBD | TBD | \$0 |
| | \$267,000 | \$714,700 | \$57,800 | \$15,000 |
| TOTAL = \$1,054,500 | | | | |

2. Busing: An estimated 46 buses will be required to transport students to the LHS location at the Cawley Site. Cost estimates range from \$0 to \$3.2 Million/year.
3. Traffic Improvements: In order to mitigate the traffic impacts of the estimated 4,033 daily vehicle trips generated by the Cawley site, roadway improvements at the various project intersections will be necessary.
 - a. Andover/Douglas – This intersection is likely to require a traffic signal. Estimated costs are \$350,000 due to the reinforced concrete pavement on Andover Street. Right of way takings are not anticipated to be necessary.
 - b. Andover/Clark - A signalized intersection will be required at this intersection. Raven Road may need to be realigned to remove the median. Estimated costs for engineering and construction may be about \$350,000 to account for the reinforced concrete pavement on Andover Street. Right of way takings are not anticipated to be necessary.

- c. Route 38 Intersections – MassDOT will be the ultimate arbiter of the necessary improvements required at these intersections. As previously mentioned, their decision will not be available until the MEPA process is completed. One possible outcome is that MassDOT requires the addition of left turn lanes at the Douglas Road and Village Street intersections in order to accommodate the increase in traffic. Another possible outcome is that MassDOT does not require or allow traffic improvements at these intersections. The ultimate site plan for the school will also influence the level of improvements necessary.

Widening Route 38 to add left turn lanes is the most costly option, as it would require right-of-way acquisition from several adjoining properties. This option is estimated to cost about \$1.75 Million based on similar projects.

In summary, without further engineering design and completion of the MEPA process it is difficult to determine the exact costs of traffic improvements. Table 2 below shows the likely range of costs to be between \$700,000 and \$2.45 Million.

Table 2 – Intersection Improvements

| | Andover/ Douglas | Andover/ Clark | Rt. 38/ Douglas | Rt. 38/ Village |
|--|-----------------------------|---------------------------|----------------------------|----------------------------|
| Traffic Signal | \$350,000 | \$350,000 | \$0 - \$250,000 | \$0 - \$250,000 |
| Right-of-way | \$0 | \$0 | TBD | TBD |
| Roadway Widening | \$0 | \$0 | \$0 - \$250,000 | \$0 - \$250,000 |
| Trees (qty.) | 2 +/- | 1 +/- | 0 | 0 |
| Drainage Improvements | TBD | TBD | TBD | TBD |
| Utility Relocation | TBD | TBD | TBD | TBD |
| | \$350,000 | \$350,000 | \$0 - \$1M | \$0 - \$750,000 |
| TOTAL = \$700,000 to \$2.45 Million | | | | |