

August 28, 2023

Mr. Travis Ahern
Town Administrator
Town of Holliston
703 Washington Street
Holliston, MA 01746

RE: Lowland Street Heavy Commercial Vehicle Restrictions

Dear Travis:

McMahon, a Bowman company (McMahon), has completed a review of alternatives related to restricting heavy commercial vehicle traffic from Lowland Street between Jeffrey Avenue and Woodland Street in the Town of Holliston. It is our understanding that residents in the vicinity have raised concerns relative to property damage due to the passage of large commercial vehicles along this segment of Lowland Street and the neighboring section of Woodland Street. In addition, the Town is concerned that existing signage relative to established truck routes, Heavy Commercial Vehicle Exclusions, and detour signage for the long-term Woodland Street bridge closure is inadequate to effectively guide trucks and other vehicles to the proper roadways.

This memorandum summarizes potential alternatives to discourage or exclude heavy commercial vehicle traffic from Lowland Street, and both short-term and long-term improvement recommendations for the intersection of Washington Street (Route 16) at Whitney Street.

Existing Conditions

Due to the long-term closure of the Woodland Street bridge over Bogastow Brook, a detour is in place that restricts all through vehicles from using Woodland Street between Lowland Street and Linden Street. As a result, vehicles accessing Woodland Street from Washington Street are detoured via Lowland Street, Fiske Street, and Central Street. As Woodland Street has a Heavy Commercial Vehicle Exclusion (HCVE) prohibiting through truck traffic, additional Truck Route signs have been installed along Washington Street to direct truck drivers to utilize Whitney Street and Jeffrey Avenue as the detour route. However, as trucks are accustomed to using Woodland Street and Lowland Street as cut-through routes and the enforcement capabilities of the Holliston Police Department are limited, through truck traffic along Lowland Street between Woodland Street and Jeffrey Avenue has increased due to the bridge closure, resulting in damage to abutting residential properties including overhead electrical services. Photograph 1 below illustrates a rental truck on Lowland Street at the Upper Charles Rail Trail crossing.



Photograph 1: Commercial Truck Traffic on Lowland Street

Signalized Intersections

Washington Street (Route 16) at High Street/Woodland Street:

The signalized intersection of Washington Street (Route 16) and High Street/Woodland Street consists of four approaches and is under Town jurisdiction. All approaches consist of one general purpose lane. Painted crosswalks are provided along the Washington Street (Route 16) eastbound approach and High Street southbound approach to the intersection, with curb ramps and pedestrian pushbuttons provided. An exclusive pedestrian phase is provided at the signal.

Unsignalized Intersections

Washington Street (Route 16) and Whitney Street:

The unsignalized intersection of Washington Street (Route 16) and Whitney Street consists of three approaches, with Whitney Street under Stop control. The 91-95 Washington Street commercial development is located on the north side of the intersection, with driveways on either side of the intersection. The Washington Street eastbound and westbound approaches to the intersection consist of one general purpose lane. There is a wide radius for the eastbound approach to accommodate truck turns. The Whitney Street northbound approach consists of one general purpose lane, which is separated from southbound traffic by a raised landscaped median. There are no pedestrian accommodations or dedicated bicycle facilities provided at the intersection; however, the Upper Charles Rail Trail crosses Washington Street approximately 150 feet west of the intersection. The intersection is controlled by Rectangular Rapid Flashing Beacons (RRFBs). Immediately west of the Rail Trail crossing, the Covanta Holliston transfer station driveway generates significant amounts of truck traffic throughout the day.

Woodland Street and Lowland Street:

The unsignalized intersection of Woodland Street and Lowland Street consists of three approaches, with Lowland Street under Stop control. Each approach to the intersection consists of one general purpose lane. Pedestrians are accommodated via a bituminous concrete sidewalk along the western side of

Woodland Street; no pedestrian facilities are provided along Lowland Street. A marked crosswalk is provided across the southern Woodland Street leg of the intersection, although ADA compliant curb ramps are not provided. No dedicated bicycle facilities are provided at the intersection. The southern Woodland Street leg of the intersection is currently closed to all vehicular traffic due to the closure of the bridge over Bogastow Brook. The roadway and bridge are still open to pedestrians.

Potential Truck Exclusion Improvement Measures

In order to address concerns relative to the passage of heavy commercial vehicles along the section of Lowland Street between Jeffrey Avenue and Woodland Street, McMahon has identified a variety of potential improvement measures to deter trucks from using Lowland Street due to the long-term Woodland Street bridge closure. A summary of these alternatives, including potential advantages and disadvantages, is provided below.

Improve Truck Route and Detour Signage

To discourage truck traffic from traveling along Woodland Street and Lowland Street, existing signage for the Woodland Street detour could be improved to direct truck traffic to Whitney Street. For example, signs posted at the intersection of Washington Street at Whitney Street read TRUCK ROUTE as shown in Photograph 2 below.



Photograph 2: TRUCK ROUTE signage, Washington Street at Whitney Street

Signage indicating WOODLAND ST TRUCK DETOUR may provide clearer information to truck drivers to use Whitney Street. Similarly, although a signs reading WOODLAND ST CLOSED – RESIDENTS ONLY- NO TRUCKS are posted on Woodland Street at its intersection with Washington Street as shown in Photograph 3, the sign faces Woodland Street and no advance information is provided to drivers approaching via Washington Street. Advance detour signs along eastbound Washington Street indicating separate detour routes for cars via Woodland Street and Lowland Street and for trucks via Washington Street and Whitney Avenue may deter through truck traffic from using Lowland Street.



Photograph 3: Detour signage, Woodland Street at Washington Street

In addition, based on prior discussions with the Town, the EXCEPT LOCAL DELIVERIES plaques posted beneath R5-2 No Trucks signs on roadways with HCVEs have been misinterpreted by some drivers to include any deliveries within the Town of Holliston. To avoid confusion, these plaques should be removed Town-wide, as the R5-2 No Trucks sign already implies local deliveries to the immediate segment of the roadway is permitted. To clarify the intent of the HCVE, plaques reading "OVER 2½ TONS" should be provided beneath the R5-2 No Trucks signs.

To further protect against truck traffic along Lowland Street damaging overhead utilities, W12-2 Clearance signs, shown in Photograph 4, may be provided indicating the clearance height.

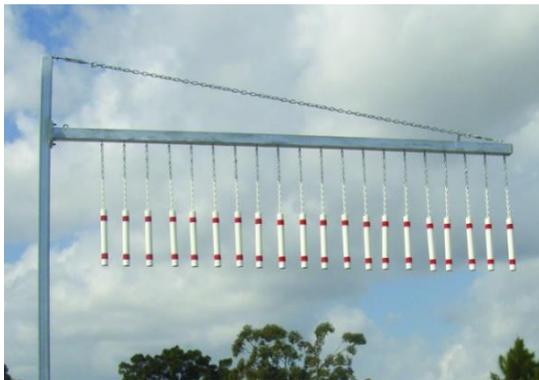


Photograph 4: W12-2 Sign

Based on conversations with the Town, enforcement of HCVEs is challenging due to limited police resources, low fines for violations, and general lack of respect for posted regulations. As a result, it is anticipated that improved signage alone may reduce truck traffic along Lowland Street but would not completely correct the issue.

Overhead Height Barrier

To physically restrict truck traffic, an overhead height barrier may be installed on Lowland Street south of the Upper Charles Rail Trail. Available barrier styles include non-rigid barriers with a hanging bar or tubes, as shown in Photograph 5, which strike the top of a vehicle as an alert but do not cause damage, and rigid barriers as shown in Photograph 6 which would damage an overheight truck. Examples of overhead height barriers are typically found in parking structures or on public roadways in advance of low bridges. Either barrier would be supplemented with advance W12-2 warning signs as shown in Photograph 4. A complementary barrier should also be provided on Woodland Street at its intersection with Washington Street to prevent trucks entering the Lowland Street from the north, as there would be the potential for trucks to be stuck at the Upper Charles Rail Trail with the need to turn around in the residential area.



Photograph 5: Hanging tube barrier



Photograph 6: Rigid vehicle height restriction barrier

Based on the existing lack of compliance with posted HCVE regulations, it can be assumed that truck drivers may ignore non-rigid barriers and continue to use Lowland Street. While a rigid barrier would physically prevent trucks from entering Lowland Street, if a truck were to hit the barrier, debris from the collision could potentially injure a pedestrian or cyclist on the Upper Charles Rail Trail at the crossing. A physical height restriction would also impede emergency vehicles, school buses, and local deliveries. As a result, a physical height barrier is not recommended.

Traffic Calming

Through truck traffic would potentially be discouraged through the installation of traffic calming measures along Lowland Street between Woodland Street and the Upper Charles Rail Trail. These measures may include roadway narrowing through installation of curb extensions, a median divider to restrict the travel lane width at the Rail Trail crossing, or chicanes to narrow the roadway and require vehicles to follow a curved, S-shaped path, as shown in Photographs 7 and 8 below.



Photograph 7: Median with Curb Extensions



Photograph 8: Chicane

Due to the existing narrow width of Lowland Street and property damage caused by trucks using the roadway, it is anticipated that further roadway narrowing may not effectively deter truck traffic. In addition, as speeding was not noted as an issue on Lowland Street, vertical traffic calming measures designed to control vehicle speeds, such as speed humps, are not likely to reduce through truck traffic and are not recommended.

Roadway Closure

To prevent all through traffic from using Lowland Street between Woodland Street and Jeffrey Avenue, the roadway may be fully closed at the Upper Charles Rail Trail crossing. In order to accommodate emergency vehicles, a locking pipe gate may be installed for emergency vehicle access as shown in Photograph 8. Alternately, a gate with a remote control locking mechanism may be installed to reduce response times; however, a remote control gate would require a power source and would have higher maintenance costs. McMahon recommends implementing a full roadway closure, as it is the only alternative which would physically prevent trucks from accessing Lowland Street between the Rail Trail and Woodland Street without the aforementioned risks of an overhead height barrier.



Photograph 9: Pipe Gate

Improvements to the Intersection of Washington Street (Route 16) and Whitney Street:

Full closure of Lowland Street would relocate all detoured traffic from Woodland Street to Whitney Street and Jeffrey Avenue, increasing traffic volumes at the unsignalized Washington Street at Whitney Street intersection. Prior to implementation of the roadway closure, McMahon recommends collecting traffic counts for a minimum 11-hour weekday period when school is in session at the intersections of Washington Street at Whitney Street and Lowland Street at Jeffrey Avenue to assess existing and potentially diverted traffic volumes, and performing traffic operations analysis and traffic signal warrant analysis at the intersection of Washington Street at Whitney Street. If poor operations along the Stop-controlled Whitney Street approach are projected and traffic signal warrants are met, the Town should consider installing a traffic signal at the intersection and evaluate potential restriping and/or box widening to provide the optimal lane configuration along each approach. As a short term measure, temporary traffic signals may be provided at the intersection while permanent intersection improvements are in design and construction. Temporary signals may be trailer mounted (Photograph 10) or may use temporary wooden span poles (Photograph 11).



Photograph 10: Temporary Traffic Signals (Trailer Mounted)



Photograph 11: Temporary Traffic Signals (Span Wire Mounted)

Prior to implementation of traffic signals, available sight distances to the projected back of queue on each approach should be evaluated, with advance warning signs provided where applicable.

The Town has also indicated that reconstruction of the intersection of Washington Street at Whitney Street as a roundabout has been discussed previously. However, based on a cursory review of available right-of-way, a roundabout would not be feasible without significant impacts to abutting properties.

Conclusion and Recommendations

Based on a review of potential alternatives to restrict heavy commercial vehicle traffic from using the segment of Lowland Street between Woodland Street and the Upper Charles Rail Trail, McMahon recommends closing Lowland Street at the trail crossing with a pipe gate or remote control gate to allow for emergency vehicle access. Closure of Lowland Street would require detour signage for the Woodland Street bridge closure to be updated to route detoured traffic via Whitney Street. To ensure the associated increase in traffic volumes would be adequately accommodated at the Washington Street at Whitney Street intersection, McMahon recommends collecting traffic counts and performing traffic operations and signal warrant analyses to evaluate if signalization is appropriate and to determine optimal lane assignments for each intersection approach. Should a signal be warranted, temporary traffic signals may be provided as an interim measure while permanent intersection improvements are in design and construction. Additionally, sight distance for each intersection approach should be evaluated to determine if advance warning signs prior to the signal are appropriate.

If you should have any questions or require further information, please feel free to contact us.

Sincerely,



Robert A. Smith, P.E.
Senior Project Manager



Michael V. Pompili, EIT
Senior Project Engineer