November 19, 2014

Mr. Jonathan Beder, Director
Town of Plymouth Department of Public Works
159 Camelot Drive
Plymouth, MA. 02360

RE: Red Brook Road Traffic Data and Crosswalk Placement Analysis

Dear Mr. Beder,

Per the Town’s request, through the Old Colony Planning Council’s Local Highway Transportation Planning Technical Assistance Program, OCPC has completed collection of traffic data on Red Brook Road and sight distance analysis as it pertains to the potential placement of a crosswalk at the Lyman Reserve hiking trail that crosses the roadway. Traffic data (traffic volumes, travel speeds, and vehicle classifications) was collected during the week of July 21st to July 26th of 2014. The Lyman Reserve trail crossing at Red Brook Road has a history of pedestrian related accidents. On March 30th, 2013, two pedestrians were struck at the trail crossing by a vehicle traveling westbound on Red Brook Road. The Lyman Reserve is a popular recreational and education area, and hosts several events and camps throughout the year. The trail crossing is heavily utilized by visitors.

Table 1 summarizes the traffic data collected on Red Brook Road, just west of Packard Street, in the area of the trail crossing. Traffic volumes, speeds, and truck traffic are similar by direction, with slightly higher volumes, speeds, and truck volumes in the westbound direction. Traveling eastbound, away from the study area, there is a posted speed limit of 35 miles per hour on Head of the Bay Road. Traveling westbound, there is a posted speed limit of 30 miles per hour, away from the study area. There were no speed limit signs observed on the approaches to the study area in Plymouth.

Table 1: Summary of Traffic Data

<table>
<thead>
<tr>
<th>Count Location</th>
<th>Direction</th>
<th>ADT</th>
<th>Average Speed</th>
<th>85th Percentile Speed</th>
<th>10 MPH Pace Speed</th>
<th>% Heavy Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Brook Road, west of Packard Street</td>
<td>Eastbound</td>
<td>3,365</td>
<td>28 MPH</td>
<td>39 MPH</td>
<td>30 - 39 MPH</td>
<td>7.0%</td>
</tr>
<tr>
<td></td>
<td>Westbound</td>
<td>3,577</td>
<td>30 MPH</td>
<td>41 MPH</td>
<td>34 - 43 MPH</td>
<td>8.0%</td>
</tr>
<tr>
<td></td>
<td>Combined</td>
<td>6,942</td>
<td>29 MPH</td>
<td>40 MPH</td>
<td>33 - 42 MPH</td>
<td>7.5%</td>
</tr>
</tbody>
</table>
Figures 1 and 2 indicate the sight distances that were measured between the Red Brook Road and the Lyman Reserve trail crossing, and Red Brook Road and Packard Street.

**Figure 1: Measured Sight Distance between Red Brook Road and Trail Crossing**

<table>
<thead>
<tr>
<th>Red Brook Road at Lyman Reserve</th>
<th>Measured Sight Distance Between Traffic and Trail Crossing</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>Trail</td>
</tr>
<tr>
<td>439'</td>
<td>326'</td>
</tr>
<tr>
<td>332'</td>
<td>591'</td>
</tr>
</tbody>
</table>

*Not To Scale

**Figure 2: Measured Sight Distance between Red Brook Road and Packard Street**

<table>
<thead>
<tr>
<th>Red Brook Road at Packard Street</th>
<th>Measured Sight Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>Packard Street</td>
</tr>
<tr>
<td>539'</td>
<td>260'</td>
</tr>
</tbody>
</table>

*Not To Scale

According to *A Policy on Geometric Design of Highways and Streets 6th Edition (2011)* from the American Association of State Highway and Transportation Officials (AASHTO), a vehicle traveling at 40 miles per hour needs 305 feet to come to safely come to a stop (the “stopping sight distance”). This sight distance is available between both directions of traffic on Red Brook Road and the Lyman Reserve trail crossing. The required sight distance is not available, however, at the intersection of Red Brook Road and Packard Street. The trail crossing itself appears to be a suitable location for the placement of a crosswalk. Based on sight distance constraints, a crosswalk is not advised at the intersection of Red Brook Road and Packard Street.

The placement of a crosswalk is recommended at the location where the Lyman Reserve trail crosses Red Brook Road. The crosswalk should be appropriately signed with Manual on Uniform Traffic Control Devices (MUTCD) compliant crosswalk signage, and be placed both in advance of
the crosswalk and at the crosswalk itself. According to Best Practices Synthesis and Guidance in At-Grade Trail-Crossing Treatments (2013) published by the Minnesota Department of Transportation, a Pedestrian Crossing (W11-2) or Combined Bicycle/Pedestrian Warning (W11-15) sign should be placed in both directions 250 feet in advance of the crosswalk. Furthermore, STOP signs on both approaches of the trail (similar to existing design of Cape Cod Rail Trail) where it crosses Red Brook Road may be appropriate.

In addition to a crosswalk and appropriate signage, the Town may also consider the following improvements to further enhance safety for pedestrians and bicyclists:

- Trimming and clearing of roadside vegetation to maximize sight distances and reduce obstructed views
- Regular street sweeping to maintain accessible shoulders
- The installation of Rectangular Rapid Flash Beacons (RRFBs) or High Intensity Crosswalk (HAWK) Beacons at the crosswalk
- The installation of sidewalks and bicycle accommodating shoulders along Red Brook Road, consistent with the Town’s Complete Streets Policy

If you have any questions, or if any additional information is needed, please contact Bill McNulty at 508.583.1833 x207 or wmcnulty@ocpcrpa.org.

Sincerely,

[Signature]

Charles Kilmer, AICP
Assistant Director / Transportation Program Manager

Cc:
Chief Michael E. Botieri, Plymouth Police Department
Mr. Lee Hartmann, Plymouth Director of Planning and Development
Mr. Sid Kashi, P.E., MPS, Plymouth Town Engineer

Enclosures:
- ATR Data for Red Brook Road
- Baystate Roads Program Tech Notes – Stopping Sight Distance
- Crosswalks- MassDOT Massachusetts Traffic Safety Toolbox
- Letter of Request