



| | | | |
|----------|--|------------------|----------------|
| TO: | Emily Wentworth, Town of Hingham | DATE: | March 30, 2016 |
| FROM: | Joe SanClemente, P.E., AICP | HSH PROJECT NO.: | 2015151.01 |
| SUBJECT: | Avalon Hingham Shipyard II – 319 Lincoln Street Transportation Technical Memorandum | | |

On behalf of AvalonBay Communities (the “Proponent”), Howard Stein Hudson (HSH) has conducted an evaluation of the transportation impacts of the revised building program for the proposed Avalon Hingham Shipyard II residential project (the “Project”).

In February 2016, HSH prepared a comprehensive Traffic Impact and Access Study (TIAS) assuming a building program of 250 residential units with 390 parking spaces. Since that time, in response to feedback from the Town and the community, the proposed building program has been reduced in size to 190 residential units with 298 parking spaces.

The following sections discuss the reduced impact of the Project and proposed mitigation measures.

Trip Generation Comparison

The vehicle trip generation for the revised building program (190 units) is compared to that of the previous proposal (250 units) that was analyzed in the TIAS (see **Table 1**). Trip generation was calculated using the Institute of Transportation Engineers (ITE) *Trip Generation Manual* Land use Code (LUC) 220 – Apartment, the same methodology used in the February 2016 TIAS submission.

As shown in **Table 1**, the revised building program will result in 294 fewer daily vehicle trips on a typical weekday (22% reduction) and 470 fewer daily trips on a typical Saturday (28% reduction).

The Project will generate just 78 new vehicle trips during the weekday morning peak hour, 99 new vehicle trips during the weekday evening, and 97 new vehicle trips during the Saturday midday peak hour, which corresponds to less than two new vehicle trips per minute on the adjacent roadway network. Consistent with the findings summarized in TIAS, the Project is expected to have a very small impact on traffic operations at study area intersections. Overall, the Project will result in only an approximately 1 to 3% increase in traffic volume along the Route 3A corridor during the peak hours – or only about one-half of the Projected background growth rate (see **Figure 1**).

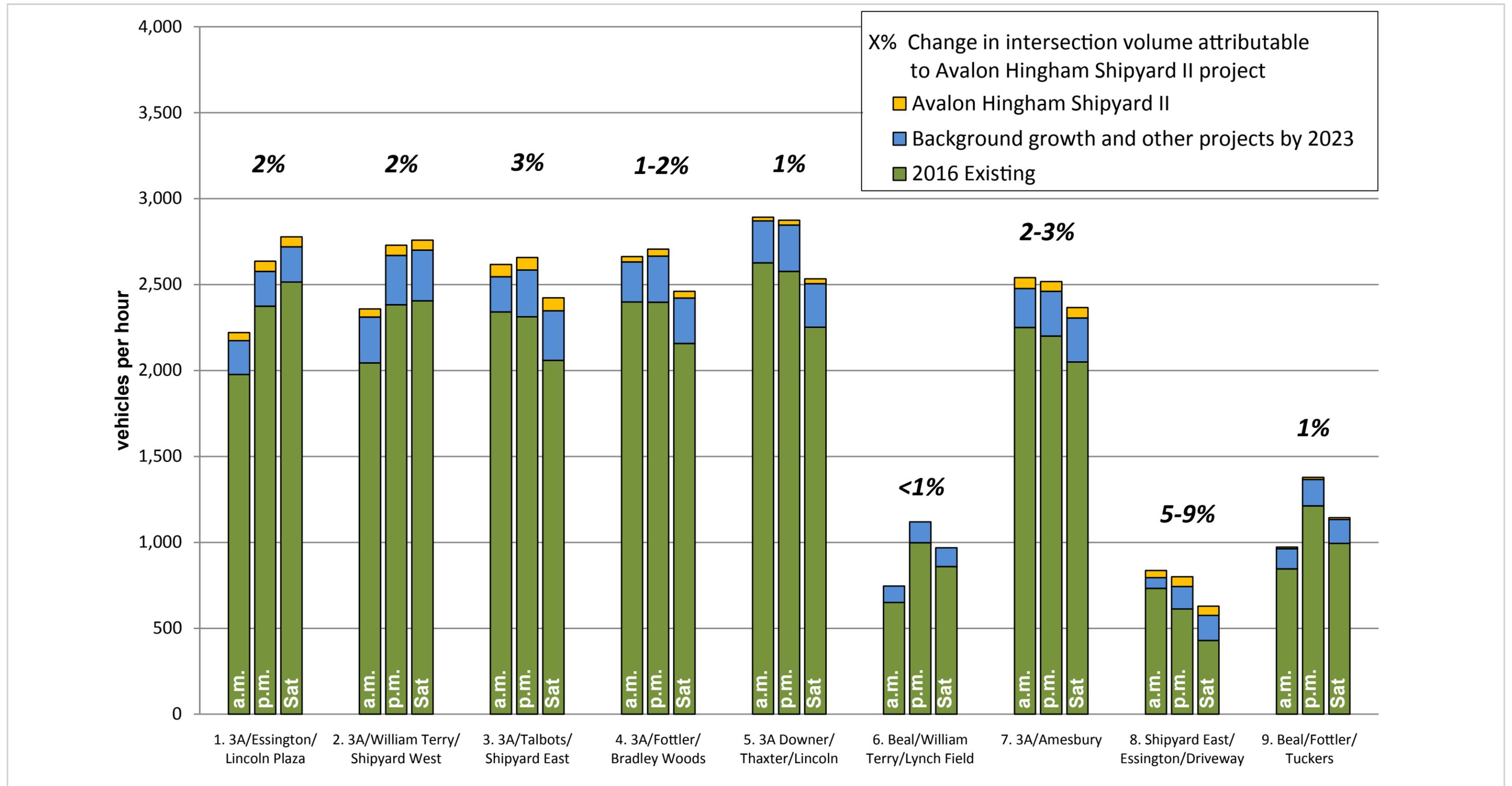


Table 1. Vehicle Trip Generation Comparison

| Time Period | Direction | Previous Proposal (250 units) ¹ | Revised Proposal (190 units) | Difference |
|---------------------------|--------------|--|------------------------------|-------------|
| Weekday Daily | In | 663 | 516 | -147 |
| | <u>Out</u> | <u>663</u> | <u>516</u> | <u>-147</u> |
| | Total | 1,326 | 1,032 | -294 |
| Weekday a.m. Peak Hour | In | 20 | 15 | -5 |
| | <u>Out</u> | <u>82</u> | <u>63</u> | <u>-19</u> |
| | Total | 102 | 78 | -24 |
| Weekday p.m. Peak Hour | In | 82 | 64 | -18 |
| | <u>Out</u> | <u>44</u> | <u>35</u> | <u>-9</u> |
| | Total | 126 | 99 | -27 |
| Saturday Daily | In | 853 | 618 | -235 |
| | <u>Out</u> | <u>853</u> | <u>618</u> | <u>-235</u> |
| | Total | 1,706 | 1,236 | -470 |
| Saturday Midday Peak Hour | In | 66 | 52 | -14 |
| | <u>Out</u> | <u>56</u> | <u>45</u> | <u>-11</u> |
| | Total | 122 | 97 | -25 |

1. *Avalon Hingham Shipyard II, Traffic Impact and Access Study (TIAS), prepared by Howard Stein Hudson, dated February 25, 2016, assuming 250 residential units.*

Figure 1. Study Area Intersection Volumes - Project Related Trips Impact





Transportation Mitigation

While the revised Project is expected to have a reduced impact on area traffic operations (22 to 28 percent fewer vehicle trips), the Proponent has committed to the mitigation measures that were previously outlined in the TIAS along with some additional improvements based on comments received from the public, Town staff, and the Town's Peer Review consultant.

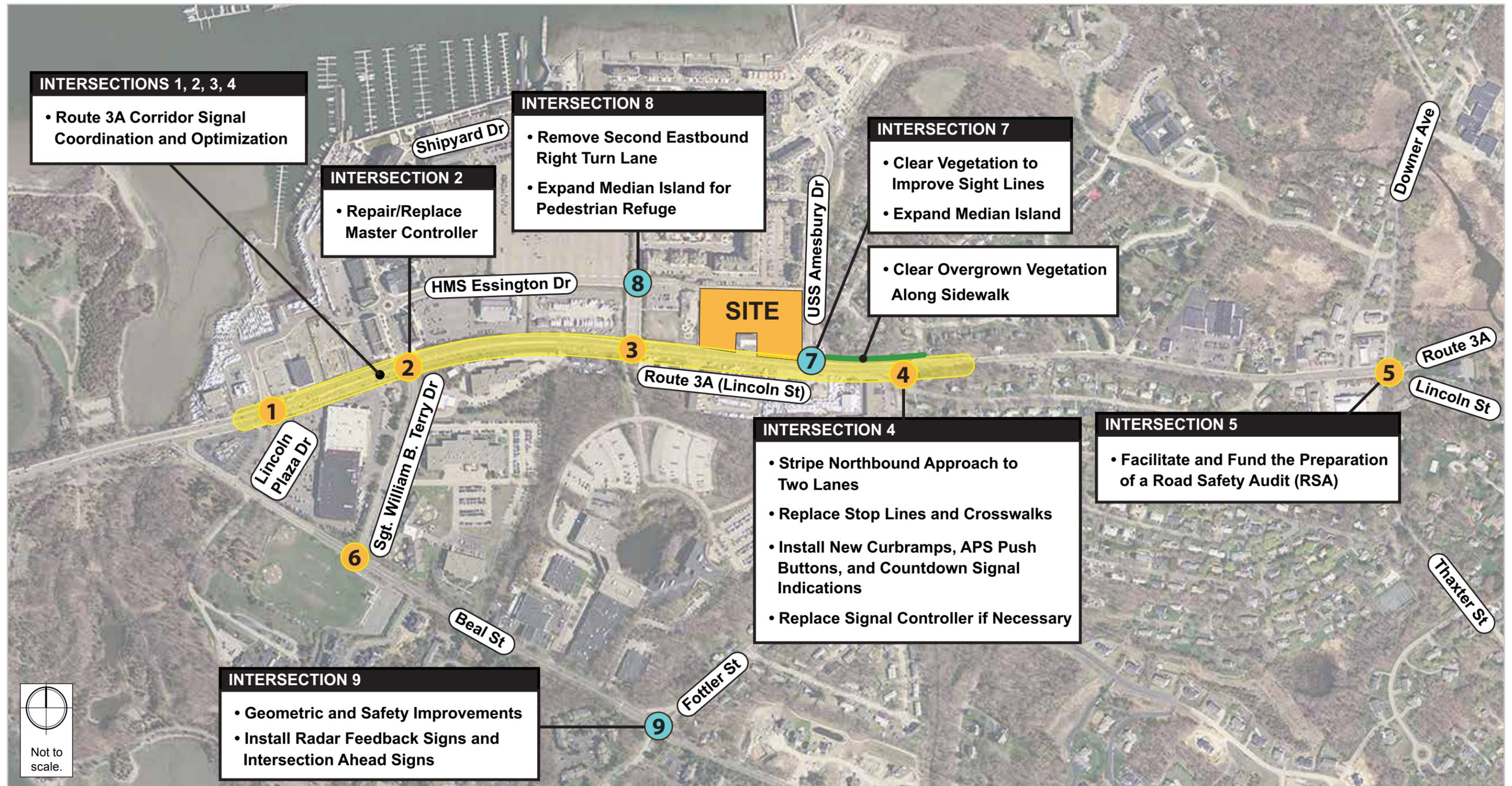
The proposed mitigation measures are summarized in **Figure 2** and in the following sections.

ROUTE 3A CORRIDOR SIGNAL COORDINATION AND OPTIMIZATION

The four traffic signals located along Route 3A between Lincoln Plaza Driveway and Fottler Road are currently interconnected for coordinated signal operations. However, field observations, and inspection of the traffic signal controller, by HSH indicate that the signals are not currently operating under coordination during any of the peak time periods which limits the progression of traffic.

The Project proposes to repair, or replace, the master controller at the intersection of Route 3A/Shipyard Drive West/ Sgt. William B Terry Drive to restore traffic signal coordination along the corridor at the four signalized intersections between Bradley Woods Drive and Lincoln Plaza Drive during the weekday a.m. and weekday p.m. peak hours. The corridor would continue to operate in free operation (uncoordinated) during the Saturday midday peak period due to the heavy driveway volumes with respect to the volume along Route 3A. In addition, the Project would develop, and implement, optimal signal timings at the four signal locations, including a re-evaluation of all pedestrian and vehicle clearance intervals per current design standards and for the prevailing travel speeds. These changes would reduce overall delay throughout the corridor and restore traffic progression during the commuter peak periods. Modifications to the signal equipment, and timings, would be subject to review and approval by MassDOT.

Figure 2. Proposed Off-Site Mitigation Summary





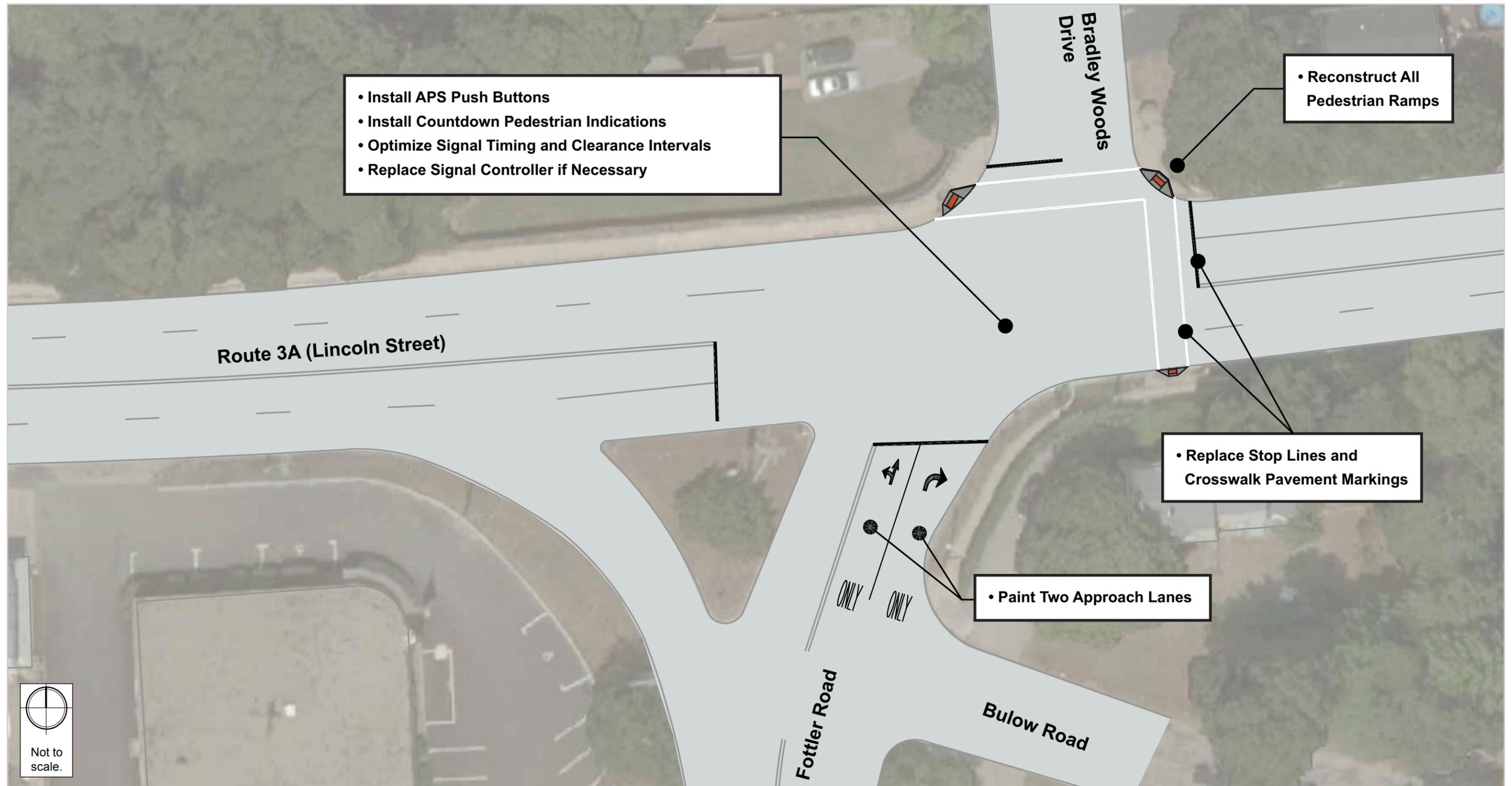
ROUTE 3A/FOTTLER ROAD/BRADLEY WOODS DRIVE INTERSECTION IMPROVEMENTS

While the Project is expected to result in only an approximately 1 to 2% increase in traffic during the peak periods, the Project proposes the following improvements to the intersection to enhance traffic operations and improve pedestrian safety (see **Figure 3**):

- Restripe the Fottler Road northbound approach to provide a shared left-turn through lane and a dedicated right-turn lane. Field observations indicate that the approach occasionally operates as two lanes today; this enhancement would formalize the two lanes to increase the capacity of the approach.
- Restripe all existing crosswalks and stop lines.
- Replace existing pedestrian indications with countdown signal indications to better inform pedestrians how much time they have to safely cross Route 3A.
- Reconstruct all curb ramps to bring them up to current accessibility standards.
- Replace all existing pedestrian push button assemblies with Accessible Pedestrian Signal (APS) assemblies per current accessibility standards. APS devices let pedestrians who are blind or visually impaired know when the WALK interval begins or terminates and communicates information about the pedestrian timing in a non-visual format such as audible tones, verbal messages, and/or vibrating surfaces.
- Replace traffic signal controller, if necessary, to accommodate above improvements.

Modifications to the curb ramps, pavement markings, signal equipment, and signal timings would be subject to review and approval by MassDOT.

Figure 3. *Proposed Improvements at Route 3A (Lincoln Street)/Fottler Road/Bradley Woods Drive*





ROUTE 3A/DOWNER AVE/THAXTER ST/LINCOLN ST INTERSECTION SAFETY IMPROVEMENTS

The intersection of Route 3A/Downer Avenue/Thaxter Street/Lincoln Street has been classified by MassDOT as a Highway Safety Improvement Program (HSIP) eligible Crash Cluster indicating that the total number of "equivalent property damage only" crashes in the cluster is within the top 5% of all locations in that region. While the Project is expected to result in only an approximately 1% increase in traffic during the peak periods, and not significantly impact the intersection operations, the Project is proposing the following improvements aimed at improving safety at the intersection:

- Facilitate and fund the preparation of a Road Safety Audit (RSA).
- If deemed appropriate following the completion of the RSA, the Project will implement the following safety enhancements previously committed to in the TIAS:
 - Prohibit left-turns at the Route 3A westbound approach, which would improve overall intersection operations from LOS F to LOS E during the weekday a.m. peak hour. This move does not have a protected left-turn phase and requires motorists to site in the through travel lane while waiting to find a safe gap in two lanes of on-coming traffic. Meanwhile, there is approximately 1,300 vehicles per hour during the weekday a.m. peak hour traveling westbound on Route 3A that are partially blocked by left-turning vehicles, which limits overall capacity at the intersection. Currently only 31 vehicles make left-turns during the morning peak hour, 4 during the evening peak hour, and just 22 during the Saturday midday peak hour. This modification would require the following modifications to the intersection:
 - Replace Route 3A westbound green ball signal indication with a straight-through green arrow indication.
 - Install No Left Turn sign (R3-2) along Route 3A westbound.
 - Replace Route 3A westbound left-hand post mounted and left-hand overhead signal indications with Optically Programmed Signal indications to reduce visibility from Lincoln Street north-westbound and minimize motorist confusion.
 - Develop, and implement, optimal signal timings at the intersection. This effort would also include a re-evaluation of all pedestrian and vehicle clearance intervals per current design standards and for the prevailing travel speeds.

The above improvements would be subject to MassDOT review and approval.

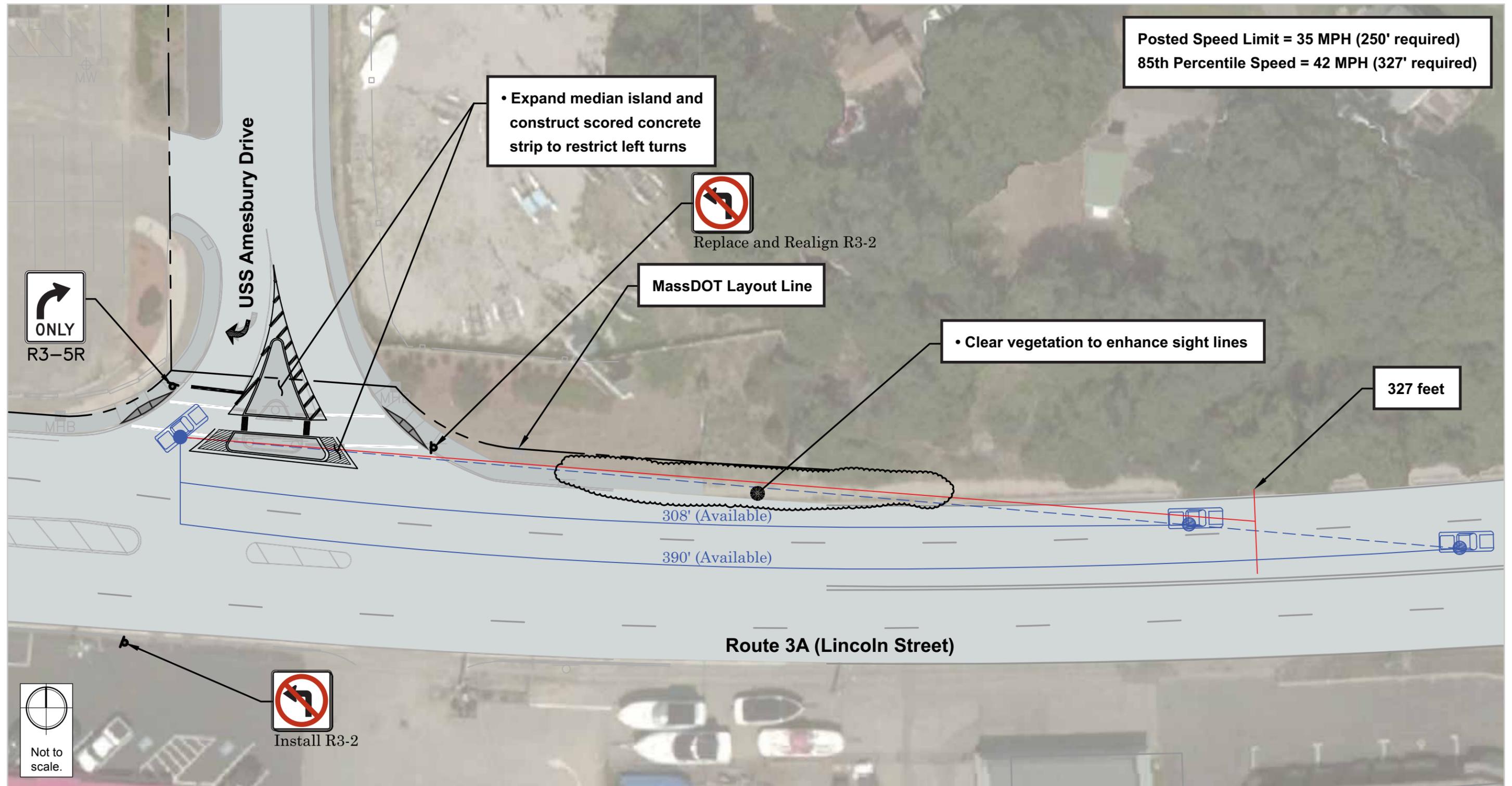


ROUTE 3A/USS AMESBURY DRIVE INTERSECTION SAFETY IMPROVEMENTS

The Project proposes the following improvements to the intersection to enhance intersection safety (see **Figure 4**):

- Trim vegetation located along the north side of Route 3A to the east of USS Amesbury Drive in order to improve sight lines east of the intersection. This effort would involve removing the vegetation behind the back of sidewalk and along the top of the existing stone retaining wall. All work would be completed within the MassDOT roadway layout and would require coordination with MassDOT.
- Expand and enhance the existing channelized right-turn island to reinforce the left-turn restriction.
- Rotate and replace the existing No Left-Turn sign (R3-2) at the northwest corner of the intersection; the sign is currently twisted and unclear if it applies to Route 3A eastbound or the driveway northbound traffic.
- Install No Left-Turn sign (R3-2) in the Route 3A eastbound direction, on the south side of the roadway to further reinforce the left-turn restriction.
- Install a “right-turn-only” (R3-5r) sign at the southbound USS Amesbury Drive approach.
- Restripe stop line and crosswalk pavement markings.
- The Proponent agrees to remove snow windrows from the southwest and southeast corners of the intersection, where such accumulations exceed two feet in height, in order to enhance sight lines, subject to coordination with the abutting property owner and MassDOT as necessary.

Figure 4. *Proposed Improvements at Route 3A (Lincoln Street)/USS Amesbury Drive*





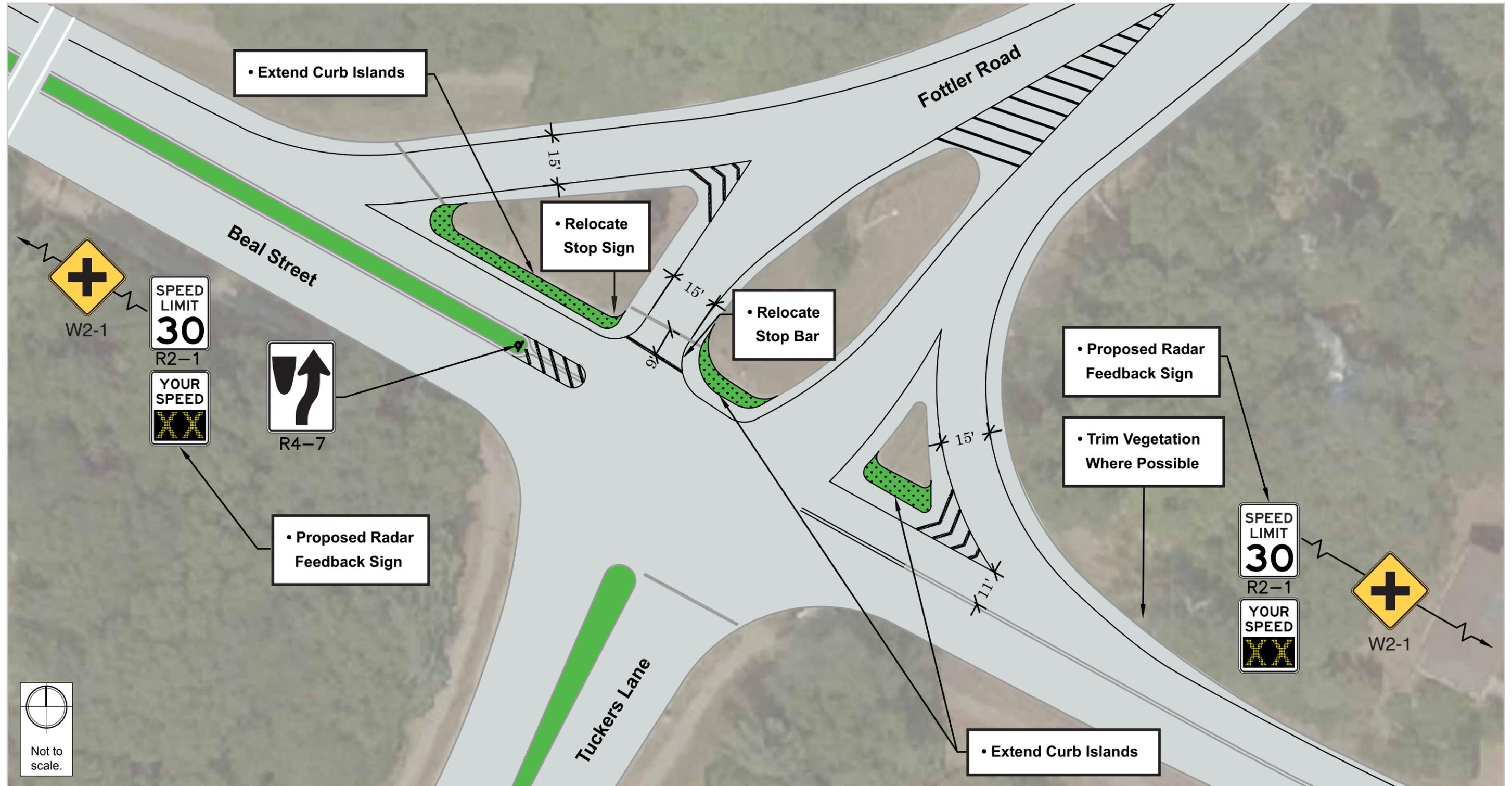
BEAL STREET/FOTTLER ROAD INTERSECTION SAFETY IMPROVEMENTS

While the Project is expected to result in only an approximately 1% increase in traffic during the peak periods, and not significantly impact the intersection operations, the Project is proposing the following improvements aimed at enhancing safety (see **Figure 5**):

- Install radar speed feedback signs along each direction of Beal Street in advance of the intersection as a countermeasure for reducing the prevailing travel speeds. Speed studies completed by HSH indicate that the 85th percentile speed is 39 mph along Beal Street westbound versus the posted speed limit of 30 mph. The signs have the ability to collect volume and speed data that can help inform the Police Department when to most efficiently target enforcement efforts.
- Install in road pavement markings indicating “30 mph” along each direction of Beal Street to further reinforce the speed limit.
- Install “intersection ahead” (graphic) warning signage (W2-1) along each direction of Beal Street.
- Trim vegetation where possible on the northern side of Beal Street to the east of the intersection to enhance sight lines.
- Relocate the Fottler Road southbound stop line approximately 9 feet south of its current location to enhance sight lines east of the intersection. This improvement would also require extending the adjacent islands south to protect the southbound approach and would have the added benefit of narrowing the Beal Street travel lanes which could further reduce travel speeds.
- Enhance intersection pavement markings, and signage, including reducing the Beal Street westbound travel lane to 11 feet.

Improvements to this intersection would be subject to review and approval by the Town of Hingham.

Figure 5. Proposed Improvements at Beal Street/Fottler Road/Tuckers Lane





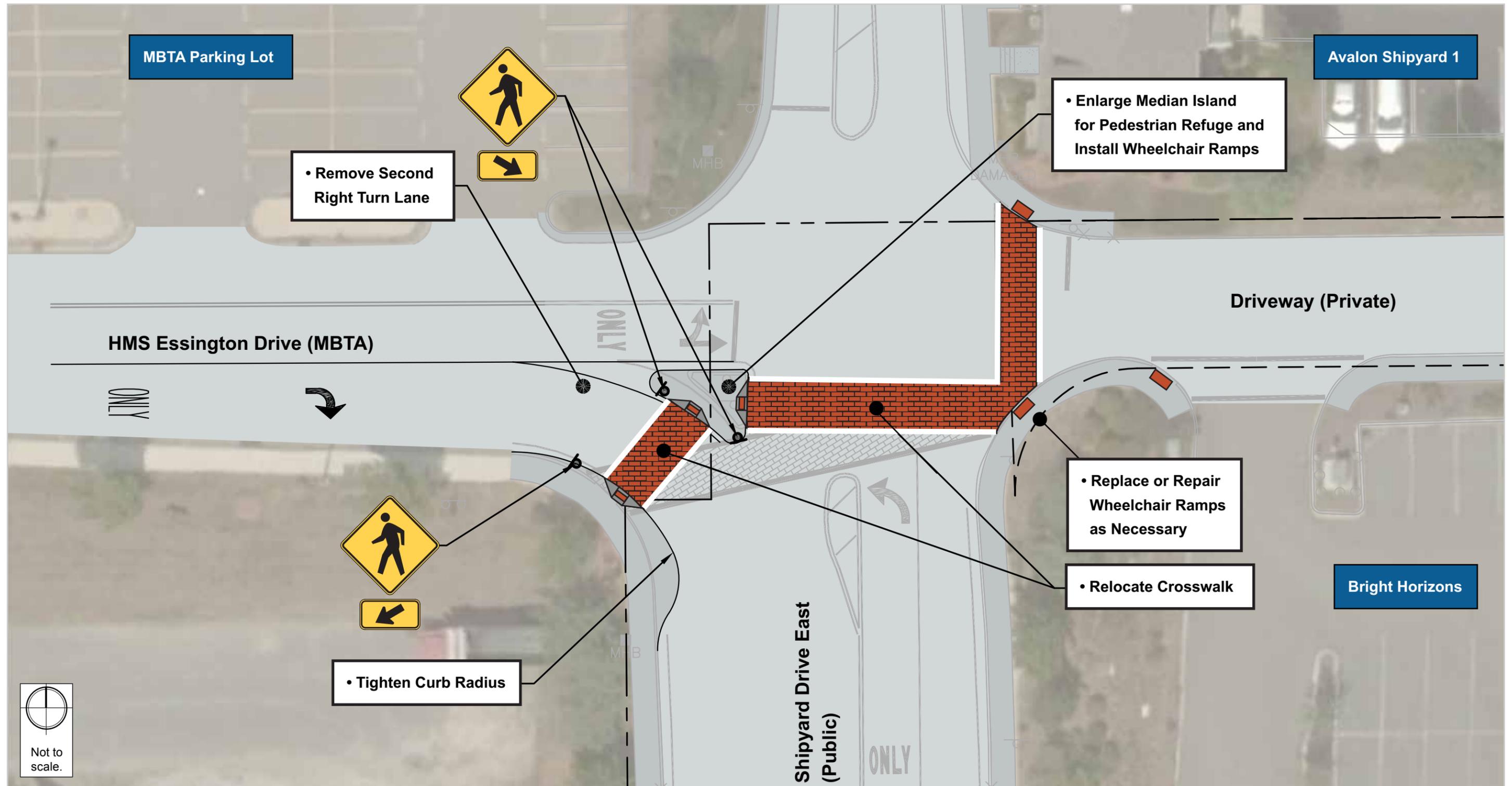
SHIPYARD DRIVE EAST/HMS ESSINGTON DR. INTERSECTION AND SAFETY IMPROVEMENTS

The Project proposed the following improvements at the intersection of Shipyard Drive East/HMS Essington Drive (see **Figure 6**):

- Reduce the width of the HMS Essington eastbound channelized right-turn lane from two lanes to one lane. This modification would not significantly alter capacity at this intersection, which is largely constrained by the nearby traffic signal at Route 3A/Shipyard Drive East.
- Enlarge the channelized right turn island to eliminate the approximately 85-foot long crosswalk across Shipyard Drive East and create a pedestrian refuge for staged crossings.
- Realign and replace the existing crosswalks across Shipyard Drive East.
- Reconstruct, replace, and install accessible curb ramps, where necessary.

These improvements would be subject to both Town of Hingham and MBTA review and approval.

Figure 6. *Proposed Improvements at Shipyard Drive East/HMS Essington Drive/Private Driveway*





ROUTE 3A SIDEWALK ENHANCEMENTS

The Proponent agrees to clean, trim overgrown vegetation, and repair, as necessary, the sidewalk along the north side of Route 3A between Bradley Woods Drive and USS Amesbury Street. These enhancements would be coordinated with MassDOT as appropriate.

TRANSPORTATION DEMAND MANAGEMENT (TDM) PROGRAM

The Proponent is committed to implementing a Transportation Demand Management (TDM) program for Project residents and employees in an effort to minimize the Project's vehicular impacts on the adjacent transportation network and overall parking demand. TDM measures will promote the use of public transportation (including the commuter boat, local bus, and commuter rail), walking, bicycling, and other options to reduce single occupant vehicle trips. TDM measures include:

- Transportation Coordinator – The Project will designate a transportation coordinator to manage all transportation issues associated with the Project, including parking, service, loading, and move-in/move-out activity. The transportation coordinator will work with residents as they move in and to raise awareness of public transportation and vanpool/carpool alternatives and incentives.
- Resident Orientation Packets – These packets will provide new residents with information about available transportation demand management programs and public transportation options, including program information, route schedules, maps, and fare information.
- Public Transit Information – Information regarding public transportation services, maps, schedules and fare information will be posted in a central location
- Bicycle Storage – The Project will provide secure covered bicycle storage on-site for at least 10% of the units. The bicycle storage area has been strategically located at the northwest corner of the building, which is closest to the commercial uses in the Shipyard and the Ferry. Additional outdoor bicycle racks will be positioned near the management office entrance for visitors and guests.
- Ridesharing Information – Residents, and building employees, will be notified, and encouraged, to participate in MassRIDES' NuRide program, which rewards individuals that choose to walk, bicycle, carpool, vanpool or that use public transportation to travel to and from work.
- Emergency Ride Home Programs – Residents, and building employees, will be made aware of the Emergency Ride Home (ERH) program available through MassRIDES, which reimburses employees of a participating MassRIDES employer partner worksite that is registered for ERH and that carpool, take transit, bicycle, walk or vanpool to work.