

**AN ACT PRESERVING OPEN SPACE IN THE COMMONWEALTH (M.G.L. C.3, 5A)  
ANDOVER – BRIDGE REPLACEMENT  
TEWKSBURY STREET BRIDGE OVER CSX RAILROAD  
ALTERNATIVE ANALYSIS AND WAIVER REQUEST**

In accordance with the Executive Office of Energy and Environmental Affairs (EEA) Guidance on Implementation of An Act Preserving Open Space in the Commonwealth (M.G.L. c.3, §5A) issued in February 2023, the Massachusetts Department of Transportation (MassDOT) provides the following alternatives analysis as required by M.G.L. c.3, §5A for the change of use of land related to the proposed full bridge replacement of the Tewksbury Street Bridge over the CSX railroad (the “Project”). The purpose of the alternatives analysis is to demonstrate that no feasible or substantially equivalent alternative exists that avoids or further minimizes impacts to public land adjacent to the project site that is protected by Article 97 of the Massachusetts Constitution. MassDOT also requests a waiver from the replacement land requirement of M.G.L. c.3, §5A as allowed under §5A(a)(B).

**PROJECT SUMMARY**

The proposed project consists of a full bridge replacement of the Tewksbury Street Bridge over the CSX railroad as the bridge, along with intersection improvement of Old Tewksbury Street to the south of the bridge and Yardley Road and Pine Cone Lane to the north of the bridge. The existing bridge is in poor condition with numerous deficiencies, the most significant being the poor condition of the concrete beams. The bridge, built in 1980, had temporary shoring and barrier added in 2018 due to the deteriorating condition of the concrete beams. To remove loading from the most deteriorated beams, traffic is currently restricted to one-way travel across the eastern half of the structure which is controlled by temporary traffic signals from each approach. Additionally, the bridge lies on the high point of a vertical crest curve which does not meet current minimum standard sight distance recommendations.

**ARTICLE 97 PROTECTED LAND**

The impacts to protected lands are limited to permanent easements totaling approximately 704 square feet. These impacts abut the existing bridge structure and roadway and are not of significant natural resource or recreation value as they are in a location not easily accessible or safe for public enjoyment. The impacts to the protected land are critical to this public safety and improvement project for guy wire placement, guardrail removal and bridge special slope paving.

**BRIDGE REPLACEMENT ALTERNATIVES**

Multiple structure alternatives were considered in the early design phases. Steel beams and concrete beams were considered. Additionally, multiple span configurations were evaluated including a three-span bridge, consistent with the existing structure, and a single-span bridge which would have spanned over the locations of the existing piers. It was determined that the preferred alternative for the bridge type and cross section is a three-span continuous steel beam bridge with a reinforced concrete deck. The steel beam superstructure was determined to be preferable for the

following reasons. First, a steel beam cross section is more easily cambered to follow the vertical roadway curvature without requiring extra concrete in the deck or pavement. Second, steel beams are a relatively lighter structure that allows for reuse of the existing piers.

### **ROADWAY ALIGNMENT ALTERNATIVES**

Three roadway alignment alternatives were considered. The first alternative would accommodate two 11-foot travel lanes, two 5-foot shoulders, and a 5'-6" sidewalk along the east side of the road. This cross section is the most similar to that of the existing structure and roadway. The profile for this alternative would meet the stopping sight distance criteria for a design speed of 35 mph, however, the intersection sight distance at the Yardley Road-Pine Cone Lane intersection and the Old Tewksbury intersection would remain sub-standard. The second alternative would accommodate the same 11-foot lanes, 5-foot shoulders, and 5'-6" sidewalk, however, the sidewalk would be along the west side of the road, opposite its position in the existing condition. The profile for this alternative would exceed all sight distance minimums including the stopping-sight distance at the crest curve over the bridge, intersection sight distance at both intersections, and headlight stopping distance at the Yardley Road-Pine Cone Lane intersection for the 35-mph design speed. The third alternative would accommodate the same lanes and shoulders as the other two alternatives, however, two 5'6" sidewalks would be provided, one on each side of the roadway. This alternative was evaluated for a 40-mph design speed and as such would require significantly more fill to achieve the required sight distances, and would require grade changes at the intersections, therefore extending the project limits significantly and impacting intersections with side roads. The preferred roadway alternative, Alternative 2, balances the benefit of improved roadway safety with the cost of raising the roadway grade drastically. It was determined that moving the sidewalk to the west side of the road would be advantageous for maintaining pedestrian accommodations during construction and provide more direct pedestrian access to the businesses on Old Tewksbury Street. The profile associated with this alternative allows for greater stopping sight distance over the bridge, greater intersection sight distance at both intersections within the project limits and meets headlight stopping distance minimums.

### **WAIVER REQUEST**

Pursuant to Chapter 3 of the General Laws, Section 5A(a)(B), MassDOT respectfully requests that the Secretary consider a waiver of the replacement land requirement of M.G.L. c.3, §5A, as the area within the parcel being permanently changed, approximately 704 square feet, are not of significant natural resource or recreation value. Further, this project serves significant public interest.