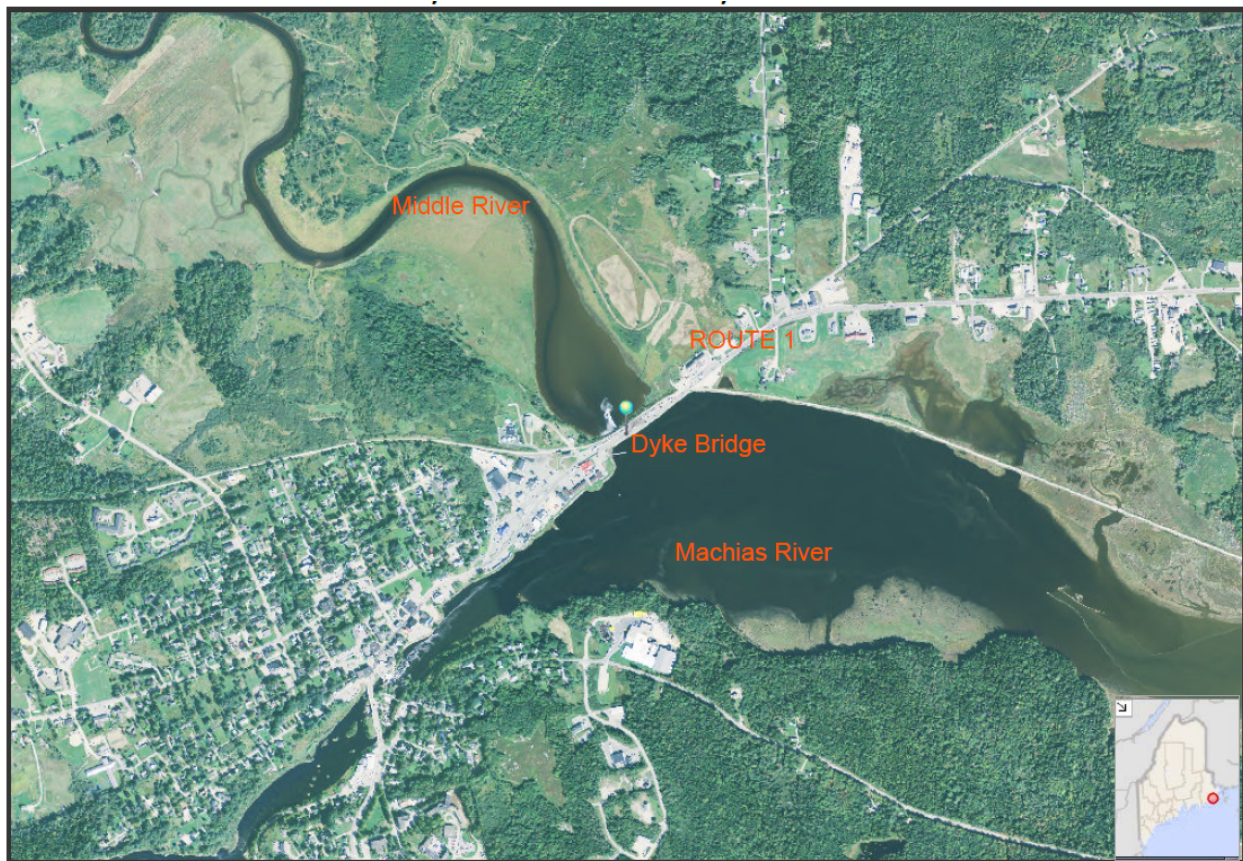


## 1.1 Purpose and Need for Action

The primary purpose is to achieve an overall structure rating of at least 8 (scale 0-9). The desired structure rating of 8 (scale 0-9) indicates there are no noticeable or noteworthy deficiencies which affect the condition of the structure. This is in accordance with Federal Highway's *Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridge* (NBIS). The structure item evaluates the alignment, settlement, joints, structural condition, scour, and other items associated with the structure. The rating code is intended to be an overall condition evaluation of the structure.

The current Dyke Bridge has a current structure rating of 4 (scale 0-9) based on the 12/27/2016 MaineDOT inspection. The inspection indicated large spalls, heavy scaling, wide cracks, loss of and rotten timber members, and the need for numerous urgent and unscheduled repairs. A dive inspection was also conducted on 9/21/16 and supports this rating.

## 1.2 Project Area



Machias, Dyke Bridge, Route 1

## 2.0 Alternatives Considered

This section discusses the alternatives considered.

### 2.1 No action alternative

The no action alternative presumes the existing structure remains unchanged except for required regular maintenance activities. Regular maintenance activities would not allow for this structure to obtain a rating of 8. Therefore, the no action alternative does not meet purpose and need.



Existing Dyke Bridge Structure

### **2.2 Replace existing structure with multiple boxes with tide gates.**

This alternative presumes the existing structures would be replaced with new multiple boxes. All structures would have a tide gate. This alternative would allow for this structure to obtain a rating of 8. Therefore, this alternative does meet purpose and need.

The Normal High Water (NHW) elevation behind the dyke would be lowered due to a tighter fitting gate system than exist today. The elevation would drop approximately 1 foot.



Duckbill check valve



Metal flapper gate

### **2.3 Replace existing structure with multiple boxes with a system that retains existing water elevation upstream of the dyke**

This alternative presumes the existing structures would be replaced with new multiple boxes. All boxes would have a tide gate and at least one would be equipped to regulate existing hydrology. This alternative would allow for this structure to obtain a rating of 8. Therefore, this alternative does meet purpose and need.

The Normal High Water (NHW) elevation behind the dyke would remain at the existing elevation.

### **2.4 Replace existing structure with bridge span or multiple open boxes**

This alternative presumes the existing structures would be replaced with a new bridge or new multiple boxes. This alternative would allow for this structure to obtain a rating of 8. Therefore, this alternative does meet purpose and need.

The Normal High Water (NHW) elevation behind the dyke would be raised by approximately 7' due to the open bridge or boxes and introduce tidal flow above the existing dyke.



Single span bridge (40' to 60')



Multiple adjacent culverts