Water Street Feasibility Study

WIN 19041.10
Route 201 Hallowell, Maine

October 9, 2014
Prepared by:

Maine Department of Transportation
Bureau of Planning
16 State House Station
Augusta, ME 04333-0016

In cooperation with:

City of Hallowell
One Winthrop Street
Hallowell, ME 04347
INTRODUCTION

Background
The Water Street Feasibility Study was a jointly funded enhanced scoping effort between MaineDOT (80%) and the City of Hallowell (20%). MaineDOT’s enhanced scoping process is a planning approach, based on the principles of Context Sensitive Solutions (CSS), that manages future risk by detailing the basic need, potential impacts, roadway design considerations, potential costs, and stakeholder issues of proposed projects. This planning approach is designed to reduce overall project costs by identifying project elements and determining the feasibility of different options prior to spending significant resources on project engineering.

The feasibility study was kicked-off in December of 2012 in response to a City request (Appendix A) for a reconstruction project to address various needs along Water Street in downtown Hallowell, including:

- Poor pavement condition
- A severe crown in the roadway between Academy Street and Winthrop Street that negatively impacts on-street parking
- An aging stormwater system
- Local interest in integrating with planned northern Granite City Park and other streetscape improvements

The analysis reviewed existing and future transportation conditions along Water Street in downtown Hallowell. To evaluate proposed alternatives, a planning level Purpose and Need Statement was developed by MaineDOT and the Hallowell Highway Committee (a sub-committee of the Hallowell City Council) to identify the specific needs that would be addressed with each alternative. Over a span of approximately 18 months, MaineDOT and the City (Study Partners) worked collaboratively to develop several alternatives that addressed the Purpose and Need. This report provides analysis on the existing and future conditions of the study area. It also describes the various alternatives reviewed by the study partners, including the preferred alternative.

Finally, it is worth noting, that MaineDOT paved the section of Water Street from the Augusta City Line to the boat launch during the summer of 2014. This treatment was intended to maintain the serviceability of Water Street during the study and design period until a more significant treatment can be accomplished. As part of this project, the City funded the paving of the parking stalls in order to have a complete curb-to-curb overly through the center of the downtown.

Study Area
As shown on Figure 1, page 2, the study area extends from the intersection of Water Street and Maple Street (BMP 28.03), in the south, to the Augusta/Hallowell city line (EMP 30.07) to the north for a total of 2.04 miles. The study limits correspond to the beginning and end points of two recent major highway improvements:
1. WIN 1853.30 Reconstruction of Route 201 in Farmingdale, extending to Maple Street in Hallowell. Completed in 2007

2. WIN 17052.00 Highway Resurfacing of Route 201 in Augusta, beginning at the Hallowell town line. Completed in 2012.
The study area was further divided in three segments (from north to south) with similar highway characteristics and land uses:

- Segment 1 extends from the Augusta/Hallowell city line to a gravel lot, the City’s “Snow Dump,” just south of the railroad trestle.
- Segment 2 extends from the Snow Dump to the Boat Launch entrance, south of Temple Street.
- Segment 3 extends from the Boat Launch entrance to the Maple Street intersection.

While typical section details (page 18) were developed for all 3 segments of the study area, only Segment 2, the segment with the greatest demonstrated need, was chosen by the study partners to move forward into preliminary design. The decision to focus preliminary design efforts on Segment 2 also took into consideration the likelihood of available construction funding within the next 3 to 5 years. The remaining segments will be addressed as the need and funding arises.

**Purpose and Need**

The primary purpose of this project is to improve safety, roadway geometry for on-street parking, and roadway drainage and to maintain efficient flow of motorized and non-motorized traffic along Water Street between Maple Street and the Hallowell/Augusta town line while minimizing or enhancing economic, environmental and cultural impacts or opportunities.

The need for the project is based upon an analysis of existing conditions and is demonstrated in several ways:

- **Inadequate pavement condition.** Water Street in Hallowell is primarily rated B (Good) and D (Poor) for pavement condition. Based on the expected life of the current pavement treatment (4-6 years) the condition is expected to decrease over time without additional investment.

- **Inadequate roadway geometry for on-street parking.** The existing cross slope for on street parking is extreme in many locations between Academy Street and Winthrop Street making it difficult and potentially dangerous for motorists to enter and exit their vehicles when parked.

- **An aging stormwater system.** Based on a recent inspection of the stormwater system along Water Street, a significant number of catch basins and pipes are in need of repair and/or replacement; and, the intersection of Water and Central frequently floods due to stormwater capacity constraints or other reasons.

- **Traffic and pedestrian safety concerns.** The intersection of Winthrop Street and Water Street is current rated as a High Crash Location (HCL) based on the number of crashes over a 3 year period. The area also experiences a significant amount of bicycle and pedestrian traffic, creating conflict points at intersecting streets, including Winthrop Street. Roof drains and other drainage issues create pedestrian safety issues, especially during frozen conditions.
• **Bicycle and pedestrian mobility concerns, vehicular demand management.** Bicycle and Pedestrians are important components to the transportation system and economic vibrancy of Hallowell. The proposed project will address sidewalk conditions, gaps, ADA ramps, crossing improvements, bicycle connectivity and safety through options such as signage, bike lanes, and pavement markings through the project area, and potential extensions of sidewalks.

• **Interface with planned Granite City Park improvements.** The City has planned improvements to the Granite City Park, including realigned entrances and off-street parking, and realignment of rail trail interface. The Water Street reconstruction project should anticipate planned (simultaneous or later) off-streets investments, including design of shoulders and proposed curb cuts.

• **Streetscape.** The City’s recent investment in historic street lighting and planned expansions of street lighting systems are intended to enhance the commercial and residential appeal of a nationally significant historic commercial district. Coordination of City investment simultaneous with highway and sidewalk work would create opportunities for efficiencies and enhancement.

**Public Involvement Process**

The study’s public outreach process communicated the purpose and need and provided details regarding the existing conditions and various proposed alternatives. The outreach process provided the public and stakeholders with the opportunity to provide opinions and input as the study progressed through the development of the various alternatives. A study website, maintained by the City, was utilized to distribute fact sheets, study recommendations, meeting notices, public meeting minutes, and relevant correspondence. Over the course of approximately 18 months, the City held a number of public forums to develop study alternatives and solicit feedback, including:

1. **Highway Committee Meetings.** The Hallowell Highway Committee, which includes three members of the Hallowell City Council and the City Manager, served as the study advisory committee and hosted all study events. The Committee worked collaboratively with MaineDOT to develop study recommendations and provide a preferred alternative for approval by the City Council. Committee meetings were advertised on the City’s website and through e-mail distribution lists. The meetings were open to the public and were held at the City Council Chambers on weeknights. A total of ten Highway Committee meetings were held during the study process:

   • January 22, 2013
   • April 24, 2013
   • June 27, 2013
   • July 23, 2013
   • August 26, 2013
   • September 18, 2013
   • December 4, 2013
   • January 27, 2014
   • April 9, 2014
   • July 1, 2014

2. **Public Meetings.** Public meetings were held at the City Hall Auditorium on May 22\(^{nd}\), 2013 and May 15\(^{th}\), 2014. The purpose of the first meeting was provide the public with details of the existing condition analysis and obtain input on the proposed purpose and need. The
second meeting focused on the preferred alternative: reconstruction. The City communicated the risks of not addressing the roadway and utility needs, and the potential benefits of a proposed project. MaineDOT provided the details of a proposed reconstruction project for Segment 2 and discussed the typical design process for a major reconstruction project. Public input and discussion overwhelmingly focused on potential construction impacts on Water Street businesses. The second meeting was intended to help the City Council make a well-informed decision on whether to formally support the reconstruction of Water Street. In addition to asking questions and making comments at the meeting, the public was encouraged to submit comments in writing. Notes from both public meetings are included in Appendix B.

3. City Council Meetings. Initial City Council discussions regarding the proposed feasibility study of Water Street took place on May 7, 2012, July 9, 2012 and August 13, 2012. MaineDOT attended the May and August meetings and presented a proposed scope of work for the study at the August meeting. At a City Council meeting on June 9, 2014, subsequent to the final public meeting for the feasibility study, the City Council unanimously approved entering an agreement with MaineDOT for the engineering and design of a reconstruction or rehabilitation project on Water Street. The Cooperative Agreement (Appendix C) for a reconstruction project was approved by the Council on August 11, 2014.

EXISTING CONDITIONS

Customer Service Levels

MaineDOT currently utilizes customer-focused engineering measures to track highway safety, condition and serviceability, and grades them similar to a report card (A=Excellent, B=Good, C=Fair, D=Poor, F=Unacceptable). CSLs were developed to provide a fair, consistent measure of how a road compares to other roads of the same priority across the state. Table 1 lists the individual measures that make up the overall service level grade.

<table>
<thead>
<tr>
<th>Safety</th>
<th>Condition</th>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crash History</td>
<td>Ride Quality</td>
<td>Posted Road</td>
</tr>
<tr>
<td>Pavement Rutting</td>
<td>Pavement Condition</td>
<td>Posted Bridge</td>
</tr>
<tr>
<td>Paved Roadway Width</td>
<td>Roadway Strength</td>
<td>Congestion</td>
</tr>
<tr>
<td>Bridge Reliability</td>
<td>Bridge Condition</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2 compares the CSL values for Water Street with statewide averages for highways with a similar characteristics and classification. The individual CSL values for Water Street are summarized on the next page.
1. **Safety.** The Customer Service Level (CSL) for Safety (see Figure 2, page 3) along Water Street between Maple Street and the Hallowell/Augusta town line is primarily rated B and C. Approximately, 0.4 miles of Route 201 to the south of the paved 5’ bike lane is currently rated D for safety due to a lack of paved shoulders.

2. **Condition.** A majority of Water Street is rated B and D for Condition (see Figure 2). Prior to light capital paving (LCP) projects in 2012 and 2014, the entire corridor was rated D and F. Based on the expected life of this particular pavement treatment (4-6 years) the condition is expected to decrease over time without additional investment.

3. **Service.** Water Street is predominately rated B for service reflecting no road or bridge postings and very little congestion.

*Figure 2: Water Street (Route 201) Customer Service Levels*

<table>
<thead>
<tr>
<th>Highway Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Street is a two-lane highway that runs north to south through the Hallowell along the Kennebec River. The inactive Lower Road Branch rail line runs generally parallel to Water Street, crossing the highway to the south of downtown and again near Hinckley Road. The Kennebec River Rail Trail (KRRT) follows the rail line from Gardner to Augusta, leaving the railroad ROW and following Water Street for 0.6 miles through downtown. The KRRT is partially served by bike lanes/paved shoulders and sidewalks through this section.</td>
</tr>
</tbody>
</table>

| Water Street is classified as a Minor Arterial and a Highway Priority 1 corridor. The existing pavement consists of two 12’ wide travel lanes and variable width paved and gravel shoulders. The posted speed limit is 40 miles per hour (mph) from the Farmingdale town line to the southerly intersection of the KRRT and is lowered to 25 mph in the downtown. The speed limit increases north of downtown to 30 mph near Hinckley Road. |
Existing traffic volumes on Water Street range from 10,000 to 15,000 vehicles per day. Table 2 summarizes the highway characteristics of this facility.

### Table 2: Summary of Existing Highway System

<table>
<thead>
<tr>
<th>Classification</th>
<th>Water Street (Route 201)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highway Corridor Priority</td>
<td>1</td>
</tr>
<tr>
<td>Federal Functional Class</td>
<td>Minor Arterial</td>
</tr>
<tr>
<td>Urban/Rural</td>
<td>Rural</td>
</tr>
<tr>
<td>Federal Aid Highway System</td>
<td>Fed aid non-NHS</td>
</tr>
<tr>
<td>State Highway System</td>
<td>State Highway-0001</td>
</tr>
<tr>
<td>Scenic Byway System</td>
<td>No</td>
</tr>
<tr>
<td>Number of Lanes</td>
<td>2</td>
</tr>
<tr>
<td>Posted Speed Limit (mph)</td>
<td>25 to 40</td>
</tr>
<tr>
<td>Paved Width (feet)</td>
<td>24 to 53</td>
</tr>
<tr>
<td>AADT</td>
<td>10,000 – 15,000 vehicles per day</td>
</tr>
</tbody>
</table>

### Roadway Geometry

The geometric review of Water Street focused entirely on the portion of Water Street from Academy Street to Winthrop Street intersections. This section of highway (approximately 0.21 miles) has a severe grade to the northbound parking lane that negativity impacts on-street parking.

This issue seems to be the result of ground floor buildings heights on the east side of the street that are several inches below the west. The crown was further exacerbated by a State Highway Commission Public Works Project in 1934 (see Figure 3, page 4) that constructed a northbound shoulder at an 8% grade. Subsequent paving has worsened the situation significantly.

In order to address the severe grade, MaineDOT considered three options for adjusting the crown of Water Street:

- **Option 1.** Lower the southbound (west) parking lane and add a double granite curb to the sidewalk
- **Option 2.** Raise the northbound (east) parking lane and add a double granite curb to the sidewalk
- **Option 3.** Shift the crown of the highway from the centerline to the edge of the southbound parking lane (see Figure 4) and adjust sidewalk elevations where necessary.
Options 1 and 2 effectively add two steps up or two steps down to the sidewalk surface. These options were dismissed for various reasons including potential visual impacts to the historic district, ADA impacts, and local concerns regarding winter maintenance. Option 3 (shifting the crown to the west) was determined to be technically feasible and causes the least impacts to the streetscape. This solution was included in the preferred alternative.

**Pedestrian and Bicycle Facilities**

The portion of the study area located between the two trailheads, including the downtown area, experiences a high volume of pedestrian and bicycle traffic on a daily basis. The 2010 Highway Capacity Manual (HCM), developed by Transportation Research Board of the National Research Council, was used to evaluate how well this section of Water Street serves bicycle traffic. The 2010 HCM defines bicycle level of service on a scale ranging from A to F, where A is an excellent level of service and F is a very poor level of service. Factors that affect the bicycle level of service of a street include the overall width of the street, presence of a dedicated bike lane, vehicular traffic volume, pavement condition and number of access points (ex: driveways). Table 3 illustrates the HCM 2010 Bicycle levels of service for Water Street in Hallowell.
Table 3: Bicycle Level of Service for Water Street

<table>
<thead>
<tr>
<th>Segment</th>
<th>Level of Service AM Peak Hour</th>
<th>Level of Service PM Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>North</td>
<td>South</td>
</tr>
<tr>
<td>Winthrop St to Central St</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>Central St to Union St</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td>Union St to Academy St</td>
<td>D</td>
<td>D</td>
</tr>
</tbody>
</table>

The bicycle level of service for Water Street ranges from D to E depending on the time of day. Level of service E is a poor rating. This rating could be improved a letter grade by providing a dedicated bike lane and improving the pavement condition of Water Street. Additional information on the bicycle level of service for Water Street can be found in Appendix D.

**Americans with Disabilities Act (ADA) Accessibility:** The existing sidewalks within Segment 2 of the Study Area were reviewed for compliance with current ADA design standards. The review found several areas of potential improvement for ADA accessibility within the downtown:

1. **Cross slope of the existing brick side sidewalks.** The existing cross slope of the brick sidewalks varies significantly and exceeds the maximum 2.0% slope required by ADA. Cross-slope is defined as the slope measured perpendicular to the direction of travel. Steep cross-slopes can make it difficult for wheelchair or crutch users to maintain lateral balance and can cause wheelchairs to veer downhill or into the street.

2. **Transition between curb ramps and the gutter at crosswalks.** The exaggerated crown on Water Street between Winthrop Street and Academy Street has created excessive slope differences between curb ramps and the gutter at crosswalks near Union and Central Street. These slopes can be difficult for wheelchair users to navigate and create rapidly changing grades at curb ramps. Rapid changes in grade can cause wheelchair users traveling with speed to flip over (backward or forward) at the transition point between the curb and the gutter. This problem is the most significant on the east side of Water Street.

3. **Lack of curb ramps and detectable curb ramps (truncated domes).** All of the crossing locations along Water Street, excluding the newly constructed crossing at Academy, lack one or more of the required features for accessible curb ramps including:
   - Presence of a ramp altogether
   - Presence of truncated domes
   - Adequate ramp length, width and slope

4. **Uneven brick sidewalks.** Uneven brick sidewalks, like those in the downtown, can increase the amount of work required for mobility and create tripping hazards. The cobblestone crosswalk at Winthrop Street is similarly uneven with large gaps between stones, in addition to being narrow. MaineDOT’s current specification for brick sidewalks includes 12” of aggregate subbase with 1” of bituminous base to minimizing settling and movement.
Parking

According to the 2014 update to the Hallowell Downtown Plan, the community has an estimated 716 public and private parking space with the downtown area. A recent parking inventory of Water Street identified 90 existing parking spaces on Water Street, starting at Winthrop Street and ending at Temple Street. Currently, vehicles also park along the shoulders of Water Street to the north of Winthrop Street. There are no painted stalls along the 8’ paved shoulder on the west side of the street in this location. The shoulder on the east side of Water Street is gravel. Since the shoulder is not designated (i.e. striped) as official parking spaces, they were not counted in the inventory.

Two other areas within the study area were also identified as locations for on-street parking.

1. The existing gravel shoulder near the southerly trailhead is currently used as parking for trail users.
2. The paved shoulder along the east side of Water Street accommodates intermittent parking at the Hallowell Cemetery.

The Study Partners reviewed Segment 2 for potential parking improvements including:

- Constructing an 8’ paved shoulder on the east side of Water Street near the Granite City Park.
- Striping parking stalls on existing paved shoulders on the east side of Water Street near the Boat Launch
- Constructing angled (45 degree) parking spots at the snow dump.

These improvements were included in the scope of the preferred alternative under “Recommendations” on pages 16 – 18.

Land Use

The Hallowell Downtown Plan delineates three distinct areas along Water Street within the Study Area. The Historic Center/Arts District starts at the railroad trestle in the north and ends just beyond the Public Works Garage in the south. The Northern and Southern Business Gateways stretch along Water Street to the north and south of the Historic Center/Arts District to the Augusta and Farmingdale town lines. The areas roughly correspond to the Study Segments in Figure 1, page 2.

According to the Hallowell Plan, the downtown area has approximately 250,000 square feet of commercial and residential space, including 152 apartments, 30 retail storefronts, 21 offices, and 18 restaurants. The area also includes several prominent public facilities including the Granite City Park, the Kennebec River Boat Launch, the Kennebec River Rail Trail, and the Kennebec Chaudiere Hallowell Scenic Turnout. A portion of the downtown area along Water Street, from Railroad trestle to Temple Street, is currently listed on the National Register of Historic Places as a historic district. The Hallowell Historic District encompasses 260 acres, and includes 446 buildings as contributing properties.
Geotechnical Investigations

Ground Penetrating Radar (GPR) data was collected in support of this study on December 4, 2012 in an effort to estimate pavement depths and identify other anomalies within the roadway structure. GPR data was collected using MaineDOT’s 1.5 MHz ground coupled antenna. Data collection was completed from the edge of pavement to edge of pavement, or from curb to curb wherever possible. Data was collected transversely at 100 foot intervals starting at the existing pavement joint near the boat launch entrance and extending 1,750 feet to a location just north of Winthrop Street.

The travel lanes and shoulders were also drilled at seventeen locations to collect information about the existing pavement structure (HMA thickness, the underlying gravel thickness, gravel gradation, and the subgrade type). Borings were located so that pavement structure information was collected transversely at six scoping design stations. Borings were drilled to a depth of 5’ (+/-) below the pavement/shoulder surface unless refusal was encountered before those depths were reached. Pavement cores were collected to calibrate GPR data.

According to the GPR Report, including as Appendix E, a strong layer reflection exists at most transverse locations. This layer is believed to be the bottom of the asphalt pavement layer. A layer of macadam was present at many of the locations, but was not as clearly defined in most cases. The existing asphalt ranges from 5” to 7” in the travel lanes, and 2” to 5” in the shoulders, not including the macadam layer. These depths correlated very well with the asphalt pavement/macadam interface identified in multiple pavement cores.

The existing roadway and shoulder aggregate that underlies the HMA is very high in silt size particles and far exceeds the maximum allowable of the MaineDOT specification for the percentage of material passing the #200 sieve (7% maximum). Because of the high fines content, the existing aggregate is considered poorly draining and has lower bearing strength. Aggregate that is slow draining directly beneath the HMA will shorten the design life of the pavement (i.e. wet soils are weak soils). The complete geotechnical analysis is included in Appendix F.

Drainage/Hydrology

The existing drainage along Water Street for Segments 1 and 3 predominately consists of sheet flow and open shallow ditches with occasional cross culverts and catch basins. Vaughan Bridge (#2892), located immediately south of the Hallowell Public Works Garage, carries Water Street over Vaughn Stream. This concrete slab has a deck rating of 6 (satisfactory), a superstructure rating of 6, and a substructure rating of 5 (Fair). Originally constructed in 1935, the Vaughan Bridge has a span of 18’ with a road width of 41’

The closed drainage system in Segment 2 was reviewed using closed-circuit television equipment and determined to be in generally poor condition and needs replacement. The system consists of various large granite sluiceways, corrugated metal, clay and PVC pipes.

A number of roof drains also empty onto the sidewalks in the downtown area. The City has identified this as a potential pedestrian hazard and maintenance issue during the winter months.
Utilities

A letter was sent out to the known utilities in Hallowell on November 26, 2012 requesting information regarding the existing above and below ground utilities within Segment 2 of the study area. The following utilities responded to MaineDOT’s initial request for information:

- **Aboveground**
  - Central Maine Power
  - Time Warner Cable
  - SegTel, Inc.

- **Belowground**
  - FairPoint Communications
  - Great Augusta Utility District (Sewer)
  - Hallowell Water District
  - City of Hallowell (street lighting conduit)

- **Utilities not located in Segment 2**
  - OTT Communications
  - Buckeye Partners LP (Petroleum Pipeline crosses Water Street near Wilder Street)

**Water:** The water system is currently managed and operated by the Hallowell Water District. According to the District, the water main, constructed in 1898, is undersized and need of replacement. The 8” cast iron main is generally located near the edge of the northbound travel way, approximately 5’ below the surface of the pavement. According to the Water District, the depth of this structure is a concern for any alternative that proposes to lower the pavement surface and reduce cover over the main. The District is currently attempting to build up a cash reserve in anticipation of a proposed project.

**Sewer:** The sewer system is owned and maintained by the Greater Augusta Utility District (GAUD). The stormwater and sewer systems are separated systems. The City is responsible for maintaining the stormwater system and GAUD is responsible for the sewer system. A combined sewer overflow (CSO) exists at the pump station near the railroad trestle. Removal of this CSO is part of GAUD’s long term plan.

GAUD recently analyzed the sewer system within the study area for potential stormwater separation issues and did not discover any stormwater pipes conveying water to the sewer system.

**Natural Gas:** Summit Natural Gas of Maine recently installed a gas “distribution line” along Water Street from Augusta to Winthrop Street and from Temple to Greenville Street.

**Right-of-Way**

Table 4 contains the approximate Right-of-Way (ROW) widths for 5 sections of Water Street starting at the Augusta City line and heading south.
Table 4: ROW Widths for Water Street

<table>
<thead>
<tr>
<th>Segment</th>
<th>Begin Milepoint</th>
<th>End Milepoint</th>
<th>Length (miles)</th>
<th>Length (feet)</th>
<th>ROW Width</th>
<th>ROW Width (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Augusta City line to unknown location in the vicinity of the cemetery. Assume Stoddard Ln.</td>
<td>30.07</td>
<td>29.84</td>
<td>0.23</td>
<td>1214</td>
<td>4 Rods</td>
<td>66</td>
</tr>
<tr>
<td>Stoddard Ln to unknown location in the vicinity of Burt's Security</td>
<td>29.84</td>
<td>29.63</td>
<td>0.21</td>
<td>1109</td>
<td>3.5 Rods</td>
<td>57.8</td>
</tr>
<tr>
<td>Burt's Security To Academy St</td>
<td>29.63</td>
<td>29.16</td>
<td>0.47</td>
<td>2482</td>
<td>4 Rods</td>
<td>66</td>
</tr>
<tr>
<td>Academy to Greenville St</td>
<td>29.16</td>
<td>28.51</td>
<td>0.65</td>
<td>3432</td>
<td>3 Rods</td>
<td>49.5</td>
</tr>
<tr>
<td>Greenville St to Farmingdale TL</td>
<td>28.51</td>
<td>27.88</td>
<td>0.63</td>
<td>3326</td>
<td>4 Rods</td>
<td>66</td>
</tr>
</tbody>
</table>

Environmental Conditions

Historic Resources: A portion of the downtown area along Water Street, from Railroad trestle to Temple Street, is currently listed on the National Register of Historic Places as a historic district. The Hallowell Historic District encompasses 260 acres, and includes 446 buildings as contributing properties. Additional architectural surveys will be completed during the design phase.

Natural Resources: A review of natural resources suggests that the study area encompasses Critical Habitat for an Endangered Species Act - Distinct Population Segment (ESA – DPS) of Atlantic salmon. Areas of potential effect include the Kennebec River and Vaughan Stream crossing near the Public Works Garage. The scope of work should also be reviewed for potential effects to two additional endangered species also present in the Kennebec River: Atlantic and Short-nosed sturgeon.

The Kennebec River to the north of the turn-out is classified as intertidal vegetated freshwater wetland. The Kennebec, at this point, is tidal. The river is listed as essential fish habitat by the National Oceanic and Atmospheric Administration (NOAA). A mapped eagle’s nest is located on the ridge just south of Vaughn Stream. The buffer for the nest may include parts of Route 201 to the south of the Public Works Garage. Much Route 201 in the study area is within the 100-year flood plain (see Figure 5, page 10).
Hazardous Materials: Based on MaineDOT’s Phase I contamination assessment (Appendix G), the project appears to have the potential for petroleum contamination in six areas along the project corridor. Further subsurface investigation is recommended to identify potential impacts to the proposed project from these sites.

Recreational Uses: The Kennebec River Boat Launch was constructed using Land & Water Conservation Fund (LAWCON) grant program funds. Any lands acquired or developed with LAWCON assistance must be retained solely for outdoor recreation. No other use can be made of these lands without prior written approval of the National Park Service. The proposed alternative should be reviewed during the Preliminary Engineering (PE) Phase for potential impacts to the boat launch.

Lighting
In 2011, the City upgraded the 22 pedestrian lights on the east side of Water Street between Academy Street and Winthrop Street using LED technology. According to the City, the pedestrian lights are “Clearwater” 55-watt LED luminaires on “Newburyport” style, cast iron posts painted black.

Roadway illumination is provided along the entire length of the Study Area. Lighting elements, cobra-head luminaires, are mounted to utility poles at regular intervals and at intersections along Water Street.

Safety
The section of Water Street within the study area has a crash rate of 211 crashes per 100 million vehicle miles (MVM) which is above the statewide average crash rate for a similar facility (117 crashes per 100 MVM). However, there is currently only one high crash location (HCL) along the corridor based on crash statistics from January 1, 2011 and December 31, 2013. This location is at the Water Street and Winthrop Street intersection in downtown.

The Winthrop Street intersection was evaluated for the addition of a traffic signal and a left-turn pocket from Water Street to Winthrop Street. Results of the intersection analysis can be found on pages 12 – 14.

Traffic Conditions
Traffic Volumes: Traffic counts were obtained at three locations on July 16 through July 18, 2014: north of Winthrop Street, south of Winthrop Street, and west of Water Street on Winthrop Street. A summary of the counts is shown in Table 5, page 12.

Water Street in Hallowell serves approximately 10,000 – 15,000 vehicles a day and often experiences significant congestion during the AM and PM peak hours. Average speeds from the Synchro/SimTraffic models on Water Street in Hallowell are typically reduced to 21 mph in the AM peak hour and 17 mph during the PM peak hour. Heavy pedestrian activity during the PM peak hour and left turns from and to Water Street are contributing factors to the increased congestion. The heaviest left-turn movement is from Water Street to Winthrop Street.
During the AM peak hour approximately 250 vehicles make this left-turn movement. The left-turn volume from Water Street to Winthrop Street is approximately 200 vehicles during the PM peak hour. A proposed left-turn pocket from Water Street to Winthrop Street would potentially improve the mobility of the intersection. Results of the intersection analysis can be found under on page 14.

**Table 5: 2013 Average Annual Daily Traffic (AADT) Summary**

<table>
<thead>
<tr>
<th>Location</th>
<th>AADT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NB/EB</td>
</tr>
<tr>
<td>Water St north of Winthrop St</td>
<td>4,990</td>
</tr>
<tr>
<td>Water St south of Winthrop St</td>
<td>6,960</td>
</tr>
<tr>
<td>Winthrop St west of Water St</td>
<td>2,760</td>
</tr>
</tbody>
</table>

Manual traffic counts were collected at the intersection of Water Street and Winthrop Street on July 18, 2013 from 6:00 AM to 6:00 PM. The data show the morning peak hour occurs between 7:15 and 8:15 AM and accounts for approximately 6.5% of the Average Annual Daily Traffic (AADT). The afternoon peak hour for Water Street occurs between 4:30 and 5:30 PM and accounts for approximately 8.5% of the AADT. The turning movement count data also identifies the number of single unit trucks and tractor trailers. Peak hour volumes at the intersection are shown in Figure 6. Detailed traffic count data is included in Appendix H.

**Signal Warrant Analysis:** The Winthrop Street intersection was evaluated for the addition of a traffic signal and a left-turn lane from Water Street to Winthrop Street. The signal warrant evaluation was conducted using nine traffic signal warrants contained within the Manual on Uniform Traffic Control Devices (MUTCD).

These nine warrants define minimum conditions under which signal installations may be justified. The MUTCD suggests that traffic control signals should not be installed unless one or more of the signal warrants are met. However, the satisfaction of a warrant or warrants is not in itself justification for a signal. Every situation is unique and warrant guidelines must be supplemented by the effects of specific site conditions and the application of good engineering judgment. The following traffic signal warrants were evaluated for the Winthrop Street intersection:
Installation of a traffic signal should improve the overall safety and/or operation of an intersection and should be considered only when deemed necessary by careful traffic analysis and after less restrictive solutions have been attempted.

Table 6: Signal Warrant Analysis Summary

<table>
<thead>
<tr>
<th>Signal Warrant</th>
<th>Winthrop Street</th>
<th>Water Street</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Left-Turns onto</td>
<td>Left-Turns</td>
</tr>
<tr>
<td></td>
<td>Water Street</td>
<td>onto Winthrop</td>
</tr>
<tr>
<td>1A: Minimum Vehicle Volume</td>
<td>Not Met</td>
<td>Not Met</td>
</tr>
<tr>
<td>1B: Interruption of Continuous Traffic</td>
<td>Not Met</td>
<td>Not Met</td>
</tr>
<tr>
<td>1C: Combination of 1A and 1B</td>
<td>Not Met</td>
<td>Not Met</td>
</tr>
<tr>
<td>2: 4-Hour Vehicle Volume</td>
<td>Not Met</td>
<td>Not Met</td>
</tr>
<tr>
<td>3A: Peak-Hour Delay</td>
<td>Not Met</td>
<td>Not Met</td>
</tr>
<tr>
<td>3B: Peak-Hour Volume</td>
<td>Not Met</td>
<td>Not Met</td>
</tr>
<tr>
<td>4A: 4-Hour Pedestrian</td>
<td>Not Met</td>
<td>Not Met</td>
</tr>
<tr>
<td>4B: Peak-Hour Pedestrian</td>
<td>Not Met</td>
<td>Not Met</td>
</tr>
<tr>
<td>5: School Crossing</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>6: Coordinated Signal System</td>
<td>N/A</td>
<td>Not Met</td>
</tr>
<tr>
<td>7: Crash Experience</td>
<td>Not Met</td>
<td>Not Met</td>
</tr>
<tr>
<td>8: Roadway Network</td>
<td>Not Met</td>
<td>Not Met</td>
</tr>
<tr>
<td>9: Railroad Crossing</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Based on the results of the analysis shown in Table 6, the Winthrop Street intersection did not meet any of a 9 warrants for a traffic control device. Detailed warrant analysis worksheets are provided in Appendix I.

**Dedicated left-turn lane onto Winthrop Street.** The traffic analysis also determined that the addition of a left-turn lane from Water Street to Winthrop would not significantly impact the operation of the intersection or improve traffic flow on Water Street. The left-turn lane would slightly reduce the delay per vehicle for the left-turn movement from Water Street to Winthrop Street. In addition, the left-turn lane would result in a minor improvement to the northbound mobility on Water Street. Under existing conditions, the width of Water Street allows northbound vehicles to bypass left-turning vehicles. Also, due to long southbound queueing during the PM peak hour, southbound vehicles often yield to left-turning traffic on Water Street. These two factors contribute to only a minor increase in mobility resulting from the addition of a left-turn lane on Water Street to Winthrop Street. Table 7 lists changes in performance expected to occur on Water Street with the addition of a left-turn lane from Water Street to Winthrop Street. Further analysis of the dedicated left-turn lane can be found in Appendix D.

**Table 7: Change in Performance of Water Street**

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>AM</th>
<th>PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Delay per Vehicle (s)</td>
<td>0.4</td>
<td>-7.8</td>
</tr>
<tr>
<td>Average Speed (mph)</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

**Pedestrian and Bicycle Volumes:** In addition to the collection of the vehicular turning traffic data, bicycle movements were specifically collected at the intersection of Water Street and Winthrop Street and Water Street and Central Street. During the PM peak hour for vehicular traffic approximately 20 pedestrians were counted crossing Water Street at either Winthrop Street or Central Street. The peak hour for pedestrian traffic begins in the early afternoon hours and may exceed 30 pedestrians crossing Water Street. During the PM peak hour for vehicular traffic approximately 10 bicycles were counted traveling along Water Street. Based on the bicycle counts collected the bicycle peak hour volume is also 10 bicycles, which occurs at both noon and 4:30.

**ALTERNATIVES CONSIDERED**

MaineDOT and the City worked collaboratively to develop several alternatives for improving Water Street in Segment 2 of the Study Area. Several factors were considered by the Study partners during the review of alternatives including the purpose and need, the estimated duration of construction, the total project cost, and other potential benefits to the community. A summary of the study alternatives is shown in Table 8 on page 15.

**Light Capital Paving (LCP)**

Light Capital Paving, also known as a maintenance surface treatment, is typically the application of a 5/8" overlay, used as a holding action on unbuilt roads. The section of Water Street from the Augusta City Line to the boat launch received this treatment during the summer of 2014. Without significant improvement to subbase (roadbed) and drainage system, Water Street will require this treatment approximately every seven years. Effectively, this treatment equates to the “status
quo” or “no build” option. This alternative would improve the pavement condition in the short term but does not improve the crown of the road or satisfy the project purpose and need.

Table 8: Alternatives for Improving Water Street

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Satisfy Purpose and Need?</th>
<th>Other Project Benefits</th>
<th>Estimated Construction Duration</th>
<th>Expected Life (Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Roadway Geometry</td>
<td>Pavement Condition</td>
<td>Stormwater Upgrades</td>
<td>Improve Safety</td>
</tr>
<tr>
<td>Light Capital Paving</td>
<td>N</td>
<td>Y</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>Mill and Fill</td>
<td>N</td>
<td>Y</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>Rehabilitation</td>
<td>Y</td>
<td>Y</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>Rehabilitation Plus</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Reconstruction</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

Notes:
Abbreviations: Y = Yes, N = No, and P = Partial
Figures listed under "Estimated Construction Duration" assume no significant schedule restrictions

Mill and Fill
A typical Mill and Fill extends the life of existing roadways by removing (or milling) a portion of the roadway surface and replacing it with a suitable depth of new hot mix asphalt. Generally, this treatment is best suited for “built” highways with an adequate subbase (roadbed) below the pavement. A Mill and Fill was completed during the summer of 2012 on the section of Route 201 (State Street), north of the study area, in Augusta. This alternative would improve the pavement condition over the mid-term but does not improve the crown of the road or satisfy the project purpose and need.

Rehabilitation
The Rehabilitation alternative is based on a perpetual pavement (or full depth asphalt) approach with a 20-year design life. With this type of pavement structure, the Hot Mix Asphalt (HMA) can be placed directly on the existing subgrade. The treatment would include removal of the existing pavement, removal of some of the existing aggregate to improve the cross slope, and placement of 11’ of new HMA. Rehabilitation includes spot drainage improvements only and does not include new lighting or sidewalks. Rehabilitation would improve the pavement condition over
the long-term and partially satisfies the project purpose and need. Details of the perpetual pavement design concept for Water Street are contained in Appendix J.

Rehabilitation Plus

The Rehabilitation Plus includes the same pavement design as Rehabilitation (see above) and full replacement of the stormwater system, water and sewer improvements, new sidewalks, and new pedestrian lighting. Rehabilitation Plus would improve the pavement condition over the long-term and satisfies the project purpose and need.

Reconstruction

Reconstruction includes removal of existing pavement, 24” of new gravel, 6” of new pavement and replacement of the stormwater system. This option includes a number of local amenities including new brick sidewalks and pedestrian lighting improvements, replacement of the aging water main and potential improvements to the sewer system. Both Reconstruction and Rehabilitation improve the slope of Water Street to safely accommodate on-street parking. Reconstruction would improve the pavement condition over the long-term and satisfies the project purpose and need.

RECOMMENDATIONS

After review of various study alternatives and consideration of public input during the year-and-a-half study process, the Study Partners developed the following recommendations for Water Street within Segment 2 of the Study area:

Reconstruction of Water Street

On August 11, 2014 the Hallowell City Council unanimously voted to enter into an agreement with MaineDOT for a reconstruction project from the Snow Dump to the Boat Launch entrance, south of Temple Street. The scope of the project, as defined in the Agreement, includes:

- Reconstruction of the existing roadway base and shoulders to provide adequate structural composition for two 14-foot (where feasible) shared-travel lanes (one travel lane in either direction) and two 8-foot paved shoulders.
- Replacement of the stormwater system.
- Reconstruction the deteriorated sidewalks, within the highway right-of-way, to a standard that is ADA compliant.
- Construction of a new 5-foot bituminous sidewalk with bituminous curb on the east side of Water Street from the Boat Launch Exit to the end of the existing sidewalk near the Lucky Garden Restaurant to a standard that is ADA compliant.
- Construction of a new 7-foot brick sidewalk with granite curb on the west side of Water Street at a former driveway entrance next to Slate’s Bakery to a standard that is ADA compliant.
• Construction of a new 7-foot brick sidewalk with granite curb on the east side of Water Street from the end of the existing sidewalk across from the Winthrop Street intersection to Front Street to a standard that is ADA compliant.

• Construction of a new 5-foot bituminous sidewalk with granite curb on the east side of Water Street from Front Street to the Kennebec River Rail Trail near the snow dump to a standard that is ADA compliant.

• Construction of a curb bump-out, crosswalk and pedestrian activated signal at the new trailhead on Water Street near the snow dump to a standard that is ADA compliant.

• Construction of an 8’ paved shoulder from Front Street to the snow dump to accommodate on-street parking.

• Construction of approximately seven angled (45 degree) parking spots at the snow dump.

• Installation of 22 “Newburyport style” 55-watt LED luminaire streetlights on west side of Water Street.

• Installation of approximately 15 underdrain outlets and check valves for various roof drains along Water Street.

The scope of work presented above is based on the information available at the time this report. Subsequent, more detailed, design work may result in a need to modify this scope. The project limits covered under this scope include the “Snow Dump” area in the north and the boat launch entrance in the south (for a total of 0.41 miles). The final project limits will be determined at PDR in order to develop an adequate estimate for future construction funding and to manage predicted construction and business impacts.

Other Recommendations

• Addition of 13 (approximately) parking stalls by striping the existing 8’ shoulder on east side of Water Street between the Boat Launch exit and entrance for on-street parking.

• Addition of Shared-Lane Markings (Figure 7) to Water Street from the new sidewalk/trail crossing near the snow dump to the 5’ bike lane near Temple Street. Install “Share the Road” signage at locations to the north and south of the project to inform vehicles entering the downtown of the designated shared lanes. Consider additional signage, including bicycles “May Use Full Lane” signs (Figure 8, page 18), as necessary.

Note: Prior to the completion of this report, the City of Hallowell added shared-lane markings to Water Street.

• Retain the existing cobblestone crosswalk at Winthrop Street.
• Continued consultation with City and appropriate stakeholders on design elements related to historic preservation, including the reuse of old granite curbs and potential expansion of brick sidewalks.

• Integration of the project design with potential Granite City Park redevelopment plan. The City of Hallowell developed a conceptual design for the park which includes parking improvements on and to adjacent to Water Street. Seven angled (45 degree) parking spots at the snow dump were included in the scope of the proposed reconstruction project based on the park plan. The City may explore additional park improvements in the near future.

• Continued dialogue between the City and MaineDOT on methods to lessen construction impacts for the community. Reconstruction of Water Street will, undoubtedly, pose a substantial disruption of day-to-day activities in downtown Hallowell: however, the study partners have agreed to work with community to lessen impacts. The following tools to were presented at the May 15, 2014 public meeting as methods to address potential construction impacts for the community and travelers:
  • Innovative contracting (Cost plus time bidding)
  • A robust public information plan
  • Development of a Traffic Management plan

**TYPICAL SECTIONS**

While cross section details were developed for all 3 segments of the Study Area, only Segment 2 was chosen by the study partners to move forward into preliminary design. The remaining segments will be addressed as the need and funding arises. Each Segment was divided into typical sections based on like characteristics. The Study Partners developed the following series of typical sections for the 3 study areas:

**Segment 1:** The typical section for Segment 1 from the Augusta City Line to Bolley’s Restaurant includes 11’ travel lanes and 5’ paved shoulders with an 8’ shoulder (existing) along the cemetery for intermittent on-street parking. The Committee also recommended the addition of streetscape features to improve pedestrian connectivity between Hallowell and Augusta and to signal a change from the State Street commercial area to downtown Hallowell. The typical section also includes a new 5’ sidewalk with bituminous curbing and 3’ esplanade from the City Line to Bolley’s Restaurant. The Highway Committee also expressed interest in adding trees to the esplanade as part of a potential project or at a later date.

The proposed improvements would maintain the existing crosswalk at Bolley’s with a safe pedestrian landing area on east side of Water Street. The sidewalk and esplanade width may be reduced in this section to accommodate ROW encroachments where necessary.
Figure 9: Typical Section from Augusta City Line to Bolley’s Restaurant

The typical section for Segment 1 from the Bolley’s Restaurant to the City of Hallowell sign includes 11’ travel lanes, 5’ paved shoulders and a new 5’ sidewalk with bituminous curbing on the West side of Water Street. A retaining may be required along the east side of Water Street in this section to accommodate the additional width for a 5’ shoulder. On the west side, a section of handrail or length of fencing may be necessary to safety separate the new sidewalk from a sharp slope to the parking area at 47 Water Street.

Figure 10: Typical Section from Bolley’s Restaurant to the City of Hallowell Sign

The typical section for Segment 1 under the railroad trestle will remain as currently configured: 11’ travel lanes, 4’ paved shoulders, and a 5’ sidewalk with granite curbing on the West side of Water Street.

Figure 11: Typical Section under the Railroad Trestle
The typical section for Segment 1 from the railroad trestle to the snow dump will remain as currently configured: 11’ travel lanes, 5’ paved shoulders, and a 5’ sidewalk with granite curbing on the West side of Water Street.

*Figure 12: Typical Section from the Railroad Trestle to the Snow Dump*

**Segment 2:** The typical section for Segment 2 from the Snow Dump to Winthrop Street includes 11’ travel lanes and 8’ paved shoulders (striped for on-street parking). The existing 5’ bituminous sidewalk along the West side of Water Street from the Snow Dump to Wilson Lane and the existing 8’ brick sidewalk (both with granite curbing) from Wilson to Winthrop Street will be retained. A 5’ bituminous sidewalk with granite curbing will be added to the east side of Water Street from the Snow Dump to Front Street. The existing brick sidewalks on the east side of the street will be extended to the Front Street. The Highway Committee also expressed interest in expanding the brick sidewalks in this section (not included in the current cost estimate).

The new sidewalk will connect to the KRRT at a new trailhead just south of the Snow dump. A crosswalk, bump-out, and pedestrian activated beacon will be installed at this location to ensure safe crossing for rail trail users and pedestrians.

Construction of approximately seven angled (45 degree) parking spots at the snow dump is also recommended.

*Figure 13: Typical Section from the Snow Dump to Winthrop Street*

The typical section for Segment 2 from Winthrop Street to Central Street includes 14’ (min) shared travel lanes, an 8’ shoulder for on-street parking, 7’ brick sidewalks with granite curbing, and ornamental pedestrian lighting on both sides of Water Street. Crosswalks will be located at Winthrop and Central Streets.
The typical section for Segment 2 from Central Street to Union Street includes 14’ (min) shared travel lanes, an 8’ shoulder for on-street parking, 7’ brick sidewalks with granite curbing, and ornamental pedestrian lighting on both sides of Water Street. A crosswalk will be located at Union Street.

The typical section for Segment 2 from Union Street to Academy includes 14’ shared travel lanes, an 8’ shoulder for on-street parking, 7’ brick sidewalks with granite curbing, and ornamental pedestrian lighting on both sides of Water Street. The existing crosswalk and bump-out will be retained at Academy Street.
Figure 16: Typical Section from Union Street to Academy

The typical section for Segment 2 from Academy to Temple Street includes 14’ shared travel lanes, an 8’ shoulder for on-street parking, and 5’ bituminous sidewalks with bituminous curbing on both sides of Water Street. A new 5’ bituminous will be added to the east side of Water Street from the Lucky Garden to the Boat Launch.

Figure 17: Typical Section from Academy Street to Temple.

The typical section for Segment 2 from Temple Street to the Boat Launch Entrance includes 14’ shared travel lanes transitioning to 11’ lanes, an 8’ shoulder for on-street parking on the east side of Water Street, and a 5’ shoulder, 5’ esplanade and 5’ sidewalk with bituminous curbing on the west side.
Segment 3: The typical section for Segment 3 from the Boat Launch to the southerly KRRT trailhead includes 11’ travel lanes, 5’ paved shoulders and a 5’ bituminous sidewalk with bituminous curbing on the west side of Water Street.

The typical section for Segment 3 from the KRRT to Maple Street includes 11’ travel lanes and 5’ paved shoulders.
PLANNING-LEVEL COST ESTIMATES

The current estimated cost for a proposed reconstruction project along Segment 2 of Water Street is presented in Table 9. This estimate is based on projected quantities and current bid prices for similar projects and takes into consideration the recommendations contained on pages 16 to 18.

This figures presented in this tables should be considered planning level estimates and will require review during the design phase of the proposed project. An updated construction cost estimate will be prepared during the development of the Preliminary Design Report.

Estimated State and Local Cost Shares: According to MaineDOT’s current Local Cost Sharing Policy, the City of Hallowell is responsible for:

1. The non-federal share (20%) of the total cost of new sidewalks, including all necessary elements such as engineering, right-of-way, construction, construction engineering, and administrative cost associated therewith, unless specified otherwise.

2. One hundred percent (100%) of the total cost of any local interest elements such as new pedestrian lighting, landscaping, plantings, streetscape furniture, esplanades, additional or modified parking, etc. that are primarily for local community development purposes.

Table 9: Reconstruction Cost Estimate

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost (2014 dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preliminary Engineering</td>
<td>$300,000</td>
</tr>
<tr>
<td>Right-of-Way</td>
<td>$150,000</td>
</tr>
<tr>
<td>Environmental Mitigation</td>
<td>$200,000</td>
</tr>
<tr>
<td>Construction</td>
<td>$3,005,000</td>
</tr>
<tr>
<td>Construction Engineering</td>
<td>$451,000</td>
</tr>
<tr>
<td>Total Planning Level Cost Estimate</td>
<td>$4,106,000</td>
</tr>
<tr>
<td>Rounded Total Planning Level Cost Estimate</td>
<td>$4,110,000</td>
</tr>
</tbody>
</table>

Table 10: Estimated State and Local Cost Shares

<table>
<thead>
<tr>
<th>Work Element</th>
<th>Estimated City Share</th>
<th>Estimated MaineDOT Share</th>
<th>Estimated Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highway Reconstruction</td>
<td>0% $0</td>
<td>100% $3,121,600</td>
<td>$3,381,600</td>
</tr>
<tr>
<td>New Sidewalks¹</td>
<td>20% $61,200</td>
<td>80% $216,800</td>
<td>$278,000</td>
</tr>
<tr>
<td>Parking Improvements</td>
<td>100% $53,000</td>
<td>0% $0</td>
<td>$53,000</td>
</tr>
<tr>
<td>Lighting</td>
<td>100% $110,000</td>
<td>0% $0</td>
<td>$110,000</td>
</tr>
<tr>
<td>Roof Drains</td>
<td>100% $7,400</td>
<td>0% $0</td>
<td>$7,400</td>
</tr>
<tr>
<td>Sewer Improvements</td>
<td>0% $0</td>
<td>0% $0</td>
<td>$30,000</td>
</tr>
<tr>
<td>Water Main Replacement</td>
<td>0% $0</td>
<td>0% $0</td>
<td>$250,000</td>
</tr>
<tr>
<td>Project Shares</td>
<td>231,600</td>
<td>3,338,400</td>
<td>4,110,000</td>
</tr>
</tbody>
</table>

These estimates are based upon recommendations by the Study partners. A final decision will be made by the Hallowell City Council on all elements with a local share at PDR in order to develop an adequate estimate for future construction funding.

¹ Per the MaineDOT Local Cost Sharing Policy, MaineDOT will pay 80% of cost of a 5’ bituminous sidewalk.
Appendices (Bound Separately):

Appendix A: Initial Study Correspondence and City Council Resolutions
Appendix B: Public Meeting Summaries
Appendix C: Cooperative Agreement
Appendix D: Mobility Analysis of Water Street
Appendix E: Ground Penetrating Radar Report
Appendix F: Geotechnical Analysis
Appendix G: Phase 1 Environmental Site Assessment
Appendix H: Traffic Count Data
Appendix I: Signal Warrant Analysis
Appendix J: Perpetual Pavement Concept