Walpole – Charlestown 14747
Reconstruction of NH Route 12
Public Informational Meeting 6-8-16
Existing Conditions and Need for the Project

• The existing pavement is 24 feet wide with no shoulders, pedestrians and bicyclists must use the roadway
• 50 MPH Design and Posted Speed Limit
• The 2013 Average Daily Traffic is 6320 vehicles
• Southern roadway embankments show signs of failure
• Pavement shows signs of deterioration
• Accident history associated with lack of shoulders, need for updated guardrail in some areas and appropriate safety zone between the roadway and river/railroad.
• Geometric Constraints (River, Railroad, NH Route 12A Bridge)
• Areas of substandard drainage
NH Route 12
Originally Proposed Design

- Alternatives Considered during the Design Process:
  - No Build
  - Western Alignment Shift (Alternative 2)
  - Eastern Alignment Shift (Alternative 3)
  - Eastern Bypass (Alternative 4)
  - Online Alignment with Retaining Walls (Alternative 5)
  - Hybrid, Northern Segment Westward Shift (Alt 3-2-2)
  - NH Route 12/12A Intersection Reconfiguration (Alt 3-2-2A & Alt 3-2-3A)

- Rationale used for the selection of Alternative 3-2-3
  - Avoids impacts to the river in the southern and northern segments
  - Avoids costly impacts to a steep slope located east of the railroad in the middle section
  - Avoids extensive impacts to surrounding properties
  - Estimated construction cost approximately $15 million to $20 million
Design and Construction Challenges Associated with the Selected Alternative (3-2-3)

- Design Coordination with the Railroad
- Geotechnical Issues – Blasting next to active railroad (6 - 8 trains a day)
- Construction Phasing
- Mildly Contaminated Materials – Railroad Ballast
- Construction Duration (min of 4 years)
- Cost - $33 + Million (Department’s Program cannot support the cost of this project as designed).
Proposed Design Constraints

- No impacts to the railroad tracks.
- No impacts to the NH Route 12A Bridge.
- No impacts to archaeological area No. 10.
- Minimize traffic impacts.
- Consider Utility relocations.
Features Investigated for the Proposed Design

• Minimum westerly shift of the roadway to support constructability.
• Minimize traffic impacts.
• Maintain the existing railroad drainage.
• Construction Costs.
• Two riverside design features were investigated:
  • Armored Slopes with Surface Vegetation
  • Retaining Walls
Proposed Alternative Design

• Western Alignment Shift (Alternative 2)
• Minimizes impacts to the railroad (encroachment only), no impacts to the railroad tracks.
• Minimizes overall volume of blasting and the release of nitrates into the environment.
• Avoids a pre-split rock cut and tree clearing east of the railroad tracks.
• Minimizes the construction duration (2 years).
• Eliminates impacts to the Fall Mountain State Forest.
• Minimizes construction costs.
## Construction Costs

<table>
<thead>
<tr>
<th></th>
<th>Estimated Construction Costs</th>
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<th>Estimated Total Project Cost</th>
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<tbody>
<tr>
<td></td>
<td>Southern Segment</td>
<td>Northern Segment</td>
<td></td>
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<tr>
<td>Alternative 3-2-3</td>
<td>$22,696,000</td>
<td>Current Design</td>
<td>$10,010,000</td>
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<tr>
<td>Alignment w/o Impacts to the RR (Retaining Wall)</td>
<td>$15,610,000</td>
<td>Alignment w/o Impacts to the RR (Retaining Wall)</td>
<td>$12,242,000</td>
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<tr>
<td>Alignment w/o Impacts to the RR (Armored Riverbank)</td>
<td>$9,837,000</td>
<td>Alignment w/o Impacts to the RR (Armored Riverbank)</td>
<td>$7,192,000</td>
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</tbody>
</table>
Proposed Armored Slopes with Surface Vegetation - Southern Typical
Proposed Armored Slopes with Surface Vegetation - Northern Typical
Advantages of Armored Slopes with Surface Vegetation.

• Can be designed to allow for quick reestablishment of the riparian buffer.
• Stabilizes the riverbank slope against failure.
• Provides more natural views from the Connecticut River.
• Provides habitat for wildlife.
• Prevents future impacts to the slopes for retaining wall maintenance and repair.
• Lowest estimated construction cost.
Example of Armored Slopes with Surface Vegetation

NH Route 63 – Chesterfield (Spofford Lake)
Example of Armored Slopes with Surface Vegetation

I-93 Southbound at Exit 2
South of Brookdale Road in Salem, N.H.
Retaining Wall Disadvantages

• Greater duration for construction and impacts to traffic.
• Significant increase in construction cost compared to the armored slope with surface vegetation option.
• Potential failure of the existing 1:1 slope (southern segment) below the wall before, during and after construction.
• Need for future maintenance and replacement.
• Vandalism/graffiti.
• Prevents wildlife passage.
• Aesthetics.
Example of Retaining Wall

I-293 – Manchester (Merrimack River)
Recommendation: Armored Slope with Surface Vegetation Design

- Stabilizes the Existing Riverbank Slopes
- Eliminates Future Impacts to the Riverbank Slopes due to Retaining Wall Maintenance/Repair
- Balances Environmental Impacts
- Minimizes Impacts to the Traveling Public
- Minimizes Construction Duration
- Minimizes Construction Costs ($10 to $16 Million less than other options)
Preliminary Impacts for Proposed Armored Slope with Surface Vegetation Design

- 2.5 AC of ACOE jurisdictional wetland impacts
- 3.4 AC of NHDES jurisdictional bank impacts
- A Hydrologic and Hydraulic study is required. Impacts are anticipated to be negligible.