REPORT OF THE COMMISSIONER
DURHAM 16236, X-A001(202)
US ROUTE 4
COMMISSION PUBLIC HEARING
May 28, 2015 – Durham Town Hall, 8 Newmarket Road, Durham

The Durham, 16236, X-A001(202) project addresses the replacement of the US Route 4 Bridge over Bunker Creek in the Town of Durham.

The replacement of the structurally deficient and functionally obsolete US Rte. 4 bridge constructed in 1933 over Bunker Creek involves approximately sixteen hundred (1600) feet of roadway approach reconstruction and vertical grade raise of approximately four (4) feet to accommodate superstructure clearance for 100 year predicted flood risk occurrence with high tide. The new structure and roadway approach will be widened from existing 30 feet with narrow shoulders to two 12-foot lanes flanked by five (5) foot shoulders for curb-to-curb width of 34 feet. The US Rte. 4 approach reconstruction begins approximately seven hundred fifty (750) feet west of the Bunker Creek Bridge and continues easterly to approximately eight hundred fifty (850) feet to the intersection with Morgan Way. Minor pavement rehabilitation approach work will be necessary on the town road (Morgan Way).

The following decisions are the Department’s resolution of issues as a result of testimony presented at the May 28, 2015 Public Hearing and written testimony subsequently submitted over the ten (10) day comment period.

1. Harriet Forkey, 104 Piscataqua Road, Durham (Parcel 3), Marjorie Smith, P.O. Box 136, Durham (Parcel 2), Jere Lundholm, 104 Piscataqua Road, Durham, and Loring Tirrell, 108 Piscataqua Road (Parcel 5) request adjustments to the horizontal and vertical alignment of US Rte. 4 to minimize the impacts into the tidal marsh. Ms. Forkey and Mr. Lundholm recommended shifting the alignment of US Rte. 4 to the north to reduce the impacts on one side of the tidal waters and minimize the Right-of-Way impacts to properties. Ms. Smith and Mr. Lundholm recommend lowering the vertical grade of US Rte. 4 to reduce the height of the new bridge and ultimate filling into the tidal waters.

Response: The vertical alignment of US Rte. 4 is controlled by the superstructure span length over Bunker Creek and one foot (1 ft.) clearance over the 100 year storm event at high tide. The proposed vertical profile accommodates the new bridge's vertical clearance for the predicted 100 year storm event and includes lowering the vertical crest of US Rte. 4 to the east of Bunker Creek by approximately one to two feet to meet all decision stopping distance for the design speed. Shifting the horizontal alignment eight (8) feet at the bridge to the north side will localize the impacts to the tidal area to one side and will also result in reduced impacts for Right-of-Way acquisitions to properties along the southern side of US Rte. 4. The request for the horizontal alignment shift will be incorporated into the layout.

2. Harriet Forkey, 104 Piscataqua Road, Durham (Parcel 3), Marjorie Smith, P.O. Box 136, Durham (Parcel 2), Jere Lundholm, 104 Piscataqua Road, Durham, and Loring Tirrell, 108 Piscataqua Road (Parcel 5) request that the span of the new bridge be maintained to the existing length to minimize the increase in vertical grades, reduce the environmental
filling into the tidal waters and protect the tidal grass from potential erosion that might result from a longer bridge span opening. Mr. Lundholm expressed particular concern that the increase in hydraulic opening will increase erosion effects of wind and wave action from boats. Ms. Smith references a study completed in 1926, entitled, “An Ecological Study of a Brackish-Water Stream” to support the concern for potential impact into the ecological estuarine systems within the reach of Bunker Creek due to a wider channel opening from a longer bridge span.

Response: The existing bridge opening of 12 feet results in high tidal water velocities increasing the risk of scour on the downstream side. The proposed bridge span is set to avoid subsurface obstructions (existing bridge footings) and aid in accelerated bridge construction. A larger hydraulic opening will provide improved aquatic organism passage, allow for the opportunity to restore salt marsh habitat adjacent to the existing salt marsh in the area of the existing causeway removal, assist to reduce the maximum velocity of tide events and storm surges, and permit improved access for recreational kayak and/or canoe use. The channel opening for Bunker Creek will be in substantial compliance with the New Hampshire Stream Crossing Guidelines and the resulting lower stream velocities will assist to address the impacts for future predicted sea level rises. NH Department of Environmental Services and the Jackson Estuarine Laboratory concur that a larger bridge opening will be beneficial for the reasons noted. The Department will undertake a pre-construction vegetation assessment to document the existing conditions in the upstream salt and brackish marshes. The pre-construction vegetation assessment will allow post monitoring to evaluate benefits of how the tidal opening affects the Bunker Creek marsh location.

3. Paul Chamberlain, Associate Vice President of UNH Facilities, 22 Colovos Road, Durham, Alfred Ackerman and Nancy Schieb, 13 Morgan Way Durham, Harriet Forkey, 104 Piscataqua Road, Durham (Parcel 3), Marjorie Smith, P.O. Box 136, Durham (Parcel 2), Jere Lundholm, 104 Piscataqua Road, Durham, and Deb Johnson, 112 Piscataqua Road, Durham (Parcel 8) supports short term closure of US Rte. 4 for the construction of the bridge replacement to reduce the environmental and temporary Right-of-Way impacts caused by the on-site detour/diversion alternative. Ms. Forkey recommends the closure period for US Rte. 4 not to exceed two weeks. Mr. Chamberlain acknowledges that closure of US Rte. 4 over Bunker Creek will require an alternative route for the UNH Wildcat bus service and requested that the closure period be after the UNH Commencement (May) and one week prior to move-in day for UNH students (August/Sept). Ms. Smith supports the short term closure to include coordination with emergency responders for access to alternative trauma center at Wentworth Douglas Hospital and with the condition that the closure period is during summer recess for public schools.

Patrick Murphy, 5 Williams Way, Durham (Parcel 6) does not support the on-site diversion alternative due to the severe impact to tree buffer along his frontage on US Rte. 4 and the increased exposure to road noise.

Durham Fire Chief Corey Landry, 51 College Road, Durham expressed his concern for emergency response to the east of Bunker Creek during a short term closure period and the need for increased mutual aid from neighboring communities. Chief Landry noted the need to determine how response will be maintained should the closure period need to be extended for unforeseen reasons. Chief Landry noted his concern for impact of closure on area schools and traffic diversions along NH Rte. 108 westerly through
Newmarket and along local town roads (Spruce Road, Back River Road, and Piscataqua Road).

Sergeant Mark Speidel, Dover Police Department, 46 Locust Street, Dover noted that the City Officials, while not enamored with the prospect of a full roadway closure, pledge to work with the Department to mitigate the traffic impacts along the city streets and provide assistance with neighboring communities of Madbury and Durham through expanded mutual aid for temporary emergency response coverage. Sergeant Speidel requested the closure period be times during summer closure for the city schools (between June 20th to August 28th) to minimize disruption to student transport and during periods of lower volume of traffic on the city streets. Sergeant Speidel further requested the development of a traffic management contingency plan should the closure period requested above need to be extended and for this contingency plan to adequately address the municipality’s cost for police officers and traffic control personnel to manage the traffic through the primary NH Rte. 108 detour to the Spaulding Turnpike. He also requested that the traffic detour signage prohibit commercial vehicle and heavy truck traffic along local roads, particularly Back River Road, Mast Road and Spruce Street.

Chief Rick Malasky, Newmarket Fire Department, 4 Young Lane, Newmarket expressed concern with the increase in traffic along NH Rte. 108 through Newmarket with the roadway closure alternative and requested traffic mitigation and planning be provided for the westerly route (NH 108 to NH 33).

William Cote, Executive Director for McGregor Memorial EMS, 47 College Road, Durham does not support the short term closure alternative and requested implementation of the on-site diversion alternative to allow continuous emergency response routes to the regional trauma center in Portsmouth via US Rte. 4. Mr. Cote indicated that based upon his informal evaluation of the primary detour route (NH Rte. 108 to the Spaulding Turnpike), response time to Portsmouth regional trauma center will result in an increase travel time of seven (7) to fourteen (14) minutes.

Response: The Department has completed a comprehensive assessment of the time requirements for roadway closure to replace the Bunker Creek bridge and support the request for closure of US Rte. 4 to no more than 14 days. The construction of a temporary bridge and on-site diversion alternative will result in longer traffic disruption for the general public and emergency responders, greater adverse environmental impacts to the tidal flats, require temporary construction easements outside of the existing Right-of-Way, loss of natural tree buffers, and result in higher construction costs. The US Rte. 4 closure would be limited to a maximum of fourteen (14) days working under a sixteen (16) hour work day. US Rte. 4 traffic would be detoured along NH Rte. 108 corridor to the Spaulding Turnpike between the Towns of Durham and Madbury and the City of Dover. The added travel distance will be approximately five (5.0) miles. The detour corridor for the project will be along designated State routes. The Department will coordinate with the Towns of Durham and Madbury and the City of Dover to identify appropriate signage for installation along local roads to deter their use by non-local traffic as part of the traffic management for the project.

Considering the makeup of the US Rte. 4 east-west traffic flow, the Department expects a significant portion of the traffic will seek alternative east-west routes, including but not limited to, NH Rte. 101, NH Rte. 9 and NH Rte. 125 in order to bypass the closure. The Department will deploy Intelligent Transportation Systems
(ITS) through the use of Smart Work Zones to communicate in advance of the closure at US Rte. 4 junctions with NH Rte. 108 in the Durham and Dover, NH Rte. 125 in Lee, NH Rte. 9 in Northwood and on the Spaulding Turnpike south of its crossing over the Little Bay in Newington.

In advance of the road closure, construction activities will be required along the approaches to the bridge to address the soft soil consolidation, construction staging areas and aerial utility adjustments to support the bridge removal and replacement. These advanced construction activities will be accomplished under the management of existing traffic flow through a combination of, but not limited to, one way traffic configuration, rolling roadblocks and/or short roadway closures during off peak traffic hours and nighttime operations. In addition, after the installation of the replacement bridge, post construction activities will be necessary while under traffic management to complete the final slope stabilization, guardrail installation, final paving, and pavement markings.

The request for the closure period to be during summer break for the local schools, not to interfere with UNH Commencement (typically May) and be no later than one week prior to move-in day for UNH students (typically late August/early September) will be considered in establishing the actual closure period. The Department will coordinate with the City of Dover, Town of Durham and Madbury, UNH, and emergency responders prior to finalizing the optimum closure period.

The Department recognizes the short-term closure of US Rte. 4 may affect emergency response time to regional trauma centers in Dover and Portsmouth. The Department will coordinate with the Towns of Lee, Newmarket, Madbury, Durham and the City of Dover regarding emergency routes and assistance for mutual aid response during the roadway closure. The Department will also include an incentive and disincentive contract clause to financially encourage the contractor to reopen the roadway prior to the closure period stipulated in the construction contract documents.

4. Alfred Ackerman and Nancy Schieb, 13 Morgan Way Durham (Parcel 7), Harriet Forkey, 104 Piscataqua Road, Durham (Parcel 3), Loring Tirrell, 108 Piscataqua Road, Durham (Parcel 5) requested consideration of reducing the speed limit from 45 mph to 40 mph through the project limits to improve the safety of turning movements at Morgan Way intersection and increase safety for bicycles along US Rte. 4. Mrs. Tirrell notes a reduced speed limit to 40 mph within this section of US Rte. 4 will be in compliance with a September 2000 safety study and will permit adjustments to the vertical alignment to further minimize environmental impacts (US Route 4 Safety Study Final report, prepared by SEA Consultants and Rizzo Associates for the Town of Durham).

Response: The Department will maintain a minimum design speed of 45 MPH to ensure safe stopping sight distance is maintained for the US Rte. 4 alignment and intersection sight distance. The Department will complete an engineering and traffic investigation along US Rte. 4 after completion of the improvement from NH Rte. 108 to the Scammell Bridge to determine the appropriate posted speed. State speed zones must be supported by an engineering and traffic investigation (per RSA 265:62), which includes an analysis of the current speed distribution of free-flowing vehicles, or speed study. Typically, the speed limit is set at a value that is considered reasonable and prudent for conditions, which is generally considered to be the 85th percentile speed.
5. Harriet Forkey, 104 Piscataqua Road, Durham (Parcel 3) supports the provisions of a five (5) foot shoulders to accommodate bicycle use.  

Response: A shoulder width of five (5) feet will be provided within the project’s limits to accommodate bicycle use.

6. Harriet Forkey, 104 Piscataqua Road, Durham (Parcel 3), Jere Lundholm, 104 Piscataqua Road, Durham and Marjorie Smith, P.O. Box 136, Durham (Parcel 2) expressed concern with the raise in vertical profile of US Rte. 4 over Bunker Creek resulting in increased tire noise being amplified across the waterway. Ms. Smith recommended lowering the profile of the roadway to maintain existing bridge crossing elevation and lowering the vertical crest of US Rte. 4 to maintain needed sight lines at Morgan Way. Ms. Forkey and Mr. Lundholm recommend the installation of a solid concrete barrier similar to the architectural barrier on the Scammell Bridge to reduce vehicle tire noise over the waterway.

Response: The elevation of the bridge will be raised, but this increase will be minimized to the extent practicable with appropriate consideration given to the hydraulic flows for Bunker Creek, clearance to pass a predicted 100 year storm event at high tide and to accommodate safe intersection sight distance at Morgan Way. The Department has completed a Type I traffic noise analysis for the project in accordance with FHWA and NHDOT noise assessment guidelines. As part of this analysis, a solid parapet on the replacement bridge was evaluated to determine the noise reduction for area properties. The analysis concluded the noise reduction directly associated with the solid bridge parapet on the bridge would result in less than 2 dBA reductions, whereas, a 5 dBA reduction is required to support a mitigation measure and, therefore, is not warranted.

7. Jere Lundholm, 104 Piscataqua Road, Durham, Loring Tirrell, 108 Piscataqua Road, Durham (Parcel 5) and Deb Johnson, 112 Piscataqua Road, Durham (Parcel 8) inquired about the design alternative presented at the October 2013 Public Informational Meeting (PIM) that used UNH Engineering Department’s recommendation for rapid bridge construction to included drilled, prestressed concrete columns and accelerated bridge construction technique (i.e.: prefabrication). Ms. Tirrell felt that the UNH alternative would result in reduced Right-of-Way impacts, economical alternative and less environmental impacts.

Response: The alternatives presented at the October 2013 PIM consisted of three DOT preliminary layouts for early public feedback (i.e.: northerly bridge alignment, southerly bridge alignment and on-line bridge alignment). No particular alternative was recommended due to the additional engineering refinements and need for geotechnical subsurface information. At this meeting, the Department outlined two approaches for maintenance of traffic during construction. One alternative included maintaining traffic at existing location on a temporary bridge and on-site diversion. The second alternative consisted of using Accelerated Bridge Construction (ABC) techniques with a short term closure of US Rte. 4. Traffic would be detoured to other State routes during the closure. At the PIM, a graduate student from the UNH Engineering Department presented an ABC alternative for a roadway closure of 20 days to include the use of drilled shafts, prefabricated pile caps and NEXT Beam bridge deck. The recommended layout and bridge span as presented at the Public Hearing has refined the UNH alternative to address the improvement to the intersection sight lines at Morgan Way, the installation of piles to be outside the influence of the old timber foundation of the existing bridge, the span length for ABC
constructability, improved hydraulic opening and to address constructability within the subsurface geology (marine clay on the westerly approach and ledge on the easterly approach). The recommended layout captures and refines the elements of prior alternatives and UNH’s recommended ABC techniques.

8. Deb Johnson, 112 Piscataqua Road, Durham (Parcel 8) expressed concern for the constructability of the on-site diversion alternative requiring temporary fills and its removal in the tidal area without causing long-term impacts to the tidal marsh. Patrick Murphy, 5 Williams Way, Durham (Parcel 6) expressed concern for construction impacts (ground movement) to residential structures located uphill from the project site caused by ledge removal.

**Response:** The Department will pursue the short-term closure alternative to substantially reduce the temporary impacts to the tidal marsh. The Department will complete geotechnical site evaluations to determine if ledge removal will be necessary during the construction of the project. If ledge removal is found to be necessary, a pre-blast condition survey during construction will be completed by a certified Seismologist/Blasting consultant for residential structures within 500 feet of the blasting area. The vibration monitoring will be completed to ensure maximum peak particle velocity (PPV) of ground movements are not exceeded in accordance with the Department’s specification. Where complaints or claims for property damage have been received, the contractor will be responsible to address, to include but not limited to, completion of a post-blast survey of affected properties.

Date: __01/30/2017____________

Victoria Sheehan
Commissioner
NH Department of Transportation