

Dummer-Cambridge-Errol 16304B
Improvements to NH 16
Project Summary Report

Prepared for:
Land and Community Heritage Investment Program
Board of Directors

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Introduction

The NH Department of Transportation (NHDOT) is proposing a project to address a section of NH Route 16 starting at approximately the Dummer/Cambridge town line and continuing north for approximately 1.3 miles (see attached location map). The entire project length is bordered by the Androscoggin River to the east and 13 Mile Woods to the west. Throughout much of the project area, the top of the river bank is just off the edge of pavement.



Google StreetView October 2008

The 13 Mile Woods Community Forest is located on both sides of the Androscoggin River within the limits of the project. This property is protected by LCHIP and Forest Legacy easements, both of which extend to the center of the river.

The 13 Mile Woods Community Forest consists of approximately 7,100 acres of multi-use forest. The land was protected in phases, with the property along the west side of NH Route 16 through the project area known as the “13 Mile Woods II” tract, owned and managed by the Town of Errol. The conservation and preservation purposes of 13 Mile Woods, summarized from the *13 Mile Woods Stewardship Plan (2006)* and *Economic Impacts of the 13 Mile Woods Community Forest in Errol, New Hampshire (March 2013)*, include the following:

- conserve open space
- maintain a sustainable working forest
- enhance and protect public recreational opportunities including hiking, hunting, fishing, cross country skiing, and snowmobiling
- protect natural resources, including wildlife habitat, rare floodplain forest, and trout streams
- protect a lengthy scenic approach to Errol

The NHDOT has initiated coordination with LCHIP, NH Division of Forest and Lands, and the Town of Errol. Coordination with all stakeholders will continue as the project progresses.

In the early 1970s, a scenic easement was given to the State by the Brown Company along 11.4 miles of NH Route 16. This easement extends 125’ from the Controlled Access Right-of-Way to the west and to the edge of the river to the east. Following discussions with the NH Division of Forest and Lands, it is agreed that the easement holder is NHDOT.

Project Purpose and Need

The purpose of the project is to address 1) the deteriorated condition of the roadway and 2) the long-term stability of the slope between the roadway and river.

The need for this project is evidenced by the following:

- Maintaining NH Route 16 as a safe, reliable corridor is essential to this region of the state. NH Route 16 is one of two major north-south corridors in the North Country. Tourism, outdoor recreation, logging, manufacturing, and other economically vital industries rely on NH Route 16 on a daily basis, as do local residents, with most commuting to jobs located to the south in Berlin and Gorham. The 2015 North Country Council Regional Transportation Plan identifies NH Route 16 as a regional priority in the Berlin-Gorham socioeconomic center.
- The section of NH Route 16 within the project area was constructed in the late 1950s/early 1960s with only minor resurfacing since that time. The pavement is in poor condition. Due to the condition of the road and the influence of the river on the road bed, frost heaving can be severe in the spring. This creates a safety concern for the traveling public, results in excessive wear and tear on vehicles, and hinders winter maintenance. Addressing the poor pavement condition of NH Route 16 is listed as a priority in the 2015 North Country Council Regional Transportation Plan.
- Due to the poor condition of the roadway, the NHDOT must implement seasonal load weight restrictions along this section of NH Route 16 for approximately two months every year. In 2018, weight restrictions were in place from the first week of March to the second week of May. The maximum vehicle weight allowed on the posted road is 15 tons, with most loaded trucks prohibited and required to use lengthier alternative routes (US Route 3/NH Route 26).
- The slopes between NH Route 16 and the Androscoggin River have a history of instability, and a number of slope failures have occurred in recent years to the north and south of the project area. Evidence of slope instability has been observed within the project area in the last year (see photos below). Slope failures cause concern for public safety, require traffic delays or detours during repairs, and result in negative impacts to the river from sedimentation and loss of riparian habitat.



Photos: NHDOT July 201

Project Alternatives

Several reasonable and prudent alignment alternatives were developed and evaluated to determine a solution that best addresses the project's purpose and need and minimizes impacts. Important considerations that influenced the evaluation of these alternatives included wetland impacts, river/channel impacts, floodplain impacts, impacts to 13 Mile Woods, stormwater treatment options, overall sustainability, and traffic control during construction. The alternatives analysis also needs to consider the roadway's vertical alignment, since raising the grade of the roadway above the influence of the river will improve the long-term structural integrity of the road bed. Additionally, while not the primary driver, additional consideration to the scenic nature of the corridor was included in the alternative development.

As a result of this analysis, four "build" alternatives 1) reconstruction on the same alignment; 2) a partial alignment shift away from the river (approximately one lane width); 3) a complete alignment shift away from the river (full roadway width or more); and 4) a complete alignment shift variation, were considered, and are described below:

Online Alternative

This alternative includes reconstruction of NH Route 16 within the existing roadway footprint, with a slight widening to support the addition of 4' roadway shoulders, and improved overall horizontal and vertical geometry. The roadway elevation would be increased to minimize damage to the roadway structure caused by the water level from the adjacent river. To account for raising the roadway in close proximity to the river, the slopes between the roadway and the river would need to be steepened, which would be considered a safety hazard and warrant the installation of guardrail. For a significant length of the project, these steepened slopes would also require stone lining of the riverbank for stabilization. Additionally, in order to maintain traffic during construction, the roadway would need to be temporarily widened with temporary traffic signals to control a single lane of alternating traffic, resulting in a longer construction duration than the other alternatives.

While construction of the roadway itself would not require significant right-of-way or wetland impacts, this alternative provides very little non-wetland area to treat stormwater runoff or mitigate for floodplain impacts which will be required for environmental permitting. Furthermore, the installation of guardrail and the need for hard armoring of the bank mean that two of the project's primary goals, preserving the scenic nature of the area and long-term sustainability of the roadway, are not able to be met by this alternative.

Due to the challenges associated with constructing this alternative and the fact that that purpose and need of the project is not fully met, this alternative was not chosen as the preferred.

Partial Alignment Shift

This alternative proposes shifting the roadway centerline 12' west to allow for construction of the new 30' wide roadway. It also includes improved overall geometry including raising the roadway to minimize the effects of the water level from the adjacent river on the roadway structure. The steepness of the slopes between the proposed roadway and existing river vary, but in some locations they are steep enough to be considered a hazard and would warrant the installation of guardrail. Also, stone lining of the riverbank would likely be required in spot locations to stabilize the slope. One benefit of this alternative over first is that it will be easier to maintain traffic during construction,

since the proposed shift allows a portion of the roadway to be constructed outside of existing traffic operations, although it will also require alternating traffic.

Similar to the Online Alternative, limited right-of-way and wetland impacts would result from construction of the roadway itself, but additional impacts would be necessary to provide for adequate stormwater treatment and floodplain mitigation which will be required for environmental permitting. Impacting a wetland resource to create stormwater treatment or flood storage is generally not acceptable, which means that this alternative may be difficult to permit and the need for guardrail and hard armoring will affect the existing scenic nature of the area.

Due to the possibility that this alternative may not be supported or permitted by the environmental permitting agencies, this alternative was not chosen as the preferred.

Full Alignment Shift

This alternative includes shifting the entire roadway west so that the proposed roadway can be constructed offline, outside of the existing roadway, and includes improved overall horizontal and vertical geometry. Similar to the other alternatives, the roadway elevation will be raised to minimize the effects of the water level from the adjacent river and wetlands on the roadway structure.

The slopes between the proposed roadway and the existing river would be fairly flat (a maximum of 15%), and allow this area to be used to provide stormwater treatment of the roadway runoff, commonly referred to as a vegetated buffer. The horizontal separation between the road and the river offers space for potential mitigation and the flatter slopes also reduce, if not fully eliminate, the need for guardrail, which supports the scenic context of the corridor. Lastly, traffic control operations are greatly simplified with offline construction, since most of the work will occur outside of the existing flow of traffic.

Although this alternative has a large right-of-way impact and is anticipated to have the largest amount of wetland and floodplain impacts, by shifting the roadway away from the river, impacts along the riverbank and into the river itself can be avoided. This alternative protects the roadway from erosion on the riverbank, allows for treatment of stormwater and floodplain compensation required for permitting, and provides significant opportunity for wildlife and scenic enhancements within the vegetated buffer area.

Full Alignment Shift Variation (Preferred Alternative)

This alternative is the same as described under the Full Shift Alternative above, except that to minimize the large quantity of wetland and floodplain impacts, it takes advantage of a segment of "high ground" through the floodplain at the north end of the project. For this part of the project, the horizontal alignment will be shifted even further west, minimizing the current curve in the roadway and avoiding some areas of wetlands and floodplain. Utilizing this alignment allows for a reduction of the total wetland and floodplain impacts that would occur if the alignment were to more closely follow the existing road as proposed in the previous alternative. Similar to the other alternatives, the roadway elevation will be raised to minimize the effects of the water level from the adjacent river and wetlands on the roadway structure.

This alternative will provide the same, or greater, separation between the roadway and river as described above, and will also create the same vegetated buffer along the river's edge to provide

stormwater treatment and enhanced scenic and wildlife value. It also has the benefit of being able to be constructed with minimal disruption to vehicles traveling this corridor.

Although this alternative is anticipated to have the largest right-of-way impact, it minimizes the wetland and floodplain impacts and avoids impacts to the riverbank and river itself, which are of great concern to the environmental permitting agencies. This variation provides the same benefits as the Full Alignment Shift Alternative by protecting the roadway from erosion on the riverbank, allowing for treatment of stormwater and floodplain compensation required for permitting, and providing significant opportunity for wildlife and scenic enhancements within the vegetated buffer area while also reducing the overall wetland and floodplain impact. Therefore, this alternative, the Full Alignment Shift Variation has been selected as the preferred alternative.

Preferred Alternative Impacts

- Right-of-way

The existing Controlled Access Right-of-Way (CAROW) for NH Route 16 extends 75 feet from the current roadway centerline. Based on the preferred, Full Alignment Shift Variation alternative described above, the project would require the acquisition of approximately 12 acres of 13 Mile Woods to construct this alternative and reestablish the CAROW along the 1.3 mile project. In addition, temporary and permanent easements may be needed for construction and/or maintenance of drainage, these will be finalized during later project development phases when final pipe crossing locations are determined.

The 125' wide scenic easement would be reestablished based on the new CAROW. Mitigation for any impacts to 13 Mile Woods would be determined through coordination with all stakeholders, with potential mitigation to include land replacement, monetary compensation for land, and scenic enhancements. Investigation of all mitigation options will be considered.

- Natural Environment

There are approximately 5 acres of permanent wetland impacts resulting from the preferred alternative based on the current level of plan refinement. These impacts require appropriate mitigation and that stormwater treatment to be provided in order to receive a permit. Impacts to the Zone AE 100-year floodplain result in approximately 1,900 cubic yards of fill, for which compensation must be provided. All impacts would require appropriate mitigation that would be determined through coordination with State and Federal regulatory agencies.

- Cultural Resources: No cultural resources or archeological sites have been identified within the project area.

Impacts to Conservation Purposes under RSA 227-M

As described above, the project will require acquisition of 13 Mile Woods Community Forest land to establish the new Right-of-Way and construction of the project. Due to the size of the parcel that is conserved (approximately 7,100 acres), the project is not expected to have a noteworthy effect on the forestry, education, low-impact outdoor recreation and snowmobiling uses, cultural resource protection

or conservation of plants and natural communities. These uses will be able to continue in the same manner as they are currently performed.

The project's selected alternative will provide a benefit to the waterfront and water quality of the Androscoggin River, fish and wildlife habitat, and the scenic value of the project area. By fully shifting the roadway away from the river, the roadway is protected from erosion and slope failures along the riverbank while allowing the natural environment to be maintained, rather than needing to install armoring or rip-rap that would stand out as man-made. Maintaining the natural river bank is beneficial for the wildlife and preserves the scenic quality of the area.

The shift in the roadway alignment also allows for the creation a vegetated buffer between the roadway and river. This buffer removes pollutants from the roadway runoff, thereby increasing the water quality of the river. It also creates approximately 50' of wildlife habitat directly adjacent to the river which both helps to stabilize the river bank and provides improvement for wildlife. While it is still necessary for wildlife to cross the roadway while seeking access to the river, the buffer area provides protection by giving them and safe, relatively flat, area to shelter in, instead of finding themselves immediately on the sloped bank.

While this project will have impacts to the 13 Mile Woods conservation property, the overall impact of the roadway will be similar to that of the existing condition, with the added benefit of a natural buffer zone along the Androscoggin River.

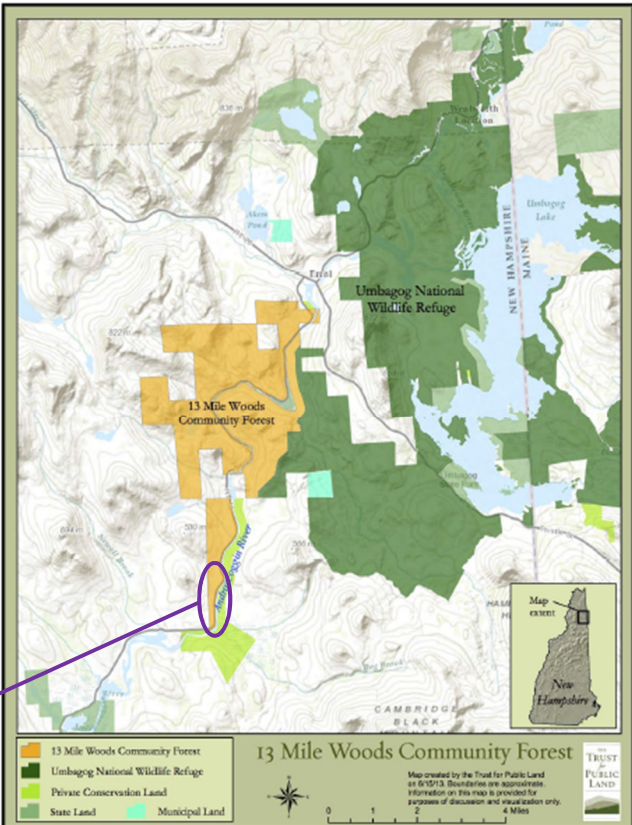
Potential for Cumulative Impacts to 13 Mile Woods Community Forest

As shown in purple in the figure to the right, approximately 10 miles of NH 16 right-of-way is located adjacent to the 13 Miles Community Forest within the Towns of Cambridge and Errol.

Due to the relationship between NH 16 and the Androscoggin River within the 13 Mile Woods Community Forest, there is potential for future impact to this LCHIP property to make similar roadway or slope stability improvements.

At this time there are no planned projects beyond the one presented here. The future impacts could either be through planned transportation projects, or unplanned natural events like the slope failures that have occurred along this section of NH 16 in the past.

Approximate limits of
NHDOT Project 16304B



Economic Impacts of the 13 Mile Woods Community Forest in Errol, NH, March 2013

Conclusion

Development of design alternatives requires a delicate balance between meeting the objectives of a project (the Purpose and Need), and minimizing impacts to the surrounding environment. Improvements to NH 16 provide an overall benefit to the Town of Errol and Coos County by providing connectivity and reliability of the transportation system. The Full Alignment Shift Variation alternative considers the overall long term sustainability of the corridor while most comprehensively addressing the competing needs and interests of project stakeholders and permitting agencies. It provides the opportunity for the creation of a vegetated buffer between the river and the roadway, which benefits and supports water quality, wildlife passage, slope stability, as well as reduces the man-made environment, by avoiding guardrail and stone lined riverbanks, which further emphasizes the natural, scenic and conservation characteristics of the corridor and adjacent 13 Mile Woods Community Forest property.