

Twin State Rail Trail

Wing Road Rail Corridor Feasibility Study



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This study was made possible through the combined support of the following organizations:



INTRODUCTION: PROJECT HISTORY AND CONTEXT

RAIL TRAILS IN NEW HAMPSHIRE

Throughout New Hampshire and across New England, many former freight and passenger rail corridors have been successfully transformed into valuable recreational assets. In the Granite State, snowmobile clubs make seasonal use of inactive rail lines when winter snow safely blankets the rails - but during warmer months these corridors sit largely unused.

Where rails and ties have been removed, former rail corridors have become vibrant multi-use trails that support both motorized and non-motorized recreation as well as active transportation. These trails serve communities year-round, fostering outdoor recreation, enhancing connectivity, and stimulating local economies.

This study has been developed in support of the Twin State Rail Trail Project. The Twin State Rail Trail Project Team seeks to repurpose the unused Twin State Railroad corridor into a multi-use trail that would link four major rail trails in northern New Hampshire and Vermont—the Ammonoosuc, Presidential, Lamoille Valley, and Missisquoi Valley Rail Trails. This proposed 38-mile connection would help create a continuous 200-mile trail network across New Hampshire and Vermont, offering a transformative opportunity for long-distance recreation, local access, and regional economic development.

The Twin State Rail Trail is a key component of the emerging New England Rail Trail Network, a 1,000-mile “TrailNation” initiative led by the Rails to Trails Conservancy.

Currently 61% complete, the goal is to link all six New England states with an interconnected system of rail trails, strengthening regional outdoor recreation and active transportation.



The Twin State Rail Trail Project Overview Map

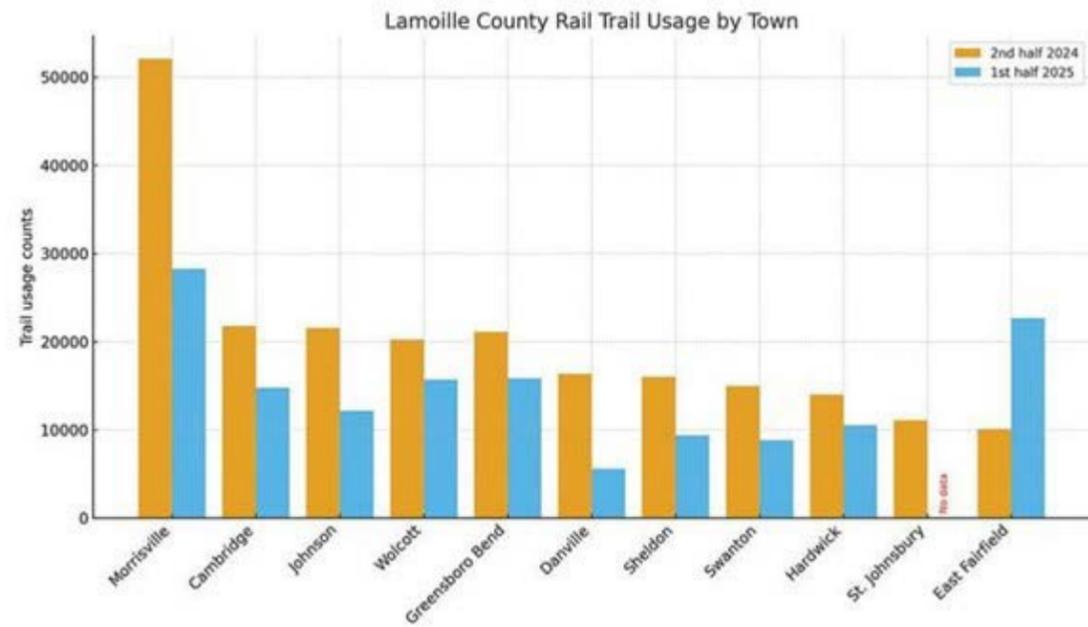
The Twin State Railroad corridor has declined over the many years as a result of weather-related damage and limited maintenance. In several locations, tracks hang suspended over washouts caused by flooding or erosion. Early in 2024, the Twin State Rail Trail Project Team commissioned Base Flow, LLC to assess five of the most visibly degraded sites. The resulting report estimated that repairing these five locations to a safe recreational standard would cost approximately \$1.6 million.

Twin State Rail Trail progress paused in April of 2024 when a railroad company, Vermont Rail System (VRS), expressed interest in reviving unused rail corridors in northern NH and VT for freight operations. Because the company prohibits recreational use of the rail corridor for safety reasons, winter snowmobile connectivity between towns was severed, and the Ammonoosuc Rail Trail now ends abruptly at the active rail line east of Littleton, NH - leaving no safe, legal connection to Wing Road.



Twin State Rail Bridge Condition - 2025

Though many communities across the northeastern US benefit from rail trails, few have the potential to connect into a 200-mile network like the one envisioned through the Twin State Rail Trail. Existing trails already generate significant visitation and local economic activity through hospitality services, tourism, and enhancing the region's appeal for remote workers and small businesses. For example, data from the Presidential Rail Trail (Whitefield, NH trailhead) indicates an estimated 23,775 annual trail users for 2025, and the Lamoille Valley Rail Trail corridor in Vermont sees annual user counts in towns in excess of 50,000, with significant year over year growth forecast.



data courtesy of Vermont Agency of Transportation

WING ROAD FEASIBILITY STUDY

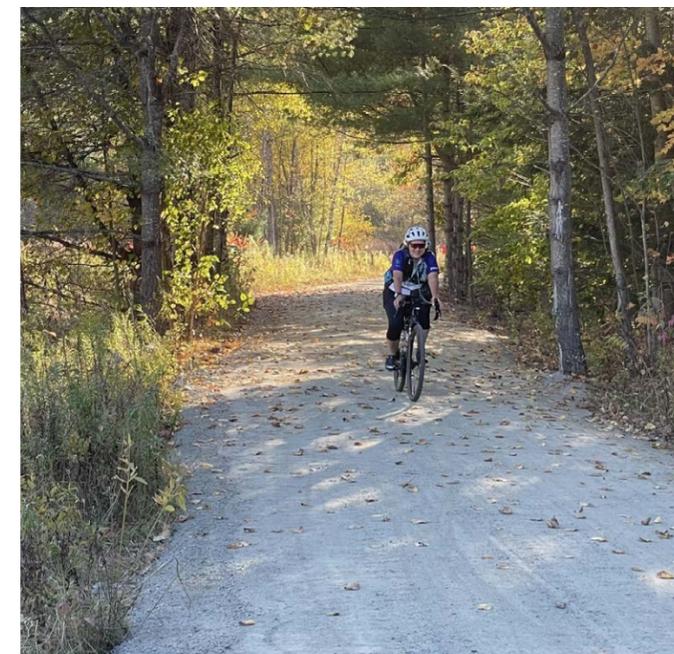
This Wing Road Rail-With-Trail Feasibility Study presents design alternatives to connect a key component of the Twin State Rail Trail vision – linking the Ammonoosuc Rail Trail in Littleton with Wing Road - creating a functional transportation corridor through Rail-With-Trail design.

This study examines a short but critical 0.3-mile segment that would link the 26-mile Ammonoosuc Rail Trail to Wing Road, a quiet road following the Ammonoosuc River south toward central Bethlehem. This connection would restore snowmobile access between Littleton and Bethlehem and provide walkers and bicyclists with a safe alternative to travel east of Littleton to Bethlehem avoiding 55mph traffic on State Highway 116. Although modest in length, this segment is a foundational first step in advancing the broader Twin State Rail Trail vision. Its findings can also serve as a model for similar Rail-With-Trail applications along the Twin State corridor and elsewhere in New Hampshire and Vermont.

Led by the NH Snowmobile Association, local snowmobile clubs, the NH Bureau of Trails and the Cross NH Adventure Trail—with support from the Rails to Trails Conservancy—this report provides a detailed design study for a short but essential Rail-With-Trail connection. This 0.3-mile segment will link Littleton to Bethlehem and beyond as part of the future Twin State Rail Trail network.



Wing Road Overview Map



Ammonoosuc Rail Trail in Littleton



Project Area

PRECEDENTS & BEST PRACTICES

When planning for recreational use within rail corridors, two primary design options are typically considered: maintaining the existing rails and creating a Rail-with-Trail, or removing the rails entirely to develop a traditional rail trail. Rail-With-Trail designs can be attractive because they preserve the possibility of future rail use while accommodating recreation. However, they can become challenging to implement where the right-of-way (ROW) is narrow or constrained by environmental or structural conditions, making it difficult for both uses to safely coexist.

NATIONAL AND STATE BEST PRACTICES

Excellent guidance exists for Rail-With-Trail development, both through demonstrated regional precedent and state and national guidance. Both the Federal Rail Administration (FRA) and the State of New Hampshire have published best practice guidelines for Rail-With-Trail development. These can be reviewed in full at the following links:

- [NH Rail Trails Plan \(NH DOT, 2022\)](#)
- [Rails with Trails: Best Practices and Lessons Learned \(U.S. Department of Transportation Federal Railroad Administration and Federal Highway Administration, 2021\)](#)
- [A Resource for Planners, Agencies and Advocates on Trails along Active Rail Corridors \(Rails to Trails Conservancy, 2013\)](#)

These documents present best practices to design trail systems which maintain public safety and comfort while ensuring smooth and seamless operation of freight or passenger rail. These best practices are not published as absolute requirements, because in the real world, the design of these facilities is often limited by other factors, such as constrained ROW, steep slopes, wetlands, private property, transportation or utility infrastructure and available funding.

The documents call out specific rail trail design criteria, including ideal setbacks and separation measures between active rail lines and recreational paths. FRA guidance states that minimum setback between rail centerline and edge of an adjacent path depends on the specific situation. NHDOT guidance recommends seeking a 20' minimum setback between the edge of the trail and the centerline between the active rails. Relatedly, fencing is recommended to be constructed at a minimum of 15' from the edge of the outer track. These two measurements are generally compatible, and this document references the 20' setback measurement for clarity. As exhibited in both the regional precedents illustrated here, and the Wing Road design concepts, constraints often create situations where recommended minimum setbacks and separation are not followed – illustrating the potential for context sensitive design to deliver successful results.

Both guidance documents recommend a vertical element (fencing or vegetation / grade separation) as a buffer to better separate rail and trail use. Real world examples, however, have presented challenges with these 'typical' design recommendations for fencing, particularly during periods of heavy snowfall. Chain link fencing has been reported to act as a snow fence, causing scouring of snow from the snowmobile / ski trail corridor and covering the active railroad tracks with deep snow drifts. For this reason, split rail fencing is recommended over chain link fencing as part of this study's proposed designs.

According to a 2021 report from the FRA, the United States has 343 Rail-With-Trail corridors, totaling 917 miles within 47 states, including Vermont and New Hampshire. These examples demonstrate that Rail-With-Trail is commonly used to provide a safe and effective shared use of rail corridors.

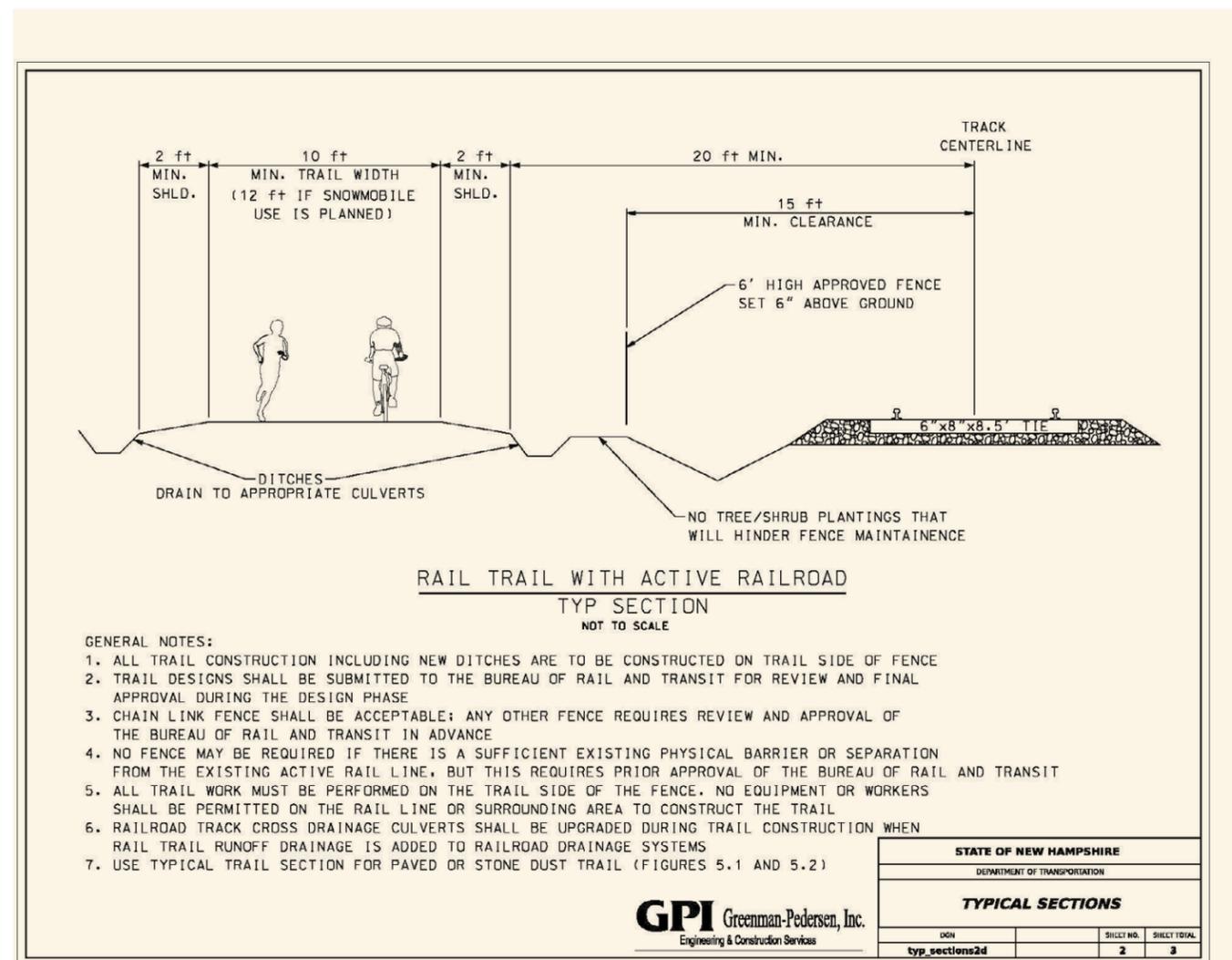


FIGURE 5-3: Typical Section – Rail Trail with Active Railroad

Typical rail trail design sections which incorporate the design standards shown above are shown in Figures 5-1, 5-2, 5-3 and 5-4 as follows:

- Paved Path – A rail trail with a bituminous asphalt surface.
- Unpaved Path – A rail trail with a stone dust / crushed stone surface.
- Rail with Trail – A rail trail that runs parallel to an active railroad line but has physical width constraints that reduce the buffer between the railroad line and the path to a minimum width (20 feet between the track center line and the edge of the rail trail shoulder).
- Separate Path Rail Trail – A rail trail with two parallel surfaces: a hard surface (pavement) for users such as bicyclists and wheelchair users, and a soft surface (grass or compacted soil) for users such as horseback riders and joggers. It is desirable to provide separate paths where there is user demand for an alternate surface, and where width is available.

Excerpt pages from: NH Rail Trails Plan (NH DOT, 2022)

PRECEDENT FOR RAIL-WITH-TRAIL IN NEW HAMPSHIRE

Of the approximately 338 miles of rail trails in New Hampshire, only about four qualify as Rail-With-Trail segments. None of these trails share the ROW with an actively operating freight or passenger railroad.

These New Hampshire Rail-With-Trail examples occur on short segments of four trails in the Lakes Region. The WOW Trail and the Winnisquam Scenic Trail each include brief stretches where the trail runs alongside a seasonal tourist excursion railroad.



WOW Trail: Laconia, NH



Lake Winnisquam Scenic Trail

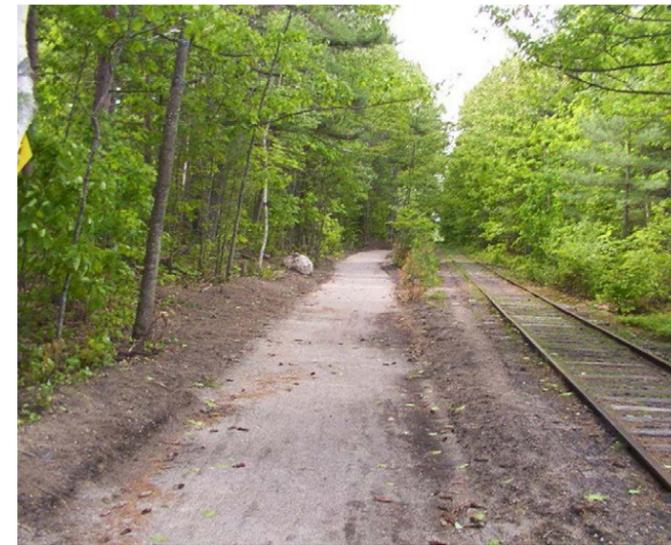


A section of the Winnepesaukee River Trail also parallels a technically active rail line, though train operations there are essentially nonexistent. In these locations, the trail is set back from the rails by varying distances, sometimes with fencing and sometimes without.



Winnepesaukee River Trail. Photo Credit: Charles Martin, *New Hampshire Rail Trails*, 2017, Branch Line Press.

The Cotton Valley Rail Trail is unique in that it shares the corridor with restored hobby “Speeder” cars—small, recreational motorized rail vehicles. There is no freight or passenger service on this line. For most of its length, the walking and biking trail runs parallel and adjacent to the tracks; however, in constrained areas such as bridges, causeways, and wetlands, the trail is located between the rails. In those spots, the ties are covered with a ledgepack surface, creating a narrow but functional shared-use corridor.



Cotton River Rail Trail (image from 2022 NH Rail Trail Plan)



Transition to trail between rails (image from 2022 NH Rail Trail Plan)

Given this context, the proposed 0.3-mile Rail-With-Trail segment of the Ammonoosuc Rail Trail at Wing Road would represent the first instance in New Hampshire of a rail corridor shared between a four-season recreational trail and an actively operating freight railroad – assuming freight operations do resume in this corridor. Precedents in Vermont, however, demonstrate that Rail-With-Trail alongside an actively operating VRS freight rail line can be a safe and successful shared use of a narrow rail corridor.

REGIONAL PRECEDENT – MONTPELIER, VT

In Montpelier, Vermont's small capital city (pop. 8,000), VRS operates a freight rail line alongside the popular Montpelier Recreation Path (also known as the Sibonebi Path) through the center of town, roughly paralleling the Winooski River.

Multiple segments of Rail-With-Trail are in place through this 3.75-mile corridor, and the trail crosses the rails five times throughout this length. Setbacks between the rail infrastructure and recreation trail vary widely. As detailed below, many locations along this corridor do not adhere to New Hampshire's recommended minimum setbacks, yet in the 6-year history of its operation as a completed Rail-With-Trail, no rail-related injuries or deaths have been recorded.

Current rail use of the Montpelier segment includes regular passage of low-speed freight rail, whose cadence varies but does not exceed one train each day. In this relatively urban context, the path and rail coexist in close proximity, with far less setback and fencing than recommended in the NH state guidance.



Overview Map of Montpelier Recreation Path - Source: City of Montpelier

MONTPELIER RAIL WITH TRAIL SITE CONDITIONS

The following section illustrates several locations on the Montpelier Recreation Path.

Site Condition 1 – Barre Street West of Gin Lane

- Setback: 24'
- Fence: Yes - Chain Link
- Context: Single family homes to the north, commercial/industrial mix to the south.
- Constraints: Slopes and property boundaries.



Site Condition 2 – Stone Cutters Way, west of Granite Street

- Setback: 12' or less
- Fence: No
- Context: no fence, active rail line, popular recreation path, Apartments and residential neighborhood immediately north, Hunger Mountain Co-Op grocery immediately south.
- Constraints: road and property boundaries.



Site Condition 3 – Old Country Club Road East of Pioneer Street

- Setback: 30'
- Fence: No
- Context: Grade separated, located adjacent to Winooski River and forested area.
- Constraints – Rivers' edge and steep slopes between trail and rail corridor



Images from Google Earth

Summary

Despite setbacks at less than recommended minimums, and a very 'porous' rail corridor through central Montpelier where unauthorized pedestrian crossing of the rail line is apparent, the VRS-operated freight line and a popular recreation trail in the heart of Vermont's capital city comfortably co-exist. This shows the potential for low-volume freight and recreation to operate safely and comfortably together, even when recommended ideal setbacks cannot be achieved.

WING ROAD RAIL CORRIDOR - EXISTING CONDITIONS

The existing conditions of Wing Road are summarized below in the following categories: land area and ownership, property adjacencies, infrastructure, general topography, and water.

LAND AREA AND OWNERSHIP

Throughout the 0.3-mile rail corridor, the ROW is approximately 90' wide. The corridor is owned by the State of NH and leased to VRS.

PROPERTY ADJACENCIES

The corridor is bordered by private lands to the south and State Highway 116 ROW to the north. The southern private lands appear to be utilized as a seasonal camp. An "Old Highway (as noted on the 1914 Valuation Map) runs within and to the south of the rail corridor ROW. Access to the camp appears to traverse a portion of the NHDOT-owned rail corridor ROW.. North of the corridor, State Highway 116 traffic counts reveal an AADT of 4,892 (2024) (source: NHDOT). The speed limit in this section is 55mph eastbound toward Whitefield and 50mph westbound, approaching Littleton. On the north side of State Highway 116, approximately 0.8 mile east of the Wing Road study area, there is an existing lumber mill. The mill has expressed interest in reestablishing rail service, though significant challenges remain to develop a transfer station that can safely and efficiently move lumber across a highway. The overall cost and complexity of restoring rail service and building this transfer station are extensive and currently unknown.

INFRASTRUCTURE

There are single and dual rail segments (sidings) in place through the corridor. Segments with dual rail lines create challenges building a Rail-With-Trail per NHDOT recommended standard setbacks. As shown in the images below, the rails are generally in an intact condition but are covered with overgrown vegetation throughout. The corridor is largely clear of significant growth and trees, but encroachment from the surrounding forest is notable. For decades, the local snowmobile club and the NH Bureau of Trails have been responsible for keeping this rail corridor open for



Current corridor conditions

snowmobile travel by repairing washouts along with clearing brush and downed trees.

GENERAL TOPOGRAPHY

The topography of the corridor is generally flat but slopes down to wetlands and the Ammonoosuc River to the south and slopes up towards the highway corridor to north. The rail line itself has a trapezoidal profile, with the rail bed elevated on a berm above the surrounding landscape.

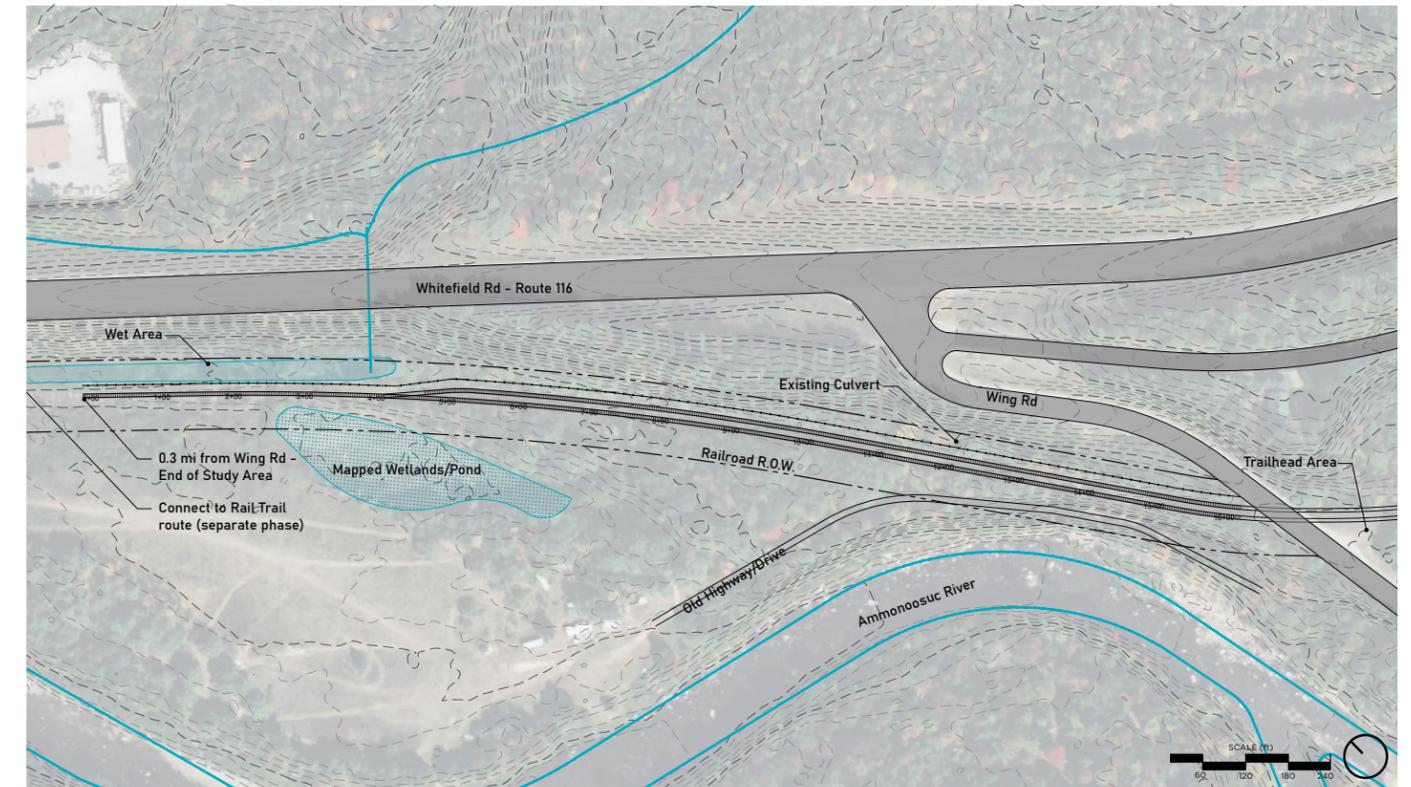
WATER

The Ammonoosuc River lies south of the project site. Drainage flows from the State Highway 116 roadway and the northern hillside through the site, ultimately reaching the riverine areas to the south. Mapped wetlands exist south of the rail corridor. Potential wetlands exist in the drainage between elevated railway and the hillside to the north, but additional study will need to determine the official status and ecological value of this isolated wet area.

PROPOSED ALTERNATIVES

The following alternatives are proposed as potential concepts for Rail-With-Trail at Wing Road. These alternatives represent baseline concepts and can be further refined to implement this Rail-With-Trail. Both alternatives assume the use to be shared by snowmobiles, skiers, bikers, and pedestrians throughout New Hampshire's four seasons for recreation and transportation.

SITE MAP



ALTERNATIVE 1: NORTH SIDE

In this alternative, the trail runs along the north side of the tracks. This trail alignment is the furthest away from the river, which reduces challenges related to potential erosion or trail failure from future flooding events. Due to the segments of dual rail line, ROW and slope constraints, the eastern segment of trail is proposed with an approximately 12' setback between the main rail centerline and the edge of the shoulder in the most constrained portion – notably less than the 20' recommended by the NH Rail Trail Master Plan.

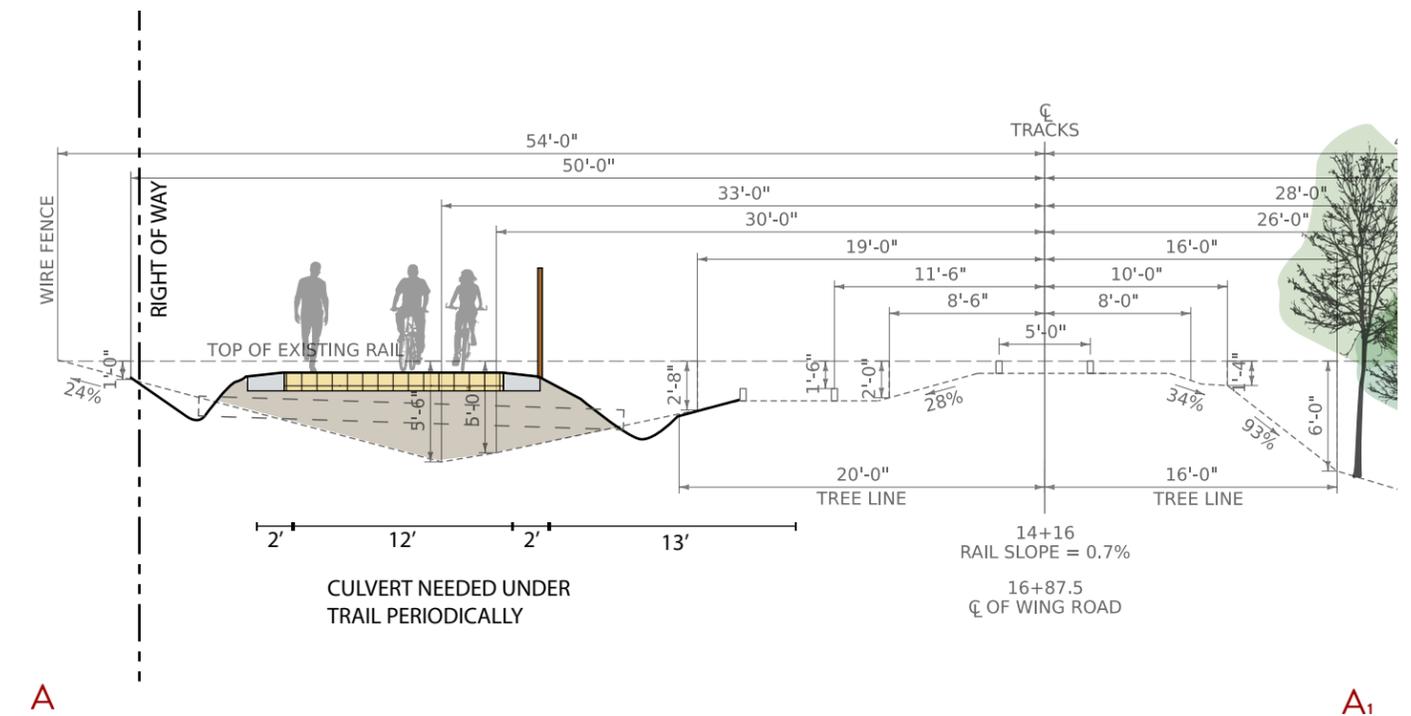
Key Drivers of Cost & Complexity

- Steep slopes extending down from State Highway 116 will require significant earthwork, slope benching, and additional fill and slope stabilization.
- Slopes draining down from the state highway currently converge in a swale to an existing culvert. Managing this runoff for the trail will require construction of culverts and piping underneath the trail to properly channel the drainage.
- A wet area exists between the tracks and bottom of slope on the western portion of this corridor. Depending on ecological permitting and structural review, additional steps may be required to mitigate impact on this area for habitat/hydrological preservation. If future wetland delineation determines that this area does require a boardwalk to span the wet area, this will greatly increase the cost and complexity of this alternative.
- This alternative cannot meet NH suggestions for setbacks from the main track centerline due to slopes and dimensions of rail corridor ROW. Encroaching on the highway property would address ROW constraint but add significant costs and complexity for additional cut/fill and steep slope stabilization. If the siding track is not used and officially abandoned, the trail would likely meet guidance on setbacks from main track centerline.

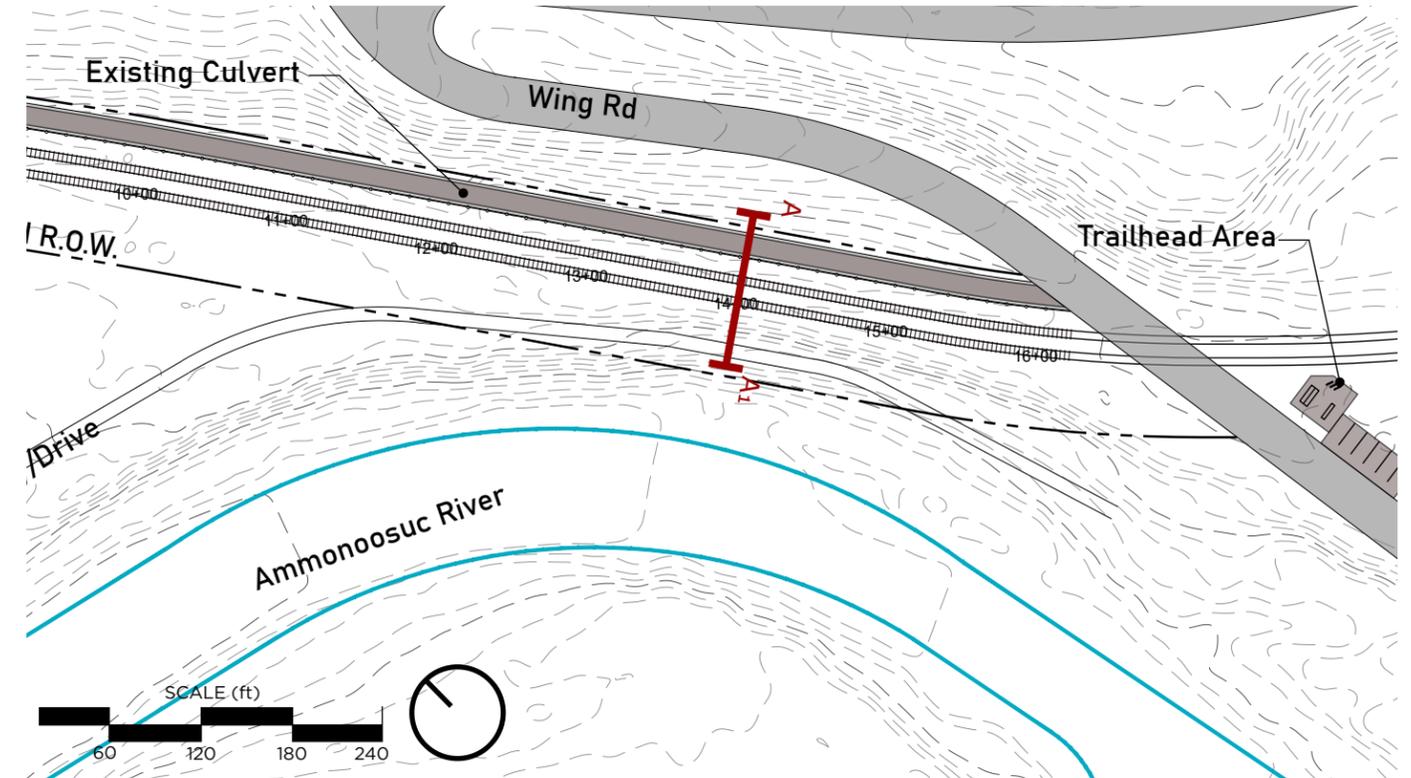
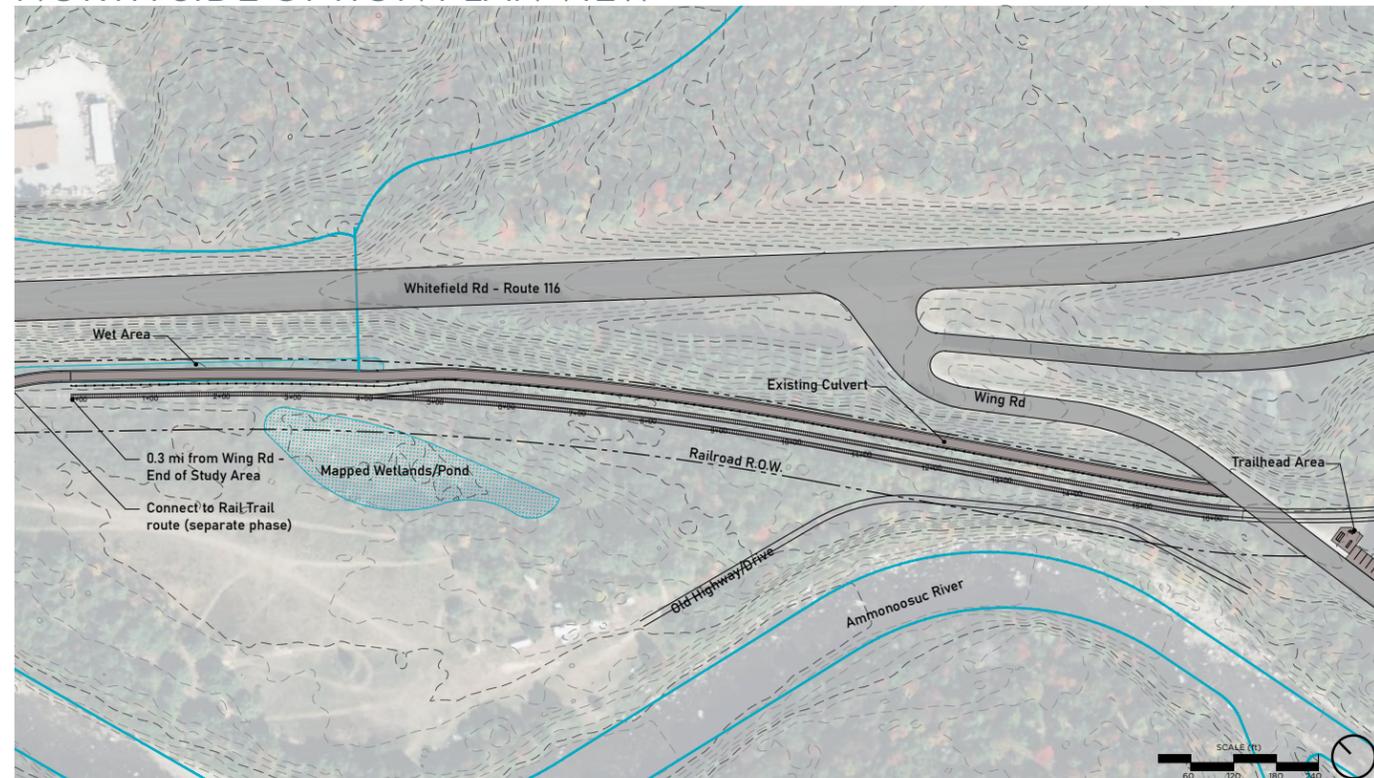
See the following pages for typical cross-sections illustrating this alternative's proposed design.

NORTH SIDE OPTION

SECTION A

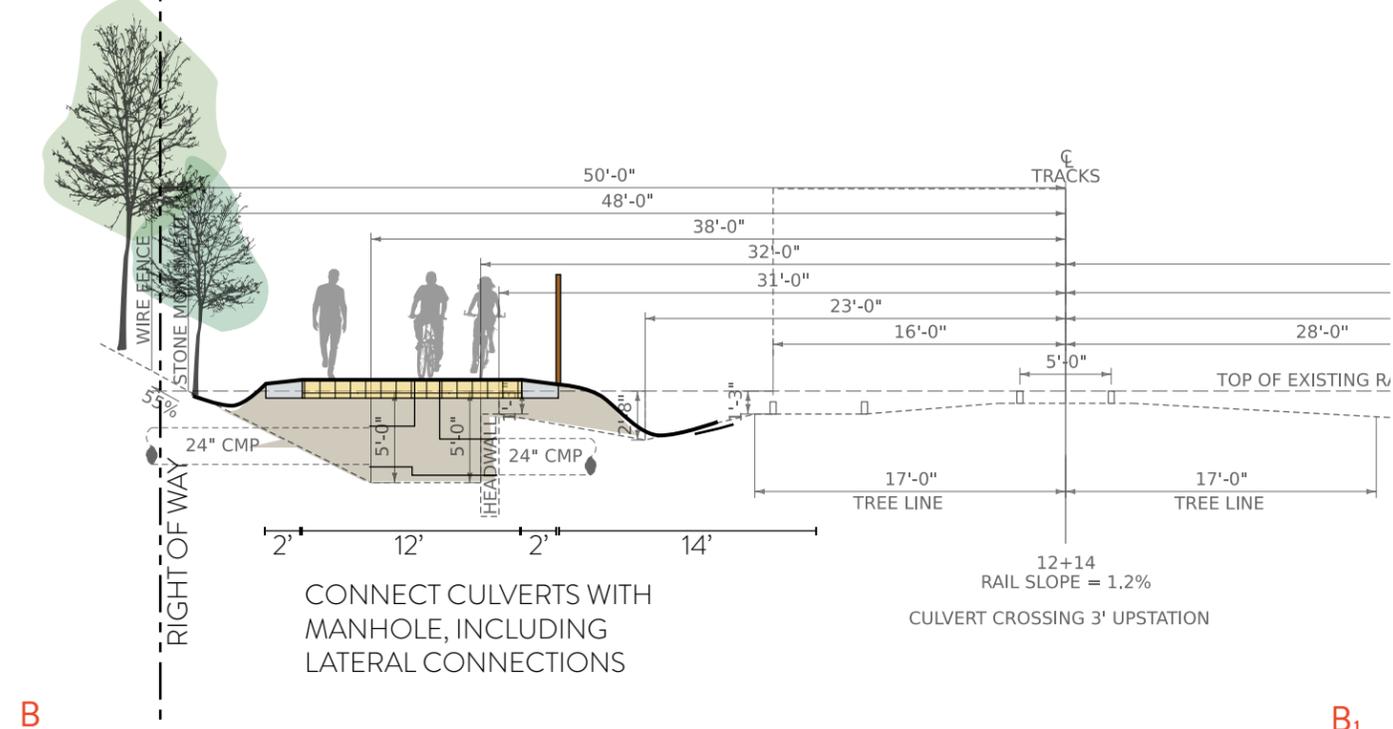


NORTH SIDE OPTION PLAN VIEW



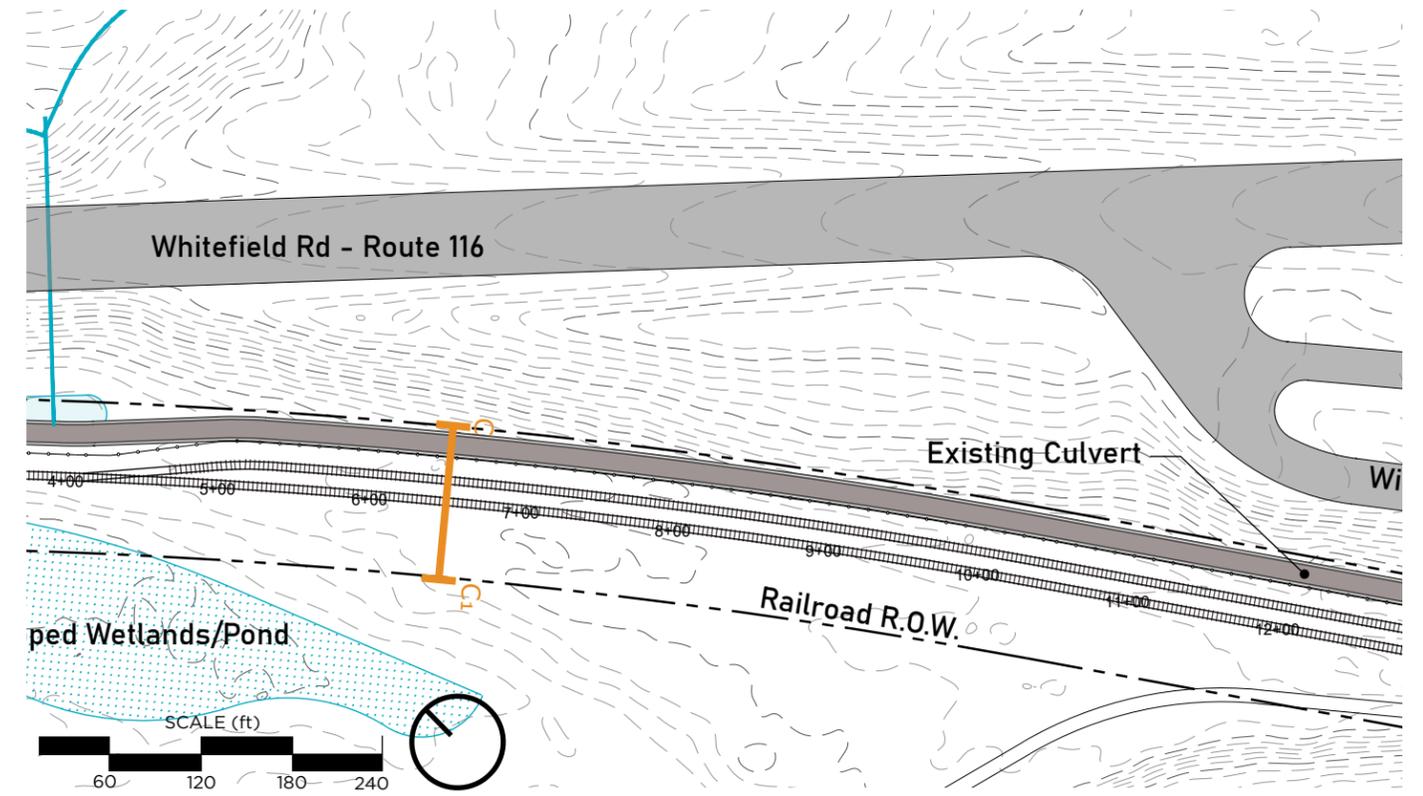
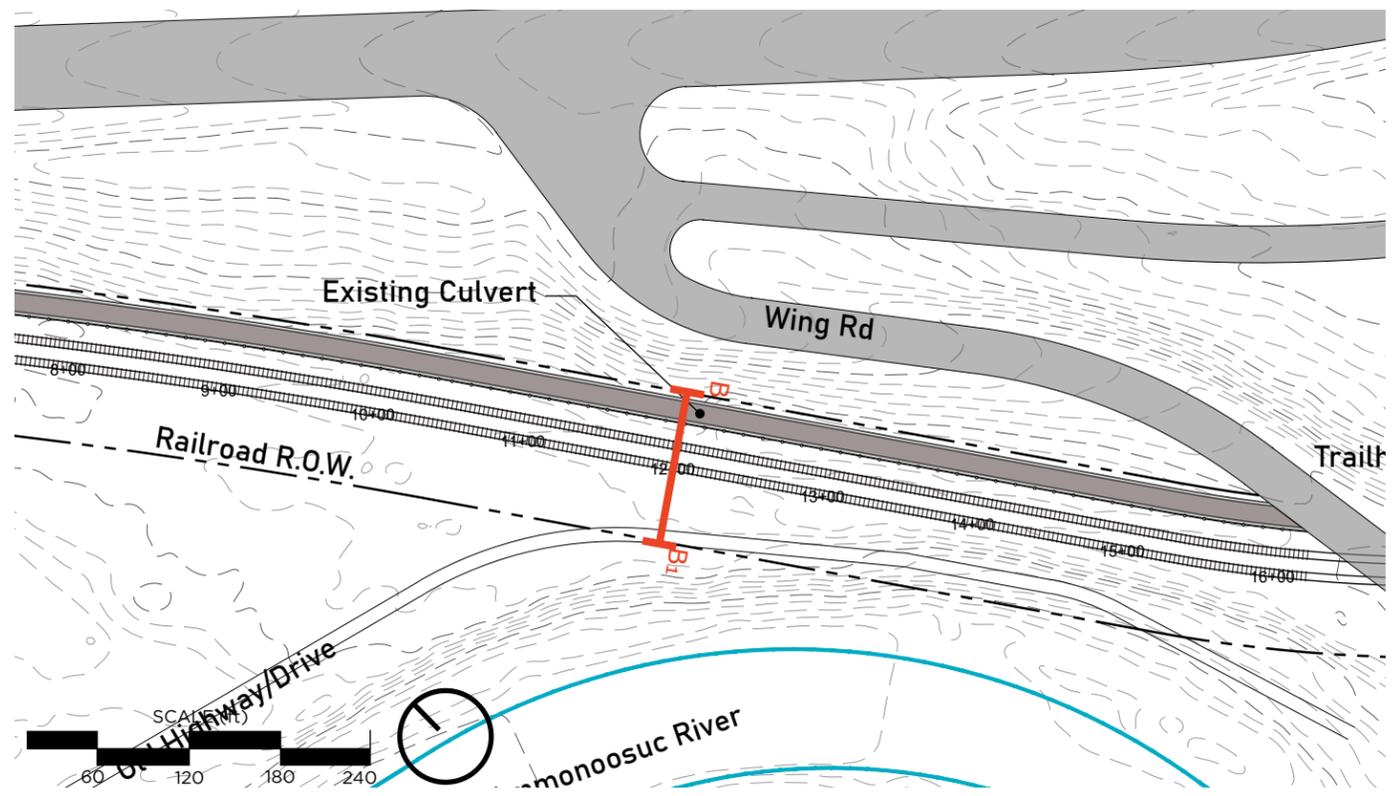
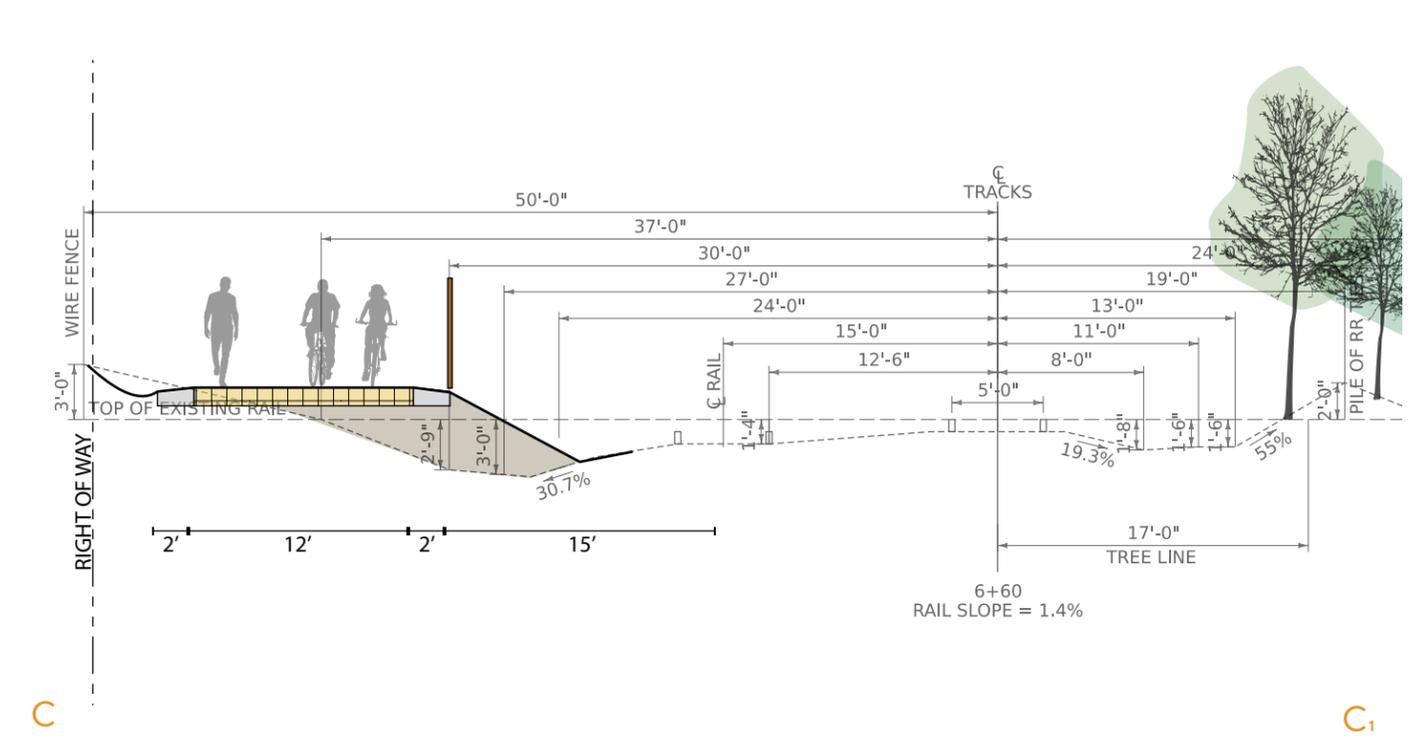
NORTH SIDE OPTION

SECTION B



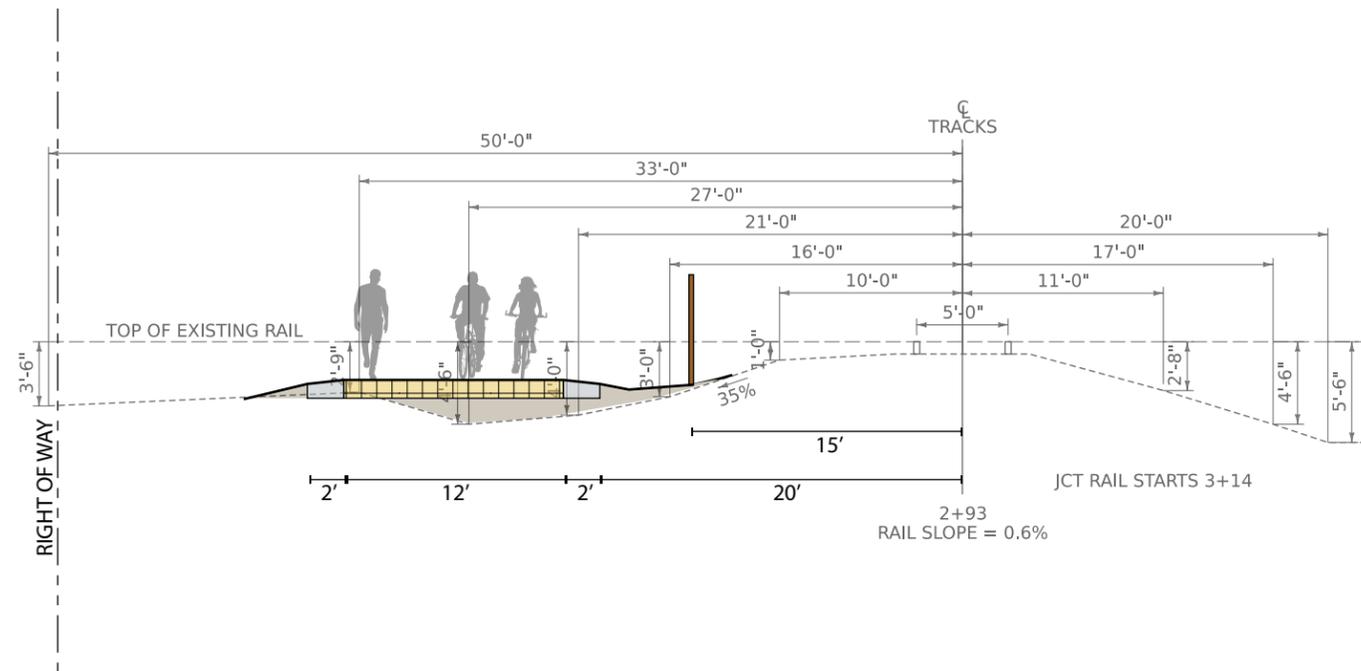
NORTH SIDE OPTION

SECTION C



NORTH SIDE OPTION

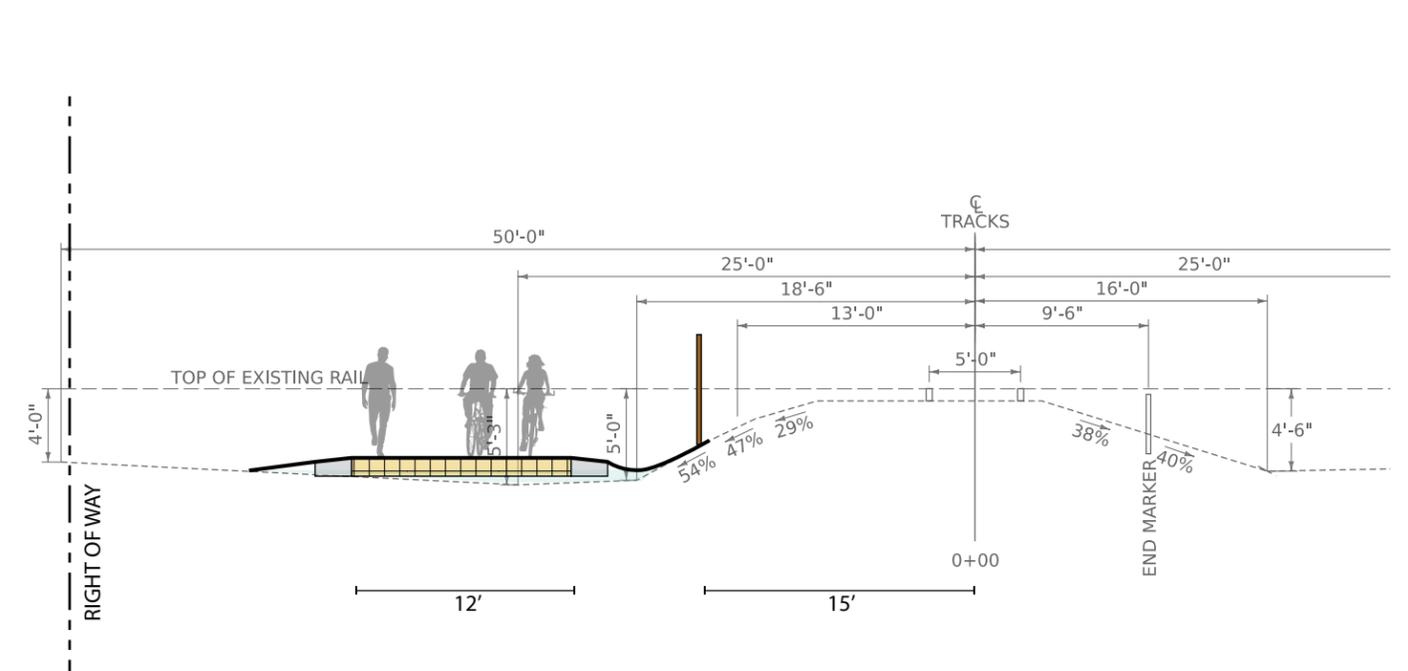
SECTION D



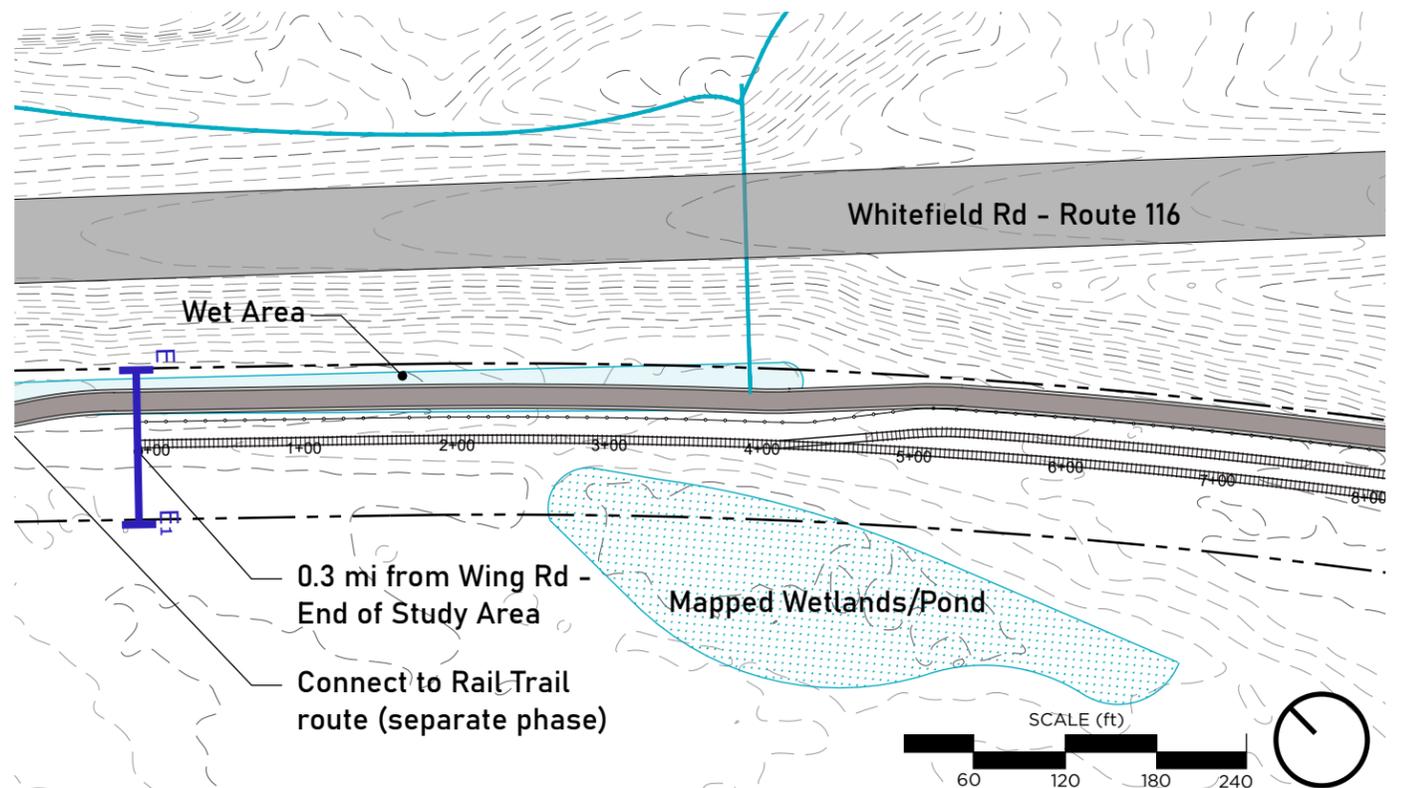
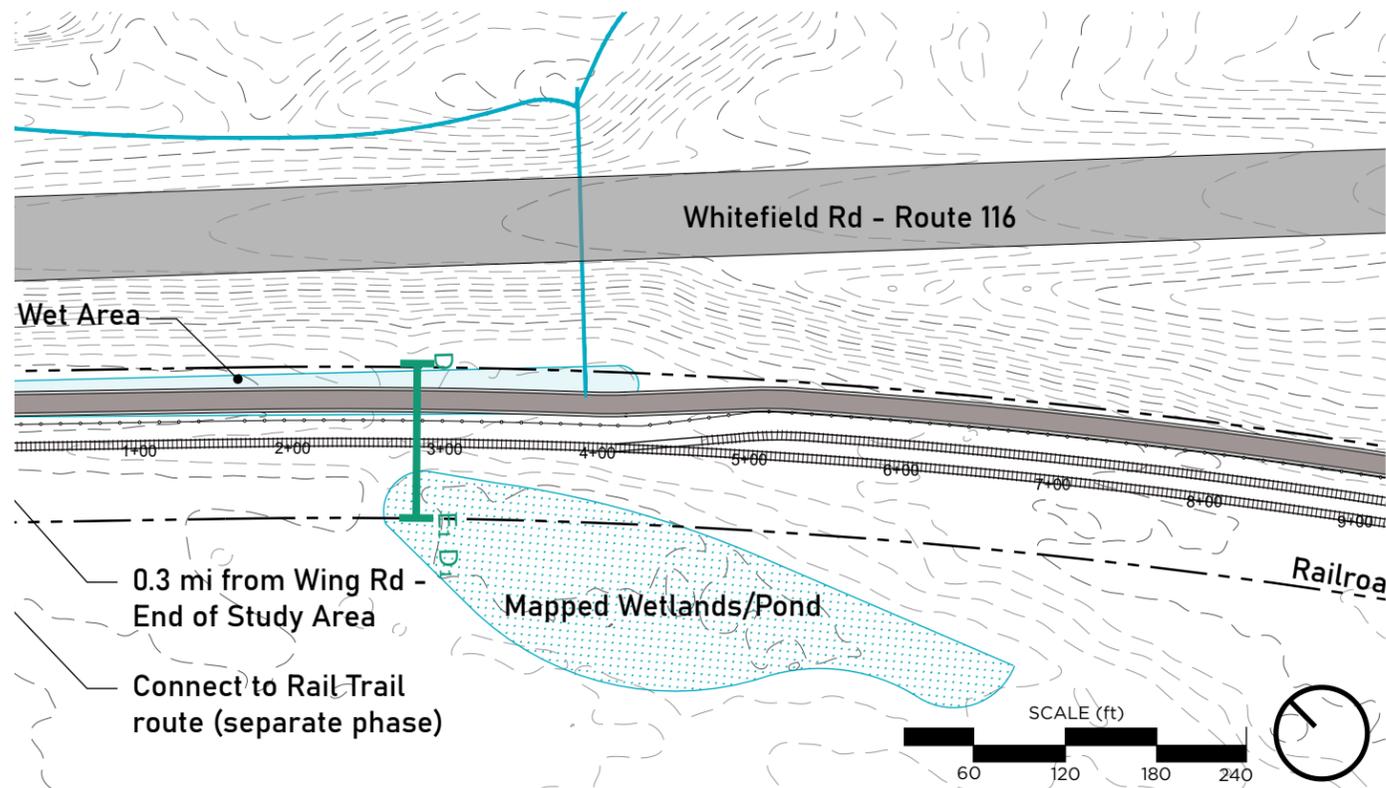
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NORTH SIDE OPTION

SECTION E



E E₁



ALTERNATIVE 2: SOUTH SIDE

In this alternative, the trail runs along the south side of the tracks. This trail alignment is closer to the river. A section of the Rail-With-Trail would run on the “Old Highway” located within the NHDOT-owned ROW. This section along the old highway =has significant grade separation from rail, which would not necessitate fencing. The next section of trail would be in a relatively flat area which would allow the trail to run along the edge of the ROW and allow for a strip of forested vegetation between trail and rail, reducing the need for fencing. The next section would be within a wetland.

The constraints of the southern alignment also create potential for a relatively complex design moving forward.

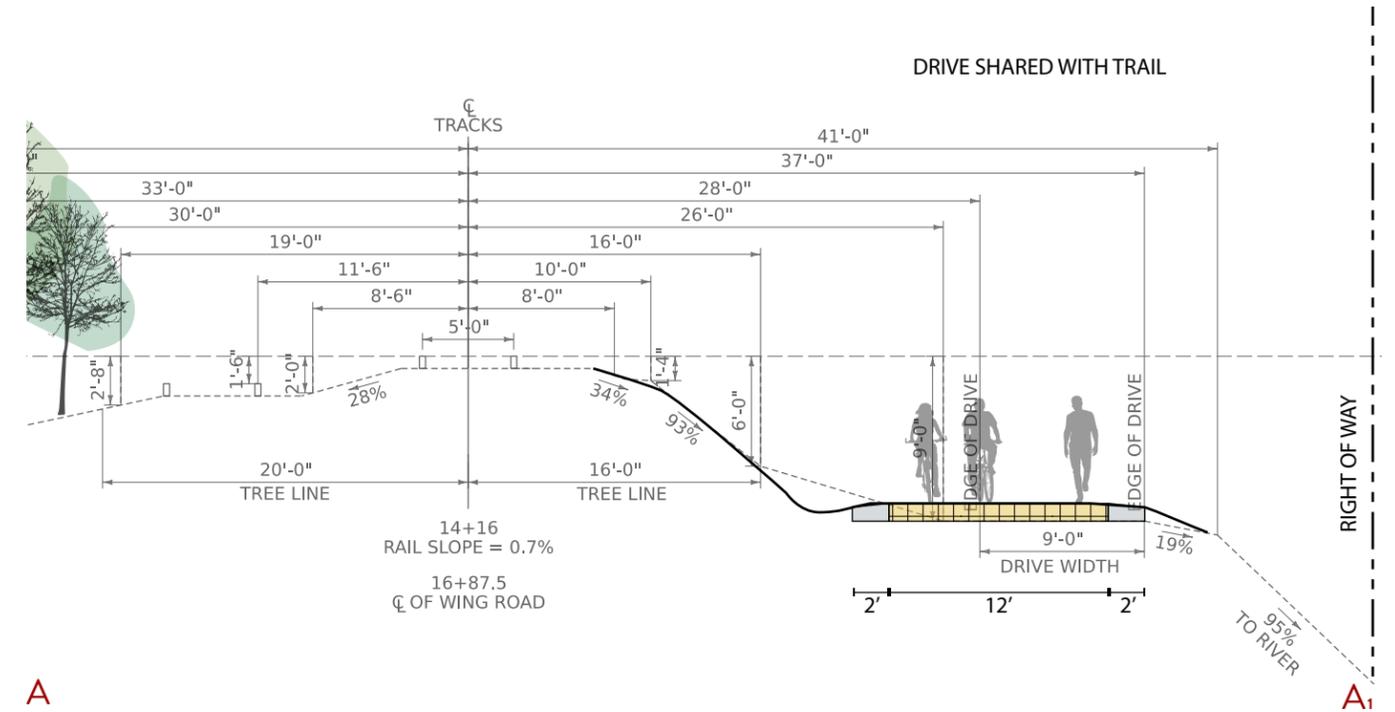
Key Drivers of Cost & Complexity

- Successful utilization of the portion of the trail proposed along the old highway, on which a section is apparently used as a camp access, will require coordination between the camp landowner and NHDOT. Although the state owns the land, this use should be noted, and it is anticipated that additional negotiation will be needed before any specific alignment can be approved.
- A section of the trail would need to cross a mapped wetland and would require a boardwalk. Due to the use of the trail by snowmobiles and grooming equipment, the boardwalk will need to be wide enough and include appropriate micropile footings to support the load of snow and grooming equipment. This infrastructure alone would pose a significant cost burden, and future wetland delineation could uncover additional wetland areas not currently mapped.
- Due to the proximity to the river, this alternative carries a higher risk of flooding and intense rainfall-related erosion damage.

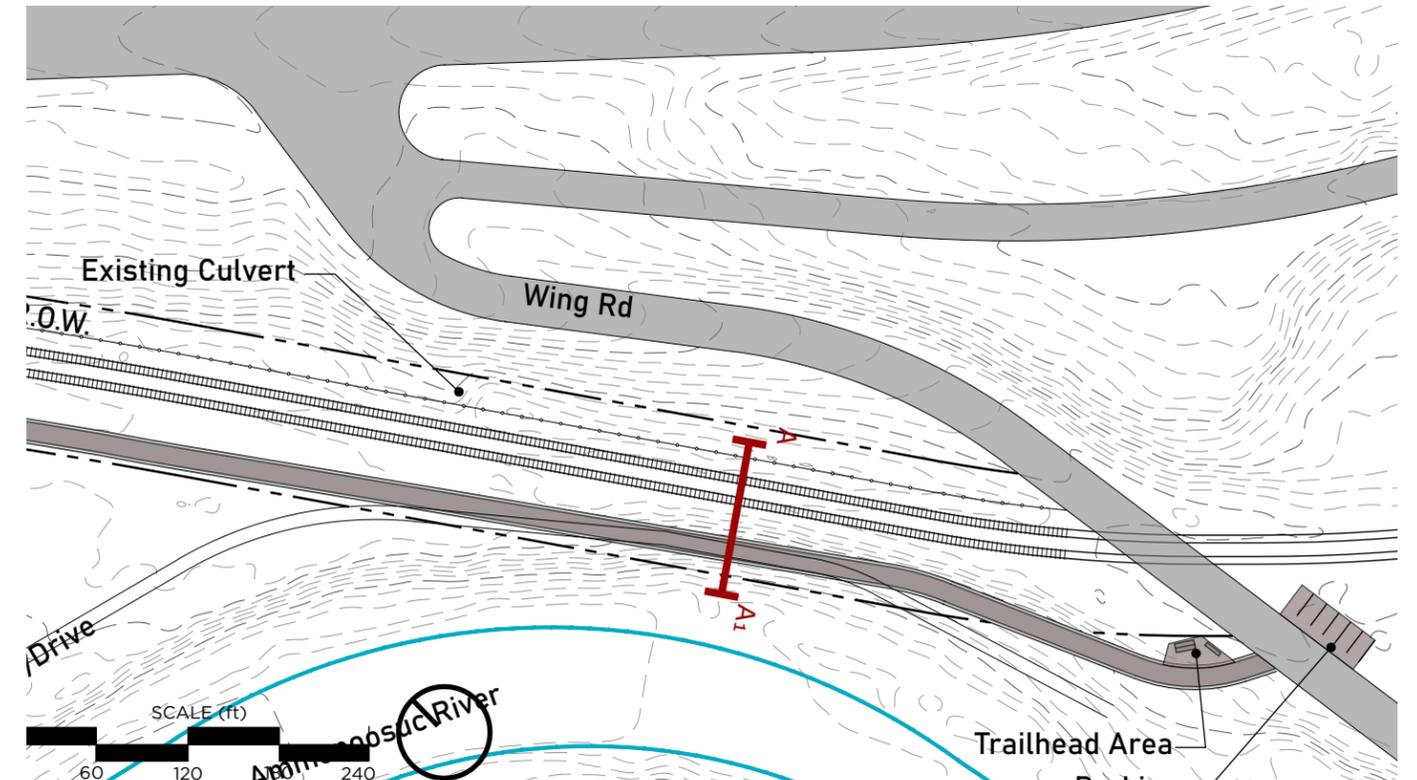
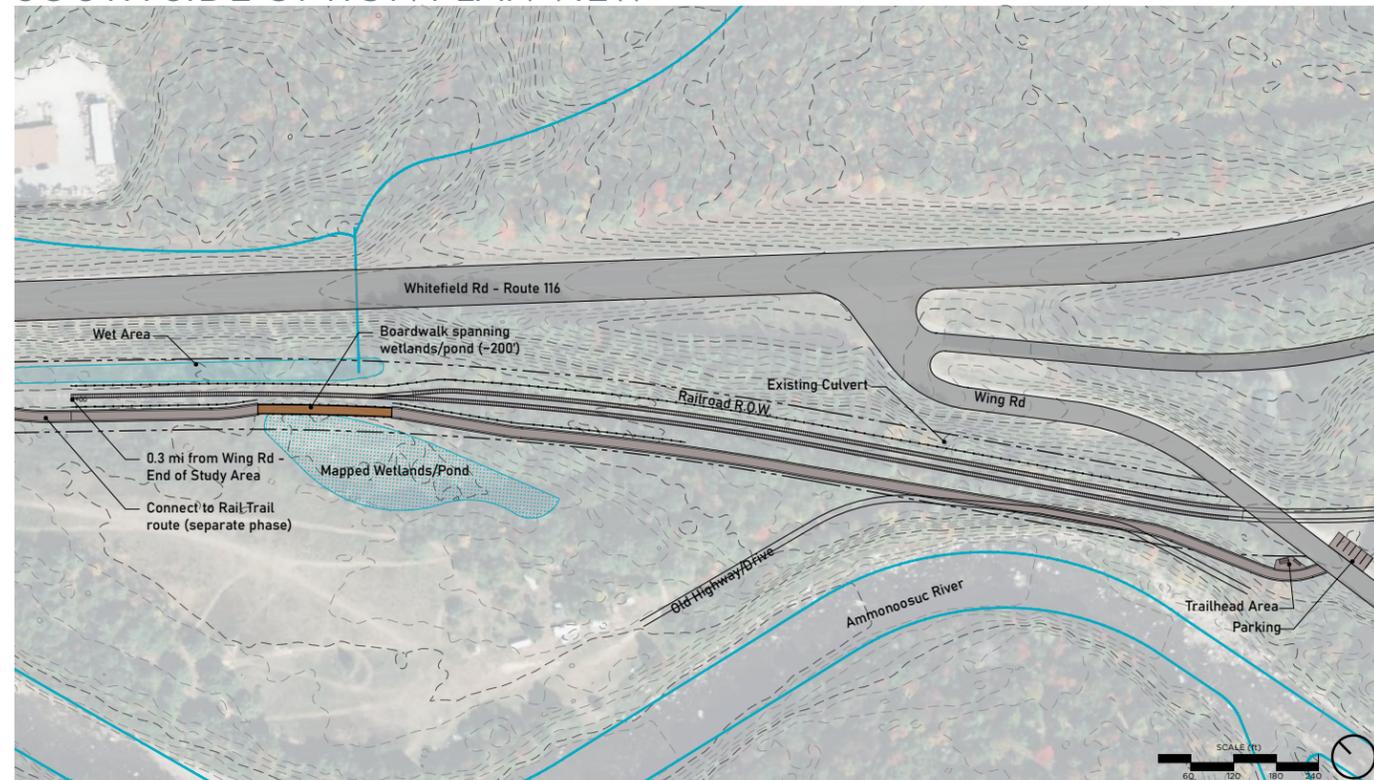
See the following pages for typical cross-sections illustrating this alternative’s proposed design.

SOUTH SIDE OPTION

SECTION A

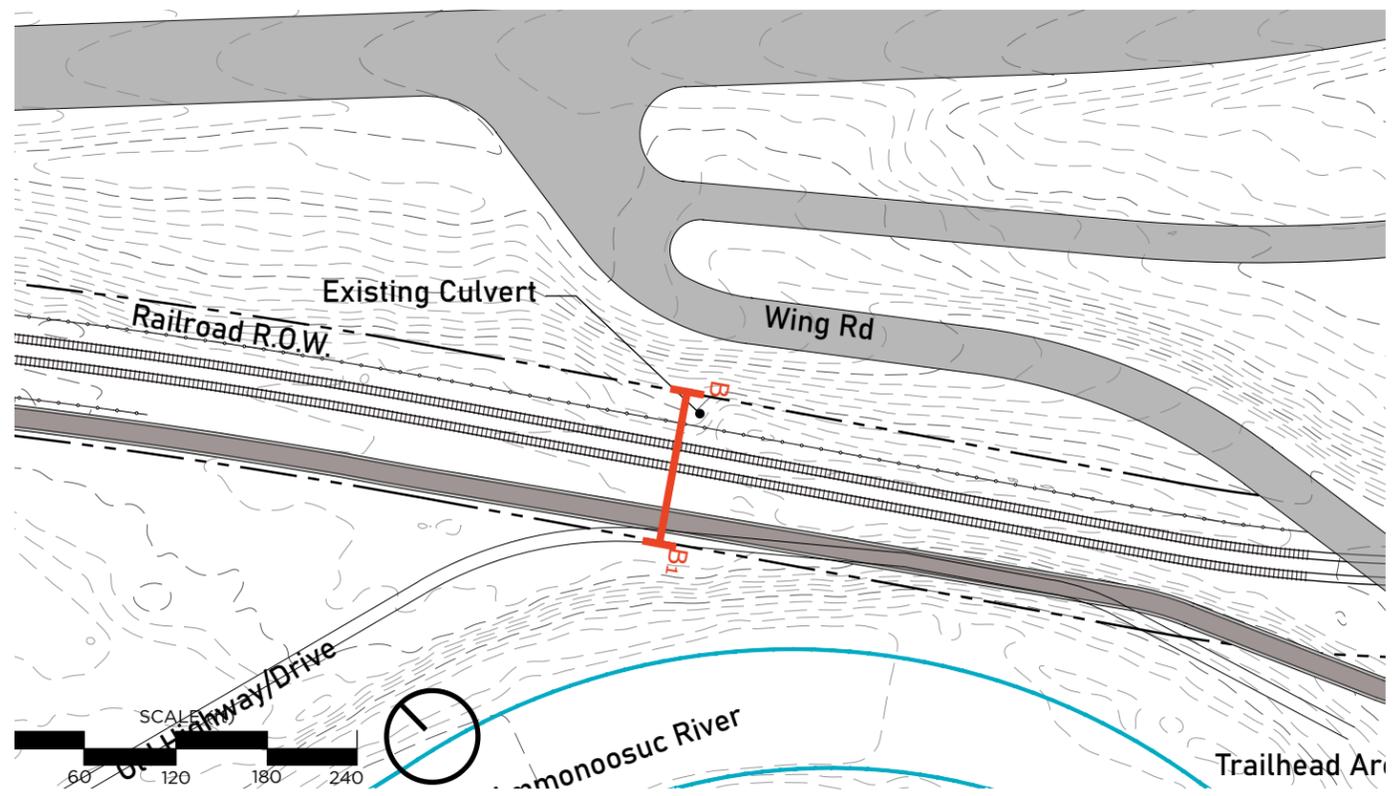
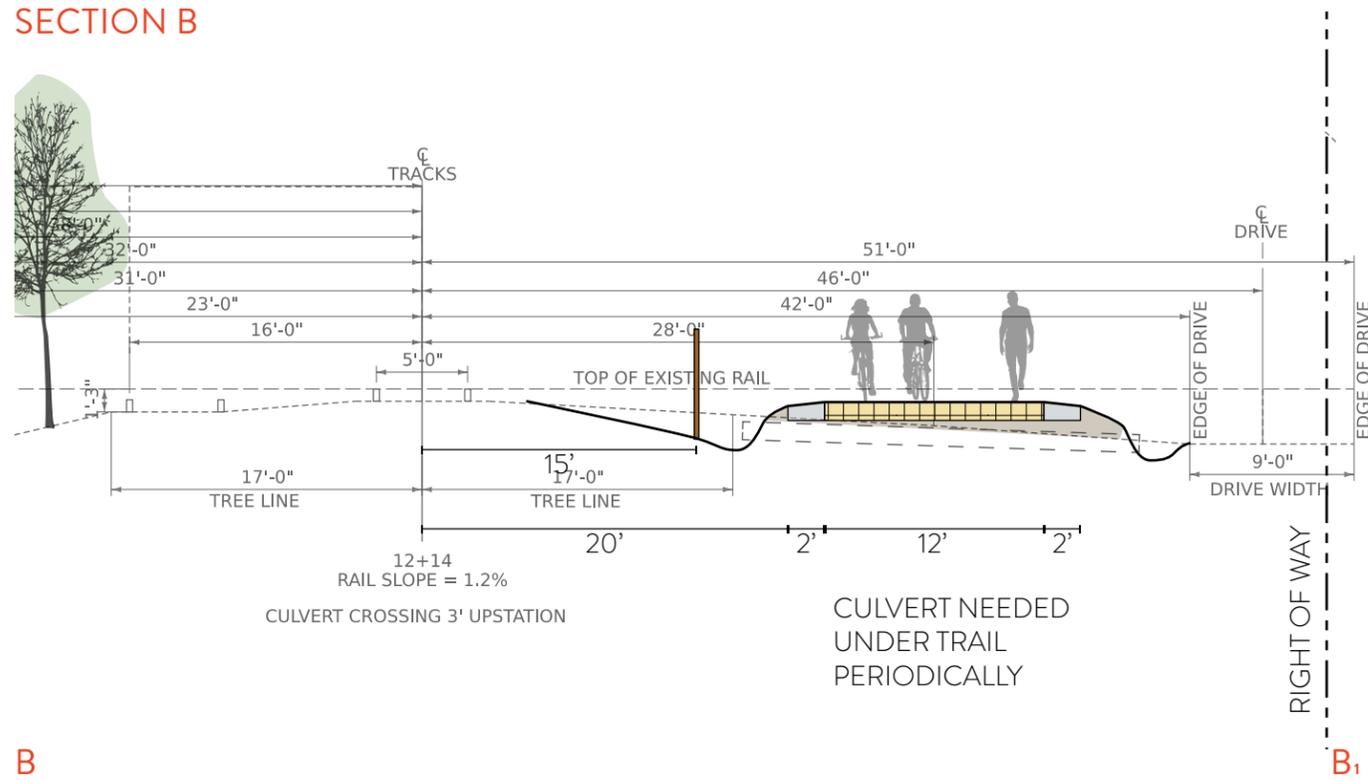


SOUTH SIDE OPTION PLAN VIEW



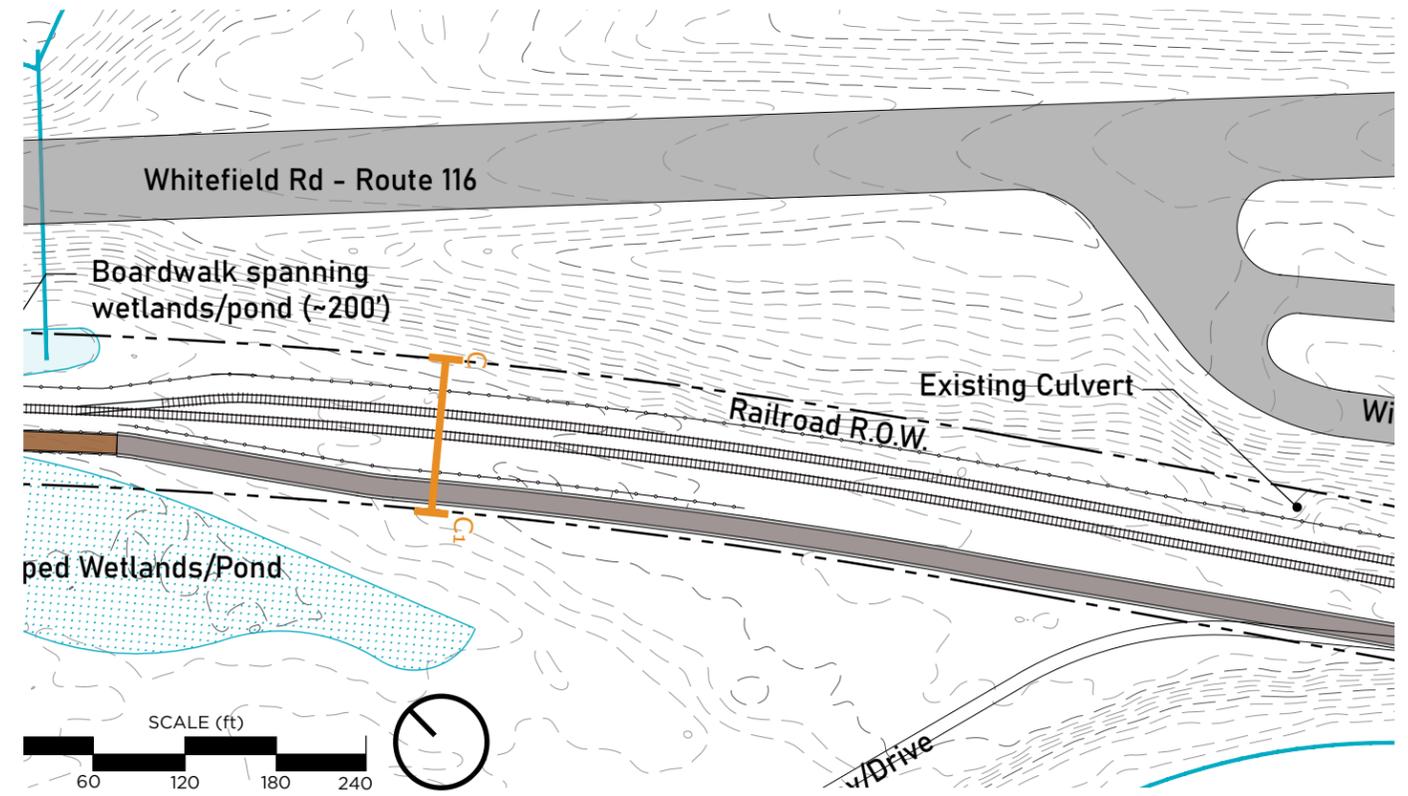
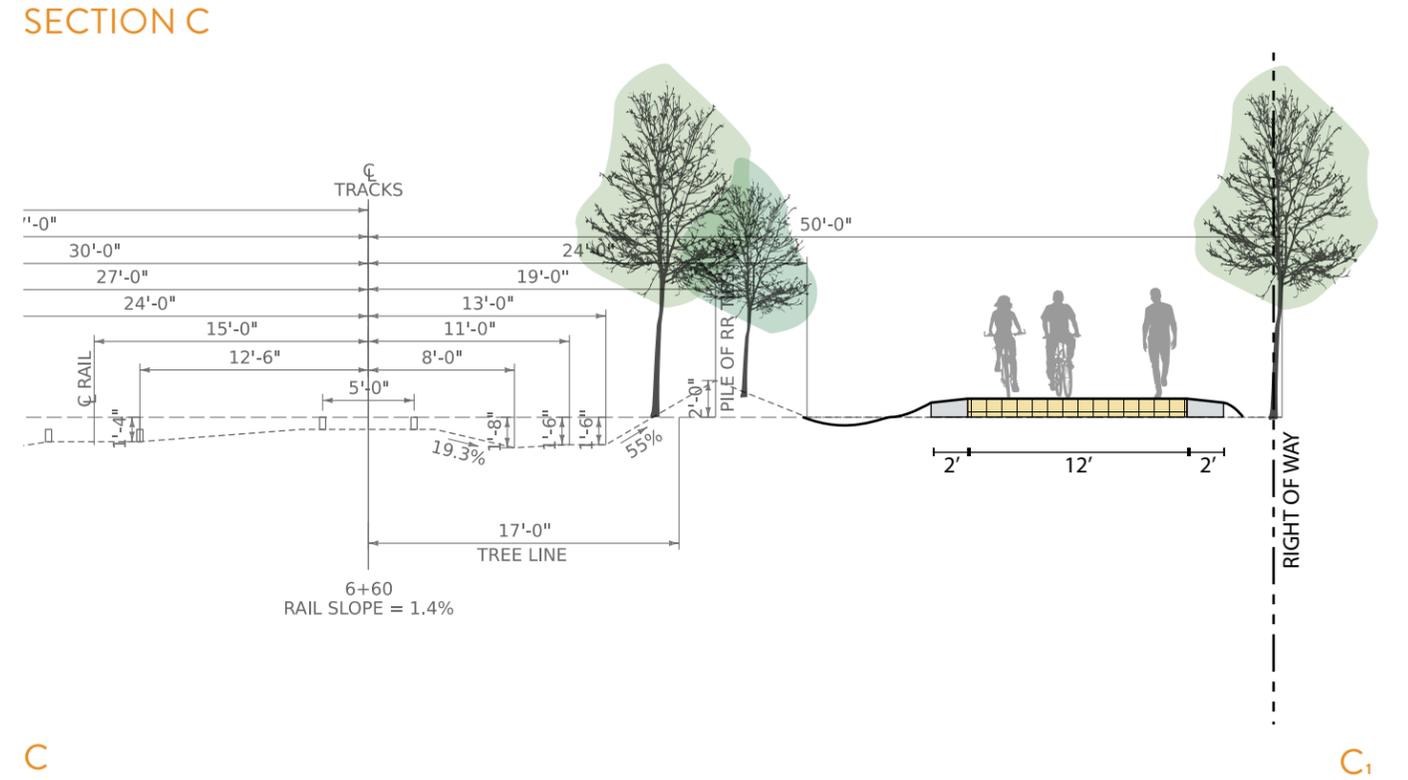
SOUTH SIDE OPTION

SECTION B



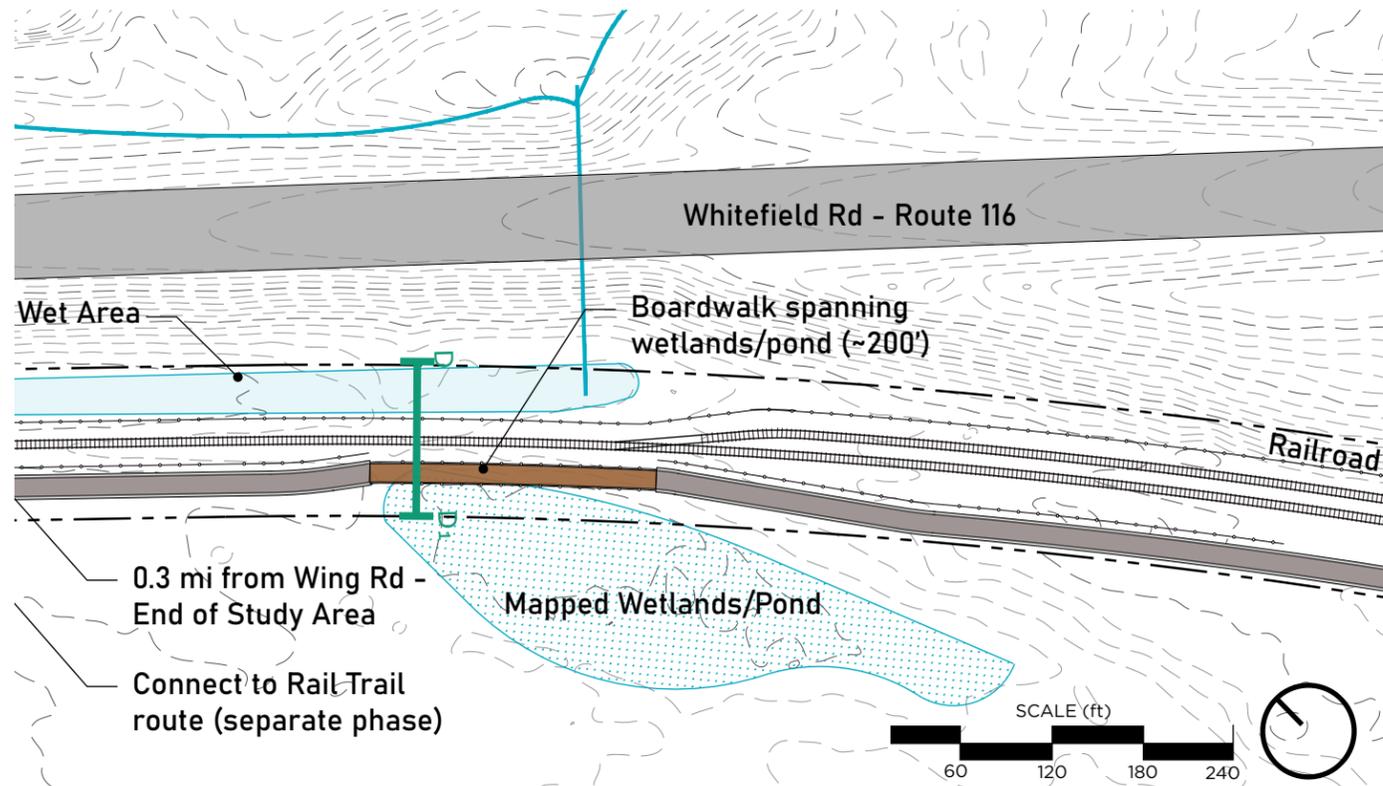
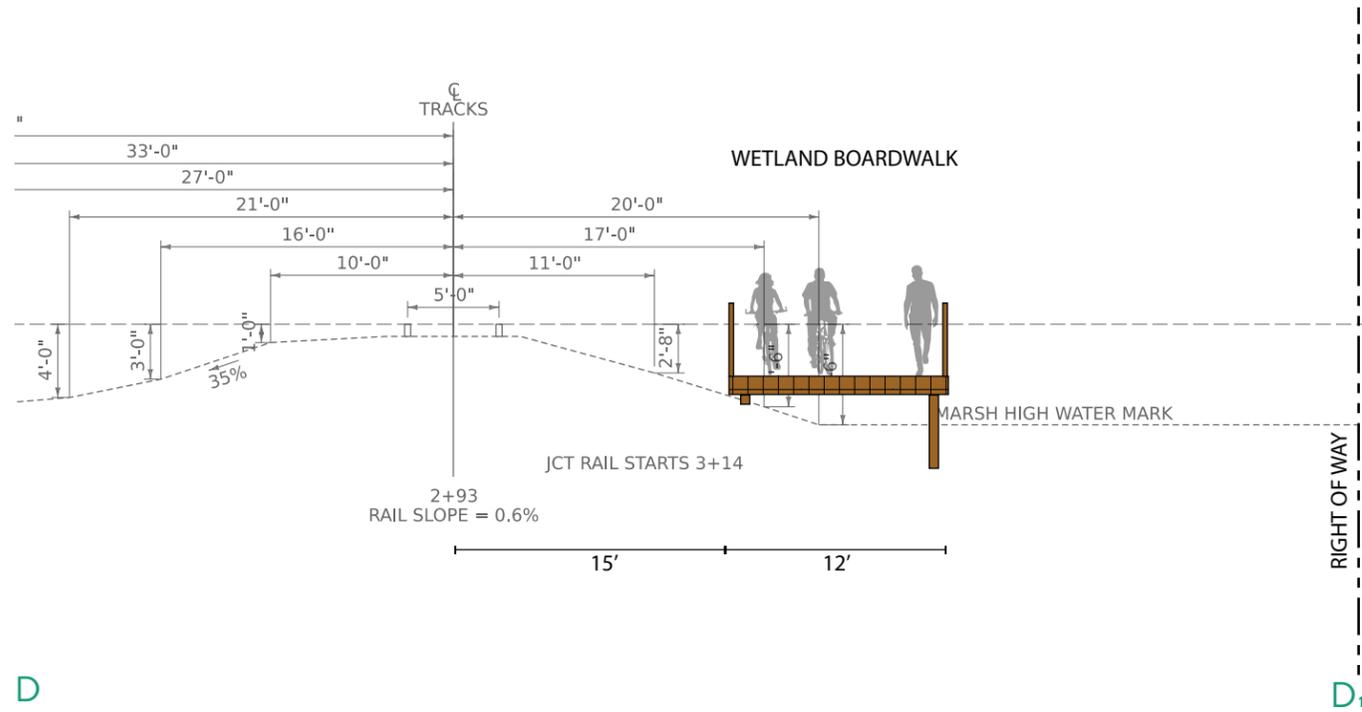
SOUTH SIDE OPTION

SECTION C



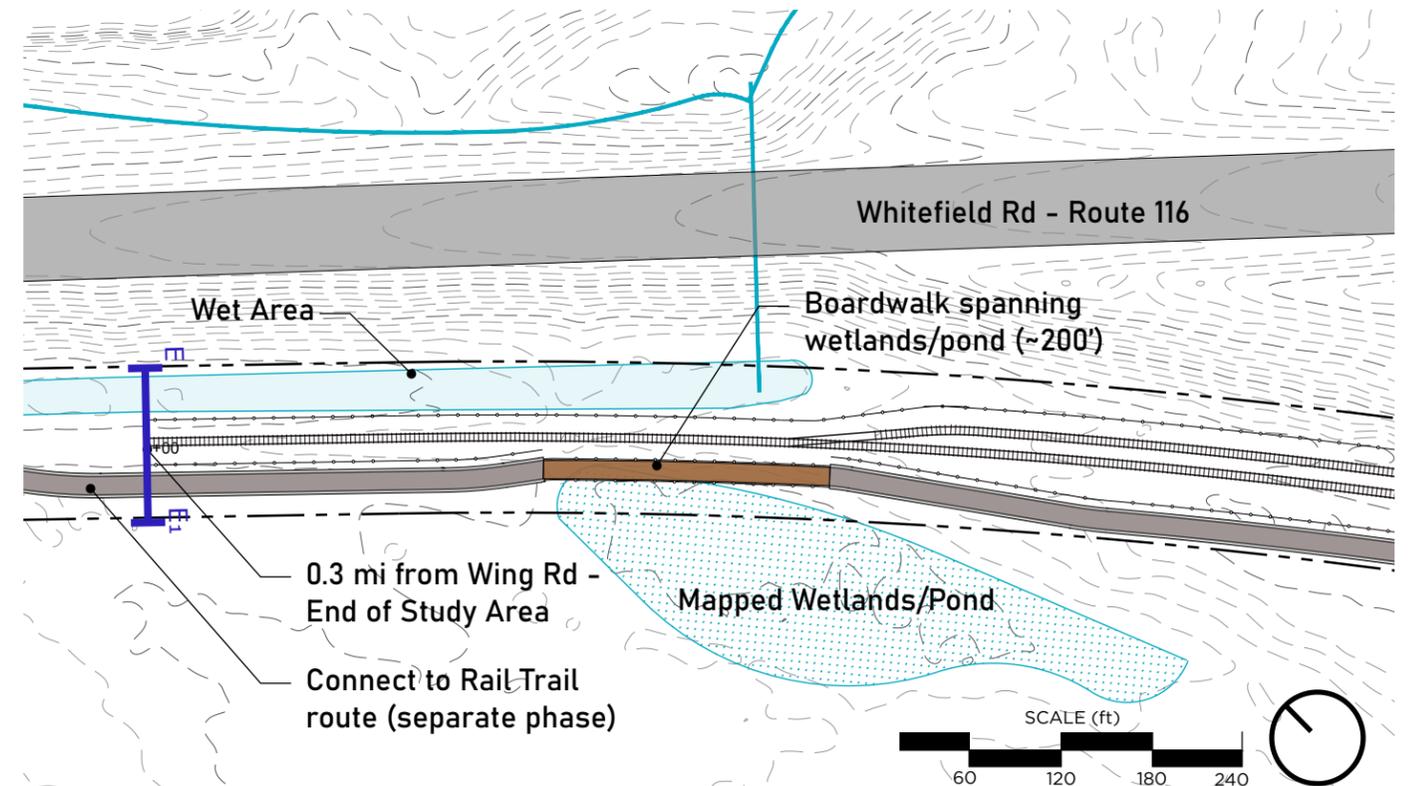
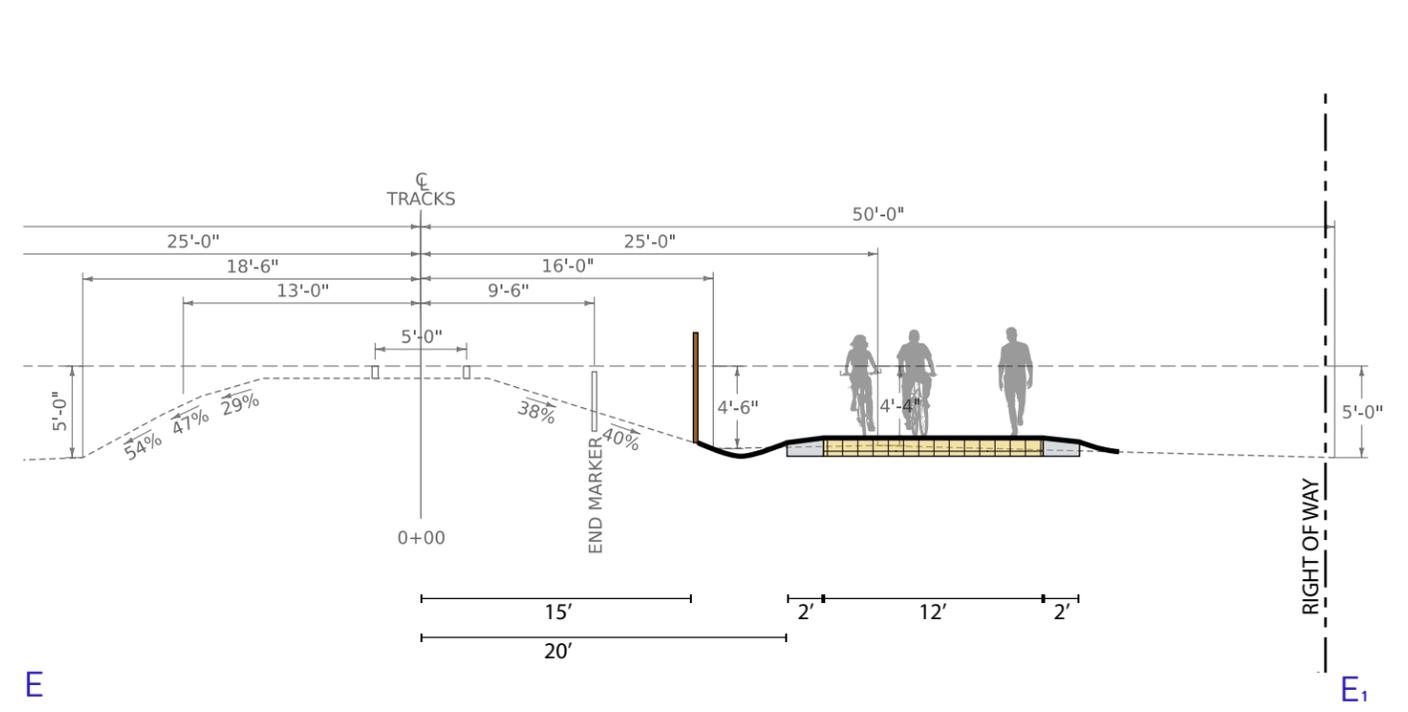
SOUTH SIDE OPTION

SECTION D



SOUTH SIDE OPTION

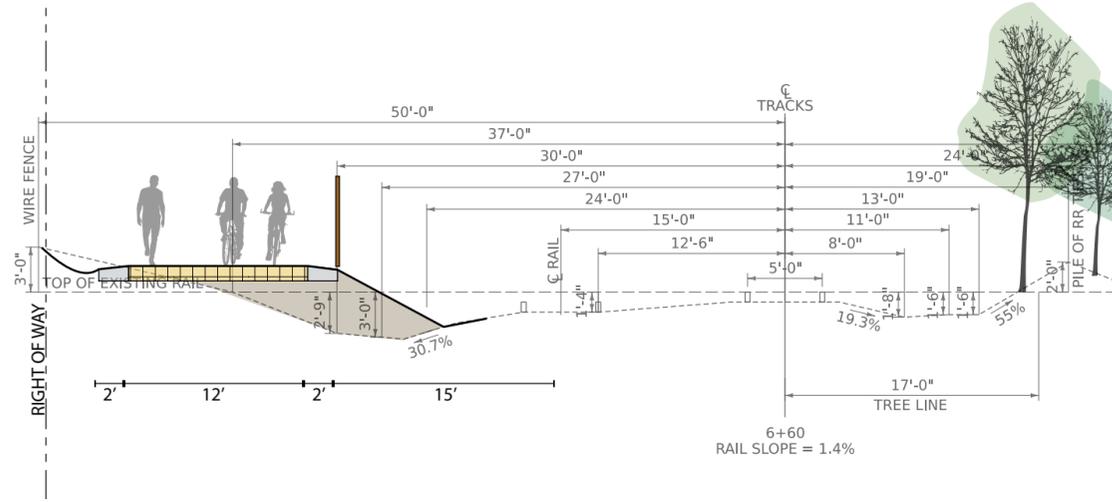
SECTION E



CURRENT PREFERRED ALTERNATIVE: NORTH SIDE

The current preferred alternative identified by this study represents the most cost-effective method of building a Rail-With-Trail to connect the Ammonoosuc Rail Trail east of Littleton with Wing Road in Bethlehem. This alternative reduces cost and complexity due to the lack of required boardwalk segments, and avoids potential political / legal entanglements of the private property/camp access on existing on state-owned rail corridor ROW.

NORTH SIDE OPTION TYPICAL SECTION



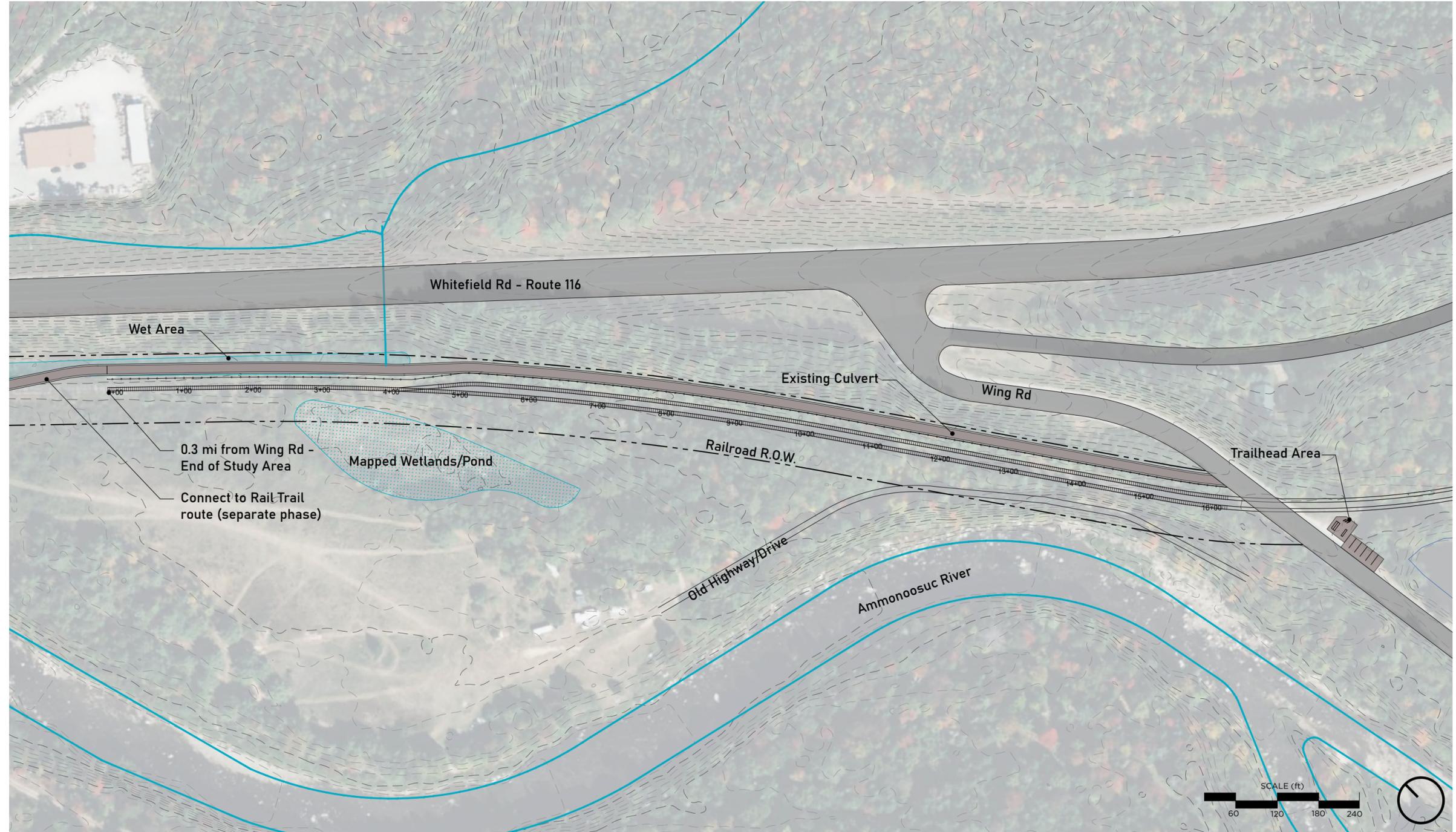
DUAL OPTION FEASIBILITY

This study has been informed through a detailed site visit, GIS level boundary and environmental data review, and manually surveyed cross sections. This study did not include detailed wetlands delineation, boundary surveys, or legal deed research.

The current preferred option presented above, as well as the alternate southern option should both be considered for future study to determine a final path towards implementation. Future wetland delineation will provide important awareness of exact length and necessity of boardwalks that could change current cost estimation significantly. In addition, concern regarding private landowner use of railroad ROW for a section of driveway was taken into account to recommend the northern option. But should adjacent landowners find these improvements beneficial, such unknowns could further adjust this study's current recommendation.

This study provides foundational recommendations for a Wing Road Rail-With-Trail corridor on either side of the tracks. Future due diligence and refinement of this study's findings will be an important part of determining a final path towards implementation and connection of the Ammonoosuc Rail Trail with Wing Road to support the overall Twin State Rail Trail Vision.

NORTH SIDE OPTION CONCEPT PLAN



COST REDUCTION STRATEGIES

To achieve an efficient and context-sensitive design, the preferred alternative incorporates the following strategies:

- Where feasible, the design leverages the existing rail embankment, drainage features, and access roads, minimizing new construction and earthwork where possible.
- Nonessential elements such as fencing, trailheads, and user amenities should be deferred until warranted by safety needs or increased trail use.
- Drawing from FRA guidance and successful precedents such as the Montpelier Recreation Path/VRS collaboration, fencing will only be installed where warranted by active rail operations or specific safety conditions. When needed, lower-cost fencing options such as cable or split-rail systems are recommended.
- The trail is designed with a 12 foot gravel paved surface and 2 foot shoulder on either side for a 16 foot clear corridor. There may be an option to further reduce trail and shoulder size for additional savings. The cleared corridor width is assumed to be sufficient to accommodate winter snowmobile grooming and recreational access.
- The alignment assumes no need for elevated boardwalks or complex retaining structures, reducing both capital and long-term maintenance costs. Where wet or uneven areas exist, compacted gravel or short-span culverts can provide adequate drainage solutions.
- Coordination with partners, including The NH Snowmobile Association, the NH Bureau of Trails, Cross NH Adventure Trail, NHDOT and VRS, is anticipated to support shared maintenance responsibilities, volunteer labor, and fundraising.

IMPLEMENTATION & PHASING

A phased approach is recommended to align investments with corridor readiness and available funding:

Phase 1 – Interim Trail Condition (No Rail Service):

Rail service is currently non-operational. Establishing a trail while rail service is inactive focuses on building trail only - allowing public access while deferring additional costs related to fencing, plantings, trailhead access or major kiosks and signage.

Phase 2 – Shared Corridor (Limited Rail Operations):

This phase introduces Rail-With-Trail operations with appropriate safety measures as rail activity resumes. This phase also includes investments in fencing and additional vegetation to ensure safety in the Rail-With-Trail operation. Amenities such as benches, major kiosks and signage, or trailhead construction would be deferred for phase 3.

Phase 3 – Full Build-Out (Amenities):

This phase constitutes a fully functional Rail-With-Trail operation. This phase adds user amenities (e.g., a trailhead and parking area), wayfinding and interpretive elements, and aesthetic enhancements as trail demand and funding capacity grow.