ENVIRONMENTAL ASSESSMENT

State Project: 8816-1127
Minnesota Project: XXXXXX

Northern Lights Express High Speed Passenger Rail Project from Minneapolis to Duluth, Minnesota

From The Interchange to Duluth Union Depot in
Counties: Hennepin, Anoka, Isanti, Kanabec, Pine, Carlton, and St. Louis of Minnesota and Douglas of Wisconsin
Sections, Townships, Ranges: Multiple. See Appendix A.

Submitted pursuant to 42 USC 4332, 64 FR 28545, M. S. 116D, and Section 1.11 Wisconsin Statutes, Wisconsin Administrative Code TRANS 400
By the
U.S. Department of Transportation
Federal Railroad Administration
and
Minnesota Department of Transportation
and
Wisconsin Department of Transportation

Recommended for approval by:

_____ _____

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Date

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Date

Wisconsin Department of Transportation (WisDOT) signs as a Cooperating Agency under agreement between Minnesota and Wisconsin for the Northern Lights Express Project (November 2009). This WisDOT signatory approval is expressly limited to the adequacy of environmental elements under the jurisdiction of WisDOT; which does not include the system characteristics such as projected ridership, revenue and/or project cost/benefit.

This document is available in alternative formats to individuals with disabilities by calling the Minnesota Relay Service at 1-800-627-3529.

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APPENDICES

Appendices are provided as a separate volume in electronic format. Appendices are also available upon request.

EXECUTIVE SUMMARY

The Minneapolis-Duluth-Superior Passenger Rail Alliance (Alliance[1]), in cooperation with the Minnesota Department of Transportation (MnDOT), proposes to construct the necessary infrastructure for, and to operate, an approximately 155-mile long, high-speed intercity passenger rail service between Minneapolis and Duluth, Minnesota, a portion of which will travel through Douglas County in Wisconsin (See Figure ES.1), and that will reach speeds of at least 110 miles per hour. The Alliance and MnDOT propose eight round trip trains per day as discussed in greater detail in Section 3.3.2.4. This proposed passenger rail service is known as the Northern Lights Express (NLX) service.

The Federal Railroad Administration (FRA) is the lead federal agency for this Tier 1 Service Level National Environmental Policy Act (NEPA) document for the proposed NLX service. In addition, FRA is providing funding for subsequent Tier 2 (project level) environmental analyses and preliminary engineering for the discrete capital projects required to implement the proposed NLX service (such funding is conditioned on the completion of the Tier 1 environmental analysis for the proposed NLX service).

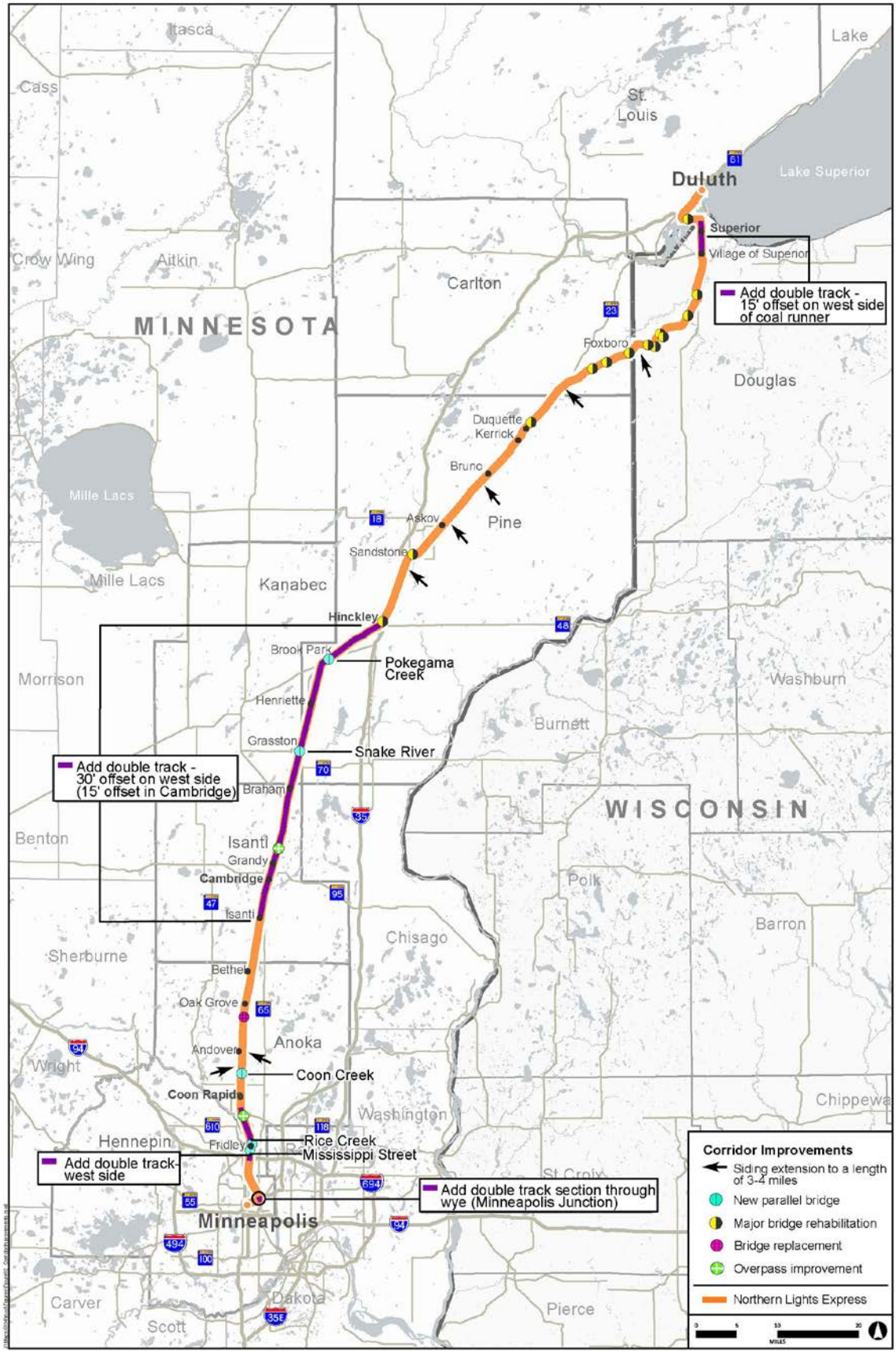
This Environmental Assessment (EA) describes the Purpose and Need for the proposed project, alternatives considered, environmental impacts and identified mitigation, and agency coordination and public involvement. This EA was prepared by MnDOT in consultation with FRA, the Alliance and the Wisconsin Department of Transportation (WisDOT). Projects requiring either federal approval or potential federal funding must comply with NEPA . "The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment" (40 CFR 1500.1). NEPA requires the evaluation of a proposed project to determine if the proposed action would have a foreseeable significant impact on the human and natural environment. If FRA determines that the proposed action would not have a foreseeable significant impact, then FRA will prepare and issue a Finding of No Significant Impact (FONSI).

With a tiered approach, the Tier 1 Service Level NEPA document evaluates impacts of a project as a whole, with a focus on corridor-wide and more qualitative impacts. Following completion of the Tier 1 Service Level NEPA document and the associated decision document, Tier 2 Project Level NEPA documents would be developed to evaluate the environmental impacts within one or more specific areas.

The purpose of this Tier 1 Service Level EA is to evaluate the service-wide environmental impacts of the alternatives developed to meet the project's purpose and need. In addition, the EA is used to provide sufficient environmental documentation to determine the need, under Minnesota state law, for an Environmental Impact Statement (EIS) or a Negative Declaration and

[1] The Minneapolis-Duluth/Superior Passenger Rail Alliance is a joint powers board formed in 2007 to explore options for renewing passenger rail service between the two metropolitan areas. Alliance members include the regional rail authorities of Hennepin, Isanti, Pine, St. Louis and Lake counties, the cities of Minneapolis and Duluth, and the Mille Lacs Band of Ojibwe.

Figure ES.1. Project Location



under NEPA for an EIS or a Finding of No Significant Impact (FONSI). At the Wisconsin state level, Wisconsin Administrative Code Chapter TRANS 400 directs the Wisconsin Department of Transportation (WisDOT) to follow NEPA for both NEPA and Wisconsin Environmental Policy Act (WEPA) purposes when federal funds are involved in the proposed action.

MnDOT has prepared this EA is in compliance with NEPA, FRA's Procedures for Considering Environmental Impacts (64 FR 28545), MS 116D, and Section 1.11 Wisconsin Statutes, Wisconsin Administrative Code, TRANS 400. This document also serves as a Minnesota Environmental Assessment Worksheet (EAW).

The environmental analysis conducted for this EA is based on a project description that has been developed at the concept engineering level and that provides information for a "worst case" impact analysis. Project refinements may result in impacts that substantially differ from these assumed worst-case impacts, however it is not anticipated that project refinements would result in additional significant environmental impacts. These refinements will be evaluated and addressed in subsequent environmental documentation as determined by FRA and MnDOT (and Wisconsin as applicable) to meet federal and state requirements.

The Tier 1, or what is referenced as the Service Level EA, evaluates the service-wide environmental impacts of the proposed action and will set the foundation for the subsequent Tier-2, or what is referenced as the Tier 2 or Project Level NEPA documentation.

This Tier 1 EA addresses concept level engineering improvements, including corridor improvements (i.e. concept level track and bridge construction and rehabilitation, communication and safety improvements, and roadway improvements) and proposed NLX-required station improvements at the Interchange in Minneapolis (extension of the existing platform), and the Depot in Duluth (addition of a platform and separation of passenger and freight rail operation in yard territory)

The Project Level NEPA documents will evaluate proposed NLX project elements that at the time the Tier 1 Service Level EA was completed were not defined at a level where detailed evaluation and required mitigation could be completed and disclosed. As noted in this Tier 1 Service Level EA, proposed project elements that will be fully addressed in the Tier 2 Project Level EAs include, but are not limited to, the layover facility at the south terminus (Minneapolis) and the locations for stations within the communities of Cambridge, Hinckley and Superior. Additionally, the potential for a light (satellite) maintenance facility would be included in subsequent Project EA documents. Potential refinements to the proposed station at Coon Rapids-Foley station will also be included in the Tier 2 Project Level EA document.

Information included in the Tier 1 Service Level EA will be incorporated by reference, as appropriate in the Tier 2 Project Level EAs. Additionally, as engineering is advanced for the proposed NLX project, the impact evaluation and mitigation measures identified in the Tier 1 Service Level EA will be refined, as appropriate, and documented in the Tier 2 Project Level EA documents. Specific areas where refinements, resulting in anticipated further minimization of potential impacts include right-of-way, vegetation, floodplains, wetlands, farmland, noise mitigation, hazardous materials, potential public at-grade road closures, cultural resources

(Section 106) and Section 4(f) (public land and historic sites).

For the proposed NLX project, three stand-alone Tier 2 EAs will be completed and advanced simultaneously. Each Tier 2 EA document will include project elements that were not defined at a project level at the time the Tier 1 EA document was prepared, along with refinements in the impact evaluation that reflect the advancement of the engineering analysis for the specific geographic section. For purposes of the Tier 2 environmental evaluations, the full NLX corridor from Minneapolis to Duluth will be divided into three distinct geographic sections, as defined below:

- Section A - The Minneapolis Interchange in Downtown Minneapolis to Coon Creek Junction
- Section B - Coon Creek Junction to Hinckley
- Section C - Hinckley to Duluth

The three geographic sections for the NLX Corridor do not reflect phases of the proposed action, as the proposed action is the full build out of the NLX high speed rail project from Minneapolis to Duluth. The Tier 2 Project Level EA documentation will complete the studies and environmental assessments required for the NLX Corridor investments and capital improvements.

Purpose and Need for the Project

Purpose

The purpose of the NLX project is to meet transportation needs, summarized below and detailed in Chapter 2, through the creation of a passenger rail service that links Minneapolis and Duluth, and that connects with other existing and planned transportation systems, including other planned Passenger Rail, Commuter Rail, Light Rail Transit (LRT), and Bus Rapid Transit (BRT) routes, as well as the roadway network.

Need

The need for the proposed action is based on the limitations and vulnerabilities of available travel modes between Minneapolis and Duluth. The proposed action offers an opportunity for a viable alternative to vehicular travel between Minneapolis and Duluth by providing: competitive travel times; safe, reliable and accessible service; and amenities to improve passenger travel quality and comfort. In addition, the proposed project could provide: improved overall system continuity in the state and interstate transportation networks, in conformance with statewide and regional transportation plans; opportunities for rail oriented development – land use patterns that encourage more efficient development of land in combination with more efficient use of transportation facilities; an impetus for station-area joint development, downtown redevelopment and economic development for growth in travel and tourism in all the communities along the route, contributing to the viability and vitality of the region; and transportation improvements that avoid or minimize environmental impacts.

The *Minneapolis-Duluth/Superior Restoration of Intercity Passenger Rail Service Comprehensive Feasibility Study and Business Plan* (December 2007) found sufficient travel demand between Minneapolis and Duluth to support high speed rail.

An alternative mode of travel needs to have a competitive travel time as compared to the estimated highway travel time for the 155-mile distance between Minneapolis and Duluth of two hours and 30 minutes (during uncongested conditions).

Alternatives Evaluation Process

In accordance with FRA guidance, a multi-level evaluation (Level 1, 2 and 3) was used which included an identification of a wide range of corridors, screening based on operational characteristics, investment requirements and environmental constraints at a broad level, followed by examination of ridership and operations in more detail for potentially viable alternatives. The process included input through public outreach and participation by stakeholder agencies in a rigorous evaluation process.

Seventeen alternative corridors were identified as part of the Level 1 process, which was an initial screening of rail alternatives, addressing operational characteristics, investment requirements, and environmental constraints at a broad conceptual level. Three corridors (Routes 9, 11 and 11a) were carried into the more detailed Level 2 analysis to compare their functional characteristics (capital investment, travel time, ridership, revenue and benefit-cost). Additional review in the Level 3 study included development of conceptual engineering of Routes 9, 11 and 11a and a more detailed capital cost estimate based on this concept engineering. Based on the Level 2 analysis and additional information from the Level 3 analysis, Route 9 was identified as the only build alternative to be evaluated in the EA. It is also the preferred alternative. See Appendix B for related FRA correspondence. This evaluation process is discussed in more detail in Chapter 3 of this EA.

Alternatives Under Consideration

No Build Alternative

The No Build Alternative would perpetuate the existing condition, i.e., no high speed passenger rail service between Minneapolis and Duluth. The existing track configuration would remain. There would be no new bridges. Any rehabilitation or replacement of track or bridges would be by BNSF to meet its needs for regular freight rail operations. No stations, layover or maintenance facilities specific to NLX passenger rail service would be constructed. Improvements to the LRT component of the intermodal station (the Interchange) located at Fifth Street and 3rd Avenue in Minneapolis are assumed under the No Build Alternative, as these are the only programmed improvements at the Interchange at this time.

The No Build alternative was retained for detailed analysis, and its consequences were fully developed to allow equal comparison to the Build Alternative.

Build Alternative

The Build Alternative route follows the existing BNSF Railway right of way from downtown Minneapolis (referenced as the Interchange) northeast to Duluth (the Depot), including shared and new dedicated track. This route represents the only railroad connection currently in full active freight service between Minneapolis and Duluth. The corridor roughly parallels State Highways 65 and 23 through Hennepin, Anoka, Isanti, Kanabec, Pine, Carlton, Douglas (Wisconsin), and St. Louis counties and terminates in Duluth. See Figure ES.1.

NLX Route Improvements by Segments

The preferred Build Alternative route is approximately 152 miles long. For purposes of description only, the route is divided into nine segments, shown in Figure ES.2 and described in Table ES.1.[2] As noted previously, the service level impact analysis presented in this EA is based on a concept-level project definition. This definition, presented in Table ES.1, includes assumed project improvements based on current knowledge, using "worst case" assumptions in order to identify the potential for significant environmental impacts.

Figure ES.2. NLX Route Segments

[2] Route segment numbers are discontinuous. These segments were used during the route alternative evaluation process to allow for consistency in comparing alternatives. Information in the Level 2 and Level 3 studies is presented by these segments.

Table ES.1. NLX Route Segments and Assumed Concept-Level Corridor Improvements

Segment	Location		Milepost*		Segment Mileage	Assumed Concept-Level Improvements**
	Start	End	Start	End		
1 Wayzata Subd.	The Interchange, Minneapolis	Minneapolis Junction, Minneapolis	11.6	9.7	2.1	new connecting track 15' from the existing track – on west for segment and east for a segment – through wye at Minneapolis Junction for a distance of approx. 3,000'.
2 Midway Subd.	Minneapolis Junction, Minneapolis	University Avenue, Minneapolis	9.7	11.4	1.4	
3 Staples Subd.	University Avenue, Minneapolis	Coon Creek Junction, Coon Rapids	11.4	21.1	9.7	6.2 mi new track partially west and partially east of existing track between I-694 and Hwy 610/Coon Creek Junction in Fridley (referred to as "the third main"). Track improvements through Coon Creek Junction. New RR bridges over Mississippi Street and Rice Creek. Modification of Hwy 610 overpass.
4 Hinckley Subd.	Coon Creek Junction, Coon Rapids	Isanti	136.9	113.0	23.9	3 mi. siding west of existing track and 1 mi. siding extension east of existing track in Andover. RR bridge replacement over Coon Creek. New parallel RR bridge over Coon Creek.
5 Hinckley Subd.	Isanti	Cambridge	113.0	107.4	5.6	6 mi. of new track located 30' west of existing track between Isanti and Cambridge, and 15' west of existing track in Cambridge.*** Connection of existing sidings between Isanti and Cambridge.
6 Hinckley Subd.	Cambridge	Hinckley	107.4	72.3	34.1	35 miles of new track located 15' west of existing track in Cambridge and Braham, and 30' west of existing track elsewhere between Cambridge and Hinckley. New RR bridges over Snake River at Grasston, ditch near Henriette (box culvert), and Pokegama Creek at Brook Park. Replacement of 379th Street overpass

						over RR near Grandy. Rehab of existing bridges over Pokegama Creek and Snake River.
17 Hinckley Subd.	Hinckley	Boylston	72.3	11.8	60.5	New or extended sidings to a total length of 3-4 miles each, 15' east of existing track, near Sandstone, Askov, Bruno, Holyoke, and Foxboro. Rehab of existing bridges over Grindstone, Kettle, Big Willow, Net (2), Black and Nemadji Rivers, and State Line, Balsam, Little Balsam, Hubert and Norvell Creeks.
18 Lakes Subd.	Boylston	Superior (n. of 28th St.)	12.6	5.4	8.7	3 mi. of new track 15' west of existing track between Central Avenue and 11th St. N. in Superior.
19 Lakes Subd.	Superior (n. of 28th Street)	Duluth Union Depot	5.4	0	5.4	1.5 mi. of new track 15' west of existing track between Segment 18/19 boundary and 11th Street in Superior. 1.1 mi new freight siding along existing track from the wye west of Grassy Point to Bridge to 46th Ave. in Duluth. Bridge over water inlet. Segment of main track approaching the Depot and track for layover at Depot. Rehab of Grassy Point Bridge.
Total					152.4	

*Mileposts change due to change in railroad subdivision. Note that RR MPs often are not exact miles, therefore differences between MP references may not equate to actual distances.
**The assumed track spacing represents worst-case assumption. The existing track would be rehabilitated to continuous welded rail in all segments. The need for rehabilitation of the existing track parallel to the areas of dedicated track between Isanti and Hinckley and in Superior will be evaluated as operational analyses are refined in subsequent project phases.
***Note 0.3 mile of the dedicated passenger track is located in Segment 4.

Station Locations

Downtown Minneapolis Station – Passenger Rail Element of the Proposed Interchange Intermodal Station. The southern terminus of the proposed NLX service would be at the intermodal station (the Interchange) located at Fifth Street and 3rd Avenue in Minneapolis. The existing platform would be extended to a length of approximately 900 feet. This improvement is addressed by this EA.

Duluth Union Depot. The northern terminus of the proposed NLX service would be the Duluth Union Depot located at Michigan Street and Fifth Avenue in Duluth, Minnesota. There is an existing platform at the Depot that serves the Northshore Scenic Railroad. A new platform to serve NLX would be needed to meet safety and accessibility requirements. In addition, separation of passenger and freight operations in yard territory would be required to accommodate the proposed NLX service. These improvements are addressed by this EA.

Coon Rapids – Foley Station. A center platform immediately south of Foley Boulevard, between the existing BNSF Main 2 line and the proposed third main, and additional parking for the proposed station in the northeast corner of Foley Boulevard and the BNSF tracks near East River Road are proposed. These improvements are addressed by this EA.

Cambridge. Station area planning conducted by the city of Cambridge considered four sites and has recommended further analysis of the City Center site, located north of 1st Avenue East and east of Main Street, and the Ritchard site located at 24th Avenue Southwest east of Main Street for NLX station location options. Station area planning has assumed that improvements would

consist of an 850 foot long platform and parking space for 200. Station improvements in Cambridge will be addressed separately in future environmental documentation.

Hinckley. Station area planning conducted by the city of Hinckley considered two sites and has recommended further analysis of both of these: the Southwest Site near the intersection of Old Highway 61 and Fire Monument Road, and the Pit Site, south of Main Street, east of Power Avenue South, north of 2nd Street SE and west of Steven Avenue South. Station area planning has assumed that improvements would consist of an 850 foot long platform and parking space for 200 cars. Station improvements in Hinckley will be addressed separately in future environmental documentation.

Superior. While no formal station area planning has yet been done in Superior, improvements are assumed to be similar to stations in Foley, Cambridge, and Hinckley with respect to platform length, access to platform, and parking. A site just north of Highway 2 (Belknap Street) immediately east of the proposed Build Alternative, has been identified by City staff as a potential station location. Station improvements in Superior will be addressed separately in future environmental documentation.

Other Project Improvements

Except where noted, the following improvements are also addressed by this Service Level EA.

- Extension of existing culverts within new track areas.
- Rehabilitation/improvements to existing track where new parallel track is not provided.
- Limited curve straightening occurring within existing railroad right of way.
- Signalization and communication systems upgrades throughout the corridor.
- Track and signal improvements, including control points, turnouts and crossovers, to increase flexibility and capacity in operations.
- Installation of warning devices with four quadrant gates or other acceptable protections/appropriate warning devices at all public crossings.
- Improvements to "humped" at-grade street crossings.
- Closure of 30 to 40 percent of private at-grade crossings, with alternative access provided.
- Installation of fencing in urbanized areas of the corridor and as determined needed for safety in rural areas of the corridor.
- Layover occurring at existing train yards at the south and north project termini. Layover facilities include stage and storage tracks and provide for basic cleaning and daily servicing including FRA-mandated daily equipment inspections.
    - At the south terminus (Minneapolis), the location of layover facilities is yet to be determined, but is subject of on-going coordination with planning for the Midwest Regional Rail Initiative (MWRRI), with the desired location being immediately proximate to the Interchange. To accommodate the layover needs of the proposed NLX service only (two train sets), approximately 1,000 feet of track is anticipated to be required. Additional track would be required to serve the layover needs of other passenger rail service, either at a shared site with the proposed NLX service or elsewhere. The layover site at the south terminus will be addressed separately in future environmental documentation.
    - At the north terminus (Duluth), the identified NLX layover site is the rail yard immediately west of the Depot; this site will accommodate layover of two train sets. There are currently no facilities for layover at this location. Facilities to be built include a building to house cleaning equipment, restocking convenience items on the train and equipment for minor repairs to train sets. It would also include fuel storage and a fueling facility. The layover facility would have the capability to provide FRA-mandated daily equipment inspection.
- Heavy maintenance would be provided by the equipment vendor or other agencies at an existing off-site location yet to be selected.

Area of Direct Impact (Footprint)

Typical cross-sections developed for new track areas estimate an area of impact (footprint) with widths that range from 44 feet to 92 feet except for a portion in the City of Braham where a cross-section of 29 feet was developed in order to avoid impacts to a park. This area of direct impact is addressed by this EA.

Operations

While the NLX operating plan would continue to be refined through on-going project development activities, including consultation with BNSF, preliminary analysis has assumed a track configuration along with assumed speeds of up to 79-mph south of Coon Creek Junction, up to 90 mph on existing track north of Coon Creek Junction, and up to 110-mph on dedicated track between Isanti and Hinckley. This track configuration results in a 2 hour 17 minute timetable between Minneapolis and Duluth. The preliminary analysis also has assumed use of FRA Tier-I Compliant tilting trains, and preliminary NLX train schedules using a three-train active fleet rotation (a fourth train held for equipment protections and maintenance reserve) and assuming eight round trip trains per day.

Ridership

Analysis to date reports ridership forecasts for the proposed project of 938,000 annual riders in 2020 growing to 1,302,000 annual riders in 2040, and annual passenger miles at 96 million in 2020 growing to 130 million in 2040.[3]

Impacts and Measures to Avoid, Minimize and Mitigate

Table ES.2 summarizes the impacts of the No Build and the Build Alternative, as well as the proposed measures to avoid, minimize and mitigate the impacts of the Build Alternative.

Public and Agency Coordination

Several public information meetings were held between 2009 and 2012 in Braham, Cambridge, Coon Rapids, Duluth, Hinckley, Minneapolis, and Sandstone, Minnesota and in Superior, Wisconsin. Project information has been distributed through newsletters and the project website http://www.northernlightsexpress.org.

The project is guided by a Steering Committee comprising staff from the Alliance, MnDOT, WisDOT, Anoka County, Hennepin County, the Mille Lacs Band of Ojibwe and the Duluth–Superior Metropolitan Interstate Council (MPO).

Numerous agencies provided input to the study process, both through environmental agency coordination meetings, held October 2009, November 2011 and December 2011, as well as via

[3] *Northern Lights Express Technical Memorandum: Functional Analysis of Routes 9, 11 and 11A (Level 2 Analysis)*, December 2010.

email, phone or mail correspondence. In addition to the FRA, MnDOT, WisDOT, and other agencies participating through the project Steering Committee, agencies involved in project coordination include the Minnesota Department of Natural Resources (MnDNR), Wisconsin Department of Natural Resources (WDNR), Minnesota Pollution Control Agency (MPCA), Natural Resources Conservation Service (NRCS), U.S. Fish and Wildlife Service (USFWS), U.S. Coast Guard (USCG), U.S. Army Corps of Engineers (COE), Great Lakes Indian Fish and Wildlife Commission (GLIFWC), Minnesota State Historic Preservation Office (MnSHPO), Wisconsin State Historic Preservation Office (WisSHPO), and Federally-recognized tribes in Minnesota and Wisconsin.

In addition, project staff met with BNSF on a number of occasions to discuss project progress and review technical data. BNSF evaluated and commented on proposed operations, infrastructure and analyses with regard to track charts, timetables and proposed improvements as they were being developed at the concept level described in this EA.

Additional comments from the public and agencies affected by this project are requested during the public comment period described on the transmittal letter distributing this EA. A combined public informational meeting/public hearing will be held after the EA distribution. Following the comment period, the responsible agencies (FRA, MnDOT, and WisDOT) will make a determination as to the adequacy of the environmental documentation. If further documentation is necessary it could be accomplished by preparing an Environmental Impact Statement (EIS), by revising the EA, or clarification in the Findings of Fact and Conclusion, whichever is appropriate.

Table ES.2. Summary of Impacts and Measures to Avoid, Minimize and Mitigate[4]

Resource	No Build Impact	Build Alternative	
		Impact	Avoidance, Minimization, Mitigation Measures
Land use	Does not meet development goals in station communities.	No significant change in land use type.	N/A
		Compatible with corridor land use.	N/A
		Corridor footprint impacts: -420 acres within construction limits -120 acres right of way acquisition -relocate RR structure in Cambridge -temporary impact to rear parking lot of Cambridge Mall/City Hall.	Further minimization of corridor footprint impacts through refinements in preliminary engineering phase. Right of way acquisition in accordance with federal law.
		Station locations compatible with local land use plans.	N/A
Ridership	N/A	938,000 annual riders in 2020 1,302,000 annual riders in 2040	N/A
Intermodal transit	No expanded travel options for corridor.	Connections to other modes expand travel options.	N/A
		No adverse impacts to transit.	N/A
Traffic circulation	No safety improvement at at-grade crossings.	Temporary impacts to at-grade crossings and more circuitous travel during construction.	Staging of construction to ensure availability of convenient alternative crossings.
		No permanent closure of public at-grade crossings.	N/A
		Closure of up to 14 private at-grade crossings.	Alternate access or property acquisition where private crossings closed.
		Safety improvements at at-grade crossings.	N/A
Pedestrian/ bicyclists	No safety improvement at at-grade crossings.	Temporary impacts to at-grade crossings and more circuitous travel during construction.	Staging of construction to ensure availability of convenient alternative crossings.
		No permanent closure of public at-grade crossings.	N/A
		Closure of up to 14 private at-grade crossings.	Alternate access or property acquisition where private crossings closed.
Freight	None.	Proposed trackwork and system improvements support joint passenger and freight operations.	N/A
Vegetation/ Wildlife/ Habitat	None.	Vegetation converted to trackbed and slopes: -61 acres wooded -94 acres brush/grass -94 acres wetlands -47 acres cropland[5] (remaining 124 acres developed, i.e. lawn, impervious surface)	Further minimization of corridor footprint impacts through refinements in preliminary engineering phase. Mitigation as required by agencies such as COE and DNR.
		Construction potential to spread invasive species.	Good housekeeping construction practices, e.g. decontamination of equipment on site, use of weed-free mulch, etc.

[4] Refer to detail in EA chapters for discussion of impacts by state.

[5] Note that "cropland" refers to cover type, specifically planted or cultivated agricultural land, and differs from "prime farmland" and "farmland of statewide importance" which are based on soil types.

Table ES.2. Summary of Impacts and Measures to Avoid, Minimize and Mitigate (continued)

Resource	No Build Impact	Build Alternative	
		Impact	Avoidance, Minimization, Mitigation Measures
Vegetation/ Wildlife/ Habitat (cont.)	None.	Minimal impact to terrestrial wildlife habitat, i.e. strip uses of small portions of edge habitat.	Further minimization of corridor footprint impacts through refinements in preliminary engineering phase.
		Where corridor not fenced, increased risk of animal mortality, i.e. animal-train collision; where corridor fenced, animal movement restricted.	Consult with DNR regarding fencing. Investigate innovative fencing types that permit animal movement but minimize for potential increase in animal-train collisions.
		Potential impact to migratory bird nesting (bridges).	Coordination with USFWS regarding the Migratory Bird Treaty Act. Bridges cleared of nest and protected from nest-building during construction.
		Potential for erosion/sedimentation, other construction impact to aquatic habitat.	Bridge activities timed to avoid spawning periods. BMPs to protect stream banks and control silt.
		Impacts to 2 native prairies.	Further minimization of corridor footprint impacts through refinements in preliminary engineering phase. Coordination with MnDNR. Reseeding with native plant species.
Threatened and endangered species	None.	May affect but not likely to adversely affect the Canada lynx. No effect to other federally-listed species known to occur in project area counties.	N/A
		Construction potential for effect to state plant species (MN and WI), Blandings turtle (MN), and mussel species (MN).	Avoidance or minimization of impacts to species through refinements in preliminary engineering phase. Consultation with DNRs regarding need for plant survey; subsequent consultation pending findings. MnDNR practices for protection of Blandings turtle. Mussel surveys at new water crossings within 3 years of construction.
Wetlands	None.	Impacts up to 97 acres. Impacts 3 Minnesota Public Waters.	Avoidance or minimization of wetland impacts through refinements in preliminary engineering phase. Mitigation in accordance with Corps of Engineers (COE) and state requirements. Up to 200 acres of mitigation; public and private wetland banks likely mitigation options.
Water quality/ stormwater runoff	Perpetuates minimal water quality treatment (existing condition).	Potential for water quality and erosion/sedimentation impacts during construction.	BMPs (erosion control practices; also see contamination) during construction Vegetate embankment after construction.
		Increased impervious surface. Project adds water quality treatment where there currently is none.	Storm treatment ponds and other permanent BMPs to provide treatment in accordance with regulatory requirements.

Table ES.2. Summary of Impacts and Measures to Avoid, Minimize and Mitigate (continued)

Resource	No Build Impact	Build Alternative	
		Impact	Avoidance, Minimization, Mitigation Measures
Floodplain and other water-related management districts	None.	415 linear feet of floodplain fill. 11 FEMA waterbody crossings in areas of new construction. No significant floodplain encroachment.	Further minimization of corridor footprint impacts through refinements in preliminary engineering phase. Permitting requirements.
		No special issues related to shoreland districts, coastal zone management areas, navigable waters, or state wild and scenic rivers, not otherwise addressed through other impact areas.	N/A
Groundwater	None.	Construction areas within well protection areas, source water assessment areas, and drinking water supply management areas.	Conditional use permitting review. Route stormwater runoff outside of protection areas and/or line treatment facilities that are within protection areas.
Air quality	No reduction in emissions.	Reduction in emissions of carbon monoxide, nitrogen oxide, volatile organic compounds, particulate matter and carbon dioxide.	N/A
Noise	None.	Temporary construction noise.	Avoid nighttime construction in residential areas. Locate stationary construction equipment and route construction-related truck traffic away from noise-sensitive sites. Temporary noise barriers during construction. Alternative construction methods
		Operation noise: -43 severe residential impacts. -18 severe institutional (parks, churches, schools) impacts. -279 moderate residential impacts. -10 moderate institutional impacts.	Assist communities with quiet zone application process to the FRA (Waiver from the FRA for the Train Horn rule). Implementation of quiet zones would reduce impacts to one severe park impact and 4 moderate residential impacts. More detailed noise modeling during preliminary engineering. Additional mitigation options may include noise barriers, vehicle noise specifications, building sound insulation, and special trackwork.
Vibration	None.	Temporary construction vibration.	Avoid nighttime construction in residential areas. Locate stationary construction equipment and route construction-related truck traffic away from vibration-sensitive sites. Alternative construction methods.
		Operation vibration: 4 residential impacts.	More detailed vibration modeling during preliminary engineering. Mitigation options include ballast mats, tire derived aggregate, floating slabs, resilient rail fasteners, special trackwork.

Table ES.2. Summary of Impacts and Measures to Avoid, Minimize and Mitigate (continued)

Resource	No Build Impact	Build Alternative	
		Impact	Avoidance, Minimization, Mitigation Measures
Hazardous waste/ contaminated material/solid waste	None.	Several contaminated sites within 500 ft. of corridor construction; potential to encounter contamination during ground disturbance.	Avoidance or further minimization of impacts through refinements in preliminary engineering phase. Further site investigation prior to construction. Plan for handling and treating contaminated soil consistent with state rules and procedures.
		Solid waste generated during construction.	Solid waste management and disposal consistent with state rules and procedures.
		Potential for impact to water quality from bridge rehab cleaning and painting.	Best practice containment and monitoring procedures.
		Slight increase in potential for spills due to increased rail traffic.	Best practice containment and monitoring procedures.
Cultural Resources	None.	Programmatic Agreement identifies Section 106 procedures. Impacts will be addressed in Tier 2 documents.	Measures will be addressed in Tier 2 documents.
Farmland and soils	None.	Up to 33 acres of prime farmland impacted. Up to 70 acres of farmland of statewide importance impacted. Land bridge may be needed in area of soft, compressive soils.	Further minimization of corridor footprint impacts through refinements in preliminary engineering phase. Consultation with NRCS and WDATCP during Tier 2 environmental review.
		Closure of up to 14 private at-grade crossings; potential for effect to farming operations.	Alternate access or property acquisition where private crossings closed.
Section 4(f)/6(f): parks, recreation areas and trails	None.	Temporary closure of Rice Creek, Coon Creek, and Sand Creek Trails during construction. No Section 4(f) use, including constructive use.	Trail signage, public information during closures.
		Temporary noise, dust and visual impacts to numerous parks during construction. No Section 4(f) use, including constructive use.	Best practices compliant with local ordinances.
		Moderate operational noise impacts to Rose Memorial Garden (Braham) and Unnamed Park (Askov). Severe operational noise impacts to Freedom Park (Braham), Train (Railroad) Park (Sandstone), Banning State Park (Sandstone), Jackie Berger Memorial Park (Duquette). No Section 4(f) use, including constructive use.	Coordinate with communities to encourage and assist with implementation of train horn quiet zones as full implementation of zones would reduce park impacts to one severe park impact (Freedom Park). More detailed noise modeling during preliminary engineering. Additional mitigation options include noise barriers, vehicle noise specifications, building sound insulation, and special trackwork.
Section 4(f): historic sites	None.	Impacts will be addressed in Tier 2 documents.	Measures will be addressed in Tier 2 documents.

Table ES.2. Summary of Impacts and Measures to Avoid, Minimize and Mitigate (continued)

Resource	No Build Impact	Build Alternative	
		Impact	Avoidance, Minimization, Mitigation Measures
Visual	None.	Generally minor change in views (existing railroad corridor).	N/A
		Fencing would affect views in urban areas (permanent fixture and potential maintenance issue).	Decorative fencing in visually sensitive urban areas, as identified in consultation with communities. Establishment of agreements to ensure responsibility for fence upkeep and maintenance of fenced area.
Socioeconomic	Does not meet development goals in station communities.	Temporary impact to rear parking lot of Cambridge Mall/City Hall.	Further minimization of corridor footprint impacts through refinements in preliminary engineering phase
		Closure of up to 14 private at-grade crossings. Potential change to Braham Area Sportsman's Club access.	Alternate access or property acquisition where private crossings closed.
		Moderate noise impacts to 4 schools, 3 churches, and 2 parks. Severe noise impacts to 2 schools, 8 churches, 2 cemeteries, 1 daycare, and 4 parks.	Assistance to communities to establish train horn quiet zones. Quiet zones eliminate noise impacts to all schools, churches, cemeteries, and daycare, and all but one park.
		Enhanced safety at existing at-grade crossings.	N/A
Environmental justice	None.	Minority and low-income populations identified in the study area but no high or disproportionate adverse effects.	N/A
Economic	Does not meet development goals in station communities.	Benefits:[6] 18,833 jobs. $617M income. $26M state tax revenue. $69M federal tax revenue. $21M property tax revenue. $372M household income. Benefit/cost ratio: 1.03.	N/A
	No reduction in energy use.	Benefits:[6] Reduction in energy use. $210.5M highway fuel savings. Up to 47M vehicle miles traveled (VMT) diverted to rail by 2040.	N/A
	No property value impacts.	Potential for minor negative property value impact due to land conversion.	Any minor negative impacts are offset by corridor property tax value gains due to project-related economic growth.
Indirect and cumulative	None.	Indirect: change in land use patterns in station communities has potential for development-related impacts.	Adverse impacts addressed through planning, permitting and environmental processes.
		Cumulative: NLX impacts plus direct and indirect impacts[7] from other actions would not result in significant potential for cumulative effects.	N/A

[6] *Minneapolis-Duluth/Superior Restoration of Intercity Passenger Rail Service Comprehensive Feasibility Study and Business Plan.* December 2007.

[7] Potential indirect impacts due to other foreseeable actions include impacts to land use, traffic/pedestrian/bicycle circulation, visual quality, farmland, natural areas, wetlands, property, vegetation, noise, animal mortality and vibration.

1.0 INTRODUCTION

The Minneapolis-Duluth-Superior Passenger Rail Alliance, in cooperation with the MnDOT, proposes to construct the necessary infrastructure for, and to operate, an approximately 155-mile long, high-speed intercity passenger rail service between Minneapolis and Duluth, Minnesota that will reach speeds of 110 miles per hour, a portion of which will travel through Douglas County in Wisconsin. MnDOT and the Alliance propose eight round trip trains per day as described in greater detail in Section 3.3.2.4. See Figure 1.1. This proposed high speed passenger rail service is known as the Northern Lights Express (NLX) service.

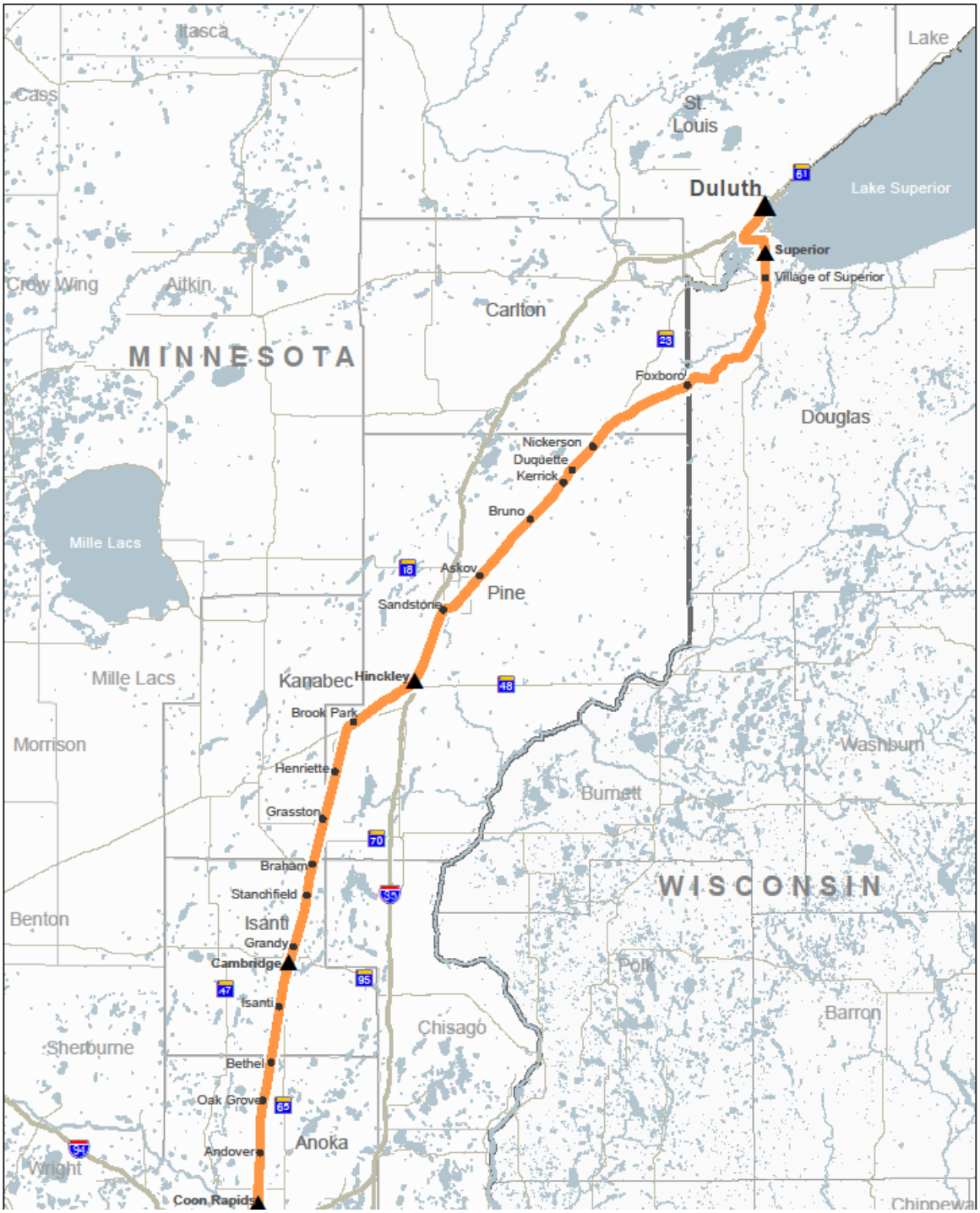
The Cities of Minneapolis and Duluth are approximately 155 miles apart. The existing transportation system connecting these cities includes highway, bus, and air modes. Amtrak provided limited passenger rail service on this corridor, but discontinued it in 1985.

Rail infrastructure in the two termini metropolitan areas includes multiple tracks, heavily used mainlines, and several major freight yards. The existing rail connection between Minneapolis and Duluth is a single track Burlington Northern Santa Fe (BNSF) mainline called the Hinckley Subdivision, which has been a freight-only line since 1985 when passenger service was discontinued. The Union Pacific and Canadian Pacific also use this line. This corridor is the Build Alternative, described in detail in Chapter 3.

Most of the Build Alternative corridor is in Minnesota; approximately one-fifth is in Douglas County, Wisconsin[8]. The southern terminus of the corridor would be in downtown Minneapolis at the Interchange, an intermodal facility that currently serves as the terminal for the Northstar commuter rail line and Hiawatha light rail transit (LRT) at the crossing of Fifth Street and the BNSF mainline. The corridor outside of the two termini metropolitan areas is primarily rural, with several communities along the southern two thirds of the corridor. The northern terminus of the corridor would be in downtown Duluth at the St. Louis County Heritage and Arts Center (The Depot) which includes the historic Union Depot located at Fifth Avenue and West Michigan Street.

FRA is the lead federal agency for this Tier 1 Service Level National Environmental Policy Act (NEPA) document for the proposed NLX service. In addition, FRA is providing funding for subsequent Tier 2 (project level) environmental analyses and preliminary engineering for the discrete capital projects required to implement the proposed NLX service (such funding is conditioned on the completion of the Tier 1 environmental analysis for the proposed NLX service).

[8] Corridor counties: Hennepin, Anoka, Isanti, Kanabec, Pine, Carlton, and St. Louis of Minnesota; Douglas of Wisconsin. See Appendix A for Sections, Townships, Ranges.


Itasca
Lake
Cass
St. Louis
Duluth
Lake Superior
Superior
Village of Superior
Crow Wing
Aitkin
Carlton
MINNESOTA
Foxboro
Douglas
Nickerson
Duquette
Kerrick
Bruno
Mille Lacs
Askov
Pine
Sandstone
Mille Lacs
Kanabec
Hinckley
Brook Park
Morrison
Washburn
Henriette
Burnett
Grasston
Braham
WISCONSIN
Stanchfield
Benton
Isanti
Grandy
Cambridge
Polk
Isanti
Barron
Chisago
Sherburne
Bethel
Oak Grove
Anoka
Andover
Wright
Coon Rapids
Chippewa

To date the proposed project has involved the following agreements between FRA and MnDOT:

- March 11, 2009 - Cooperative Agreement No. DTFR53-09-H-00008 to conduct environmental review and associated engineering for the proposed project.

- September 7, 2011 - The Northern Lights Express - PE/NEPA Cooperative Agreement No. FR-HSR-0070-11-01-00 to complete preliminary engineering (PE) and Tier 2, project level environmental reviews for the NLX.

- December 30, 2011 - The Northern Lights Express Light Detection and Ranging (LiDAR) Flights/Mapping and Service Development Plan – Twin Cities – Duluth Route Cooperative Agreement No. FR-RLD-0009-12-01-00 to conduct LiDAR flight/mapping and completion of the Service Development Plan (SDP) for the NLX.

A Steering Committee comprising staff from the Minneapolis-Duluth-Superior Passenger Rail Alliance, MnDOT, the Wisconsin Department of Transportation (WisDOT), Anoka County, Hennepin County, the Mille Lacs Band of Ojibwe and the Duluth–Superior Metropolitan Interstate Council (MPO) was formed to provide technical assistance to the project development process. Participation in the Steering Committee was open to all Alliance members. Members of the Steering Committee provided a vast knowledge of existing transportation services including roadway, trail, bus, Bus Rapid Transit (BRT), LRT and commuter rail services as well as other developing high speed rail routes. The Steering Committee held numerous meetings beginning August 2009 and continuing through the project development.

This Environmental Assessment (EA) describes:

- Purpose and need for the proposed project
- alternatives considered
- environmental impacts and mitigation
- agency coordination and public involvement

MnDOT prepared this EA in compliance with NEPA to fulfill requirements of 42 USC 4331, et seq (NEPA) and the FRA's Procedures for Considering Environmental Impacts found in 64 Federal Register 28545.

Tiering is a concept encouraged by the Council on Environmental Quality (CEQ) in environmental impact assessment reviews, so as to eliminate repetitive discussions of the same issues and focus on the actual issues ripe for decisions at each level of environmental review (see 49 CFR §1502.20 and §1508.28). This Tier-1 Service-level NEPA document addresses broader issues and likely environmental effects for the entire Rail Corridor relating to the type of service(s) being proposed, including cities and stations served, route alternatives, service levels, types of operations (speed, electric, or diesel powered), ridership projections, major infrastructure components, and identification of major terminal area or facility capacity constraints. Following completion of the Tier 1 Service Level NEPA document and the associated decision document, Tier 2 Project Level NEPA documents will be developed to

evaluate quantitatively the environmental impacts within one or more discrete projects.

The purpose of this Tier 1 Service Level EA is to evaluate the service-wide environmental impacts of the alternatives developed to meet the project's purpose and need.

The next steps in project development include the completion of a Service Development Plan and preliminary engineering (PE). MnDOT will develop a program of implementation, including discrete projects through these efforts. The proposed project's infrastructure improvements in the NLX Corridor (Table ES.1 and Station Locations) include:

- Construction or extension of passing sidings and sections of double track;
- Bridge and culvert construction, rehabilitations and replacements;
- Construction of rail stations in Minneapolis, Cambridge, Coon Rapids, Hinckley, Duluth, MN and Superior, WI, as well as platform and parking area construction;
- Construction of a layover and light maintenance facility in the Duluth area for fueling, inspections, provisioning and light maintenance;
- At-grade crossing upgrades;
- Improvements to track configuration; and
- Installation of new crossovers and signal upgrades.

The environmental analysis conducted for this EA is based on a project description that has been developed at the concept engineering level and that provides information for a "worst case" impact analysis. Note that as preliminary engineering proceeds, project refinements may result in impacts that substantially differ from these assumed worst-case impacts. However, it is not anticipated that project refinements would result in additional significant environmental impacts. These refinements will be evaluated and addressed in subsequent environmental documentation as determined by FRA, MnDOT, and WISDOT to meet federal and state requirements.

The Tier 1, or what is referenced as the Service Level EA, evaluates the service-wide environmental impacts of the proposed action and will set the foundation for the subsequent Tier-2, or what is referenced as the Tier 2 or Project Level NEPA documentation.

This Tier 1 EA addresses concept level engineering improvements, including corridor improvements (i.e. concept level track and bridge construction and rehabilitation, communication and safety improvements, and roadway improvements) and proposed NLX-required station improvements at the Interchange in Minneapolis (extension of the existing platform), and the Depot in Duluth (addition of a platform and separation of passenger and freight rail operation in yard territory).

The Project Level NEPA documents will evaluate proposed NLX project elements that at the time the Tier 1 Service Level EA was completed were not defined at a level where detailed evaluation and required mitigation could be completed and disclosed. As noted in this Tier 1 Service Level EA, proposed project elements that will be fully addressed in the Tier 2 Project

Level EAs include, but are not limited to, the layover facility at the south terminus (Minneapolis) and the locations for stations within the communities of Cambridge, Hinckley and Superior. Additionally, the potential for a light (satellite) maintenance facility would be included in subsequent Project EA documents. Potential refinements to the proposed station at Coon Rapids-Foley station will also be included in the Tier 2 Project Level EA document.

Information included in the Tier 1 Service Level EA will be incorporated by reference, as appropriate in the Tier 2 Project Level EAs. Additionally, as engineering is advanced for the proposed NLX project, the impact evaluation and mitigation measures identified in the Tier 1 Service Level EA will be refined, as appropriate, and documented in the Tier 2 Project Level EA documents. Specific areas where refinements, resulting in anticipated further minimization of potential impacts include right-of-way, vegetation, floodplains, wetlands, farmland, noise mitigation, hazardous materials, potential public at-grade road closures, cultural resources (Section 106) and Section 4(f) (public land and historic sites).

For the proposed NLX project, three stand-alone Tier 2 EAs will be completed and advanced simultaneously. Each Tier 2 EA document will include project elements that were not defined at a project level at the time the Tier 1 EA document was prepared, along with refinements in the impact evaluation that reflect the advancement of the engineering analysis for the specific geographic section. For purposes of the Tier 2 environmental evaluations, the full NLX corridor from Minneapolis to Duluth will be divided into three distinct geographic sections, as defined below:

- Section A - The Minneapolis Interchange in Downtown Minneapolis to Coon Creek Junction
- Section B - Coon Creek Junction to Hinckley
- Section C - Hinckley to Duluth

The three geographic sections for the NLX Corridor do not reflect phases of the proposed action, as the proposed action is the full build out of the NLX high speed rail project from Minneapolis to Duluth. The Tier 2 Project Level EA documentation will complete the studies and environmental assessments required for the NLX Corridor investments and capital improvements.

This EA was also prepared as part of the Minnesota and Wisconsin state environmental review processes to fulfill the requirements of MS 116D and Section 1.11 Wisconsin Statutes, Wisconsin Administrative Code, TRANS 400.

At the Minnesota state level, this document serves as an Environmental Assessment Worksheet (EAW). Minnesota Rules 4410.1300 allows the EA to take the place of the state EAW form, provided that the EA addresses each of the environmental effects identified in the EAW form. This EA includes each of the environmental effects identified in the EAW form which is provided for reference in Appendix A. For purposes of the EAW, the Minneapolis-Duluth-Superior Passenger Rail Alliance is the proposer and MnDOT is the Responsible Governmental Unit (RGU) for this project. Preparation of an EAW is considered mandatory under Minnesota Rules 4410.4300 subp. 1, and under the following subsection: 4410.4300 subp.

27(A) and (B) Wetlands and Public Waters. The EA is used to provide sufficient environmental documentation to determine the need, under Minnesota state law, for an Environmental Impact Statement (EIS) or a Negative Declaration.

At the Wisconsin state level, Wisconsin Administrative Code Chapter TRANS 400 directs WisDOT to follow both NEPA and Wisconsin Environmental Policy Act (WEPA) when federal funds are involved in the proposed action. WisDOT is a reviewing agency for the portion of the proposed NLX corridor that is within the state of Wisconsin.

This document is made available for public review and comment in accordance with the requirements of 40 CFR 1506, 64 FR 28545, Minnesota Rules 4410.1500 through 4410.1600, and Wisconsin Administrative Code TRANS 400.

2.0 PURPOSE AND NEED FOR PROJECT

2.1 Project Purpose

The purpose of the NLX High Speed Passenger Rail project is to provide a means to meet transportation needs through the creation of a passenger rail service that links Minneapolis and Duluth, connecting with other existing and planned transportation systems, including other planned Passenger Rail, Commuter Rail, LRT, and BRT routes as well as the roadway network. Downtown Minneapolis is the identified southern terminus as it contains the greatest population and employment numbers of the Twin Cities Central Business Districts (CBDs); provides access to several event facilities including Target Field, Target Center, the Metrodome and the Hennepin Avenue Theater District; and provides the greatest opportunity for connections to both existing and planned/programmed transportation modes including Northstar Commuter Rail, Hiawatha Corridor LRT, Central Corridor LRT, and Southwest LRT. See Figure 2.1.

The proposed action offers an opportunity for a viable alternative to vehicular travel between Minneapolis and Duluth by providing:

- Competitive travel times;
- Safe, reliable and accessible service; and
- Amenities to improve passenger travel quality and comfort.

In addition, the project can provide:

- Improved overall system continuity in the state-wide and interstate transportation network in conformance with statewide and regional transportation plans;
- Opportunities for rail oriented development – land use patterns that encourage more efficient development of land in combination with more efficient use of transportation facilities;
- An impetus for station-area joint development, downtown redevelopment and economic development for growth in travel and tourism in all the communities along the route, contributing to the viability and vitality of the region;
- Transportation improvements that avoid or minimize environmental impacts.

2.2 Project Need

The need for the proposed action is based on the limitations and vulnerabilities of available travel modes between Minneapolis and Duluth. Existing transportation modes, including highway, bus and air travel, have inherent problems including congestion near the Twin Cities metropolitan area and sensitivity to inclement weather conditions. Passenger rail service can provide an additional passenger travel alternative to congested highways and weather-sensitive airports. Additional needs range from inherent safety risks and environmental impacts resulting from congested highways, travel time delays, thereby improving intermodal connectivity and reliability.

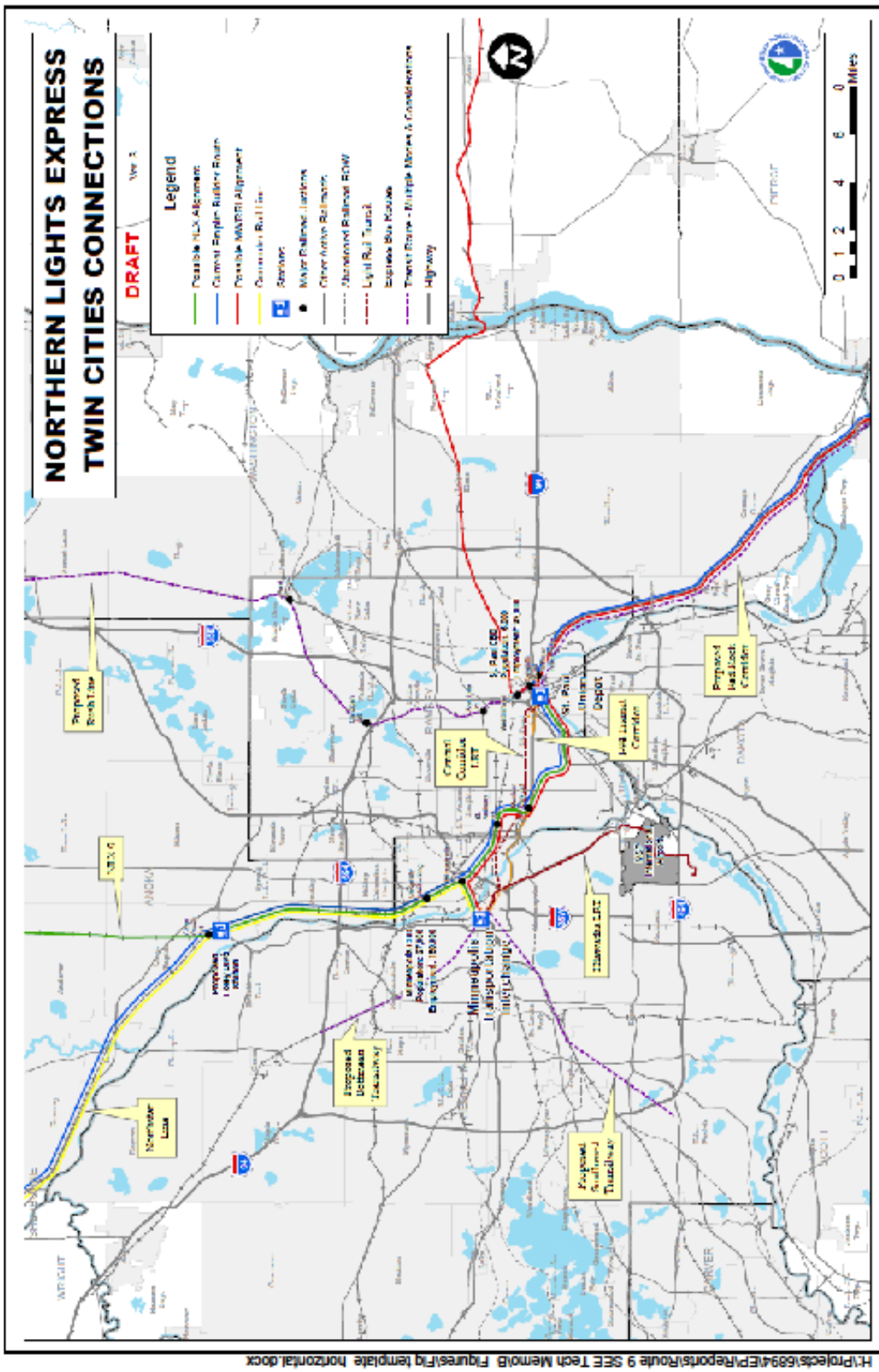


Figure 2.1

Twin Cities Connections

Northern Lights Express

The need for improvements serving intercity travel between Minneapolis and Duluth relates to the following inter-related issues and trends:

2.2.1 Travel Demand

Non-automotive transportation between Minneapolis and Duluth is currently provided by bus and by air. Three privately held bus lines – Greyhound, Jefferson Lines and Skyline Shuttle – provide daily bus service between Duluth and Minneapolis-St. Paul.

Delta Airlines currently provides six daily non-stop round trip passenger flights between Minneapolis-St. Paul International Airport and Duluth International Airport. Flight durations are approximately one hour.

Currently there is no passenger rail service provided between Minneapolis and Duluth. Amtrak had provided passenger rail service until 1985.

Interstate 35 (I-35) currently provides 70-mph automobile travel between Minneapolis and Duluth. Just north of Minneapolis, I-35W carries over 125,000 vehicles per day while just south of Duluth, I-35 carries 28,000 vehicles per day. Mid-corridor volumes on I-35 are approximately 37,000 vehicles per day at State Highway 95 (Cambridge/North Branch), 22,000 vehicles per day at Hinckley (State Highway 48), and 17,000 vehicles per day at Sandstone.[9] While the I-35 volumes indicate sufficient capacity at mid-corridor, volumes in the segments approaching the Twin Cities are high, resulting in significant traffic delays during peak periods.

Future traffic volumes are expected to increase by 50 to 100 percent by 2030.[10] I-35 has been identified by MnDOT as a High Priority Interregional Corridor connecting the regional trade centers of the Twin Cities and Duluth.

The *Minneapolis-Duluth/Superior Restoration of Intercity Passenger Rail Service Comprehensive Feasibility Study and Business Plan* (December 2007) found sufficient travel demand between Minneapolis and Duluth to support high speed rail.

2.2.2 Vehicular Travel Times

Any alternative mode of travel needs to have a competitive travel time with the estimated highway travel time for the 155-mile distance between Minneapolis and Duluth of two hours and 30 minutes (during uncongested conditions).

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[9] MnDOT, 2006 Traffic Flow Maps.

[10] MnDOT, I-35 Interregional Corridor Study, 2005.

2.2.3 Intermodal Connectivity

The NLX High Speed Passenger Rail Project is envisioned as a significant element within a system of intermodal transportation options, connecting major population centers both within the state of Minnesota as well as with adjoining states. These intermodal transportation options that would connect to NLX are described below.

Intercity Passenger Rail

Existing Amtrak Service: Empire Builder

Amtrak provides rail transportation through the Empire Builder, a long-distance service between Chicago and Seattle/Portland. See Figure 2.1. Minnesota stations include Detroit Lakes, Staples, St. Cloud, Minneapolis-St. Paul, Red Wing, and Winona. Currently, Amtrak provides one eastbound and one westbound train daily. The Minneapolis/St. Paul Midway Station is located equidistant from both downtown Minneapolis and St. Paul in an industrial area adjacent to Interstate 94 (I-94).

Midwest Regional Rail Initiative (MWRRI)

The MWRRI represents a nine-state effort supported by Amtrak to develop an inter-state high speed passenger rail system connecting the upper Midwest. The MWRRI vision includes a 400-mile connection between Chicago and the Twin Cities. Planning efforts for the Milwaukee to Twin Cities segment of MWRRI is currently underway. Service between Chicago and the Twin Cities is currently envisioned as six trains daily with a travel time reduction from eight hours by automobile to five hours by passenger rail. The current Minnesota State Rail Plan states that MWRRI is intended to serve both St. Paul and Minneapolis through a multi-modal transportation hub in both cities. The Plan principles of an integrated system and connected services to both downtown Central Business Districts is reaffirmed in the April 2011 Addendum to the State Rail Plan.

Commuter Rail

Northstar Commuter Rail

Minnesota's first commuter rail service, the Northstar line, began operations in November 2009. Northstar provides service from the northwest including the cities of Big Lake, Elk River, Anoka, Coon Rapids and Fridley to downtown Minneapolis during the morning rush hour, and return service during the evening rush hour. Northstar also provides limited service during special events such as Twins baseball games at Target Field.

Planned Commuter Rail

Alternative analyses, either in process or completed, for the Bottineau Transitway, Rush Line Corridor and Red Rock Corridor have considered and evaluated commuter rail in the alternatives analysis process and have yielded the following recommendations:

- Bottineau Transitway: screened from further consideration
- Rush Line (St. Paul north): screened from further consideration
- Red Rock (St. Paul south): a potential long-term consideration, with a western terminus at the downtown Minneapolis intermodal facility

Light Rail Transit

Hiawatha Corridor LRT

In 2004, Minnesota opened its first LRT line traveling along the Hiawatha Corridor. The 12-mile LRT line connects downtown Minneapolis, with the Minnesota Veterans Administration, the Minneapolis-St. Paul International Airport, and the Mall of America in Bloomington with a travel time of 40 minutes. The line, which currently operates 27 light-rail vehicles, has exceeded year 2020 ridership projections.

Central Corridor LRT

Central Corridor is an under-construction LRT facility connecting downtown St. Paul, the University of Minnesota and downtown Minneapolis. The western terminus of this line is planned for the Target Field Station to facilitate connectivity with Northstar Commuter Rail, Hiawatha LRT and other planned LRT corridors. The eastern terminus of the corridor lies at the front door of Union Depot, a planned multi-modal facility for the eastern portion of the metro area. Construction on the Central Corridor project began in 2010. Central Corridor will open for operation in 2014.

The Interchange Project

The Interchange Project is located in downtown Minneapolis, near the existing Hiawatha LRT Target Field Station. It proposes to provide transportation infrastructure improvements that will maximize the efficiency of existing transit operations, provide for enhanced multi-modal connections, and appropriately plan for future system integration to better serve passengers.

Physical improvements planned with the Interchange include elevated track, a second LRT platform located approximately 100 feet west of the existing Target Field Station platform, a storage track, construction of two connected pedestrian plaza areas, and reconfiguration of 5th Street North/6th Avenue North intersection. A Finding of No Significant Impact (FONSI) was issued on March 6, 2012 by the Federal Transit Administration (FTA). Note: this includes only "Phase I" Interchange improvements, i.e. for LRT only**.**

Additional Planned LRT routes

Two additional LRT routes are currently under environmental review. The EIS for the Southwest Corridor, an LRT corridor extending from downtown Minneapolis to the southwest suburbs, is scheduled to be released for public comment in 2012. The EIS for the Bottineau

Transitway, extending northwest from the Interchange in downtown Minneapolis intermodal facility, is scheduled to be released for public comment in 2013.

LRT alternatives are also being included in alternatives analysis studies for the Rush Line Corridor (extending north from the St. Paul Union Depot) and the Gateway Corridor (extending east from the St. Paul Union Depot to western Wisconsin).

Bus Rapid Transit

A BRT route from the southern suburbs of Lakeville, Apple Valley and Eagan to downtown Minneapolis is in final design and construction.

BRT alternatives are currently under study for the Rush Line and the Gateway Corridor.

Urban Bus Transit

Metro Transit

Metro Transit is one of the country's largest transit systems, providing roughly 95 percent of the 73 million bus trips taken annually in the Twin Cities. Each weekday customers board Metro Transit buses and trains an average of 240,000 times.

Metro Transit operates the Hiawatha LRT line and 118 bus routes (63 local-service routes, 46 express routes and 9 contract service routes) using a fleet of 821 buses. The majority of the company's fleet (681) is standard 40-foot buses while 140 are articulated ("accordion") buses. All Metro Transit buses are equipped with wheelchair lifts or ramps and racks for bicycles. All trains feature step-free boarding, bicycle racks and luggage storage areas.

Duluth Transit Authority

The Duluth Transit Authority operates 20 routes serving Duluth, Minnesota and Superior, Wisconsin. Key destinations within the system include downtown Duluth and Superior, a number of college campuses in both Duluth and Superior, the Duluth International Airport, Miller Hill Mall and a number of recreational and tourist activities. Downtown Duluth routes run near the Duluth Depot. Among the areas served in Superior is Tower Avenue (Wisconsin State Highway 35), which is near a potential station location, located near the city's downtown.

Automobile Connections

Interstate 35 (I-35) is the principal arterial providing connection between Minneapolis and Duluth. Near the Twin Cities metro area, I-35 splits into two corridors: I-35E running through St. Paul and I-35W running through Minneapolis. These divergent segments rejoin in the southern Twin Cities suburbs to continue south.

Interstate 94 is the principal arterial providing east-west mobility connecting the downtowns of St. Paul and Minneapolis, extending both east and west through the state of Minnesota into

adjoining states. Through the Twin Cities metro area, I-94 divides into 3 adjacent corridors: I-694 through the northern portion of the metro area, I-494 through the southern portion of the metro area, and I-394 connecting I-94 and I-494 west of downtown Minneapolis. The eastern terminus of I-394 lies adjacent to the downtown Minneapolis intermodal facility where high-volume parking garages totaling 6,750 spaces provide connections to transit and alleviate congestion in downtown Minneapolis.

This principal arterial network is supplemented by U.S. Highways 10 and 610 in the northern metro suburbs.

Intermodal connectivity between this principal arterial network and NLX is envisioned to occur at park and ride facilities adjacent to stations.

Rural Transit

Heartland Express is a rural public transportation system serving area residents in Isanti County. Dial up service is provided to residents of Cambridge (population 5,500), Isanti (population 5,200), Braham (population 1,300), and Pine Brook (unincorporated). Arrowhead Transit serves Pine, Carlton and St. Louis Counties. Timber Trails Public Transit provides bus service in Kanabec County on a demand responsive basis.

Recreational Transportation Services

The North Shore Scenic Railroad runs several trains a day departing from the Duluth Union Depot during the summer and fall for a trip through downtown Duluth, Canal Park, along the shore of the Lake Superior and into the City of Two Harbors. Fully narrated tours tell the history of Duluth, the harbor, and the stories of the railroads that connected the people and transported the material that built the region. While this rail segment serves a recreational purpose at this time, regional plans have identified this corridor for future passenger rail service.

2.3 Applicable Regulations, Permits, and Agreements

Table 2.1 presents the permits, approvals and agreements anticipated to be required for construction of the project based on agency coordination to date. These will be reaffirmed or updated in subsequent phases of project development, which will include additional agency involvement.

Table 2.1. Anticipated Permits, Approvals and Agreements

Permits and Approvals	Agency	Action Required
Federal		
Environmental Assessment	FRA	FONSI
Section 4(f) determination	FRA	Determination
Section 7 (Threatened/ Endangered Species)	FRA U.S. Fish and Wildlife Service (USFWS)	Coordination Consultation (if required)
Section 10 Permit	U.S. Army Corps of Engineers (COE)	Permit
Section 404 Permit – Individual	COE	Permit
Section 9 Permit	U.S. Coast Guard	Permit
State		
EAW Certification	MnDOT	Approval
EIS Need Decision	MnDOT	Approval
Geometric Layout	MnDOT	Approval
Construction Plans	MnDOT	Approval
Wetland Conservation Act – approval of wetland boundaries	MnDOT	Approval
Wetland Conservation Act – approval of replacement plan	MnDOT with review by Board of Soil and Water Resources, and Minnesota Department of Natural Resources (MnDNR)	Approval/Review
Water Use Appropriation Permit (dewatering during construction)	MnDNR – waters	Permit
Public Waters Work Permit	MnDNR	Permit
Section 401	Minnesota Pollution Control Agency (MPCA) WDNR	Certification
National Pollutant Discharge Elimination System Section 402 Permit	MPCA	Permit
Section 106 (Historic / Archeological)	Minnesota and Wisconsin State Historic Preservation Offices (SHPO)	Consultation/agreement documents
Construction Site Stormwater General Permit	Wisconsin Department of Natural Resources (WDNR)	Permit
Waterway and Wetland Permit	WDNR	Permit

Table 2.1. Anticipated Permits, Approvals and Agreements (continued)

Permits and Approvals	Agency	Action Required
Local*		
Wetland Conservation Act, Restoration Plan	Affected Cities and Counties	Approval
Land alteration permits	Cities of Minneapolis, Fridley, Coon Rapids, Cambridge, Braham, Hinckley, and Superior Anoka, Isanti, Pine, Carleton, Kanabec, and Douglas Counties	Approval
Watershed District Permit	Rice Creek WD Coon Creek WD	Permit
Watershed Management Organization	Upper Rum River Joint Powers WMO Six Cities Joint Powers WMO Snake River Watershed Management Board (SRWMB)	Consultation
County Ditch Permit	Anoka, Isanti, Kanabec, Pine, Carlton, and Douglas Counties	Approval
Anticipated Agreements	**Agency**	
Topics including, but not limited to track usage, work w/in RR right of way, construction responsibilities, property acquisitions, relocation of affected RR structures, permitting responsibilities, and operations, maintenance and operator agreements.	BNSF	Agreement
Topics related to shared facilities at the Interchange	Metro Transit	Agreement
Topics related to shared layover facilities	Multiple agencies involved in rail planning in Twin Cities	Agreement
*Local permitting would be coordinated among watershed districts, watershed management organizations, counties, and municipalities.		

3.0 ALTERNATIVES

This chapter describes the alternatives being evaluated for the proposed NLX high speed passenger rail service between Minneapolis and Duluth, Minnesota, including the alternatives analysis process that resulted in the identification of the preferred Build Alternative and a description of the improvements and operational characteristics that were developed to address the identified purpose and need for the project.

3.1 Alternatives Analysis

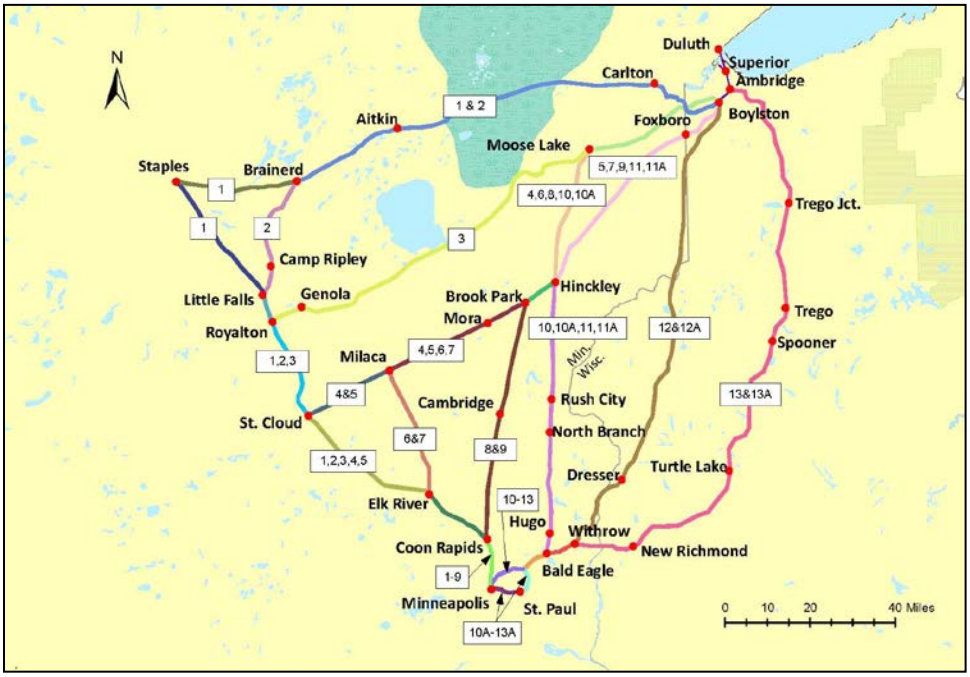
The alternatives analysis process and findings that resulted in the selection of a preferred Build Alternative for the proposed NLX project are detailed in Appendix B and summarized below. In accordance with FRA guidance, a multi-level evaluation was used which included an identification of a wide range of corridors, screening based on identified operational characteristics, investment requirements and environmental constraints at a broad level (Level 1), followed by examination of ridership and operations in more detail for potentially viable alternatives (Level 2 and 3). See Appendix A for definitions of the Level 1, 2 and 3 studies.

The alternative analysis process included input through public outreach and participation by stakeholder agencies in a rigorous evaluation process. In addition, project staff met with BNSF periodically to discuss project progress and review technical data. BNSF evaluated and commented on proposed operations, infrastructure and analyses with regard to track charts, timetables and proposed improvements to the extent applicable to the initial planning and design phase of the project. See Chapter 5 for additional information on public, agency and BNSF involvement during the alternatives analysis process.

The Level 1 screening is detailed in *Northern Lights Express High Speed Rail: Corridor Assessment Report, Level 1 Screening Final* Report, December 2009, Revised June 2010. See Appendix C-1.

Seventeen alternative corridors were identified as part of the Level 1 process. The route alternatives were developed by identifying track segments between Minneapolis and Duluth, including existing tracks currently owned by private freight railroads or abandoned rail rights of way with or without existing track; these segments were analyzed to develop all possible route alternatives for the proposed project. Each corridor includes a number of track segments as detailed in Table B-1 in Appendix B. Figure 3.1 below illustrates the corridors identified and evaluated in the Level 1 process.

Figure 3.1. Level 1 Corridors



Each of the seventeen route alternatives were first screened according to:

- Population and population centers – as an estimate of potential ridership. Route corridor populations within a 20-mile band of each route and within a 20-mile radius of each of terminal stations in Minneapolis and Duluth were compiled and compared for difference in potential ridership market. However, since each of the potential corridors would terminate in the greater Minneapolis and Duluth/Superior regions which together comprise between 88 and 96 percent of the total population of each route, the variation in corridor populations between the two centers among the potential alignments was not major factor in eliminating alternatives at this stage.
- Route distance – from end point to end point. Longer distance routes will have greater operating and maintenance costs than more direct routes. In addition to knowing that one route is physically longer than another, route distance can be used to predict travel times. The shortest route was approximately 152 miles long; the longest route was approximately 283 miles long. Routes over 15 percent longer than the shortest route were considered significantly greater.

- Presence of route defects – conditions that would make construction or operation of passenger rail particularly costly or difficult. Any defects that would effectively prohibit rail line construction or operation and could not be reasonably mitigated were considered "untenable defects" and eliminated a route from further screening. High-level review of the corridors found the key defects to be the presence of development on abandoned railroad right of way, in that the conversion of these developed areas to rail use for the proposed project would result in significant adverse community impacts.

Based on unfavorable assessment with regard to the route distance and route defects criteria, the following routes were eliminated from further consideration at this step in the process:

- Route 1: significantly greater route distance (87 percent longer than shortest route)
- Route 2: significantly greater route distance (65 percent longer than shortest route)
- Route 3: significantly greater route distance (48 percent longer than shortest route); untenable defect of commercial and residential development of abandoned railroad right of way segments
- Route 4: significantly greater route distance (44 percent longer than shortest route); untenable defect of commercial and residential development of abandoned railroad right of way segments
- Route 5: significantly greater route distance (37 percent longer than shortest route); untenable defect of commercial and residential development of abandoned railroad right of way segments
- Route 6: significantly greater route distance (23 percent longer than shortest route); untenable defect of hospital, school, park, commercial, residential and highway interchange development of abandoned railroad right of way segments
- Route 7: significantly greater route distance (16 percent longer than shortest route); untenable defect of hospital, school, park, commercial, residential and highway interchange development of abandoned railroad right of way segments
- Route 13: significantly greater route distance (23 percent longer than shortest route); untenable defect of commercial, residential and US highway development of abandoned railroad right of way segments
- Route 13A: significantly greater route distance (27 percent longer than shortest route); untenable defect of commercial, residential and US highway development of abandoned railroad right of way segments

The eight remaining routes (Routes 8, 9, 10, 10A, 11, 11A, 12, and 12A) underwent a more thorough quantitative screening and evaluation process, including a technical evaluation as well as prioritization of evaluation criteria and scoring of alternatives. On the basis of the technical evaluation of environmental, cost and operational concerns, the following evaluation criteria were established for scoring these eight routes:

- Travel time – the estimated route travel time between end points
- Proximity to markets (ridership) – population within 20 miles of the route and the terminal stations
- Conflicts with freight or future rail purposes – ability for high speed passenger rail to coexist successfully with freight rail
- Conflicts with existing ownership – whether or not the historic rail corridor is now owned by a non-rail entity with the rail right of way fully-abandoned leaving no revisionary rights for return of the corridor to rail service
- System connectivity – intermodal connections such as Amtrak, bus, commuter rail, light rail transit, air, and intra-state connectivity (e.g., connections to Rochester, Eau Claire, Mankato)
- Capital costs – rough estimate for comparing routes against each other

- Political/public support – the perceived level of political/public support, either for or against, that a route has or would have should it be selected
- The scoring was done in part during an interactive workshop involving MnDOT, WisDOT, the Alliance, and metro area counties, followed by project team scoring of additional identified routes. The scoring results are shown in Table 3.1 (1=very poor, 2=poor, 3=good, 4=very good and 5=excellent). Route 9 was the highest scoring route with an average weighted score of 4.15, with Route 11 the second highest with a score of 3.51. Routes 8, 10, and 12 scored significantly lower.

Based on the evaluation, Routes 8, 10, 10A, 12, and 12A were eliminated from further consideration. Routes 9, 11 and 11A were carried over from Level 1 into a more detailed Level 2 analysis to compare their functional characteristics (capital investment, ridership, revenue and benefit-cost).

Routes 9, 11 and 11A are depicted in Figure 3.2 below. The routes are identical between Hinckley and Duluth. The Route 9 corridor between Minneapolis and Hinckley is through Cambridge. The Route 11/11A corridor between Minneapolis and Hinckley is through Forest Lake, North Branch and Rush City. In the Twin Cities, Route 11 uses the CP Withrow subdivision from Minneapolis to Cardigan Junction in Arden Hills and does not go through St. Paul, while Route 11A uses the CP Merriam Park subdivision from Minneapolis to St. Paul and then to Cardigan Junction.

Figure 3.2. Level 2 Corridors

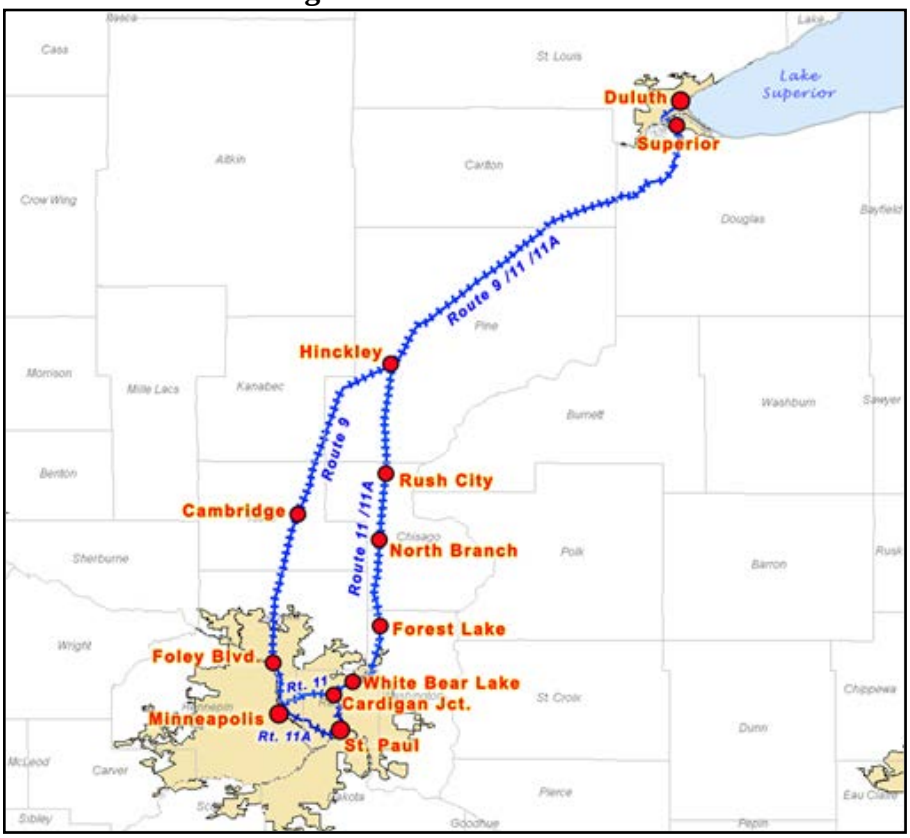


Table 3.1. Alternative Alignment Evaluation Scoring

Evaluation Criteria	Criteria Weight	Route 8		Route 9		Route 10		Route 10A		Route 11		Route 11A		Route 12		Route 12A	
		Score		Score		Score		Score		Score		Score		Score		Score	
		Raw	Weighted	Raw	Weighted	Raw	Weighted	Raw	Weighted	Raw Score	Weighted	Raw	Weighted	Raw	Weighted	Raw	Weighted
Travel time	9	3.4	30.6	5	45.0	2.2	19.8	1.4	12.6	4	36.0	2.9	26.1	2	18.0	1.4	12.6
Proximity to markets / Ridership	9	4	36.0	3.8	34.2	4	36.0	4.2	37.8	4	36.0	4.2	37.8	2.4	21.6	2.6	23.4
Conflict with freight, future rail use	5.4	2.8	15.1	2.2	11.9	4.2	22.7	3.5	18.9	3.2	17.3	2.8	15.1	4.2	22.7	3.5	18.9
Conflict with existing ownership	7.6	1.4	10.6	4.2	31.9	1.2	9.1	1.2	9.12	3.2	24.3	3.2	24.3	1.4	10.6	1.4	10.6
System connectivity	6.6	4	26.4	3.8	25.1	3.2	21.1	4	26.4	3.2	21.1	4	26.4	2	13.2	4	26.4
Capital cost	8.8	2.4	21.1	5	44.0	1.2	10.6	1.2	10.6	3	26.4	2.4	21.1	1.2	10.6	1.2	10.6
Political/public support	6.4	1.8	11.5	4.2	26.9	1.8	11.5	4.2	26.9	3.8	24.3	4.2	26.9	1.4	9.0	4.2	26.9
Total			151.4		219.0		130.8		142.3		185.4		177.7		105.6		130.0
Weighted average			**2.87**		**4.15**		**2.48**		**2.81**		**3.51**		**3.38**		**2.00**		**2.68**

The Level 2 functional analysis of Routes 9, 11 and 11a is detailed in *Northern Lights Express Technical Memorandum: Functional Analysis of Routes 9, 11, and 11a* (Level 2 Analysis) December 2010. See Appendix C-2. Table 3.2 presents the results of the Level 2 functional analysis.

Table 3.2. Level 2 Functional Analysis

Level 2 Evaluation Criteria	Alternatives		
	Route 9	**Route 11**	**Route 11A**
Capital investment	$0.82B	$1.36B	$1.49B
Annual Ridership[1]	938,000	834,000	981,000
Revenue	$27.66M	$26.34M	$26.86M
Benefit/cost	>1.0	<1.0	<1.0
Operating ratio[2]	>1.0	<1.0	<1.0

[1]2020
[2]2025 and 2040

Key findings include:

- Capital investment on Routes 11 and 11A are significantly higher than Route 9.
- Ridership is higher for Route 11A due to the additional stop provided in St. Paul; however, revenue is diminished as the route configuration and overall travel time encourages shorter trips between Minneapolis and St. Paul and discourages longer trips throughout the remainder of the corridor.
- Only Route 9 yields a cost benefit rate greater than 1.
- Only Route 9 achieves an on-going operating ratio greater than 1.0 in both 2025 and 2030.

Based on the Level 2 analysis, Route 9 was identified as the only build alternative to be evaluated in the EA (See FRA letter dated July 29, 2011 to MnDOT in Appendix B). MnDOT has also identified Route 9 as its preferred alternative.

Following completion of the Level 2 analysis and identification of the Build Alternative, a Level 3 concept engineering report was completed and additional concept level refinements were undertaken that together further defined certain aspects of the project. Those refinements are reflected in the environmental analysis provided in Chapter 4.

It is important to note that the required improvements will continue to be further refined during preliminary and final engineering studies for the project. The description of the Build Alternative (Section 3.2.2 below) is based on the concept engineering that has been completed to date, addresses a "worst case" in terms of impact, which may be reduced as a result of subsequent refinement, and is for the purpose of a service level analysis under NEPA.

Refinements and changes to the project description based on preliminary engineering will be addressed in subsequent project-level review under NEPA, which will also satisfy Wisconsin state (WEPA) environmental requirements.

As described in Chapter 1, this EA also serves as the EAW for the Minnesota state environmental review process (MEPA). If changes to the project definition increase the impacts beyond the worst-case addressed in this EA, additional environmental review under NEPA and MEPA would be required.

3.2 Alternatives Under Consideration

3.2.1. No Build Alternative

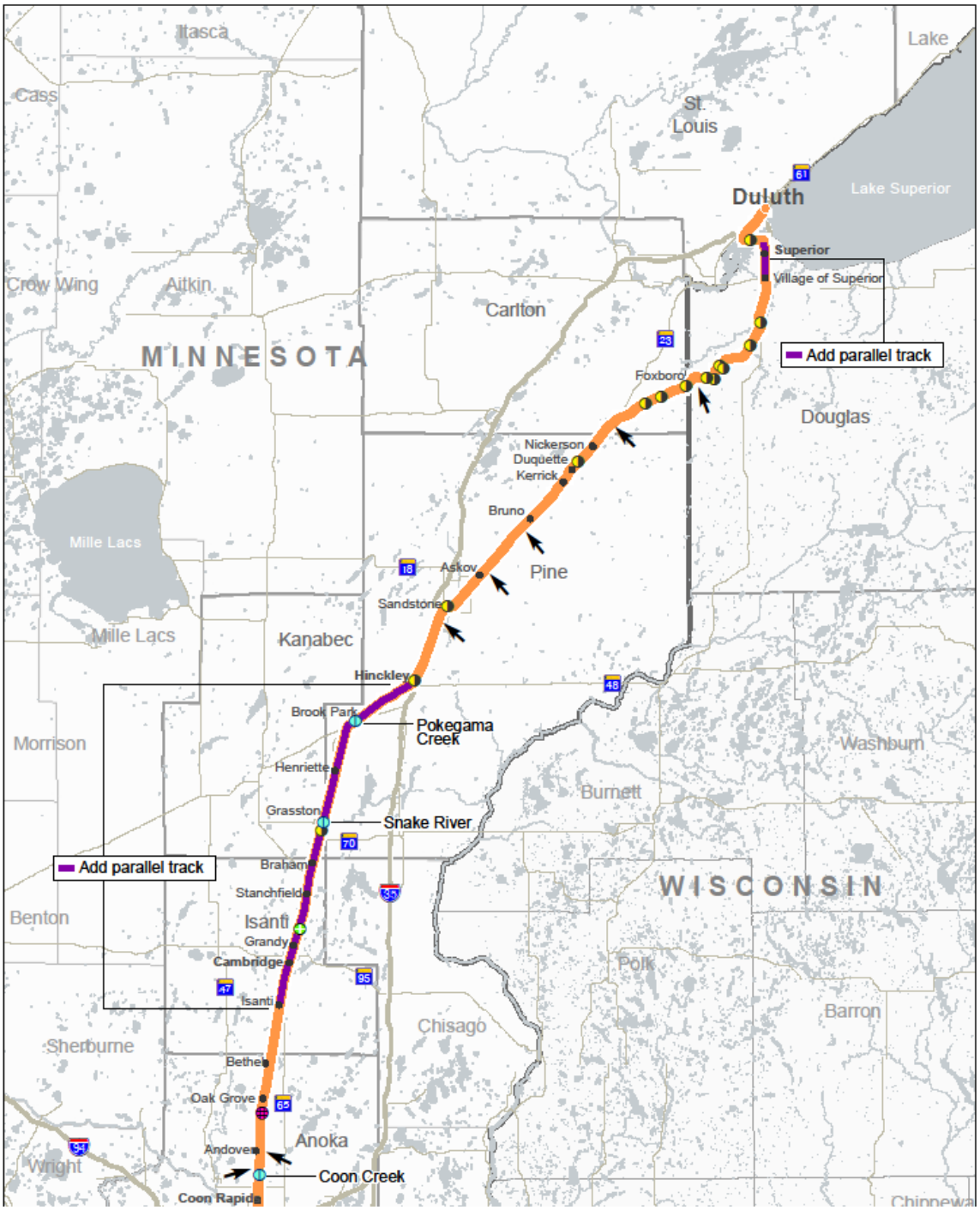
The No Build Alternative would perpetuate the existing condition, i.e. no high speed passenger rail service between Minneapolis and Duluth. The existing track configuration would remain. There would be no new bridges. Any rehabilitation or replacement of track or bridges would be by BNSF to meet its needs for regular freight rail operations. No stations, layover or maintenance facilities specific to NLX passenger rail service would be constructed. Only improvements to the LRT component of the Interchange are assumed under the No Build Alternative, as these are the only programmed improvements at this time.

The No Build Alternative was retained for detailed analysis, and its consequences were fully developed to allow equal comparison to the Build Alternative and to help decision-makers and the public understand the ramifications of taking no action.

3.2.2 Build Alternative

The Build Alternative is illustrated below in Figures 3.3-3.12. The route follows the existing BNSF Railway right of way from downtown Minneapolis (the Interchange) northeast to Duluth (the Depot), including shared and new dedicated track. This rail line represents the only railroad connection currently in full active service (freight) between Minneapolis and Duluth. The corridor roughly parallels State Highways 65 and 23 through Hennepin, Anoka, Isanti, Kanabec, Pine, Carlton, Douglas (Wisconsin), and St. Louis counties and terminates in Duluth.

Figure 3.3. NLX Route Segments


Itasca
Cass
Crow Wing
Aitkin
Carlton
St. Louis
Lake
Lake Superior
Duluth
Superior
Village of Superior
MINNESOTA
Add parallel track
Foxboro
Douglas
Nickerson
Duquette
Kerrick
Bruno
Pine
Askov
Sandstone
Mille Lacs
Kanabec
Hinckley
Brook Park
Pokegama Creek
Morrison
Henriette
Washburn
Burnett
Grasston
Snake River
Add parallel track
Braham
Stanchfield
Isanti
Grandy
Cambridge
Benton
WISCONSIN
Polk
Barron
Chisago
Sherburne
Bethel
Oak Grove
Anoka
Andover
Coon Creek
Coon Rapids
Wright
Chippewa

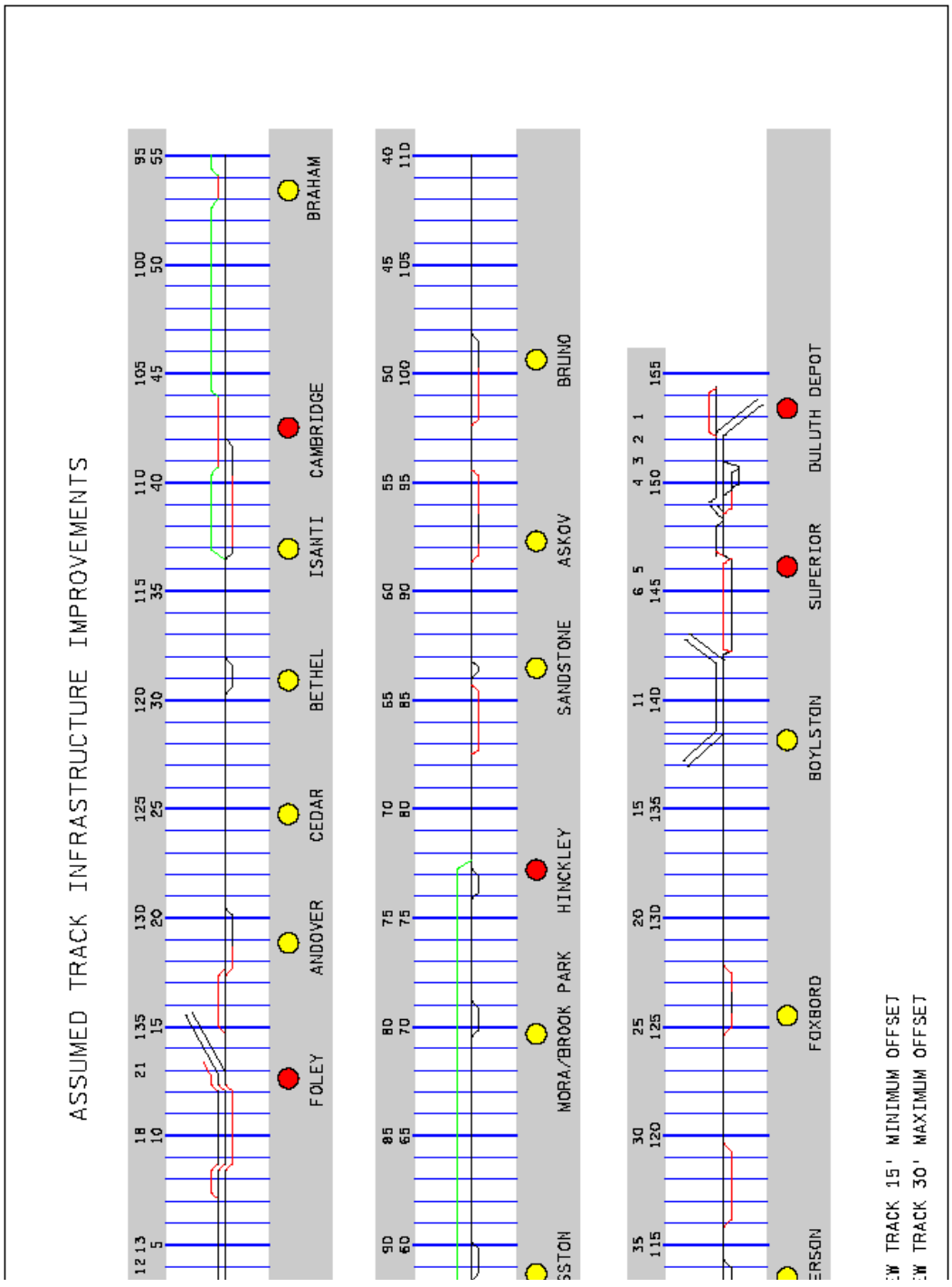
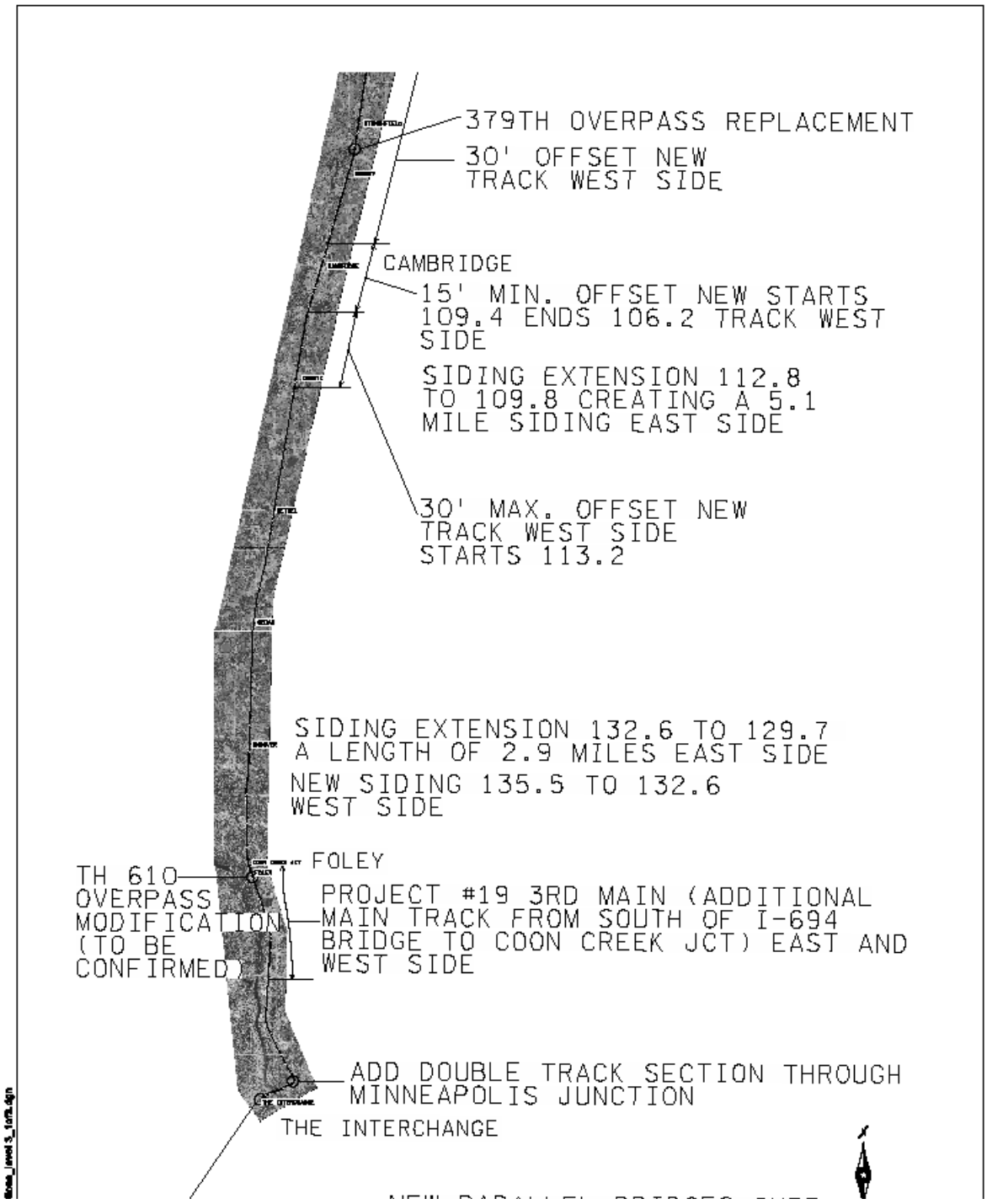
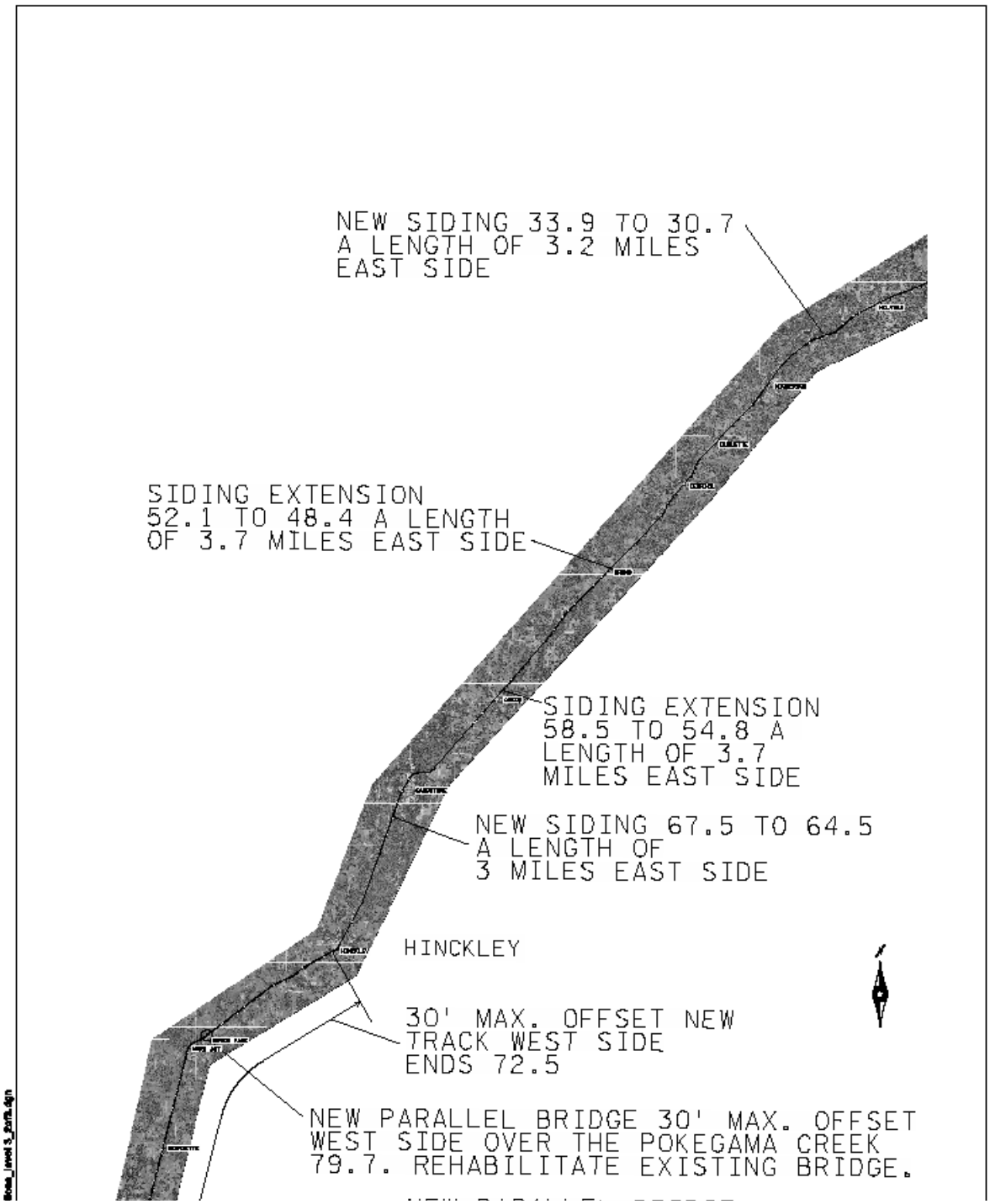
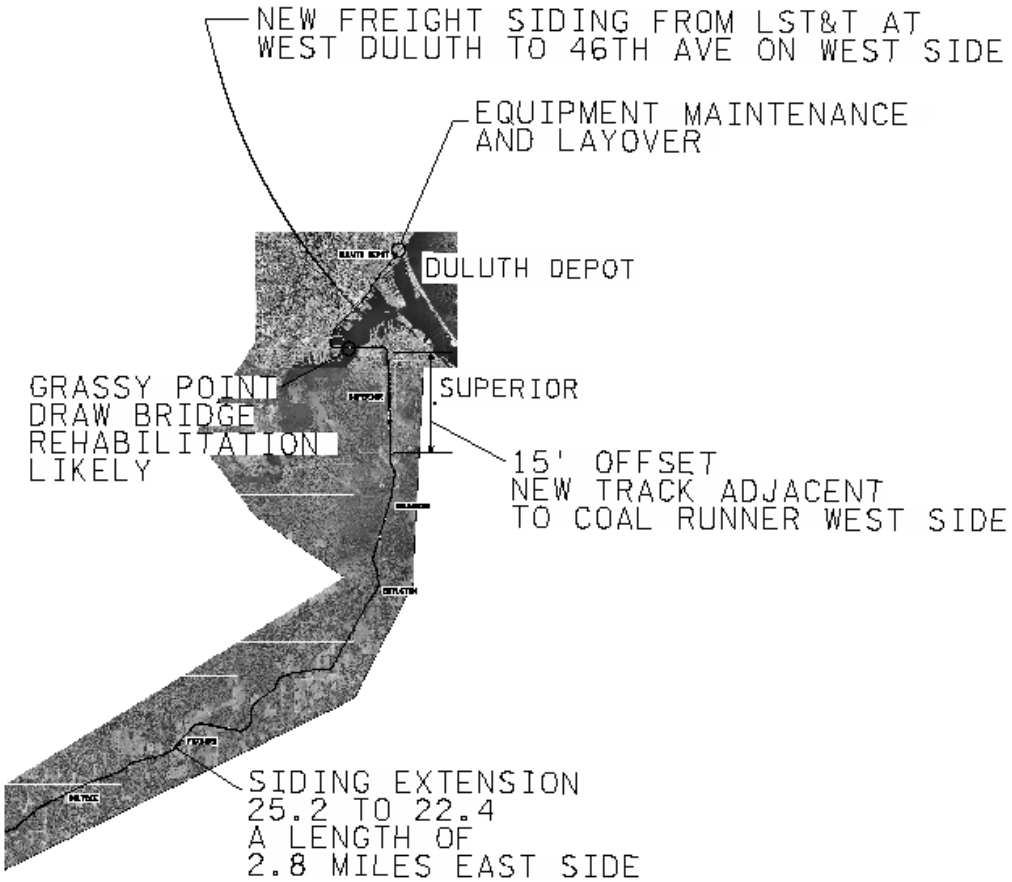

ASSUMED TRACK INFRASTRUCTURE IMPROVEMENTS
FOLEY
ANDOVER
CEDAR
BETHEL
ISANTI
CAMBRIDGE
BRAHAM
MORA/BROOK PARK
HINCKLEY
SANDSTONE
ASKOV
BRUNO
FOXBORO
BOYLSTON
SUPERIOR
DULUTH DEPOT
W TRACK 15' MINIMUM OFFSET
W TRACK 30' MAXIMUM OFFSET

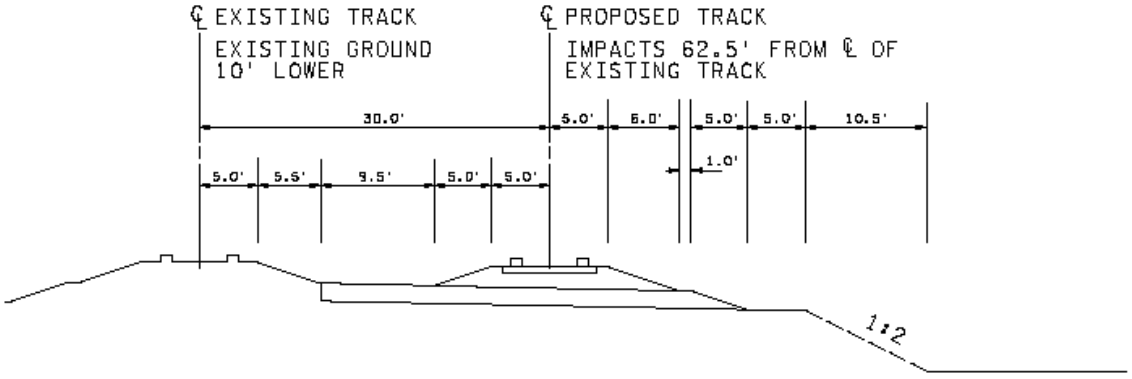
Figure 3.5


379TH OVERPASS REPLACEMENT
30' OFFSET NEW TRACK WEST SIDE
CAMBRIDGE
15' MIN. OFFSET NEW STARTS 109.4 ENDS 106.2 TRACK WEST SIDE
SIDING EXTENSION 112.8 TO 109.8 CREATING A 5.1 MILE SIDING EAST SIDE
30' MAX. OFFSET NEW TRACK WEST SIDE STARTS 113.2
SIDING EXTENSION 132.6 TO 129.7 A LENGTH OF 2.9 MILES EAST SIDE
NEW SIDING 135.5 TO 132.6 WEST SIDE
FOLEY
TH 610 OVERPASS MODIFICATION (TO BE CONFIRMED)
PROJECT #19 3RD MAIN (ADDITIONAL MAIN TRACK FROM SOUTH OF I-694 BRIDGE TO COON CREEK JCT) EAST AND WEST SIDE
ADD DOUBLE TRACK SECTION THROUGH MINNEAPOLIS JUNCTION
THE INTERCHANGE

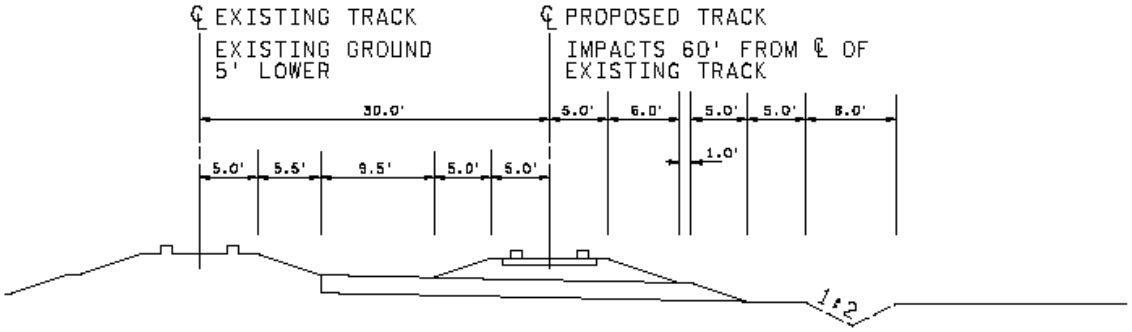

NEW SIDING 33.9 TO 30.7
A LENGTH OF 3.2 MILES
EAST SIDE
SIDING EXTENSION
52.1 TO 48.4 A LENGTH
OF 3.7 MILES EAST SIDE
SIDING EXTENSION
58.5 TO 54.8 A
LENGTH OF 3.7
MILES EAST SIDE
NEW SIDING 67.5 TO 64.5
A LENGTH OF
3 MILES EAST SIDE
HINCKLEY
30' MAX. OFFSET NEW
TRACK WEST SIDE
ENDS 72.5
NEW PARALLEL BRIDGE 30' MAX. OFFSET
WEST SIDE OVER THE POKEGAMA CREEK
79.7. REHABILITATE EXISTING BRIDGE.


NEW FREIGHT SIDING FROM LST&T AT
WEST DULUTH TO 46TH AVE ON WEST SIDE
EQUIPMENT MAINTENANCE
AND LAYOVER
DULUTH DEPOT
GRASSY POINT
DRAW BRIDGE
REHABILITATION
LIKELY
SUPERIOR
15' OFFSET
NEW TRACK ADJACENT
TO COAL RUNNER WEST SIDE
SIDING EXTENSION
25.2 TO 22.4
A LENGTH OF
2.8 MILES EAST SIDE

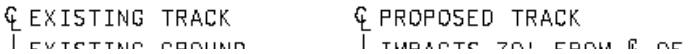
TYPICAL 30-E10L



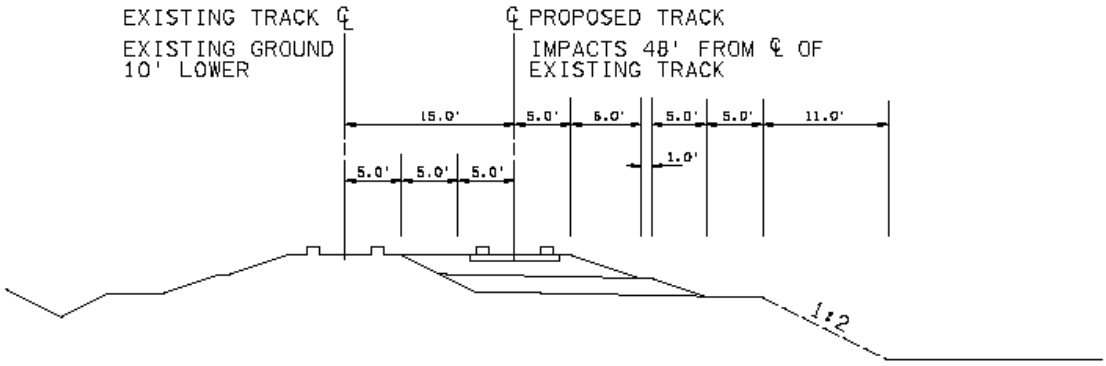
TYPICAL 30-E5L



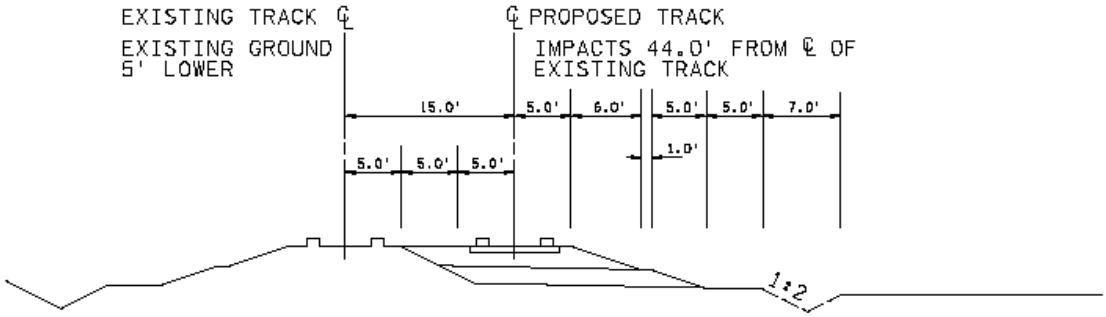
TYPICAL 30-E0L



TYPICAL 15-E10L



TYPICAL 15-E5L



TYPICAL 15-E0L

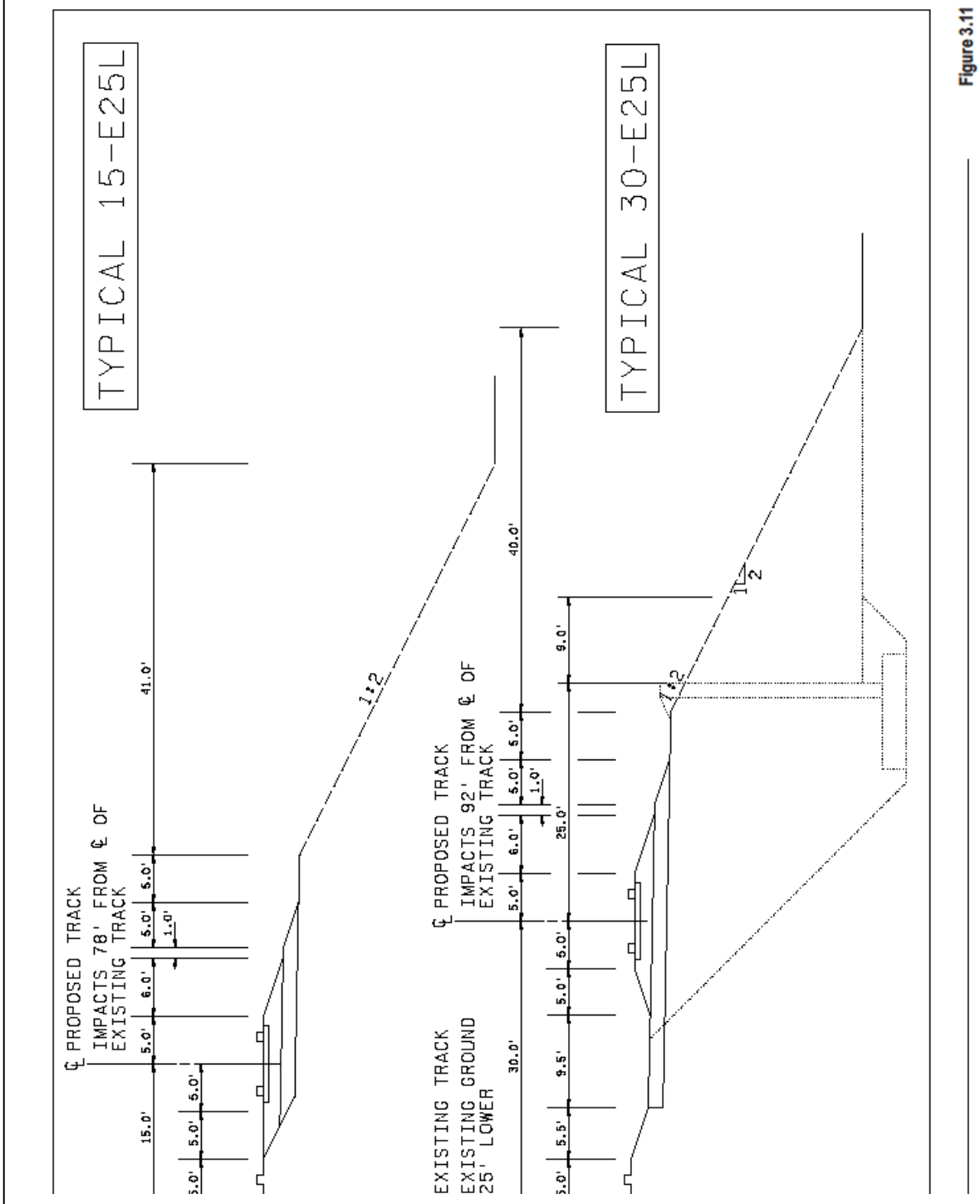
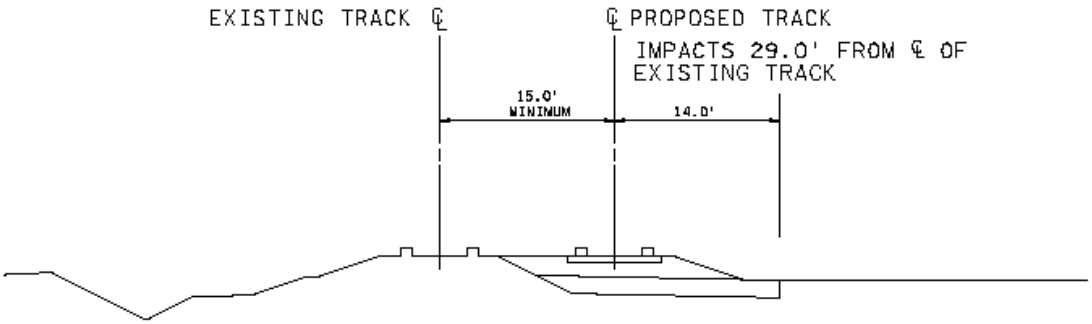

TYPICAL 15-E25L
℄ PROPOSED TRACK
IMPACTS 78' FROM ℄ OF
EXISTING TRACK
41.0'
15.0'
5.0'
5.0'
5.0'
6.0'
5.0'
5.0'
1.0'
5.0'
1:2
TYPICAL 30-E25L
℄ PROPOSED TRACK
IMPACTS 92' FROM ℄ OF
EXISTING TRACK
EXISTING TRACK
EXISTING GROUND
25' LOWER
40.0'
30.0'
5.5'
9.5'
5.0'
5.0'
5.0'
6.0'
5.0'
5.0'
1.0'
25.0'
9.0'
1:2
1:2

Figure 3.11

TYPICAL SECTION FOR MINIMUM 15' OFFSET



The proposed preferred Build Alternative route is approximately 152 miles long. For purposes of description, the route is divided into nine segments defined by logical end points, junctions, or populations[11], shown in Figure 3.3 and described in Table 3.3.

As described above, the Build Alternative has been developed to the concept-level only at this time. The description provided below is based on the engineering and operational studies that have been conducted to date and uses "worst case" assumptions in order to identify the potential for significant environmental impacts.

The next steps in project development include the completion of a Service Development Plan and preliminary engineering (PE). A program of implementation, including discrete projects, would be identified through these efforts. As detailed in Table 3.3 and the following text, **t**he proposed project's infrastructure improvements in the NLX Corridor include:

- Construction or extension of passing sidings and sections of double track;
- Bridge and culvert construction, rehabilitations and replacements;
- Construction of rail stations in Minneapolis, Cambridge, Coon Rapids, Hinckley, Duluth, MN and Superior, WI, as well as platform and parking area construction;
- Construction of a layover and light maintenance facility in the Duluth area for fueling, inspections, provisioning and light maintenance;
- At-grade crossing upgrades;
- Improvements to track configuration; and
- Installation of new crossovers and signal upgrades.

3.2.2.1 Station Locations

Downtown Minneapolis Station – Passenger Rail Element of the Proposed Interchange intermodal station

The southern terminus of the proposed NLX service would be at the intermodal station located at Fifth Street and 3rd Avenue in Minneapolis. Current transit service in this area includes Hiawatha LRT, Northstar Commuter Rail, and Metro Transit bus lines. Regional and state plans envision expansion of multi-modal connections at this location through a project named "the Interchange." The LRT component of the proposed Interchange that was recently the subject of an Federal Transit Administration (FTA) NEPA review would provide transportation infrastructure that will maximize the efficiency of existing transit operations, provide for enhanced multi-modal connections, and appropriately plan for future system integration to better serve passengers. Further future expansion of the proposed Interchange is envisioned to accommodate complementary modes of passenger rail transportation options, as described

[11] Route segment numbers are discontinuous. These segments were used during the route alternative evaluation process to allow for consistency in comparing alternatives. Information in the Level 2 and Level 3 studies is presented by these segments.

Section 2.2.3. If only the proposed NLX service were implemented, the existing platform, which is 409 feet long, would need to be extended to 908 feet. This will be reconfirmed in preliminary engineering. Additional expansion of passenger rail facilities would be needed to accommodate other passenger rail service at the Interchange. See Figure 3.13 for Interchange location.

Duluth Union Depot

The northern terminus of the proposed project would be the Duluth Union Depot located at Michigan Street and Fifth Avenue in Duluth, Minnesota. See Figure 3.15 for location of the Depot.

Improvements to the Duluth Depot required for proposed NLX station purposes include addition of a platform and the separation of passenger and freight operations within the yard. St. Louis County has prepared a master plan for improvements to revitalize the Depot and improve the pedestrian environment, promote mixed use development, and create significant new public spaces in the surrounding area. A pedestrian connection to a proposed adjacent Duluth Transit Authority facility will provide additional multi-modal connections. These master plan improvements are separate from the proposed NLX project.

In addition to proposed stations in Minneapolis and Duluth, stations are proposed at Foley Boulevard near East River Road in Coon Rapids, and at yet-to-be-determined locations in Cambridge, Hinckley, and Superior (Wisconsin). See Figures 3.13-3.15.

Coon Rapids – Foley Station

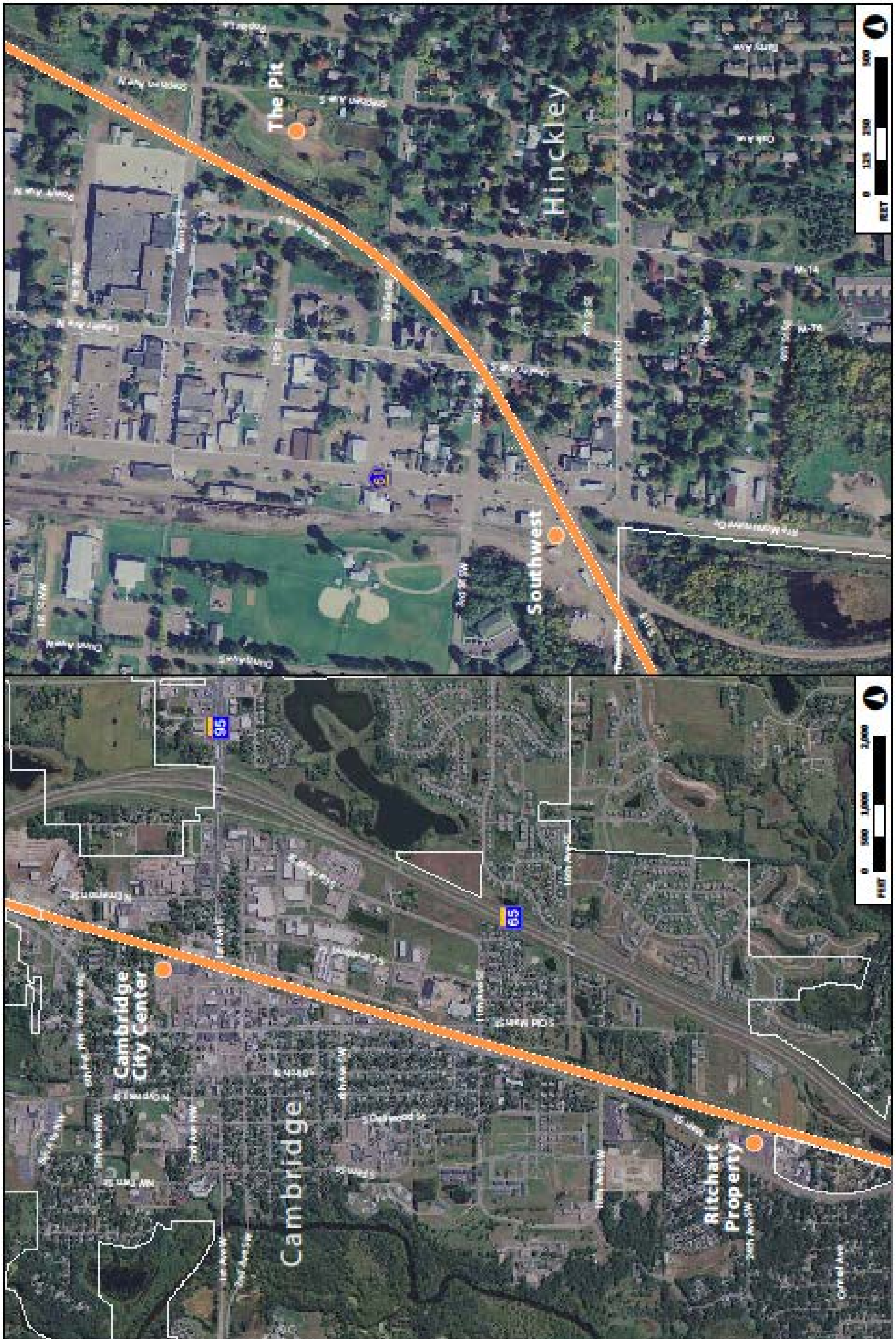
An intermodal transit station at Foley Boulevard has been identified and evaluated in the Northstar Commuter Rail Corridor federal and state environmental review documents (Final EIS and Record of Decision, 2002). Metro Transit currently operates a park and ride facility off of Foley Boulevard, to the east of the existing BNSF right of way. Anoka County has also prepared a Draft Categorical Exclusion document in an FRA format[12] that further details expanded station area plans at Foley Boulevard, including additional parking for the proposed station in the northeast corner of Foley Boulevard and the BNSF tracks. For purposes of this NLX service level EA, a center platform is proposed immediately south of Foley Boulevard, between the existing BNSF Main 2 line and the proposed third main. Track improvements are noted below under Segment 3. See Figure 3.13 for station location.

[12] The Categorical Exclusion document was not finalized nor submitted to FRA as the proposed project was not funded.

Figure 3.13

Location of Potential Stations - The Interchange (Minneapolis, MN) and Foley (Coon Rapids, MN)

Northern Lights Express



Location of Potential Stations - Cambridge, MN and Hinckley, MN

Northern Lights Express

Figure 3.14

Figure 3.15

Location of Potential Stations - Duluth, MN and Superior, WI

Northern Lights Express

Table 3.3. NLX Route Segments and Assumed Concept-Level Corridor Improvements

Segment	Location		Milepost*		Segment Mileage	Assumed Concept-Level Improvements**
	Start	End	Start	End		
1 Wayzata Subd.	The Interchange, Minneapolis	Minneapolis Junction, Minneapolis	11.6	9.7	2.1	new connecting track 15' from the existing track – on west for segment and east for a segment – through wye at Minneapolis Junction for a distance of approx. 3,000'.
2 Midway Subd.	Minneapolis Junction, Minneapolis	University Avenue, Minneapolis	9.7	11.4	1.4	
3 Staples Subd.	University Avenue, Minneapolis	Coon Creek Junction, Coon Rapids	11.4	21.1	9.7	6.2 mi new track partially west and partially east of existing track between I-694 and Hwy 610/Coon Creek Junction in Fridley (referred to as "the third main"). Track improvements through Coon Creek Junction. New RR bridges over Mississippi Street and Rice Creek. Modification of Hwy 610 overpass.
4 Hinckley Subd.	Coon Creek Junction, Coon Rapids	Isanti	136.9	113.0	23.9	3 mi. siding west of existing track and 1 mi. siding extension east of existing track in Andover. RR bridge replacement over Coon Creek. New parallel RR bridge over Coon Creek.
5 Hinckley Subd.	Isanti	Cambridge	113.0	107.4	5.6	6 mi. of new track located 30' west of existing track between Isanti and Cambridge, and 15' west of existing track in Cambridge.*** Connection of existing sidings between Isanti and Cambridge.
6 Hinckley Subd.	Cambridge	Hinckley	107.4	72.3	34.1	35 miles of new track located 15' west of existing track in Cambridge and Braham, and 30' west of existing track elsewhere between Cambridge and Hinckley. New RR bridges over Snake River at Grasston, ditch near Henriette (box culvert), and Pokegama Creek at Brook Park. Replacement of 379th Street overpass over RR near Grandy. Rehab of existing bridges over Pokegama Creek and Snake River.
17 Hinckley Subd.	Hinckley	Boylston	72.3	11.8	60.5	New or extended sidings to a total length of 3-4 miles each, 15' east of existing track, near Sandstone, Askov, Bruno, Holyoke, and Foxboro. Rehab of existing bridges over Grindstone, Kettle, Big Willow, Net (2), Black and Nemadji Rivers, and State Line, Balsam, Little Balsam, Hubert and Norvell Creeks.
18 Lakes Subd.	Boylston	Superior (n. of 28th St.)	12.6	5.4	8.7	3 mi. of new track 15' west of existing track between Central Avenue and 11th St. N. in Superior.
19 Lakes Subd.	Superior (n. of 28th Street)	Duluth Union Depot	5.4	0	5.4	1.5 mi. of new track 15' west of existing track between Segment 18/19 boundary and 11th Street in Superior. 1.1 mi new freight siding along existing track from the wye west of Grassy Point to Bridge to 46th Ave. in Duluth. Bridge over water inlet. Segment of main track approaching the Depot and track for layover at Depot. Rehab of Grassy Point Bridge.
Total					152.4	

*Mileposts change due to change in rail subdivision. Note that RR MPs often are not exact miles, therefore differences between MP references may not equate to actual distances. .

** The assumed track spacing represents worst-case assumption. The existing track will be rehabilitated to continuous welded rail in all segments. The need for rehabilitation of the existing track parallel to the areas of dedicated track between Isanti and Hinckley and in Superior will be evaluated as operational analyses are refined in subsequent project phases.

***Note 0.3 mile of the dedicated passenger track is located in Segment 4.

Cambridge and Hinckley

Station area planning efforts conducted to date by the cities of Cambridge and Hinckley assumed that improvements would consist of an 850 foot long platform and parking space for 200 cars.[13] Sites evaluated in Cambridge and sites evaluated in Hinckley are shown in Figure 3.14.

In Cambridge, the City Center site, located north of 1st Avenue East and east of Main Street, and the Ritchart site have been recommended for further analysis. In Hinckley, the Southwest Site near the intersection of Old Highway 61 and Fire Monument Road, and the Pit Site, south of Main Street, east of Power Avenue South, north of 2nd Street SE and west of Steven Avenue South have been recommended for further analysis. Additional study will occur in the next phase of project planning. Station improvements in Cambridge and Hinckley will be addressed separately in future environmental documentation.

Superior

No formal station area planning has yet been done in Superior. Improvements are assumed to be similar to stations in Foley, Cambridge, and Hinckley with respect to platform length, access to platform, and parking. A site just north of Highway 2 (Belknap Street), immediately east of the proposed Build Alternative, has been identified by City staff as a potential station location. See Figure 3.15. Additional study will occur in the next phase of project planning. Station improvements in Superior will be addressed separately in future environmental documentation.

3.2.2.2 Proposed Improvements

Ongoing operational analysis completed by MnDOT in consultation with BNSF has identified anticipated corridor improvements needed to accommodate high speed rail at a concept level. The proposed corridor improvements are described below, summarized in Table 3.3, and identified on Figures 3.4-3.12. This description reflects the improvements included in the *NLX Concept-Level Engineering Report, Level 3 Analysis,* dated June 2011, updated with refined track schematics, dated November 2011, but assuming a worst-case corridor footprint, as described in Section 3.2.2.3.

Segments 1 and 2: Construction of an additional connecting track section from the Wayzata Subdivision to the Midway Subdivision through the wye at Minneapolis Junction (which is the boundary of Segments 1 and 2), located 15 feet west of the existing track center from approximately MP 10.0 to approximately MP 9.7 and 15 feet east of the existing track center from MP 9.7 to MP 10.0, for a total distance of approximately 3,000 feet.

[13] Northern Lights Express Passenger Rail Site Selection Analysis and Preliminary Station Area Planning, Hay Dobbs, P.A., for East Central Regional Development Commission, August 2010. Advised by NLX-appointed Station Development Advisory Committee. Funded in part by the Initiative Foundation, a regional foundation. Site analysis informed by FRA standards and Transit Oriented Development Guidelines available at the time. There was no direct federal government involvement in this study.

Segment 3: This segment is also known as "the third main"[14]. Construction of new track offset 15 feet from the centerline of the existing track between MP 14.8 (south of Interstate 694 in Fridley) and MP 21.1 (Coon Creek Junction in Coon Rapids). New track would be east of the centerline between MP 16.8 and 20.1, west of the centerline for the remaining portions of this segment. Track improvements through Coon Creek Junction. Construction of new bridges over Mississippi Street and Rice Creek. Modification of the underpass at Highway 610.

Segment 4: Construction of a siding 15 feet west of the existing track from MP 135.6 to MP 132.6 and extension of the existing siding 15 feet east of the existing track from MP 132.6 to MP 131.6 in Andover. Construction of a new bridge (parallel to the existing bridge) over Coon Creek at MP 135.5. Replacement of the existing railroad bridges over Coon Creek (MP 135.5).

Segment 5: Construction of new dedicated track 30 feet west of the centerline of the existing track from MP 113.3[15] (in Isanti near Elizabeth Street) to MP 109.4 (in Cambridge at 18th Avenue SW), then construction of new track 15 feet west of centerline of existing track to Segment termini at MP 107.4. Construction of 3.2 miles of new siding track on the east side of the main track to connect the existing sidings between Isanti and Cambridge.

Segment 6: Construction of new dedicated track between MP 109.4 to MP 72.3 (in Hinckley at Fire Monument Road), to be constructed 30 feet west of the centerline of the existing track, except in the following locations where it would be 15 feet west of the centerline of the existing track: MP 109.4 to MP 106.2 (in Cambridge at Hwy 65), and MP 97.0 (in Braham at 4th Street) to MP 95.9 (in Braham at Central Drive). Construction of new bridges across the Snake River at MP 91.8 in Grasston and Pokegama Creek at MP 79.3 in Brook Park, 30 feet west of existing bridges. The new bridges are assumed to be of the same design (number of spans and piers, scale, height, proportion, similar materials) as the existing and to be located 30 feet off centerline. Construction of a box culvert over a ditch[16] at MP 84.1 near Henriette. A new highway bridge at 379th Street at MP 101.3 near Grandy, crossing over the existing main track and new dedicated passenger track and replacing the wooden bridge that is over the single main track. Rehabilitation of the existing bridge across the Snake River at MP 91.8 in Grasston and Pokegama Creek at MP 79.3 in Brook Park. See Appendix D for a description of bridge rehabilitation expected for this project.

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[14] Many of the third main improvements were initially evaluated under NEPA as part of the Northstar Corridor Draft and Final Environmental Impact Statement/Record of Decision (2000 and 2002, respectively), re-evaluation as part of the Northstar Corridor EA/FONSI (2006), and Draft Categorical Exclusion Worksheet for the Northstar Foley Boulevard Station Area Improvements (2010); findings from these evaluations inform the analysis of this segment reported in Chapter 4. The FTA was the lead federal agency for the completed NEPA evaluations; at the time the Categorical Exclusion Worksheet was drafted, FRA was anticipated to be the lead federal agency, however the project was not selected for federal funding therefore there was no federal action or conclusion of a NEPA process. The specific length and location of third main has changed in definition over the period of time addressed by these earlier documents. The third main is new track along this corridor, i.e. there were not historically three main lines in this segment.

[15] The Segment 4/5 boundary is 113.0, therefore 0.3 mi. of the dedicated track is in Segment 4, however this improvement is listed under Segment 5 for clarity.

[16] Identified as Pine County Ditch #7 on BNSF track chart.

Segment 17: Construction of five sidings (new and extended) 15 feet east of the existing track near Sandstone from MP 67.5 to MP 64.5 (new); near Askov from MP 58.5 to MP 54.8 (extended); near Bruno from MP 52.1 to MP 48.4 (extended); near Holyoke from MP 33.9 to MP 30.7 (new); and near Foxboro from MP 25.2 to MP 22.4[17] (extended). Rehabilitation of existing bridges (see Appendix D) over the following rivers:

- Grindstone River – MP 71.6 (Minnesota)
- Kettle River – MP 62.4 (Minnesota)
- Big Willow River – MP 40.5 (Minnesota)
- Net River – MP 30.2 (Minnesota)
- Net River – MP 28.3 (Minnesota)
- State Line Creek – MP 25.2 (Minnesota/Wisconsin)
- Balsam (W. Balsam) Creek – MP 22.2 (Wisconsin)
- Little Balsam (E. Balsam) Creek – MP 21.7 (Wisconsin)
- Hubert Creek – MP 20.2 (Wisconsin)
- Norvell Creek – MP 20.0 (Wisconsin)
- Black River – MP15.5 (Wisconsin)
- Nemadji River – MP 12.7 (Wisconsin)

Segments 18 and 19: Construction of new track 15 feet west of the existing track in Superior, Wisconsin between MP 8.3 (Central Avenue) and MP 4.2 (11th Street North). Rehabilitation of the existing Grassy Point Bridge over the St. Louis River. Construction of 1.1 mi new freight siding along the existing track from the wye west of Grassy Point to Bridge to 46th Ave. in Duluth, Minnesota. Bridge over water inlet. Segment of main track approaching the Depot and track for storage, layover and equipment maintenance at the Duluth Depot.

In total, expansion of the existing corridor for track dedicated for passenger train use occurs for approximately 53 miles of the total 152 mile corridor. Expansion of the corridor for new or extended freight sidings needed for operational efficiency occurs for approximately 17 miles of the 152 mile corridor. Of the 70 miles of new track, approximately 65 miles would be in Minnesota and five miles would be in Wisconsin.

[17] MP 24.8 to 22.4 is in Wisconsin; the remainder of the proposed siding construction sites in Segment 17 are in Minnesota.

Other proposed project improvements include:

- Extension of existing culverts within new track areas.
- Rehabilitation/improvements to existing track where new parallel track is not provided. The existing BNSF freight rail line from Hinckley to Superior is currently a Class 3 line and would need to be improved to a Class 5 line for use by passenger trains at 90 miles per hour.[18] The existing track utilizes 136 pound continuously welded rail. The upgrades can be accomplished through tie replacement and ballast improvements. This can be done as maintenance on the line utilizing tie replacement trains and ballast replacement trains. All work is performed from the track and has no impacts outside the existing track bed. Some "truing" of the rail may also be necessary but this is also done as routine maintenance.
- Limited curve straightening occurring within existing railroad right of way.
- Signalization and communication systems upgrades throughout the corridor.
- Track and signal improvements, including control points, turnouts and crossovers, to increase flexibility and capacity in operations.
- Installation of warning devices with four quadrant gates or other acceptable protections/appropriate warning devices at all public crossings.
- Improvements to "humped" at-grade street crossings (a condition at a highway/rail at-grade crossing where the elevation of the tracks is above the elevation of the approaching roadway).
- Closure of 30 to 40 percent of private at-grade crossings (estimate based on field survey), with alternative access provided.
- Installation of fencing in urbanized areas of the corridor and as determined needed for safety in rural areas of the corridor. In populated areas or at public crossings, chain link would be the likely type of fencing, although decorative fencing may be considered in municipalities where determined to be appropriate. Where fencing is installed in rural areas (as needed for safety), farm fencing is the assumed type.
- Layover would occur at existing train yards at the south and north project termini. Layover facilities include stage and storage tracks and provide for basic cleaning and daily servicing including FRA-mandated daily equipment inspections. The facility size estimated to support this activity is approximately 37,000 square feet not including the storage yard and lead tracks.

[18] FRA's track safety standards establish specific classes of track, based on progressively more exacting standards for track structure, geometry, and inspection frequency. Each Class of Track has a corresponding maximum allowable operating speed for both freight and passenger trains. The higher the Class of Track, the greater the allowable track speed and the more stringent track safety standards apply. Railroads determine the Class of Track to which each stretch of track belongs based upon business and operational considerations. Once the designation is made, FRA holds railroads accountable for maintaining the track to the corresponding standards for that particular class. (*Federal Railroad Administration Federal Track Safety Standards Fact Sheet,* June 2008.)

- At the south terminus (Minneapolis), the location of layover facilities is yet to be determined, but is subject of on-going coordination with MWRRI, with the desired location being immediately proximate to the Interchange. To accommodate the layover needs of the proposed NLX service only (two train sets) is anticipated to require approximately 1,000 feet of track. Additional track would be required to serve the layover needs of other passenger rail service, either at a shared site with the proposed NLX service or elsewhere. The layover site at the south terminus will be addressed separately in future environmental documentation.
- At the north terminus (Duluth), the identified NLX layover site is the rail yard immediately west of the Depot; this site will accommodate layover of two train sets. There are currently no facilities for layover at this location. Facilities to be built include a building to house cleaning equipment, restocking convenience items on the train and equipment for minor repairs to train sets. It would also include fuel storage and a fueling facility. The layover facility would have the capability to provide FRA-mandated daily equipment inspection.

- Heavy maintenance would be provided by the equipment vendor or other agencies at an existing off-site location yet to be selected.
- Borrow and staging areas are yet to be determined and will be reviewed for environmental concerns at a later date.

3.2.2.3 Area of Direct Impact (Footprint)

Typical cross-sections were developed for new track areas based upon assumed track spacing, installation of a drainage system, and the general topographic conditions throughout the corridor. The cross-section included track bed and slopes for drainage. From these cross-sections, an area of impact (footprint) was developed and is the basis for the impacts reported in this EA. The width of impact ranges from 44 feet to 92 feet except for a portion in the City of Braham where a cross-section of 29 feet was developed in order to avoid impacts to a park, businesses and a home. See discussion in Section 4.1. Figures 3.9-3.12 illustrate cross-sections.

3.2.2.4 Operations

As part of the 2007 feasibility study, operating scenarios including varying train speeds, frequencies and sizes were evaluated in relation to ridership, required improvements, operating costs and revenue to inform how to best structure the service at a concept level. Operating characteristics were further developed in the Level 2 functional analysis that was prepared by MnDOT for the proposed project. While the NLX operating plan would continue to be refined through on-going project development activities, including consultation with BNSF, this EA includes the operations assumptions used in the Level 2 functional analysis.

The Level 2 functional analysis was also informed by consultation with BNSF regarding relationship to freight operations. Currently 12 freight trains per day run on the project corridor. This level of freight activity is assumed to continue. The impacts assessed in this EA that are due to the proposed passenger service would be in addition to the impacts of the freight train activity.

The Level 2 functional analysis used the track configuration discussed above and depicted below along with assumed speeds of up to 79-mph south of Coon Creek Junction, up to 90 mph on existing track north of Coon Creek Junction, and up to 110-mph on dedicated track between Isanti and Hinckley. This track configuration results in a 2 hour 17 minute timetable between Minneapolis and Duluth. Figure 3.16 presents the evaluated speed profile.

The Level 2 functional analysis assumed tilting trains that are FRA Tier-I Compliant (i.e. meets standards for operating at speeds up to 125 mph) as shown in Figure 3.17. Examples of such trains may include the Midwest Regional Rail System "generic 110-mph train" which was characterized as a Talgo T-21, a locomotive-hauled train, or an equivalent diesel multiple unit (DMU) option, commonly known as the ICE TD.

The Level 2 functional analysis provided detailed train schedules for passenger rail in consideration of input provided by BNSF regarding its freight operations. The passenger rail schedules were preliminary and for the purpose of functional analysis; they will continue to be refined through project development. The Level 2 functional analysis time distance diagram and the preliminary schedules are shown in Figures 3.18 and 3.19. The schedules were developed using a three-train active fleet rotation (a fourth train held for equipment protections and maintenance reserve) with train meets only in double track areas (not in freight sidings) and also avoiding Northstar commuter train slots.

As recommended in the functional assessment, eight trains are assumed as optimizing the service; in addition, of the range of frequencies investigated at the concept level, eight trains also represents the worst-case for environmental impacts related to operations (e.g. noise, vibration, visual).

3.2.2.5 Ridership

The Level 2 functional analyses reports ridership forecasts for the proposed project of 938,000 annual riders in 2020 growing to 1,302,000 annual riders in 2040. The Level 2 functional analysis also reports annual passenger miles at 96 million in 2020 growing to 130 million in 2040.

Figure 3.16. Speed Profile – Route 9 – 2:17 Schedule

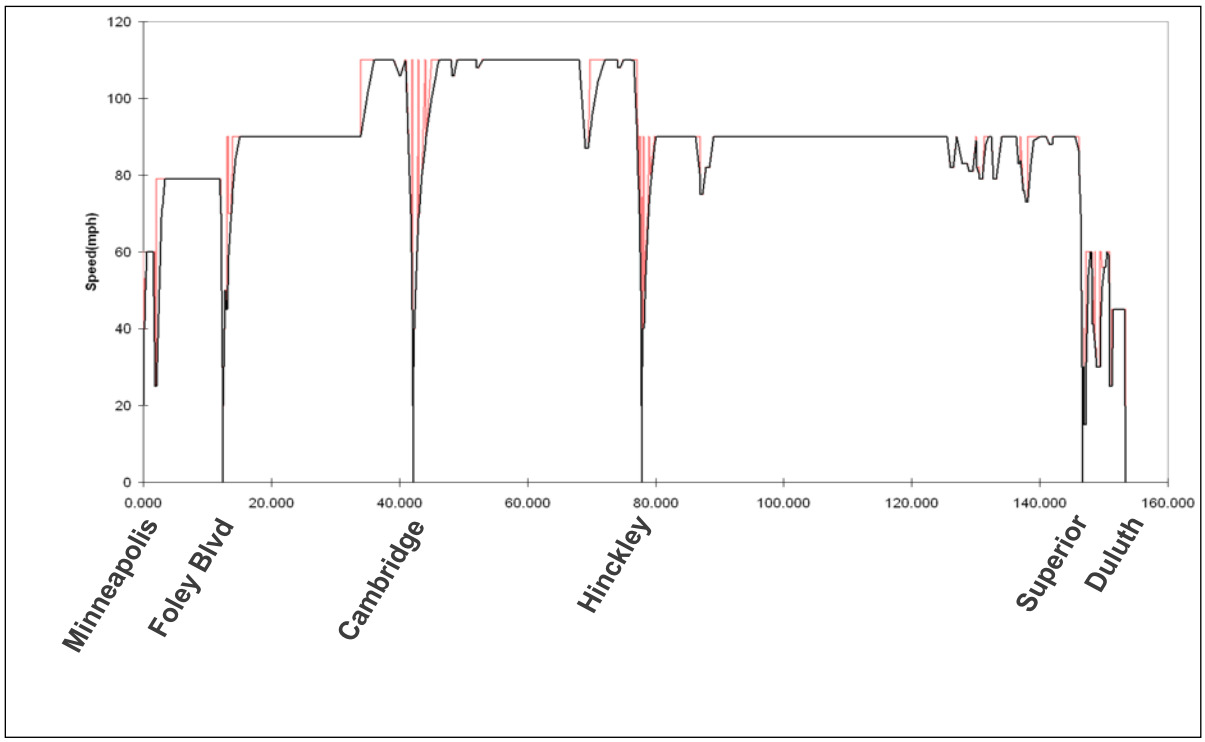


Figure 3.17. "Generic 110-mph Train Options" Represented by Talgo T-21 and Tilting DMU

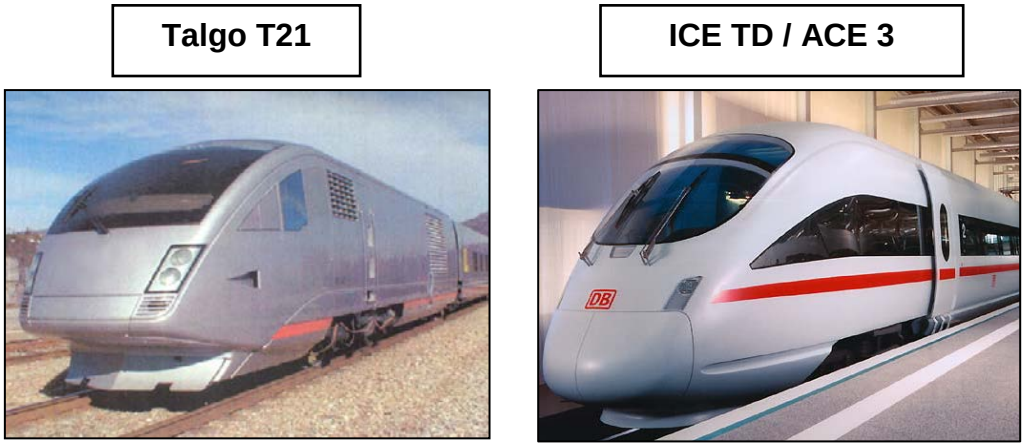


Figure 3.18. Level 2 Functional Assessment Time Distance Diagram

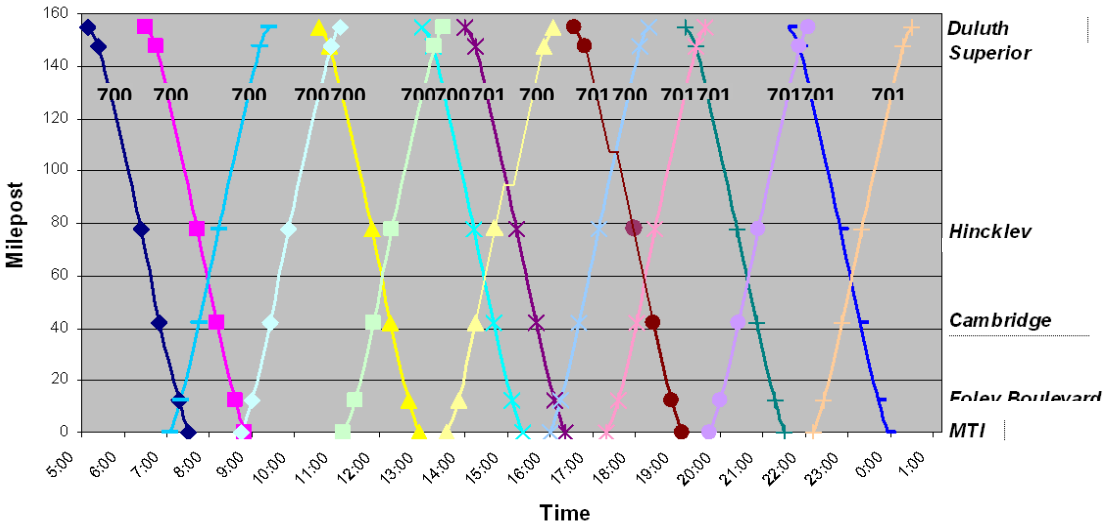
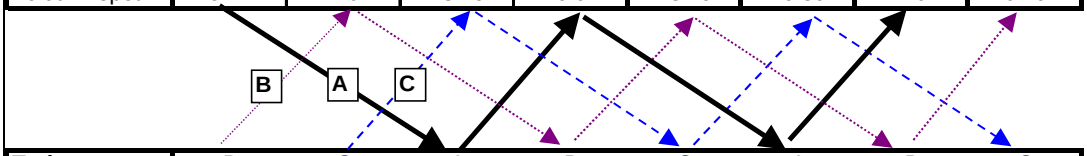


Figure 3.19. Preliminary Timetable Used in Level 2 Functional Assessment

Trainset	A	B	C	A	B	C	A	B
Northbound	***#7000***	***#7002***	***#7004***	***#7006***	***#7008***	***#7010***	***#7012***	***#7014***
MTI	7:05	8:45	11:10	13:35	16:00	17:20	19:45	22:10
Foley Blvd	7:20	9:00	11:25	13:50	16:15	17:35	20:00	22:25
Cambridge	7:46	9:26	11:51	14:16	16:41	18:01	20:26	22:51
Hinckley	8:12	9:52	12:17	14:42	17:07	18:27	20:52	23:17
Sandstone	-	-	-	-	-	-	-	-
Superior	9:11	10:51	13:16	15:51	18:06	19:26	21:51	0:16
Duluth Depot	9:24	11:04	13:29	16:04	18:19	19:39	22:04	0:29



Trainset	B	C	A	B	C	A	B	C
Southbound	***#7003***	***#7005***	***#7007***	***#7009***	***#7011***	***#7013***	***#7015***	***#7017***
Duluth Depot	5:10	6:30	10:35	13:00	14:00	16:35	19:10	21:35
Superior	5:25	6:45	10:50	13:15	14:15	16:50	19:25	21:50
Sandstone	-	-	-	-	-	-	-	-
Hinckley	6:23	7:43	11:48	14:13	15:13	17:58	20:23	22:48
Cambridge	6:51	8:11	12:16	14:41	15:41	18:26	20:51	23:16
Foley Blvd	7:17	8:37	12:42	15:07	16:07	18:52	21:17	23:42
MTI	7:30	8:50	12:55	15:20	16:20	19:05	21:30	23:55

Equipment Rotations:
Train A: 7000,7007,7006,7013,7012 Starts at MTI, Ends at Duluth
Train B: 7003,7002,7009,7008,7015,7014 Starts at Duluth, Ends at Duluth
Train C: 7005,7004,7011,7010,7017 Starts at Duluth, Ends at MTI

1) #7011 need to get equipment back into Minneapolis as quickly as possible for evening rush, this is a lightly used midday departure so meet opposing train #7006 (delaying #7006) in freight siding north of Sandstone.
2) #7008 is advanced to meet peak hour capacity requirement must meet opposing #7013 in freight sidings north of Sandstone; delay opposing #7013 which will be less heavily loaded
3) Schedules of #7003 and #7010 have to be slotted in between Northstar Commuter Trains

Schedule Locked due to Northstar Slot

Meet Point with opposing NLX Train

4.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Impacts described in this chapter are based on the project definition as described in Chapter 3, including expansion of the existing corridor for track dedicated for passenger train use for approximately 53 miles of the total 152 mile corridor, expansion of the corridor for new or extended freight sidings needed for operational efficiency for approximately 17 miles of the 152 mile corridor, railroad bridge construction, replacement or rehabilitation at several locations; specific station locations in Minneapolis, Coon Rapids and Duluth; and identification of Cambridge, Hinckley and Superior as other station communities.

Environmental analysis was initiated early in the project development process to inform the design of the proposed track improvements to accommodate the high speed rail project. Early analysis was based on a substantially longer distance of new track and conservative (i.e. broad) impact area (footprint) assumptions. In addition, options for locating new track on either the west or east sides of the existing track were assessed for impacts to resources. Early impact findings along with operations and infrastructure analysis informed a project design that currently reflects reduced length of required new track and footprint. Investigation of specific community impact areas led to further refinement of the typical cross-section, most notably in the City of Braham. Sections 3.2.2.2 and 3.2.2.3 in Chapter 3 describe the improvements and corridor footprint.

Field investigations and quantified assessments of corridor-long impacts to resources such as land use by type, cover type, wetlands, and farmland were conducted based on improvements assumed as part of the Level 2 functional analysis. Certain refinements to these assumed improvements were made during the development of the Level 3 concept engineering report and track charts in order to optimize operations; these refinements included modifications in the location and length of freight sidings and a minor extension of the area of new dedicated track segment. The effect of these modifications on the impacts calculated was reviewed. Where the modifications resulted in substantively different impacts, the assessment was updated and is reported in this chapter. Where modifications would not result in substantively different impacts, the calculations based on the Level 2 assumptions are provided in this chapter and noted as such. See Appendix A for a description of Level 1, Level 2 and Level 3 studies that inform this EA.

As noted in previous chapters, design and operational analysis will continue beyond the service-level NEPA process and will result in additional project refinements and changes in impacts that will be assessed in subsequent environmental documents, as determined appropriate by FRA and the states in order to meet both federal and state environmental review requirements. Additional efforts to avoid and minimize impacts, as well as specific detailing of mitigation commitments, will also occur as part of the various permitting processes.

Specific station locations are identified in Minneapolis (the Interchange), Coon Rapids (Foley Boulevard), and Duluth (the Depot). Potential station locations have been identified in Cambridge, Hinckley, and Superior. New stations in these communities will be subject to future project level environmental documentation. The potential for impacts, based on general information about basic requirements – platforms and parking sites – is discussed.

4.1 Land Use/Plans/Right of Way Acquisition

4.1.1 Land Use

Affected Environment

The proposed NLX corridor is currently an active freight rail line used by BNSF. The existing BNSF right of way generally ranges from 50 to 150 feet in width.

Minneapolis and Duluth, the project termini, are the most developed portions of the study corridor with a mix of residential, public, commercial, industrial, and parkland/open space land uses. Minneapolis is located along the banks of the Mississippi River, just north of the river's confluence with the Minnesota River. The metropolitan area is a center for the arts and is also the primary business center between Chicago and Seattle, with an economy based in commerce, finance, rail and trucking services, health care, and industry. The most prevalent land uses adjacent to the proposed NLX corridor between Minneapolis and Duluth are commercial, industrial, and residential. The area surrounding the Interchange is primarily mixed use, with industrial, commercial, and residential uses.

Duluth-Superior is the largest inland freshwater port on the Great Lakes. Transportation (airports, rail yards, harbor, and roads) constitutes nearly 14 percent of Duluth's total land area. Other primary land uses include parks (17 percent), residential (23 percent), and undeveloped land (36 percent), with less prevalent uses including commercial/industrial and civic uses.[19] In Superior, land use includes a mixture of residential, public, commercial, and industrial uses. Approximately 55 percent of Superior's land base is under some form of public ownership due to its role as the governmental hub of Douglas County and northwestern Wisconsin.[20] With 3.5 million visitors annually, many traveling from the Twin Cities, tourism plays an important role in Duluth's economy. Within the Duluth-Superior metropolitan area, the most prevalent land uses adjacent to the NLX corridor are industrial, commercial, and residential. The Depot area is primarily industrial with some mixed use and residential areas.

Between the Minneapolis-St. Paul metropolitan area and Duluth-Superior metropolitan area, land use is primarily low-density and rural with several communities along the southern two-thirds of the study corridor. Existing land use includes agricultural lands, undeveloped lands, rural residential properties, single family and multi-family residential development (including seasonal homes), parks, other public, commercial, and industrial uses. Agricultural use is most prevalent in Anoka County, Isanti County, Kanabec County, and southern Pine County. North of Hinckley, in Pine County and through Douglas County, agriculture gives way to a landscape dominated by wetlands and forests.

[19] *City of Duluth Comprehensive Plan*, 2006.

[20] *Douglas County Comprehensive Plan 2010 – 2030*

Future development pressure is expected to be greatest in the southern portion of the project corridor, which is closest to the Twin Cities metropolitan area. The *Isanti County Comprehensive Plan* (Draft 2008), states that rapid growth is anticipated in proximity to the Twin Cities. The *City of Coon Rapids Comprehensive Plan* (August 2009) indicates that, since the community is already developed, nearly all residential growth will occur as the redevelopment of under-utilized land.

Isanti, Kanabec, and southern Pine County are within commuting distance of the Twin Cities metropolitan area. Isanti County is one of 10 Minnesota counties defined by the 2000 census as being part of the Twin Cities "commuter shed." This designation means that five percent or more of the residents within these counties commuted to employment within the metropolitan area.

The natural resources in Pine, Carlton, and St. Louis counties support the outdoor recreation industry. Hinckley and Sandstone serve as gateways to several parks and recreation areas. This area of the state provides opportunities for fishing, boating, canoeing/kayaking, hiking, and cross-country skiing. Pine County's comprehensive plan identifies outdoor recreation resources among its greatest assets and indicates the importance of protecting those resources considered vital to the tourism and recreation industry.

Impacts

No Build Alternative

The No Build Alternative would result in no specific changes to land uses within the corridor. It will remain in use as a freight rail corridor. Broader land use goals related to the economic benefits of high speed rail service along the corridor would not be supported.

Build Alternative

The proposed NLX project is not expected to cause significant change in land use through the corridor as a whole. There would likely be new development near stations. The proposed NLX project is generally compatible with adjacent and nearby land uses along the entire corridor and is consistent with local and/or regional comprehensive plans. Specific impacts to land use are described below.

Within the two terminal metropolitan areas, impacts to land use due to construction of new tracks would be minimal with all improvements located within or immediately adjacent to an existing active freight rail corridor.

Having the proposed service termini at the Interchange intermodal station in Minneapolis and the Depot in Duluth is compatible with the function of those facilities and with the surrounding land uses in the two cities. Furthermore, the addition of high speed passenger rail service supports these metropolitan areas as primary business, education, arts, and recreation centers.

Construction of a new track parallel to the existing track and dedicated for passenger train use would be needed for approximately 53 miles of the total 152 mile corridor. New or extended freight sidings needed for operational efficiency would be needed for approximately 17 miles of the 152 mile corridor. The edge of the proposed footprint is between 44 and 92 feet from centerline of the existing track, except for a short segment in the City of Braham where a cross-section of 29 feet was developed in order to avoid impacts to a park, businesses and a home.

With some exceptions, at least 50 feet of the assumed new footprint area is existing BNSF right of way. Where the footprint exceeds the width of the existing right of way, the project would convert existing land use to new railroad use. In rural areas, this is chiefly agricultural or undeveloped uses. Through several communities, the expanded track area is in an undeveloped area between a highway and the existing track.

Table 4.1 identifies the amount of land that would be impacted by the construction footprint assumed based on concept-level project definition.[21] The calculated direct impact to approximately 420 acres includes the area within the construction limits as based on the cross-sections discussed in Section 3.2.2.3 and depicted in Figures 3.9-3.12 in Chapter 3. About three-quarters of the area within this worst-case construction limit is already BNSF right of way. Approximately 120 acres of the affected footprint is in other ownership and would need to be acquired as railroad right of way.

Table 4.1. Acres Within Assumed Construction Footprint and Required Right of Way Acquisition

		Acres within Assumed Construction Footprint*			**Acres of Required Right of Way Acquisition****		
		MN	WI	Total	MN	WI	Total
1	The Interchange to Mpls Jct	1.0	0	1.0	0	0	0
2	Mpls Jct to Univ. Ave.	2.9	0	2.9	0.1	0	0.1
3	Univ. Ave. to Coon Creek Jct***	5.1	0	5.1	2.0	0	2.0
4	Coon Creek Jct to Isanti	7.0	0	7.0	0.1	0	0.1
5	Isanti to Cambridge	47.2	0	47.2	16.8	0	16.8
6	Cambridge to Hinckley	291.4	0	291.4	89.8	0	89.8
17	Hinckley to Boylston	30.4	8.2	38.6	9.0	0	9.0
18	Boylston to Superior	0	24.4	24.4	0	1.0	1.0
19	Superior to Duluth****	0	3.0	3.0	0	0	0
Total		395.0	25.6	420.6	117.8	1.0	118.8

*Note that total impacts vary from Table 4.2 because of the coarse resolution of the dataset used in Table 4.2 and different data sources. Table 4.1 reflects a more accurate calculation; both are based on worst-case footprint assumption.
** Only segments that would incur permanent right of way impact out of existing BNSF right of way are noted, as this table is estimating the amount of land that would be converted to rail right of way from other ownership.
***Acres are estimated from past environmental documents for the third main.
****Estimate for freight siding.

[21] Level 2 functional assessment. The refined improvements identified in the Level 3 concept engineering report would not entail a substantive change in acres of impact or required right of way acquisition.

Most of the land that would be impacted by the construction footprint is cropland or undeveloped open space.

During project development, particular effort was made to minimize impacts to developed land uses (structures or parking lots). Based on the footprint developed for the proposed project, impacts to developed land uses were initially identified within Minneapolis, Cambridge, Braham, Henriette, Hinckley, and Sandstone. Additional investigation and design changes eliminated impacts to developed land uses in Minneapolis, Braham, Henriette, Hinckley, and Sandstone.

The most detailed refinements were done for the segment of the corridor through the city of Braham (MP 97.0 to MP 95.9), with gradual curves introduced to allow for reduction in spacing between tracks as well as elimination of ditch drainage in the cross-section (the trackbed would drain as it does under existing conditions) in order to minimize the construction footprint and avoid impacts to businesses, a home and a park which all abut the rail corridor. The refinements and related information specific to the impacts and minimization efforts in the city of Braham are included in Appendix E.

Additional investigation and design changes also minimized impacts to developed land uses in Cambridge, however did not avoid all impacts with the community. The project would result in the following impacts to developed land uses in Cambridge:

- MP 109.0-180.8: minor temporary easement on industrial property
- MP 107.4: relocation of railroad structure (a small metal industrial building used for storage)
- MP 107.4: temporary construction impacts to rear parking lot of Cambridge Mall

There are no direct impacts to developed land uses (other than to railroad uses) in the other communities.

Layover and Maintenance

Layover and maintenance activities pose no issues of land use incompatibility because they would be located in existing rail yards.

Stations

Improvements to the existing platform and station facility currently serving the Northstar Commuter rail in Minneapolis (as described in Section 3.2.2.1) are being planned cooperatively among a number of government stakeholders with interests in various potential future rail services. Planning to date has considered compatibility with downtown Minneapolis character and its location with Minneapolis Warehouse Historic District which is listed on the National Register of Historic Places (NRHP). A station at this location is compatible with surrounding land uses.

The new station at Foley Boulevard in Coon Rapids would be generally consistent with the area's mixed land use which dominated by highway infrastructure and also includes commercial,

low density and light industrial uses as well as parcels acquired by MnDOT or the Anoka County Regional Rail Authority to accommodate the station platform and park and ride.

The proposed project includes new stations at Hinckley, Cambridge and Superior. Locations have not been selected; therefore, impacts on specific land uses within these communities cannot yet be fully assessed. Station planning activities have been undertaken in Hinckley and Cambridge, as described in the *Northern Lights Express Passenger Rail Site Selection Analysis and Preliminary Station Area Planning*, 2010, Hay Dobbs. Alternative locations were evaluated against criteria that included site availability, availability of infrastructure, and consistency with local government and community goals. Potential locations of the Hinckley and Cambridge stations are in Figure 3.14 in Chapter 3. Formal station planning has not begun in Superior; however City staff have identified a potential site that is in a commercial/industrial area with redevelopment opportunity and adequate space for a station platform and parking. See Figure 3.15 in Chapter 3.

The addition of the proposed NLX service, including addition of a platform and separation of passenger and freight operations within the yard, at the Duluth Depot, would be compatible with area land uses which consist of trackage and other rail equipment at the yard, and commercial/industrial uses in the general vicinity.

Avoidance, Minimization and/or Mitigation Measures

As noted above, additional investigation and minor design refinements eliminated potential impacts to developed land uses in corridor communities with the exception of minor impacts in Cambridge, which would be minimized to the extent possible during construction. The small railroad storage building would need to be relocated; based on available space, it is assumed that this would be accommodated within existing BNSF right of way.

The design refinements developed to date to avoid direct property impacts in Braham will be further evaluated during preliminary engineering. If impacts to properties occur in Braham or any other location in the corridor, measures to minimize and/or mitigate would be developed in future environmental documentation.

The acquisition of property for the proposed project would be conducted in accordance with the Uniform Relocation and Real Property Acquisition Act of 1970, as amended, and 49 CFR Part 24.

4.1.2 Compatibility with Local Plans and Regulations

The proposed project is compatible with the plans discussed below.

The *Minnesota Comprehensive Statewide Freight and Passenger Rail Plan* (February 2010, Addendum April 2011) calls for Minnesota to develop a robust intrastate and interstate intercity passenger rail system that provides improved travel options, costs, and speeds for travelers. The plan focuses on the development of intercity passenger rail service that links the Twin Cities with the Chicago Hub high speed rail network, the national Amtrak system, and major regional

trade centers in Minnesota and the upper Midwest. High speed passenger rail service from Minneapolis to Duluth is among the Plan's Phase I priority corridors, i.e. projects scheduled between 2010 and 2030.

The *2030 Hennepin County Transportation Systems Plan* (Hennepin County, MN, Draft – December 2008), an update of the Plan prepared by the County in 2000, sets forth the long term vision of how transportation services should be provided for the future. The Plan indicates that the economic vitality of the region is dependent on a transportation system that provides numerous travel options, including high speed rail. The Plan references the National Transportation Policy and Revenue Study Commission study that recommends the Minneapolis–Duluth-Superior project as one of eight projects for new service.

The *Anoka County 2030 Transportation Plan* (Anoka County, MN, December 2008) includes a goal to preserve and enhance the potential for mobility by improving connectivity between communities within and adjacent to Anoka County. The Plan also recommends enhancing alternative travel modes and connections, including high speed rail service and existing and planned rail corridors. Planned improvements include schedule service by Metro Transit (TH 65 and CSAH 14), which is interrelated to start-up of the NLX passenger rail project. The plan also lists study of a new transit route from St. Louis and Lake Counties to Minneapolis via the Coon Rapids juncture with the Northstar Commuter Rail service.

The *Isanti County Comprehensive Plan* draft, (Isanti County, MN, February 2009) includes an implementation Plan objective of maintaining a safe, cost-effective, efficient, and environmentally sensitive transportation system. As related to railroads, this includes promoting fully utilized, safe, and quiet freight and passenger rail services. The Plan also supports the investigation of future commuter rail transportation to/from the Twin Cities metropolitan area.

The *Pine County, Minnesota Comprehensive Plan Update* (Pine County, MN, March 1993[22]) predates discussion of high speed rail, but includes policies relevant to the proposed project. The Plan identifies the County's numerous natural resources and their association with a wide variety of tourism and recreational opportunities. One of the Plan's goals is to protect and manage these resources, which are necessary to increasing the diversity of the area's commercial base, including the tourism and recreation industry. NLX high speed rail would support the Plan's goal of promoting rural/residential development in areas convenient to facilities, services, and activities for residents.

The *Carlton County Community-Based Comprehensive Plan* (Carlton County, MN, April 2001) includes a goal to provide a transportation network that facilitates the efficient flow of people and goods throughout the County by promoting transit use. The Plan also supports the development of a strong and diversified economic base that promotes job growth and an increased tax base. Recognizing tourism and recreation as a viable part of a diversified economy supports this economic development goal.

[22] Most recent plan, still in effect.

The *Douglas County Comprehensive Plan 2010 – 2030* (Douglas County, WI, December 2009), identifies the nearest available passenger rail service as Amtrak's route through Minneapolis-St. Paul, and the Plan further indicates that there has been recent discussion about reinstating the Amtrak line from Minneapolis-St. Paul to the City of Duluth. The NLX Passenger Rail Project would provide rail service to local residents.

The Minneapolis Plan (Minneapolis, MN, October 2006) (Chapter 8) states that the City's existing transportation system must be balanced to strengthen transit and other non-automobile forms of transportation. According to the Plan, Minneapolis will strengthen the transportation system to make transit a better choice for a range of transportation needs and will continue to pursue transit improvements in corridors that serve major transit origins and destinations with the eventual goal of having a region-wide rail system. The Plan also promotes accessibility to downtown by improving and balancing the existing transportation system.

The *City of Coon Rapids Comprehensive Plan* (Coon Rapids, MN, August 2009) includes a policy to promote the development of Duluth to the Twin Cities passenger rail service with a stop at the Foley Boulevard station site.

The *2006 City of Duluth Comprehensive Plan* (Duluth, MN) does not specifically mention high speed passenger rail, but does acknowledge the expansion of regional infrastructure. The Plan states that the City's seaport, airport, rail connections, and regional highways will evolve over time in response to changing markets, industrial expansion or contraction, and a growing or shrinking tourism industry and that consideration of the expansion, contraction, or protection of transportation facilities is crucial to meeting the long-term land use goals set forth in the Plan.

The *Duluth-Superior Long Range Transportation Plan – Directions 2035* (Duluth, MN, and Superior, WI, July 2010) includes a goal to develop and maintain the Duluth-Superior transportation system in ways that support economic productivity, efficiency, and competitiveness; an associated goal is to increase the number of passenger trips to and from the Duluth-Superior metro area, and strategies include advocating for passenger rail service to/from the Twin Cities and assisting jurisdictions in planning for rail connections. The Plan anticipates that the proposed NLX Passenger Rail Project would facilitate increased commuter traffic between Duluth-Superior and the Twin Cities.

The *Saint Louis County Union Depot Passenger Rail Terminal Study* (Saint Louis County, MN, March 2010) includes guiding principles that recognize the NLX high speed passenger rail project and the North Shore Scenic Railroad as unique transportation features for Duluth, while extending the multi-modal nature of the Saint Louis County Union Depot (Depot) area to buses, boats, bicycles, and other forms of transportation. According to the study, the planned return of passenger rail service between Duluth and the Twin Cities metropolitan area provides an opportunity to evaluate new uses for the Depot that capitalize on the historic value of the building while strengthening the local economy. It is likely that Lake Superior Railroad Museum will remain at the Depot, thereby providing a unique opportunity to combine a reputable transportation history museum with an active multi-modal transportation facility. Physical changes to the Depot or its tenant mix were encouraged to capitalize on transportation access and tourism activities as well as acknowledging the historic status of the building.

The preliminary station planning for Hinckley and Cambridge includes "consistency with the comprehensive plan and potential to support local planning initiatives" among the station local evaluation criteria. The stations would undergo separate environmental review.

Minnesota and Wisconsin have established statewide minimum standards for shoreland development. Many counties and local units of government have adopted these or stricter standards into their zoning ordinances. Shoreland zoning include standards related to lot sizes, setbacks, and land use. The proposed project would comply with state and local shoreland zoning regulations.

4.2 Transportation

Affected Environment

The existing transportation system serving the proposed NLX corridor is described in Section 2.2.1. There is currently no passenger rail service between Minneapolis and Duluth. Non-automotive transportation between Minneapolis and Duluth is provided by bus and air. Interstate 35 (I-35) provides freeway connection for automobile travel.

Impacts

No Build Alternative

The No Build Alternative would result in continued lack of passenger rail service between Minneapolis and Duluth. The transportation objectives described in Chapter 2, Purpose and Need, would not be met.

Build Alternative

Ridership

The Level 2 functional analysis reports ridership forecasts for the proposed project of 938,000 annual riders in 2020 growing to 1,302,000 annual riders in 2040. The Level 2 functional analysis also reports annual passenger miles at 96 million in 2020 growing to 130 million in 2040.

Intermodal Transportation

The proposed project would connect to existing and future intermodal transportation options, including inter-city passenger rail, LRT, BRT, commuter rail, urban and rural bus systems, automobile, bicycle, and recreational transportation options (such as the North Shore Scenic Rail).

No adverse impacts to transportation are anticipated. Delays at at-grade crossings due to eight additional roundtrip trains a day would be limited in duration. Potential connections between proposed high speed passenger rail and other transportation modes would offer expanded travel opportunities for residents and visitors. Intermodal connections with existing roadways are anticipated to occur primarily at park and ride facilities adjacent to stations. Stations would also provide opportunities for connections between high speed rail and other modes of transportation including buses, LRT, and commuter rail. Further information about intermodal transportation is provided in Section 2.2.3.

Traffic Circulation

Based on track charts, there are 160 at-grade crossings of the corridor, 126 public and 34 private. Of these 138 (108 public and 29 private) are in Minnesota and 23 (18 public and five private) are

in Wisconsin. There would be temporary impacts to crossings during construction. Alternate access would be available during construction. To the extent feasible, construction would be staged to ensure that travelers would only have to go a short distance out of their way to find an alternative crossing opportunity.

All public crossings would be protected with warning devices with four quadrant gates or other acceptable protections/appropriate warning devices. Approximately 30 to 40 percent of the private crossings would be closed, with alternate access provided. This may result in more circuitous travel, but should affect a small number of properties. Property acquisition would occur at critical areas where alternate access cannot be provided. Gate protection would be provided at all other private crossings.

The addition of eight roundtrip trains a day would have a minor impact on vehicular travel within communities. Based on the level of analysis conducted for this EA, dwell times for passenger trains at stations are estimated to be two minutes. Depending on station locations, at-grade crossings near the stations may be affected (cross-street access closed) during this time. Station locations in Minneapolis, Coon Rapids, Superior (potential), and Duluth are in areas with grade-separated crossings. There are at-grade crossings in the vicinity of the potential station locations in Cambridge and Hinckley, however there are other at-grade crossings within a few blocks that could provide alternative routes for vehicles. With the limited dwell time at stations and alternative routes, the impact of any traffic delays due to stops at stations is expected to be minimal. The goal to avoid/minimize grade crossing impacts was considered during preliminary station siting work. Further analysis would occur during the project level station analysis.

Pedestrian/Bicyclists

As noted, there are numerous at-grade crossings of the existing rail corridor accessible by pedestrians and bicyclists. As noted in Section 4.11, the Gandy Dancer Trail crosses the corridor near Dedham, WI, and the Soo Trail parallels the corridor for a short distance in Superior, WI. As with vehicular travel, access and circulations for pedestrians/bicyclists would be affected by temporary impacts to crossings during construction, rerouting of access where private crossings are closed and minimal wait time at crossing during train operations.

The project would add more train activity to the corridor, and trains would operate at speeds up to 110 mph. In urbanized areas and as needed in rural areas for safety, the proposed NLX corridor would be a “sealed corridor,” which means that the tracks would be fenced to prevent unsafe access to the corridor. Where appropriate due to the level of pedestrian and bicycle activity, crossing gates would accommodate pedestrian and bicycle movement.

Freight

As listed in Section 3.1, conflicts with freight or future rail purposes i.e. the ability for high speed rail to coexist successfully with freight rail, was among the Level 1 route selection alternative evaluation criteria. Analysis done during Level 2 and Level 3 concept development, in consultation with BNSF, resulted in trackwork and system improvements for track segments that support joint passenger and freight operations (for daily operations and during periods of

track maintenance). Through the concept development process, improvements were refined (in particular, location and length of freight sidings) in order to add capacity and flexibility into the system and minimize impacts to freight movement. This objective would continue through subsequent preliminary design work.

Summary of Impacts in Local, Regional, National and International Perspectives

The proposed project:

- supports intermodal transit
- has minor impacts on localized traffic circulation
- has positive impact on system highway congestion by diverting automobile trips
- has minor impacts on pedestrian/bicycles access and circulation
- has positive safety impacts on pedestrians/bicycles
- supports joint passenger and freight operations

Layover and Maintenance

The layover and maintenance activities would not result in negative impacts to transportation. The site for layover, fueling and equipment maintenance in Duluth would be designed to minimize impacts to other rail uses in the yards. Existing parking and access would be sufficient for facility employees. While the location of the layover site in Minneapolis is subject to on-going discussion among agencies with interests in NLX and MWRRI and has not yet been selected, it would be in an existing rail use area and likewise would be designed to minimize impacts to other rail uses and to ensure sufficient parking and access for facility employees.

Stations

The proposed NLX stations are anticipated to generate traffic associated with drop off and park and ride activity. This could result in localized traffic impacts. Specific parking and traffic related impacts at the proposed stations would be studied in the project level environmental documents. Station areas would be designed to accommodate pedestrians and bicyclists.

<u>Avoidance, Minimization, and/or Mitigation Measures</u>

Adverse impacts to traffic circulation for vehicles, pedestrians and bicyclists due to construction would be temporary. To the extent feasible, construction would be staged to ensure the availability of convenient alternate crossings.

Alternate access would be provided or property acquisition would occur where private crossings are closed.

4.3 Vegetation and Wildlife/Threatened and Endangered Species

4.3.1 Vegetation, Wildlife Resources and Habitats

Affected Environment

The proposed NLX project corridor includes parkland, rivers, streams, wetlands, woodlands, farmland, and urban habitat areas, providing a wide range of fish and wildlife resources and habitats. Rivers, streams, and wetland areas provide habitat for aquatic wildlife and other species (birds, mammals, amphibians/reptiles). Coniferous forests cover much of the northern half of the corridor, providing woodland habitat for, among many other species, larger mammals including gray wolf, coyote, white-tailed deer, and black bear. Farmland provides wildlife habitat for grassland birds and small rodents. Urban areas provide habitat in parks, yards, and undeveloped areas for common species that have adapted to urban areas, such as white-tailed deer, rabbits, raccoons, and various birds.

Sensitive habitat resources in the project area include rivers and streams, railroad right of way prairies, a Wildlife Management Area (WMA), and other biologically significant areas. These resources are discussed below. Key resources are illustrated in Figures 4.1 and 4.2.

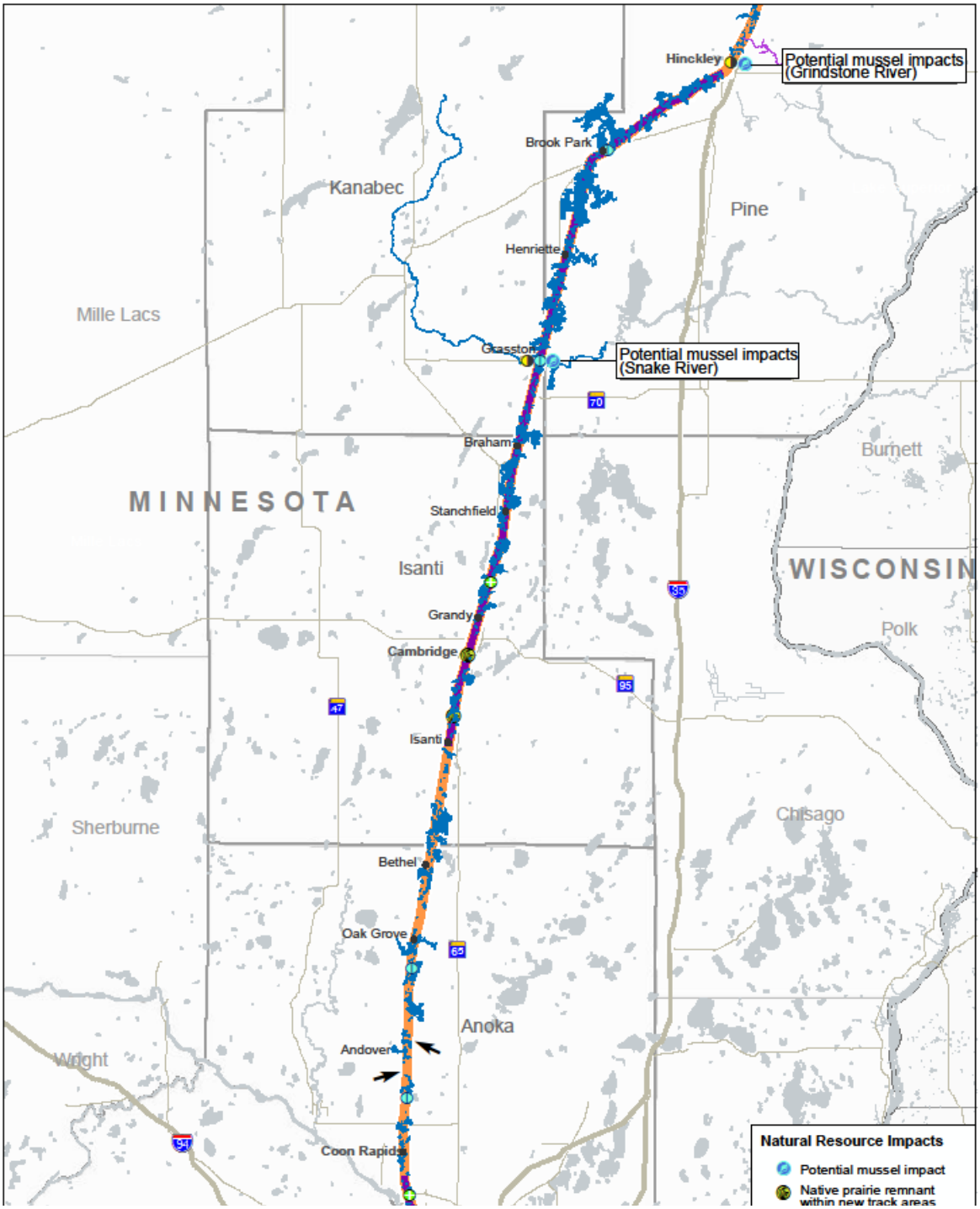
Aquatic Habitat

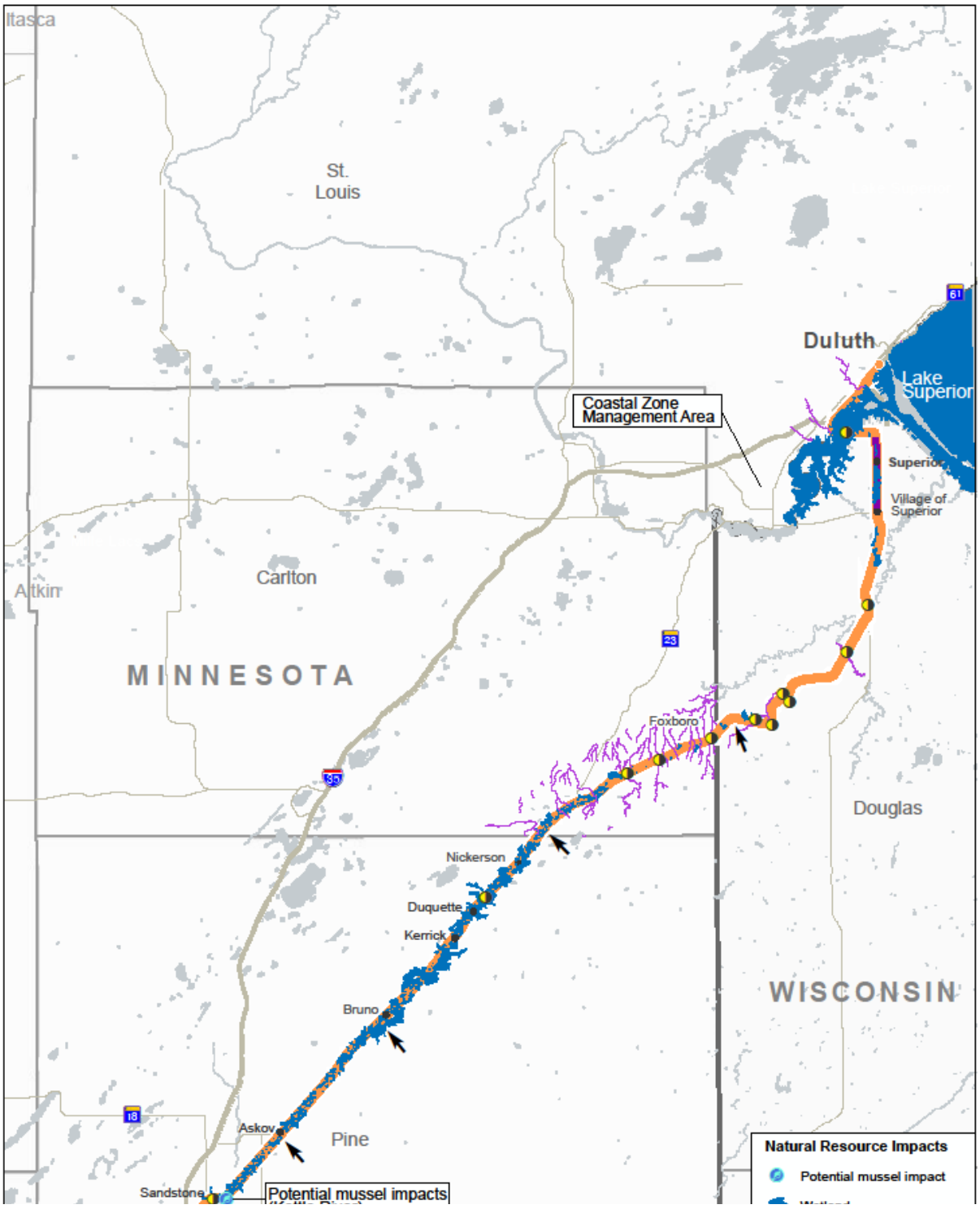
The proposed NLX corridor crosses 99 watercourses (65 in Minnesota, 34 in Wisconsin).[23] While impacts to water quality are of concern to all aquatic species, trout streams are particularly sensitive to environmental changes due to the potential impact of stormwater discharge on the chemical composition and temperature regime of the stream and therefore the trout population. The proposed NLX corridor involves 27 crossings of trout streams (18 streams total, 12 in Minnesota, six in Wisconsin). In addition, as discussed in Section 4.3.2, mussels have been identified in five rivers in the project area and may be present in others. Section 4.5 also discusses water quality conditions of potentially affected watercourses, many of which are impaired.

Native Prairies

In 1997 and 1998, the Minnesota County Biological Survey (MnDNR) conducted a study that identified a total of 17 linear dry and mesic prairies within BNSF right of way along the existing railroad corridor. The data indicated that most prairie remnants are located within Anoka County with a few isolated segments existing in Isanti County. The quality of the prairies ranges from fair to very good with most being fair in quality. According to the study data, the prairie remnants present at each location may occur on either or both sides of the railroad grade.

[23] MnDNR 1:24K hydrography base map. Perennial streams, intermittent streams, and drainage ditches are included in this dataset; Wisconsin DNR


Hinckley
Potential mussel impacts (Grindstone River)
Brook Park
Kanabec
Pine
Henriette
Mille Lacs
Grasston
Potential mussel impacts (Snake River)
70
Braham
Burnett
MINNESOTA
Stanchfield
WISCONSIN
Isanti
Grandy
Polk
Cambridge
95
47
Isanti
Chisago
Sherburne
Bethel
Oak Grove
65
Anoka
Andover
Wright
94
Coon Rapids
Natural Resource Impacts
Potential mussel impact
Native prairie remnant within new track areas


Itasca
St. Louis
Duluth
Lake Superior
Coastal Zone Management Area
Superior
Village of Superior
Carlton
Aitkin
MINNESOTA
Foxboro
Douglas
Nickerson
Duquette
Kerrick
Bruno
WISCONSIN
Askov
Pine
Sandstone
Potential mussel impacts
Natural Resource Impacts
Potential mussel impact

Wildlife Management Area

The Robert and Marilyn Burman Wildlife Management Area (WMA) is located west of the existing BNSF track near the town of Cedar in Anoka County. The 204 acre WMA consists of upland hardwoods, open fields oak savanna, and lowland shrub swamp. WMAs are part of Minnesota's outdoor recreation system and are established to protect lands and waters that have a high potential for wildlife production, public hunting, trapping, fishing, and other compatible recreational uses.

Outstanding Biodiversity Significance Sites

A Minnesota County Biological Survey (MCBS) "Outstanding" designation means that the site contains the best occurrences of the rarest species, the most outstanding example of the rarest native plant communities, and/or the largest, most ecologically intact or functional landscapes. Two designated sites are located adjacent to the project corridor in southern Anoka County immediately north and south of Bunker Lake Boulevard Northwest. The southern site has an area of 1,061 acres and the northern site encompasses 655 acres. The southern site is contained within Bunker Hills Regional Park and much of the northern site has undergone residential development.

Wild Rice

The Great Lakes Indian Fish and Wildlife Commission was consulted to identify any surface waters within or near the project limits that are mapped for the presence of wild rice. None were identified.

Impacts

No Build Alternative

The No Build Alternative would have no impacts to vegetation, wildlife or habitat.

Build Alternative

Cover Type

The effect of the proposed project on cover type is provided in Table 4.2, as derived from National Land Cover Database 2001 (NLCD 2001) Land Cover Classifications. While more recent land cover data (2006) was available for portions of the corridor at the time that the analysis was conducted, the 2001 dataset was chosen because it covered all counties within the area of proposed additional track. A comparison of the two data sets (GIS shapefiles) indicates almost no difference in land cover in the areas affected by NLX construction.

Note that areas between the tracks, and side slopes would likely re-vegetate over time allowing for semi-pervious conditions within the corridor footprint. The cover type change shown in Table 4.2 is based on the improvements assumed as part of the Level 2 functional analysis. The refined

improvements identified in the Level 3 concept engineering report would not entail a substantive change in impacts to cover type.

Table 4.2. Land Conversion to Rail Use by Cover Types

Cover Type	Acres*		
	MN	WI	Total
Types 1-8 wetlands	91	3	94
Wooded/forest	53	8	61
Brush/grassland	94	0	94
Cropland	47	0	47
Developed, open space	44	17	61
Developed, low to high density	55	2	63
Open water	0	0	<1
Total	384	36	420

*The NLCD dataset has a very coarse spatial resolution, so cover typing is only estimated, and should not be construed as exact amounts. Acre calculations were rounded to the nearest whole acre. Note that total impacts vary from Table 4.1 and wetland impacts vary from those reported in Section 4.4 because of the coarse resolution of the dataset and different data sources. Table 4.1 reflects a more accurate calculation; both are based on concept level project definition and worst-case footprint assumptions.

Invasive Species

Invasive species are present in all types of habitat along the project corridor. Pathways for the spread of invasive species relevant to the proposed project include inadvertent introduction of weed seed during construction or rehabilitation work via personnel clothing, gear, and equipment, through the use of mulch, imported soil, gravel or sod, or through inadvertent transport of non-native aquatic species via equipment used in waterways during bridge construction or rehabilitation. Minnesota and Wisconsin have comprehensive regulations related to control of invasive species[24] and both state agencies promote best practices within the construction industry through education, permitting and contract specifications.

Wildlife Habitat

Impacts to habitats would occur within the construction limits of new dedicated track and siding extensions. These would be narrow or "strip" uses (approximately 29 to 96 feet wide) of relatively small portions of various habitat types. In addition, as an extension of an existing rail corridor, these conversions of vegetation to rail use would be at the edge of existing habitat sites, minimizing the effect to wildlife due to habitat fragmentation (effect on animal migration discussed below). Furthermore, much of the construction limits beyond the new track ballast would revegetate over time. Outside of the construction limits and siding extension areas, there would be no conversion of habitat to rail use. Considering the entire corridor, the amount of impact to each habitat type represents a small fraction of the total amount of these habitat types. In general, minimal construction impacts to wildlife habitat are anticipated.

[24] For best management practices to be followed in Wisconsin, see http://council.wisconsinforestry.org/invasives/transportation/pdf/ROW-Manual.pdf.

Animal Mortality and Movement

As the project corridor is currently an active freight rail line with 12 trains per day, the addition of eight round trip high speed rail trains a day would have minimal potential for significant additional impacts to most wildlife due to train-animal collisions. The corridor is intended to be fenced for safety, but fencing the entire corridor would present a barrier to animal movement and may limit their accessibility to water, food, shelter, and breeding areas. DNR and USFWS staff were consulted regarding the potential for impacts to wildlife. Of the two potential impacts – train-animal collisions or restriction of movement – the concern is greater for the restriction of movement. Therefore, fencing would be restricted to urbanized areas and as needed for human safety in rural areas. DNR staff indicated that there were no major migration routes through the corridor.

Bridge rehabilitation activities pose the potential for impacts to nesting for migratory birds.

Noise Impacts to Wildlife

Section 4.7 addresses noise effects on wildlife (as well as domestic animals) noting that, while there are no established criteria relating high speed train noise and animal behavior, the conservative screening distance at which noise exposures may affect animals is 10 feet from the track centerline where NLX trains would not sound locomotive warning horns and 170 feet from the track centerline near at-grade crossings where NLX trains would sound locomotive warning horns.

Aquatic Habitat

Impacts to aquatic habitat (rivers and streams) are most likely to occur where new track, siding extensions, bridge rehabilitations, and new water body crossings would be constructed. As described in Section 4.5, numerous river and streams are within the area of proposed new track construction. Potential stream and river impacts may include suspended or deposited silt and sediment which can interfere with the feeding, movement, and reproductive activities of aquatic species. Permanent impacts include additional piers where new bridges would be constructed (over the Snake River and Pokegama Creek) and the extension of existing culverts over other streams within the new construction area, however, impacts to aquatic life as a result of these improvements are expected to be minor as they would not substantially interfere with feeding, movement or reproduction of aquatic species.

Trout streams crossed or within 200 feet of the existing track within the areas of new dedicated track or siding construction include Silver Creek tributary near Holyoke and State Line Creek near Foxboro, both locations in Minnesota. Mission Creek, near Hinckley in Minnesota, is within one mile of new track construction. Of the 13 major bridge rehabilitations, five are at identified trout streams including the Net River (two locations), State Line Creek, Balsam Creek, and Little Balsam Creek. In addition, while not identified as a trout stream, the Nemadji River, a bridge rehabilitation location, has been identified by WDNR as used by trout to migrate to reach spawning grounds.

Appendix D provides information on the expected nature of the railroad bridge rehabilitation, including replacing the open decks with ballasted deck, cleaning and painting, bearing replacement, and pointing of abutments and/or piers. Deck work is typically completed from on top of the bridge. Staging for cleaning and painting may be located below the bridge on waterway banks or in the waterway channel, which may cause minor short-term impacts to waterway flow. Bearing replacement requires jacking the existing superstructure off of the bearing surface on the substructure. If this work is performed, the staging for the jacking device would be located below the waterway banks or potentially in the waterway channel depending on span length. The work may cause short-term (i.e. a few days) impacts to the waterway flow. Likewise, the construction staging for abutment or pier pointing may be located near the bridge site or within waterway bank slopes, posing impacts to waterway flow, and therefore to aquatic species, that would be short-term and minor (i.e. a small encroachment, not blocking the flow of water or movement or feeding of fish, reptiles or amphibians).

Native Prairies

Impacts to identified prairie resources may occur at two locations where new track would be constructed. These include a 2.5 acre impact to an estimated 4-acre prairie remnant designated as "fair" along the track south of 301st Avenue NE in Isanti and a 3.5 acre impact to an estimated 4.5-acre prairie remnant designated as "good" south of 11th Avenue SE in Cambridge. DNR have been consulted regarding these potentially impacted areas. It should be noted that the impacts described above include the total area within the construction footprint and that substantial area within the construction footprint would be for slopes for drainage; these provide an opportunity for minimization through design and also reseeding with native grass mixtures, as described in the mitigation discussion below.

Other

Because the WMA and the two sites of Outstanding Biodiversity Significance are outside the construction limits of new dedicated track and sidings, no impacts are anticipated to these resources.

Avoidance, Minimization, and/or Mitigation Measures

Impacts to vegetation and wildlife habitat as a result of habitat conversion to rail use are expected to be minimal and are mitigated by some expected re-vegetation within construction limits. Measures to minimize impacts will be further developed during final design.

The potential spread of invasive species would be avoided/minimized through construction practices focused on "good housekeeping" such as decontamination of equipment on site, use of weed-free mulch, and other best practices.

To minimize barrier to animal movement, fencing would be omitted from the project corridor in areas where doing so would not pose safety danger to pedestrian/bicycles or vehicles. Where fencing is installed, it should not be extended into waterways which provide the opportunity for

wildlife crossing; wildlife benches should be created as needed to provide for animal crossing. Project staff will continue to consult with DNR staffs regarding fencing and related wildlife crossing considerations for the corridor, as well as design measures to help prevent significant increase in animal mortality due to the high speed train operations.

Bridges provide potential bird nesting habitat. In compliance with the Federal Migratory Bird Treaty Act, 50 CFR 21.41, bridges to be rehabilitated would be kept clear of nests prior to nesting season. After inactive nests have been removed, tarps or nets would be secured to the bridges to restrict birds from gaining access below the bridge to discourage nesting and keep the structure clear of nests until nesting season is over.

Potential measures to avoid, minimize, or mitigate impacts to aquatic habitat include timing of new bridge construction and bridge rehabilitation activities to avoid spawning periods, to occur during periods of low flow, and best management practices to protect stream banks and to prevent silt from entering streams. Measures to avoid adverse impacts to water quality are discussed in Section 4.5.

Prairie impacts may be minimized by narrowing construction limits where avoidance is not feasible. The project staff would coordinate with MnDNR staff regarding mitigation measures focused on reseeding with native grass mixtures.

4.3.2 Rare, Threatened, and Endangered Species

4.3.2.1 Federally-Listed Species

The County Distribution of Minnesota and Wisconsin's Federally-Listed Threatened, Endangered, Proposed, and Candidate Species list provided by the US Fish and Wildlife Service (USFWS) indicates the species/designated critical habitat that are known to occur in the project area counties. These are shown in Table 4.3.

Impacts

No Build Alternative

The No Build Alternative would have no effect on federally-listed threatened and endangered species.

Build Alternative

The USFWS was contacted to assist in determining the appropriate consultation path in accordance with Section 7 of the Endangered Species Act of 1973, as Amended (Act). On December 29, 2011, staff from the USFWS, MnDNR and MnDOT conducted a field evaluation of various locations along the project corridor with the intent of determining the potential for effect.

Determination

Based on the coordination and field work conducted by staff from USFWS, MnDNR and MnDOT, the nature of the proposed activities, the federally-listed species identified and the absence of designated critical habitat within the action area, FRA determined that the proposed action may affect, but is not likely to adversely affect the Canada lynx, a federally-listed threatened species. For all other federally-listed species identified, FRA determined that the project would have no effect.

Table 4.3 Listed Species/Critical Habitat within Project Area Counties– Minnesota/Wisconsin

Minnesota				
County	**Species**	**Listing Status**	**Critical Habitat**	**Determination**
Hennepin	Higgins eye pearlymussel (*Lampsilis higginsii*)	Endangered	No	No Effect
Anoka	None	NA	No	NA
Isanti	None	NA	No	NA
Kanabec	None	NA	No	NA
Pine	Canada lynx (*Lynx canadensis*)	Threatened	No	May Affect, not Likely to Adversely Affect
	Spectaclecase (*Cumberlandia monodonta*)	Proposed as Endangered	No	No Effect
Carlton	Canada lynx (*Lynx canadensis*)	Threatened	No	May Affect, not Likely to Adversely Affect
St. Louis	Canada lynx (*Lynx canadensis*)	Threatened	Yes – However none within the project area	May Affect, not Likely to Adversely Affect
	Piping plover (*Charadrius melodus*)	Endangered	Yes – However, none within the project area	No Effect
Wisconsin				
County	**Species**	**Listing Status**	**Critical Habitat**	**Determination**
Douglas	Canada lynx (*Lynx canadensis*)	Threatened	No	May Affect, not Likely to Adversely Affect
	Piping plover (*Charadrius melodus*)	Endangered	Yes – However, none within the project area	No Effect
	Kirtland's warbler (*Dendroica kirtlandii*)	Endangered	No	No Effect
	Fassett's locoweed (*Oxytropis campestris var. chartacea*)	Threatened	No	No Effect

Avoidance, Minimization, and/or Mitigation Measures

Based upon the determination above, no measures are required.

4.3.2.2 State-Listed Species

Affected Environment

Minnesota

A one-mile buffer surrounding the proposed project corridor was evaluated for the presence of rare plants, animals, native plant communities, and other rare features including railroad prairies. The analysis used Geographical Information Systems (GIS) in conjunction with the MnDNR's Natural Heritage Information System (NHIS) and Railroad Rights-of-Way Prairies layer. NHIS data was provided by MnDNR's Division of Ecological Resources under license agreement number LA-542 and was current as of June 29, 2009. (These data are not based on an exhaustive inventory of the state. The lack of data for any geographic area should not be construed to mean that no significant features are present.)

The NHIS search identified multiple occurrences of state threatened and endangered species. Eight plant species were listed as threatened or endangered. Five invertebrate species and four vertebrate species were listed as threatened. State threatened and endangered species are summarized in Table 4.4. A full list of search results is included in Appendix F.

Table 4.4. State-Listed Threatened and Endangered Species (Minnesota)

Species Type	Scientific Name*	Common Name*	MN Status
Plant	*Botrychium oneidense*	Blunt-lobed Grapefern	Endangered
	Botrychium rugulosum	St. Lawrence Grapefern	Threatened
	Cypripedium arietinum	**Ram's-head Lady's-slipper**	Threatened
	Poa paludigena	**Bog Bluegrass**	Threatened
	Potamogeton bicupulatus	**Snailseed Pondweed**	Endangered
	Rotala ramosior	Tooth-cup	Threatened
	Scleria triglomerata	Tall Nut-rush	Endangered
	Viola lancelata	Lance-leaved Violet	Threatened
Mussel	***Actinonaias ligamentina***	**Mucket**	Threatened
	Alasmidonta marginata	**Elktoe**	Threatened
	Cyclonaias tuberculata	**Purple Wartyback**	Threatened
	Pleurobema coccineum	**Round Pigtoe**	Threatened
Insect	*Cicindela lepida*	Little White Tiger Beetle	Threatened
Reptile	*Clemmys insculpta*	Wood Turtle	Threatened
	Emydoidea blandingii	**Blanding's Turtle**	Threatened
Bird	*Falco peregrines*	Peregrine Falcon	Threatened
	Lanius ludovicianus	**Loggerhead Shrike**	Threatened

*****Bold text denotes species identified within one mile of locations where new dedicated track or siding extensions are proposed or where water body crossings or bridge rehabilitation is planned.

Occurrences of three state-listed threatened or endangered plant species were identified within the proposed construction limits: ram's head lady's slipper *(Cypripedium arietinum)*, bog bluegrass *(Poa paludigean)*, and snailseed pondweed *(Potamogeton bicupulatus)*. The ram's head lady's slipper prefers dry to moist forests, fens, and cedar swamps while bog bluegrass and snailseed pondweed tend to occur in wet areas.

The NHIS search identified several mussel species within one mile of the proposed NLX corridor. Occurrences of the mucket *(Actinonaias ligamentina)* and elktoe *(Alasmidonta marginata)* were identified in the Snake River (Grasston), Grindstone River (Hinckley), and the Kettle River (Sandstone). The Round Pigtoe *(Pleurobema coccineum)* was also identified in the Kettle River. The MnDNR has also indicated the presence of mussel populations in the Snake, Kettle, Nemadji, and St. Louis rivers.

According to the MnDNR's NHIS data, known occurrences of Blanding's turtles *(Emydoidea blandingii)* have been recorded within the proposed construction limits. Blanding's turtles require both wetland and upland habitats. In Minnesota, Blanding's turtles are primarily marsh and pond inhabitants.

The NHIS data indicate the presence of a Loggerhead shrike *(Falco peregrines)* nest within one mile of the construction limits of the Andover siding extension.

Wisconsin

The Wisconsin Department of Natural Resources (WDNR) evaluated a 2,000 foot buffer surrounding the proposed project corridor within the Wisconsin portion of the corridor for the presence of rare plants, animals, native plant communities, and other rare features. The evaluation identified Public Land Survey (PLS) sections in which state threatened and endangered species have been recorded.

The search identified multiple occurrences of state threatened and endangered species. Eight plant species were listed as threatened or endangered; four vertebrate species were listed as threatened or endangered. State-listed threatened and endangered species are summarized in Table 4.5. A full list of endangered, threatened, and special concern species provided by the WDNR is included in Appendix F.

Table 4.5. State-Listed Threatened and Endangered Species (Wisconsin)

Species Type	Scientific Name*	Common Name*	WI Status
Plant	***Caltha natans***	**Northern Bur-reed**	Endangered
	Elecocharis nitida	**Slender Spike-rush**	Endangered
	Parnassia palustris	Marsh Grass-of-parnassus	Threatened
	Petasites sagittatus	**Arrow-leaved Sweet-coltsfoot**	Threatened
	Ranunculus cymbalaria	**Seaside Crowfoot**	Threatened
	Ranunculus gmelinii	**Small Yellow Water Crowfoot**	Endangered
	Salix planifolia	**Tea-leaved Willow**	Threatened
	Sparganium glomeratum	Northern Bur-reed	Threatened
Reptile	***Glyptemys inculpta***	**Wood Turtle**	Threatened
Bird	*Charadrius melodus*	Piping Plover	Endangered
	Sterna caspia	Caspian Tern	Endangered
Mammal	*Martes Americana*	American Marten	Endangered
*****Bold text denotes species identified within PLS sections where new dedicated track is proposed.			

One reptile, the wood turtle *(Glyptemys inculpta)*, was identified within one PLS section where new dedicated track is proposed (in Superior). The wood turtle prefers clean rivers and streams

with moderate to fast flows, adjacent riparian wetlands, and upland deciduous forests. The landscape near the proposed dedicated track is dominated by residential and commercial development to the east and an existing railroad yard to the west.

Impacts

No Build Alternative

The No Build Alternative would have no effect on state-listed threatened and endangered species.

Build Alternative

Impacts to state-listed threatened or endangered species would be most likely to occur where new dedicated track or siding extensions are proposed. New water body crossings or major bridge rehabilitation locations may also impact threatened or endangered species.

There are no state-listed threatened or endangered mammal species identified in areas where new track is proposed. As discussed earlier in this section, the project is expected to pose minimal construction impacts to wildlife habitat and minimal potential for significant additional impacts to most wildlife due to train-animal collisions. Fencing would be restricted to urbanized areas and as needed for human safety in rural areas to minimize restriction of wildlife movement. Therefore impacts to state-listed mammals are expected to be minor.

Only one state-listed bird species, the Loggerhead shrike (Minnesota), has been identified within one mile of new construction areas. The Loggerhead shrike nest was observed in 1978 and was not near the construction limits. Impacts to this species are not anticipated. In addition, interference with bird movement or reproduction due to the additional train activity is not anticipated.

No state-listed insect species are identified within one mile of the new construction areas. Additional train activity is not anticipated to impact the Little White Tiger Beetle (Minnesota), the only state-listed insect species along the NLX corridor.

Biological surveys may be necessary to determine the presence of threatened or endangered plant species where suitable habitat exists within the proposed construction limits.

Construction of new bridges may impact mussel populations. Surveys would be done within three years of construction to determine the presence of mussels in/near the construction impact area. Depending on the survey outcomes, future agency consultation may be required to investigate measures to avoid, minimize, or mitigate mussel impacts.

The addition of dedicated track and siding extensions is not expected to result in greater potential for impact to Blandings turtles (Minnesota), as the existing freight track already presents a barrier to movement. Blandings turtles may be affected during construction.

WDNR advised that Slender Spike-rush (endangered), Arrow-leaved Sweet-coltsfoot (threatened), and Seaside crowsfoot (threatened) are likely to be present in the project corridor. Plant surveys have not been done.

Layover and Maintenance

Layover and maintenance facilities are not included in cover type impact calculations presented in Table 4.2. All sites for layover and equipment maintenance activities under consideration are in urban areas already in rail use and would not result in vegetation impacts or associated impacts to wildlife. In addition, the layover and maintenance facilities will be evaluated as part of the Tier 2 NEPA documentation.

Stations

Station areas are not included in cover type impact calculations presented in Table 4.2. The extension of the existing platform at the Interchange and addition of a platform and separation of passenger and freight operations in yard territory at the Duluth Depot would not impact vegetation, wildlife resources or habitat. Previous environmental documentation for the Foley Station in Coon Rapids indicates no effect to federal threatened or endangered species, and determined no negative impacts to state-listed rare occurrences. As noted previously, stations at Cambridge, Hinckley and Superior would be addressed in separate environmental documentation; however, as they would be located adjacent to the tracks in developed communities, they should pose minimal potential for impacts to vegetation, wildlife resources and habitat.

Avoidance, Minimization, and/or Mitigation Measures

Construction impacts on Blanding's turtles would be minimized by following MnDNR recommendations which include installing silt fence to keep turtles out of the construction area. If encountered during construction and determined to be in danger, the turtles would be moved to a safe place by hand. If it is determined that they are not in danger, the turtles would be left undisturbed. The MnDNR flyer summarizing recommendations for avoiding and minimizing impacts to Blanding's turtles would be distributed to all contractors in the area.

Project staff would continue to coordinate with Minnesota and Wisconsin DNR staff regarding the need for surveys related to state threatened and endangered species as the project progresses, including location and methodologies.

If sensitive plant or animal species are found in locations that would be impacted by construction activities, agencies would be consulted regarding methods to, first, avoid and then, minimize such impacts. Agencies would also be consulted for viable procedures to transplant species or other mitigation measures where impacts are unavoidable.

As noted above, mussel surveys would be conducted at new water crossing locations. Depending on the survey outcomes, future agency consultation may be required to investigate measures to avoid, minimize, or mitigate mussel impacts.

4.4 Wetlands

Affected Environment

Regulatory Environment

Agencies with jurisdiction over wetlands in the project area include the U.S. Army Corps of Engineers (COE) which regulates the placement of fill in waters of the United States, including wetlands, through Section 404 of the Clean Water Act; Minnesota state agencies, counties and cities acting as the Local Governmental Unit (LGU) to carry out the requirements of the Minnesota Wetland Conservation Act (WCA), with oversight provided by the Minnesota Board of Water and Soil Resources (BWSR); the MnDNR which regulates lakes and larger wetlands that are identified as state public waters in Minnesota, and the WDNR which carries out the Wisconsin wetland regulatory program rules (Chapter NR 103, 299, 300, and 350-353 Wisconsin Administrative Code).

Wetlands Identification Methodology

Wetlands in the project area were assessed through a combination of on-site review and off-site mapping review. Wetlands were initially investigated for a longer and wider footprint than is the current proposed corridor footprint. The selection of feasible alternatives was informed by analysis of this initial wetland study corridor which reviewed 100 feet on either side of the existing track centerline extending from Highway 610 in Coon Rapids to Duluth.

In general, wetlands are distributed throughout the entire wetland study corridor, on both sides of the existing railroad ballast. See Figures 4.1 and 4.2. Wetlands assessed reflect a wide variety of functions including, but not limited to: flood storage, wildlife habitat, nutrient filtration, recreational purposes and fish habitat. As noted above, the wetland impact assessment analyzed potential wetland impacts east of and west of the existing railroad tracks.

The COE defines wetlands using the three parameters of hydrophytic vegetation, hydric soils, and wetland hydrology, stating: *The term "wetlands" means those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.* (33 CFR 328.3(b); 40 CFR 230.3(t))

For purposes of the wetland analysis in this EA:

"Wetland(s)" is contextual. In the context of the National Wetland Inventory (NWI) or Wisconsin Wetland Inventory (WWI) it means polygons mapped as wetlands by these remote sensing efforts. In the context of our fieldwork "Wetland(s)" are defined as those areas typically depressional on the landscape that were observed to have a predominance of hydrophytic vegetation and/or no obvious evidence of complete drainage.

"Study Sites" refers to the 48 locations that were pre-selected along the rail alignment prior to fieldwork in which field data was collected. The purpose of the study sites was to compare the accuracy of remotely sensed data sets against "ground-truthed" data.

"Area" refers to a field assessed location that was found to be non-wetland, whether it was mapped by NWI/ WWI or not.

The methodology to assess wetland impacts is presented in Appendix G. This included an abbreviated field methodology, developed in consultation with U.S. Army Corps of Engineers (COE) staff, to provide wetland data of sufficient resolution to inform the EA, and to guide decisions concerning opportunities for wetland impact avoidance and minimization. The methodology and findings were also reviewed with the WDNR during an agency coordination meeting.

The methodology is not intended to provide a permitting level of wetland delineation and wetland impact calculation. An abbreviated field delineation will be completed during final design based on a method agreed to by the COE and members of the Technical Evaluation Panel (TEP) per the Minnesota WCA.

The NWI and hydric soils mapping are useful as a guide to where wetlands may be; however, each effort has intrinsic inaccuracies. The field methodology for this project was designed to focus on landscapes in the project area where the NWI tends to fail frequently. Specifically, such landscapes are forested areas adjacent to waterways and partially drained agricultural land. In wetlands with abundant hydrology the NWI tends to be reasonably accurate because the wetness signatures are quite well defined. Wetlands on the drier side of the hydrology spectrum tend to have weak wetness signatures and are frequently overlooked by the NWI. The NWI generally doesn't distinguish wetland forest from upland forest with much acuity in areas along streams and rivers, thus, it tends to undermap wetlands in this situation. In partially drained agricultural landscapes, the NWI may map a temporarily flooded wetland, e.g., PEMA, where one does not exist, or may not map one where it does exist.

The field methodology pre-selected 48 study sites along the entire initial wetland study corridor that were:

- Relatively well distributed throughout the wetland study area (including east of and west of the existing tracks).
- Focused on forested and drained agricultural landscapes (scrub-shrub and shallow emergent marshes were well-represented in the sample).
- Focused on potential wetlands with drier hydrological regimes.
- Reasonably close to public road crossings of the existing tracks.

Fieldwork in the wetland study area was conducted in October 2010. Data collected at each Study Site included wetland type classification per Circular 39, Cowardin, and Eggers and Reed; predominant plant species observed, and a qualitative listing of the major wetland functions that each wetland expresses. Results are presented in Appendix G.

Wetland boundaries at each Study Site were estimated through a combination of sketching boundaries based on observed landscape characteristics and imagery phototones and using GPS to record the edges of depressional areas dominated with hydrophytic vegetation.

Impacts

No Build Alternative

The No Build Alternative would not impact wetlands.

Build Alternative

The discussion of impacts below discusses impacts to (1) wetlands as identified by the National Wetland Inventory (NWI) and Wisconsin Wetland Inventory (WWI), and (2) Minnesota Public Waters wetlands.

NWI/WWI Wetlands

Wetland impacts were calculated using NWI and WWI, in conjunction with the proposed construction limits. Findings were reviewed in agency meetings involving COE, USFWS, MnDNR, and WDNR staff. All impacts are reported by Circular 39 wetland types. The field work effort to ground-truth NWI/WWI data indicate that the NWI/ WWI under-maps the extent of wetlands compared to field assessed wetlands. Analysis indicates that actual wetland impacts might inflate NWI/WWI-based impacts by a factor of approximately1.3.

The NWI uses the Cowardin classification and the WWI uses its own wetland classification system. Many NWI and WWI polygons mapped within the project area have a dual wetland type, e.g., "PEM/SS1B", a combination of emergent wetland and scrub-shrub wetland. For ease of wetland impact analysis, it was assumed that the first part of the Cowardin code (i.e., PEM - emergent wetland) represents the major wetland type of that mapped polygon. Therefore, that polygon was tallied completely as PEM. Conversely, other polygons were mapped dually as PSS1/EMB, where the major wetland type was assumed PSS - Scrub shrub wetland. Table 4.6 summarizes how the Cowardin/WWI polygons were translated to Circular 39 wetland types, and notes a descriptive name of these types.[25]

Table 4.7 summarizes potential wetland impacts based on the NWI and WWI, broken down by wetland type (per Circular 39). The potential wetland impacts are based on the improvements assumed as part of the Level 2 functional analysis. The refined improvements identified in the Level 3 concept engineering report would not entail a substantive change in impacts to potential wetland impacts, which are based on a worst-case footprint and incorporate a multiplier to account for the discrepancies between NWI/WWI and observed field conditions.

[25] Eggers and Reed's *Wetland Plant Communities of Minnesota and Wisconsin*. 1997.

Actual impacts addressed through permitting would be based on both delineation of the affected wetlands and more detailed engineering to define actual construction limits.

Table 4.6. Translation of Cowardin/ WWI to Circular 39 Wetland Types; Descriptive Name

Circular 39 Wetland Types	Cowardin (WWI Wetland Types)	Descriptive Name
Type 1	PEMAd, PEMA	Seasonally flooded basins
Type 1L	PFO/SS1C, PFO1A, PFO1B, PFO1Bd, PFO1C, PFO4/1B, PFO4/SS3B, PFO4B, PFO4Bg, PFO5/EMB, PFO6B, PFO1/EMB, PFO1Bg, PFO5Fb **(T3/8Kr, T3/S3K, T3/S3Ka, T3/W0H, T3K, T3Kr, T3/S3Kr)**	Floodplain forests
Type 2	PEM/SS1B, PEM/SS1Bgd, PEMB, PEMBd, PEMBg, PEMBgd, PEM/FO1Bd, PEM/SS1Bd, PEM/SS1Bd, PEMBg,	Wet meadows
Type 3	PEM/SS1C, PEM/SS1Cd, PEMC, PEMCb, PEMCd,	Shallow marshes
Type 4	PEMF, PEMFb, PEMFd,	Deep marshes
Type 5	PUBF, PUBFx, PUBGx **(W0H)**	Open water wetlands
Type 6	PSS/FO1Bg, PSS1/3B, PSS1/EMB, PSS1/EMBd, PSS1/EMBg, PSS1/EMBgd, PSS1/EMC, PSS1/FO2Bg, PSS1B, PSS1Bg, PSS1Bgd, PSS1C, PSS1Cb, PSS1Cd, PSS3B, PSS3Bg, PSS6C, PSS1/EMBg, PSS1A, PSS1F, PSS6Cd, PSSB **(S3/EK2, S3K, S3Ka, S3Kr, S3/E2Ka)**	Shrub swamps
Type 7 *****	Undefined	Wooded swamps
Type 8	PFO2B, PFO2Bg	Bogs

**Notes: ***NWI does not distinguish Type 7 wetlands from Type 1L wetlands. There are likely some Type 7 wetlands included in the tally of Type 1L wetlands.

Table 4.7. Summary of Potential Wetland Impacts

Wetland Type/Descriptor	Estimated Impacts (ac)*	
	based on the NWI (Minnesota)	**based on the WWI (Wisconsin)**
Corridor North of Third Main		
Type 1- Seasonally flooded basins	0.6	--
Type 1L – Floodplain forest	1.3	0.3
Type 2 – Wet meadows	46.1	--
Type 3 – Shallow marshes	3.8	--
Type 4 – Deep marshes	0.03	--
Type 5 – Open water wetlands	--	--
Type 6 – Shrub swamps	21.6	0.05
Type 7 – Wooded swamps	Undefined	Undefined
Type 8 – Bogs	0.1	--
Impacts by State*	**73.6**	**0.4**
Combined Impacts**: 74.0 acres		
Combined Impacts x 1.3 multiplier**: 96.2 acres		
Third Main Impacts: 0.5 acres***		
Total Estimated Wetland Impacts: 96.7 acres		

*Note that wetland impacts differ from those reported under change in cover type described in Section 4.3, due to different data sets and methodology. In general, impacts in this table have the higher degree of accuracy.
**Results are rounded. Difference in sum due to rounding.
***Estimated from previous environmental documents for the third main.

Public Waters

In Minnesota, "Public Waters" are designated as such to indicate which lakes, wetlands, and watercourses over which the Minnesota DNR Waters has regulatory jurisdiction. The statutory definition of public waters includes **public waters** and **public waters wetlands** (Minnesota Statute 103G.005, Subdivision 15). Wisconsin does not have a water and wetland inventory program that applies to this section.

A review of the MnDNR Public Waters Inventory (PWI) resulted in the list of Minnesota public waters provided in Table 4.8 that, based on the PWI mapping, appear to be adjacent to the proposed track improvements; however note that, due to the limited PWI resolution, the true potential impact extent is not known.

The public waters are identified with a number followed by a "P" (e.g., 85P) and the public waters wetlands are identified with a number followed by a "W" (e.g., 30W). Watercourses are not numbered. Watercourses have two types of jurisdiction; 1) watercourses over which DNR Waters always has permit authority and 2) watercourses where DNR Waters jurisdiction is subject to public ditch law procedures.

Review of the PWI maps yielded 20 PWI features that appear to be adjacent to the track alignment. Of these, three are within the worst-case construction limits, based on Level 3 concept engineering. These are listed in Table 4.8.

Table 4.8. Minnesota Public Waters

Segment	County	PWI Number	Within Construction Limits
4	Anoka	**635W**	No
4	Anoka	**83P**	No
4	Anoka	**432W**	No
4	Anoka	**433W**	No
4	Anoka	**416W**	No
4	Anoka	**85P**	No
4	Anoka	**215W**	No
4	Anoka	**231W**	No
4	Anoka	**188W**	No
4	Anoka	**167W**	No
4	Isanti	**30-27P**	No
4	Isanti	**30-239W**	No
5	Isanti	**30-40W**	No
5	Isanti	**30-39W**	**Yes**
5	Isanti	**30-38W**	**Yes**
17	Pine	**122P**	No
17	Pine	**155W**	**Yes**
17	Pine	**156P**	No
17	Pine	**51P**	No
17	Pine	**33W**	No

The project would impact three public waters, all of which are public waters wetlands. The majority of PWI impacts would likely be in the form of fill. The impact to public waters is accounted for in the total wetland impacts report in Table 4.7.

Layover and Maintenance

The Minneapolis layover location is yet to be determined but expected to be in existing rail corridor. There are no mapped (NWI) wetlands at the Duluth layover and equipment maintenance sites.

Stations

Station areas are not included in impact calculations presented above. The extension of the existing platform at the Interchange and addition of a platform and separation of passenger and freight operations in yard territory at the Duluth Depot would not impact wetlands. Previous environmental documentation for Foley Station in Coon Rapids reported no wetland impacts. Stations at Cambridge, Hinckley and Superior would be addressed in separate environmental documentation; however, as they would be located adjacent to the tracks in developed communities, they should pose minimal potential for wetland impacts.

Avoidance, Minimization/and or Mitigation Measures

Opportunities to further minimize construction and permanent impacts, including impacts to wetlands would continue to be identified through final design. Applicable permits include Section 404 permits for impacts to Waters of the United States (jurisdictional wetlands); Minnesota WCA permits, and Wisconsin DNR waterway and wetland permits.

Mitigation for wetland impacts that are due to construction of the third main is proposed to be achieved through expansion of the wetland mitigation site that was created at Big Lake to mitigate wetland impacts of the Northstar Commuter Rail project.

In the remainder of the project area, the proposed project is anticipated to have fill impacts of between 74 and 96 acres of wetland. Replacement ratios will range from a ratio of 1:1 to 2:1. Based on these mitigation ratios, up to 200 acres of mitigation would be needed. Mitigation of all unavoidable impacts would likely be accomplished through a combination of on-site mitigation and through the purchase of wetland banking credits.

It is anticipated that in Minnesota, where the majority of wetland impacts are expected to occur, mitigation would be primarily through the state's wetland banking system. PWI mitigation would be required in accordance with applicable regulatory rules, including the MnDNR option to waive the public waters work permit requirement for projects regulated by the Wetland Conservation Act (WCA). Note that, due to the expansive nature of this project, there may be multiple WCA regulatory jurisdictions.

For impacts occurring within Wisconsin, the typical mitigation ratio would be 1.5 acres of mitigation for each acre of wetland impact (mitigation ratio of 1.5:1). A mitigation ratio of 1:1

may be possible if mitigation would be accomplished through an established mitigation bank within an appropriate Geographical Management Unit (GMU) and the impact is not to a rare wetland type as described by the WDNR. During agency coordination, WDNR and WisDOT staff advised that the project would not be eligible for use of public mitigation banking (through the WisDOT-WDNR cooperative process) but that a private banking site(s) would be a likely option.

Wetland Permitting

The project will require local, state and federal wetlands/water permits. The permitting requirements for this project would depend upon the amount of wetland impact as it relates to the threshold amounts under each regulatory jurisdiction involved. Some impacts may fall under several jurisdictions while some may not. The permitting agencies, including the COE, MnDNR, WDNR, and LGUs, will continue to be consulted during subsequent project development, permitting and mitigation.

4.5 Water Resources

4.5.1 Surface Water

Affected Environment

Watersheds

There are several watersheds that are traversed along the NLX corridor. These include the Upper Mississippi River Basin and the St. Croix River Basin in Minnesota, and the Lake Superior Basin in Wisconsin. These are split into sub-watershed units defined by the U.S. Geological Survey (USGS). Many of these have Watershed Districts (WDs), Watershed Management Organizations (WMOs), or other organizations that regulate the management of the watersheds. Below is a description of the sub-watersheds and the management organizations affiliated with them that are within the limits of this project.

The Upper Mississippi River Basin is located in Minnesota and includes the Twin Cities Mississippi River Watershed and the Rum River Watershed. Additionally, there are the Twin Cities Metro Area (TCMA) Watersheds. The TCMA includes portions of the Rum River Watershed and the Twin Cities Mississippi River Watershed. This area has numerous management agencies, several of which cover areas included in this project. These are the Mississippi WMO, Six Cities WMO, Coon Creek WD, Lower Rum River WMO, and Upper Rum River WMO. The Rum River Watershed has an additional organization that covers an area within the project that is called the Mille Lacs Lake-Rum River Watershed Planning Area. The limits of this project cross the Twin Cities Mississippi River Watershed in Anoka County and the Rum River Watershed in Anoka and Isanti counties.

The St. Croix River Basin is located in Minnesota and includes the Snake River Watershed and the Kettle River Watershed. The Snake River Watershed is crossed by the proposed alignment in Isanti, Kanabec, and Pine Counties. The limits of this project cross the Kettle River Watershed in Pine and Carlton Counties. The Snake River Watershed Management Board is within this area; there are no other formal WDs or WMOs within these watersheds. Regulation of surface water runoff, therefore, falls to the Minnesota Pollution Control Agency (MPCA) through the National Pollutant Discharge Elimination System (NPDES) program (Section 402 of the Clean Water Act).

The Lake Superior Basin is located in Wisconsin and includes the Beartrap-Nemadji Watershed. The limits of this project cross the Beartrap-Nemadji Watershed in Douglas County. This area is included in the Lake Superior Water Management Unit (WMU). The WDNR also defines sub-watersheds within the Lake Superior Basin. This project includes land within the St. Louis and Lower Nemadji River Basin (LS01), and the Black and Upper Nemadji River Basin (LS02). Both river systems are regulated by the WDNR.

Watercourses

Agency databases that map perennial streams, intermittent streams and drainage ditches show nearly 100 stream or river crossings along the length of the 152 mile corridor. Among the watercourses crossed by the project corridor are navigable waters, subject to USCG and COE jurisdiction. The St. Louis River system is on the U.S. Environmental Protection Agency's (EPA) list of Great Lakes Areas of Concern (AOC). Area rivers designated by Minnesota as state wild and scenic rivers include the Rum River and the Kettle River, with scenic rivers existing in a free-flowing state and with adjacent lands that are largely undeveloped and wild rivers existing in a free-flowing state with excellent water quality and with adjacent lands that are essentially primitive.

A review of the MPCA 303(d) list database was conducted to identify impaired waters and special waters within a mile of the project construction areas. The WDNR provided input on potentially impacted Wisconsin waterways, including information on Outstanding Resource Waters (ORWs), which provide valuable fisheries, hydrologically or geologically unique features, outstanding recreational opportunities, unique environmental settings, and which are not significantly impacted by human activities.

Table 4.9 identifies major watercourses near the study area, relevant regulatory status, and relevant project improvements based on the Level 3 concept engineering study. Note that unnamed creeks are not included. Also note that several streams are located both in Minnesota and Wisconsin.

Table 4.9. Watercourses Near the Study Corridor

Minnesota		
Rivers/Streams	**Regulatory Status**	**Relevant Project Improvement**
Mississippi River	Impaired for PCB in Fish Tissue and Fecal Coliform. No TMDL Plan.	Within 1 mile of proposed wye construction
Rice Creek	Impaired for Invertebrates. No TMDL Plan.	Third main
Sand Creek	Impaired for Biological, Invertebrates. No TMDL Plan.	No construction within 1 mile
Coon Creek	Impaired for Biological, Invertebrates. No TMDL Plan.	Siding construction New bridge Bridge rehab
Crooked Brook	Impaired for Dissolved Oxygen. No TMDL Plan.	No construction within 1 mile
Cedar Creek		No construction within 1 mile
Rum River	Impaired for Mercury. Approved TMDL Plan. Wild and Scenic River.	Within 1 mile of proposed new track at Cambridge
Spirit Brook		No construction within 1 mile
Park Brook		No construction within 1 mile
Isanti Brook		New parallel track
Snake River	Impaired for Mercury. Approved TMDL Plan. Navigable Water.	New bridge Bridge rehab
Mud Creek (Co. Ditch 10)	Impaired for Biological, Fish and Fecal Coliform. No TMDL Plan.	New parallel track
Pokegama Creek and tributaries		New bridge
East Pokegama Creek		New parallel track Bridge rehab

Table 4.9. Watercourses Near the Study Corridor (continued)

Minnesota		
Rivers/Streams	**Regulatory Status**	**Relevant Project Improvement**
Mission Creek	Trout stream.	Within 1 mile of proposed new track near Hinckley.
Grindstone River	Impaired for Biological, Fish and Fecal Coliform. No TMDL Plan. Navigable Water.	Bridge rehab.
Spring Creek	Trout stream.	No construction within 1 mile.
Skunk Creek		No construction within 1 mile.
Deer Creek		No construction within 1 mile.
Kettle River	Impaired for Mercury. No TMDL Plan Wild and Scenic River. Navigable Water.	Bridge rehab.
Bear Creek		Siding construction.
Little Willow River		No construction within 1 mile.
Big Willow River		Bridge rehab.
Tributary to South Fork Nemadji River	Impaired. Turbidity but has no approved TMDL Plan.	No construction within 1 mile of track.
Anderson Creek	Trout stream.	No construction within 1 mile.
Silver Creek and tributaries	Trout stream.	Siding construction.
Little Net River	Trout stream.	No construction within 1 mile.
Net River	Trout stream.	Bridge rehab (2).
Multiple tributaries to the South Fork Nemadji River	Impaired for Turbidity. No approved TMDL Plan.	Siding construction.
Section Thirty-Six Creek	Trout stream.	No construction within 1 mile.
State Line Creek	Trout stream.	Bridge rehab. Siding construction.
Stewart Creek		No construction within 1 mile.
Miller Creek		No construction within 1 mile.
Buckingham Creek		Near Depot.
St. Louis River	EPA Great Lakes Area of Concern. Navigable Water.	Bridge rehab. Within 1 mile of proposed new track.
Wisconsin		
Rivers/Streams	**Regulatory Status**	**Relevant Project Improvement**
Balsam Creek (W.)	Trout stream (Class II).	Bridge rehab.
Little Balsam Creek (E.)	Trout stream (Class I). Outstanding Resource Water.	Bridge rehab.
Miller Creek	Trout Stream (Class II).	No construction within 1 mile.
Rock Creek		No construction within 1 mile.
Stony Brook		No construction within 1 mile.
Pokegama River		No construction within 1 mile.
Little Pokegama River		No construction within 1 mile.
Hubert Creek		Bridge rehab.
Norvell Creek		Bridge rehab.
Black River	Trout stream (Class III). Navigable Water.	Bridge rehab.
Empire Creek	Trout stream. Outstanding Resource Water.	No construction within 1 mile.
Nemadji River	WDNR: used for trout migration; no spawning.	Bridge rehab.
St. Louis River	EPA Great Lakes Area of Concern. Navigable Water.	Bridge rehab. Within 1 mile of proposed new track.

Impacts

No Build Alternative

The No Build Alternative would not result in impacts to water resources. The existing drainage system includes minimal water quality treatment. This will continue under the No Build condition.

Build Alternative

Water Quality/Stormwater Runoff

Although railroad ballast is not as impervious to water runoff as roadway materials, rail projects can impact water quality by increasing runoff, generating wastewater, or altering drainage patterns.

The potential for impacts to water resources is limited to areas of new track construction, new bridges, and major bridge rehabilitation[26]. The proposed project would alter the existing drainage pattern where new track is constructed, but these changes would not cause major change in the direction or volume of flow. A rural drainage system is anticipated for most of the corridor. There is a short segment in the City of Braham where no ditch drainage or other conveyance is planned in order to minimize the construction footprint and avoid impacts to businesses, a home and a park which all abut the rail corridor. The trackbed would drain in the same manner as it does under existing conditions. There are other drainage system options (e.g. curb and gutter, stabilized slopes, etc.) to minimize additional impacts to properties elsewhere in the corridor that may be identified as a result of preliminary engineering studies.

All existing drainage culverts would be extended beneath the new track and would be installed at the same or comparable size as the existing culverts. Consequently, no substantial effect to downstream surface water hydrology is anticipated.

The track expansion would result in increased impervious surfaces and potential fill placement in order to accommodate the new track embankment. It is assumed that track ballast is impervious due to compaction. New impervious surfaces can have potentially adverse impacts on receiving water bodies and waterways if not mitigated properly. An increase in impervious surface typically results in increased peak flows and runoff volumes. Higher flows can also result in an increase in sediment and pollutant loading.

As noted, the increased impervious surface can be attributed to the track beds and bridges. Based on the type of development (disconnected impervious of a longitudinal project) and the potential for implementing Best Management Practices (BMPs) along the corridor, it is anticipated that the

[26] As described in Chapter 3, the existing track tie replacement and ballast improvements can be done as maintenance on the line utilizing tie replacement trains and ballast replacement trains. All work is performed from the track and is expected to have no impacts outside the existing track bed.

impact on the quality of the receiving waters, including special and impaired waters would be negligible.

Nearly all of the impervious area associated with the track bed is disconnected impervious, which would help mitigate the increase in peak flows and runoff volumes by routing runoff over vegetated pervious surfaces. Vegetation is effective in reducing sediment loads.

The benefits of routing runoff through vegetated swales can be further enhanced by incorporating ditch blocks. Ditch blocks promote slower velocities, which help prevent erosion, and increase the runoff exposure to the pervious surface. The increased exposure often results in additional infiltration and reduced volume runoff and peak flows.

At waterbody crossings, ponds may be employed to remove sediment and slow peak flows. Direct discharge from bridges is not allowed and runoff from the structures would require some treatment. This could be in the form of a vegetated swale. Treatment area sizing and location would be further developed during subsequent design activities.

Rehabilitation of existing railroad bridges includes open deck rehabilitation, cleaning and painting, bearing replacement and pointing of abutments and/or piers. Of these activities, cleaning and painting poses the greatest potential for contamination impact to water quality, however mitigation described below reduces this potential significantly.

Erosion and Sedimentation

The project would disturb up to approximately 420 acres, based on the worst-case footprint. Track design typically avoids steep grades and follows lowland routes. As the proposed project would be within an existing railroad corridor, it is not anticipated that the track expansion area of impact would include steep slopes. Locally, however, the track embankment could be at a grade of 1 horizontal to 3 vertical (1:3 grade). The slope lengths of the embankment would not be excessive nor propagate erosion.

Activities during construction have a potential to cause erosion, sedimentation and accidental release of pollutants. Erosion and sedimentation of all exposed soils within the project corridor would be minimized utilizing the appropriate BMPs during construction. The embankment would be vegetated immediately after construction, complying with the MPCA, WDNR and NPDES requirements. If long slopes are created or encountered, erosion control measures such as erosion control blanket, disk mulching, or hydromulch could be employed. Likewise, sediment management measures such as biorolls and silt fence could be used on long slopes during construction. Where practicable, drainage from the tracks could also be routed through vegetated ditches and through ditch checks to help promote sediment removal prior to entering receiving water bodies.

Floodplains

The Federal Emergency Management Agency (FEMA) floodplain impacts summarized below are limited to the proposed sidings and the segment of proposed track expansion. The current track alignment often intersects with Zone A designated (this includes A, AE, and A1-A30) floodplain. The Zone A designation identifies areas within the 100-year floodplain. The linear impact of the track expansion and siding segments of the proposed project has been broken down according to county and side (east or west) to which the additional track would be added, with "west" being floodplain impacts due to parallel dedicated track in Isanti and Pine counties and "east" being floodplain impacts due to extension of sidings in Pine County. A summary of longitudinal impacts parallel to the track is provided in Table 4.10. While typical cross-sections have been prepared to estimate footprint, the details of the track embankment configuration and fill quantities are not yet known. Therefore, the impacts are represented as a linear estimate from published FEMA Flood Insurance Rate Maps (FIRMs). The FIRMs exist in hardcopy or scanned formats only. Digital GIS or CADD overlays are not available. The impacts were scaled by comparing the proposed track alignment, the track chart, and the FIRMS.

Table 4.10. Longitudinal Impacts FEMA Regulated Zone A Floodplain

County	Length of Fill (ft.)*	
	West	East
Hennepin	0	0
Anoka	0	0
Isanti	350	0
Kanabec	0	0
Pine	65	10
Carlton	0	0
Douglas	0	0
St. Louis	0	0

*Based on the improvements assumed as part of the Level 2 functional analysis. The refined improvements identified in the Level 3 concept engineering report would not entail a substantive change in longitudinal floodplain impacts.

Floodplain fill mitigation could take the form of compensatory storage or it may be shown by computation or modeling that the fill impacts at certain locations have negligible impacts of flood stage. In the case where impacts are shown to be negligible, no mitigation is required. Consultation with the MnDNR would be required to determine method for identifying impacts, and what, if any, mitigation is necessary.

The project also includes numerous transverse stream, creek, and ditch crossings. A summary of transverse impacts perpendicular to areas of new track are shown in Table 4.11.

A summary of FEMA-regulated crossings where bridge construction or rehabilitation is anticipated is presented in Table 4.12. Appendix D provides a description of the type of work expected to be entailed in the bridge rehabilitation. Specifics of the bridge construction and rehabilitation would be developed during preliminary engineering, but the following items are reasonable assumptions:

- It is unlikely that new piles or piers would be needed for bridges under rehabilitation. However, it is possible that pointing or patching work on piers may be required.
- It is likely that the existing abutments would remain in their current configuration, but it is possible that pointing or patching work would be required.
- The bridge lengths would not be shortened for rehab structures.
- For new bridges, it is very doubtful that the bottom flange would be at a lower elevation than existing.

Although current rehabilitation assumptions would result in no adverse impact to FEMA-regulated crossings, MnDNR and WDNR would be consulted prior to any bridge work.

Table 4.11. FEMA-Regulated Waterbody Crossings[27] Transversed By Areas of New Construction

County	MP	Crossing Type	Waterbody Name	Zone
Anoka	16.9	New parallel bridge	Rice Creek	A
Anoka	131.5	Bridge replacement	Coon Creek	A
Anoka	120.0	Box culvert	Creek	A
Isanti	111.2	Bridge (concrete trestle, cattle pass)	Isanti Brook	A
Isanti	102.2	Culvert	Creek	A
Isanti	101.7	Culvert	Creek	A
Isanti	101.4	2 Box culverts	Ditch	A
Kanabec	91.8	Bridge New parallel bridge	Snake River	A
Pine	79.8	Bridge	Pokegama Creek	A
Pine	63.9	No crossing shown on track maps	Skunk Creek	A-7

Table 4.12. FEMA-Regulated Waterbody Crossings at Major Bridge Rehabs

County	MP	Waterbody Name	Zone
Kanabec	91.8	Snake River	A
Pine	71.6	Grindstone River	A
Pine	62.4	Kettle River	A
Carlton	40.5	Big Willow River	N/A
Carlton	30.2	Net River	N/A
Carlton	28.3	Net River	N/A
Carlton	25.2	State Line Creek	N/A
Douglas	22.2	Balsam Creek	A
Douglas	21.7	Little Balsam Creek	A
Douglas	20.2	Hubert Creek	A
Douglas	20.0	Norvell Creek	A
Douglas	15.5	Black River	A
Douglas	12.7	Nemadji River	A
St. Louis	4.5	St. Louis River	A1

[27] Refers to FEMA regulation of the floodplain.

At this time, it does not appear that the project would result in significant encroachment to floodplain. The construction limits would be refined in preliminary engineering to avoid impacts. If, in subsequent studies, it is determined that the proposed project would result in a significant, unavoidable floodplain encroachment, a floodplain finding (Only Practicable Alternative Finding) would be prepared.

Shoreland Protection

In addition to state regulation of activities occurring below the ordinary high water mark of lakes and rivers, additional protection of waters and related land resources is afforded through the Minnesota and Wisconsin state delegation of responsibility to local governments of the state to regulate the subdivision, use, and development of the shorelands. As the project corridor traverses through developed and undeveloped areas, the shoreland management standards are applied to the corridor at three levels; the city or local governmental unit (LGU) level, the county level and the state level.

Shoreland regulation is carried out in Isanti, Pine, Kanabec, Carlton, and Douglas counties, and several communities in the affected portions of the corridor. During subsequent design and permitting phases, LGUs would be consulted to clarify which jurisdictions overlap the project and relevant regulations.

Coastal Zone Management Area – Lake Superior

The area of the St. Louis River in Carlton County (south of Duluth) as well as Duluth and surrounding areas of urban expansion to the north and west are protected by the National Coastal Zone Management (CZM) program. Specific boundaries are included in the Minnesota's Lake Superior Coastal Program Final Environmental Impact Statement. The counties in Wisconsin bordering Lake Superior are also protected by the CZM (Douglas County in the study area). Coastal Zone Management encompasses potential impact areas discussed elsewhere in Chapter 4 including shoreland protection, erosion control, fish and wildlife, visual impact, surface and groundwater quality, floodplain management, air quality, contamination, cultural resources and parks.

Navigable Waters

The project involves rehabilitation of existing railroad bridge (Grassy Point Bridge) over the St. Louis River, which is federal navigable water. (The Nemadji River is also federal navigable water for a portion of its length, but not where it is crossed by the NLX corridor.) The USCG and the COE were consulted regarding the potential for impacts and permitting under Section 10 of Rivers and Harbors Act of 1899 as well as Section 404 of the CWA. Based on the assumed bridge rehabilitation work, it is not likely that a Section 10 permit would be required. Coordination would be required. See correspondence in Appendix H.

Wild and Scenic River

The project improvements include rehabilitation of the existing railroad bridge over the Kettle River, which is on the state of Minnesota's list of wild and scenic rivers. Consultation with the MnDNR indicated no specific concerns related to the Kettle River other than potential impacts related to bridge rehabilitation work that are discussed elsewhere in Chapter 4 (e.g. contamination, erosion control, wildlife movement, etc.).

Other

Wetland impacts are discussed in Section 4.4. The potential for additional stream diversions, diking, or impoundment of any surface waters is unlikely.

Stations

The extension of the existing platform at the Interchange and addition of a platform and separation of passenger and freight operations in yard territory at the Duluth Depot would not increase impervious surface nor impact floodplains, water quality or navigable waterways as these improvements are located in existing rail corridors. Previous environmental documentation prepared for the Foley Station indicates no impacts to floodplains, water quality, or navigable waterways. Development of stations and related parking areas at Cambridge, Hinckley, and Superior would increase the amount of impervious surface. Stormwater management at station sites would be addressed as part of site planning. Based on locations under consideration, no floodplain or groundwater impacts are expected.

Avoidance, Minimization, and/or Mitigation Measures

Measures to avoid, minimize and mitigate potential impacts to surface water resources are discussed above.

4.5.2 Groundwater

Affected Environment

Wellhead Protection

Land uses, along with water quality mitigation practices, are often influenced by the surface water interaction with groundwater by direct contact or certain geologic conditions. In Minnesota, the proposed corridor aligns with several regions identified by the Minnesota Department of Health (MDH) as being susceptible to adverse impacts to groundwater due to surface water contamination. The regions are:

- Wellhead Protection Area (WHPA). An MDH approved surface and subsurface area surrounding a public water supply well or well field that supplies a public water system, through which contaminants are likely to move toward and reach the well or well field.

- Source Water Assessment area (SWA). An MDH interim surface and subsurface area surrounding a public water supply well that completely contains the scientifically calculated time-of-travel (TOT) area. The primary purpose of the SWA is to give the public water supplier an idea of the potential size of the final Wellhead Protection Area (WHPA). The TOT for a non-vulnerable SWA is 3 years and for a vulnerable SWA is 10 years. Ultimately the SWA will be replaced by a WHPA and a corresponding Drinking Water Supply Management Area (DWSMA).
- Drinking Water Supply Management Area (DWSMA). This is an assessment of the likelihood for a potential contaminant source within the drinking water supply management area to contaminate a public water supply well based on the aquifer's inherent geologic sensitivity; and the chemical and isotopic composition of the groundwater. A DWSMA is identified as:

    - DWS_VUL_C: DWSMA Vulnerability Code
        - VH=Very High
        - H= High
        - M= Moderate
        - L= Low
        - VL= Very Low
        - U= Unknown

    - AQ_VUL_C: Aquifer Vulnerability Code (for public and regulatory use)
        - V= Vulnerable
        - N= Not Vulnerable
        -

These datasets were developed with the intention of protecting the public drinking water supply to comply with the Federal Safe Drinking Water Act. The locations corresponding to the proposed NLX corridor are provided in Tables 4.13-4.15.

Table 4.13. Wellhead Protection Areas in Areas of New Construction

Segment	County	City	WHP_Name	WHP_ID	DWS_ID	Within construction limits
2	Anoka	Fridley	Fridley CJDN 11	16304	163	**Yes**
4	Anoka	Coon Rapids	Coon Rapids NE CMTS	18801	188	**Yes**
4	Anoka	Andover	Andover 3	35001	350	**Yes**
4	Anoka	Andover	Andover Central QBAA	37802	378	No
5, 6	Isanti	Cambridge	Cambridge 4	39501	395	**Yes**
6	Isanti	Braham	Braham	49701	497	**Yes**

Table 4.14. Source Water Assessment Area

Segment	County	City	SWA_Name	SWA_ID	Within construction limits
4 and 5	Isanti	Isanti	Isanti Well Num 1	1617	**Yes**
5	Isanti	Isanti	Isanti Well Num 2	1618	**Yes**
5	Isanti	Cambridge	Pine Village Inc	1140	**Yes**
17	Pine	Hinckley	Hinckley 3	1187	No
17	Pine	Sandstone	Sandstone 12	1190	No

Table 4.15. Drinking Water Supply Management Area

S	County	City	DWS_Vul	DWS_Vul ID	AQ_DWS_ID	Within construction limits
2	Anoka	Fridley	Moderate	163001	V	**Yes**
4	Anoka	Andover	Low	188001	N	**Yes**
4	Anoka	Andover	Low	350001	N	**Yes**
4	Anoka	Andover	Low	378003	N	No
5, 6	Isanti	Cambridge	Moderate	395001	V	**Yes**
6	Isanti	Braham	Moderate	497001	V	**Yes**
17	Pine	Askov	High	415001	V	**Yes**

The WDNR has two programs that address source water protection: 1) the Wellhead Protection Program and 2) the Source Water Assessment Program. The WDNR, working with other state and federal agencies, has developed a state wellhead protection program plan which was approved by the EPA in 1993. For security purposes, the WDNR and LGUs do not publish wellhead protection areas. Therefore, these areas are not listed in this document. The WDNR would be contacted to identify project specific wellhead protection information during design.

For Minnesota and Wisconsin, the wellhead protection areas and associated source and drinking water areas have conditional uses coupled with them in order to prevent groundwater contamination. Of primary importance to the proposed track expansion is the handling of track bed rainwater runoff. Within the protection areas the promotion of runoff infiltration may be in conflict with the conditional uses. In these cases it may be desirable to route the runoff outside of the protected area prior to infiltration, if possible. If rate attenuation is required within a protected area, the treatment facility may require lining to ensure that infiltration does not occur.

Wells

A review of the Minnesota County Well Index (CWI) was completed for the proposed siding and new dedicated track areas within Minnesota. The CWI does not represent all wells in the state, but is the single most complete listing of state wells.

Based on the current project limits, no wells fall within the construction limits. There are however, multiple wells located just outside of the construction limits.

For the portion of track located in Wisconsin, a request was made to the Wisconsin Department of Natural Resources to obtain Well Inventory data for Douglas County. Based on the DNR Groundwater Retrieval Network, no wells are located within the construction limits.

Impacts

No Build Alternative

The No Build Alternative would result in no impacts to groundwater.

Build Alternative

No impacts to wells are anticipated, however if any unused or unsealed wells are discovered in the proposed project area during construction, they would be addressed in accordance with Minnesota Rules, Chapter 4725 and Section NR 812.26 of the Wisconsin Administrative Code.

Based on preliminary engineering, it is unknown if, or where any groundwater (including dewatering) would be needed. If appropriation of water is deemed necessary during project development, proper permits would be obtained prior to any work occurring.

Section 4.8 discusses the potential for encountering contamination or generating hazardous materials that could pose impacts to groundwater quality, including measures to avoid leaks or spills and to address and issues that should arise.

No other impacts to groundwater are anticipated.

Layover and Maintenance

Layover and equipment maintenance facilities would connect to city water and sewer, as needed.

Stations

The Interchange station in Minneapolis would connect to City water and sanitary sewer. The improvements required for NLX at the stations at Foley, Cambridge, Hinckley, and Superior (platform and parking) would require no water or sanitary sewer service. The Depot in Duluth would not require any additional water or sanitary sewer capacity for NLX**.**

Avoidance, Minimization, and/or Mitigation Measures

Measures to avoid, minimize, and mitigate potential impacts to groundwater resources are discussed above.

4.6 Air Quality

Affected Environment

The primary pollutants from motor vehicles and trains are unburned hydrocarbons, also known as volatile organic compounds (VOCs), oxides of nitrogen (NOx), carbon monoxide, and particulates. Hydrocarbons and NOx can combine in a complex series of reactions catalyzed by sunlight to produce photochemical oxidants such as ozone (O3) and NO2. Because these reactions take place over a period of several hours, maximum concentrations of photochemical oxidants are often found many miles downwind of the precursor sources.

Carbon monoxide (CO) is a colorless and odorless gas, which is the product of incomplete combustion. It is the major pollutant from gasoline, not diesel (train locomotives), fueled motor vehicles. CO emissions are greatest from motor vehicles operating at low speeds and prior to complete engine warm-up (within approximately eight minutes of starting). Congested urban roads and large parking lots, therefore, tend to be the principal problem areas for CO. Portions of the project are within the Minneapolis-St. Paul seven county metropolitan area CO Maintenance Area and the Duluth CO Maintenance Area.

Particulates from motor vehicles and locomotives are made up of mineral matter from engine wear, and exhaust emissions. The ability for these particulates to stay in suspension in the air is a function of size and meteorological conditions. The larger particulates fall out of the air much quicker than the smaller and lighter particulates. The particulates of concern from transportation sources are those 10 microns in size or smaller.

Carbon dioxide (CO_2), a greenhouse gas, is emitted naturally and through human activities such as the burning of fossil fuels. In the United States, the transportation sector is the second largest source of CO_2 emissions. Nearly all of the energy consumed in the transportation sector is petroleum based, including gasoline, diesel, and jet fuel. Because greenhouse gases absorb and emit heat, increasing their concentrations in the atmosphere tends to have a warming effect. However, the rate and amount of temperature increase is not known with absolute certainty.

Impacts

No Build Alternative

The No Build Alternative would not alter current conditions because there would be no proposed changes in train operations or locomotives. Under No Build conditions, no reduction in emissions due to increased train ridership and decreased automobile use would occur.

Build Alternative

The proposed project is anticipated to result in a reduction of pollutants due to a reduction in personal vehicle use. The reduction in pollutants was estimated from the vehicle miles traveled (VMT) reductions derived from the ridership model. The assumption is that a reduction in VMT

is directly proportional to the reduction in emissions. Several critical pollutants were included for evaluation in estimating the potential highway emission saving value.

Consistent with the approach used by the FRA, the number of vehicle-miles saved was calculated by multiplying the number of diverted auto trips, times average trip length, divided by an average vehicle occupancy factor. The net emission reduction is obtained by subtracting locomotive emissions produced by the trains from the highway emissions saved. Locomotive emissions were calculated using the Tier 4 Line-Haul locomotive emissions standards.[28] Table 4.16 shows the estimated pollutant tonnage reduction.

Table 4.16. Emissions Reduction Per Mile

Pollutant	Average Emission Reduction per Mile (gram)
CO	25
NOx	1.3
VOC	1.05
PM	0.09
CO_2	607

Potential for air quality impacts exists at high speed rail crossings where automobiles are stopped while waiting for passenger trains to pass through. Automobile queuing at high speed rail crossings would be of relatively short duration because of the high speed of the train (i.e. gate would be down for seconds) for most of the corridor. The estimated dwell time at rail stations is expected to be approximately two minutes. However, the effect on traffic congestion would be minimal. A maximum of eight roundtrip high speed passenger trains daily are anticipated.

No at-grade crossings are near planned stations within either of Minneapolis or Duluth-Superior CO maintenance areas, therefore no congestion at crossings during station dwell times is expected.

Layover and Maintenance

No air quality impacts are anticipated due to implementation of layover or fueling/equipment maintenance facilities because these operations would not generate significant vehicle traffic.

Stations

As noted, the stations at the proposed passenger rail element of the Interchange in downtown Minneapolis, Foley (Coon Rapids), Superior, and the Duluth Depot are all in CO non-attainment or maintenance areas. However, because there are no at-grade crossings near proposed stations, air quality impacts due to traffic congestion are not anticipated. Potential station locations in Cambridge and Hinckley are not in CO non-attainment or maintenance areas.

[28] US Code of Federal Regulations, 40 CFR Parts 85, 89 and 92.

Air quality impacts at Cambridge, Hinckley and Superior stations would be evaluated in future environmental documentation.

Avoidance, Minimization and/or Mitigation Measures

Since the proposed project would reduce the project area's emissions, no mitigation is required.

4.7 Noise and Vibration

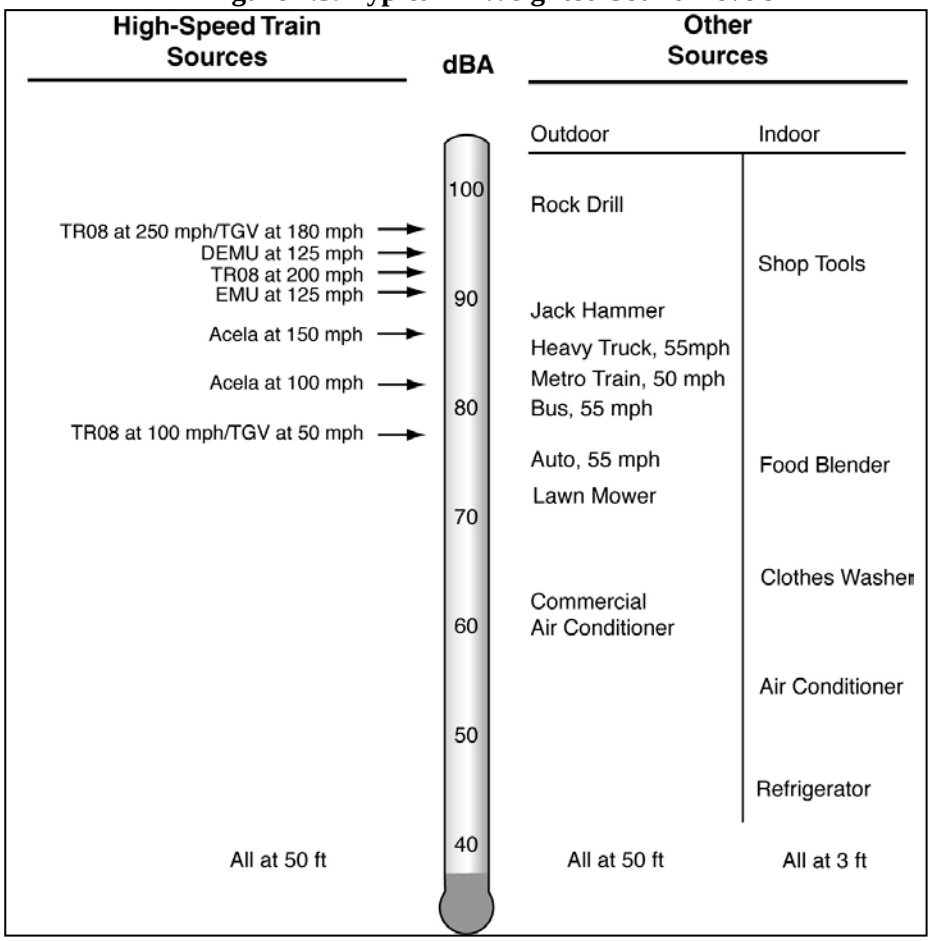
4.7.1 Noise Fundamentals

Noise from a high speed train (HST) system is expressed in terms of a "source-path-receiver" framework. The "source" generates noise levels which depend on the type of source (e.g., high speed train) and its operating characteristics (e.g., speed). The "receiver" is the noise-sensitive land use (e.g., residence, hospital, or school) exposed to noise from the source. In between the source and the receiver is the "path" where the noise is reduced by distance, intervening buildings and topography. Environmental noise impacts are assessed at the receiver. Not all receivers have the same noise-sensitivity. Consequently, noise criteria are established for the various types of receivers.

Noise is typically defined as unwanted or undesirable sound, where sound is characterized by small air pressure fluctuations above and below the atmospheric pressure. The basic parameters of environmental noise that affect human response are (1) intensity or level, (2) frequency content and (3) variation with time. The first parameter is determined by how greatly the sound pressure fluctuates above and below the atmospheric pressure, and is expressed on a compressed scale in units of decibels. By using this scale, the range of normally encountered sound can be expressed by values between 0 and 120 decibels. On a relative basis, a 3-decibel change in sound level generally represents a barely-noticeable change outside the laboratory, whereas a 10-decibel change in sound level would typically be perceived as a doubling (or halving) in the loudness of a sound.

The frequency content of noise is related to the tone or pitch of the sound, and is expressed based on the rate of the air pressure fluctuation in terms of cycles per second (called Hertz and abbreviated as Hz). The human ear can detect a wide range of frequencies from about 20 Hz to 17,000 Hz. However, because the sensitivity of human hearing varies with frequency, the A-weighting system is commonly used when measuring environmental noise to provide a single number descriptor that correlates with human subjective response. Sound levels measured using this weighting system are called "A-weighted" sound levels, and are expressed in decibel notation as "dBA". The A-weighted sound level is widely accepted by acousticians as a proper unit for describing environmental noise. Typical A-weighted sound levels for high speed ground transportation and other sources are shown in Figure 4.3. The figure includes data for the Amtrak Acela train that operates between Boston, MA and Washington D.C. as well as the TR08 German maglev train, the TGV train in France, and electric (EMU) and diesel (DEMU) trains at various speeds.

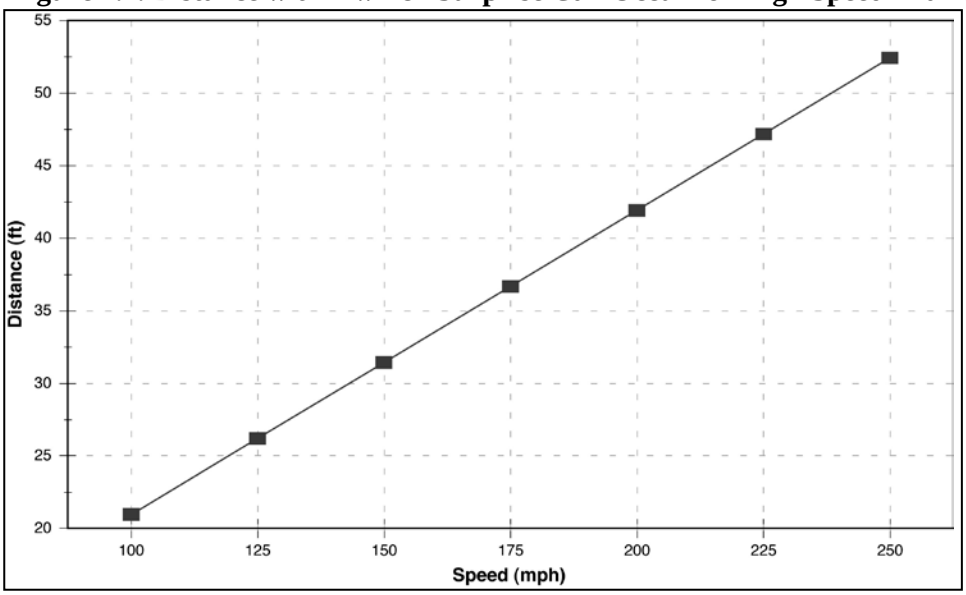
Figure 4.3. Typical A-Weighted Sound Levels



Source: FRA (2005)

An important characteristic of the noise from high speed rail systems is the onset rate of the sound signature. Onset rate is the average rate of change of increasing sound pressure level in decibels per second (dB/sec) during a single noise event. The rapid approach of a high speed train is accompanied by a sudden increase in noise for a receiver near the tracks. Sounds that have faster onset rates can cause more annoyance than sounds with slower variation or steady noise with the same noise level. The relationship between speed and distance defines locations where the onset rate for high speed train operations may cause surprise or startle. The onset rate of 30 dB/sec is used as the basis for establishing distances within which startle is likely to occur; this is shown in Figure 4.4 and serves as added information in the impact assessment. For the most part, the potential for increased annoyance is confined to an area very close to the tracks. For example, Figure 4.4 shows that for the maximum speeds along the project corridor of 110 mph high speed train operations would have the potential for surprise within 22 feet of the track centerline. Any noise-sensitive land use within the distances shown in Figure 4.4 will be considered to have the potential for increased annoyance.

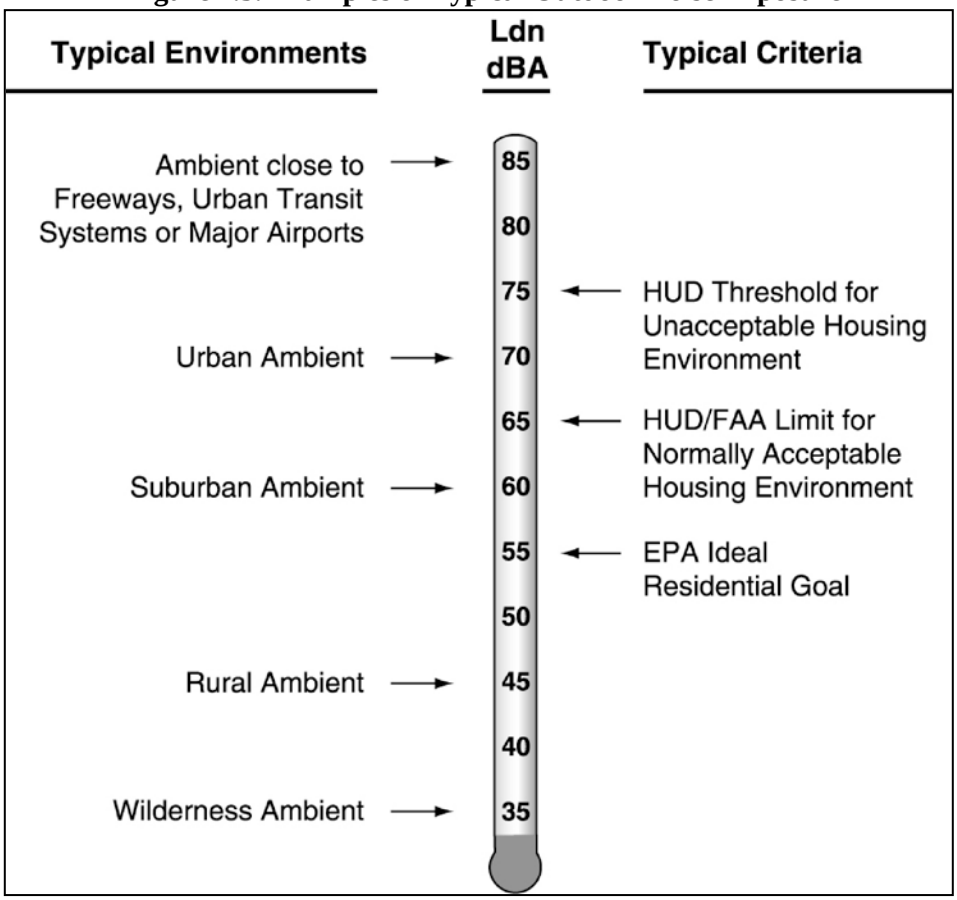
Figure 4.4. Distance within which Surprise Can Occur for High Speed Trains



Source: FRA (2005)

Because environmental noise fluctuates from moment to moment, it is common practice to condense all of this information into a single number, called the "equivalent" sound level (Leq). Leq can be thought of as the steady sound level that represents the same sound energy as the varying sound levels over a specified time period (typically 1 hour or 24 hours). Often the Leq values over a 24-hour period are used to calculate cumulative noise exposure in terms of the Day-Night Sound Level (Ldn). Ldn is the A-weighed Leq for a 24-hour period with an added 10-decibel penalty imposed on noise that occurs during the nighttime hours (between 10 P.M. and 7 A.M.). Many surveys have shown that Ldn is well correlated with human annoyance, and therefore this descriptor is widely used for environmental noise impact assessment. Figure 4.5 provides examples of typical noise environments and criteria in terms of Ldn. While the extremes of Ldn are shown to range from 35 dBA in a wilderness environment to 85 dBA in noisy urban environments, Ldn is generally found to range between 55 dBA and 75 dBA in most communities. As shown in Figure 4.5, this spans the range between an "ideal" residential environment and the threshold for an unacceptable residential environment according to U.S. Federal agency criteria.

Figure 4.5. Examples of Typical Outdoor Noise Exposure



Source: FRA (2005)

4.7.2 Ground-Borne Vibration Fundamentals and Descriptors

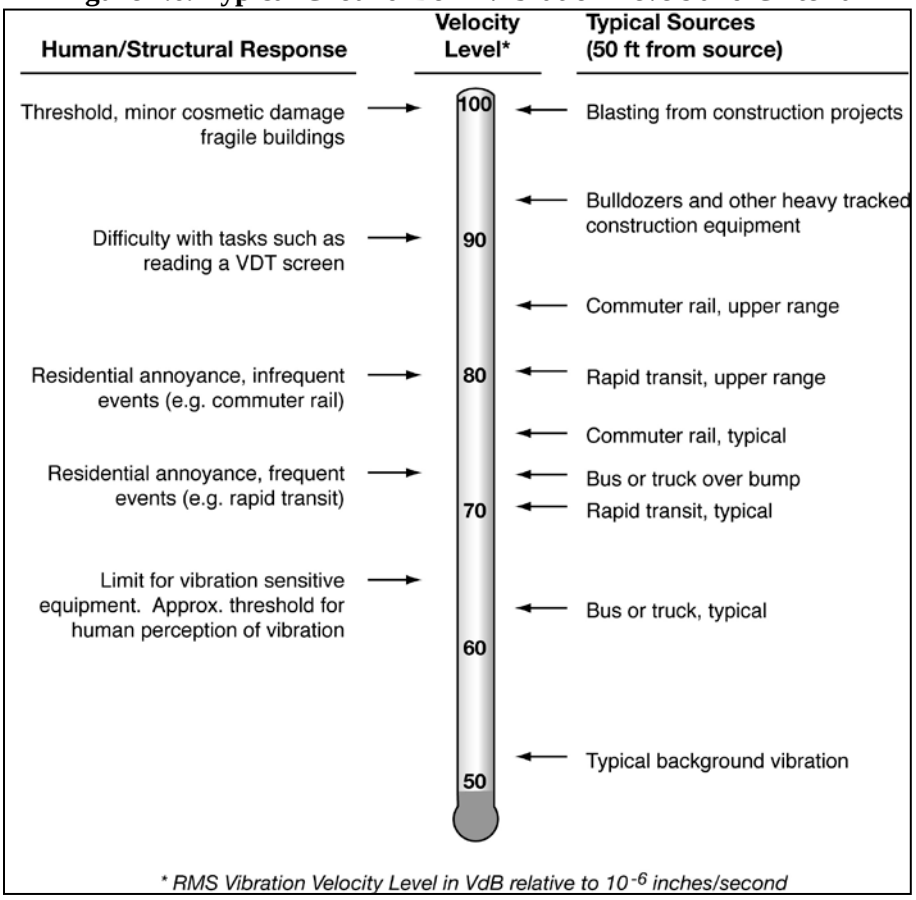
Ground-borne vibration is the oscillatory motion of the ground about some equilibrium position that can be described in terms of displacement, velocity or acceleration. Because sensitivity to vibration typically corresponds to the amplitude of vibration velocity within the low-frequency range of most concern for environmental vibration (roughly 5-100 Hz), velocity is the preferred measure for evaluating ground-borne vibration from surface transportation projects.

Vibration from a high speed train system is expressed in terms of a "source-path-receiver" framework. The "source" is the train rolling on the tracks which generates vibration energy transmitted through the supporting structure under the tracks and into the ground. Once the vibration gets into the ground, it propagates through the various soil and rock strata, the "path", to the foundations of nearby buildings, the "receivers." Ground-borne vibrations generally reduce in level with distance depending on the local geological conditions. A "receiver" is a vibration-sensitive building (e.g., residence, hospital, or school) where the vibrations may cause perceptible shaking of the floors, walls and ceilings and a rumbling sound inside rooms. Not all receivers have the same vibration-sensitivity. Consequently, vibration criteria are established for the various types of receivers.

The most common measure used to quantify vibration amplitude is the peak particle velocity (PPV), defined as the maximum instantaneous positive or negative peak of the vibratory motion. PPV is typically used in monitoring blasting and other types of construction-generated vibration, since it is related to the stresses experienced by building components. Although PPV is appropriate for evaluating building damage, it is less suitable for evaluating human response, which is better related to the average vibration amplitude. Thus, ground-borne vibration from high speed trains is usually characterized in terms of the "smoothed" root mean square (rms) vibration velocity level, in decibels (VdB), with a reference quantity of one micro-inch per second. VdB is used in place of dB to avoid confusing vibration decibels with sound decibels.

Figure 4.6 illustrates typical ground-borne vibration levels for common sources as well as criteria for human and structural response to ground-borne vibration. As shown, the range of interest is from approximately 50 to 100 VdB, from imperceptible background vibration to the threshold of damage. Although the approximate threshold of human perception to vibration is 65 VdB, annoyance is usually not significant unless the vibration exceeds 70 VdB.

Figure 4.6. Typical Ground-Born Vibration Levels and Criteria



Source: FRA (2005)

4.7.3 Noise and Vibration Impact Criteria

Regulatory Requirements

Noise and vibration impact for this proposed project is based on the criteria as defined in the FRA guidance manual (FRA, 2005). The criteria contained in this document are applicable for both NEPA and state documentation.

Noise Impact Criteria

Operational Noise

The FRA noise impact criteria are founded on well-documented research on community reaction to noise and are based on change in noise exposure using a sliding scale. Although higher levels of train noise are allowed in neighborhoods with high levels of existing noise, smaller increases in total noise exposure are allowed with increasing levels of existing noise. The criteria apply to high speed train operations as well as to fixed facilities such as storage and maintenance yards, passenger stations and terminals, parking facilities, and substations.

The FRA Noise Impact Criteria group noise sensitive land uses into three categories as described in Table 4.17. Ldn is used to characterize noise exposure for residential areas (Category 2). For other noise sensitive land uses such as parks and school buildings (Categories 1 and 3), the maximum 1-hour Leq during the facility's operating period is used.

There are two levels of impact included in the FRA criteria. The interpretation of these two levels of impact is summarized below:

- Severe Impact: Project-generated noise in the severe impact range can be expected to cause a significant percentage of people to be highly annoyed by the new noise and represents the most compelling need for mitigation. Noise mitigation will normally be specified for severe impact areas unless there are truly extenuating circumstances that prevent it.

- Moderate Impact: In this range of noise impact, the change in the cumulative noise level is noticeable to most people but may not be sufficient to cause strong, adverse reactions from the community. In this transitional area, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation. These factors include the existing noise level, the predicted level of increase over existing noise levels, the types and numbers of noise-sensitive land uses affected, the noise sensitivity of the properties, the effectiveness of the mitigation measures, community views and the cost of mitigating noise to more acceptable levels.

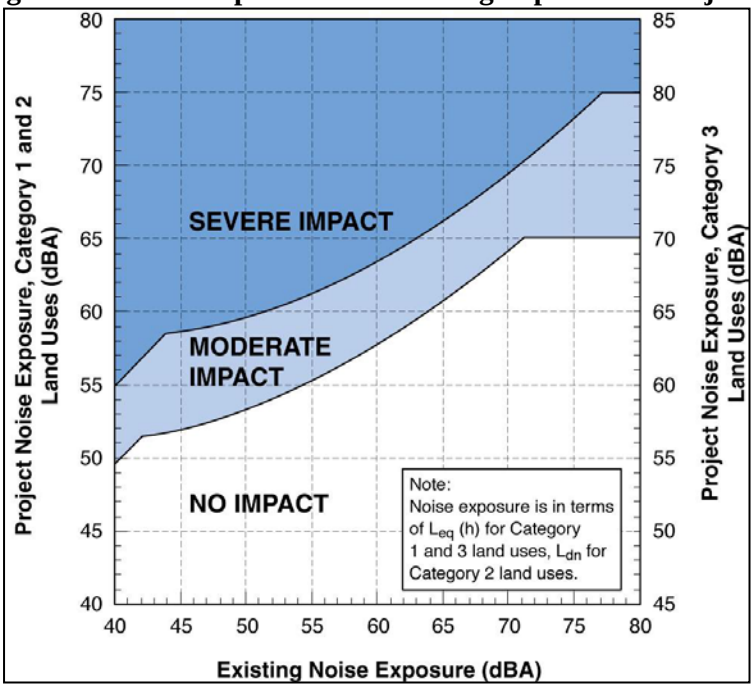
Table 4.17. Land Use Categories and Metrics for High Speed Train Noise Impact Criteria

Land Use Category	Noise Metric[1] (dBA)	Description of Land Use Category
1	Outdoor $L_{eq}(h)$[2]	Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use.
2	Outdoor L_{dn}	Residences and buildings where people normally sleep. This category includes homes, hospitals and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor $L_{eq}(h)$[2]	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries and churches where it is important to avoid interference with such activities as speech, meditation and concentration on reading material. Buildings with interior spaces where quiet is important, such as medical offices, conference rooms, recording studios and concert halls fall into this category, as well as places for meditation or study associated with cemeteries, monuments and museums. Certain historical sites, parks and recreational facilities are also included.

[1] Onset-rate adjusted sound levels (L_{eq}, L_{dn}) are to be used where applicable.
[2] L_{eq} for the noisiest hour of train-related activity during hours of noise sensitivity.
Source: FRA, 2005

The noise impact criteria are summarized in Figure 4.7. The plot shows the relationship between the existing noise exposure and the project noise exposure that would cause moderate impact and severe impact. FRA strongly encourages noise abatement on high speed train projects, especially where severe noise impacts are identified.

Figure 4.7. Noise Impact Criteria for High Speed Rail Projects



Source: FRA (2005)

Noise Effects on Wildlife and Domestic Animals

Noise effects on livestock and wildlife are also considered. The following information is from the FRA report, "High-Speed Ground Transportation Noise and Vibration Impact Assessment," (October 2005).

Although there are no established criteria relating high speed train noise and animal behavior, some characteristics of high speed train noise are similar to those from aircraft overflights and researchers generally agree that such noise can have a disturbing effect on both domestic livestock and wildlife. Some animals get used to noise exposure, while some do not; documented effects range from simply taking notice and changing body position to taking flight in panic. Whether these responses represent a threat to survival of animals remains unclear, although panic flight may result in injuries to animals in rough terrain or in predation of unprotected eggs of birds.

In lieu of established criteria, a limited amount of quantitative noise data relating actual aircraft overflight noise levels to effects provides enough information to develop a screening procedure to identify areas where noise from high speed train operations could affect domestic and wild animals. While a noise descriptor for noise effects on animals has not been universally adopted, recent research indicates the sound exposure level (SEL) is the most useful predictor of responses; this metric represents the sound energy at a receiver location from a single noise event. The criteria used to screen where animals may be affected by high speed trains are shown in Table 4.18.

Table 4.18. Interim Criteria for High Speed Train Noise Effects on Animals

Animal Category	Class	Noise Metric	Noise Level (dBA)
Domestic	Mammals (Livestock)	SEL	100
	Birds (Poultry)	SEL	100
Wild	Mammals	SEL	100
	Birds	SEL	100
Source: FRA, 2005			

Construction Noise

Construction noise criteria are based on the guidelines provided in the FRA guidance manual. These criteria, summarized in Table 4.19 below, are based on land use and time of day and are given in terms of Leq for an eight-hour work shift.

Table 4.19. FRA Construction Noise Assessment Criteria

Land Use	8-hour L_{eq}, dBA		Noise Exposure, dBA
	Day	Night	30-day Average
Residential	80	70	75[1]
Commercial	85	85	80[2]
Industrial	90	90	85[2]

[1] In urban areas with very high ambient noise levels (L_{dn} > 65 dB), L_{dn} from construction operations should not exceed existing ambient + 10 dB.
[2] Twenty-four-hour L_{eq}, not L_{dn}.
Source: FRA, 2005

Vibration Impact Criteria

Operational Vibration

The FRA groups vibration-sensitive land uses into three categories. Since ground-borne vibration does not typically annoy people who are outdoors, vibration impact is only assessed inside buildings. In addition to the potential for human annoyance, vibration impact is also assessed for certain equipment that is sensitive to vibration.

- **Vibration Category 1 – High Sensitivity:** Included in this category are buildings where vibration would interfere with operations. Vibration levels may be well below those associated with human annoyance. These buildings include vibration-sensitive research and manufacturing facilities, hospitals with sensitive equipment and university research operations. The sensitivity to vibration is dependent on the specific equipment present. Some examples of sensitive equipment include electron-scanning microscopes, magnetic resonance imaging scanners and lithographic equipment.
- **Vibration Category 2 – Residential:** Residences and buildings where people normally sleep. This category includes homes, hospitals, and hotels.
- **Vibration Category 3 – Institutional:** This category includes buildings with primarily daytime and/or evening use. This category includes schools, libraries and churches.

The FRA ground-borne vibration and noise impact criteria are based on land use and train frequency, as shown in Table 4.20. There are some buildings, such as concert halls, recording studios and theaters that can be very sensitive to vibration and noise but do not fit into any of the three categories listed in Table 4.20. Due to the sensitivity of these buildings, they usually warrant special attention during the environmental assessment of a high speed rail project. Table 4.21 gives criteria for acceptable levels of ground-borne vibration and noise for various types of special buildings.

It should be noted that there are separate FRA criteria for ground-borne noise: the “rumble” that can be radiated from the motion of room surfaces in buildings due to ground-borne vibration. Although expressed in dBA, which emphasizes the more audible middle and high frequencies, the criteria are set significantly lower than for airborne noise to account for the annoying low-

frequency character of ground-borne noise. Because airborne noise tends to mask ground-borne noise for above ground (i.e., at-grade or elevated) rail systems, ground-borne noise criteria are primarily applied to subway operations where airborne noise is not a factor. For the above ground high speed rail system planned along the proposed rail alignment, ground-borne noise criteria are applied only to buildings that have sensitive interior spaces that are well insulated from exterior noise.

Table 4.20. Ground-Borne Noise and Vibration Impact Criteria

Land Use Category	Ground-Borne Vibration Impact (VdB re 1 micro-inch/sec)		Ground-Borne Noise Impact (dB re 20 micro-Pascals)	
	Frequent[1] Events	Infrequent[2] Events	Frequent[1] Events	Infrequent[2] Events
Category 1: Buildings where vibration would interfere with interior operations.	65 VdB[3]	65 VdB[3]	N/A[4]	N/A[4]
Category 2: Residences and buildings where people normally sleep.	72 VdB	80 VdB	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use.	75 VdB	83 VdB	40dBA	48 dBA

[1] "Frequent Events" is defined as more than 70 vibration events per day.
[2] "Infrequent Events" is defined as fewer than 70 vibration events per day.
[3] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
[4] Vibration-sensitive equipment is not sensitive to ground-borne noise.
Source: FRA, 2005

Table 4.21. Ground-Borne Noise and Vibration Impact Criteria for Special Buildings

Type of Building or Room	Ground-Borne Vibration Impact (VdB re 1 micro-inch/sec)		Ground-Borne Noise Impact (dB re 20 micro-Pascals)	
	Frequent[1] Events	Infrequent[2] Events	Frequent[1] Events	Infrequent[2] Event
Concert Halls	65 VdB	65 VdB	25 dBA	25 dBA
TV Studios	65 VdB	65 VdB	25 dBA	25 dBA
Recording Studios	65 VdB	65 VdB	25 dBA	25 dBA
Auditoriums	72 VdB	80 VdB	30 dBA	38 dBA
Theaters	72 VdB	80 VdB	35 dBA	43 dBA

[1] "Frequent Events" is defined as more than 70 vibration events per day.
[2] "Infrequent Events" is defined as fewer than 70 vibration events per day.
Source: FRA, 2005

Construction Vibration

In addition to ground-borne vibration criteria for humans in residential, institutional and special buildings and vibration-sensitive equipment, there are ground-borne vibration criteria for potential damage to structures. The limits of vibration that structures can withstand are substantially higher than those for humans and for sensitive equipment. The FTA has established vibration damage criteria (Federal Transit Administration, May 2006, "Transit Noise and Vibration Impact Assessment", United States Department of Transportation, Office of Planning and Environment.) Table 4.22 presents criteria for assessing the potential for vibration damage to structures based on the type of building construction. This table includes rms vibration levels in VdB reference to 1 micro-inch per second and peak-particle velocity levels in inches per second. A crest factor of four (representing a PPV-rms difference of 12 decibels) is used to calculate the approximate rms vibration velocity levels from the PPV values in this table. It should be noted that these criteria are more conservative than other standards such as the U.S. Bureau of Mines frequency-dependent vibration criteria which is equivalent to approximately 114 VdB at 40 Hz and above.

Table 4.22. Construction Vibration Damage Criteria

Building Category	PPV (in/sec)	Approximate L_v[1]
I. Reinforced-concrete, steel or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

[1] RMS velocity in VdB re 1 micro-inch/second.
Source: FTA (2006)

4.7.4. Finding

Affected Environment

The proposed NLX corridor runs from Minneapolis to Duluth, Minnesota. In Minneapolis and the northern suburbs, the corridor is densely populated with a mix of residential land use with some sections of commercial land use. Traveling north the corridor then becomes more rural in between many small towns. The corridor runs directly through many of these downtown areas. At the northern end of the corridor, the tracks run through the city of Superior, Wisconsin and then cross a bridge to Duluth, Minnesota to the west. Noise-sensitive and vibration-sensitive receptors along the proposed NLX project corridor largely consist of single-family residences, multi-family residences, schools, churches, hotels, and parks. The majority of the land use along the corridor is Category 2, as defined in Section 4.7.3 above, which includes all residential land use, along with hotels and other land use with nighttime sensitivity as well as scattered Category 3 land uses. Additionally, the Bayfront Festival Park in Duluth, Minnesota is the only Category 1 land use along the corridor.

The primary sources contributing to the existing noise environment at most locations on the corridor are freight train operations on the BNSF track, including horns that are sounded in the vicinity of at-grade crossings, and motor vehicle traffic on nearby roadways. The Northstar commuter rail service is also a contributing noise source along the rail corridor for locations south of the Coon Creek Junction. All of the existing at-grade crossings along the BNSF track between Minneapolis and Andover are within quiet zones where the locomotive warning horns are not sounded. Other noise sources include aircraft overflights and general residential and commercial activities. BNSF freight and Northstar commuter train operations are the most significant sources of existing ground-borne vibration along the project corridor and represent the dominant sources of existing noise and vibration along the corridor between Minneapolis and Duluth.

Impacts

No Build

The No Build Alternative would result in no noise or vibration impacts.

Build Alternative

Methodology

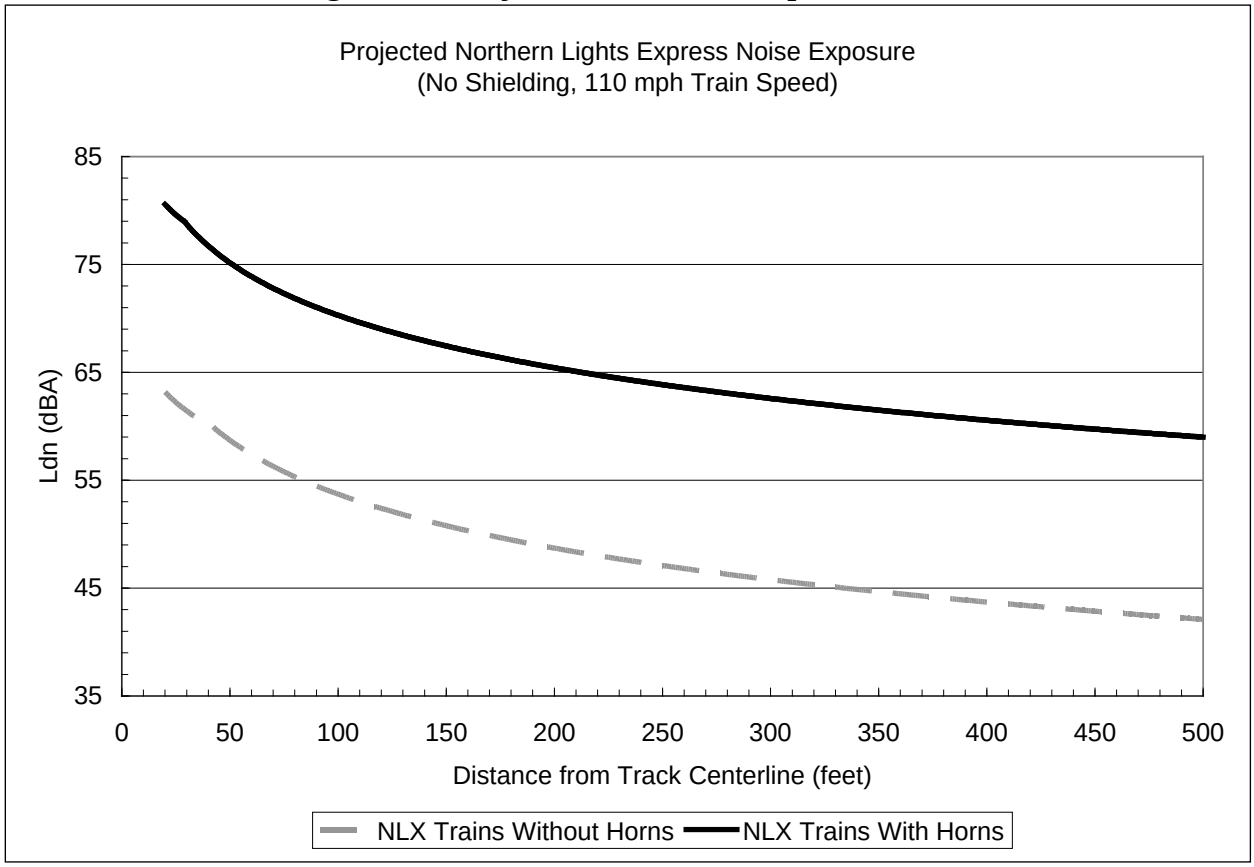
The noise and vibration analysis methodology is detailed in *The Northern Lights Express Environmental Assessment Noise and Vibration Technical Report and Addendum*, April 2011.

Relevant NLX operational characteristics (speed, number, and frequency trains) used in the analysis were based on the Level 2 functional assessment. Noise measurements were conducted at representative sites to characterize the existing baseline noise conditions at sensitive receptors along the corridor. Direct field measures were conducted to characterize the existing baseline vibration conditions at sensitive receptors along the corridor.

The primary components of wayside noise from train operations on the corridor are locomotive warning horns sounding as trains approach at-grade crossings, wheel/rail noise, which results from the steel wheels rolling on steel rails, and power car (locomotive) noise, which results from the engine. The projection of wayside noise from train operations was carried out using the models specified in the FRA guidance manual and the FTA guidance manual, based on the assumptions outlined in the project description.

The projected noise exposure in terms of Ldn at unshielded community locations from the proposed NLX operations are shown in Figure 4.8 as a function of distance for the maximum train speed of 110 mph. These results show that the highest noise levels occur when train horns are sounded.

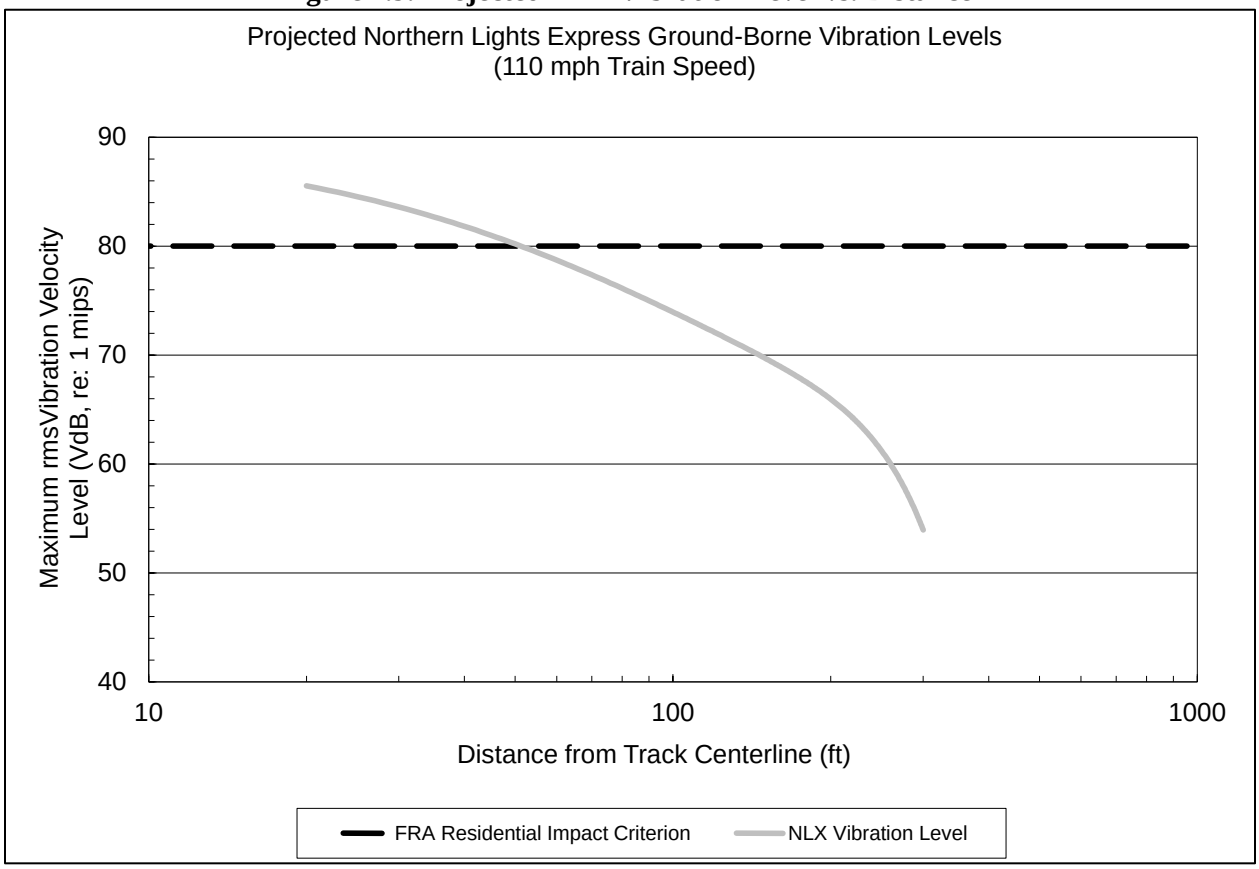
Figure 4.8. Projected NLX Noise Exposure vs. Distance



Source: Harris Miller Miller & Hanson Inc., 2011

The potential vibration impact from high speed rail operations was assessed on an absolute basis using the FRA criteria. The projected maximum ground-borne vibration levels from the proposed NLX operations are provided in Figure 4.9 as a function of distance for the maximum train speed of 110 mph.

Figure 4.9. Projected NLX Vibration Level vs. Distance



Source: Harris Miller Miller & Hanson Inc., 2011

Operational Noise Impact

The results of the noise analysis based on current NLX operational assumptions indicate that there would be 43 residential (Category 2), and 18 institutional (Category 3) severe noise impacts in addition to 279 residential, and 10 institutional moderate noise impacts from the NLX trains. There is no noise impact projected at Bayfront Festival Park in Duluth, MN, the only Category 1 land use along the corridor. Tables 4.23, 4.24, and 4.25 provide detailed results within separate communities for the impacted receivers. Table 4.23 presents impacts for Category 2 (residential) receptors and Table 4.24 presents impacts for Category 3 (non-residential) receptors. Table 4.25 summarizes impacts by community.

For impacted receivers Tables 4.23 and 4.24 provide the location by mile post along the alignment (see table note for explanation of mile post designations for purposes of noise and vibration studies), range of train speeds, distance from the NLX track centerline, existing noise level and noise impact criteria, predicted NLX sound level as well as total future noise level and increase above existing, and the number of noise impacts. The results for Category 2 and 3 receptors are listed separately in the table. For communities with no noise impacts the projected levels and other information are provided for the closest residential receptor to the NLX track.

In Minneapolis there is one multi-family residential building, located west of the tracks east of 1st Street N, consisting of four residences, predicted to have moderate noise impact. These noise impacts are due to the proximity of the proposed alignment to the buildings, approximately 30 feet away. Trains currently do not sound their horns in this area. In Braham, there is one park (Freedom Park) with severe noise impact due to the proximity of the proposed alignment. All of the other noise impacts listed in Tables 4.23 through 4.25 are caused primarily by the sounding of locomotive warning horns as trains approach at-grade crossings.

Noise Effects on Wildlife and Domestic Animals

FRA also addresses impacts to wildlife (mammals and birds) and domestic animals (livestock and poultry), as follows. Noise exposure limits for each are an SEL of 100 dBA from train passbys. A screening assessment was conducted to determine typical and maximum distances from the NLX tracks at which this limit may be exceeded. Train passby SELs were calculated for the maximum train speed along the corridor. To provide a conservative estimate no shielding due to intervening structures or terrain was assumed.

In locations where NLX trains would sound horns, this wildlife and domestic animal noise exposure limit is reached approximately 170 feet from the track centerline. In locations where NLX trains would not sound horns, this noise exposure limit is reached approximately 10 feet from the track centerline.

Comparison of Projected Sound Levels to Minnesota Noise Pollution Control Standards

Chapter 7030 of the Minnesota Administrative Rules includes the Noise Pollution Control Standards. The standards are intended to specify sound level limits according to various land use activity areas. Land use activities are separated into three Noise Area Classification (NAC) categories. NAC-1 includes mostly residential and institutional land uses, NAC-2 includes mostly commercial land uses, and NAC-3 includes mostly industrial land uses.

The noise standards are based on percentile sound levels, Ln, which refer to the sound level exceeded "n" percent of the time. The limits are based on the hourly L10 and L50, during both the daytime and nighttime hours. These metrics refer to the sound level that is exceeded 10 percent and 50 percent of the hour, respectively. Daytime hours are defined as 7:00 A.M. to 10:00 P.M. and nighttime hours are defined as 10:00 P.M. to 7:00 A.M. The noise standards are summarized in Table 4.22a.

Table 4.22a. Minnesota Noise Pollution Control Standards

Land Use	Noise Area Classification	Daytime		Nighttime	
		L10[1]	L50[1]	L10[1]	L50[1]
Residential	NAC-1	65	60	55	50
Commercial	NAC-2	70	65	70	65
Industrial	NAC3	80	75	80	75

[1]The noise limits are expressed in terms of the hourly A-weighted sound level (dBA).
Source: Minnesota Administrative Rules, Chapter7030, Noise Pollution Control, 2003

The noise analysis conducted (using FRA methodology described earlier in this section) assessed the potential for noise impact primarily at land uses that would fall under NAC-1. The limits for NAC-1 are the lowest and are therefore used to analyze impacts in relation to Minnesota state standards.

As previously noted, measurements of existing noise were conducted throughout the NLX study area, including continuous monitoring over one 24-hour period at each of ten long-term sites. A comparison of the Minnesota noise standards to the measured sound levels is provided in Table 4.22b.

As shown in bold in Table 4.22b, the noise standards were exceeded at seven of the ten measurement sites. Most of the existing exceedances of the noise standards are due to relatively high L10 values during hours when freight trains passed by the noise monitor location.

Table 4.22b. Summary of Existing Noise Measurements

Measurement Site	Measured Existing Range				Minnesota Noise Standards			
	Daytime		Nighttime		Daytime		Nighttime	
	L10[1]	L50[1]	L10[1]	L50[1]	L10[1]	L50[1]	L10[1]	L50[1]
LT-1	48-62	45-53	47-54	42-**52**	65	60	55	50
LT-2	51-**65**	43-56	45-**61**	40-50	65	60	55	50
LT-3	43-52	39-49	41-53	34-50	65	60	55	50
LT-4	44-60	41-50	39-50	34-47	65	60	55	50
LT-5	46-56	42-54	37-54	31-**51**	65	60	55	50
LT-6	50-64	45-**61**	40-52	34-46	65	60	55	50
LT-7	48-**68**	44-48	44-**69**	37-45	65	60	55	50
LT-8	42-61	39-47	44-**64**	40-50	65	60	55	50
LT-9	43-**66**	38-50	40-**64**	35-43	65	60	55	50
LT-10	45-52	41-47	45-50	40-44	65	60	55	50

[1]The noise limits are expressed in terms of the hourly A-weighted sound level (dBA).
Source: Harris Miller Miller & Hanson Inc., 2012

It is important to clarify that the Minnesota Noise Pollution Control Standards are intended to be measurement standards for an acceptable noise environment rather than criteria for a specific noise source. For this analysis, the future NLX train noise has been modeled and combined with the measured ambient sound levels at each long-term measurement site.

The projections of future NLX train noise have been conducted for a sample receptor located near an at-grade crossing where the locomotive horn would be sounded. The receptor was assumed to be located 50 feet from the center of the crossing road and 50 feet from the centerline

of the track. This receptor location represents a "worst-case" scenario, where the future sound levels from the train passby would be relatively high.

The analysis added the noise of a train passby to the measured one-hour data at each measurement site.[29] The hour with the highest measured L10 and L50 levels was used. As a conservative assumption, it was assumed that a total of two train passbys occurred during each hour. For this analysis, the future sound levels were calculated for trains operating at two speeds, 20 mph and 110 mph. These two speeds represent the range of speeds throughout the study area. Table 4.22c summarizes the results of the projected future sound levels compared to the Minnesota noise standards. Noise levels that exceed the noise standards are shown in bold. Except for site LT-10, all of the future exceedances of the noise standards occur where the measured existing noise levels already exceed the standards. At site LT-10, the nighttime L10 level would exceed the standards only for 20 mph speeds. This is because slower moving trains take a greater amount of time to passby a receptor, therefore contributing more to the percentile sound levels.

Table 4.22c. Minnesota Noise Standards Analysis

Measurement Site	Future Projected at 20 mph				Future Projected at 110 mph				Minnesota Noise Standards			
	Daytime		Nighttime		Daytime		Nighttime		Daytime		Nighttime	
	L10[1]	L50[1]	L10[1]	L50[1]	L10[1]	L50[1]	L10[1]	L50[1]	L10[1]	L50[1]	L10[1]	L50[1]
LT-1	64	54	55	**52**	63	53	54	**52**	65	60	55	50
LT-2	**67**	56	**62**	50	**66**	56	**62**	50	65	60	55	50
LT-3	53	49	53	50	52	49	53	50	65	60	55	50
LT-4	61	50	52	47	60	50	50	47	65	60	55	50
LT-5	57	54	55	**51**	56	54	54	**51**	65	60	55	50
LT-6	64	**61**	54	47	64	**61**	52	46	65	60	55	50
LT-7	**72**	49	**70**	45	**70**	48	**69**	45	65	60	55	50
LT-8	62	48	**65**	50	61	47	**64**	50	65	60	55	50
LT-9	**66**	52	**64**	44	**66**	50	**64**	43	65	60	55	50
LT-10	58	47	**57**	44	53	47	53	44	65	60	55	50

[1]The noise limits are expressed in terms of the hourly A-weighted sound level (dBA).
Source: Harris Miller Miller & Hanson Inc., 2012

The above discussed screening analysis used preliminary road and rail traffic flow data, unattended long term noise measurements, and a "worst case" noise receptor location (rail and roadway intersection) used at all of the checked noise sensitive areas along the rail route. It was

[29] The projections of the sound level from the train passby were made in accordance with the methodology in Appendix C of the FRA's "High-Speed Ground Transportation Noise and Vibration Impact Assessment" (October 2005) guidance manual.

found that seven of the ten checked areas are presently impacted under the MN State Noise Standards. Further, it was found that eight of the ten checked areas would be impacted after the introduction of the NLX trains. As the screening information was preliminary, the measurements limited, and the analysis based on non-typical "worst case" receptor locations, a detailed analysis will need to be conducted before final conclusions about impacts and noise mitigation can be drawn. This detailed analysis would be conducted during the preliminary engineering and Tier2 environmental assessment phase of project development when detailed information will be available and representative locations for noise sensitive receptors will be determined. If, after a detailed analysis, it is found that an area is impacted, and/or will be impacted after planned changes, then, according to MnDOT Noise Policy, noise mitigation will have to be considered and analyzed.[30] Noise mitigation will be evaluated as to feasibility and reasonability according to MnDOT Noise Policy procedures. At those locations where noise mitigation is found feasible and reasonable, noise mitigation will be proposed. Further information on the MnDOT Noise Policy may be found at the following website:
http://www.dot.state.mn.us/environment/noise/pdf/2011mndotnoisepolicy.pdf

Operational Vibration Impact

The results of the vibration analysis based on current NLX operational assumptions indicate that there would be four residential ground-borne vibration impacts from NLX trains. Table 4.26 provides detailed information for sensitive vibration receivers within separate communities including the distance of the closest receiver from the NLX track centerline, location by mile post along the alignment, range of train speeds, existing vibration level, projected vibration level, vibration impact criterion, and number of vibration impacts. All the data in Table 4.26 are for residential locations with the exception of the Duluth Depot Museum.

The ground-borne vibration and ground-borne noise impact criteria for special buildings from Table 4.20 above were applied to the Duluth Depot Great Hall auditorium. For the ground-borne noise assessment, the ground-borne noise levels were estimated using the methods recommended in the preliminary vibration assessment methodology provided in Chapter 8 of the FRA guidance manual (FRA, 2005). Even with a conservative assessment of the ground-borne vibration and ground-borne noise in the auditorium, the levels were substantially below the impact criteria, and no ground-borne noise or vibration impact is projected at the Duluth Depot Great Hall.

There are three projected vibration impacts at single-family residences in Stanchfield, MN. These impacts are caused by the proximity of these residences to the NLX track, approximately 50 feet, and the speed of the passing NLX trains at 110 mph. There is also one projected vibration impact at a single-family residence in Nickerson, MN. This vibration impact is caused by the close proximity of the residence to the NLX track, approximately 35 feet, and the speed of the passing NLX trains at 90 mph.

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[30] The MnDOT Noise Policy was developed specifically in response to FHWA highway noise requirements and the need to address Minnesota Pollution Control Agency (MPCA) noise rules and standards. MnDOT requires the same feasibility and reasonability analysis to evaluate noise mitigation in relation to State noise standards for rail projects for which it is a project sponsor. This analysis will occur in addition to the evaluation done to comply with FRA noise requirements.

Table 4.23 Residential Land Use Noise Impact Summary

Receptor Location	Land Use Category	Distance to NLX Track (ft)	Mile Post*	NLX Train Speed (mph)	Existing Noise Level[1]	NLX Project Noise Level[1]			Total Noise Level[1]	Noise Level Increase[1]	Number of Impacts	
						Predicted[2]	Impact Criteria					
							Moderate	Severe			Moderate	Severe
Minneapolis	Cat. 2	29	0-5	60	55	57	55	61	59	4	4	0
Fridley	Cat. 2	61[3]	5-11	79[3]	67[3]	54[3]	62[3]	68[3]	67[3]	0[3]	0	0
Coon Rapids	Cat. 2	95[3]	11-16	71[3]	62[3]	51[3]	59[3]	64[3]	62[3]	0[3]	0	0
Andover	Cat. 2	133-221	16-30	90	75	65-67	65	73	75-76	0-1	7	0
Bethel	Cat. 2	116-215	30-35	90	75	66-70	65	73	75-76	1	7	0
Isanti	Cat. 2	98-119	35-37	108-110	75	65-68	65	73	75-76	1	22	0
Cambridge	Cat. 2	82-396	37-46	20-107	70	64-69	64	69	71-73	1-3	53	0
Stanchfield	Cat. 2	85-146	46-53	109-110	70-78	66-67	64-65	69-75	72-78	0-2	11	0
Braham	Cat. 2	96	53-54	110	78	67	65	75	78	0	12	0
Grasston	Cat. 2	98-116	54-60	110	78	66	65	75	78	0	2	0
Henriette	Cat. 2	86-146	60-65	110	78	67-71	65	75	78-79	0-1	11	0
Brook Park	Cat. 2	52-73	65-73	87-105	83	66-74	65	75	83-84	0-1	4	0
Hinckley	Cat. 2	59-383	73-79	20-109	83	66-81	65	75	83-85	0-2	36	10
Sandstone	Cat. 2	159[3]	79-88	90[3]	72[3]	64[3]	65[3]	71[3]	72[3]	0[3]	0	0
Askov	Cat. 2	93-197	88-99	90	72	65-68	65	71	72-73	1-2	16	0
Bruno	Cat. 2	250[3]	99-105	90[3]	72[3]	61[3]	65[3]	71[3]	72[3]	0[3]	0	0
Kerrick	Cat. 2	153-224	105-113	90	72	65-66	65	71	72-73	1	1	0
Nickerson	Cat. 2	153-224	105-113	90	72	65-66	65	71	72-73	1	1	
Holyoke	Cat. 2	142-317	113-124	90	62	59-67	59	64	64-68	2-6	9	2
Superior	Cat. 2	104-410	124-146	73-90	62-63	59-69	59	64-65	64-70	2-8	83	31
Duluth	Cat. 2	474[3]	146-154	45[3]	61[3]	38[3]	59[3]	64[3]	61[3]	0[3]	0	0
Total NLX Alignment Residential Noise Impacts											**279 Residential**	**43 Residential**

[1] Noise levels for land use category 2 are based on Ldn and measured in dBA.
[2] Predicted levels include horn and bell noise, where applicable (rounded to the nearest decibel).
[3] Data are for the closest non-impacted residential receptor in this location. There are no noise impacts in this section.
*Mile Posts used in this table are specific to the noise and vibration study references, are based on the NLX corridor using Mile Post 0 as the southern terminus in Minneapolis. These noise and vibration study Mile Posts are not the MPs used elsewhere in this document which use the railroad subdivision system.
Source: Harris Miller Miller & Hanson Inc., 2011

Table 4.24. Non-Residential Land Use Noise Impact Summary

Receptor Location	Land Use Category	Distance to NLX Track (ft)	Mile Post	NLX Train Speed (mph)	Existing Noise Level[1]	NLX Project Noise Level[1]			Total Noise Level[1]	Noise Level Increase[1]	Number of Impacts	
						Predicted[2]	Impact Criteria					
							Moderate	Severe			Moderate	Severe
Andover	Cat. 3	237	16-30	90	45	63	57	64	63	18	1 School	0
Bethel	Cat. 3	473	30-35	90	45	61	57	64	61	16	1 Church	0
Isanti	Cat. 3	288	35-37	110	45	63	57	64	63	19	1 Church	0
Cambridge	Cat. 3	80-441	37-46	20-34	45	64-74	57	64	64-74	19-29	0	2 Churches 1 Cemetery, 1 Daycare
Stanchfield	Cat. 3	101-127	46-53	110	45-49	65-68	57-58	64	65-68	17-23	0	1 Cemetery, 2 Churches
Braham	Cat. 3	10-146	53-54	110	49	64-82	58	64	64-82	16-33	1 Park	1 Park
Hinckley	Cat. 3	52-250	73-79	20	46	72-83	57	64	72-83	26-37	0	1 School, 3 Churches
Sandstone	Cat. 3	79-375	79-88	75-90	45	59-71	57	64	59-71	15-26	1 School, 1 Church	2 Parks
Askov	Cat. 3	194-363	88-99	90	45	60-64	57	64	60-64	15-20	1 School, 1 Church, 1 Park	1 Church
Bruno	Cat. 3	296-459	99-105	90	45	58-64	57	64	58-64	14-20	1 School	1 Church
Duquette	Cat. 3	196	105-113	90	45	64	57	64	64	19	0	1 Park
Superior	Cat. 3	135	124-146	89	45	67	57	64	67	22	0	1 School
Total NLX Alignment Non-Residential Noise Impacts											**4 Schools, 4 Churches, 2 Parks**	**2 Cemeteries, 2 Schools, 9 Churches, 4 Parks, 1 Daycare**

[1] Total Noise Level" is the result of combining the Existing Noise Level with the Predicted Noise Level from NLX operations. Noise levels for land use category 3 are based on Leq and measured in dBA.
[2] Predicted levels include horn and bell noise, where applicable (rounded to the nearest decibel).
*Mile Posts used in this table are specific to the noise and vibration study references, are based on the NLX corridor using Mile Post 0 as the southern terminus in Minneapolis. These noise and vibration study Mile Posts are not the MPs used elsewhere in this document which use the railroad subdivision system.
Source: Harris Miller Miller & Hanson Inc., 2011

Table 4.25. Noise Impact Summary

Receptor Location	Number of Impacts	
	Moderate	**Severe**
Minneapolis	4 Residential	0
Fridley	0	0
Coon Rapids	0	0
Andover	7 Residential, 1 School	0
Bethel	7 Residential, 1 Church	0
Isanti	22 Residential, 1 Church	0
Cambridge	53 Residential	2 Churches 1 Cemetery, 1 Daycare
Stanchfield	11 Residential	1 Cemetery, 2 Churches
Braham	12 Residential, 1 Park	1 Park
Grasston	2 Residential	0
Henriette	11 Residential	0
Brook Park	4 Residential	0
Hinckley	36 Residential	10 Residential, 1 School, 3 Churches
Sandstone	1 School, 1 Church	2 Parks
Askov	16 Residential, 1 School, 1 Church, 1 Park	1 Church
Bruno	1 School	1 Church
Kerrick	1 Residential	0
Duquette	0	1 Park
Nickerson	1 Residential	
Holyoke	9 Residential	2 Residential
Superior	83 Residential	31 Residential, 1 School
Duluth	0	0
Total NLX Alignment Noise Impacts	**279 Residential, 4 Schools, 4 Churches, 2 Parks**	**43 Residential, 2 Cemeteries, 2 Schools, 9 Churches, 4 Parks, 1 Daycare**

Source: Harris Miller Miller & Hanson Inc., 2011

Vibration levels typically decrease very rapidly as the distance from the vibration source increases. The vibration levels from high-speed trains are generally much lower in level than freight trains. One reason for this is the significantly greater weight of a freight locomotive compared to a high-speed train locomotive. Additionally, the track standards for a high-speed train system are typically higher than for freight service, resulting in smoother rails with no corrugations or other defects or surface irregularities that lead to higher vibration levels.

Table 4.26. Vibration Impact Summary

Receptor Location	Dist. To NLX Track (ft)	Mile Post	NLX Train Speed (mph)	Existing Freight Vibration Level[1]	Projected NLX Vibration Level[1]	Vibration Impact Criterion[1]	Number of Vibration Impacts[2]
Minneapolis	29	0-5	60-79	86	79	80	0
Fridley	61	5-11	79	78	76	80	0
Coon Rapids	159	11-16	46-90	74	73	80	0
Andover	86	16-30	90	78	74	80	0
Bethel	116	30-35	90-103	76	71	80	0
Isanti	98	35-37	108- 110	77	74	80	0
Cambridge	121	37-46	109-110	73	72	80	0
Stanchfield	51	46-53	110	81	80	80	3
Braham	126	53-54	110	79	74	80	0
Grasston	128	54-60	110	78	74	80	0
Henriette	86	60-65	110	75	75	80	0
Brook Park	58	65-73	101-110	77	78	80	0
Hinckley	64	73-79	65-110	82	74	80	0
Sandstone	159	79-88	76-90	73	67	80	0
Askov	93	88-99	90	76	73	80	0
Bruno	206	99-105	90	70	64	80	0
Nickerson	31	105-113	90	85	82	80	1
Holyoke	142	113-124	90	74	69	80	0
Superior	141	124-146	89-90	74	79	80	0
Duluth	178	146-154	45	73	60	80[3]	0
Total NLX Alignment Vibration Impacts							**4**

[1]Vibration levels are measured in VdB referenced to 1 µ-inch/second.
[2]All impacts are residential unless otherwise noted.
[3]Special building vibration impact criteria from Table 4.21 applied to Duluth Depot Great Hall auditorium.
*Mile Posts used in this table are specific to the noise and vibration study references, are based on the NLX corridor using Mile Post 0 as the southern terminus in Minneapolis. These noise and vibration study Mile Posts are not the MPs used elsewhere in this document which use the railroad subdivision system.

Source: Harris Miller Miller & Hanson Inc., 2011

Construction Noise and Vibration Impacts

Temporary noise and vibration impacts could result from activities associated with the construction of new tracks and stations, utility relocation, grading, excavation, track work, demolition, and installation of systems components. Such impacts may occur in residential areas

and at other noise-sensitive land uses located within several hundred feet of the alignment. The potential for noise impact would be greatest at locations near pile-driving operations for bridges and other structures and at locations close to any nighttime construction work. The potential for vibration impact would be greatest at locations near pile-driving for bridges and other structures, and at locations close to vibratory compactor operations.

Layover and Maintenance

Noise impacts would likely occur during construction of layover and fueling/equipment maintenance facilities, as well as the satellite light maintenance facility; however this would be mitigated through compliance with local code requirements limiting construction work hours. Noise due to activities at the facilities would involve low-speed train car movements. The Minneapolis layover location is yet to be determined but is expected to be in an existing rail corridor. Layover in Duluth would be at the Depot. These areas are located in areas subject to substantial highway noise; the addition of layover and/or maintenance facilities in existing rail yard areas should not pose significant additional noise impacts.

Vibration impacts should be minimal.

Stations

Noise impacts would likely occur during construction of new station improvements and would be mitigated through compliance with local controls on construction activities. No permanent noise or vibration impacts are anticipated. Noise and vibration would be addressed in separate environmental documentation for Cambridge, Hinckley and Superior stations.

Avoidance, Minimization and/or Mitigation Measures

Potential Operational Noise Mitigation Measures

Potential mitigation measures for reducing noise impacts from high speed train system sources are described below:

- **Noise Barriers**: Installation of noise barriers beside the tracks is commonly used to reduce noise from surface transportation sources. Depending on the height and location relative to the tracks noise barriers can achieve between 5 and 15 dB of noise reduction. The primary requirements for an effective noise barrier are that (1) the barrier must be high enough and long enough to break the line-of-sight between the sound source and the receiver, (2) the barrier must be of an impervious material with a minimum surface density of 4 lb. /sq. ft., and (3) the barrier must not have any gaps or holes between the panels or at the bottom. Because many materials meet these requirements, the selection of materials for noise barriers is usually dictated by aesthetics, durability, cost, and maintenance considerations. Noise barriers typically range in height from twelve to fifteen feet for diesel locomotive-hauled trains, eight to ten feet for electric trains.

- **Establishment of Quiet Zones**: One option for mitigating noise impacts along the alignment would be to establish "quiet zones" near grade crossings in accordance with FRA regulations. In quiet zones, because of safety improvements at the at-grade crossings, train operators would sound horns only in emergency situations rather than as a standard operating procedure. The municipalities are key participants in the process as they must initiate the request to establish the zones through application to the FRA. To meet safety criteria, MnDOT and WisDOT working with the municipalities will likely be required to provide improvements at grade crossings such as modifications to the streets, raised medians, warning lights, and other devices. The FRA regulation also authorizes the use of automated wayside horns at crossings along with flashing lights and gates as a substitute for the train horn. While activated by the approach of trains, these devices are pole-mounted at the grade crossing, thereby limiting the horn noise exposure area to the immediate vicinity of the crossing. There are 18 at-grade crossings along the corridor between Minneapolis and Andover that are currently "quiet zones" where the train horns are not regularly sounded.

- **Vehicle noise specification**: In the procurement of vehicle technology, performance limits can set for noise levels in order to reduce community noise impacts throughout the corridor. Depending on the available technology this could reduce the number of impacts throughout the corridor.

- **Building Sound Insulation**: Sound insulation of residences and institutional buildings to improve the outdoor-to-indoor noise reduction has been widely applied around airports and has seen limited application for rail and transit projects. Although this approach has no effect on noise in exterior areas, it may be the best choice for sites where noise barriers are not feasible or desirable and for buildings where indoor sensitivity is of most concern. Substantial improvements in building sound insulation (on the order of 5 to 10 dBA) can often be achieved by adding an extra layer of glazing to the windows, by sealing holes in exterior surfaces that act as sound leaks, and by providing forced ventilation and air-conditioning so that windows do not need to be opened.

- **Special Trackwork at Crossovers and Turnouts**: Because the impacts of wheels over rail gaps at track crossover locations, or turn-outs for passing tracks, increases noise by about 6 dBA, crossovers are a major source of noise impact when they are located in sensitive areas. If crossovers cannot be relocated away from residential areas, another approach is to use spring-rail or moveable point frogs in place of standard rigid frogs at turnouts. These devices allow the flangeway gap to remain closed in the main traffic direction for revenue service trains.

The projected NLX noise impacts are primarily due to the sounding of horns near at-grade crossings, rather than due to wheel/rail noise, which results from the steel wheels rolling on steel rails, and power car (locomotive) noise, which results from the engine. Therefore, the most feasible way to mitigate the noise impacts would be with the establishment of quiet zones for all at-grade crossings near noise-sensitive receivers. As noted above, municipalities must initiate the request to establish quiet zones through application to the FRA; however the NLX project proposers can encourage and assist municipalities in making this application.

The establishment of quiet zones would eliminate all but four moderate noise impacts at one multi-family residential building in Minneapolis, described above, and one severe noise impact

at Freedom Park in Braham; these noise impacts that would remain after full implementation of quiet zones are referred in subsequent text as “residual impacts”.

Table 4.27 summarizes the noise impacts by community, without mitigation and with the implementation of quiet zones along the corridor. The implementation of quiet zones in the project corridor would have the additional benefit of reducing the existing noise from freight train locomotive horns. This would be expected to decrease the Ldn at sensitive locations along the corridor by up to 5 dBA to 15 dBA compared to existing levels. The implementation of noise barriers would not be an effective mitigation option for the corridor where noise impacts are caused by locomotive horn noise. Noise barriers would need to be approximately 15 feet high in order to provide noise reduction from the locomotive horns. Additionally noise barriers would be ineffective at locations near at-grade crossings because they could not extend across roadways.

Trains do not currently sound horns in the area of the multi-family residential building with residual moderate impact in Minneapolis, so the noise impacts would be caused by the proposed NLX trains and not horn noise. The impacted multi-family building is elevated above the alignment in this location. A noise barrier could potentially mitigate this noise impact if located near the track, but it would need to be approximately 12 feet to 15 feet high in order to provide noise reduction from the locomotive noise source. Providing sound insulation for this building is another potential mitigation option. Before any final decision is made regarding noise mitigation at this building, a site specific long-term existing noise measurement would be conducted during the design phase of the proposed project. The existing Ldn at this location was estimated from a one-hour noise measurement. A 24-hour noise measurement at this site would refine the results and may indicate no noise impact.

The residual severe noise impact at Freedom Park in Braham, MN could potentially be mitigated with a noise barrier, but may not be feasible due to its proximity to the track. It is important to note that the noise analysis was done based on a worst-case corridor footprint which has since been reduced. Refined noise study would be done based on preliminary engineering and as a part of the Tier 2 process.

Potential Operational Vibration Mitigation Measures

The assessment assumes that the vehicle wheels and track are maintained in good condition with regular wheel truing and rail grinding. Beyond this, there are several approaches to reduce ground-borne vibration from high speed rail operations, as described below.

- **Ballast Mats**: A ballast mat consists of a pad made of rubber or rubber-like material placed on an asphalt or concrete base with the normal ballast, ties, and rail on top. The reduction in ground-borne vibration provided by a ballast mat is strongly dependent on the frequency content of the vibration and design and support of the mat.

- **Tire Derived Aggregate (TDA):** Also known as shredded tires, a typical TDA installation consists of an underlayment of 12 inches of nominally 3-inch size tire shreds or chips wrapped with filter fabric, covered with 12 inches of sub-ballast and 12 inches of ballast above that to the base of the ties. Tests suggest that the vibration attenuation properties of

this treatment are midway between that of ballast mats and floating slab track. To date, this low-cost option has been installed on two U.S. LRT systems (San Jose and Denver); tests

Table 4.27. Summary of Noise Mitigation Effectiveness

Receptor Location	Number of Moderate and Severe Residential Noise Impacts[1,2]			
	Without Mitigation		With Quiet Zones	
	Moderate	Severe	Moderate	Severe
Minneapolis	4	0	4	0
Fridley	0	0	0	0
Coon Rapids	0	0	0	0
Andover	7 1 School	0	0	0
Bethel	7 1 Church	0	0	0
Isanti	22 1 Church	0	0	0
Cambridge	53	2 Churches 1 Cemetery, 1 Daycare	0	0
Stanchfield	11	1 Cemetery, 2 Churches	0	0
Braham	12 1 Park	1 Park	0	1 Park
Grasston	2	0	0	0
Henriette	11	0	0	0
Brook Park	4	0	0	0
Hinckley	36	10 1 School, 3 Churches	0	0
Sandstone	1 School 1 Church	2 Parks	0	0
Askov	16 1 School 1 Church 1 Park	1 Church	0	0
Bruno	1 School	1 Church	0	0
Kerrick	1	0	0	0
Duquette	0	1 Park	0	0
Nickerson	1	0	0	0
Holyoke	9	2	0	0
Superior	83	31 1 School	0	0
Duluth	0	10	0	0
TOTAL	**279 Residential, 4 Schools, 4 Churches, 2 Parks**	**43 Residential, 2 Cemeteries, 2 Schools, 9 Churches, 4 Parks, 1 Daycare**	**4 Residential**	**1 Park**

[1] All impacts are residential unless otherwise noted.
[2] Analysis based on Level 2 functional assessment operational characteristics.
Source: Harris Miller Miller & Hanson Inc., 2011

conducted in San Jose indicated no significant change in the physical characteristics of the track or the vibration reduction effectiveness of the TDA after five years. It has not yet been applied on high-speed passenger rail systems in the U.S.

- **Floating Slabs**: Floating slabs consist of thick concrete slabs supported by resilient pads on a concrete foundation; the tracks are mounted on top of the floating slab. Most successful

floating slab installations are in subways; their use for at-grade track is less common because they are only used where there is a concrete base such as the subway tunnel invert or a slab track. Floating slabs are designed to provide vibration reduction at lower frequencies than other treatments like resilient rail fasteners but they are extremely expensive.

- **Resilient Rail Fasteners**: Resilient fasteners can be used to provide vibration isolation between rails and concrete slabs for direct fixation track on aerial structures or in tunnels. These fasteners include a soft, resilient element to provide greater vibration isolation than standard rail fasteners in the vertical direction.

- **Special Trackwork at Crossovers and Turnouts**: Because the impacts of wheels over rail gaps at track crossover locations, or turn-outs for passing tracks, increases vibration by about 10 dBA, crossovers are a major source of vibration impact when they are located in sensitive areas. If crossovers cannot be relocated away from residential areas, another approach is to use spring-rail or moveable point frogs in place of standard rigid frogs at turnouts. These devices allow the flangeway gap to remain closed in the main traffic direction for revenue service trains.

The proposed NLX alignment is projected to cause four vibration impacts at residential buildings. Specific vibration mitigation measures would be recommended in preliminary design when more specific characteristics of the vehicle are known. Additionally, site specific ground-borne vibration propagation testing may be conducted during design to provide less conservative results that may indicate no vibration impact.

Potential Construction Noise and Vibration Mitigation Measures

Construction activities would be carried out in compliance with all applicable local noise regulations. Mitigation measures that can be applied as needed to minimize temporary construction noise and vibration impacts include:

- Avoiding nighttime construction in residential neighborhoods.
- Locating stationary construction equipment as far as possible from noise-sensitive sites.
- Constructing noise barriers, such as temporary walls or piles of excavated material, between noisy activities and noise-sensitive receivers.
- Routing construction-related truck traffic to roadways that will cause the least disturbance to residents.
- Using alternative construction methods to minimize the use of impact and vibratory equipment (e.g., pile-drivers and compactors).

Noise and vibration analysis would be reassessed based on subsequent preliminary engineering. Specific mitigation would be identified based on results and specific circumstances of identified impact areas at that time.

4.8 Hazardous Waste/Contaminated Material/Solid Waste

Affected Environment

The presence of potentially contaminated properties (defined as properties at which soil and/or groundwater is impacted with pollutants, contaminants or hazardous wastes) is a concern in the development of transportation projects because of the potential liabilities associated with ownership of such properties, the potential cleanup costs, and the safety concerns for construction personnel. Contaminated materials encountered during construction projects must be properly handled and treated in accordance with state and federal regulations. Improper handling of contaminated materials can exacerbate their impact on the environment. Contaminated materials also cause adverse impacts to a construction budget and schedule by increasing costs and causing delays.

Contamination along rail corridors may be either residual or associated with industrial uses near the railroad corridor. Common residual contamination from railroad operation includes herbicides used to control weeds, creosote to preserve wood ties, polynuclear aromatic hydrocarbons (PAHs) from diesel exhaust, and spilled or leaked liquids such as oil, gasoline, diesel fuel, or cleaning solvents. Contamination related to industrial uses often occurs in railroad or switching yards where evidence of petroleum, metals, pesticides and other substance associated with repairs and maintenance can be found. Contamination can also be found on sidings or in areas adjacent to industries where contaminants may have spread to the rail bed.

The proposed NLX project corridor has supported various industrial land uses within the study area, including railroad yard operations. The extensive length of the proposed project, along with the commercial and industrial uses in urban areas, contributes to the potential for encountering contaminated sites in locations where parallel track, stations, and other corridor upgrades may be constructed.

An online review of the MPCA database and the WDNR RR Sites Map revealed multiple occurrences of contaminated sites along the study corridor. A 500-foot buffer area was used to capture nearby sites from which contaminants may have migrated.

The MPCA “What’s in my Neighborhood?” database results included tank (underground or aboveground) sites, petroleum leak sites, Voluntary Investigation & Cleanup (VIC) non-petroleum brownfield program sites, unpermitted dump sites, feedlots, and sites where there are multiple MPCA activities occurring. Additional information about these types of sites is provided in Appendix I.

“Multiple Activity” sites were researched to determine the types of activities that have occurred at each location. Multiple Activity sites for which all activities were considered low risk were eliminated from the search results. Low risk sites include properties where minor volumes of chemicals or hazardous materials have been used or stored. Other types of sites (small hazardous waste generators, stormwater permits and wastewater dischargers) were removed from the search results due to low potential for contamination, or because the MPCA activity is not relevant to

studying the impacts of the project. The sites that were not eliminated from the search results are listed in Table I-1 and I-2 in Appendix I.

In Minnesota, sites were identified in or near the proposed project construction limits in the communities of Minneapolis (8), Isanti (7), Cambridge (9), Stanchfield (1), Braham (7), Grasston (2) and Holyoke (1). A tank and leak site is approximately 300 feet from the proposed new stream crossing at Pokegama Creek in Brook Park. In Wisconsin, four sites with soil contamination were identified near the proposed project construction limits in the City of Superior.

Impacts

No Build Alternative

The No Build Alternative would result in no potential to encounter contamination or generate contaminated material.

Build Alternative

Ground disturbance associated with new construction in the proposed project corridor may impact residual contamination within the corridor or contamination related to industrial use. As noted above, there are a number of sites within 500 feet of the corridor where new track construction is planned that present some potential for contamination.

Rehabilitation of existing railroad bridges includes open deck rehabilitation, cleaning and painting, bearing replacement and pointing of abutments and/or piers. Of these activities, cleaning and painting poses the greatest potential for contamination impact, however mitigation described below reduces this potential significantly.

No above or below ground storage tanks are planned for permanent use in conjunction with this project. Temporary storage tanks for petroleum projects may be located in the project area for equipment during construction. Toxic or hazardous materials would not be present at the site, except for fuel and oil necessary for equipment during construction and to operate the trains. The proposed project could result in a slight increase in the potential for hazardous material spills along the right of way due to the increase in rail traffic compared to the existing condition; however this potential is offset by the opportunity that the proposed project affords to increase safety as a result of improved rail capacity, track condition, and signal and communications systems.

All solid wastes generated by construction of the proposed project would be disposed of properly in a permitted, licensed solid waste facility or a similarly regulated facility elsewhere. Project demolition of concrete, asphalt and other potentially recyclable construction materials would be directed to the appropriate storage, crushing or renovation facility for recycling or reuse.

Layover and Maintenance

Investigation of environmental site conditions in the vicinity of the layover area at the southern terminus (Minneapolis) would occur when the location is identified. The MPCA review identified no sites within 500 feet of the Duluth layover site. The layover site would be in area of existing rail use and therefore some degree of rail related soil contamination is expected. Additional investigation would be conducted as design proceeds. Identified impacts would be mitigated consistent with state and federal regulations.

Stations

Contamination studies conducted at or in the vicinity of the downtown Minneapolis station (the proposed Interchange) and Foley Station in Coon Rapids have identified historic land uses, and past release of hazardous substances and/or petroleum products, indicating a potential for encountering contaminated soils during station construction. Additional investigation at these and other station locations would be done during subsequent engineering activities and as part of separate environmental documentation, as required. Identified impacts would be mitigated consistent with state and federal regulations.

Avoidance, Minimization, and/or Mitigation Measures

As part of final design and prior to right of way acquisition, further evaluation of potentially contaminated properties affected by project construction would be completed to determine the extent and magnitude of contaminated soil and/or groundwater in the areas of concern. The results of this investigation would be used to determine whether the contaminated materials can be avoided or whether the project's impacts to these properties can be minimized. If necessary, a plan would be developed for properly handling and treating contaminated soil and/or groundwater during construction in accordance with all applicable state and federal requirements.

Appropriate measures would be taken during construction to avoid spills that could contaminate groundwater or surface water in the project area. In the event that a leak or spill occurs during construction, appropriate action to remediate the situation would be taken immediately, in accordance with MPCA and/or WDNR containment and remedial action procedures, as appropriate.

Specifically for bridge construction and rehabilitation, the contractor would be required to propose a containment plan, environmental monitoring plan, waste management plan and contingency plan in order to avoid contamination of the waterway from lead-based paint materials. Typical containment systems include tarps, negative pressure, barges/pontoons/small floats, and vacuum equipment. Similarly, debris containment measures would be in place as needed to ensure that construction materials for the open deck rehabilitation do not fall into the waterway.

In the event of a hazardous materials spill from a high speed rail train, environmental response procedures would be followed to minimize adverse impacts.

Prior to construction of corridor improvements, a construction contingency plan addressing hazardous substance identification, notification, management, and disposal if hazardous substances are encountered during construction and operation would be developed. If a spill of hazardous or toxic substances should occur during or after construction of the proposed project, it is the responsibility of the transport company to notify the Minnesota Department of Public Safety, Division of Homeland Security and Emergency Management, to arrange for corrective measures to be taken pursuant to 6 Minnesota Code of Agency Rules (MCAR) 4.9005E. If any spills should occur in Wisconsin, it is the responsibility of the transport company to notify the WDNR's Remediation and Redevelopment Program, and to follow the requirements of Chapter NR 700 of the Wisconsin Administrative Code. Any contaminated spills or leaks that occur during construction are the responsibility of the Contractor and would be responded to according to the MPCA and/or WDNR's containment and remedial action procedures.

4.9 Cultural Resources

Regulatory Context

Section 106

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, requires federal agencies to consider the effects of their undertakings on historic properties. Section 106 implementing regulations are outlined in 36 CFR Part 800 and define the Section 106 process, which consists of four steps: (1) initiation of the Section 106 process; (2) identification and evaluation of historic properties; (3) assessment of the effects of an undertaking on historic properties; and (4) resolving adverse effects. An historic property is defined as any prehistoric or historic site, object, structure, building, or district included in, or eligible for inclusion on the National Register of Historic Places (NRHP).

Criteria for determining whether a property is eligible for listing on the NRHP are set forth in federal regulation 36 CFR Part 60, and are used to evaluate the significance of historic properties. To qualify for listing in the NRHP, a property must possess integrity of location, design, setting, materials, workmanship, feeling, association, and meet one of the following criteria:

- Criterion A: association with events that have made a significant contribution to the broad patterns of history; or
- Criterion B: association with the lives of persons significant in our past; or
- Criterion C: embodiment of the distinctive characteristics of a type, period, or method of construction, or representation of the work of a master, or possession of high artistic values, or representation of a significant and distinguishable entity whose components may lack individual distinction; or
- Criterion D: the ability to yield information important in prehistory or history (U.S. Department of the Interior 1997: 2).

Section 4(f)

The Section 4(f) legislation as established under the Department of Transportation Act of 1966 (49 USC 303, 23 USC 138) provides protection for publicly owned parks, recreation areas, historic sites (regardless of ownership), wildlife and/or waterfowl refuges from conversion to a transportation use. Section 4(f) is addressed in Section 4.11 of this EA.

State Regulations

In addition to federal legislation, the undertaking must also comply with applicable state laws including the Minnesota Historic Sites Act (Chapter 138); Minnesota Field Archaeology Act (Chapter 138); Minnesota Private Cemeteries Act (MS 307.08); Wisconsin Historical Societies and Historical Preservation (Chapter 44) and Wisconsin Burial Sites Preservation (Wisconsin Statutes Section 157.70).

Minnesota Rules Chapter 4410.3900 (Environmental Review Program) states that when a joint federal and state environmental document is being prepared, governmental agencies shall, to the fullest extent, avoid duplication between Minnesota Statutes and federal requirements. Therefore, for the purposes of this EA, the federal Section 106 process, described below, is being conducted to meet requirements set forth by Minnesota Statute Chapter 138 and the Field Archaeology Act.

Consultation

FRA has initiated consultation with Federally recognized Native American tribes. See FRA correspondence sent December 20, 2011, in Appendix I-1. Responding tribes have expressed no concerns.

MNDOT and the FRA have also initiated consultation with the Minnesota SHPO and the Wisconsin SHPO to begin the project, to review the Area of Potential Effect (APE) for the project, and to discuss survey and evaluation of historic properties within the APE. See correspondence in Appendix H.

Affected Environment

Literature Review

A cultural resources literature review was conducted in fall 2009 to inform the alternatives evaluation process described in Chapter 3. This effort reviewed the historic property inventories maintained by the Minnesota and Wisconsin SHPOs of previously recorded archaeological sites and architecture history properties within 0.25 miles of the route alternatives. The review includes properties that are listed on the NRHP, as well as others that have been inventoried but not evaluated. In addition, the study examined the railroad lines in the various corridors and determined that of eight railroad corridors, three were found to be previously determined eligible for listing on the NRHP and the remaining five were recommended as potentially eligible and thus would require Phase II evaluation if included in a later study.

The literature review concluded that Route 9 (Build Alternative) had the least number of potential impacts to known archaeological sites of the various routes examined. However, it was recognized that because this review only identified known historic properties, further survey work would be required to identify all potential cultural resources. The literature review provided total numbers of known properties, which was useful information for subsequent study activities.

Area of Potential Effect

For this EA, MnDOT, in cooperation with FRA developed an Area of Potential Effect (APE) for the Build Alternative, taking into account comments from MnSHPO and WisSHPO. See Appendix I-1. The APE was drawn to include an area that encompasses potential physical, auditory, atmospheric and visual impacts to historic properties. Project activities considered in developing the APE included the following:

- New track parallel to existing rack;
- New bridge associated with new parallel track;
- Replacing an existing bridge/underpass;
- Improving/upgrading an existing bridge;
- Using an existing alignment; and
- Operation of the line.

For archaeology, the APE includes all areas of proposed construction activities or other potential ground disturbing activities associated with the project. For construction of the railroad corridor itself, it is assumed that the construction footprint would not extend beyond the existing railroad right of way. Location of borrow areas or other storage/laydown areas outside the construction footprint are not known and would be evaluated in Tier 2 environmental reviews.

For architectural history properties, the APE may need to be adjusted based on the potential effect from the project, whether it is physical, auditory, atmospheric, or visual. In general, the APE is 500 feet either side of new or existing track. For areas with new bridge construction, the APE would expand to 0.25 mile around the proposed project area to account for effects from vibrations and potential visual effects. The APE for other new construction and station areas may require additional survey, and would be determined in later Tier 2 environmental documents. See Appendix I-1 for SHPO concurrence correspondence.

Current Status

Approximately 1,800 properties from Minneapolis to Duluth, including properties in Wisconsin, have received Phase I architectural history survey within the APE. Identification of properties that meet eligibility requirements and criterion for NRHP consideration, as described above, is in process. Review of those properties is ongoing and consultation is underway with the MnSHPO and WisSHPO for concurrence on NRHP-eligibility.

Phase IA Archaeological analysis has been completed. The Phase IA Archaeology was focused on the existing rail corridor, which has been previously disturbed. Reporting and consultation with the MnSHPO and WisSHPO is underway.

Impacts

No Build

The No Build Alternative would result in no impacts to cultural resources.

Build Alternative

Eligible properties and impacts will be identified in Tier 2 Project Level environmental studies. At that point, assessment of effects on historic properties would be carried out, and all efforts would be made to avoid, minimize and mitigate any adverse effects.

As noted above, survey and evaluation of properties in the proposed NLX corridor is in process and consultation is continuing with the MnSHPO and WisSHPO to identify properties that are potentially eligible for the NRHP. Once MnDOT, in coordination with FRA, has determined eligible properties and consulted with the SHPOs, further engineering and design must be completed before assessment of effects can be conducted. Because of the time frames required for this EA, MnDOT, in coordination with FRA, MnSHPO, and WisSHPO has developed a Programmatic Agreement (PA) to guide the Section 106 process going forward (see draft PA in Appendix I-1).

The PA establishes procedures for carrying out the Section 106 process, and includes stipulations that address the following: roles and responsibilities of signatories to the PA; consultation with Native American tribes, other consulting parties, and the public; identification and evaluation of historic properties; assessment of adverse effects; treatment of historic properties; changes in size or location of project areas; unanticipated adverse effects; treatment of human remains. As a procedural PA, the document does not identify specific properties within the corridor since consultation is ongoing with the SHPOs. MnDOT will carry out a cultural resources survey in accordance with the procedures established in the PA (draft attached to this EA). The cultural resources survey will be completed as part of Tier 2 project level work for the project. MnDOT anticipates that there would be a Tier 2 cultural resources study for the corridor as a whole, as well as site specific Tier 2 studies for locations such as stations or bridge replacements.

Avoidance, Minimization, and/or Mitigation Measures

The Tier 2 project level cultural resource studies will identify eligible properties and evaluate them for potential project impacts. Avoidance, minimization and/or mitigation measures for cultural resources would be determined and memoranda of agreement (MOAs) developed to resolve adverse effects.

4.10 Farmland and Soils

Affected Environment

Agricultural areas are located outside of urban areas, particularly in the south half of the length of corridor. An estimated half of the 34 private crossings affected by the proposed project are accesses to farmsteads or fields.

General soil types throughout the corridor include sand, loam, muck and clay. Between Hinckley and Sandstone there is an area of soft, compressive soils that has caused problems with settlement and repeated maintenance to adjust the track bed and rail alignment.

Impacts

No Build Alternative

The No Build Alternative would not impact farm land, farm operations or soils.

Build Alternative

Farmland

Potential impacts to farmland were assessed for the areas within the assumed project construction limits. Prime Farmland and Farmland of Statewide Importance were calculated based on Natural Resource Conservation Services (NRCS) soil types. All areas within the construction limits were included, though portions of the construction limits are currently being used for railroad purposes, and are not considered farmable. Table 4.28 provides the acres of potential impacts. Per the NRCS, complete soil data is not available for Pine County; therefore, it was excluded from the table. However, based on cover type in the Pine County portion of the corridor, it is reasonable to assume that approximately 10 to 15 acres of farmland would be affected in Pine County.

Table 4.28. Farmland Impacts*

County	Prime Farmland (acres)	Prime Farmland if Drained (acres)	Farmland of Statewide Importance (acres)
Hennepin, MN	0	0	0
Anoka, MN	0	0.3	1.7
Isanti, MN	14.0	8.3	34.0
Kanabec, MN	3.1	1.5	14.6
Pine, MN	N/A	N/A	N/A
Carlton, MN	0	0	0.6
Douglas, WI	0	0	7.0
St. Louis, MN	0	0	0
*Based on Level 2 functional analysis assumed improvements			

It is estimated that 30 to 40 percent of private at-grade crossings would need to be closed. Many of these would be farm properties. Alternative access would be provided where feasible; this

may result in more circuitous travel to access farmsteads or fields. Where alternative access is not feasible, property would be acquired.

Soils

The potential for erosion impacts is described in Section 4.5.

Proposed project improvements in the length of soft, compressive soils between Nickerson and Foxboro may require construction of a land bridge, which would be constructed from the in-place track and may include driving piling to provide a foundation, placement of precast pier caps, and concrete box girders. This may require some excavation to provide room for the pier caps and box girders. This construction activity is not expected to result in impacts not otherwise addressed in this EA.

Layover and Maintenance

The layover and maintenance facilities would be located in developed communities. No farmland or soil impacts are anticipated.

Stations

Stations would be located in developed communities. No farmland or soil impacts are anticipated.

Avoidance, Minimization, and/or Mitigation Measures

Opportunities to further minimize construction impacts, including impacts to farmland and soils, would continue through final design.

Farmland

The Federal Farmland Protection and Policy Act (FPPA) of 198, the Minnesota Agricultural Land Preservation and Conservation Policy Act (MS 17.80-17.84), and the WI State Statute 32.035) have been enacted to ensure that impacts on agricultural lands and operations are integrated into the decision-making process, and that impacts upon agricultural land are minimized to a reasonable extent.

At the time of project level environmental review under NEPA, the project team would consult with NRCS offices to provide assistance with the completion of the AD 1006 form (the Federal Farmland Conversion Impact Rating form used for proposed conversions of farmland to non-agricultural uses) which would inform the need for additional attention to avoidance and minimization. In addition, the project team would consult with the Wisconsin Department of

Trade, Agriculture and Consumer Protection (WDATCP) regarding the need for an Agricultural Impact Statement.[31]

Where private at-grade crossings that provide access to farmland are closed due to the proposed project, alternate access to the farmland would be provided.

Soils

Measures to avoid/minimize impacts due to erosion are described in Section 4.5. Any excavated material from land bridge construction would be hauled off site and properly disposed of at appropriate borrow sites.

[31] Note that the reported acres of impact to Farmland of Statewide Importance in Wisconsin (7 acres) reported in Table 4.28 reflects several landowners, includes substantial portions that are actually in rail yard use, and reflects a worst-case footprint, therefore it is unlikely that the impacts will require the preparation of an AIS, though the WDATCP may choose to do so.

4.11 Section 4(f)/6(f): Parks, Recreation Areas, Historic Sites, and Wildlife or Waterfowl Refuges

Affected Environment

Section 4(f)

The Section 4(f) legislation as established under the Department of Transportation Act of 1966 (49 USC 303, 23 USC 138) provides protection for publicly owned parks, recreation areas, historic sites eligible for or listed on the National Register of Historic Places(regardless of ownership), wildlife and/or waterfowl refuges from conversion to a transportation use. As an Agency within the U.S. Department of Transportation (USDOT), the FRA may not approve the use of land from a significant publicly owned park, recreation area, or wildlife and waterfowl refuge, or any significant historic site unless a determination is made that:

- There is no feasible and prudent alternative to the use of the land from the property; and
- The action includes all possible planning to minimize harm to the property resulting from such use.

Section 6(f)

Protection is provided for outdoor recreational lands under the Section 6(f) legislation (16 USC 4602-8(f)(3)) where Land and Water Conservation (LAWCON) funds were used for the planning, acquisition or development of the property. These properties may be converted to a non-outdoor recreational use only if replacement land of at least the same fair market value and reasonable equivalent usefulness and location is assured.

Parks and Local Trails

Numerous designated parks, recreation areas, and trails are located adjacent to the proposed NLX project corridor. Table 4.29 lists park and local trail resources adjacent to the existing BNSF corridor between Minneapolis and Duluth and indicates whether the resource is subject to Section 4(f) and/or 6(f). Park and trail resources are also described below.

West River Parkway is located on the west bank of the Mississippi River. The proposed NLX corridor passes over the Parkway before crossing Nicollet Island. The parkway, which follows the river from Plymouth Avenue in downtown Minneapolis to Minnehaha Park, has a biking path, a walking path, picnic area, and restroom facilities. Subject to Section 4(f).

Nicollet Island Park covers an area of nearly 27 acres and is located within the Mississippi River east of downtown Minneapolis. The lower end of the island offers a view of the 1858 horseshoe-shaped dam, the first dam on the Mississippi River. The upper end of the island has a 19th century residential district. Additional park features include the Nicollet Island Pavilion, an amphitheater, walking and biking paths, and a picnic area. Subject to Section 4(f).

Table 4.29. Park, Trail and Recreational Resources Adjacent to the NLX Corridor

Name	Location				Subject to:	
	City	County	State	Side of Track	4(f)	6(f)[1]
West River Parkway (under the track)	Minneapolis	Hennepin	MN	Both	X	
Nicollet Island Park	Minneapolis	Hennepin	MN	Both	X	
Mississippi River and National Recreation Area Overlay District	Multiple	Hennepin	MN	Both	N/A overlay	
Edgewater Gardens Park	Fridley	Anoka	MN	West	X	
Lake Park	Fridley	Anoka	MN	West	X	
Rice Creek Regional Trail West	Fridley	Anoka	MN	Both	X	
Plaza Park	Fridley	Anoka	MN	East	X	
Fridley Community Park	Fridley	Anoka	MN	East	X	X
Springbrook Nature Center	Fridley	Anoka	MN	East	X	X
Erlandson Park	Coon Rapids	Anoka	MN	West	X	X
Sand Creek Athletic Field	Coon Rapids	Anoka	MN	East	X	
Sand Creek Trail	Coon Rapids	Anoka	MN	Both	X	
Sand Creek Elementary	Coon Rapids	Anoka	MN	East	X	
Wilderness Park	Coon Rapids	Anoka	MN	West	X	
Bunker Hills Regional Park and Bunker Hills Golf Course	Andover	Anoka	MN	Both	X	X
Coon Creek Park	Andover	Anoka	MN	West	X	
Andover Lions Park	Andover	Anoka	MN	East	X	
Forest Meadows Park	Andover	Anoka	MN	West	X	
Robert & Marilyn Burman Wildlife Management Area	Rural	Anoka	MN	Both	X	
Shade Tree Commons Park	Oak Park	Anoka	MN	East	X	
Bluebird Park	Isanti	Isanti	MN	West	X	
Freedom Park	Braham	Isanti	MN	West	X	
Memorial Park ("The Pit")	Hinckley	Pine	MN	East	X	X
Train Park	Sandstone	Pine	MN	East	X	
Main Park	Sandstone	Pine	MN	East	Potential[32]	
Banning State Park	Rural	Pine	MN	Both	X	X
D.A.R. State Forest	Rural	Pine	MN	Both	X	X[2]
Nemadji State Forest (private land within State Forest)	Rural	Pine and Carlton	MN	Both	N/A	
18th & Oakes Park	Superior	Douglas	WI	East	X	
Bayfront Festival Park	Duluth	St. Louis	MN	East	X	

[1] Per Minnesota Department of Natural Resources list of LAWCON resources (as of February 2013)
[2] The D.A.R. State Forest campground is a LAWCON property.

[32] Section 4(f) applies to parks that are publicly owned. Approximately one-third of the park area is on City-owned right of way and approximately two-thirds of the park area is on property that is owned by BNSF and used by the City of Sandstone under the terms of an annually-renewed lease with BNSF. Typically, non-public land that is leased by a governmental entity for recreation use is subject to Section 4(f) if the lease is in perpetuity; the duration of the lease arrangement would be considered in Section 4(f) applicability should there be direct impact to the park property. The proposed project does not propose improvements adjacent to or directly affecting Main Park.

Mississippi River and National Recreation Area (MNRRA) overlay district, located east of downtown Minneapolis, covers a 72 mile stretch of the river from just south of Hastings to the Cities of Dayton and Ramsey. In contrast to other national park sites, MNRRA is not a major land owner. To achieve its mission, MNRRA works with local, state, and federal governments, non-profits, businesses, educational institutions, and private landowners along the river. Section 4(f) applies to parks within the MNRRA district that are publicly owned. As an overlay district, MNRRA itself does not convey Section 4(f) protection to private lands within MNRRA.

Edgewater Gardens Park is situated along the west side of the existing track north of Mississippi Street NE in Fridley. The park has a tennis court and parking area. The Mississippi River Regional Trail on the eastern edge of Edgewater Gardens Park is accessible from this location. Subject to Section 4(f).

Lake Park is located immediately south of Locke Lake and west of the railroad tracks (per *City of Fridley Park System Guide*). The one-half acre park, located at 6625 Ashton Avenue, has a trail. Note that the city's list of park facilities refers to this resource as "Locke Lake." Subject to Section 4(f).

Rice Creek Regional Trail West crosses under the existing track between Locke Lake and Plaza Park in Fridley. The trail travels eastward along Rice Creek through Locke County Park. Rice Creek Regional Trail West connects to the Mississippi River Regional Trail west of the existing track. Subject to Section 4(f).

Plaza Park, located east of the existing track and north of Locke Lake in Fridley, has a basketball court and playground. Rice Creek Regional Trail (West) runs along the western portion of the park. Subject to Section 4(f).

Fridley Community Park, east of the track, is accessible from University Service Road NE between Mississippi Street NE and 73rd Avenue in the City of Fridley. The park has a playground, six lighted softball fields, and parking facilities. Subject to Section 4(f).

Springbrook Nature Center, east of the existing track and south of 85th Avenue NW, is currently the largest and most widely used park in Fridley. With a total of 127 acres, the park amenities include an interpretive center, more than three miles of hiking trails, picnic shelter, amphitheater, a wetland boardwalk, and wildlife overlooks. LAWCON funds were used to purchase 124 acres of Springbrook Nature Center. Subject to Section 4(f) and Section 6(f).

Erlandson Park, west of the existing track and north of Egret Boulevard NW in Coon Rapids, encompasses a five-acre wooded area. Park amenities include Coon Creek, a picnic area, trail loop, and small arboretum adjacent to the parking lot at the entrance of the park. It is also known as Erlandson Nature Center. Erlandson Park used LAWCON funds. Subject to Section 4(f) and Section 6(f).

Sand Creek Athletic Field, east of the existing track and adjacent to Northdale Boulevard in Coon Rapids, has multiple playing fields including a football field very near the park's western boundary. The 50-acre park features six regulation softball fields, skate park, four artificial turf

tennis courts, basketball courts, two full-size hockey rinks and warming house. The park also has two lighted football fields used primarily for the City of Coon Rapids' fall youth football program and summer youth soccer program. The park is also the site of the annual 4th of July celebration. Subject to Section 4(f).

Sand Creek Trail in Coon Rapids connects the Coon Creek Regional Trail within Bunker Hills Regional Park. The trail passes beneath the existing track north of Northdale Boulevard NW. LAWCON funds were used for the development of the trail. Subject to Section 4(f).

Sand Creek Elementary, east of the existing track and south of Main Street NW in Coon Rapids, provides open space. Subject to Section 4(f).

Wilderness Park, west of the existing track and north of 121st Avenue NW in Coon Rapids, consists of an undeveloped wooded area. Subject to Section 4(f).

Bunker Hills Regional Park, located on both sides of the track between Main Street NW and Bunker Lake Boulevard NW in Andover. The 1,600-acre park offers a wide range of recreation opportunities including swimming and water slides, horseback riding, biking, hiking, camping, archery, picnicking, and cross-country skiing. Park amenities include Bunker Park Stables, Bunker Beach Water Park, and a playground. LAWCON funds were for the development of Bunker Hills Regional Park. Bunker Hills Golf Course, east of the existing track between Main Street NW and Bunker Lake Boulevard NW, is a public 27-hole golf course. Subject to Section 4(f) and Section 6(f).

Andover Lions Park has a ball diamond, playground equipment, and a parking lot at its most southern portion. A north/south paved trail runs along the western boundary of the park and connects to a trail that runs through Coon Creek Park, located west of the existing track. The trail terminates at the 142 Avenue NW cul de sac. The remainder of the park is undeveloped. Subject to Section 4(f).

Coon Creek Park borders the north and south banks of Coon Creek from the existing track westward to Hanson Boulevard NW in Andover. A paved trail runs along the northern edge of the park and passes under the railroad tracks just north of the creek. Subject to Section 4(f).

Forest Meadows Park is located south of 179th Avenue NW in northeastern Andover. This 6.7 acre park is mostly undeveloped. Subject to Section 4(f).

Robert and Marilyn Burman Wildlife Management Area (WMA) is located in northern Anoka County and west of the existing track. The 204 acre WMA consists of upland hardwoods, open fields oak savanna, and lowland shrub swamp and offers hunting and wildlife viewing opportunities for many different species. Cedar Creek runs through the WMA. Subject to Section 4(f).

Shade Tree Commons Park is located west of Goldenrod Street in Oak Park. The two acre park has a playground and parking area. Subject to Section 4(f).

Bluebird Park, located west of the existing track at 201 Isanti Parkway West in Isanti, is being developed as a regional park with a variety of recreational facilities. The 73 acre park features a Bicycle Motocross (BMX) facility, picnic tables and picnic tables, nine soccer fields, a baseball diamond, skate park, outdoor hockey and skating facility, playground, and trail system. Planned facilities include additional picnic areas and baseball fields, a warming house, and tennis and basketball courts. Subject to Section 4(f).

Rose Memorial Park is located on state-owned land approximately 200 feet west of the existing tracks, across Highway 107 (Main Street), in the City of Braham. It is maintained by the Braham Community Garden Club as a flower garden. Subject to Section 4(f).

Freedom Park, located west of existing track between the track and Main Street, is the site of the annual Pie Day Festival in Braham. The 1.4 acre park has a picnic shelter, veterans' memorial, and a band shell. Subject to Section 4(f).

Memorial Park ("The Pit") is situated east of the existing track and south of Main Street near downtown Hinckley. The park is the site where many Hinckley residents successfully took refuge from the Great Hinckley Fire in September 1894. The former gravel pit, dug by the Eastern Minnesota Railroad for materials used in the construction of the train track, has been filled and a park created in its former location. LAWCON funds were used for the development of Memorial Park. Subject to Section 4(f) and Section 6(f).

Train Park (also called Railroad Park) is located between Main Street and the east side of the existing track in the City of Sandstone. BNSF track charts indicate that the railroad right of way has a width of 150 feet at this location. Subject to Section 4(f).

Main Park is located east of the existing track and northwest of Angie Avenue in the City of Sandstone. Facilities include a skate board park, skating rink with warming house, and a gravel parking area. Approximately two-thirds of the park is owned by BNSF and used by the City of Sandstone under the terms of an annually-renewed lease with BNSF. The duration of the lease arrangement would be in considered in determining Section 4(f) applicability should there be direct impact to the park property. The remainder of the park is City property.

Banning State Park is located east of Sandstone and adjacent to the Kettle River in Pine County. The proposed project corridor passes directly through the southern portion of the park and crosses the Kettle River via the Great Northern Railroad Bridge. Banning State Park provides opportunities for hiking, camping, picnicking, and cross-country skiing. The rapids within the park are popular with kayak and canoe enthusiasts. The park is the location of the Kettle River Paddle Fest, an annual event held in the spring with activities for white water and flat water paddlers. LAWCON funds were designated for the development of Banning State Park. Subject to Section 4(f) and Section 6(f).

The Kettle River, part of Minnesota's wild and scenic rivers system, flows through Banning State Park. The river is classified as *scenic* from the Carlton-Pine county line downstream to the former Kettle River dam site at Sandstone. (The dam was removed in 1995.) The river

is classified as *wild* from the former dam site downstream to its confluence with the St. Croix River.

D.A.R. State Forest is located along Highway 23 east of Banning State Park. The existing track passes through the 643 acre state forest. The park, named after the Daughters of the American Revolution, has no designated trail system within its boundaries. LAWCON funds were used for the development of this state forest. Subject to Section 4(f) and Section 6(f).

Jackie Berger Memorial Park, including ballfield and ice rink, is located in the unincorporated community of Duquette approximately 500 feet west of the existing tracks. Subject to Section 4(f).

Unnamed Park including play equipment and green space is approximately 500 feet east of the tracks in the City of Askov. Subject to Section 4(f).

Nemadji State Forest is located in northeastern Pine and southeastern Carlton counties. The 92,924 acre forest provides opportunities for camping, hiking, picnicking, fishing, and all-terrain vehicle (ATV) and off-highway motorcycle (OHM) use. The project corridor passes through a small area of private land within the forest boundary. The private land is not subject to Section 4(f) or Section 6(f).

18th & Oakes Park is a small (1.4 acres) mini-park located at 1725 Oakes Avenue in Superior, WI. This facility serves the neighborhood south of Belknap Street and west of Tower Avenue. The park provides playground access to children primarily west of Tower Avenue. Amenities include basketball courts, a playground area, a picnic area, a shelter, and restrooms. The park also offers summer programs. Subject to Section 4(f).

Bayfront Festival Park, along the shore of Lake Superior in Duluth, is situated east of the tracks near the northern terminus of the NLX passenger rail corridor. The park hosts a variety of events and festivals throughout the year. Park facilities include a playground, ice skating rink (in winter), and the Lois Paulucci Music Pavilion, which is used primarily for large music festivals. Subject to Section 4(f).

National Wildlife Refuge

The Rice Lake and Mille Lacs National Wildlife Refuge – Sandstone Unit is located in Pine County southeast of the City of Sandstone. At its closest, the Unit is two miles east of the proposed NLX corridor, where freight siding construction is planned. Refuge staff have reviewed project information, including description of proposed improvements for the entire corridor and highlighting the proposed freight siding locating, and advised the opinion that the project as currently defined would have no impact to the Refuge Unit.

State and National Trails

Two state-owned recreational trails run through and/or adjacent to the project corridor in Wisconsin. The Gandy Dancer Trail is a 98-mile interstate trail that crosses into Minnesota and

then back into Wisconsin on its way from St. Croix Falls to its connection with the Saunders State Trail south of Superior. The trail provides opportunities for ATV riding, snowmobiling, hiking, mountain biking, and horseback riding. The Gandy Dancer Trail crosses the proposed corridor near Dedham via South Reed Merrill Road. In this location, the trail occupies highway right of way. In this circumstance, a "use" of land (as defined under Section 4(f), i.e. conversion of park to transportation use) would not occur as the highway is already a transportation use. Therefore Section 4(f) does not apply.

The Saunders State Trail runs along the west side of the proposed project corridor near Boylston Junction. The 8.4 mile trail begins near the town of Saunders and passes through the communities of Boylston Junction, Boylston, and Borea before continuing into Minnesota. The Saunders State Trail provides opportunities for ATV riding, horseback riding, mountain biking, and cross-country skiing. The trail does not abut or cross the proposed NLX project corridor.

The Soo Trail is located in Douglas County and parallels the corridor for a short distance in Superior, WI. The Soo Trail is identified as a summer-use ATV trail.

Planned Trails

Several other trails are planned within or near the proposed project corridor. According to the City of Superior Parks and Recreation System Composite Map, the corridor crosses several locations in Superior, Wisconsin where non-motorized trails are planned. In addition, a non-motorized trail connection is planned between the northern terminus of the Willard Munger State Trail and Canal Park and the Lakewalk in Duluth. However, these crossings would need to occur regardless of the proposed project.

The proposed NLX project corridor is adjacent to a proposed segment of the North Country National Scenic Trail, located in Wisconsin. The North Country Scenic Trail is largely built and maintained by volunteers of National Scenic Trail Association and is managed by the National Park Service (NPS).When completed, the 4,600 mile North Country Scenic Trail will be the longest continuous hiking trail in the United States. The portion of the future trail segment located south of Boylston would likely require a crossing of the proposed corridor.

Historic Sites

As described in Section 4.9, cultural resources studies and consultations are underway to establish NRHP-eligible properties in the area of potential affect (APE). This effort will be completed as part of the Tier 2 environmental documentation for the project.

Impacts

No Build Alternative

The No Build Alternative would have no impacts to existing Section 4(f) resources.

Construction of a grade separated trail crossing for the future trail segment of the North Country National Scenic Trail would be necessary with or without the proposed NLX passenger rail project, as the trail would cross the existing BNSF track. Because this segment of the trail is still under development, there are opportunities to minimize impacts through design measures.

Build Alternative

Parks, Wildlife Refuges, and Trails

Areas of new track (dedicated parallel track or siding construction) abut the following parks:

- Bunker Hills Regional Park in Andover (siding)
- Andover Lions Park in Andover (siding)
- Coon Creek Park in Andover (siding)
- Blue Bird Park (dedicated parallel track)
- Freedom Park (dedicated parallel track)
- D.A.R. State Forest (siding)

For each of these parks, the proposed NLX improvements would be within existing railroad right of way, and require no acquisition of park property. Of particular note, and as described in Chapter 3, Section 4.1 and Chapter 5, detailed refinements to the assumed concept-level cross section and alignment were developed for a short segment of the corridor through the City of Braham (MP 97.0 to MP 95.9) in order to avoid direct impacts to Freedom Park (as well as impacts to businesses and a residence in the community). These refinements include gradual curves introduced to allow for reduction in spacing between tracks as well as elimination of ditch drainage in the cross-section (the trackbed would drain as it does under existing conditions) in order to minimize the construction footprint. See Appendix E.

As noted, a freight siding is proposed where the existing rail corridor bisects the D.A.R. State Forest. During preliminary engineering, avoidance of impacts outside of the existing right of way would be confirmed.

No other parks are located immediately adjacent to or within the proposed project construction limits. As noted above, the Rice Lake National Wildlife Refuge – Sandstone Unit is located two miles east of the NLX corridor. 18th Street & Oakes Park in Superior is located approximately 300 feet from the construction limits.

There are no permanent impacts to any existing trails. There may be temporary closure of the Rice Creek Regional Trail, Coon Creek Trail and Sand Creek Trail where they cross under the track during track rehabilitation activities but this would be of limited duration.

A number of parks are adjacent to the existing tracks that would be rehabilitated; however, as all work would be done from the tracks, construction impacts such as noise, dust and visual, should be limited and brief in duration.

The existing railroad bridge over the Kettle River in Banning State Park would be rehabilitated as part of the proposed project. This work would require no right of way acquisition. The nature of the bridge rehabilitation work is described in Appendix D; impacts to the recreational use of the park are not anticipated.

Urbanized areas of the corridor, including portions adjacent to parks, would be fenced for safety.

As described in Section 4.7, without mitigation, severe noise impacts occur at a number of parks along the corridor. These include Freedom Park in Braham, Train (Railroad) Park in Sandstone, and Banning State Park, just east of Sandstone and Jackie Berger Memorial Park in Duquette. Section 4.7 also identifies that, without mitigation, moderate noise impacts occur at Rose Memorial Garden in Braham and an Unnamed Park in Askov.

Historic Sites

Eligible properties and impacts will be identified in Tier 2 project level environmental studies. At that point, assessment of effects on historic properties would be carried out, and all efforts would be made to avoid, minimize and mitigate any adverse effect.

A PA (see draft in Appendix I-1) will guide the Section 106 process going forward and provide direction for carrying out cultural resources survey, evaluation and assessment of effects as part of Tier 2 project level work. The PA addresses the following: roles and responsibilities of signatories to the PA; consultation with Native American tribes, other consulting parties and the public; identification and evaluation of historic properties; assessment of adverse effects; treatment of historic properties; changes in size or location of project areas; unanticipated adverse effects; and treatment of human remains. Avoidance, minimization and/or mitigation measures for cultural resources would be determined and memoranda of agreement (MOAs) developed to resolve adverse effects under the Section 106 process.

Layover and Maintenance

As noted the location of the layover facility in Minneapolis is not yet known. The potential for impacts to parks or trails would be assessed in future environmental documentation. Layover and maintenance activities in Duluth would not impact any parks or trails.

Stations

The proposed passenger rail phase of the Interchange site in downtown Minneapolis would not impact any existing parks or trails. Planning for the Interchange site has been done cooperatively with the planning for the future extension of the Cedar Lake Trail. Previous environmental documentation for the Foley Station identifies no impacts to parks or trails. The improvements at the Duluth Depot would not impact parks or trails.

Potential station sites identified in Cambridge would affect no park sites. Preliminary station planning identified Memorial Park (a Section 4[f] and Section 6[f] resource) as one of two potential station sites in Hinckley, and noted that both sites should be studied further. The

potential station site at Superior would not impact any parks or trails. The impacts on parkland of stations in these communities, including any necessary Section 4(f)/6(f) evaluations, would be evaluated in separate environmental documentation.

Constructive Use

Constructive use of land occurs in those situations where, including mitigation, the proximity impacts of a project on the Section 4(f) property are so severe that the activities, features or attributes that qualify the property or resource for protection under Section 4(f) are substantially impaired. Substantial impairment occurs when the activities, features or attributes of the 4(f) property are substantially diminished (23 CFR 771.135(p)(2)), which means that the value of the resource in terms of its Section 4(f) significance will be meaningfully reduced or lost.

Table 4.30 below compares such uses as defined in 23 CFR 774.15 with the impacts of the project (including mitigation) on Section 4(f) properties in the proposed project area (excluding historic properties which have not yet been identified; see Section 4.9 and Appendix I-1 for additional information). Based on this comparison, the proposed project results in no Section 4(f) constructive use.

Avoidance, Minimization and/or Mitigation Measures

As described above, the assumed project footprint results in no direct impacts to Section 4(f) or Section 6(f) park properties and the indirect operational noise impacts and construction impacts do not result in constructive use under Section 4(f). If subsequent project refinement reveals the potential for use of any park properties subject to Section 4(f) or Section 6(f) resources, an evaluation that further considers avoidance alternatives, as well as measures to minimize harm, would be prepared.

Temporary noise, visual, and dust impacts to parks during construction would be minimized through compliance with local ordinances applicable to construction activities.

Measures would be implemented to minimize harm due to temporary closure of trails during construction including posting of trail closure signs and working closely with park officials to ensure timely public information regarding closures.

As described in Section 4.7, the implementation of quiet zones in communities impacted by noise reduces noise levels such that only the severe impact to Freedom Park remains. Section 4.7 describes the additional mitigation measures for noise impacts that would be further investigated in subsequent phases of the proposed project.

Also as previously discussed, avoidance, minimization and/or mitigation measures for impacts to historic sites constituting use (including constructive use) under Section 4(f) would be carried out when eligible properties have been determined and project impacts are known. Identification of eligible properties would be completed in time for all measures to avoid, minimize and mitigation effects on those properties to be taken. If impacts constituting use under Section 4(f)

are identified, a Section 4(f) evaluation will be prepared as part of the Tier 2 environmental documentation for the project.

Table 4.30. Comparison of 23 CRF 774.15 Constructive Use Examples and NLX Impacts to Parks

23 CRF 774.15 Constructive Use Examples	NLX Impacts to Parks
The projected noise level increase attributable to a proposed project substantially interferes with the use and enjoyment of a resource protected by Section 4(f), such as hearing a performance at an outdoor amphitheater, enjoyment of a historic site where a quiet setting is a generally recognized feature of the site, or enjoyment of an urban park where serenity and quiet are significant attributes.	Project results in a severe noise impact to Freedom Park in Braham. This is a worst case impact; refined noise study would be done during preliminary engineering. Potentially applicable noise mitigation measures include noise barriers and vehicle noise specifications. (Assumes quiet zones implemented in all communities with noise impacts.) Noise impacts would not substantially interfere with the use and enjoyment of the resource. Serenity and quiet are not significant attributes of Freedom Park which is situated in between an existing track that carries 12 freight trains a day and a state highway that carries 5,200 vehicles per day.
The proximity of a proposed project substantially impairs aesthetic features or attributes of a resource protected by Section 4(f), where such features or attributes are considered important contributing elements to the value of the resource. An example of substantial impairment to visual or aesthetic qualities would be the location of a proposed transportation facility in such proximity that it obstructs or eliminates the primary views of an architecturally significant historical building, or detracts from the setting of a park or historic site which derives its value in substantial part from its setting.	The proposed project would not alter the general visual character of nearby parks, athletic fields, wildlife management areas or state forests.
A proposed project results in a restriction of access to the Section 4(f) property, which substantially diminishes or eliminates the utility of the resource.	The proposed project does not restrict access to any Section 4(f) parks, athletic fields, wildlife management area, or state forests. Potential temporary closures of the Rice Creek Regional Trail, Coon Creek Trail, and Sand Creek Trail during existing track rehabilitation would not substantially diminish or eliminate the utility of the resources because such closures would be of limited duration and measures to minimize harm (signage and agency coordination for public information) would be implemented.
The vibration impact from operation of a proposed project would substantially impair the use of a Section 4(f) property, such as a projected vibration level that is great enough to affect the structural integrity of a historic building or substantially diminish the utility of a historic building.	The project results in no vibration impacts to any Section 4(f) parks, athletic fields, wildlife management areas, or state forests.
The ecological intrusion of a proposed project substantially diminishes the value of wildlife habitat in a wildlife or waterfowl refuge adjacent to a proposed project or substantially interferes with the access to a wildlife or waterfowl refuge when such access is necessary for established wildlife migration or critical life cycle processes.	The project does not intrude into any wildlife or waterfowl refuge nor does it interfere with access to any wildlife or waterfowl refuge.

4.12 Visual Impacts

Affected Environment

Visual impacts are changes to the existing visual environment that may occur as the result of the proposed project. These changes may detract from the visual environment or enhance it.

The existing visual environment of the proposed NLX corridor includes the BNSF railroad line, adjacent roadways (e.g., TH 65, TH 107, TH 23, and I-35), rivers crossed by the corridor (e.g., Mississippi, Snake, Grindstone, Kettle, Willow, Net, and Nemadji rivers), St. Louis Bay, and the Duluth Harbor. The existing rail corridor includes tracks, bridges, culverts, crossbucks, signals, railroad-related structures and adjacent industrial uses. The cities and towns along the corridor range from urban high density in Minneapolis and Duluth-Superior to smaller low density communities such as Bethel and Askov. The visual landscape of the corridor consists of agricultural, residential, institutional, commercial, industrial, and recreational uses. Other visual elements of the corridor include wetlands, woodlots, farm buildings, water towers, strip malls, and office buildings.

A brief description of the visual character of the corridor, by defined project segment is presented below. Section 4.13 provides more detail on the relation of the individual communities to the existing railroad corridor.

Segment 1 – The proposed Interchange in downtown Minneapolis to Minneapolis Junction contains a variety of visual elements, including the high density area of downtown Minneapolis and the Mississippi River. This segment contains a mix of commercial, residential, and industrial uses.

Segment 2 – Minneapolis Junction to University Avenue has primarily industrial and commercial uses immediately adjacent to the rail corridor, with residential uses beginning within one block of the corridor.

Segment 3 – University Avenue to Coon Creek Junction is primarily industrial and contains Northtown Yard, which has heavy rail use and contains multiple tracks and spurs.

Segment 4 – Coon Creek Junction to Isanti transitions from an area of heavy rail and industrial use to more suburban and then exurban character. Density of development gradually declines over this segment.

Segment 5 – Isanti to Cambridge includes the two communities and the rural area between them.

Segment 6 – Cambridge to Hinckley is also a mix of smaller cities interspersed with areas of more rural character, including farms and forested areas. Communities within this segment include Grandy, Stanchfield, Braham, Grasston, Henriette, and Brook Park. In some of these communities, the railroad corridor is on the edge of town, separated from development by a highway, while in others the corridor travels through the center of town and is a prominent visual element in the community.

Segment 17[33] – Hinckley to Boylston contains small cities and towns as well as rural character. Areas such as Banning State Park, forested areas, and stream crossings have a more natural visual character.

Segment 18 – Boylston to Superior transitions from farmland, forested areas, and wetlands to urban character in Superior. The portion of Segment 18 in Superior is an area with several rail tracks and heavy rail use.

Segment 19 – Superior to Duluth Depot is primarily urban with industrial visual character, though commercial and residential areas also parallel portions of this segment. This portion of the corridor crosses the St. Louis River and enters downtown Duluth.

Impacts

No Build Alternative

The No Build Alternative would result in no visual impacts.

Build Alternative

The proposed project is not expected to alter the general visual character of the adjacent landscape. Expansion of the existing rail corridor is limited to the areas previously described. In areas with additional track or siding extensions, the corridor would essentially double in width, but since the corridor is currently used for freight rail, widening the corridor would not greatly alter the existing visual character of the surrounding communities. Visual impacts during construction would be temporary.

North of the Twin Cities and south of Duluth-Superior, the addition of eight roundtrip relatively short passenger trains a day to a corridor that currently carries 12 freight trains per day would be a minor visual impact; this new train activity would be even less of a visual change in the two termini metropolitan areas where the visual environment involves relatively more freight rail activity than in the more rural portions of the corridor. In the portions of the corridor where the trains would travel at high speeds, the passenger train operations may be a novelty of visual interest to observers.

Fencing is proposed in urbanized areas and where needed for safety in rural areas for the length of the corridor, which is largely unfenced at present. Chain link is assumed in developed areas and farm fencing in rural areas. Particularly within developed areas, the introduction of fencing would affect some views. In addition, fences can collect unsightly debris. Decorative fencing may be installed in selected areas.

[33] As noted in Chapter 3, the segment designations relate to the Level 1 analysis of multiple alternatives. Segments 7 through 16 are not part of the Preferred Build Alternative corridor.

Additional signals and gates at at-grade crossings would be a visual change in communities and at rural area crossings.

Minor removal of vegetation is expected throughout the corridor but is not expected to significantly change the visual character of the corridor. For example, vegetation removal is primarily adjacent to industrial areas or farm fields, or localized removal of several trees that do not form a substantial visual screen. Portions of areas within construction limits would likely revegetate over time. Removal of existing vegetation that may be perceived as a visual screening would occur in Cambridge (near MP 108.8 to 108.4) as well as in several rural areas along the corridor.

Segment 1 – Visual impacts to the area between the proposed Interchange in downtown Minneapolis to Minneapolis Junction are anticipated to be relatively minor since the additional track at the Minneapolis Junction is in an industrial area.

Segment 2 – Minneapolis Junction to University Avenue is expected to have minor visual quality impacts since this segment would mostly utilize existing track.

Segment 3 – The segment from University Avenue to Coon Creek Junction would have new track introduced, parallel railroad bridges added, and the Highway 610 overpass modified, but the project is not expected to adversely impact visual quality in this area due to the extensive freight use already present.

Segment 4 – The Coon Creek Junction to Isanti segment includes siding construction through Andover. The additional track would be within existing railroad right of way adjacent to parkland and residences and represents a minor visual change for properties directly adjacent to the corridor.

Segment 5 – Isanti to Cambridge adds new parallel track offset from the existing track up to 30 feet and connection of existing sidings. While the rail corridor is currently proximate to other uses, the new track represents a minor visual change for properties directly adjacent to the corridor.

Segment 6 – Cambridge to Hinckley would have new track offset up to 30 feet from the existing track. While the rail corridor already exists proximate to other uses, the new track, additional gates at crossings and fencing, represents a visual change for properties directly adjacent to the corridor. Communities in this segment where the corridor runs through town (rather than on the edge of town) include Stanchfield, Braham and Henriette. The proximity of development to the project improvements corridor and therefore to visual change is particularly close in Braham, where private property immediately abuts the rail corridor

New bridges over the Snake River at Grasston and over Pokegama Creek at Brook Park would also have a visual impact; however it is intended that they would be similar in design to the existing parallel bridges at these locations, minimizing negative impact on views of the river and landscape. The new box culvert over a ditch near Henriette would also have a visual impact, but again be similar in design to the existing culvert and located in an area that is not easily viewed

from developed properties or public right of way. The rehabilitation of the existing railroad bridge over Snake River would involve visual effects while the work is being done, but the visual effect of the work (deck rehab, cleaning and painting) to the permanent look of the bridge would not be negative and should be an improvement. The replacement of the wooden bridge over the tracks at 379th Street would be a visual change for road users but is in a rural area with little visual effect to adjacent properties.

Segment 17 – Hinckley to Boylston would have minor visual quality impacts in areas of siding extensions in Sandstone, Askov, Bruno, Holyoke, and Foxboro. Twelve (12) railroad bridges would be rehabilitated in this segment, which would result in visual effects similar to those discussed for the bridge over the Snake River, discussed under Segment 6 above.

Segment 18 and 19 – Boylston to Duluth Union Depot would have minor visual impacts due to the addition of track and passenger train activity, as this area where new track is added is already a busy train yard. In Superior, the new track would be to the west of the existing "coal main" track, which separates it from adjacent residential and commercial areas.

As with the other railroad bridges that require rehabilitation for the proposed NLX project, the required improvements for the Grassy Point Bridge over the St. Louis River would be detailed in preliminary and final design. The potential for visual effect is similar to the 14 other bridges in corridor proposed to be rehabilitated.

The Grassy Point Bridge is eligible for the National Register of Historic Places (NHRP). Other existing bridges that need to be rehabilitated are in the process of being assessed for NHRP-eligibility. Any properties that are NRHP-eligible are subject to review under Section 106 of the National Historic Preservation Act, as discussed in Section 4.9. A determination of effect under Section 106 would be made, including whether the proposed project would have adverse visual effects to NHRP-eligible bridges, either due to the rehabilitation activities or other construction work. Such a determination would also be made for other historic properties identified in the corridor.

Layover and Maintenance

Layover and fueling/equipment maintenance activities would be located at existing rail yards, therefore should pose no incompatible visual effects.

Stations

Moderate impacts are anticipated adjacent to the proposed stations due to the addition of station infrastructure required for the proposed NLX service at the proposed Interchange in Minneapolis (passenger rail component of facility), Foley Boulevard in Coon Rapids, and the Duluth Depot.

Visual impacts adjacent to the proposed stations in Cambridge, Hinckley, and Superior, would vary depending on location, extent of parking facilities, and infrastructure requirements such as changes in access, stormwater facilities, and utility modifications; however, they would not be inconsistent with the general visual character of the surrounding developed community settings.

Character and image are among the evaluation criteria used in the preliminary station planning in Cambridge and Hinckley. Station planning in Superior has yet to begin. The stations at Cambridge, Hinckley and Superior would be subject to separate environmental review.

Avoidance, Minimization and/or Mitigation Measures

The primary change in visual quality would be due to the introduction of fencing in developed areas. Installation of decorative fencing in visually sensitive areas would mitigate this impact, as would on-going maintenance of the corridor right of way, including maintenance related to fencing, trash, and snow removal.

4.13 Socioeconomic Impacts

Affected Environment

A description of each community along the proposed NLX project corridor (from south to north) is provided below. Year 2010 population is noted. An inventory of community facilities (e.g. government buildings, churches, schools, medical facilities, etc.) in relation to the corridor is presented in Appendix J. Parks are described in Section 4.11.

Minneapolis, MN (population 382,578)

The southern NLX corridor terminus is located in downtown Minneapolis. From the proposed passenger and commuter rail stage of the Interchange in downtown Minneapolis, the track travels eastward over the Mississippi River and across Nicollet Island before turning northward towards Fridley. Community facilities near the corridor in Minneapolis include churches, schools, community centers, libraries, and emergency services. Three churches, two school facilities, and Firefighters Hall and Museum are within one block of the existing track.

Fridley, MN (population 27,208)

The City of Fridley is located between Minneapolis and Coon Rapids. The corridor runs along existing track east of the Mississippi River near the western Fridley city limits. Major north/south routes through the city are the East River Road (County Highway 1) and University Avenue NE (Highway 47). There are three grade-separated crossings of the proposed NLX corridor in Fridley. Community facilities include numerous parks, several of which are located directly adjacent to corridor. Most other community facilities are located several blocks away from the corridor and include Unity Hospital on Osborne Road NE. The Fridley fire department, city hall, and public library are located east of the tracks and south of Mississippi Street NE. The community center is located in Community Park, between the tracks and University Avenue NE. One church is located within a block of the existing track.

Coon Rapids, MN (population 61,476)

Within Coon Rapids, the corridor is bordered by single-family housing, multi-family housing, manufactured housing, commercial and industrial property, and parkland. Creekside Estates, a mobile home community, is located at Egret Boulevard SW, just west of the existing track.

Community facilities within Coon Rapids include city hall, a police station, three fire stations, Mercy Hospital, and public libraries. The city hall, located at 11155 Robinson Drive, also houses the senior center. The police station is adjacent to the city hall. None of these facilities are proximate to the proposed corridor.

Of the public schools within the Coon Rapids city boundary, Coon Rapids High School and Coon Rapids Middle School are close to Northdale Boulevard and Hanson Boulevard, both of which cross the existing railroad tracks at-grade. Sand Creek Elementary School is east of the

corridor near 121st Avenue NW, another at-grade crossing. The only school in close proximity to the corridor is Arona Academy.

There is one mobile home park adjacent to the corridor in Coon Rapids.

A railroad siding provides access to an Anheuser Busch facility west of the tracks and several hundred feet north of US 10 in Coon Rapids.

Andover, MN (population 30,598)

The City of Andover is predominantly a residential community. Community facilities in Andover are generally located at least a mile away from the proposed corridor, with the exception of four parks adjacent to the corridor, described in Section 4.11.

Oak Grove, MN (population 8,031)

The proposed NLX corridor runs along the eastern portion of Oak Grove. The former town of Cedar, now part of Oak Grove, is located adjacent to the corridor. Approximately three blocks of residences, as well as industrial uses, are located in the area formerly known as Cedar. Lifelong Learning Center is a continuing adult education and early childhood education center located within one block of the existing track at 190th Lane NW.

Bethel, MN (population 466)

The proposed NLX corridor runs along the eastern edge of this small community. Bethel is accessed via County Road 24 on the southern edge of town and more directly by Main Street, both of which are at-grade crossings of the NLX corridor. One church is located a block away from the corridor.

Isanti, MN (population 5,251)

The City of Isanti contains an older core community with a small downtown area. Many new houses and businesses are being developed around the perimeter of the community. The proposed corridor runs through town and has three at-grade crossings. Commercial, industrial, residential, and park properties are located within a block of the at-grade crossings. Community facilities within one block of the corridor include one church, a fire station, post office, and the city hall. Two additional churches are within several blocks of the tracks near Main Street. The David C. Johnson Civic Arena site abuts the existing tracks on the west.

Cambridge, MN (population 8,111)

Cambridge is bisected by the existing rail corridor and Highway 65. The tracks separate the downtown, community facilities, and established residential areas on the west side of the tracks from the existing retail complex and newly-developing residential areas to the east closer to Highway 65.

The corridor crosses roadways in several locations. At-grade crossings occur at 11th Avenue SE, Highway 95, and at Emerson Street N. There are also two at-grade crossings south of town. Highway 65 crosses over the existing tracks at a grade-separated crossing north of town.

The Cambridge City Center municipal office and fire station abut the railroad corridor on the west. Several churches, schools, a library, and the Cambridge Medical Center are located on the west side of the proposed NLX corridor. Two of the churches, near 10th Avenue SW, are within several hundred feet of the corridor. Two cemeteries, Cambridge Union Cemetery and Christ the King Catholic Cemetery, are situated east of the existing tracks between 20th Avenue SW and 11th Avenue SW. A large retail complex is located east of the existing track near the intersection of Highway 95 and Highway 65. There is a mobile home park west of South Main Street between 23rd Pine Lane and 21st Pine Lane, beginning one block away from the existing track.

Grandy, MN (population not reported)

Grandy is an unincorporated small town adjacent to the proposed NLX corridor. The uses adjacent to the corridor are primarily industrial or commercial. A post office is located a block from the corridor. A church is located on Highway 65 which parallels the corridor.

Stanchfield, MN (population 1,209)

The proposed NLX corridor runs through the community of Stanchfield which has several blocks of residences located either side of the existing railroad tracks. Several businesses are located west of the corridor. A church and a cemetery are located just west of the tracks.

Braham, MN (population 1,793)

The proposed corridor runs through the center of Braham, immediately east of Highway 107 (Main Street), with at-grade crossings at 8th Street, Central Drive and at 4th Street. Residential neighborhoods are located both east and west of the tracks, with residences abutting the tracks on either side. The downtown business area is located west of the tracks. The city hall and fire station are located downtown. As discussed in Section 4.11, Freedom Park is located directly adjacent to the existing track on the west side and Rose Memorial Garden is located west of the tracks across Highway 107. There is a large high school in the southwest part of town and land planned for a new community center nearby. Residents on the east side of the track need to cross the railroad to get to the downtown, the school, Freedom Park, churches and the future community center. Likewise residents on the west side of the tracks need to cross the corridor to get to the community park (Hidden Park) and church that are located on the east side of town. The Braham Area Sportsmen's Club is located just north of town on Highway 107; a private at-grade crossing of the railroad is the only access to this private club.

Grasston, MN (population 158)

The proposed corridor runs through the eastern edge of the small town of Grasston. Several blocks of residences are located on the west side of the track. Two churches are located three

blocks from the corridor. A school is located approximately a half mile away from the corridor to the west.

Henriette, MN (population 71)

Henriette is located on both sides of the existing railroad corridor. The city hall is within a block of the corridor.

Brook Park, MN (population 139)

The proposed corridor runs along the north edge of Brook Park. A post office is located within one block of the existing tracks. No other community facilities in Brook Park were identified.

Hinckley, MN (population 1,800)

The proposed NLX corridor passes through Hinckley and has multiple at-grade crossings with local streets and Old Highway 61. The community center, Hinckley-Finlayson High School, city hall, the public library, and Gateway Family Health Clinic are located west of the existing track. Hinckley Elementary School and Memorial Park ("The Pit") are east of the track. Residences and churches are located on both sides of the proposed project corridor. Several churches are situated within several hundred feet of the track.

Sandstone, MN (population 2,849)

At Sandstone, the existing track runs along the west side of County Highway 64 (Main Street). The community is situated east of the track and is therefore not divided by the railroad. Main Street crosses the corridor at-grade crossings at the north and south end of Sandstone. Community facilities east of the existing track include city hall, medical center, public library, and several churches. One church and the fire department are located within one block of the track. Train Park (also known as Railroad Park) and Main Park are east and adjacent to the proposed corridor. Train Park property is owned by BNSF and leased by the City of Sandstone whereas Main Park is owned by the City.

Askov, MN (population 364)

The proposed NLX corridor runs through the middle of Askov, a community that has adopted Danish names for its streets in honor of its Danish heritage. There are two at-grade crossings within the small community; one at County Highway 32 and one at Bregnedalgade Street. There are houses facing the railroad as well as a warehouse adjacent to the track. The city hall and fire department are located west of the existing track and churches and parkland is located east of the track.

Bruno, MN (population 102)

The community of Bruno is located primarily east of the existing track. Community facilities include a church and school. Main Street, an at-grade crossing, provides access to State Highway 23 on the west side of the track. No facilities are immediately adjacent to the corridor.

Kerrick, MN (population 65)

Kerrick is a small town located just southeast of the proposed NLX corridor. A post office is located in Kerrick approximately one block away from the existing tracks. A church is approximately two blocks away.

Duquette, MN (population not reported)

Duquette is a small unincorporated town adjacent to the proposed NLX corridor. One park is located in Duquette west of the existing tracks.

Nickerson, MN (population not reported)

Nickerson is a small unincorporated town adjacent to the proposed NLX corridor. A town hall is located in Nickerson east of the tracks.

Foxboro, WI (population not reported)

The proposed NLX corridor runs adjacent to Foxboro, a small unincorporated town in Wisconsin. The town is rural in nature with no community facilities identified.

Village of Superior, WI (population 664)

The Village of Superior is an independent municipality located approximately two miles south of Superior, Wisconsin. The Village maintains a separate identity from its northern neighbor. The corridor runs along the western edge of the Village. At-grade crossings occur west of the Village at Central Avenue and N 58th Street. Community facilities include an elementary school, a post office, several churches, and Webster Park, which are located several blocks east of the corridor. Greenwood Cemetery is located south of the Village between the existing BNSF track and Wisconsin State Highway 35, beginning within one block of the corridor.

Superior, WI (population 27,244)

Before crossing the Grassy Point Draw Bridge into Duluth, the proposed corridor passes through Superior, Wisconsin. The majority of the community is located east of the existing BNSF track. However, a large residential area, Cooper Elementary School, and several churches are situated west of the track. N 28th Street (at-grade crossing) and N 21st Street (grade-separated crossing) connect this residential area to the eastern part of Superior. A mobile home community is located adjacent to the track at North 40th Street. A park is located approximately 300 feet from the tracks at 18th Street and Oaks, also noted in Section 4.11.

Duluth, MN (population 86,265)

After entering Duluth via the Grassy Point Draw Bridge, the proposed NLX corridor travels north along St. Louis Bay and east of Interstate 35. The corridor terminates at the Union Depot at 506 West Michigan Street. Downtown Duluth is located directly north of the corridor terminus, providing convenient access to the city. The Duluth Entertainment Convention Center, Bayfront Festival Park, and the Great Lakes Aquarium are east and south of the corridor terminus.

The Union Depot currently houses the St. Louis County Heritage and Arts Center. The *Saint Louis County Union Depot Passenger Rail Terminal Study* (March 2010) has studied the building's potential as an intermodal transportation hub. A master plan for the area near the Union Depot recommends development of new housing, commercial space, and public places that could promote a westward expansion of the downtown core over the next 20 years.

Community facilities located west of the corridor in Duluth include several hospitals, the University of Minnesota–Duluth, College of St. Scholastica, Lake Superior College, high schools, elementary schools, and churches. Several community centers are scattered throughout the city. Duluth has multiple fire stations providing emergency services, including one station located east of the corridor.

Impacts

Socioeconomic impacts include effects to communities, neighborhoods, community facilities, or categories of people uniquely sensitive to transportation. Socioeconomic impacts can result from physical impacts due to construction, right of way acquisition, access closures, or train operations. Land use compatibility, noise, visual, parks, and right of way impacts which can relate to socioeconomic impacts, are addressed elsewhere in this document. Environmental justice is discussed in Section 4.14. Economic impacts, including jobs, income, taxes, property value, and development potential are addressed in Section 4.15.

No Build Alternative

The No Build Alternative would result in no change to socioeconomic conditions within the corridor. The opportunity for positive project impacts to communities due to improved regional accessibility and related economic benefits would be lost.

Build Alternative

Community Facilities

Impacts to community facilities are expected to be minor through most of the proposed NLX corridor, and consist of temporary changes in access during construction. As discussed in Section 4.1, in Cambridge there would be temporary impacts to the rear parking area that serves both the Cambridge Mall and the city hall/police department, however these would be minor. As discussed in Sections 4.1 and 4.11, based on the refined footprint of the new track area through Braham, the project would avoid direct impacts to Freedom Park. No other community facilities

in the corridor would be directly affected by right of way acquisition. Access to the Braham Area Sportsmen's Club, which is a private club, would be further evaluated during preliminary design.

With regard to noise impacts to community facilities, the noise analysis described in Section 4.7 identifies that, without mitigation, moderate noise impacts would occur to a school in Andover, a church in Bethel, a church in Isanti, Rose Memorial Garden in Braham, a school in Sandstone, a school, church and park in Askov, and a school in Bruno, and severe noise impacts would occur to two churches, a cemetery and a daycare in Cambridge, a cemetery and two churches in Stanchfield, Freedom Park in Braham, a school and three churches in Hinckley, two parks in Sandstone, a church in Askov, a church in Bruno, a park in Duquette, and a school in Superior.

As discussed below, impacts to general access and circulation within communities would be minor; therefore accessibility to most community facilities would not be negatively affected.

Access

According to current BNSF track charts, there are 126 publicly-maintained and 34 privately-maintained uncontrolled (crossbucks only) road crossings along the project corridor. See Appendix K. Four quadrant gates or other acceptable protections/appropriate warning devices would be installed at all public crossings. As noted, access may be blocked for short periods a few times a day at public crossings that are located close to stations, leading to relatively short waits or slightly more circuitous travel within communities. Crossing wait times at non-station communities would be shorter than typically experienced with an average freight train. Closure of some existing public crossings may be further investigated during preliminary engineering activities; however this EA assumes that no existing public crossings would be closed. Approximately 30 to 40 percent of private crossings would be closed, with alternative access provided. At critical areas where alternative access cannot be provided, property acquisition may be carried out. At all other private crossings, gate protection would be provided. Specific decisions regarding private crossings would be negotiated on a case by case basis during a subsequent project phase.

There would be minor temporary effects to access within communities during construction.

Community Cohesion

Physical impacts to community cohesion resulting from the addition of high speed rail service are expected to be minimal given that existing tracks and freight traffic already constitute a physical barrier within some communities.

The existing rail corridor would be widened for dedicated passenger rail track or freight sidings as described and illustrated in Chapter 3. These improvements would bring rail operations (eight round trip high speed passenger trains per day or some portion of existing freight train activity) about 15 to 30 feet closer to existing parks, residences, and other public and private properties. However, this should have no impact on the existing and potential social interaction between or among geographically defined groups and the spatial connectivity of individual sites within communities. Based on the limited effect at crossings described above, access to community

facilities would remain similar to existing conditions. Travel patterns and access may change slightly depending on the location of stations, parallel track, or the potential closure of some at-grade crossings.

Noise and visual impacts to communities and neighborhoods during the proposed project construction are described in Sections 4.7 and 4.12, respectively.

Possible Barriers to Elderly and Handicapped

No impacts are anticipated as improvements would comply with Americans with Disabilities Act (ADA) requirements.

Safety and Security/Public Health

In general, diverting trips from automobile to rail travel usually results in a reduction in accidents, fatalities, and injuries (i.e. fewer automobile crashes).

When train-vehicle collisions do occur, it is usually at rail crossings. To ensure safety at rail crossings, railroads must comply with signal and train control systems required by federal regulations. These regulations cover hazardous materials, operating procedures, at-grade crossings, and other issues related to safety and security. Additional regulatory requirements for high speed rail (in addition to those required for all rail) further decrease the risk of incidents, such as limiting at-grade crossings and requiring specific types of barriers as well as track design requirements.

To enhance safety, the proposed NLX corridor would be fenced in urbanized areas and where needed for safety in rural areas. Chain link fencing would be installed in populated areas or at public crossings, although decorative fencing may be considered in municipalities where determined to be appropriate. The remainder of the corridor would use farm fencing. Four quadrant gates or other acceptable protections/appropriate warning devices would be installed at all public crossings. Upgrades to signalization and communication systems would be made throughout the corridor. In addition, horns would be blown at all crossings, except in cities where quiet zones have been established. Quiet zone designation (see Section 4.7) also requires supplementary safety measures (such as four-quadrant gates or additional enforcement) that reduce the risk of accidents to compensate for the lack of train horns.

Infrastructure and Public Services

The construction of parallel rail for a portion of the proposed corridor and the operation of high speed passenger rail would not require new or expanded public infrastructure or services other than roadway improvements at crossings, modification of the Highway 610 overpass, and replacement of the 379th Street overpass, all of which are noted in Chapter 3 and included in the impact assessment for the proposed NLX project.

Layover and Maintenance

Development of layover or maintenance facilities in Minneapolis (location yet to be determined but expected to be in existing rail corridor) and Duluth are not expected to pose impacts to community facilities, safety and security, or public services. On-site facilities would be connected to City sewer and water and served by public safety and other municipal services.

Stations

Socioeconomic impacts would not results from the extension of the existing platform at the Interchange, the construction of a platform and parking at the Foley Station, or the addition of a platform and separation of passenger and freight operations in yard territory at the Duluth Depot.

No negative socioeconomic impacts are anticipated to occur due to stations at the proposed locations in Cambridge, Hinckley or Superior. Access, safety and security, infrastructure and public service needs will be addressed in ongoing station planning and future environmental documents for these stations.

Avoidance, Minimization, and/or Mitigation Measures

As described in Section 4.11, if preliminary design work reveals the potential for direct impacts to any park properties that are Section 4(f) resources, a Section 4(f) evaluation that further considers avoidance, as well as measures to minimize harm, would be prepared.

As also described in Section 4.7, the implementation of quiet zones in communities impacted by noise reduces noise levels such that only the severe impact to Freedom Park remains of the above noted noise impacts to community facilities. Section 4.7 describes the additional mitigation measures for noise impacts that would be further investigated in subsequent phases of the proposed project.

Temporary noise, visual, and dust impacts to community facilities during construction would be minimized through compliance with local ordinances applicable to construction activities.

Safety measures are described above.

4.14 Environmental Justice

Affected Environment

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," dated February 1, 1994, requires that environmental justice be addressed (to the greatest extent practicable and permitted by law) in all federal planning and programming activities. The purpose of Executive Order 12898 is to identify, address and avoid disproportionately high and adverse human health or environmental effects of programs, policies and activities on minority populations and low-income populations. The proposed project has federal permit requirements and will receive federal funding. As such, it is considered a federal project for the purpose of compliance with this Executive Order.

Executive Order 12898 requires that the proposed actions be reviewed to determine if there are "disproportionately" high or adverse impacts on these populations. "Disproportionate" is defined in two ways: the impact is "predominantly borne" by the minority or low-income population group, or the impact is "more severe" than that experienced by non-minority or non-low income populations. The steps for defining environmental justice impacts include the following:

1. Identification of the location of low-income population and/or minority population in the project area;

2. Identification of the impacts of the project area upon the identified low-income population and/or minority population; and

3. Determination of whether the impacts are disproportionately high or adverse.

The first step in the environmental justice determination process is to determine whether any minority and/or low-income persons are present within the project area. For the purposes of environmental justice, a low-income population or minority population is defined as a population of people or households located in close geographic proximity meeting the racial or income criteria set forth in Executive Order 12898.

Information on population characteristics of the proposed project area was obtained from U.S. Census 2010 for minority status and 2000 for income status (2010 income data was not available at the time of the analysis). For purposes of this analysis, data were examined at the Census tract level for larger municipalities. Census tracts were included if the corridor was in or adjacent to the tract. In the rural portions of the project (outside the Cities of Minneapolis, Fridley, Coon Rapids, Superior, and Duluth), census tracts cover larger geographical areas than would be appropriate to represent the demographics of the project area. Census Designated Places[34] were

[34] According to the U.S. Census, Census Designated Places represent locally-known, unincorporated communities that contain a mix of residential, commercial, cultural, and/or retail uses similar to that of an incorporated place of similar size in a similar geographic setting. The delineation of Census Designated Places allows for the identification of, and tabulation of data for, unincorporated communities within the boundaries of federally recognized American Indian reservations, off-reservation trust lands, and Oklahoma Tribal Statistical Areas. Consistency over time is important, but primarily to ensure continuous presence of a Census Designated Place in Census Bureau data

instead used to capture a more geographically-constrained level of analysis. The proposed project area was compared to statewide data and data for Hennepin, Anoka, Isanti, Kanabec, Pine, Carlton and St. Louis Counties in Minnesota, and Douglas County in Wisconsin.

The results of the Census data analysis are shown in Tables J-1 and J-2 in Appendix J.

Minority populations

As noted above, 2010 Census data was available for minority populations. Most of the proposed project corridor has a percentage of minority residents similar to the rest of the county for that Census Designated Place or census tract, with the following exceptions having proportionately higher minority and/or Hispanic population:

Hennepin County, MN: tracts 1018, 1025, 1026 and 1031. These are in Segment 2 and the portion of Segment 3 in Minneapolis. The only proposed project improvement in this area is additional track in the wye at the Minneapolis Junction.

Anoka County, MN: tracts 506.8, 507.10, 507.12, 511.01, 512.01 and 512.06. These are in Segment 3 in Fridley and Coon Rapids (to Main Street). Proposed project improvements include third main track and associated bridges.

Isanti County, MN: no communities within the proposed project area with proportionately higher minority and/or Hispanic population.

Kanabec County, MN: no communities within the proposed project area with proportionately higher minority and/or Hispanic population.

Pine County, MN: Henriette, Hinckley, Sandstone, and Bruno. Henriette is in Segment 6. Proposed project improvements include new dedicated track. The remaining communities are in Segment 17. Project improvements include bridge rehabilitations at Hinckley and Sandstone and freight siding construction near Bruno.

Carlton County, MN: no communities within the proposed project area with proportionately higher minority and/or Hispanic population.

Douglas County, WI: tracts 206 and 211. These are in Segment 19. Improvements include new track construction.

St. Louis County, MN: tracts 19, 20 and 156. These are in Segment 19 and are in the general vicinity of the Depot.

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tabulations between censuses. Census Designated Places boundaries should be updated and revised as appropriate to reflect changes in the geographic extent of the place. A Census Designated Place should not overlap with another geographic entity for which the Census Bureau tabulates data.

Low-income populations

Several census tracts have a substantially higher (more than double) percentage of low-income persons compared to the rest of the county, as indicated by the percentage of persons with poverty status. Low-income populations near the project were present in the following census tracts:

Hennepin County, MN: tracts 35.01, 1018, 1025, 1026, 1030 and 1031. These are in Segment 1, Segment 2 and the portion of Segment 3 in Minneapolis. Project improvements in this area include platform improvements at the downtown Minneapolis station and additional track in the wye at the Minneapolis Junction.

Douglas County, WI: tracts 202 in Superior. This is approximately 500 feet east of Segment 19. Improvements in Segment 19 in Superior include new track construction.

St. Louis County, MN: tracts 19, 20, 25, 28, and 32. These are in Segment 19 and include the tracts that abut the rail line from the Grassy Point bridge, which would be rehabilitated, to the Depot, which would have platform improvements additional track for storage, layover, and equipment maintenance.

Community Summary

Table 4.31 summarizes the minority and poverty level status of each of the communities along the proposed NLX project corridor. Note that race information is from 2010 Census for County Subdivisions and poverty information is for Census Designated Places, 2000, poverty level for individuals. In certain cases, these do not represent exactly the same geographical areas. Data from Census Quick Facts 2010 is noted. Also note that some communities have race data available but not poverty data because they are County Subdivisions but not Census Designated Places. Small towns for which no data is available are neither County Subdivisions nor Census Designated Places.

Impacts

No Build Alternative

The No Build Alternative would not provide the positive impacts of the proposed project, including increased mobility; however it would not result in high or disproportionate impacts to minority and low-income populations.

Build Alternative

Minority and low-income populations have been identified within the study area. Minimal disruption to the surrounding communities would result from the proposed improvements and therefore the potential for high or disproportionate impacts to low-income and minority persons would be limited.

The impact assessment has identified the following adverse impacts to the human environment:

- Right of way acquisition of private property.
- Noise impacts within most of the communities along the proposed corridor.
- Vibration impacts at three residences in Stanchfield and a residence in Nickerson.

Table 4.31. Minority and Poverty Level Status – NLX Corridor Cities

City	Percent Racial Minority	Percent Hispanic	Percent Poverty Level
Minneapolis, MN	36	11	23*
Fridley, MN	25	7	10*
Coon Rapids, MN	14	3	8*
Andover, MN	7	2	2
Bethel, MN	5	2	6
Oak Grove, MN	4	1	2
Isanti, MN	5	3	8
Cambridge, MN	5	2	11
Stanchfield, MN	3	2	N/A
Grandy, MN	N/A	N/A	N/A
Braham, MN	3	1	14
Grasston, MN	2	1	8
Henriette, MN	10	4	13
Brook Park, MN	1	0	14
Hinckley, MN	18	4	12
Sandstone, MN	29	11	17
Askov, MN	3	1	9
Bruno, MN	8	0	19
Kerrick, MN	5	0	3
Duquette, MN	N/A	N/A	N/A
Nickerson, MN	4	0	N/A
Foxboro, WI	N/A	N/A	N/A
Village of Superior, WI	N/A	N/A	N/A
Superior, WI	9	1*	15*
Duluth, MN	10	2	20*

**Census Quick Facts 2010*

Some of the right of way and noise impacts are located within census tracts identified as higher than average concentrations of low-income or minority persons; these impacts also occur at various locations all along the proposed corridor.

Based on the level of design completed for the EA, the proposed project does not require total acquisition of any parcels or relocations of residents, businesses or any other occupants. Acquisitions are partial "strip" takings and are based on a worst-case footprint. All acquisitions would be in accordance with the Uniform Relocation and Real Property Acquisition Act of 1970, as amended, and 49 CFR Part 24. Based on information available, impacts due to right of way acquisition are not disproportionate to low income or minority populations.

Noise impacts are spread along the entire proposed corridor and due largely to horn noise. These impacts are not disproportionate to low-income or minority populations. If horn noise were mitigated by the application of quiet zones throughout the corridor, there would still be moderate noise impacts affecting four residential units in Minneapolis. The income status of the affected households is not known, however the units are valued at $400,000 (Hennepin County property records, 2012). The minority status of these affected households is also not known, however the neighborhood in which these affected households reside is not known to represent a concentration of minority households in the city.

Also following mitigation of horn noise, a severe noise impact would still affect a park in the community of Braham. Braham has a proportionately higher poverty level. However, as the park is used by the entire community, a disproportionate impact to low income persons is not anticipated.

The income or minority status of the households affected by vibration is not known. The census reports relatively low percentage of racial minority persons for the communities of Nickerson and Stanchfield (poverty information is not available). Based on the available data, no high or disproportionate impact to low-income or minority persons is identified.

The Build Alternative would result in positive impacts to the populations with convenient access to stations by improving access and mobility provided by high speed passenger rail service.

Layover and Maintenance

No potential for environmental justice impacts is anticipated as a result of the development of layover and/or maintenance facilities in Minneapolis (location yet to be determined but expected to be in existing rail corridor) and Duluth (Depot).

Stations

No disproportionately high and adverse effects to minority or low income populations are anticipated due to proposed NLX improvements required at the Interchange site, the Foley Station, or the Duluth Depot. The potential for environmental justice impacts due to stations in Cambridge, Hinckley and Superior proposed be addressed in separate environmental documentation as required; however no high or disproportionate impacts are anticipated.

Avoidance, Minimization, and/or Mitigation Measures

Section 4.1 describes the procedures for property acquisition. Section 4.7 describes minimization measures for noise impacts and vibration impacts.

Environmental Justice Determination

Based on available data and evaluation of proposed project impacts the proposed action would not have disproportionately high and adverse human health or environmental effects to any minority or low-income populations.

4.15 Economics

Affected Environment

As described in Section 4.1, the Minneapolis-St. Paul metropolitan area is the primary business center between Chicago and Seattle with an economy based in commerce, finance, rail and trucking services, health care, and industry. Duluth/Superior is the largest inland port on the Great Lakes. Both metropolitan areas are tourist destinations. Economic activity between Minneapolis and Duluth is based in agriculture and tourism, along with retail, industry and service activities within corridor communities.

Impacts

No Build Alternative

The No Build Alternative would have no direct adverse economic impact. Broader land use goals related to the economic benefits of high speed rail service along the corridor would not be supported.

Build Alternative

The *Minnesota Comprehensive Statewide Freight and Passenger Rail Plan* (February 2010) addresses benefit and cost of potential rail investments in broad terms, and reports that passenger rail will result in direct and indirect economic benefits and costs in areas served by the improvements. Direct benefits and costs are associated with the planning, construction, and implementation of the proposed project. Typical benefits during construction include construction jobs and direct purchases from suppliers. After the proposed project is constructed, benefits expand to include time savings, reduced maintenance on parallel highways, and gains in safety from a reduction in accidents. Indirect benefits and costs include the broader economic effects that a project may have on a region's economy.

A corridor economic impact analysis was conducted for the proposed project. Methodology and detailed results are provided in the *Minneapolis-Duluth/Superior Restoration of Intercity Passenger Rail Service Comprehensive Feasibility Study and Business Plan* (December 2007). Estimated economic benefits due to the proposed project are presented in Tables 4.32 and 4.33.

In terms of time scale associated with the benefits presented below, the feasibility study notes that it is likely that these benefits would be achieved after the completion of the building of the entire system and within two or three years of the start of passenger rail operation. The study also notes that the benefits of the system are likely to increase over time in line with growth in the economy.

Table 4.32. Economic Benefits for NLX Corridor

	NLX Corridor	Twin Cities Area	Duluth-Superior Area	State of Minnesota	State of Wisconsin
Employment (#jobs*)	13,833	11,406	2,427	13,114	719
Income (2006$)	$617 mil	$529.9 mil	$87.4 mil	$583 mil	$34 mil
State Income Tax (2006$)	$26 mil	N/A	N/A	$24.5 mil	$1.2 mil
Federal Income Tax (2006$)	$69 mil	N/A	N/A	$66.0 mil	$3.5 mil
Property Value (2006$)	$1,778 mil	$1,529.4 mil	$248.3 mil	$1,672 mil	$106 mil
Property Tax (2006$)	$21 mil	N/A	N/A	$19.5 mil	$1.8 mil
Average Household Income (2006$)	$372 mil	N/A	N/A	$384 mil	$240 mil
*Jobs identified here are productivity jobs and not construction or operating jobs.					

Table 4.33. Economic Benefits by Station

	Minneapolis	Coon Rapids*	Cambridge	Hinckley	Superior	Duluth
Employment (#jobs)	5,700-7,400	1,400-2,000	700-1,100	300-400	700-900	1,400-1,900
Income (2006$)	$220-290 mil	$100-150 mil	$40-60 mil	$15-20 mil	$25-30 mil	$50-70 mil
Development Potential (2006$)	$670-900 mil	$250-390 mil	$120-170 mil	$55-80 mil	$70-90 mil	$140-190 mil
*Shown as "Suburban North" in the Feasibility Study.						

The addition of passenger rail service also provides benefit particularly to tourism in the communities along the northern portion of the study corridor by offering an additional mode of transportation for potential visitors. Several northern communities offer a variety of outdoor recreation activities and provide nearby access to state parks and the Willard Munger State Trail.

The City of Hinckley also offers attractions such as the Hinckley Fire Museum, Grand National Golf Course, and the Grand Hinckley Casino. The casino, run by the Mille Lacs Band of Ojibwe, is one of northern Minnesota's larger tourist draws and hosts 3.5 million guests annually. The passenger rail service would benefit these attractions.

Passenger rail system users derive economic benefit from the system in terms of time savings and other service aspects. Non-users would also derive economic benefit from the proposed project, due to reduced congestion and improved air quality resulting from diversion of travel from the highway to rail.

The proposed project requires the acquisition of private property, however these are partial acquisitions and, based on existing information, are not expected to result in total takes or relocation of businesses or residences since business or residential structures are not affected. The change in property tax value resulting from impacts to the affected properties should be non-significant as they would be acquisitions of relatively small strips of land that abut existing tracks. Furthermore, converted land would continue to be taxed (at industrial rates). In addition, Table 4.32 estimates substantial increase in property value and property tax as a result of the proposed project.

The results of the financial analysis included in the Level 2 functional analysis, found that the proposed NLX service is predicted to have a benefit/cost ratio of 1.03.

Energy

Construction of new infrastructure and rehabilitation of existing infrastructure would require additional energy beyond typical maintenance for existing freight rail activities. These are short term energy impacts lasting as long as the construction phase of the proposed project.

Vehicle miles diverted to rail as a result of the proposed project were generated for scenarios representing a range of gasoline prices and three future years, as follows:

- 2020: 28.7 – 31.0 million
- 2030: 33.6 – 39.5 million
- 2040: 38.4 – 47.0 million

In addition to reduction in fuel expenditure due to diversion of auto users to the rail mode, cost benefit includes the reduction in excess fuel expenditure that results from overall congestion on the highway system. The cost benefit evaluation reported in the Level 2 function analysis estimated a $210.5 million in highway fuel savings.[35]

Stations

Station areas often experience growth over time which is a positive effect on land use and economics.

Layover and Maintenance

No significant economic impacts are anticipated to result from the development of layover and/or maintenance facilities in Minneapolis (location yet to be determined but expected to be in existing rail corridor) and Duluth, other than the benefit of relevant job creation.

Avoidance, Minimization, and/or Mitigation Measures

Any minor property tax impacts related to conversion of land to rail use would be mitigated by overall increases in property value and tax revenue as a result of the proposed project.

[35] 2010 benefit, present value discount at 3%, 2010$

4.16 Indirect Effects and Cumulative Impacts

4.16.1 Indirect Effects

The Council on Environmental Quality (CEQ) has defined indirect effects as follows (40 CFR 1508.8):

"**Indirect effects** are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population, density or growth rate, and related effects on air and water and other natural systems, including ecosystems."

The proposed NLX project has the potential for indirect effects with regard to land use patterns and related transportation improvements. As described in Section 4.15, the proposed project is anticipated to result in substantial job and property value growth, focused generally in the Twin Cities and Duluth-Superior areas, and specifically in station communities. The greatest potential for indirect effects from development related to station areas is to land use, transportation systems, stormwater runoff/water quality, cultural resources, and visual quality. Because station areas would be in urban settings, the potential for indirect effects to natural resources (e.g. vegetation, wildlife, wetlands, etc.) is expected to be minimal.

While there is a potential for environmental consequences from any potential change in planned land use, local land use controls are adequate to manage any potential development in the areas near stations. In addition, the station area communities have and would continue to engage in station area planning activities designed to ensure that station area development is carried out consistent with community goals and environmental protection requirements. Indirect effects due to station development will be further addressed in the Tier 2 NEPA documentation to be done for the new stations. Also note that, in Minnesota, development that exceeds certain thresholds is subject to review under state Environmental Quality Board rules.

As the question of induced growth and accompanying environmental impacts is considered for any transportation project, it is important to consider that transportation improvements only affect the *location* of households and jobs within the region, not the *total number* of households and jobs within the region, which is a function of overall economic conditions. If there is faster development in one part of the region due to improvement in accessibility, there would be slower development elsewhere in the region. It is not possible to predict accurately where development elsewhere in the region would occur under No Build conditions or what the resulting impacts would be to sensitive resources.

4.16.2 Cumulative Impacts

The Council on Environmental Quality (CEQ) has defined cumulative impacts as follows (40 CFR 1508.7):

Cumulative impact is he impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Minnesota EQB rules also address cumulative impact, or effect, defined as follows:

"Cumulative potential effects" means the effect on the environment that results from the incremental effects of a project in addition to other projects in the environmentally relevant area that might reasonably be expected to affect the same environmental resources, including future projects actually planned or for which a basis of expectation has been laid, regardless of what person undertakes the other projects or what jurisdictions have authority over the projects. (Chapter 4410, Subp. 4410.0200.11a.)

Resources Affected by the Proposed NLX Project

Based on the analysis described in Section 4.1 through 4.17, the proposed NLX project has the potential for impacts (direct or indirect) to land use, traffic and pedestrian/bicycle circulation, cover type (vegetation), spread of invasive species, animal mortality and movement, native prairies, state listed species including plant species and mussels, wetlands, water quality, including erosion and sedimentation, noise, vibration, farmland, and visual quality. The potential for impacts to cultural resources cannot be identified at this time.

Effects of Other Foreseeable Future Actions on Resources Affected by the Proposed NLX Project

Other foreseeable future actions along the proposed corridor, not related to NLX, include development within communities, particularly in the metropolitan areas, and roadway improvements near the corridor. Other track area improvements necessary for freight operations (independent of NLX-related improvements) are also likely to occur over time. Expansion of passenger rail, commuter rail, and light rail transit is being pursued regionally, with particular focus in the Twin Cities metropolitan area.

Development within communities has the potential for impacts to land use, traffic and pedestrian/bicycle circulation, and visual quality in or near the areas directly or indirectly affected by the proposed NLX project. Farmland and natural areas on the advancing edge of urban growth in the corridor are also likely to be impacted by future development. However, land development is guided by city and county comprehensive plans and zoning regulations. Local land use controls and permitting (including mitigation requirements) are adequate to manage the impacts of any potential development in or near the project corridor, minimizing the potential for cumulative effects.

Depending on extent and location, roadway improvements have the potential for impacts to natural areas, wetlands, property, vegetation, noise, and farmland. As is the case with land use development, development of highway and local roadway facilities are also guided by these

comprehensive plans and are evaluated based on consistency with comprehensive plans. They are also subject to permitting and, in Minnesota, environmental review if state thresholds are exceeded. Minnesota environmental review includes requirement for noise analysis and, if federal funding is involved in transportation improvements, federal noise abatement requirements apply.

Increases in traffic have the potential for cumulative effect on animal mortality.

Increases in freight rail and/or passenger rail operations would bring additional noise and vibration to the proposed project corridor, posing potential for cumulative effects. Mitigation for the proposed NLX service noise and vibration effects would serve to also reduce the potential for cumulative effects.

Summary

The discussion above reports the potential for cumulative impacts based on currently available information, including proposed NLX impacts based on concept level functional assessment engineering and the potential for impacts from other actions that are known at this time.

The proposed NLX impacts would be re-evaluated as more detailed project information becomes available based on preliminary engineering. At that time, additional actions by others would also be identified. The potential for cumulative impacts would be reassessed with this updated information.

At the present time, in consideration of (1) the mitigation identified for these impacts of the proposed NLX project as currently identified, and (2) the development controls (e.g. zoning and subdivision review), regulations, permits and approvals in place to address impacts of other development and transportation improvements, the direct and indirect effects of proposed NLX project in combination with reasonably foreseeable future actions, as currently known, are not anticipated to result in significant potential for cumulative effects.

5.0 PUBLIC AND AGENCY INVOLVEMENT

5.1 Public Involvement

5.1.1 Public Involvement Plan

A public involvement plan (PIP) was developed and implemented early and throughout the project development process. This plan established a process for communication with the Alliance, MnDOT, WisDOT and the general public in order to answer questions and understand the concerns and technical input (such as project area knowledge, resource information, and regulatory details) that the public and agencies had about the proposed project. It also communicated project objectives, standards, procedures, and constraints to the public and stakeholder agencies. Elements of the PIP include coordination and contact meetings, newsletters, public meetings, and the public comment period on the EA.

5.1.2 Public Information Meetings

Public information and agency meetings were held between October 2009 and April 2012. The following is a list of events:

- October 20, 2009: Environmental Agency Coordination Meeting
- December 2009: Public Information Meetings, Series 1
    - December 3, 2009 in Cambridge, Minnesota
    - December 8, 2009 in Coon Rapids, Minnesota
    - December 9, 2009 in Superior, Wisconsin
    - December 10, 2009 in Hinckley, Minnesota
- July/August 2010: Public Information Meetings, Series 2
    - July 27, 2010 in Duluth, Minnesota
    - July 28, 2010 in Minneapolis, Minnesota
    - July 29, 2010 in Cambridge, Minnesota
    - August 3, 2010 in Sandstone, Minnesota

The public meetings were informal with an open house format. A brief presentation was given at all meetings approximately 30 minutes after the scheduled start time. Public involvement summaries are provided in Appendix M.

Following identification of potential project impacts to the City of Braham, MN, based on the "worst case" footprint, the project team met with City staff in February 2012, after which the design was refined to avoid direct impacts to property as described in Section 4.1, 4.11 and 4.13. The refined alignment and cross section, along with other project information, was reviewed

with the Braham City Council on April 3, 2012 and then with the community at an informational open house meeting April 23, 2012. See Appendix E for more information regarding public outreach.

5.1.3 Newsletters

Newsletters were distributed to libraries and municipal centers throughout the corridor to announce key project milestones. The newsletters were also posted to the project website. The November 2009 newsletter provided an introduction to the proposed project, high speed rail, and announced the December 2009 public information meetings. The July 2010 newsletter announced the July/August 2010 public information meetings.

A project information update will be issued to announce the public comment period and public hearing for the EA. This information is also available in the described in the transmittal letter distributing this EA.

5.1.4 Website

A website was maintained for the proposed project at http://www.northernlightsexpress.org. The site contains information about the proposed project, press releases, history, meetings, the Alliance Board, newsletters, contacts, and a supporter signup.

5.2 Agency Involvement

5.2.1 Agency Coordination

The following is a list of the agencies contacted to provide input to the NLX study process. Contact occurred through the environmental agency coordination meetings, held October 20, 2009, November 1, 2011 and December 2, 2011, follow-up email, phone or mail correspondence, either directly or through other agencies (such as contacts with the Tribal Historic Preservation Officers):

- MnDNR Natural Heritage Database
- MnDNR Environmental Review Program
- MnDNR Trails and Waterways Section
- MnDOT Office of Environmental Stewardship
- MnDOT Cultural Resources Unit
- Minnesota Pollution Control Agency
- Natural Resources Conservation Service
- U.S. Fish and Wildlife Service
- U.S. Coast Guard
- U.S. Army Corps of Engineers

- Great Lakes Indian Fish and Wildlife Commission
- Minnesota State Historic Preservation Office
- Wisconsin State Historic Preservation Office
- WisDOT Environmental Services Section
- Wisconsin DNR
- Federally-recognized tribes in Minnesota and Wisconsin

Copies of agency comments received as a result of early coordination meetings and contacts can be found in Agency Correspondence Appendix H.

5.2.2 Coordination with BNSF

The NLX Passenger Rail Alliance initiated discussion with BNSF regarding high speed passenger rail operations in year 2008. Since that time, meetings have occurred periodically to discuss project progress and review technical data. BNSF has evaluated and commented on proposed operations, infrastructure and analyses with regard to track charts, timetables and proposed improvements to the extent applicable to the initial planning and design phase of the project.

As the proposed project moves into the preliminary engineering phase, additional discussion with BNSF would occur to further refine operational and engineering requirements for the proposed NLX service. At this time, it is anticipated that BNSF would prepare final design plans and construct improvements on their facilities under formal agreement with MnDOT. Formal agreement is likely to cover additional topics such as financial responsibilities, trackage use, relocation of affected BNSF structures, right of way acquisition, operations and operator agreements.

5.3 Publication of Environmental Assessment and EIS Need Determination

5.3.1 Public Comment Period and Public Hearing

Comments from the public and agencies affected by this proposed project are requested during the public comment period described in the transmittal letter distributing this EA. A combined public informational meeting/public hearing would be held after this EA has been distributed to the public and to the required and interested federal, Native American Tribes, state and local agencies for their review.

At the informational meeting/public hearing, concept design layouts for the proposed Build Alternative under consideration along with other project documentation will be available for public review. The public will also be given the opportunity to express their comments, ideas and concerns about the proposed project. These comments will be received at the hearing and during the remainder of the comment period, and will become a part of the official hearing record.

5.3.2 Report Distribution

Copies of this document have been sent to agencies, local government units, libraries and others as per Minnesota Rule 4410.1500 (Publication and Distribution of an EAW) and Wisconsin Administrative Code Chapter TRANS 400.11 (Distribution and Review of Environmental Documents).

5.3.3 Process Beyond the Hearing

Following the comment period, the responsible agencies (FRA, MnDOT, and WisDOT) will make a determination as to the adequacy of the environmental documentation. If further documentation is necessary it could be accomplished by preparing an Environmental Impact Statement (EIS), by revising the EA, or clarification in the Findings of Fact and Conclusion, whichever is appropriate.

If an EIS is not necessary, as currently anticipated, MnDOT will prepare a "Negative Declaration" for the Minnesota state environmental requirements. A request for a "Finding of No Significant Impacts" (FONSI) will be prepared and submitted to the FRA. If the FRA agrees that this finding is appropriate, it will issue a FONSI. The WisDOT would adopt the FRA decision.

To conclude the Minnesota state environmental process, notices of the federal and state decisions and availability of the above documents will be placed in the Minnesota Environmental Quality Boards (MEQB) Monitor. MnDOT will also distribute the Negative Declaration and FONSI to the Environmental Assessment Worksheet (EAW) distribution list and publish notices in local newspapers announcing the environmental and project alternative decisions that were made.

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