WAABIZHESHIKANA THE MARTEN TRAIL:

A RIVER HERITAGE TRAIL

MINI-MASTER PLAN
ST. LOUIS RIVER CORRIDOR
DULUTH, MINNESOTA | COUNCIL APPROVED NOVEMBER 25, 2019

Duluth Parks & Recreation
ST. LOUIS RIVER CORRIDOR
LHB PERFORMANCE DRIVEN DESIGN

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- Deb DeLuca, Duluth Seaway Port Authority
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- Wayne Dupuis, Fond du Lac Band of Lake Superior Chippewa
- Jill Hoppe, Fond du Lac Band of Lake Superior Chippewa
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- Alison J. Clarke, Friends of Western Duluth Parks & Trails
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- John Lindgren, MnDNR
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- Daryl Peterson, Minnesota Land Trust
- Mike Bares, MN Pollution Control Agency
- Erin Endsley, MN Pollution Control Agency
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- Amanda Crosby, Parks & Recreation Commission - Disability Representative
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- Carole Newkumet, Riverside Community Club
- Charlie Staudahar, Spirit Lake Development
- Charlie Nelson, Twin Ports Walleye Association
- Dave Nelson, Twin Ports Walleye Association
- Jack Ezell, Western Lake Superior Sanitary District
- Dwight Morrison, Wheels on Trails

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City Council Members

- Gary Anderson
- Joel Sipress
- Em Westerlund
- Renee Van Nett
- Jay Fosle
- Zack Filipovich
- Arik Forsman
- Noah Hobbs
- Barb Russ

Mayor of Duluth

- Emily Larson

Parks & Recreation Commission Members

- Amanda Crosby
- Jill Joyce
- Tjaard Breeuwer
- Jennifer Peterson
- Dudley Edmondson
- Dennis Isernhagen
- Britt Rohrbaugh
- Erik Torch
- David Demmer

City of Duluth Staff

- Jim Filby Williams, Director of Administration

Parks & Planning Staff

- Lisa Luokkala, Project Lead
- Jim Shoberg, Technical Support
- Hank Martinsen, Property Services

Contact Information:

Lisa Luokkala

Assistant Parks & Recreation Manager

City of Duluth Parks & Recreation Department

218.730.4300

lluokala@duluthmn.gov

CONSULTANT TEAM

LHB Inc.
21 West Superior Street, #500
Duluth, MN 55802

LHB PERFORMANCE DRIVEN DESIGN.

WAABIZHESHIKANA | THE MARTEN TRAIL
MINI-MASTER PLAN

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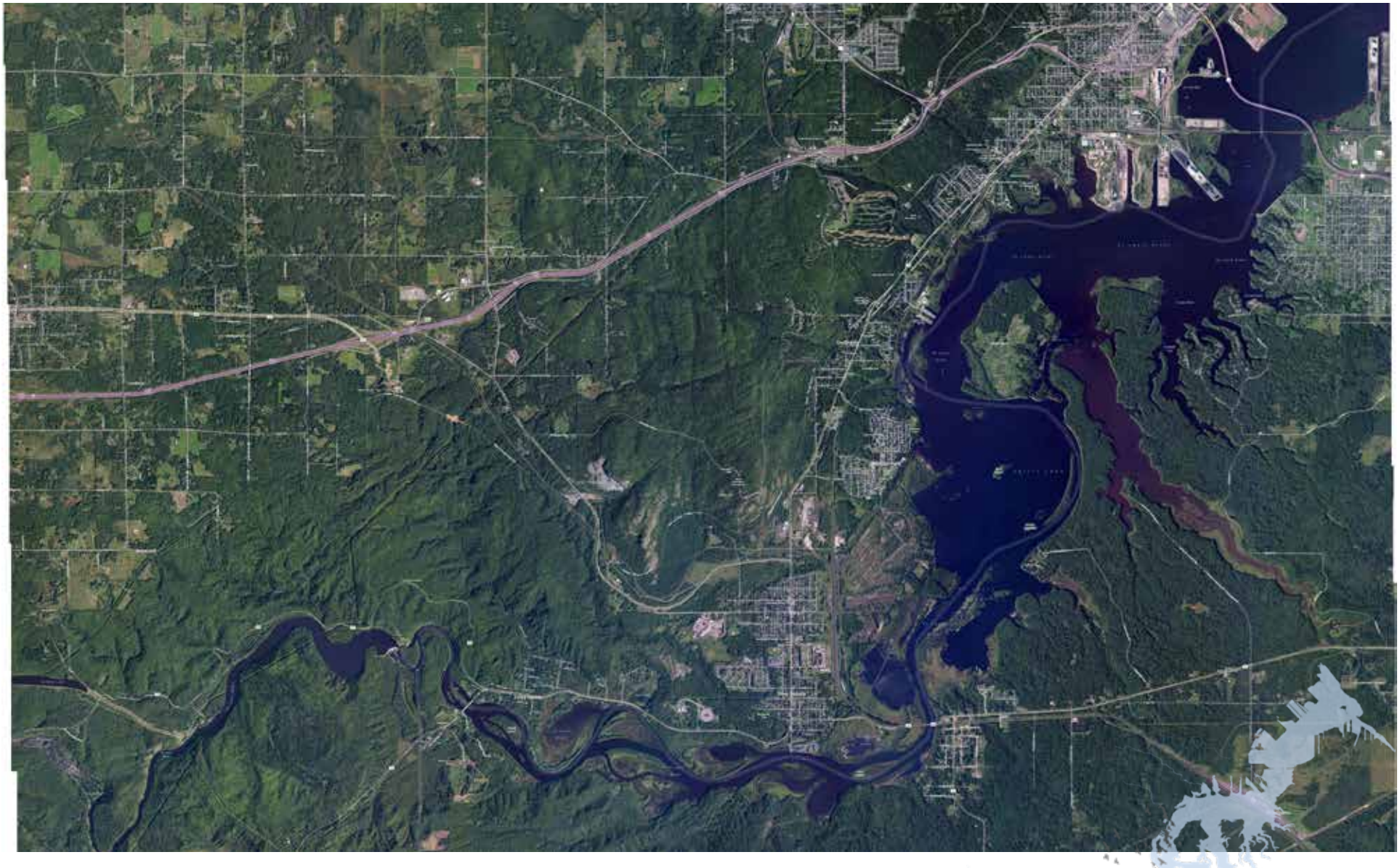

WAABIZHESHIKANA | THE MARTEN TRAIL

01 INTRODUCTION AND OVERVIEW

Introduction and Overview

Project Background

The current Western Waterfront Trail (the Trail) consists of a 3.3-mile multi-use recreational trail that traces the shore of the St. Louis River Estuary in Duluth, Minnesota. Constructed in the 1980's, the Trail was based on the 1979 City of Duluth plan that envisioned a ten-mile riverfront trail extending to Jay Cooke State Park. The remaining seven miles of trail are yet to be constructed. The nearly **$400 million** federal/state clean-up of the St. Louis River is approaching completion, therefore the time is ripe to finish the Trail and connect Duluth residents and visitors to the restored river.

Project Purpose

In August 2016, the City of Duluth Parks and Recreation Division began a public planning process to determine the future recreational use of ten miles of public riverfront encompassing 1,200 acres of green space. Public access to the riverfront is limited at present. The northernmost 3.3 miles are accessible via the existing Western Waterfront Trail. The next 4.5 miles are accessible primarily via an excursion train that provides a wonderful service but operates infrequently and necessarily charges a fee that is unaffordable to many. The majority of the southernmost 2.5 miles of riverfront lack improved access. The City intends to develop a plan that will enhance public access to the river via a ten-mile riverfront bike/pedestrian trail, improve existing water access sites, and provide new water access sites tailored specifically for paddlers. The City is committed to design all of these facilities to be as accessible as practically possible regardless of income or physical ability.

Figure1.1 WWFT 1979 City Plan

Figure1.2 WWFT existing trail sign

Project Goals

This plan's overall project goals include but are not limited to:

- Increasing connectivity from adjacent neighborhoods to the St. Louis River and each other.
- Stimulating development on private land in the St. Louis River Corridor.
- Meaningfully engaging and responding to citizen and stakeholder input.
- Enhancing neighborhood quality of life.
- Restoring and protecting natural habitat along the trail corridor.

Implementing Agencies and Plan Alignments

The City of Duluth Parks and Recreation Division will lead trail and park planning efforts, detailed design and construction, as well as facilitate operations and ongoing maintenance of the Trail. The City will also collaborate with the following departments and community partners for additional support and to ensure the overall vision and implementation of the plan are met with success:

Anticipated Partners

- Duluth Public Works Department
- Duluth Property and Facilities Management Division
- Duluth Parks Maintenance
- Duluth Indigenous Commission
- Duluth Natural Resource Commission
- Riverside Community Club
- Morgan Park Community Club
- Fond du Lac Community Club
- Fond du Lac Band of Lake Superior Chippewa
- Friends of Western Duluth Parks and Trails
- Minnesota Land Trust
- Minnesota Department of Natural Resources
- Environmental Protection Agency
- US Steel Corporation
- Minnesota Pollution Control Agency
- Lake Superior and Mississippi Railroad (LSMR)
- St. Louis River Alliance
- US Army Corps of Engineers

St. Louis River Corridor Initiative

In 2014, the City of Duluth established the St. Louis River Corridor Initiative. The Initiative is to invest in public parks and trails from Lincoln Park to the Fond du Lac neighborhood. The overall goals of this Initiative are to support the natural environment, enrich quality of life, attract new home buyers, establish new visitor destinations, and stimulate appropriate development. Corridor Initiative projects are funded in part by an additional half-percent increment in the local tourism tax, which was approved by the Minnesota Legislature in 2014. These funds leverage additional dollars through community partnerships and grants.

"Duluth's history and its future are profoundly tied to the health, sustainability and stewardship of the St. Louis River and Lake Superior. We are excited to work with the community to unveil the potential of the River Corridor and its historic and culturally rich gifts."

- Mayor Emily Larson

Figure1.3 St. Louis River Corridor Ongoing Projects

Greater Minnesota Regional Parks and Trails Strategic Plan

To secure future funding from the State of Minnesota Legacy Parks and Trails grant program administered by the Greater Minnesota Parks and Trails Commission, the City aims to align this trail plan with the Greater Minnesota Regional Parks and Trails Strategic Plan. Legacy funding is available through the State of Minnesota for parks and trail projects outside of the seven-county metropolitan area that illustrate a need and meet certain regional objectives.

This plan aligns with the Greater Minnesota Regional Parks and Trails Commission vision **to provide every Minnesotan the opportunity to have a strong connection to natural resource-based parks and trails, which improves quality of life for surrounding communities through access to safe and enjoyable recreational assets.** By providing gateways to the St. Louis River waterfront, enhancing the ecological health of former industrial sites, and increasing connectivity of people to the natural world, the Trail will provide opportunity for the public to practice good stewardship of our natural resources.

The Trail and park expansion investment is grounded in the following regionally significant objectives:

- Provides a unique experience to users that they may not experience anywhere else (the estuary is considered the largest freshwater estuary in the U.S.).
- Links to a larger network of existing local and regional trails.
- Supports a growing need for commuters using alternate modes of transportation.
- Connects neighborhoods and regional destinations.
- Secures access to a missing piece of the corridor along the St. Louis River.

Duluth Natural Area Program St. Louis River Natural Area Management

The Duluth Natural Areas Program is a city program that designates certain lands with environmental value as permanently protected natural places. The St. Louis River Natural Area is comprised of nine places along the shoreline of the St. Louis River, from Chambers Grove Park in the Fond du Lac neighborhood, to Grassy Point in the Irving neighborhood. The approximately 1,200 acres of land are home to a mix of 17 distinct native plant communities and over 150 species of birds. The natural areas program protect the waters of the St. Louis River Estuary and provide river access for Duluth's residents and visitors. The Trail will connect the nine areas encompassed by the nominated St. Louis River Natural Area. This plan aligns with the St. Louis River Natural Area plan by concentrating the impacts of recreational use in small hardened areas, fostering appreciation for the natural world, and establishing habitat protection primary purposes of the Trail.

St. Louis River - Area of Concern (AOC)

The St. Louis River is one of the 43 Areas of Concern (AOCs) in the Great Lakes Basin that was included in the Great Lakes Water Quality Agreement established by the United States and Canada in 1987. AOCs are places once polluted by common past practices of dumping untreated waste on land and water. All designated AOCs require remedial action plans (RAP) to address specific beneficial use impairments, which are managed by natural resource agencies. The City of Duluth is one of the AOC partners working with regulatory agencies to implement projects that will remediate contaminated sediments and restore aquatic habitat within the River. This plan aligns with the goals of the AOC, as cleaning up the river will allow for better public use along this natural resource corridor. This plan aligns with the AOC plan by concentrating the impacts of recreational use in small hardened areas, fostering appreciation for the natural world, and establishing habitat protection primary purposes of the Trail.

Lower St. Louis River Habitat Plan

The City supports the Lower St. Louis River Habitat Plan which was created by the St. Louis River Citizens Action Committee (CAC). The Plan serves to protect the ecological diversity of this area. The Estuary provides habitat for a rich variety of fish, aquatic invertebrate, bird, and other wildlife species. The lower 21 river miles, plus extensive areas of adjacent forested land, are included in the initial phase of the Habitat Plan.

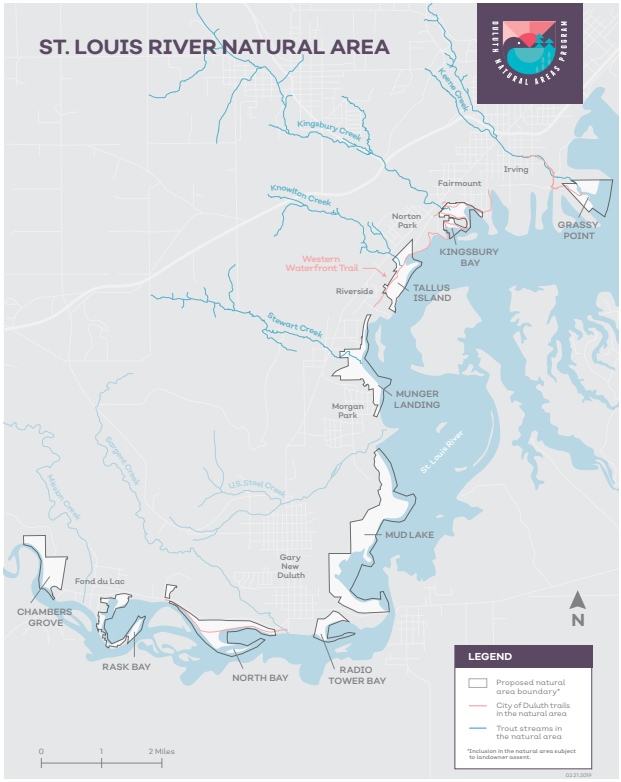

Figure1.4 Map of the St. Louis River Natural Area

The Habitat Plan guides local and state agencies implementation goals and strives to:

1. Recognize that management lies within the actions of humans and not management of the environment.

2. Promote stewardship of the resource by local residents, users of the resource, and those concerned with it.

3. Protect, enhance, and restore ecological functions and maximize biodiversity without seeking to restore the estuary to its presettlement condition.

This plan aligns with the Habitat Plan by concentrating the impacts of recreational use in small hardened areas, fostering appreciation for the natural world, and establishing habitat protection primary purposes of the Trail.

Lake Superior & Mississippi Railroad Local Historic Landmark Designation

The Lake Superior & Mississippi Railroad (LSMR) was designated as a historic landmark in July 2019 by the City of Duluth Heritage Preservation Commission. This designation of local heritage preservation landmark aims to preserve landmarks that reflect elements of the City's cultural, social, economic, political, engineering, visual or architectural history. The City intends to develop a rail and trail system that preserves the historic integrity of the Lake Superior and Mississippi Railroad as much as possible.

Trail Designation and Regional Significance

Classification

Designation of the trail as a regionally significant destination is an important goal of this plan, as the project will be eligible to receive State of Minnesota Legacy Parks and Trails grant funding. The intent for this Trail is to be recognized as a Non-Motorized Regional Trail, according to the Greater Minnesota Regional Parks and Trails Strategic Plan of April 2015, by adhering to the following criteria.

Criteria #1: Provide a High-Quality "Destination" Trail Experience

The Trail is located along the meandering shoreline of the St. Louis River. This unique location provides opportunity to curate a safe experience for trail users of all abilities, while honoring and celebrating the rich history along this great body of water. This area was and still is incredibly significant to the Anishinabe people. Rebranding the Trail to better articulate this heritage story is important to our region. The trail corridor will include quality site amenities, offer spectacular views and interpretation opportunities at key points of interest, while also providing improved water access for paddling, boating and fishing activities. The natural and cultural history will be integrated into the design of the Trail through mindful recreational development. Points of interest and viewsheds will be preserved and enhanced, including areas formerly off-limits to the public. Restoring, protecting, and enhancing the ecological health of former industrial sites are unique to this Trail, and this Plan will fill in the missing link through a former industrial site owned by US Steel and by working with various clean-up efforts.

Criteria #2: Be Well-located to Serve Regional Population and/or Tourist Destination

Duluth is a popular tourist destination, attracting 6.7 million visitors annually and a growing city, home to over 87,000 residents. The Trail will serve an historically underserved area of Duluth and the surrounding region. There are few linear, recreational amenities with adequate length that provide both land and water access in the western portion of Duluth. The Trail will provide better waterfront access and increase connectivity from adjacent neighborhoods to the St. Louis River Estuary, enhancing neighborhood quality of life.

Criteria #3: Enhance Connectivity to Regional Destinations

The Trail provides gateways to the St. Louis River waterfront, linking to a larger network of existing local and regional, land and water trails. Other significant trails and recreational destinations in the area include the Munger State Trail, the Cross City Trail, the Duluth Traverse Trail, the Superior Hiking Trail, the St. Louis River Estuary Water Trail, U.S. Bicycle Route 41, Spirit Mountain Recreational Area, the Lake Superior Zoo, Indian Point Campground, Magney Snively Nature Area, and Jay Cooke State Park. Additional points of interest that are otherwise hard to access but will be enhanced by the Trail include, views to Tallas and Clough Islands, Spirit Lake, the Riverside Marina, Blackmer Park, the former US Steel Plant, Slag Point (manmade landform), Mud Lake, and the Oliver Bridge, to name a few. Currently, the only way the St. Louis River Corridor neighborhoods are connected is via Trunk Highway 23. The Trail will enhance the sense of community by creating a linear system that links the waterfront to seven adjacent residential neighborhoods, and providing transportation alternatives to nearby businesses, recreational destinations, and public green spaces. Creating the missing links within the trail will provide a better connection to the larger network of trail systems throughout the City.

Figure1.6 Existing Trail near Indian Point Campground

Criteria #4: Fills a Gap in Recreational Opportunity within a Region

The 2010 City of Duluth Parks and Recreation Master Plan flagged the absence of high quality outdoor recreation amenities in the western half of Duluth. Extending the Trail and expanding boat access as indicated in this plan will correct that significant inequity. The project also establishes a regionally important, high quality, continuous waterfront bike/pedestrian linkage from the Gitch Gammi State Trail to the Lakewalk and the Cross City Trail all the way to Jay Cooke State Park. The water access sites in this plan provide crucial canoe/kayak infrastructure for the St. Louis River National Water Trail.

Additionally, the Trail will...

- ***Connect People to the Outdoors**. The Trail will create a welcoming and safe way for people of all abilities and incomes to enjoy the St. Louis River. The Trail will establish an enhanced venue for future regional programming and events including organized walks, run, and paddles. Overall, the Trail will connect many more people much more powerfully to the St. Louis River than has historically been the case.*
- ***Create Opportunity.** High quality trail access to ten miles of publicly owned riverfront located within easy walking distance of neighborhoods will make western Duluth a more desirable place to live, work, play, and invest, improving quality of life for all.*
- ***Take Care of What We Have.** The Trail builds on an existing linear trail already established in the region. The expansion will lead to new acquisitions or easement of lands and facilities increasing the operational and maintenance requirement. However, these investments have been planned with conservative life-cycle management costs providing a clear picture of expected investments over the life of the asset. It is critical that continued coordination with local and regional entities occur to assure that this trail expansion be stewarded by a network of stakeholders to provide for long term operational and maintenance commitments.*
- ***Collaborate Among Partners**. Park and trail users will enjoy a seamless experience along the trail, as planning efforts have included collaboration with local, state, and regional stakeholders to ensure a strong network of partners provide a cohesive experience for trail users. These partnerships better tell the collective story of the river and its ecological, cultural, and historical significance.*

Figure1.7 City Wayfinding & Signage Detail

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02 VISION, TRENDS AND PUBLIC VALUES

Vision, Trends and Public Values

Vision

The Trail's vision began in 1979 and remains the same today - to create a multi-use recreational trail along the shore of the St. Louis River Estuary from the Irving neighborhood up river to the Fond du Lac neighborhood in West Duluth. The linear pathway will provide a unique and safe experience for trail users of all abilities, while honoring and celebrating the rich history along this great body of water. The trail corridor will include quality site amenities and provide spectacular views and interpretation opportunities at key points of interest. The Trail will also provide improved water access for picnicking, boating, and fishing activities.

Guiding Principles

Six principles were established for this project to help guide decisions and measure success of the plan.

- ***Community Connection.*** Enhance sense of community by creating a linear trail system that links the waterfront to adjacent residential neighborhoods, and provides transportation alternatives to nearby businesses, recreational destinations, and public green spaces. Provide a better connection to the larger network of trail systems throughout the City.
- ***Unique Duluth Experience***. Implement the natural and cultural history into the design of the Trail. Educate on natural habitat, resource management, and local heritage. Ensure points of interest and viewsheds are preserved and enhanced.
- ***Equitable Experience***. Maximize accessibility for all regardless of income or physical ability by providing a free trail experience constructed to the highest accessibility standards that the City can finance without unacceptably scarring the natural landscape.
- ***Technically and Environmentally Feasible.*** Be mindful of technical and economic feasibility. Ensure trail design is realistic and can be maintained long term for community benefit.
- ***Environmentally Sustainable.*** Minimize disruption to the natural terrain and sensitive environmental areas. Implement low impact development and sustainable best management practices to avoid degrading natural environment.
- ***Promote Economic Development.*** Recognize opportunities and encourage future development by connecting other regional areas of interest, neighborhoods, and commercial districts.

"Did you know?

Duluth was awarded the premier "Outdoor City" in the USA by Outside Magazine, 2014.

Trends and Public Values

Greater Duluth Area Demographics

Duluth is the center of a growing metropolitan area with a population of 279,000 that is expected to exceed 300,000 in 2040. In addition to a growing population, Duluth hosts 6.7 million visitors per year, making it one of the most popular tourist destinations in the upper Great Lakes region.

Public Health Trends

Duluth community organizations improve community health by making active healthy lifestyle choices more accessible to all. The provision of high quality parks and trails for every neighborhood is central to this effort. The City's 2010 Parks and Recreation Master Plan identified an absence of high quality parks and trails in west Duluth. The St. Louis River Corridor Initiative, of which the Trail is an integral part, aims to address that inequity. Critical partners include the State Health Improvement Program, the Duluth YMCA, the St. Louis County Department of Public Health, and the Zeitgeist Center for Arts and Community.

Recreational Trends and Tourism Opportunities

Duluth's status as a nationally significant outdoor recreation destination has driven steady increases in tourist visitation that now exceed 6.7 million per year. In recognition, Outside Magazine named Duluth America's best outdoor town in 2014. Research commissioned by Visit Duluth validates that outdoor activities, especially walking and hiking, are the favorite activities of visitors while in Duluth. Duluth is capitalizing on the national interest by renewing existing parks and trails and investing in new parks and trails with an emphasis on providing access to the restored St. Louis River.

NRPA's 2017 Pulse Poll (1,003 Americans polled)

83% of American's say it is important that local government agencies prioritize environmental initiatives.

82% of Americans agree that it is important to preserve public lands.

4 out of 5 Americans make an effort to stay physically fit during winter. (Top activities include walking, jogging, running, or hiking outdoors, making up 46% of winter exercise).

According to NRPA's 2017 Agency Performance Review, a typical agency (municipal) should strive for...

1 park per every 2,266 residents and 9.6 acres of parkland per 1,000 residents.

The City of Duluth has 1 park per every 670 residents and 182 acres of Park and Open Space per 1,000 residents.

Trends and Best Practices: Accessible Boat Launch for Water Access

Design Considerations*

Provide Access Route

- Surface, grade, width and cross slope need to be accessible (not to exceed 5% for ADA, not to exceed 8.33% for ABA), and as even and level as possible without gaps or interruptions
- Route clearly marked
- 5' minimum width

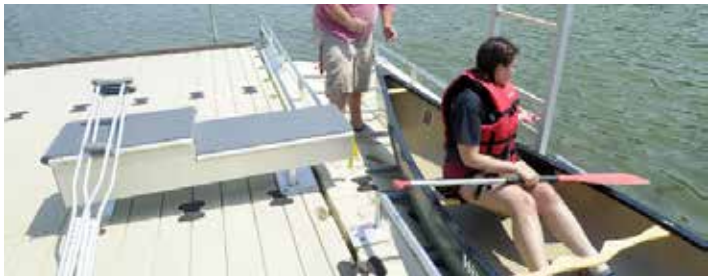
Level and stable landing/loading area

- There should be an area adjacent to the loading area that is stable, at least 60"x60"
- Can be anywhere adjacent to loading area, including in water up to 12" deep

Transfer assistance

- Transfer step
- Transfer board
- Overhead handles/grab bars
- Non-slip surface textures

**National Park Service Report, 'Long Lasting Launches,' 2004*





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03 EXISTING CONDITIONS AND SITE ANALYSIS

Existing Conditions and Site Analysis

Site History

The St. Louis River Corridor has a rich history, one that is filled with historical, ecological, and cultural significance. See Figure 1.4 for a visual representation of the area's historical timeline.

Pre-1600's: For nearly 14,000 years, indigenous peoples inhabited the shores of the St. Louis River, living off the land and water. Villages were located throughout what is known today as the Twin Ports region. Activities included fishing, wild ricing, and hunting. Stories that have been orally passed down about the Anishinabe lifestyle illustrate the spiritual connection they have with the land.

1600's-1700's: In the 1600's the region of Duluth was home to the Dakota people. By the mid-1700's, Ojibwe people had begun to occupy the area and are still present today. European settlement occurs and trading between the indigenous people and European voyageurs begin. The river is seen as a vital link connecting the Mississippi River waterways to the west with the Great Lakes to the east.

1800 -1850's: Fur trading posts and commercial fisheries are established. Land treaties open land to European settlers and displaced the Ojibwe people.

1850 -1900's: The 1854 Treaty ceded lands to the US government. Shipping on the Great Lakes begins, allowing for export of iron ore, lumber, and grain. First railroad in Duluth is established and portions of the track are still in operation today. An increase in logging industry brings the development of sawmills to the river.

1900-1975: Industrialization of a natural waterfront begins with the creation of the US Steel Mill, Atlas Cement Plant, and railroad expansions. Riverside, Smithville, Norton Park, and Morgan Park neighborhoods are established along the corridor to house steel and cement workers. By mid-20th century, the lower St. Louis River is significantly impaired because of human activities.

1975-Present "Return of the River": Restoration efforts take place to clean-up the river and restore the estuary to healthy natural habitat as part of a larger Great Lake Basin Remedial Action Plan. In 1980, Phase I of the Trail was built, spanning 3.3 miles from Indian Point Campground to Riverside neighborhood. Also during this time, the LSMR excursion rail was established. The St. Louis River Estuary is designated as an Area of Concern (AOC) in 1987. Remediation and restoration to clean-up and restore portions of the estuary have begun. The outcome has been better water quality, and improved fish and wildlife habitat. Ojibwe people continue to live alongside the River.

Did you know?

The Ojibwe name of the River is Gichigami-ziibi (Great-lake River).

The St. Louis River Estuary is considered the largest fresh water estuary in the U.S.

Land Use Context

The Trail project limits are entirely within the City of Duluth with nearly all of the proposed trail alignment located on land or easements that are, or soon will be, city-owned.

The existing 3.3 mile trail traverses an area that alternates between natural areas and single family neighborhoods. The trail is approximately 8' feet-wide with 1-foot shoulders. In 2016, the City rewidened, regraded, and resurfaced the trail to improve accessibility and restored native vegetation to the surrounding greenspace. Grades along the existing trail vary from flat terrain to over 8% in some areas. Other land uses in the area include light industrial, recreational, and unimproved greenspace.

South of the existing trail terminus at the Riverside neighborhood, the next four miles of shoreline host the LSMR excursion railroad. Where the rail was originally constructed on the mainland, there is sufficient wide, flat, and dry space to accommodate the trail right by the rail. In other locations, the rail bed was placed in the river and is now surrounded by open water on one side and wetlands on the other. These segments of rail bed cannot accommodate a side-by-side trail. On

1600
Indigenous peoples inhabited the shores of the St. Louis River prior to the 1600's

Image: Duluth Public Library

1622
European contact first reported when Etienne Brule meets with the Chippewa at Sault Ste. Marie; French traders and Chippewa people establish positive alliance

1763
French and Indian War/Seven Years' War ends, ceding French territory to Great Britain and bringing the Great Lakes region under British rule, creating greater hardship for the Ojibwe people

Image: historyinanhour.com

Image: reproduction of James Otto Lewis 1826 painting, Duluth Public Library

1808
American Fur Company organized, establishes first commercial fishery at Fond du Lac trading post in 1817

Image: University of MN Duluth, Hudson Bay Trading Co.

1854
LaPointe Treaty opens the land for European settlement and displaces the Ojibwe people. The Fond du Lac Reservation was established.

1855
Locks open at Sault Ste. Marie, making it possible for large ships to sail between Lake Superior and Lake Huron, and allowing for the export of iron ore, lumber and grain

1861
Construction on 154 miles of track of the Lake Superior and Mississippi Railroad (LSMR) begins

Image: Lake Superior & Mississippi Railroad

1869
The destruction and relocation of burial grounds occur in Fond du Lac neighborhood

1870
First train arrives in Duluth from St. Paul

1872
MN Harbor Improvement Company dredges first shipping canal in the St. Louis River Estuary

1877
LSMR is reorganized as the St. Paul and Duluth Railroad, and later folded into the Northern Pacific Railway

1894
Logging industry operations are concentrated at Jay Cooke State Park; by 1894 there are at least 15 sawmills along the St. Louis River

Image: Unknown

1915
US Steel completes construction of mill on MN side of St. Louis River; Morgan Park community is established to house steel and cement plant workers

Image: trainworldcity.webs.com

1930'S
Northern section of what was originally the LS&M is moved and no longer carries passengers

Image: LHB

1979
Western Waterfront Trail originally planned, designed to be 9 miles long. The first two segments, totaling close to four miles, are built as an 8' wide gravel corridor

Image: LS&M Railroad

1980
Present day LSMR tourist train started by volunteers from the Lake Superior Transportation Club, using original track along the St. Louis River

2019
"We are Water" campaign, Fond du Lac hosts traveling exhibit to educate people on Minnesota water stories

Figure1.8 Historical Timeline of the St. Louis River Corridor

the mainland, the shoreline is backed by steep wooded bluffs that are mostly undeveloped.

At Boy Scout Landing, the rail and ties end but the rail bed continues providing a hardened, flat, and dry corridor for cost-effective trail development along the thin strip of shoreline between the river and the bluff until it reaches Perch Lake.

From Perch Lake to Chambers Grove Park, land along the river is mostly privately owned, and transitions back to residential areas with a flatter terrain for the duration of the project limits.

Safety issues and physical barriers along the corridor include five roadway crossings, two at-grade railroad crossings, several creek or significant drainage crossings, as well as steep slopes.

Local and Regional Trail Connections

"Connecting the System" Vision

The City of Duluth takes great pride in their local and regional trail systems and is strives to become the premier trail city in North America. The Trail will play a critical role in this vision in several ways. Regionally, the trail route will serve as one of the primary connectors from the western portion of the town, linking up with the Cross City and Munger State Trails, which in turn, connects to the Lakewalk and Gitchi Gami State Trail on the east and north side of town. With this series of interconnected routes, trail users will be able to travel from Jay Cooke State Park up the north

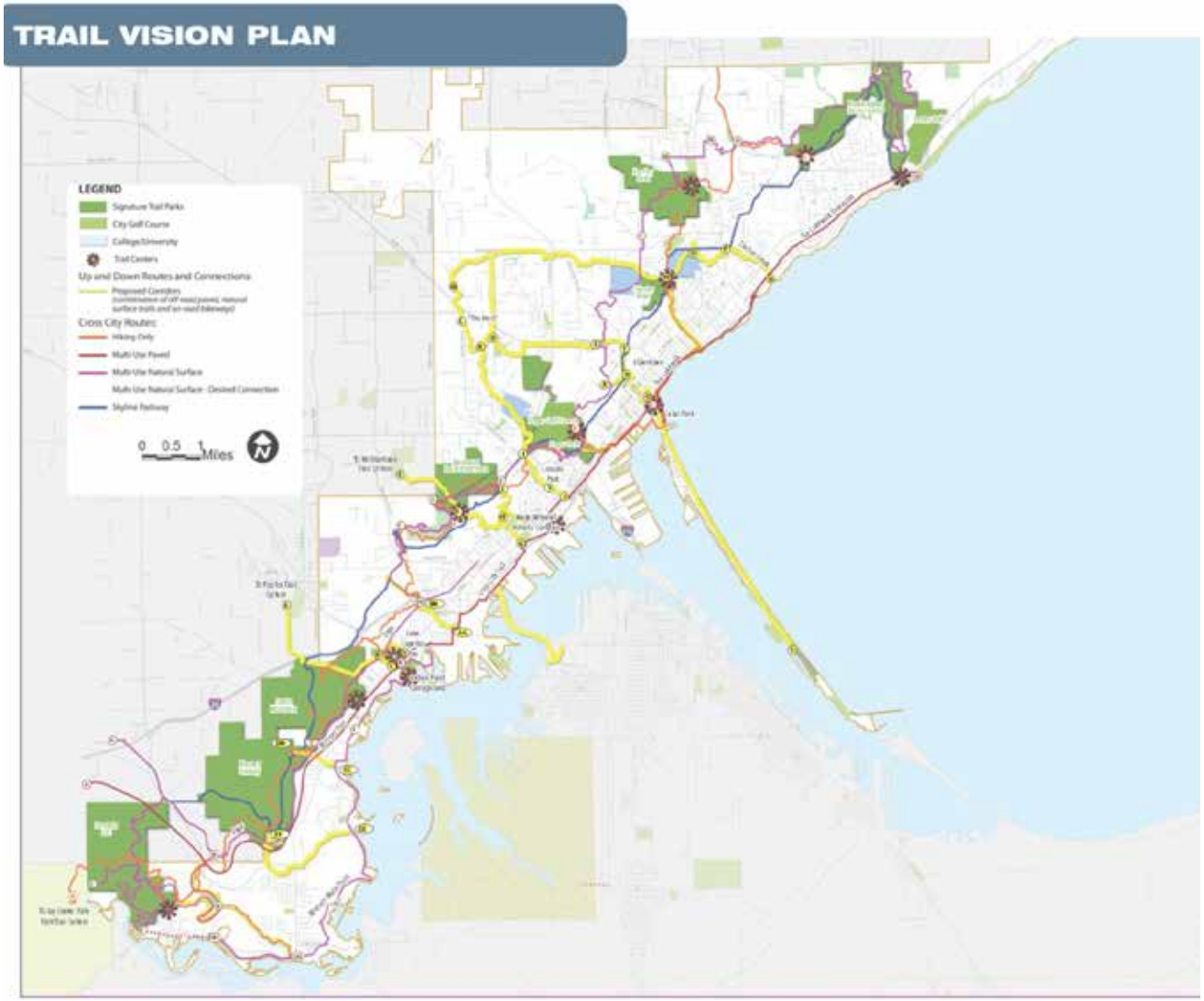

Figure1.9 Duluth Trail Vision Plan Source: Trail & Bikeway Plan, 2011

shore, spanning more than 30 miles across the Greater Duluth region. The Trail will be designed to exceed ABA standards, and will strive to meet ADA standards, creating the greatest amount of access to the most people.

At the neighborhood level, the Trail will provide equally important community linkages connecting over seven neighborhoods, as well as several business districts, parks and open space. Other recreational trail areas that are accessible from the Trail include the Superior Hiking Trail, the Duluth Traverse, the Spirit Mountain Recreation Area, and Magney Snively Nature Area.

Physical Conditions and Natural Resources

Topography, Wetlands, Streams and Habitat

The St. Louis River Estuary landscape is extremely diverse. The estuary itself is a 12,000-acre body of water comprised of deep water channels, shallow sheltered bays, extensive coastal wetlands, and expanses of open water. The envisioned trail alignment is bounded by a 1,200-acre green corridor comprised of a mix of native and invasive tree species. The City and its partners are in the midst of a multi-year effort to remove invasive species and restore natives from this corridor. The riverfront upland slopes toward the river at grades ranging from 2% to 30%. Neighborhood development is concentrated on ridges set back from the shoreline. The trail corridor crosses numerous natural streams. Looming in the background is an undeveloped 600-foot-tall ridge that hosts thousands of acres of mature forest, cold water trout streams, and dramatic granite outcrops, most of which is protected City-owned greenspace.

Trail Segments: Issues and Opportunities

Existing Trail

The existing 3.3 miles of trail serve a special purpose. Located at the center of the St. Louis River tourism hub, the trail connects flagship tourist attractions like the Lake Superior Zoo and Spirit Mountain Recreation Area, and serves as an attraction in its own right. The existing trail was rewidened, regraded, and resurfaced in 2016 to improve access and enjoyment. From 2016 to 2017, the green corridor around the trail was cleared of invasive plant species and replanted with natives. Installation of a handsome new wayfinding and signage system and additional accessibility improvements is slated for 2020. Together, these improvements will help transform what was a cluster of disconnected tourism attractions into a linked series of complimentary outdoor recreation experiences.

Figure1.10 Rail at Blackmer Park (view north)

Existing Trail Re-Route (at Tate & Lyle Site)

The current trail alignment as it approaches the Spring Street terminus near the Riverside neighborhood is unsafe for trail users. Not only is there an at grade railroad crossing to navigate through, the user experience is also not ideal as the trail is in close proximity to Tate & Lyle's operations. The plan will consider re-route alternatives for the 0.28 mile segment; one that routes the trail closer to the river, as well as an inland route.

Site constraints within this re-route area include significant wetland impacts, drainage crossing, private property access, and steep slopes. With a safer route and more defined trail entry point, this portion of the Trail will provide for a better connection to Spirit Lake Marina as well as offer new development opportunities within the Riverside neighborhood.

Segment 1: Spring Street to Munger Landing

Segment 1 poses significant trail development challenges. The land here is owned by BN railroad. It is traversed by two parallel tracks – one close to the shore, another on the hillside above. The City owns the lower tracks and ties as well as a trail easement that extends down to the river's edge. In this slim corridor, the sliver of flat land not occupied by train tracks ranges from twenty feet to as little as 5 feet. The challenge is to devise an affordable way to build a safe and enjoyable trail in this small area. If that challenge can be surmounted, Segment 1 provides a unique opportunity to give users an experience very close to the river.

Figure1.11 Existing Trail Crossing at Kingsbury Creek (future connection to Zoo)

Figure1.12 Existing Trail Crossing at Tate & Lyle site

Figure1.13 Segment 1 Existing Conditions

Segment 2: Munger Landing to Blackmer Park

The shoreline in Segment 2 is comprised primarily of a rail causeway surrounded by water and wetlands that is too narrow to accommodate a side-by-side trail; however, there is an appealing and affordable inland alternative that follows a cleared and hardened utility easement that has become a popular unofficial trail.

Site constraints that may be encountered along the inland alternative include property issues, navigating a new railroad crossing, sloping topography, and wetland/drainage crossings. Trail extension distance for Segment 2 is approximately 3/4 mile.

Segment 3: Blackmer Park to Boathouse Point (US Steel/EPA Clean-Up Area)

Segment 3 begins near Blackmer Park and traverses through a portion of the riverfront that is going to be cleaned-up and restored by the EPA and US Steel, resulting in a unique situation for trail and linear park expansion. Because of these significant clean-up efforts, there is an opportunity for the City to work with these partners to design how this 1.72 mile segment of riverfront should be restored.

Slag Point, which is a narrow manmade spit of land that juts out almost one half mile into the River, is situated midway along Segment 3 and has the potential to be a new water access site and/or open park space. Slag Point is slated to become a Contained Disposal Facility (CDF) as part of the

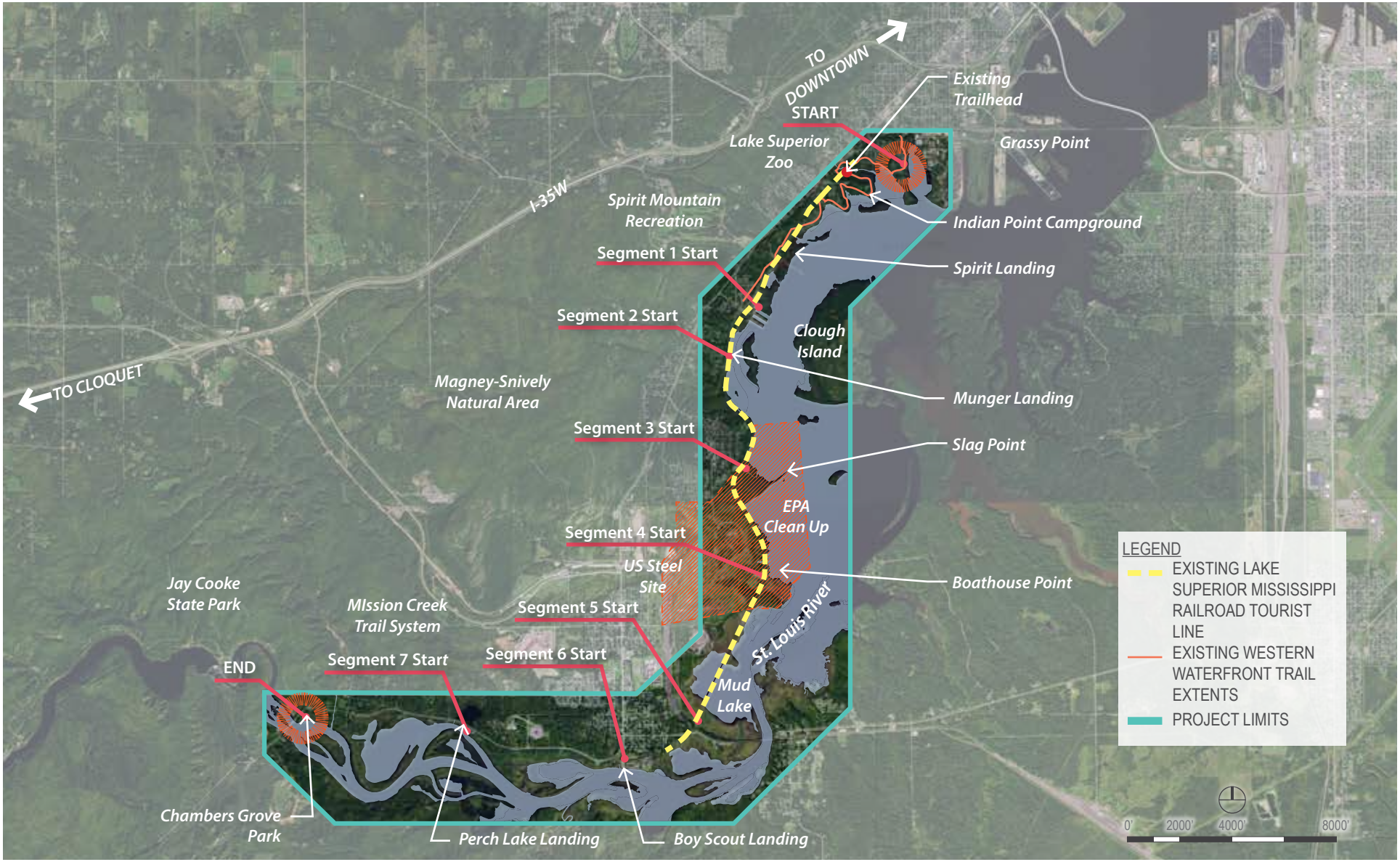

Figure1.14 Overall Project Limits

EPA's clean-up efforts. CDF's at superfund sites have historically been designed for greenfield re-use, providing open green space that adds value to a community adjacent to historical industrial waste. Greenfields are successful recreational re-use models.

This segment provides many opportunities for view corridors to Spirit Lake as well as cultural and historical interpretation along a unique stretch of land.

Segment 4: Boathouse Point to East McCuen Street

The 1.4 mile Segment 4 extends from an upland peninsula known as Boathouse Point along the shore of Mud Lake to McCuen Street in the Gary New Duluth neighborhood. Owned by US Steel, Boathouse Point could be acquired for public use and unobtrusively improved as a nature-based park featuring mature forestland and views of Spirit Lake and Spirit Island.

Segment 4 poses the trail development challenge of constructing an appealing and affordable trail from the north shore of Mud Lake to the south shore. The rail causeway that bisects Mud Lake is too narrow to accommodate affordable trail construction. The shore of Mud Lake and the bluff above are potential alignments but neither will be available for trail development unless and until US Steel completes contaminant clean-up and agrees to sell the undevelopable periphery of their property to serve as public green space or provides a recreational easement. The trail alignment on the top of the bluff would provide stunning views to the river and nearby landmarks and rich opportunities for cultural interpretation. It would be a highlight of the trail.

Figure1.15 Segment 2 Existing Conditions

Figure1.16 Segment 3 Existing Conditions

Figure1.17 Segment 4 Existing Conditions

Segment 5: East McCuen Street to Boy Scout Landing

The 0.7-mile Segment 5 connects Mud Lake to Boy Scout Landing skirting the southern periphery of the Gary New Duluth neighborhood. A narrow rail causeway with wetlands on either side bisects much of this area. It is too narrow to accommodate a side-by-side trail. An alternative is to follow the base of a sloped hill to Boy Scout Landing. Existing conditions along this segment include wetlands and steep slopes that will pose engineering, cost, and regulatory challenges. Views of the river from Segment 5 are limited.

Boy Scout Landing is already a public access location used by motorized and non-motorized recreationists, and recently had site improvements installed by the DNR, including portable toilets, trailer parking, and an improved fishing pier. This riverfront location offers opportunity to build on the existing amenities for a larger multi-use group. Enhancements could include designated trailhead parking, as well as a separated, non-motorized watercraft launching area.

Figure1.19 Segment 4 Existing Conditions from US Steel

Segment 6: Boy Scout Landing to Perch Lake

The City-owned rail line currently ends at Boy Scout Landing, however the railroad used to run all the way to Jay Cooke State Park, so there is an old remnant corridor cleared of mature trees within Segment 6. The old corridor consists of a dirt trail, which is primarily flat and very close to the water's edge, providing good access and an intimate experience with this section of the river. Property ownership will not pose a concern unless the trail alignment moves inland closer to Highway 23.

Segment 7: Perch Lake to Chambers Grove Park

The last segment of the Trail spans from Perch Lake landing to Chambers Grove Park and a portion of the trail will be constructed by MnDOT as part of the Trunk Highway 23 roadway improvements project. The waterfront is mostly privately owned within Segment 7. Site constraints will need to be addressed, including private land ownership crossing (just west of Perch Lake) or to alternately consider a roadway crossing to the north side of Highway 23. Other considerations include wetland impacts adjacent to Highway 23 as well as public safety along the road corridor.

Perch Lake, located on the north side of Highway 23, is the location of a DNR for restoration alternatives study. The City will work in partnership with the DNR to further opportunities for public recreation and water access as part of the future restoration efforts. On the riverside of Perch Lake, the City already has an existing parking lot with modest amenities. There is once again, an opportunity to enhance this existing riverfront site to become a more robust trailhead location providing additional parking, portable toilet, a picnic shelter/overlook and possibly a better non-motorized watercraft launch.

Figure1.18 Segment 5 Existing Conditions

Figure1.20 Segment 6 Existing Conditions

Figure1.21 Segment 7 Trail Terminus at Chambers Grove Park

Precedents

Rail and Trail

As part of the study, the design team looked at other community models across the nation where trails have been successfully implemented directly adjacent to a railroad alignment. In our case, the design team looked for excursion rail operations with limited speeds. The four examples shown to the right share similar conditions with the Trail corridor varying from natural surfacing materials, landscape type, anticipated trail width and length, as well as potential shoreline and causeway conditions.

Many of these precedent sites combine the rail and trail opportunities to offer multiple recreational and tourism attractions.

Heritage Rail Trail County Park and Maryland's Torrey C. Brown Rail Trail

Maryland and Pennsylvania

- 44.4 miles combined
- Crushed stone and dirt
- Walking, biking, horseback riding, x-country skiing

Great Allegheny Passage

Maryland and Pennsylvania

- 150 miles
- Asphalt, crushed limestone
- Biking, horseback riding, skiing, fishing, walking

Santa Fe Rail Trail

New Mexico

- 17 miles
- Asphalt and dirt
- Horseback riding, mountain biking, walking

Astoria River Walk

Oregon

- 17 miles
- Asphalt, dirt and boardwalk
- Horseback riding, mountain biking, walking












Rail to Trail

The design team also examined rail to trail conversion projects where existing inactive rail lines were removed and converted over to a shared-use pathway. Rail to trail conversions are considered a sustainable practice and an acceptable re-use of land.

Vermont's Island Line
Vermont
- 14 miles, 3.5 of which are a causeway over water
- Asphalt and gravel
- Biking, inline skating, fishing, walking, x-country skiing

Elroy Sparta State Bike Trail
Wisconsin
- 32 miles
- Crushed stone
- Hiking, jogging, x-country skiing, snowmobile,

Utah's Historic Union Pacific Rail Trail State Park
Utah
- 28 miles
- Crushed stone and asphalt
- Hiking, biking, x-country skiing

Kansas' Prairie Spirit Trail
Kansas
- 51 miles
- Compacted, crushed limestone
- Biking, hiking, x-country skiing












Figure1.22 Existing conditions images: (Top Row: Before 2016 improvements, Bottom Rows: After 2016 improvements)

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04 COMMUNITY ENGAGEMENT

Community Engagement

History of the Planning Effort

The vision for a riverfront trail system originated with the 1979 City Plan. While the master plan was not formally revisited until August 2016, discussions about better connectivity to the river for residents and visitors has been a topic of every St. Louis River Corridor planning process in the last thirty years.

After experiencing multiple economic downturns, the hope to reconnect people to the river was always present in community conversations. This desired connection was referred to in the following City planning documents:

- 2015 Riverside Small Area Plan
- 2013 Gary New-Duluth Small Area Plan
- 2012 Morgan Park Neighborhood Revitalization Plan
- 2011 Duluth Trails and Bikeway Master Plan
- 2010 Parks and Recreation Plan

In 2014, the trail extension was identified as one of the backbone projects of the larger St. Louis River Corridor Initiative, creating connectivity between recreational areas and the neighborhoods along the river, which are currently isolated from one another with their only connection being the Minnesota State Highway 23.

As part of the larger St. Louis River Corridor Initiative, the City reopened the conversation of what a completed trail would look like, and how it would serve the community.

Public Involvement

The City has conducted an intensive and meaningful public planning process including six stakeholder advisory committee meetings, two public meetings, an online survey, a randomly sampled survey of the 5th district, and several supporting studies of cultural resources, environmental resources, rail infrastructure, rail business planning, trail alignment and design.

Figure1.24 Stakeholder Workshop, October 2016

Figure1.23 Word Cloud Summary based on Stakeholder Input

Figure1.25 Stakeholder Workshop, January 2017

39-member Stakeholder Committee

Community engagement efforts were uniquely diverse and widespread. The City convened a group of stakeholders made up of regulatory agencies, business owners, community/ neighborhood leaders, elected officials, City staff, and environmental and recreation groups.

A series of five, 3-hour Stakeholder Committee meetings occurred from September 2016 to January 2017 and focused on:

1. Interpretation and branding to better reflect the heritage of the river corridor
2. Riverfront green spaces – Slag Point and Spirit Landing
3. St. Louis River access and put-in sites – Munger Landing, Boy Scout Landing, and Perch Lake Landing
4. Initial trail extension and rail options
5. Exploring further – River-friendly with upland trail, rail-to-trail conversion and full rail-and trail

* The stakeholder group re-convened on August 29, 2019 for a sixth and final meeting to discuss and review recommendations for implementation of the Plan.

The City of Duluth also met with the non-profit organization, Lake Superior Mississippi Railroad (LSMR), the current lease-holder of the City-owned railroad corridor, a total of six times to discuss components of the trail work.

LSMR Specific Meetings

- November 9, 2016 - Review of AMI Engineers Report
- January 20, 2017 - LSMR Business Plan Meeting
- May 5, 2017 - Federal Railroad Administration Site Visit
- July 17, 2017 - LSMR Operations
- October 6, 2017 - Mud Lake Restoration Plan Overview
- August 26, 2019 - Rail & Trail Direction

Figure1.26 Stakeholder Workshop at Morgan Park Community Center

Natural Resource Management Group

January 19, 2017 - Natural Resource overview of City-owned river corridor

August 11, 2017 - Mud Lake Restoration half-day workshop

September 22, 2017 - Mud Lake Restoration Concept Plan working meeting

Natural Resource Technical Advisors:

- Desirae Hendrickson, DNR
- John Lindgren, DNR
- Melissa Sjolund, DNR
- Jeremy Tinkerton, DNR
- Joel Hoffman, EPA
- Daryl Peterson, MN Land Trust
- Rick Gitar, Fond du Lac Band of Lake Superior Chippewa
- Nancy Schuldt, Fond du Lac Band of Lake Superior Chippewa
- Erin Endsley, MPCA
- Dan Breneman, MPCA
- Dave Warburton, USFWS

Updates and Tabling

August 25, 2016 US Steel Superfund Site- Minnesota Pollution Controls Agency Open House

Presentations to Parks & Recreation Commission:

- June 14, 2017
- October 10, 2017
- November 8, 2017
- December 13, 2017
- July 10, 2019
- August 14, 2019
- September 11, 2019
- November 12, 2019

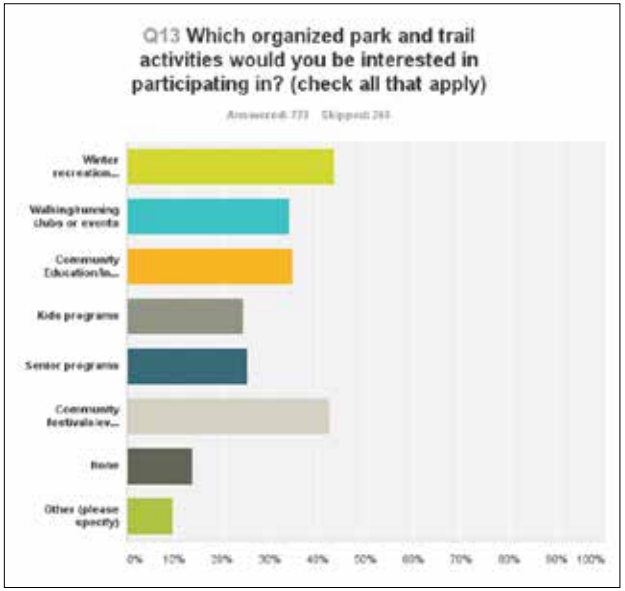


Figure1.29 Sample Question from Online Survey

Figure1.27 Stakeholder Workshop, January 2017

Figure1.28 City Presentation, January 2017

Public Meetings

Two public meetings were held during the planning process. The first was held on November 15, 2016 and attended by approximately 60 people. At the first meeting the City shared the scope of the Plan, and options currently being studied by the design team. The second meeting was held on June 13, 2017. Nearly 100 people attended the meeting where City staff shared the recommended trail extension alignment and other riverfront improvements.

Online Survey

The City administered a voluntary online survey from January 9th-26th, 2017. It featured 29 questions and had 988 responses. The survey was developed by LHB and administered through the City of Duluth's website. The findings from the survey helped direct the development of the Plan recommendations.

Randomly sampled survey of the 5th District of Duluth

Telephone interviews were conducted with 440 adult residents of Council District 5, Precincts 28 – 34 in Duluth, Minnesota completed between February 3 and February 5, 2017. The survey was developed and administered by Zenith Research Group.

Figure1.30 City staff site tour, September 2016

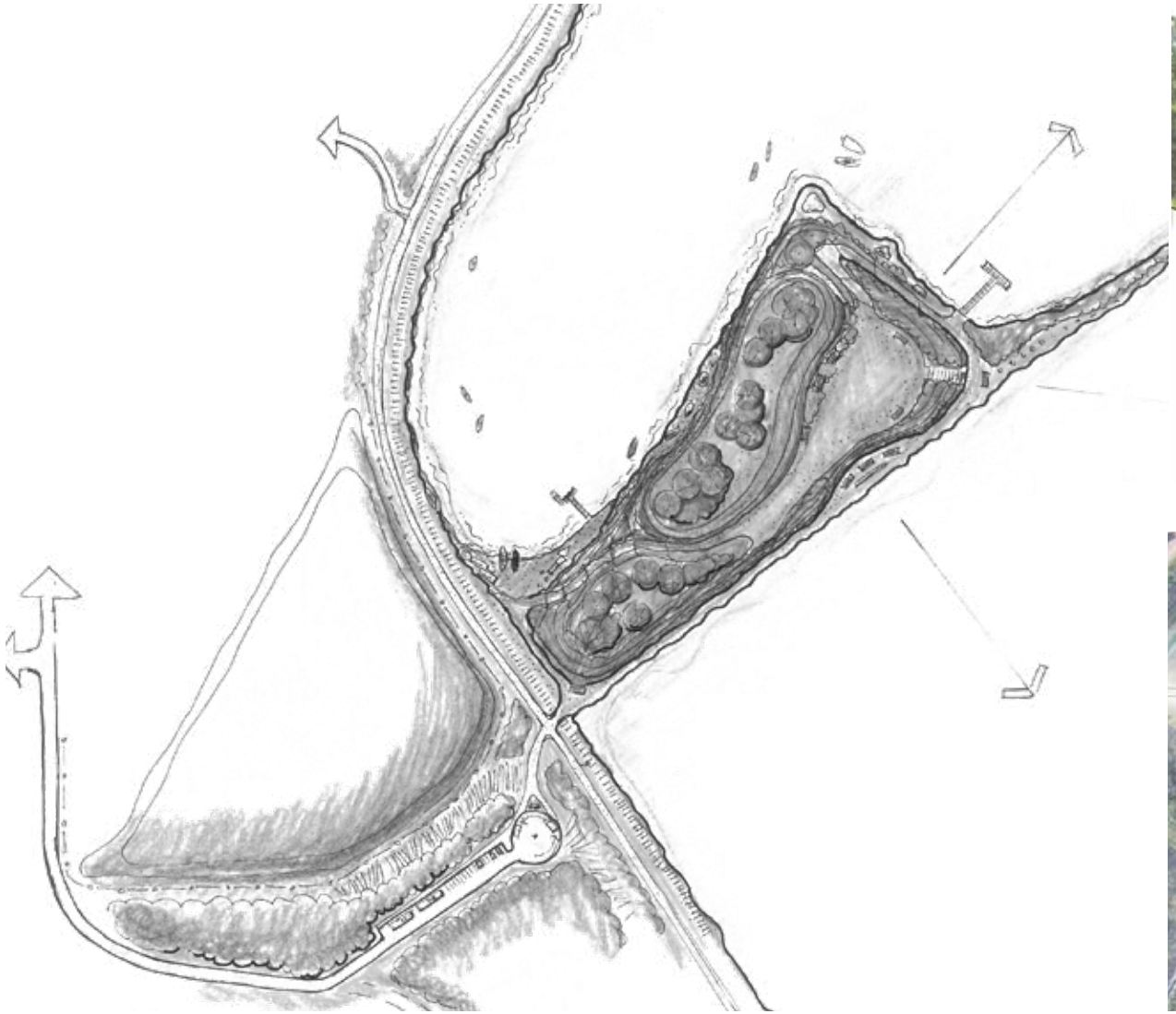
Figure1.31 City staff site tour, January 2017

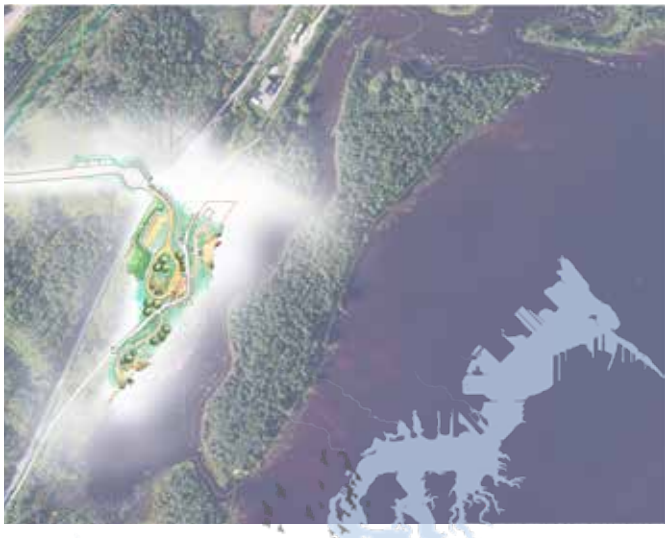
Mud Lake Causeway Alternatives Analysis

In order to analyze the feasibility and potential effects of various alternative designs for the Mud Lake section, a team of natural resource managers, ecologists, and biologist associated with the AOC, examined five conceptual restoration alternatives. The Minnesota Department of Natural Resources (DNR) and the US Environmental Protection Agency Mid-Continent Ecology Division led the process. The alternatives compared habitat and human service metrics to evaluate the benefits and trade-offs between the options. The studied alternatives were based on designs established over the past several years, including the 2017 Mud Lake Restoration Plan, focused on restoring habitat function and values at Mud Lake. An All-Commission Mud Lake Workshop was also held on May 30, 2019. The results helped inform the recommendations found later in this Plan. A detailed summary of the study can be found in the Appendix.

Ground Truth Process

Duluth planning staff and the design team led a ground truthing process to identify and confirm various trail segment feasibilities. Over a dozen on-sight visits took place during the process. The City also sought additional technical assistance from consultants for portions of the trail along Segment 1 and Segment 2. The consultant findings were used to further study alignment and cost options in particularly difficult areas.





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05 MASTER PLAN DEVELOPMENT

Master Plan Development

Chapter Overview:
This chapter is intended to give an overview of planning and site programming, typical trail development and design standards, preliminary cost comparisons, and a results summary from the public involvement.

Based on original project goals, as well as stakeholder and public input, the development of preliminary concepts and design strives to accomplish the following:

- Extend and improve the Western Waterfront Trail as cited in the 1979 City Plan.
- Re-brand the Western Waterfront Trail as a heritage trail that celebrates and interprets the rich culture and natural heritage of the corridor.
- Develop potential new linear park and river access sites at key locations.
- Develop potential new non-motorized, watercraft launches at Munger Landing, Boy Scout Landing, and Perch Lake.
- Decide the future use of the City-owned riverfront.
- Create synergy between the Water Trail, the Trail, and the City-owned rail.

Trail Interpretation Plan

As part of the stakeholder workshop and public input process, the design team gathered valuable information on trail character definition and future interpretation ideas. **This Plan recommends that the City conduct a future interpretation planning process to clearly define the specific details of interpretation along the Trail and linear park expansion project.** The process will bring together stakeholders to develop significant common themes and to determine how best to implement them. The following pages include ideal qualities and characteristics that the community would like to see incorporated into the future Trail and are helpful in the early formulation of the Plan.

Heritage

What does heritage mean to you?

Lineage: connection through time

Change over time: from indigenous land use to heavy industrial to present

Values and customs of the past

Valued objects and qualities that have been passed down from previous generations

Unique Features of the Region

- Cultural importance to Anishinabe people.
- Birding and fishing along the river.
- Connection to Lake Superior as the headwaters and Great Lakes.
- Northern port cities - unique with both Minnesota and Wisconsin border.
- Geographical significance of Sawtooth Mountains/Canadian Shield.
- Duluth watersheds: streams, tributaries, and wetlands.

Key Stories to Celebrate

- The river is the largest tributary to Lake Superior and the estuary is the largest freshwater estuary in the USA.
- Urban development and how it has affected the river, flooding and damming.
- Ancestral and contemporary stories of the indigenous people.
- Industrial development: railroads, ship building industry, and US Steel beginnings.
- Fishing; the revival of sturgeon and whitefish.
- The forest and vegetative changes, including significance of wild rice.

- Feature area as a hub, a crossroads, historically and for the future as well.
- Use recreation as a catalyst - has the power to bring people together.
- One river, many stories.
- Establishment of borough-type neighborhoods, company towns, nestled into the landscape.
- Investments in restoration of aquatic habitat and remediation of contaminated sediments.

Strategies for Implementation

- Focus interpretation at specific and key locations.
- Have a variety of interpretation features, varying from traditional story-telling panels, scenic overlooks for personal reflection, to local public art and living history.
- Include a wide span of interpretive themes, ranging from the ecological richness of the estuary, history of the railroad, spiritual significance of certain namesakes to present clean-up efforts.
- Emphasis on celebrating Anishinabe history - recognizing the Anishinabe people are still living here, practicing traditions and reinvigorating language and culture.

Honoring the Heritage of the Area

The City of Duluth partnered with the Fond du Lac Band of Lake Superior Chippewa to determine a dual-name for the Trail.

"Waabizheshikana"

The Marten Trail

Significance of The Marten Clan

The significance of the Waabizheshikana naming comes from the second edition of "History of the Ojibway People" by William W. Warren. In the book, the author states:

"Soon after the above occurrence, the Ojibways pressed up the lake shore, and Wa-me-gis-ug-o, a daring and fearless hunter, obtained a firm footing and pitched his wigwam permanently at Fond du Lac, or Wi-a-quah-ke-che-gume-eng. He belonged to the Marten Totem family, and the present respected chiefs of that now important village, Shin-goob and Nug-aun-ub, are his direct descendants. Many families of his people followed the example of this pioneer, and erecting their wigwams on the islands of the St. Louis River, near its outlet into the lake, for greater security, they manfully held out against the numerous attacks of the fierce Dakotas, whose villages were but two days' march toward the south on the St. Croix River, and the west, at Sandy Lake."

The proposed Trail intersects historic trails along the river. The Ojibway made use of existing portages and trails in the area so the name Waabizheshikana (Marten trail) is meant to honor the Marten clan for their establishment of a foothold on the estuary, as well as for the leadership of the hereditary chiefs from the Marten clan as wthey guided the path of the Fond du Lac people through interactions with fur traders and the US Government in treaty making.

Interpreting the Trail

The City is initiating a separate interpretation plan to develop the narrative themes and implementation of story-telling along the Trail.

Accessibility

Providing an accessible route that meets ADA accessibility guidelines for all users along the Trail is a primary goal for the City. An accessible route is defined as a pathway specifically designed to provide access for individuals with disabilities, including those using wheelchairs or mobility devices. Although detailed grading design has not occurred yet for the trail segments, the City is committed to making all trail segments and public access sites accessible, if at all feasible. Should existing terrain and site constraints prevent a 5% minimum slope to occur, the City will then adhere to ABA universal design standards for trail routes, allowing an 8.3% slope to occur for short distances. The City will continue to collaborate with local accessibility partners, such as Wheels on Trails and the Commission on Disabilities, for further input on accessibility implementation strategies.

Trail Design Standards

Design standards were developed with user safety, environmental protection, universal access, cost, and maintenance in mind. Those design standards are as follows:

- The trail will be surfaced with a crushed stone material that meets accessibility requirements of "firm and stable". (Preferably limestone to match existing trail condition).
- The trail will be 8 feet wide with 1 foot shoulders for a total width of 10 feet to match existing segments of the trail.
- The City will meet the accessibility standards as set forth in the ADA/ABA accessibility standards for recreational trails. (see Accessibility Section for details)
- This plan will not recommend the installation of lighting along the trail. Lighting at trailheads and parking areas will be site specific and the necessity for such lighting determined through final site design on a case-by-case basis.
- The trail will be open to pedestrians, bicyclists, cross country skiers, and snowshoers.
- The trail will not be open to equestrians or motorized vehicles. (ATV's, motorbikes, snowmobiles, etc.)
- Public access to the St. Louis River will be supported and encouraged at designated locations only.
- Screening of the trail from adjacent private residents may be necessary. Location of screening, type and extent will be determined during the design process and coordination with homeowners.

Per the Manual on Traffic Control Devices (MUTCD): The dynamic envelope is the clearance required for the train and its cargo overhang due to any combination of loading, lateral motion, or suspension failure, including the area swept by a turning train.

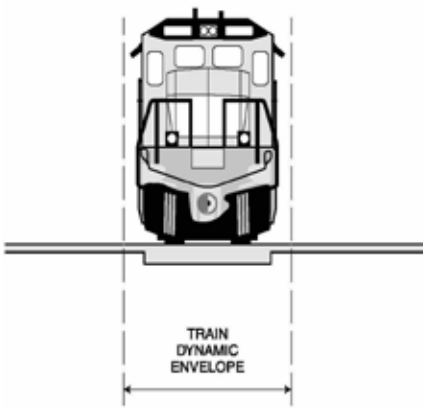


Figure 9. Dynamic enelope delineation (MUTCD Note: there are no dimensions given in MUTCD)

Dynamic Envelope Image by ALTA Planning + Design, Inc

Tight to Shoreline Condition

Trail Segments 1 and 3 may only be located in a narrow corridor of land between the active Lake Superior and Mississippi Railroad track and the estuary. To guide trail design in these "tight to shoreline conditions", the team developed a set of rail-with-trail design standards intended to balance the following goals:

1. Retaining the rail line.
2. Limiting trail construction costs to what the City can realistically afford.
3. Foster access to and enjoyment of the public riverfront.
4. Limit disruption to the excursion rail line operations.
5. Protect the safety of trail users.

Where the "tight to shoreline conditions" occur, the City and LSMR are able to modify operations that significantly mitigate safety concerns due to the following unique circumstances:

- The trail and rail line are owned by the City of Duluth.
- The nonprofit railroad operator has agreed to reduce speed as necessary to ensure safety when trail users are present. They are willing to stop the train altogether and send out a flag person to clear the line.
- There is infrequent use of the rail line with the train in operation less than 2% of the hours in a year.

In this context, the design team, in consultation with the Lake Superior and Mississippi Railroad, developed the following rail-with-trail design standards for Segments 1 and 3:

1. Strive to locate the trail 15 feet from the centerline of the railroad track whenever funding and regulatory restrictions permit.
2. Unless site-specific circumstances dictate otherwise, do not place fencing or plantings between the rail and the trail.
3. Strive to maintain a trail width of 8 feet with 1 foot shoulders whenever funding and regulatory restrictions permit.
4. When necessary to make trail construction possible, the separation between rail line and trail may be reduced to as little as 8.5 feet, measured from the centerline of the rail, without mandating reduced speed limits or unusual rail line safety procedures.
5. When necessary to make trail construction possible, the trail separation may be reduced to 4.5 feet, measured from the centerline of the rail line. This is the minimum clearance necessary for the engine and cars from the edge of the trail.
6. The width of the trail may be reduced to as little as 5.5 feet provided that the train comes to a complete stop before such sections and sends out a flag person to ensure the safety of any trail users.
7. No fixed object, structure, bridge or tunnel may be within 8.5 feet from the centerline of the track .

The lease agreement between the City of Duluth and the Lake Superior and Mississippi Railroad will be amended to incorporate requirements under the described circumstance to reduce speed, stop, send out a flag person, and/or take other unusual measures to ensure the safety of trail users.

Design Considerations - Cultural Resources

Culturally sensitive lands

The City acknowledges there is a rich history and ever-present connection between the river and indigenous people of this region. As we proceed into the design phase of the Trail and water access improvements, the City will work with the affiliated tribes to identify potentially cultural sensitive areas and work together to determine the level of examination necessary to proceed with new recreational facilities.

Programming for Public Access and Linear Park Sites

In addition to interpretative ideas, the stakeholders and general public provided feedback on how they envisioned the trail, linear park, and public access sites to look and feel. The design team facilitated several group exercises that addressed site programming and user experience. Recommendations include:

- **True multi-use trail and nature paths.** Meet the needs of a variety of users. Incorporate loops or spurs that provide different experiences, if possible.
- **Points of interest with interpretative signage.** Design a natural winding trail with key scenic overlooks creating upland views, along with river's edge experience.

Figure1.32 Typical trail sections illustrating spatial dimensions

- **Keep sites wild with natural feel.** Site furnishings and materials should be made out of natural, local materials.
- **Parking.** Include additional or small parking lots at trailheads for five or more vehicles.
- **Space for shuttles/large trailers.** Drop off area close to water is ideal, with long-term parking further away if space is limited.
- **Multi-use gathering space.** Provide outdoor area with shade for family groups, educational programming, etc.
- **Accessible non-motorized boat launches.** See page 46 for examples.
- **Toilet facilities and/or changing enclosure.** Include at least two stalls and one for family/ group changing. Permanent versus portable to be determined based on site constraints, budget, and long-term maintenance.
- **Staging area for larger groups (outfitting/ education).** With implementation of water trail, a flat staging area for outfitting and trek preparation will be critical.
- **Temporary concessions.** To be used for seasonal events, such as fishing opener, race tournaments, festivals. Coordination with utilities and City rental to be further programmed.

- **Ecological interpretation.** Tell the story of the area's flora and fauna through visual interpretative panels.
- **Pollinator/restoration plantings.** Where invasive species are problematic, restore with native pollinator plantings for increased bio-diversity. Feature stormwater management best practices as well.
- **Formal seating. Benches, picnic tables, council ring, seat boulders.** Provide trail users with a variety of seating options, benches along the trail, and tables for picnicking in both sun and shade.
- **Field/open lawn space.** Open green space is limited in the St. Louis River Corridor. Provide a field or informal lawn space where spontaneous recreation could occur (frisbee, playing catch, walking dogs).
- **Fishing piers/docks.** With the rebound of healthy fish habitat, fishing is more popular than ever.
- **Swimming beach.** Very little opportunity to swim in western Duluth. If sandy shoreline allows, designate small beach area for swimming (no lifeguard on duty).
- **Sheltered bays for beginner paddlers.** With the anticipated increase in the Water Trail use, designate sheltered areas near access sites for beginner paddlers.
- **Create opportunities for rail-trail-water experiences**. Encourage LSMR and outfitters to work together to provide a unique Duluth experience.

Figure1.33 Exploring Trail Options Charrette

Design Best Practices for Water Access Sites

During the stakeholder and public meetings, many examples of accessible launch types were explored and discussed. To the right is a summary of best practices and launch types that the Plan will be implementing.

**National Park Service Report, 'Long Lasting Launches,' 2004*

Best Practices*

For accessibility

- Accessible to all paddlers: slopes should not exceed 8.33%.
- Between nine inches and two-feet from highest expected water level, at least five-feet wide, preferably six to twelve feet; at least 25 feet in length.
- Handrails or other support structures are helpful.
- Located in areas without heavy flow, erosion, exposure to elements, heavy boat traffic or fragile riparian habitats .

For best-suited launch type

- Choose most suitable type of launch for water body, climate and ecological factors.

To be cost effective and durable

- Existing natural sites are preferable, though not always durable and require reinforcement over time.

To be environmentally friendly

- Low impact design and non-toxic materials protect water quality, vegetation, and riparian habitats.

Planning Process Results

The following is a summary of what we heard from the general public through the community engagement process as well from technical design analyses. Design decisions were made based on the findings.

What We Heard...

The City conducted two surveys: a randomly sampled phone survey administered only to residents of far western Duluth, and an online convenience survey that anyone could complete. The objectives of the surveys were to invite participation and define priorities of the Trail, linear park and public access sites, including determining existing use and activity type along the corridor, identifying the current rail experience values, distinguishing unique and culturally significant features to celebrate, and determining priority site improvements preferred at each access point. The online survey had 988 respondents, while the randomly selected survey polled 444 residents from the 5th District of Duluth.

Online Survey

Results are categorized into four topic areas:

1. USE (Online Survey)

• More than 50% of respondents stated that their use of the existing trail was limited to once a month to once a year.

• 40% of respondents use the existing LSMR excursion train once a year.

• More than 30% of respondents have never used one of the existing river public access points.

• Over 70% of respondents prefer walking as a primary activity on the trail followed by bird watching at 36%.

• The majority of respondents prefer to honor and celebrate the St. Louis River Estuary, its natural resources, and local ecology as a primary features.

2. VALUES (Online Survey)

• Nearly 75% of respondents value the scenic enjoyment of the surrounding landscape as a primary feature of the current rail experience.

• Respondents prioritized the guiding principles in the following order:

1st - Unique Duluth experience
2nd- Environmentally sustainable
3rd - Community connection
4th - Equitable experience
5th - Technically & economically feasible
6th - Promote economic development

3. ELEMENTS/FEATURES/ACTIVITIES (Online Survey)

• Public access to the river shoreline, historic and natural resource implementation, and signage and wayfinding ranked as the highest priority trail elements.

• Public space, parking, and picnic area ranked the highest as adjacent priority trail features for implementation.

• Trailhead amenities ranked the highest for improvements that would add greatest value to the trail experience.

• Winter recreation opportunities and community festivals and events ranked highest as park and trail activities were the activities of greatest interest to respondents..

4. PRIORITY IMPROVEMENT PREFERENCES (Online Survey)

• Kayak and canoe put-in sites ranked highest for Spirit Landing and Munger Landing site improvements followed by trailhead amenities.

• Kayak and canoe put-in sites ranked highest for Boy Scout Landing site improvements closely followed by ticketing and boarding for rail operations and trailhead amenities.

• Kayak and canoe put-in sites ranked highest for Perch Lake site improvements closely followed by picnic shelter/overlook area.

• Kayak and canoe put-in sites ranked highest for Slag Point site improvements closely followed historic and natural resource interpretation and restore shoreline with shore fishing.

Randomly Sampled Phone Survey of Far Western Duluth

VALUES & USES
(Randomly Sampled Phone Survey)

RAIL

• 46% of all respondents identified the LSMR as being somewhat important to them.

• 61% of all respondents said the LSMR was of importance to the entire community.

• 11% of all respondents use the rail at least four times per year.

• Rail runs weekends June through October.

TRAIL

• 64% of all respondents considered the Western Waterfront Trail important to them personally.

• 74% of all respondents said the Western Waterfront Trail was important to the entire community.

• 48% of all respondents use the existing trail at least four times per year.

• Existing trail is open year-round.

• 83% of the respondents were supportive of extending the trail.

GUIDING PRINCIPLES
(Randomly Sampled Phone Survey)

When asked to prioritize the guiding principles, respondents were more likely to support options to develop a plan that is:

1. Environmentally sustainable.

2. Technically & economically feasible.

3. Creating an accessible riverfront for as many people as possible regardless of income and physical ability.

4. Develop a plan that preserves historically significant resources.

Rail or Trail Preferences

Survey Question 6: "As one option, the City has been seeking to find a way to extend the trail without having to remove the City-owned rail line between Smithville and Gary/New Duluth that is used by the Lake Superior and Mississippi Railroad for their seasonal passenger train trips. If, for any reason, extending the trail while keeping the railroad proves not to be feasible, the City may have to choose one of the other – rail or trail".

RESPONSE	TRAIL	RAIL	NO PREFERENCE
OVERALL PERCENT	54%	32%	14%
55807	52%	31%	17%
55808	59%	31%	10%

Trail Cost Estimates

The cost estimates are based on the design team's trail construction experience, professional qualifications, and knowledge of the site. Estimates for Segment 3 and 7 should be considered preliminary. Estimates for the re-route of the existing Trail and Segments One and Two are based on an additional stage of site examination and predesign work.

Assumptions in determining opinion of cost included:

1. Contingencies are included as provisions to cover unforeseen circumstances that would affect the overall construction costs.

2. Estimates do not include costs for survey, engineering design, environmental analysis, permitting, or construction administration/site observation.

3. Topographic survey and geotechnical information were not available at the time of the estimates.

4. Sensitive area impacts refers to impacts to wetlands or riverbank. These areas will require exhaustive permitting and may require mitigation, special plantings, slope stabilization, etc.

5. Significant drainage crossings refer to culverts or pedestrian bridges to provide crossing of drainage ways. Minor drainage modifications are included in LIN FT unit prices.

What We Discovered...

The City of Duluth chose to site the Trail on each segment as close to the shoreline as environmental protection standards, trail construction costs, and preservation of the rail line would permit. In practice, that meant siting the Trail right along the water on Segments 1, 3, and 6 and further from the water on Segments 2, 4, 5, and 7.

Decisions Made based on Findings...

After thorough study and investigation into potential trail alignments, the City of Duluth will proceed with a trail with rail condition. The decision is grounded in the Guiding Principles set forth at the beginning of the planning process. The Guiding Principles provided a lens to study potential impacts of each trail alignment option and work to achieve balance amongst community values. The City used this framework when engaging stakeholders and subject-experts in compiling and studying data to inform the decision-making process. Upon review of all data and community feedback, the City determined that a trail alignment with preservation of the full rail provides the greatest amount of public access to the river and accessible user options, while still honoring the cultural and environmental values of the community.

Accessible public access to the river will be further met by improving three existing water access sites, and developing three additional public access sites along the river's edge. These sites dually serve visitors who are recreating on the trail and on the water and provide important trailhead amenities that enhance the user experience.

WAABIZHESHIKANA | THE MARTEN TRAIL

06 IMPLEMENTATION AND SUSTAINABILITY

Recommendations

Overall Trail and Park Recommendations

The following chapter illustrates trail and park recommendations and preliminary opinions of cost based on the project's guiding principles, community input, and design decisions that came out of the master planning process.

Next steps of the project will include further site and trail detailed design, additional technical studies, securing funding, land acquisitions and easements, as well as developing an operations and management plan for long term maintenance and life-cycle assessment of the linear parks and trail system.

Implementation and Phasing

This master plan serves as a framework to which future park and trail development can be forecasted and planned. As funding becomes available and partnerships are formed, trail segments and public access amenities will be designed, constructed, and implemented. Below is an implementation timeline that illustrates anticipated phasing for the full realization of the Plan.

Land Acquisition and Easements

Although the City owns most of the land within the project limits, they will need to secure easements or acquire land for a portion of Segment 4 and easements from private property owners for Segments 6 and 7.

Management and Operations

It is anticipated that the City of Duluth Parks will be the primary operator and manager for the Trail. Further work will need to occur with the Parks Commission and City Council to establish an ongoing annual budget and reserve operating funds for park amenities and trail maintenance.

Maintenance activities for the public access, park amenities and Trail will include but are not limited to mowing, invasive weed removal, parking lot snow removal, trash removal, tree clearing, trail repair, bridge/culvert repair, sign and site furnishings maintenance.

Refer to page 75 for a detailed maintenance plan.

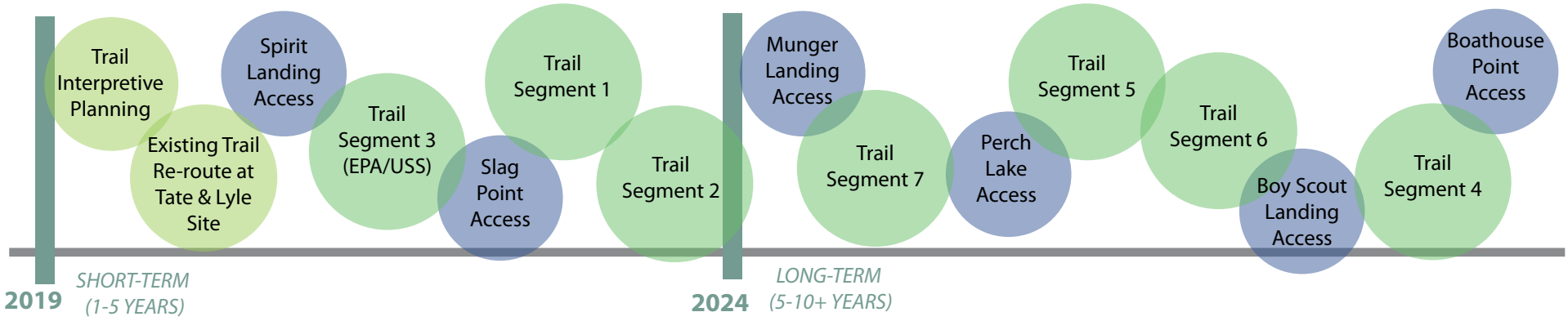


Figure1.34 Implementation Timeline

City and LSMR Roles and Responsibilities

The City and the LSMR currently have a lease agreement that allows the LSMR to utilize the City-owned railroad for seasonal tourist excursions.

Maintenance of Trackage: LSMR has exclusive responsibility for the upkeep and maintenance of all trackage, ballast, trestles, bridges, switches, and other rail facilities and infrastructure. In the performance of the upkeep and maintenance, LSMR is responsible to comply with all local, state, and federal legislation and regulations and obtain all necessary permits and licenses required before any work is performed.

City Warranty: Under the lease agreement, the City makes no representation that the licensed property is suitable for any particular purpose or specific uses and LSMR accepts the licensed property in an "as-is" condition without representations or warranties of any kind. The City has no duty to maintain or repair the licensed property.

Public Access: The LSMR's use of the City-owned railroad may in no way limit or restrict the City's or the public's use of the property.

In the undesirable event that LSMR ceases operation at some future date, the City will engage the Parks Commission, the Historic Preservation Commission, the City Council, stakeholders, and the community at large to determine how the City-owned trackage and rail corridor will be used and managed.

Operating Hours, Safety, and Signage

The City of Duluth Parks operating hours are from 6am-12am daily. Park ordinances, regulations, and trail rules will be posted at key trailhead locations. The City of Duluth is in the process of implementing a Citywide wayfinding and signage plan for better directional and general information.

The Duluth Police Department will be responsible for security along the trail and within the water access sites.

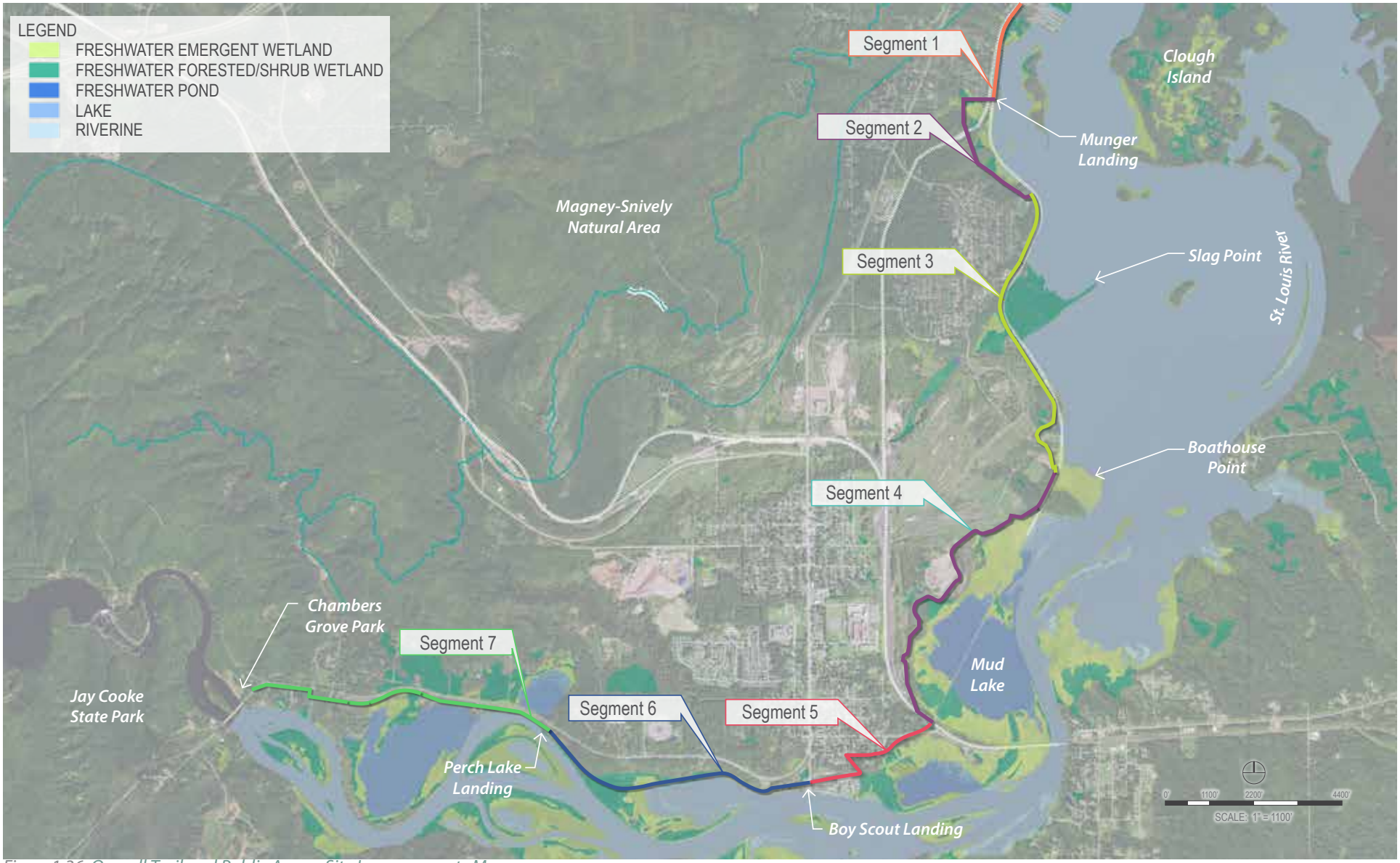


Figure1.36 Overall Trail and Public Access Site Improvements Map

EXISTING TRAIL
Recommendations

The Plan recommends that the City incrementally improve the accessibility of the Trail itself to meet or approximate ADA standards as closely as possible, increase the quality of trailheads, and develop an associated Indian Point campground mini-master plan.

EXISTING TRAIL RE-ROUTE (AT TATE & LYLE SITE)
Analysis and Recommendations

The Plan studied various trail re-route options around the Tate & Lyle site for better public safety. The recommendation for this existing segment is to re-route the Trail on the west side of the railroad tracks on City property, utilizing an old rail bed corridor. This option was deemed the most feasible and economic alternative. A shoreline alternative was not selected due to significant wetland impacts, prohibitive cost of boardwalk, multiple drainage crossings, and restricted property access through the Tate & Lyle controlled site.

Design considerations that will need to be addressed in the next phase include maintaining a 50'minimum distance from the BN rail, sloped topography and close proximity to existing residential properties.

Inland Route (1,500 LF)

Figure1.38 View of wooded corridor for proposed trail re-alignment on old rail bed, looking east.

Figure1.37 Existing trail reroute

TRAIL EXTENSION SEGMENT 1: SPRING STREET TO CLYDE AVENUE

Traditional Trail (735 LF)


Spring Street


Clyde Ave

Wetland Encroachment (required)

Tight to Shoreline Embankment

Drainage Crossings (2 Total) *

Total Distance Segment 1: 2,700 LF (.50 mile)

Analysis and Recommendations

Segment 1 is a segment of the trail that has a "tight to shoreline condition" and goes between the rail line and the estuary from Spring Street to Clyde Avenue. Because of this condition, the City engaged a transportation specialist for additional technical expertise in examining options for a trail extension through this "tight to shoreline condition".

This Plan assumes there will be adequate room to place the trail between the shoreline and rail line without crossing the rail line or encroaching on the Ordinary High Water Level of the estuary. Throughout this segment, there are locations of unstable shoreline that are actively eroding into the water threatening the stability of the rail line and space available for the trail. These shoreline locations may require stabilization to prevent further erosion.

This Plan assumes Segment 1 will have areas where the trail will be as close to the rail line as 4.5 feet from

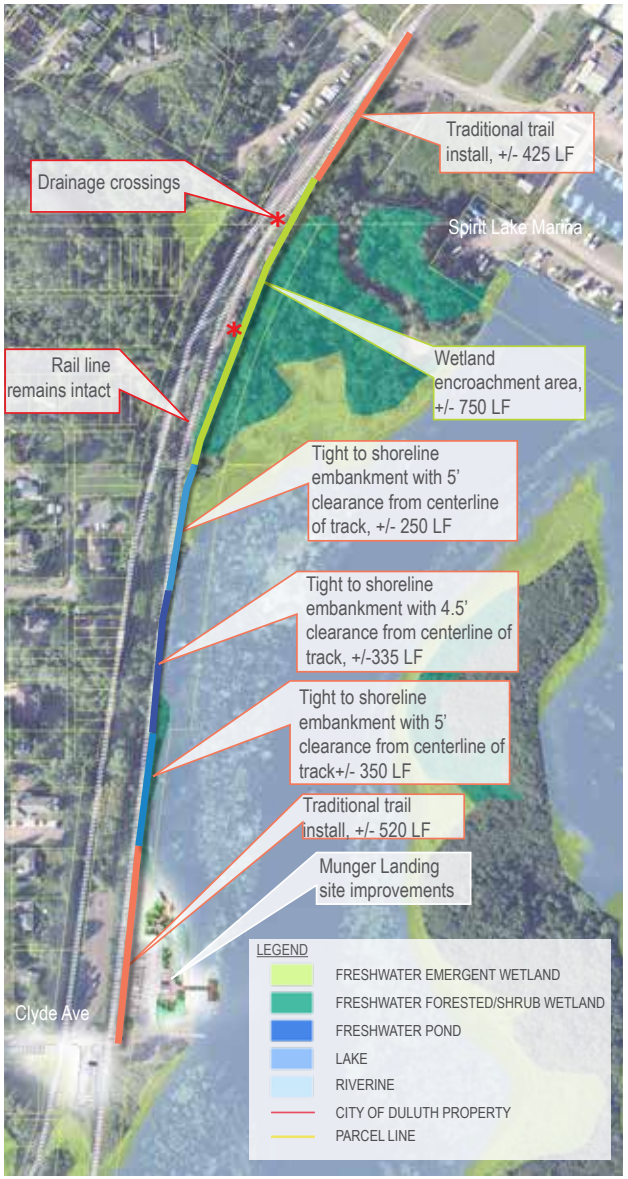


Figure1.40 Segment 1 trail

TRAIL EXTENSION SEGMENT 1 (CONTINUED):

the centerline and the width of the trail reduced to as little as 5.5 feet. This scenario assumes that there is enough room to accommodate a trail meeting the minimum requirements as set forth above.

In the event that the trail must encroach on the Ordinary High Water Level of the estuary the City will collaborate with the DNR and other necessary regulating governmental agencies on efforts to restore the eroded shoreline along this stretch of the river. The City will look for opportunities to increase bank width and prevent displacement of the rail line and proposed trail due to present and active erosion issues.

In the event that the trail must encroach on the open water of the river and the necessary permitting cannot be secured, the rail line would have to be moved inland to accommodate the trail. This would happen where the "tight to shoreline condition" occurs. Once clear of the "tight to shoreline condition", the rail re-alignment would taper back into the existing rail line and the new trail would run parallel on the east side of the trail to Munger landing.

This Plan has identified a minimum of two viewing decks, as an optional amenity, that could be installed to provide additional clearance and refuge for trail users while also providing views out into the river. These amenities are shown in Figure 1.41 to the right.

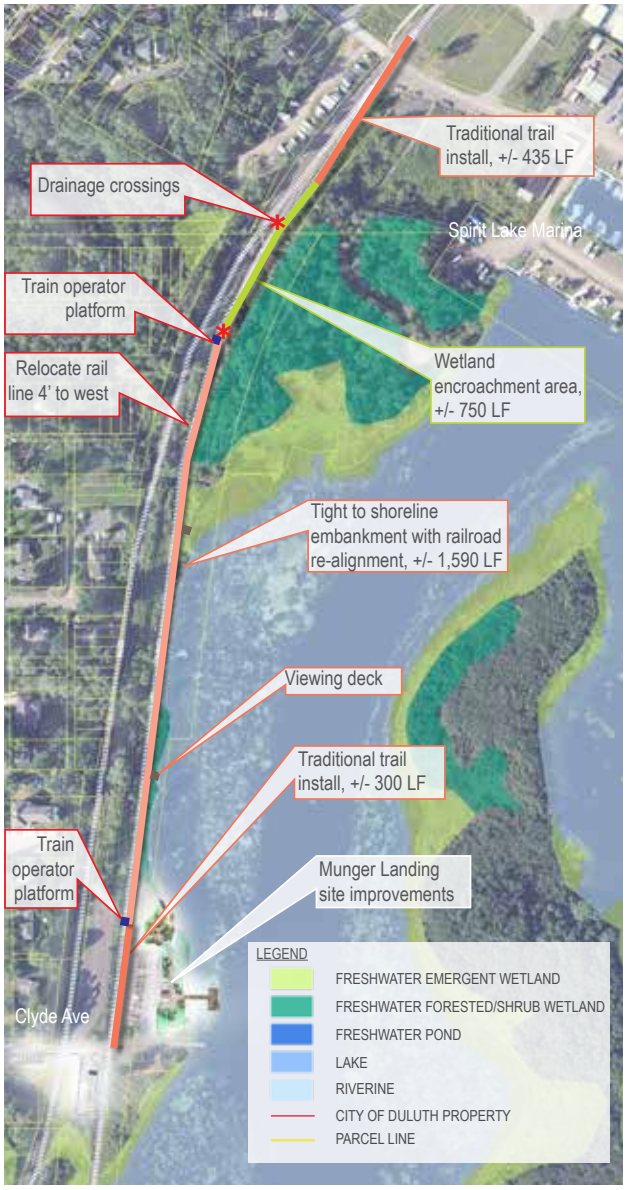


Figure1.41 Segment 1 trail - Railroad re-alignment

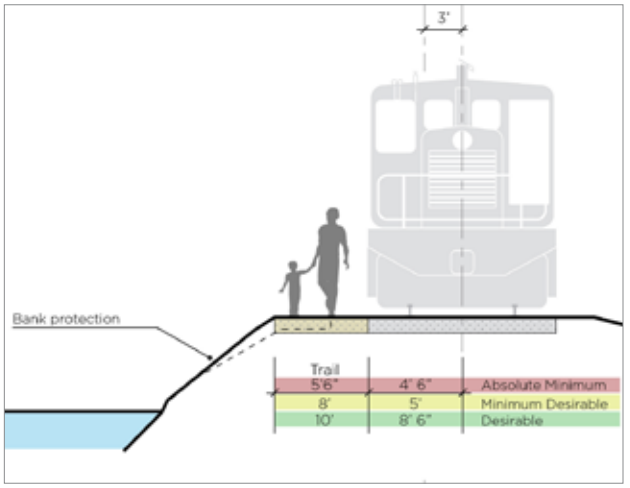


Figure1.42 Proposed rail + trail section provided by Alta Planning

TRAIL EXTENSION SEGMENT 2: MUNGER LANDING TO BLACKMER PARK

Analysis and Recommendations

Just south of Clyde Avenue, the recommended route goes inland following the south side of the road gradually veering away as it connects to Smithville Park. From Smithville Park, the Trail will follow an already tree-cleared and buried sanitary sewer mainline that has been used as an informal footpath for years. That existing pathway crosses over Stewart Creek, a trout stream, where a significant bridge structure will be necessary.

To meet accessibility requirements, grade adjustments will be necessary on the hill coming out of the Stewart Creek valley to the south. At the top of this hill, the route will require an at-grade crossing of an abandoned BN rail line. This rail line is currently inactive and is anticipated to remain that way in the future. Once past the BN line, the Trail will again need grade adjustments to descend into a valley and traverse over the top of the sanitary sewer mainline. The mainline in this segment is turnpiked up above a wetland and is narrow in spots. Due to potential wetland impacts, a standard trail width may not be achieved here. Once past this narrow turnpiked segment, the Trail again climbs a hill that will need grade adjustments to meet accessibility requirements. At the top of the hill, the route offers an overlook spur toward the river providing 180-degree panoramic views of the estuary. From here, the alignment makes its way atop the bluff line and connects into the North end of Blackmer Park.

Traditional Trail (450 LF)

Inland Trail (3,350 LF)

*The City completed a predesign study for this segment to identify a more accurate cost for budget purposes.

Total Distance Segment 2: 3,800 LF (.72 miles)

Figure1.43 Segment 2 trail

TRAIL EXTENSION SEGMENT 3: EPA/US STEEL CLEAN UP TO BOATHOUSE POINT

Analysis and Recommendations

Trail Segment 3 will be within the EPA and US Steel 1.72 mile clean-up limits. The existing rail bed is planned to be used for site access and a temporary construction road will be installed, doubling the width of the rail corridor. In addition, Slag Point will be converted into a contained disposal facility (CDF) which will change the look and use of this unique land formation. A shallow sheltered bay is planned for the north side of Slag Point, providing more open water opportunity at this location. The City has been working with the EPA and MPCA agencies to formalize a procedure that identifies how the rail corridor, shoreline, and Slag Point should be restored after the clean-up efforts are complete.

Recommendations for this segment call for re-installing the rail line along the water's edge and placing the Trail inland of the rail with a separation from rail centerline of at least 8.5 feet. Further south just before Wire Mill Pond, the Trail would then veer inland and travel around the Pond, while the rail line would cross open water on a restored bridge.

Besides Segment 1, this is the only portion of the project where a close proximity rail and trail condition would occur, providing a distinctive experience for both user groups.

Trail on EPA Access Road (6,397 LF)

Inland Trail around Wire Mill Pond (2,688 LF)

Two neighborhood connector paths will provide for easy access for adjacent Morgan Park residents, who have had limited access to the waterfront in the past.

Recommendations for Slag Point proposed improvements are located on page 70.

Total Distance, Segment 3: 9,085 LF (1.72 miles)

Figure1.44 Segment 3 trail

TRAIL EXTENSION SEGMENT 4: BOATHOUSE POINT TO E MCCUEN ST

Analysis and Recommendations

Segment 4 provides spectacular user views, with a 1.4 mile trail segment that will run along the bluff overlooking Mud Lake and the river landscape below.

Beginning at Boathouse Point, the Trail begins to head inland and climbs uphill into existing US Steel property. From the highest bluff, which is nearly sixty feet above the water, panoramic views are ever-present featuring Mud Lake, the causeway, and the St. Louis River Estuary in the background. The Trail will then wind inland and downward through aspen forests crossing a series of drainage ways. Grade adjustments will likely be needed to meet ABA/ ADA standards and bridge or culvert structures will be necessary to make the ravine crossings.

The Trail outlets onto East McCuen Street and runs parallel with the road for a short span before meeting up with the rail line again.

For information on the Mud Lake Causeway Alternatives Analysis & Restoration Plan, see Supporting Documents.

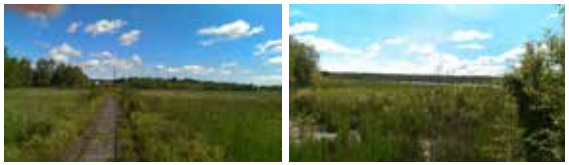
Inland Trail (7,392 LF)

Total Distance, Segment 4: 7,392 LF (1.4 miles)

Figure1.45 Segment 4 trail

TRAIL EXTENSION SEGMENT 5: EAST MCCUEN STREET TO BOY SCOUT LANDING

Inland Trail (3,590 LF)



Analysis and Recommendations

Recommendations for Segment 5 include an inland alignment for the entire 0.68 mile length. There may be technical difficulties complying with ADA accessibility through this area. because of steep slopes on the inland hillside. The exact route through existing public street networks will require further exploration. There are several opportunities for local neighborhood connections as Segment 5 moves into the design phase.

At the end of Segment 5, the Trail connects to existing Boy Scout Landing public water access, where there is existing parking and recreational development.

Total Distance, Segment 5: 3,590 LF (.68 miles)

Figure1.46 Segment 5 trail

TRAIL EXTENSION SEGMENT 6: BOY SCOUT LANDING TO PERCH LAKE ACCESS

Traditional Trail (7,200 LF)

Total Distance, Segment 6: 7,200 LF (1.36 miles)

Analysis and Recommendations

Utilization of the existing old rail bed for a 1.36 mile long traditional trail installation is recommended for Segment 6. The rail line has been long removed and used as an informal footpath, making this option most affordable and easily implementable.

Design considerations to be addressed in the next phase include, minor grading for better drainage and slope stabilization, as the corridor is in very close promizity to the water's edge.

Figure1.47 Segment 6 trail

TRAIL EXTENSION SEGMENT 7: PERCH LAKE TO CHAMBERS GROVE

Analysis and Recommendations

The recommendation for Segment 7 trail extension is to construct a traditional trail on the southern side of Highway 23, as private ownership along the St. Louis River restricts the trail from getting any closer to the water's edge. The topography flattens out in the Fond du Lac neighborhood and floodplain conditions are present, likely causing the Trail to encroach into roadside wetlands for approximately 1,290 linear feet.

The last stretch of this segment will be constructed as part of the MnDOT led Highway 23 roadway improvements project and will consist of an 8' wide bituminous trail. The current plan is to have the trail cross Mission Creek on the north side of the highway and proceed westward to the entrance of Chambers Grove Park.

There is an opportunity for a neighborhood path to connect with Fond du Lac Park as well as a potential future connection to Perch Lake. See page 73 for Perch Lake proposed improvements.

Traditional Trail (4,130 LF)

Wetland Encroachment Trail (required)(1,290 LF)

Total Distance, Segment 7: 5,420 LF (1.03 miles)

Figure1.48 Segment 7 trail

PUBLIC WATER ACCESS SITES OVERVIEW

Recommendations

The adjacent chart and overview map on page 65 illustrate the proposed water mileage between the existing and new non-motorized access points. Implementation of three new non-motorized public water access and park sites (Spirit Landing and Slag Point) will provide better recreational opportunity for the public to access the St. Louis River Estuary, and Water Trail. Improved access will also fill in a gap between Munger Landing and Boy Scout Landing.

At each public access point, paddlers and water trail enthusiasts will have the opportunity to take a break from the sun and/or wind, use the portable toilets, stretch their bodies, fish and picnic on shore, and enjoy the scenery before venturing back onto the open water. See page 67 for trailhead amenities regarding water trail use.

Mileage between public water access points:

ACCESS POINT	MILEAGE
Grassy Point to Indian Point Campground	1.9 miles
Indian Point Campground to Spirit Landing (new)	*1.3 miles*
Spirit Landing to Munger Landing	.9 miles
Munger Landing to Slag Point (new)	*.9 miles*
Slag Point (new) to Boyscout Landing	*3.6 miles*
Boy Scout Landing to Perch Lake Landing	1.5 miles
Perch Lake Landing to Historical Park	1.7 miles
Historical Park to Chambers Grove	.3 miles

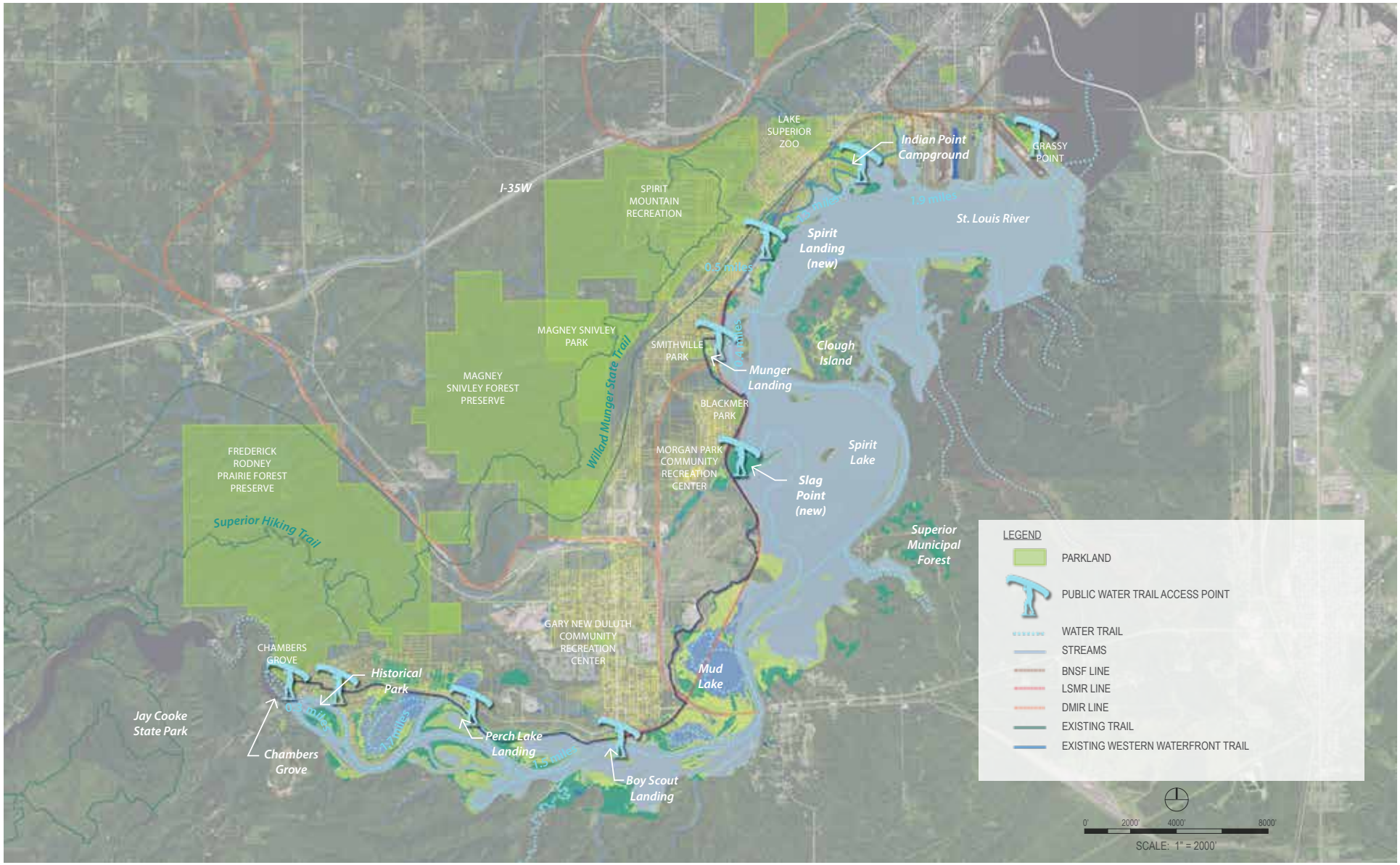


Figure1.49 Public Water Access Sites Overview Map

Recommendations

The exhibit on page 67 illustrates the existing and proposed trailheads and local trail access points. Currently, the existing trail has one trailhead location with designated parking. A second trailhead was just established in Chambers Grove Park for future trail use. The Plan recommends adding up to five new trailhead sites (Spirit Landing, Munger Landing, Slag Point, Boy Scout Landing, and Perch Lake) as well as two or more local trail access sites that would have more modest amenities.

At each trailhead location, recreational enthusiasts will have the opportunity to safely park vehicles and prepare for hiking, biking, snowshoe and/or paddling activities, use the facilities, select trail routes and points of interest on map kiosks, picnic, swim, fish, and enjoy the outdoors. Local trail access points will allow travelers to access the trail from neighborhood connectors and will provide directional signage and site furnishings such as benches, trash receptacles and places for interpretation.

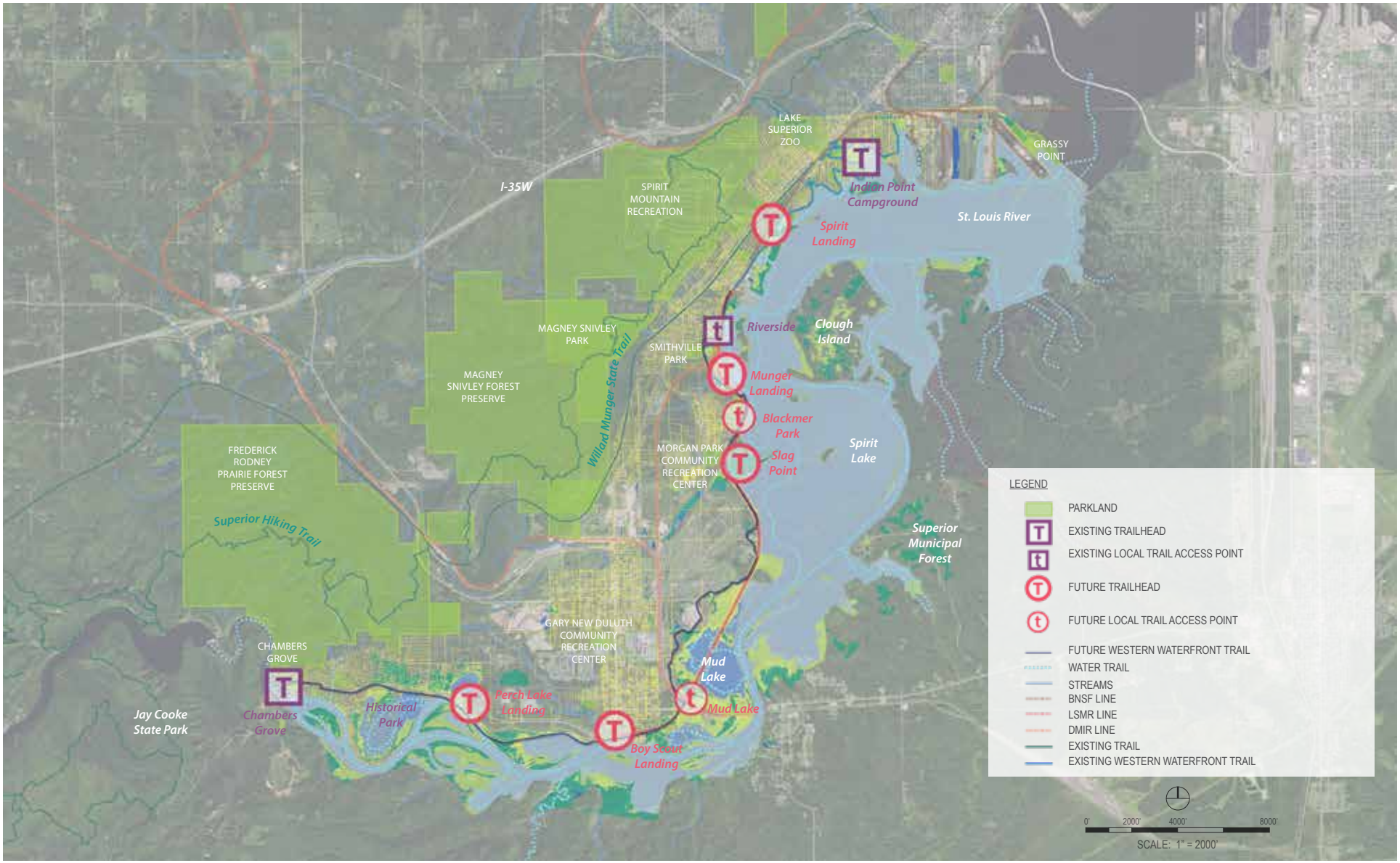


Figure1.50 Trailheads & Local Trail Access Points Overview Map

SPIRIT LANDING
PROPOSED IMPROVEMENTS

Recommendations

(New Park site)

The Spirit Landing site plan was approved by City Council on February 26, 2018. The site will include a new trailhead with directional signage, a drop-off point, and parking for ten cars and seven trailers. There will also be a portable toilet with a changing enclosure near the parking area. Near the drop-off, there will be a staging area for outfitting and group education. On the waterfront, there will be one or two beach areas; both will include shore fishing and one will include an accessible paddle sport launch. The entire project area will be completed with a landscape restoration planting.

- New trailhead with directional signage
- Drop-off and parking (10) and trailer (7)
- Portable toilet with changing enclosure
- Staging area for outfitters/group education
- Accessible paddle sport launch
- Beach access (1 or 2) with shore fishing
- Landscape restoration planting
- Work with Spirit Mountain Recreation Area and other area developments to identify opportunities for new regionally significant event staging from this location

Figure1.51 Spirit Landing site plan

- Work in partnership with the MN DNR on their on-going monitoring of sediment gathering and efforts to restore bathymetries in the protected bay between Tallus Island and the shoreline
- Restore and/or preserve adjacent lands that isn't planned for recreational development

MUNGER LANDING PROPOSED IMPROVEMENTS

Figure1.52 Munger Landing site plan

Recommendations

(Improved Public Access site)

Munger Landing will be enhanced to include a separate non-motorized boat launch, a new trailhead with directional signage, and an additional twenty parking spaces to serve trailhead users. The waterfront will have a natural sand paddle sport launch as well as an accessible boat launch added to the existing fishing pier. Near the accessible launch, there will be an outfitting staging area and a picnic area adjacent to the natural sand beach and launch area.

- New trailhead with directional signage
- Natural sand beach for paddle sport launch
- Accessible kayak launch
- Staging area for outfitting
- Picnic area
- Additional parking (20), specific for trailhead users
- City will work with the Minnesota Pollution Control Agency (MPCA) as they begin aquatic clean- up efforts

Recommendations

(New Park site)

Slag Point will have a drop-off area and 18 parking spaces, as well as a portable toilet with changing enclosure. The trailhead with directional signage will lead to a generously sized waterfront park that includes multiple picnic areas and a hiking loop. A series of interpretive and scenic overlooks will be placed along the hiking loop. An extensive beach will be on both the north and south sides of Slag Point. The northern beach will include a dock with an accessible paddle sport launch, shore fishing, and a non-motorized watercraft landing. The northeastern end of Slag Point will have a fishing pier and wetland walk.

- Trailhead with directional signage
- Accessible paddle sport launch
- Portable toilet with changing enclosure
- Drop-off area and parking (18)
- Beach/staging area and shore fishing
- Picnic and hiking loop
- Interpretive/scenic overlooks
- Work with EPA and US Steel to obtain ownership of the site after clean-up efforts, including road access for trailhead parking and usage

Figure1.53 Slag Point site plan

BOATHOUSE POINT PROPOSED IMPROVEMENTS

Figure1.54 Boathouse Point site plan

Recommendations

(New Park site)

If the City is able to purchase Boathouse Point from US Steel, the property has the potential to become an exceptionally appealing trail destination. An interpretive loop trail tracing the edge of the peninsula would offer views of Spirit Lake and Spirit Island. Interpretive signage and overlooks will feature the rich natural and cultural heritage of the site.

- Trail access point with directional signage
- Hiking loop with scenic overlooks
- Shore fishing
- Connection to future trail

BOY SCOUT LANDING PROPOSED IMPROVEMENTS

Recommendations

(Improved Public Access site)

Improvements at Boy Scout Landing will separate motor and non-motorized launch areas, include a new trailhead with directional signage, a drop-off, and additional parking (approximately 12 spaces). A portable toilet with changing enclosure will be located near the parking area. A pedestrian bridge and footpath will connect to the Trail. An accessible kayak launch will be added to the beach, and a concrete pad will be added to the parking area for seasonal concessions and event staging.

- New trailhead with directional signage
- Drop-off & additional parking (±12)
- Portable toilet with changing enclosure
- Beach access (2) with shore fishing
- Pedestrian bridge
- Accessible paddle sport launch
- Concrete pad for seasonal concessions and event staging

Figure1.55 Boy Scout Landing site plan

PERCH LAKE PROPOSED IMPROVEMENTS

Figure1.56 Perch Lake site plan

Recommendations

(Improved Public Access site)

The lower portion of Perch Lake that connects to the St. Louis River will have ADA trail access and beach access, including shore fishing. Approximately 16 additional parking spaces will be added, as well as a portable toilet and changing enclosure. The parking area will lead to a scenic overlook of the river. The area west of the culvert that connects Perch Lake to the river requires further study. If feasible, the planned improvements will shift to the west side of the culvert, which offers better accessible parking and shoreline fishing opportunities.

The upper portion of Perch Lake will be further studied as part of the DNR's AOC Perch Lake restoration project for potential recreational reuse.

- ADA trail access
- Additional parking (± 16 spaces)
- Picnic area
- Beach access with shore fishing
- Portable toilet with changing enclosure
- Scenic overlook

OPINION OF COSTS ASSOCIATED FOR TRAIL EXTENSION RECOMMENDATIONS

TRAIL SEGMENT	RECOMMENDED OPTION	
Existing Trail Re-route at Tate & Lyle		$137,600
Segment 1: Spirit Landing to Munger Landing	Rail + Trail (0.50 miles)	$602,750
Segment 2: Munger Landing to Blackmer Park*	Rail + Trail (0.72 miles)	$402,600
Segment 3: Blackmer Park to Boathouse Point (EPA/US Steel Clean-up)	Rail + Trail (1.72 miles)	By USS-EPA
Segment 4: Boathouse Point to East McCuen Street	Rail + Trail (1.40 miles)	$1,001,125
Segment 5: East McCuen Street to Boy Scout Landing	Rail + Trail (0.68 miles)	$940,410
Segment 6: Boy Scout Landing to Perch Lake Access	Trail Only (1.36 miles)	$864,000
Segment 7: Perch Lake Access to Chambers Grove	Trail Only (1.03 miles)	$921,300
CONSTRUCTION TOTAL	**$4,869,785**	
* Costs for Segment 1 & 2 reflect detailed predesign estimates.	(7.41 miles)	

Professional Opinion of Costs - Trail

The estimated costs provided above are based on preliminary designs prepared for this Plan and could vary extensively depending on results from additional analysis including but not limited to geotechnical investigation, survey data, shoreline stability, as well as design details that will be developed as part of the final design. Further on-site analysis is recommended prior to proceeding into the design phase.

The opinion of probable cost has been prepared on the basis of the design team's experience, qualifications, knowledge of the site and understanding of the project. It also takes into account constructability as well as site access challenges discussed.

Costs listed above should assist with further planning and decision-making regarding future trail extension along the St. Louis River.

TRAIL MAINTENANCE PLAN

The City is proceeding with a multi-year inventory and asset management plan in which current City parks and trails are evaluated and prioritized for infrastructure and maintenance needs on an ongoing monthly, yearly, and multi-year basis. The following is an outline of maintenance routines and cycles for the Trail.

Ongoing/Daily/Monthly

- Mow edges of trail
- Remove fallen trees
- Prune overgrown limbs and brush
- Update maps/signage/wayfinding
- Seed or rehabilitate eroded areas
- Trash removal and recovery from illegal acts of vandalism/dumping
- Trailhead parking snow removal
- Winter trail grooming (optional)

Yearly

- Fill low spots with new surface gravel, grade and compact surfaces
- Fill wash-out area and repair failed slopes
- Install permanent erosion control best management practices (BMPs) where needed (i.e. vegetation strips and rip-rap rock checks)
- Remove sediment accumulation from installed BMPS
- Assess significant infrastructure such as bridges, culverts and rail equipment
- Invasive species spot control and/or removal

Every 5-20 Years

- Review entire length of trail and top dress with new surfacing gravel
- Ongoing assessment of significant infrastructure such as bridges, culverts, and rail equipment
- Inspect fencing and any gate structures for damage and repair as needed
- Consider major construction projects such as trail capping or culvert and bridge replacement

OPINION OF COSTS ASSOCIATED FOR PUBLIC WATER ACCESS + PARK SITES RECOMMENDATIONS

PUBLIC ACCESS/PARK SITES	OPINION OF COST
Spirit Landing	$335,000
Munger Landing	$255,675
Slag Point*	By USS-EPA
Boathouse Point	$195,000
Boy Scout Landing	$471,115
Perch Lake**	$349,704 (TBD)
CONSTRUCTION TOTAL	**$1,606,494**

Professional Opinion of Costs - Sites

The estimated costs provided above are based on preliminary designs prepared for this Plan and could vary extensively depending on details that will be considered as part of the final design process.

Costs listed above should assist with further planning and decision-making regarding future site development for St. Louis River access.

* Road access and parking lot costs at Slag Point will be the City's responsibility and require further study in the next phases of design. The City will work collaboratively with the EPA and US Steel landowner on land access and design.

** Perch Lake site improvements will be further assessed and designed as part of the DNR's AOC restoration efforts of Perch Lake. The amount listed in the table above is an estimated allowance for site improvement costs based on preliminary designs generated thus far.

SUMMARY

The recommendations and concept designs presented within, reflect the balance needed to accomplish and comply with the Guiding Principles set forth at the start of the planning process. The Trail extension project will:

- Increase public access to the riverfront.
- Allow for the retention and preservation of the historic railroad.
- Offer a diverse user experience
- Increase year-round user experience
- Connect neighborhoods to the St. Louis River who otherwise are only connected by Highway 23/Grand Avenue
- Implement 7 miles of trail extension near or along the river's edge
- Provide a variety of trail conditions with a mix of higher inland ground and shoreline experience
- Take time to complete in its entirety due to site complexities and estimated costs per linear foot
- City to partner with LSMR to maximize public access that is permissible, affordable, safe and provide an equitable experience to the riverfront

SUPPORTING DOCUMENTS

The following is a list of plans and projects that were referenced during the planning process for this document.

1979 Western Waterfront City Masterplan

Currently not online (Please contact City Parks & Recreation Department for information)

Duluth, Minnesota Trail and Bikeway Plan

http://www.duluthmn.gov/media/116291/Duluth_Bike_Report_Edited_October_2011.pdf

St. Louis River Water Trail

http://www.duluthmn.gov/st-louis-river-corridor/st-louis-river-water-trail/

Western Waterfront Renewal & Restoration

http://www.duluthmn.gov/st-louis-river-corridor/western-waterfront-renewal-restoration/

Lower St. Louis River Habitat Plan

http://stlouisriver.org/lower-st-louis-river-habitat-plan/

Mud Lake Alternatives Analysis

https://duluthmn.gov/parks/parks-planning/st-louis-river-corridor/mud-lake-study/

St. Louis River Corridor Trails Plan

https://duluthmn.gov/parks/parks-planning/parks-planning-library/ Refer to St. Louis River Corridor Trails Plan under Mini-Master Plan tab