

# Downtown Long Lake Stormwater Study

July 2026



MINNEHAHA CREEK  
WATERSHED DISTRICT



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## EXECUTIVE SUMMARY

### BACKGROUND

The Minnehaha Creek Watershed District (District), in partnership with the City of Long Lake (City), completed this Downtown Long Lake Stormwater Feasibility Study to identify and prioritize practical, cost-effective landscape projects that improve water quality in Long Lake.

This study is a direct implementation step flowing from the 2023 Long Lake Creek Roadmap, a state-funded planning effort led by MCWD with the Cities of Long Lake, Medina, and Orono, and the Long Lake Waters Association to restore impaired waters across the Subwatershed.

The Long Lake Creek Roadmap established a watershed-first implementation strategy that prioritizes regional stormwater management and local landscape projects before in-lake treatment. Accordingly, this study advances external-load management. It does not evaluate or preclude future in-lake management, which will be more effective and lasting after external loads are reduced.

Within that strategy, the Downtown Long Lake Management Unit (DMU) was identified as a priority area because it contributes disproportionately high phosphorus loads to Long Lake, relative to its size and level of urbanization.

The DMU encompasses 518 acres and contributes approximately 194 pounds of phosphorus annually to Long Lake. Under MCWD's refined nutrient budget and implementation strategy, which updated the original Total Maximum Daily Load (TMDL) framework using in-lake sediment chemistry data, the target reduction from this area is 88 pounds per year through landscape projects.

### SUMMARY OF FEASIBILITY ASSESSMENT

This study screened 22 project concepts across the DMU and advanced 11 for water quality modeling, concept design, and cost estimating.

**Five projects are recommended for implementation planning and future capital programming.**

Potential projects were evaluated based on expected water quality benefit, cost, constructibility, site control, permitting, and operations and maintenance.

That process resulted in five recommended projects including two that could be advanced now and three that could be integrated into City capital improvement planning with other infrastructure and redevelopment opportunities.

### RECOMMENDED IMPLEMENTATION

Immediate implementation is recommended for two regional water quality projects: The Downtown Village Highway Pond Retrofit and Nelson Lakeside Park Restoration. In coordination with MCWD, the City should use its planning and regulatory tools to identify opportunities to route local runoff or surrounding regional drainage into redeveloping parcels, strengthening the downtown treatment train over time.

If all five projects go advanced, they are estimated to reduce TP loading by 50 to 88 pounds annually, representing approximately 57 to 100% of downtown's reduction target and substantial progress within the Long Lake Creek Roadmap implementation strategy.

For retrofit projects, phosphorus reduction is presented as a range to reflect both conservative incremental benefit and broader restored treatment potential. The lower end reflects the modeled increase above current conditions, whereas the upper end reflects the added value that may be realized where a project restores or reconfigures an existing facility that is currently underperforming due to age, sediment accumulation, or hydraulic limitations.

Before either project enters design, the City and MCWD must confirm interest and preliminary roles, complete site-specific investigations and agency coordination, and develop funding, ownership, and long-term maintenance frameworks. This study is not intended to create a City, MCWD, or outside funding commitment.

Three additional concepts should be preserved through City planning: Holbrook Park Floodplain Storage should be evaluated with future park improvements, Daniels Street Diversion should be reconsidered with future roadway and utility reconstruction. The Downtown Village Greenway

should advance through comprehensive planning, redevelopment, regulation, and landowner coordination.

More broadly, the City should continue to integrate water into public and private redevelopment. In coordination with MCWD, the City should use its planning and regulatory tools to identify opportunities to route local runoff or surrounding regional drainage into redeveloping parcels, strengthening the downtown treatment train over time.

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**Together, the two projects recommended for immediate implementation are estimated to reduce up to 74% of the phosphorus reduction target for downtown Long Lake.**

| Project Name                             | TP Reduction (lbs) | Estimated Cost       | Time (Years) |
|------------------------------------------|--------------------|----------------------|--------------|
| Downtown Village Highway Pond Retrofit** | 16.9 - 31.9        | \$700k - \$900k      | 2 to 5       |
| Nelson Lakeside Park Restoration         | 16.1 - 33.3        | \$12M - \$18M        | 2 to 5       |
| Holbrook Park Floodplain Storage**       | 4.5 - 6.7          | \$700k - \$800k      | 5 to 10      |
| Daniels Street Diversion**               | 8.8 - 13.2         | \$600k - \$2.0M      | 10+          |
| Downtown Village Greenway**              | 3.6                | \$145M               | 10+          |
| <b>Total</b>                             | <b>38.7 - 85.1</b> | <b>\$4.9M - \$7M</b> | <b>10+</b>   |

\*\*Immediate Implementation Project    \*\*Opportunity-Based Project



TP REDUCTIONS

|                            |   |
|----------------------------|---|
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## RECOMMENDED PROJECT IMPLEMENTATION MAP

**DOWNTOWN VILLAGE AREA**

### Area Description

The corridor also contains a stream channel adjacent to the Western Hemipin County Pioneer Association Museum. As described in the Downtown Village Greenway cut sheet, this creates a long-term opportunity to restore the stream as a multifunctional greenway connecting City Hall to Nelson Lakeside Park and Long Lake, while integrating downtown identity, historic interpretation, pedestrian access, and public gathering space.

## Project Concept

This project is recommended first for immediate implementation, due to public site ownership, engineering feasibility, and expected water quality benefit. Recommended next steps include coordination with MnDOT, infiltration testing, and development of a funding strategy, prior to moving the project into design. Longer-term corridor and placemaking opportunities should be protected through integration as concepts into the City's Comprehensive Plan and redevelopment, planning and partner coordination for future land use changes occur.

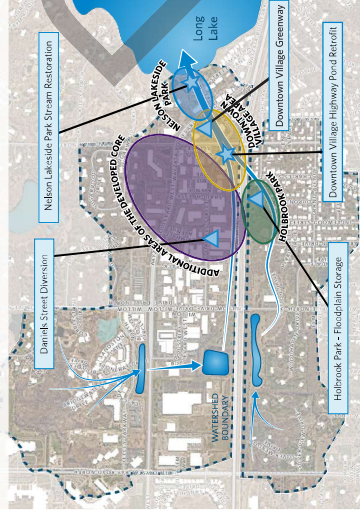
## Project Concept

The recommended project in this area is the Nelson Lakeside Park Restoration. The existing ponds and stormwater facilities are aging, underperforming, and expected to require substantial maintenance in the coming years.

The recommended concept builds on existing infrastructure by reconfiguring flow paths, expanding treatment function, increasing residence time, and improving hydraulic performance before stormwater runoff reaches Long Lake.

☆ = IMM

- ★ = IMMEDIATE IMPLEMENTATION PROJECT    ▲ = OPPORTUNITY-BASED PROJECT



### Area Description

The broader developed core includes older commercial and industrial areas with limited stormwater treatment and potentially aging public infrastructure.

## Project Concept

The recommended project in this area is the Daniels Street Diversion, which reroutes 21 acres of runoff to Kenobi Pond, increasing treatment before runoff reaches Long Lake. It is the strongest opportunity in this area because it targets an untreated source and uses existing treatment capacity. At the same time, it depends on future infrastructure work and adjacent landowner coordination.

## Implementation

This project should only be advanced with roadway reconstruction or other major public investment. Recommended next steps include integrating the concept into future capital planning, confirming corridor needs, and refining benefits. Beyond this project, the City should use comprehensive planning, redevelopment review, and stormwater regulation to identify opportunities to integrate water into future public and private investment. Coordination with MCDWD should include opportunities to route local runoff or surrounding regional drainage into developing parcels, strengthening the regional treatment train.

### Area Description

Nelson Lakeside Park is a heavily used community park along the shoreline of Long Lake, and the downstream point of the DMLU. It includes a boat access, most-downstream community gathering space for events like the annual Buckhorn Days, and the final set of stormwater treatment facilities before runoff from the city landscape enters the Lake. The park is therefore a major public amenity and one of the most important water quality locations in the downtown system.

This project is rec

This project is recommended for Immediate Implementation, following the Downtown Village Area project. It makes sense to advance now because the City owns the site, the park's water quality role is well understood, and planned maintenance needs by MCWCD create an opportunity to reinvest in a more effective long-term treatment system. Recommended next steps include site-specific infiltration testing, engagement with park users, and development of a funding strategy.

## HOLBROOK PARK

### Area Description

Holbrook Park serves as the community's primary recreation hub, hosting a variety of gatherings annually. The park is bordered by a small ravine that collects runoff from the neighborhoods to the south and east. The ravine is one of the more natural landscape features remaining in the DMU and provides an opportunity to pair water quality improvements with ecological restoration and park reinvestment.

## Project Concept

The recommended project in this area is the Holbrook Park Floodplain Storage, which focuses on restoring ravine function, increasing stormwater treatment, improving settling conditions, and stabilizing degraded areas while maintaining a vegetated buffer near adjacent homes.

## Implementation

It was selected over the alternate stream channel concept because it provides slightly greater modeled treatment at a lower estimated cost. Concepts from the stream channel restoration and related habitat improvements could be incorporated into future park planning if the City elects to advance them. Recommended next steps include aligning the concept with park planning, performing infiltration testing, and integrating the project in future capital improvement discussions.

# DOWNTOWN VILLAGE HIGHWAY POND RETROFIT

Site 2A

## PROJECT AT A GLANCE

**Implementation Status:** Immediate, recommended first

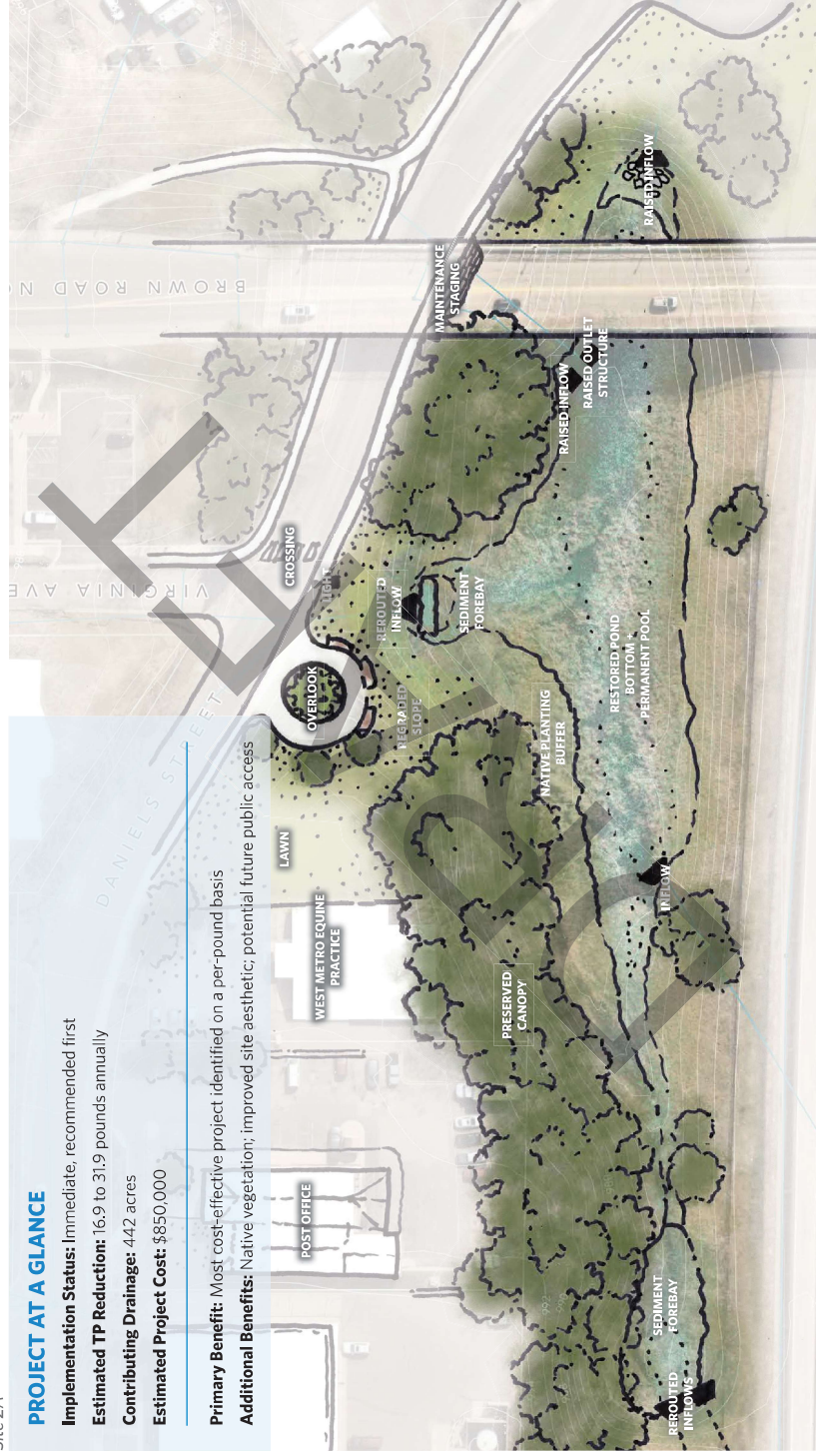
**Estimated TP Reduction:** 16.9 to 31.9 pounds annually

**Contributing Drainage:** 442 acres

**Estimated Project Cost: \$850,000**

**Primary Benefit:** Most cost-effective project identified on a per-pound basis

**Additional Benefits:** Native vegetation; improved site aesthetic; potential future public access





## PROJECT DESCRIPTION

The Downtown Village Highway Pond Retrofit project would restore an underperforming stormwater pond located within MnDOT right-of-way near Highway 125 Brown Road overpass. The pond receives runoff from 442 acres, including flows from Daniels Street, Kenobi Pond, Holbrook Park, nearby parking areas, and the neighborhoods to the south. Despite this large contributing area, the pond provides limited detention after many storm events. Rapid through-flow reduces sediment settling and leaves much of the pond's available treatment capacity unused.

The recommended concept would dredge accumulated sediment, establish a deeper permanent pool, construct sediment forebays, and modify the outlet to increase residence time and improve sediment capture. **The project is estimated to reduce total phosphorus loading by 16.9 to 31.9 pounds annually.** The lower end of this treatment range reflects the modeled improvement over current conditions, while the upper end reflects the treatment potential that may result from restoring an aging, sediment-filled facility.

The pond is situated within MnDOT right-of-way on property presumed to be owned by MnDOT, although MnDOT has stated that it does not own or maintain the facility. Itself and would support a retrofit led by the City or MCWD. The charter therefore prioritized the core stormwater retrofit and native revegetation, while also identifying a small,

optional placemaking opportunity on the adjacent West Metro Equine property, which is owned by the University of Minnesota. The lawn area immediately northwest of the pond could potentially support an overlook, seating, or small gathering space, subject to university coordination.

Over the longer term, reconstruction of Daniels Street and implementation of the Daniels Street Diversion could create additional opportunities to improve stormwater management, as well as pedestrian connections, boulevard landscaping, street trees, and lighting in this area. These broader improvements should be preserved through future redevelopment and corridor planning rather than treated as a primary driver of this pond retrofit.

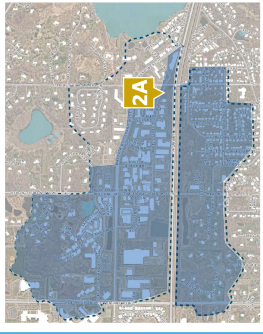
**This is the most cost-effective project identified in the study on a per-pound basis and is recommended for immediate implementation.**

### COST & FUNDING

|                           |                  |
|---------------------------|------------------|
| BMP Construction          | \$670,000        |
| Optional Amenities        | \$70,000         |
| Professional Services     | \$110,000        |
| <b>Total Project Cost</b> | <b>\$850,000</b> |

\*Estimated maintenance is \$6,000 annually.

### PROJECT SITE AND DRAINAGE AREA



### PROJECT DETAILS

Major proposed improvements include:

- Dredging accumulated sediment to restore pond depth and treatment capacity
- Raising and modifying the outlet to establish a deeper, 5-foot permanent pool
- Creating sediment forebays at major inlets to concentrate settling and simplify maintenance
- Replacing washing of low-quality vegetation with native species to enhance habitat and aesthetics
- Stabilizing and regrading pond edges to improve safety, access, and erosion control
- Providing maintenance access and staging near the Brown Road underpass

These improvements would increase residence time, create targeted sedimentation areas, and restore the pond as an effective regional treatment facility. Potential infiltration and vegetation benefits are not included in the estimated phosphorus reduction but would be evaluated ahead of design.

The principal cost drivers are dredging, outlet reconstruction, sediment forebays, slope stabilization, and constrained access near Highway 12. Significant pond expansion is limited by existing steep slopes, the MnDOT sound barrier, Daniels Street, and the Brown Road overpass piers.

## OPERATIONS & MAINTENANCE

The sediment forebays should be inspected regularly and cleaned approximately every 1-2 years. Full pond dredging is estimated at 10 - 15-year intervals. Native vegetation will require inspection and maintenance during establishment. The final design should provide durable access for sediment removal and maintenance equipment, which may be achieved through the City's public works facility property.

## PROJECT DASHBOARD

### CONTRIBUTING DRAINAGE



### WATER QUALITY



### SUPPORT FOR NATURAL SYSTEMS



### COMMUNITY BENEFITS



### CONSTRUCTIBILITY



### SITE CONTROL



### OPERATIONS AND MAINTENANCE



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# NELSON LAKESIDE PARK RESTORATION

Site 3A

## PROJECT AT A GLANCE

**Implementation Status:** Immediate, recommended second

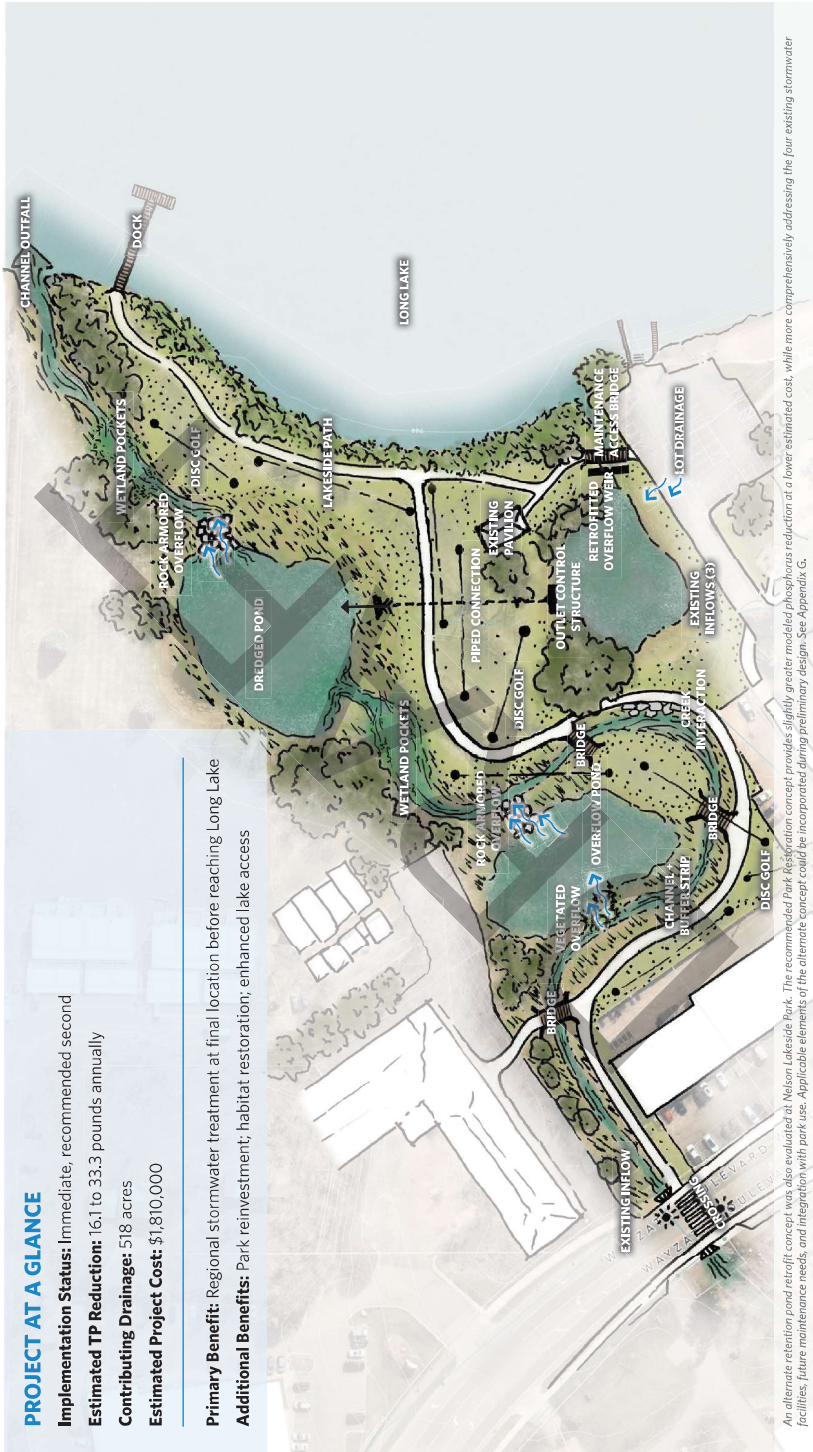
**Estimated TP Reduction:** 16.1 to 33.3 pounds annually

**Contributing Drainage:** 518 acres

**Estimated Project Cost:** \$1,810,000

**Primary Benefit:** Regional stormwater treatment at final location before reaching Long Lake

**Additional Benefits:** Park reinvestment; habitat restoration; enhanced lake access



An alternate retention pond retrofit concept was also evaluated at Nelson Lakeside Park. The recommended Park Restoration concept provides slightly greater modeled phosphorus reduction at a lower estimated cost, while more comprehensively addressing the four existing stormwater facilities, future maintenance needs, and integration with park use. Applicable elements of the alternate concept could be incorporated during preliminary design. See Appendix G.



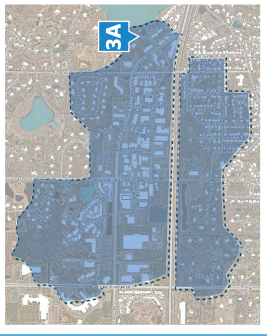
## PROJECT DESCRIPTION

Nelson Lakeside Park is located at the downstream end of the Downtown Management Unit (DMU), immediately upstream of Long Lake. The site currently contains four treatment facilities on City-owned parkland: two ponds maintained by MCWD, and two City-owned sand filters; MCWD monitoring data indicates these facilities are underperforming. The City's sand filters have reached the end of their useful life, and the MCWD-maintained ponds will require substantial maintenance before 2030.

The recommended concept would reconfigure the existing treatment system by routing stormwater through a meandering channel, wetland pockets, sediment forebay, and connected and expanded treatment ponds before discharging to Long Lake. The design would preserve base flow through the historic channel while routing storm flows through the treatment system. **The project is estimated to reduce total phosphorus loading by 16.1 to 33.3 pounds annually.** The lower end reflects modeled improvement over current conditions, while the upper end reflects the treatment potential that may result from reconstructing aging and underperforming facilities.

The charrette evaluated two concepts for Nelson Lakeside Park. The recommended concept advanced because it combines regional water quality treatment with meaningful reinvestment in an active community park.

### PROJECT SITE AND DRAINAGE AREA



It generally retains the pond locations and adds additional treatment footprints, while preserving and enhancing the park's principal uses, including the Lions Club pavilion, boat launch playground, beach, veteran's memorial, and disc golf course. The disc golf layout would be reconfigured around the reconstructed ponds and channels, integrating the water features as creative obstacles that improve the playing experience. New pathways and bridge crossings could improve circulation and access to the park's natural features.

**This study recommends this project for immediate implementation, as the second of two priority regional stormwater projects identified.**

### COST & FUNDING

| BMP Construction                | \$1,400,000        |
|---------------------------------|--------------------|
| Park and Recreational Amenities | \$200,000          |
| Professional Services           | \$210,000          |
| <b>Total Project Cost</b>       | <b>\$1,810,000</b> |

\*Estimated maintenance is \$10,000 annually.

The anticipated maintenance needs of the MCWD-maintained ponds create an opportunity to coordinate necessary dredging with a regional retrofit. The estimated \$600,000 dredging cost represents a potential avoided or

### PROJECT DETAILS

Flows primarily reach the park through a 90-inch culvert beneath Wayzata Blvd that conveys runoff from nearly 500 acres, or three pipes that meet at the south pond.

Major proposed improvements include:

- Reconfiguring the Wayzata Blvd outfall through a meandering channel with wetland pockets and treatment areas
- Creating an emergency spillway that allows high flows to safely bypass the treatment system
- Reconfiguring the existing ponds to increase residence time and removing the underperforming sand filters
- Expanding the sediment forebay to improve sediment capture and simplify maintenance

overlapping expenditure. However, at feasibility stage this should not be treated as committed funding for the retrofit.

The project may be considered for BWSR Clean Water Fund, MFCA Clean Water Partnership, or outdoor recreation funding programs. Outside funding is not assumed in the project recommendation. Implementation will require a coordinated funding plan and cooperative agreement between the City and MCWD.

### IMPLEMENTATION NEXT STEPS

The project will require typical City and MCWD permits and construction stormwater approvals, and may require MNDNR, MPCA, and US Army Corps of Engineers review. Early coordination should focus on the hydraulic connection to Long Lake and any groundwater interaction.

Land and Water Conservation (LAWCON) funding may have been used to acquire Nelson Lakeside Park. The City should coordinate with MCWD and the DNR to determine whether the project requires formal state or federal approval.

- Confirm City and MCWD interest in advancing the project and define preliminary implementation roles
- Determine how anticipated maintenance dredging could be integrated into the larger retrofit
- Develop a preliminary funding plan and City-MCWD cooperative agreement before advancing into design

- Adding pathways and bridge crossings that support recreation, maintain access, and enhance character
- Adjusting the disc golf course and orienting parkland around the reconstructed water features as an asset

These improvements would provide multiple stages of treatment before runoff reaches Long Lake. Channel and wetland areas would slow flows and encourage settling, while the sediment forebay and ponds would capture particulate phosphorus and other pollutants.

The principal cost drivers are earthwork, dredging, hydraulic control structures, bridge crossings, and park area restoration. Pathways, disc golf adjustments, and other amenities account for approximately \$200,000.

## OPERATIONS & MAINTENANCE

The sediment forebay, weir, culverts and outlet structures should be inspected regularly and cleared of accumulated debris and sediment, and the reconstructed ponds will require periodic dredging. A cooperative agreement should establish responsibility for maintaining the stormwater facilities, naturalized areas, and park amenities.

## PROJECT DASHBOARD

### CONTRIBUTING DRAINAGE

518 acres — 100% of total Downtown MU

### WATER QUALITY

16.1 lbs of phosphorus removed annually

### SUPPORT FOR NATURAL SYSTEMS

Potential for creation of new high-quality habitat

### COMMUNITY BENEFITS

Reimagining of Nelson Lakeside Park with improved access and passive circulation

### CONSTRUCTIBILITY

Site elevations and groundwater may impact storage capacity

### SITE CONTROL

Stormwater facilities are within existing parkland owned by City

### OPERATIONS AND MAINTENANCE

Enhanced vegetative and site features anticipated to increase existing maintenance

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# HOLBROOK PARK FLOODPLAIN STORAGE

Site 1B

## PROJECT AT A GLANCE

**Implementation Status:** Opportunity-Based, subject to City evaluation with future park improvements

**Estimated TP Reduction:** 5.6 pounds annually

**Contributing Drainage:** 68 acres

**Estimated Project Cost:** \$800,000

**Primary Benefit:** Additional floodplain storage and stormwater treatment upstream of Long Lake

**Additional Benefits:** Ravine and habitat restoration; erosion reduction; integration with park improvements



Two Holbrook Park concepts were evaluated: floodplain storage and stream channel restoration. Both provide similar phosphorus reduction and could be integrated with park improvements. The floodplain storage concept was carried forward because it provides slightly greater modeled treatment at a lower estimated cost. Stream channel restoration and related habitat improvements may be incorporated into future park planning if the City elects to advance them. See Appendix G.



PROJECT DESCRIPTION

Holbrook Park is bordered by a wooded ravine between Harrington Drive and Orchard Lane. The ravine receives base flow and stormwater from surrounding neighborhoods and conveys it to the Downtown Village Highway Pond and ultimately Long Lake. The channel lies approximately 10 feet below adjacent streets and park elevations and contains steep slopes, invasive vegetation, degraded habitat, accumulated sediment, and limited maintenance access.

The recommended concept would create floodplain storage and a permanent pool in the lower ravine, add a sediment forebay, improve drainage through the upper ravine, and restore native riparian vegetation. The project is estimated to reduce total phosphorus loading by 5.6 pounds annually. Potential benefit from reduced erosion and restored vegetation are not included in the modeled estimate.

The charrette evaluated two concepts: floodplain storage and stream channel restoration. Both provide similar water quality benefits, with a 0.6-pound difference in estimated annual phosphorus reduction; and either could be integrated with improvements to the adjacent recreation areas and pedestrian connections. The floodplain storage concept was carried forward because it provides slightly greater modeled treatment at a lower estimated cost. The stream channel

concept would require more extensive and costly channel work but could provide additional stream stabilization and habitat restoration benefits. Elements of both concepts could be combined if the City advances broader park improvements. Either concept would require selective vegetation removal for construction and long-term access.

Given the project's modest modeled phosphorus reduction relative to its estimated cost, the City may evaluate whether the combined water quality, ecological, and park benefits warrant further development. Additional field investigation and preliminary design, including infiltration testing, may identify opportunities to improve performance and better define costs and benefits.

**This project is recommended as an opportunity-based project that could advance with future City-led Holbrook Park improvements.**

COST & FUNDING

|                           |                  |
|---------------------------|------------------|
| BMP Construction          | \$690,000        |
| Professional Services     | \$110,000        |
| <b>Total Project Cost</b> | <b>\$880,000</b> |

*\*Estimated maintenance is \$9,000 annually.*

PROJECT SITE AND DRAINAGE AREA



PROJECT DETAILS

Approximately 68 acres drain through the wooded ravine system bordering Holbrook Park.

Major proposed improvements include:

- Creating an underground pool in the lower ravine to increase storage and improve settling
- Constructing a sediment forebay to capture coarse material and simplify maintenance
- Replacing the existing outlet structure with an adjustable stoplog structure

- Raising inflow pipes and completing limited grading and channel widening in the upper ravines
- Removing invasive vegetation and stabilization of degraded slopes and riparian areas

Next steps should only be taken if the City elects to further explore the project.

- Evaluate the concept through City park and capital planning, including whether its combined park, ecological, and water benefits warrant further efforts.
- Complete targeted field investigations and preliminary design, to refine performance, costs, permitting needs, and implementation roles.

OPERATIONS & MAINTENANCE

Maintain restored vegetation and control invasive or woody encroachment, especially during establishment. Inspect culverts, inlets, banks, and the outlet annually; winterize stoplogs; and remove sediment or repair erosion as needed. Preserve vehicle access from Harrington Drive and the existing park maintenance road.

PROJECT DASHBOARD

CONTRIBUTING DRAINAGE

68 acres — 13% of total Downtown MU

WATER QUALITY

5.6 lbs of phosphorus removed annually

SUPPORT FOR NATURAL SYSTEMS

Potential for creation of new high-quality habitat

COMMUNITY BENEFITS

Improves aesthetics of natural features in a public space

CONSTRUCTIBILITY

Construction access will require tree removal

SITE CONTROL

Stormwater facilities are within existing parkland owned by City

OPERATIONS AND MAINTENANCE

Limited required maintenance within existing City capabilities

DANIELS STREET DIVERSION

Site 4B

PROJECT AT A GLANCE

**Implementation Status:** Opportunity-Based, subject to City evaluation with future road improvements

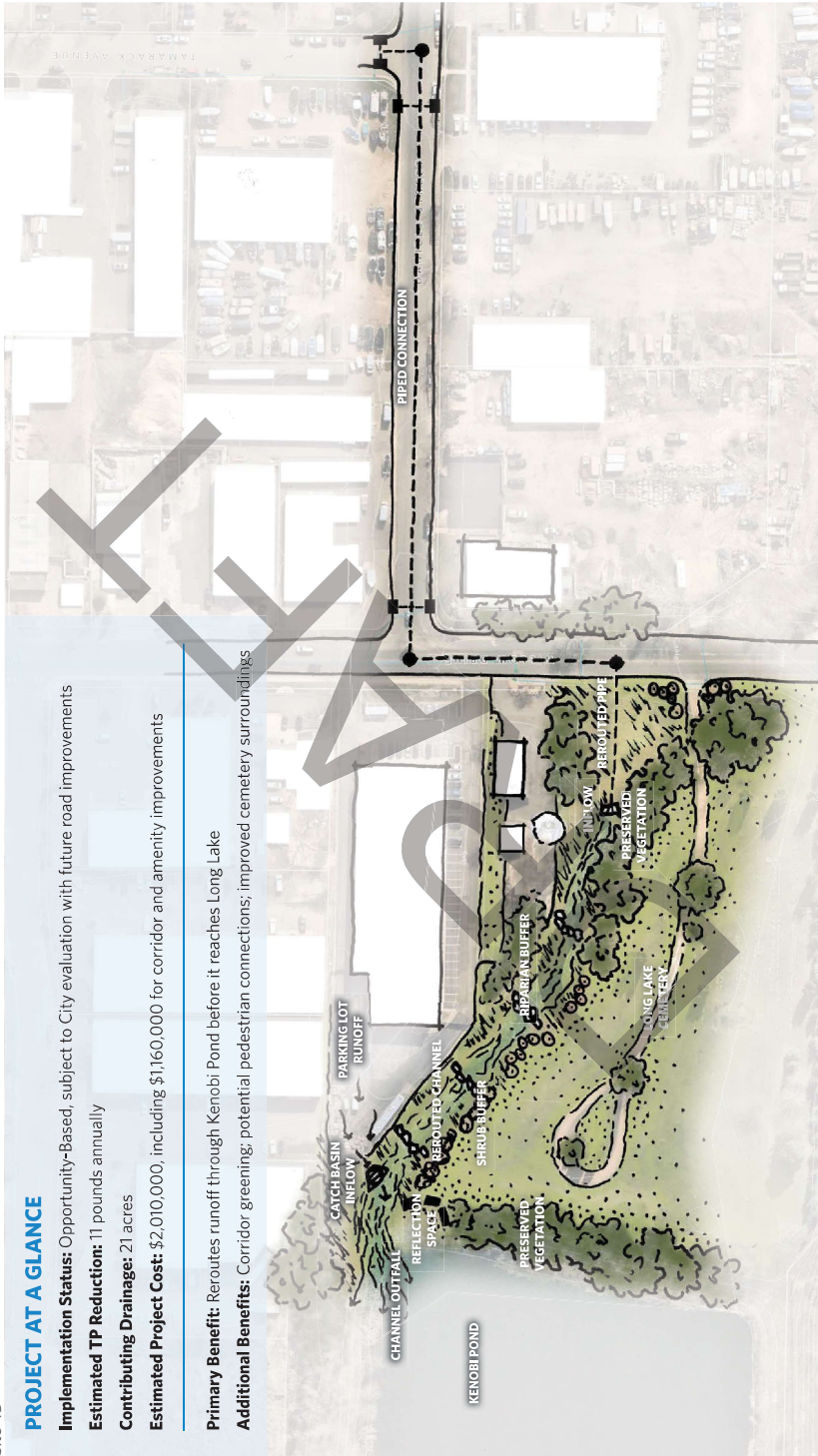
**Estimated TP Reduction:** 11 pounds annually

**Contributing Drainage:** 21 acres

**Estimated Project Cost:** \$2,010,000, including \$1160,000 for corridor and amenity improvements

**Primary Benefit:** Reroutes runoff through Kenobi Pond before it reaches Long Lake

**Additional Benefits:** Corridor greening; potential pedestrian connections; improved cemetery surroundings





## PROJECT DESCRIPTION

The Daniels Street Diversion would reconstruct and reroute storm sewer beneath Daniels Street between Willow Drive and the high point near Tamarack Avenue. The project would redirect runoff from approximately 21 acres of highly impervious development to the unnamed channel north of Long Lake Cemetery and then to Kenobi Pond, extending the treatment path before stormwater reaches Long Lake. The project is estimated to remove approximately 11 pounds of total phosphorus annually.

The concept was developed to focus on long-term opportunities to improve stormwater management, transportation, and the public realm. Because the project requires substantial roadway and utility work, it would only be cost-effective at the time the City determined to reconstruct Daniels Street.

The proposed alignment could create a naturalized channel and reflection space near the cemetery, while supporting future corridor greening or pedestrian connections. Impacts to cemetery plots appear avoidable but would need to be confirmed through survey, utility investigation, and coordination with the Church of Saint George.

The diversion would also reintroduce flow to a channel that currently carries limited runoff. If the City elects to advance reconstruction of Daniels Street, additional investigation

should evaluate channel stability, Kenobi Pond hydraulics, property impacts, water quality performance, and the cost-benefit of integrating the diversion with the roadway project. No reconstruction of Daniels Street is currently planned.

**This concept is recommended as an opportunity-based project that could advance with city-led reconstruction of Daniels Street.**

### COST & FUNDING

|                           |                    |
|---------------------------|--------------------|
| BMP Construction          | \$640,000          |
| Amenities Construction    | \$1,160,000        |
| Professional Services     | \$210,000          |
| <b>Total Project Cost</b> | <b>\$2,010,000</b> |

*\*Estimated maintenance is \$2,000 annually.*

The estimated cost represents an integrated stormwater and corridor concept. The \$16 million corridor and amenity component should be evaluated as part of a future City roadway project, not as a stand-alone water quality cost. If the City elects to advance Daniels Street reconstruction, potential City, MCWD, and outside-funding roles should be evaluated based on the refined scope, water quality benefit, and allocation of roadway and stormwater costs. No City, MCWD, or outside funding commitment is assumed.

### PROJECT SITE AND DRAINAGE AREA



### PROJECT DETAILS

Most of the modeled benefit results from routing additional runoff through Kenobi Pond, rather than treatment within the proposed channel.

Major proposed improvements include:

- Reconstructing existing storm sewer and inlets beneath Daniels Street
- Diverting approximately 27 acres of highly impervious drainage toward Kenobi Pond
- Creating a naturalized conveyance channel upstream of Kenobi Pond
- Expanding the regional treatment train that drains to Long Lake to include Kenobi Pond

- Evaluating an optional cartridge-filter system for additional dissolved phosphorus treatment

Initial modeling indicates Kenobi Pond has sufficient storage and outlet capacity to receive the diverted runoff. Survey and additional hydraulic analysis are needed to confirm pond elevations, outlet performance, downstream effects, and the treatment benefit. The evaluation should also consider whether accumulated dissolved phosphorus could affect Kenobi Pond's long-term performance.

### IMPLEMENTATION NEXT STEPS

The project will require typical City and MCWD permits and construction stormwater approvals. Wetland shoreline water quality, or federal approvals will depend on field investigations and final design.

The primary implementation dependencies are City-led roadway planning, utility relocation, property and maintenance access, and coordination with the Church of Saint George. The City of Orono should also be involved because portions of the drainage area originate in Orono, and the City of Orono maintains Kenobi Pond. Construction would require temporary closures along Daniels Street and Willow Drive.

- Preserve the diversion concept through City transportation utility, and capital planning, and reconsider it when reconstruction of Daniels Street becomes a City priority.
- Complete targeted field investigations to determine alignment, confirm vegetation and channel impacts, evaluate Kenobi Pond performance, and refine costs, benefits, permits, and roles.

Next steps should only be taken if the City elects to further explore the project.

### OPERATIONS & MAINTENANCE

Install new inlets with sumps and clean them approximately every two years using a jet-vac truck. Maintain channel vegetation and repair erosion as needed. If the project advances, the Kenobi Pond maintenance agreement should be updated and permanent access for channel and pond maintenance should be secured.

## PROJECT DASHBOARD

### CONTRIBUTING DRAINAGE

21 acres — 4% of total Downtown MU

### WATER QUALITY

11 lbs of phosphorus removed annually

### SUPPORT FOR NATURAL SYSTEMS

No substantial improvements

### COMMUNITY BENEFITS

Potential to align with public site amenities

### CONSTRUCTIBILITY

Construction access will require easement and has potential for utility conflict

### SITE CONTROL

Direct impact to Long Lake Cemetery, coordination with Orono required

### OPERATIONS AND MAINTENANCE

Limited required maintenance within existing City capabilities

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# DOWNTOWN VILLAGE GREENWAY

Site 2B

### PROJECT AT A GLANCE

**Implementation Status:** Opportunity-Based, advance through City planning and landowner coordination

**Estimated TP Reduction:** 3.6 pounds annually

**Contributing Drainage:** 458 acres

**Estimated Project Cost:** \$1,450,000, excluding property acquisition and/or redevelopment costs

**Primary Benefit:** A greenway in the heart of downtown with pedestrian connections and public greenspace

**Additional Benefits:** Treatment of 458 acres, including 190 impervious acres.





## PROJECT DESCRIPTION

The Downtown Village Greenway is an approximately 350-foot urban drainage corridor between Brown Road North and Wayzata Boulevard. It is the primary flow path conveying runoff from over 450 acres toward Nelson Lakeside Park and Long Lake. The stream is tightly constrained, densely vegetated, and difficult to access. Its location between City Hall, the Pioneer Museum, Nelson Lakeside Park, and Long Lake creates an opportunity to organize redevelopment and public greenspace around a restored urban stream.

During the charrette, the City expressed interest in a bold vision for long-term redevelopment extending from a vacant City-owned parcel at the corner of Wayzata Blvd and Lake St. This concept illustrates how the area could transform over time through market-driven redevelopment, coordinated landowner engagement, and parcel assembly. It is a long-term planning vision, not a recommendation for acquisition.

The study evaluated two concepts on opposite sides of the stream; this concept is the larger vision. It includes a restored stream, underground stormwater treatment, expanded greenspace, and a gathering area integrated with future development. Site ZC complements this vision on the Pioneer Museum side with additional treatment, parcel stabilization, and improved access to the stream. The plan also includes a greenway connecting City Hall to the shoreline through a restored stream corridor in the heart of downtown.

### PROJECT SITE AND DRAINAGE AREA



# FEASIBILITY ASSESSMENT PROCESS

## BACKGROUND

A team consisting of HDR and Damon Farber worked alongside MCWD staff to identify opportunities and evaluate the feasibility of stormwater management projects, or Best Management Practices (BMPs), located within the Downtown Management Unit (DMU) of MCWD's Long Lake Creek Subwatershed. This task was built on a prior study performed by MCWD as part of the Long Lake Creek Map.

Within that strategy, the DMU was identified as a priority area because it contributes disproportionately high phosphorus loads to Long Lake, relative to its size and level of urbanization.

The DMU encompasses 518 acres and contributes approximately 194 pounds of phosphorus annually to Long Lake. Under MCWD's refined nutrient budget and implementation strategy, which updated the original Total Maximum Daily Load (TMDL) framework using in-lake sediment chemistry data, the target reduction from this area is 88 pounds per year through landscape projects.

The focus of this study is to identify and recommend projects that provide feasible and cost-effective water quality benefits to impaired Long Lake and downstream waterbodies. Sites were additionally evaluated based on opportunities for public amenities and restoration.

The report includes a summary of general findings and work performed. Assessed projects that include site-specific details are presented as cut sheets, found on pages 3-12 for recommended or opportunity-based projects, and in Appendix G for non-recommended projects and/or alternatives.

## FEASIBILITY ASSESSMENT

The identification and evaluation of sites was conducted from a holistic perspective on a site's feasibility and potential impact on water quality, the community, and the ecosystem in an effort to align with MCWD's Balanced Urban Ecology approach. The following data sources supported evaluation:

- Long Lake Creek Subwatershed Assessment
- 2020-06-18 2020 Basin Survey Summary Technical Memo
- MCWD XP SWMM Model
- MCWD P8 model for the Long Lake Creek Subwatershed
- BMP Construction plans
- City of Long Lake and MCWD provided GIS Data
- Communicated history and operations of sites from City and MCWD staff
- Historic aerial photography

## COST & FUNDING

|                           | \$1,000,000        |
|---------------------------|--------------------|
| BMP Construction          |                    |
| Amenities Construction    | \$300,000          |
| Professional Services     | \$150,000          |
| <b>Total Project Cost</b> | <b>\$1,450,000</b> |

\*Estimated maintenance is \$10,000 annually.

The estimate reflects the larger redevelopment concept. Incorporating improvements on the Pioneer Museum side into a unified corridor may change the final scope and cost.

This project may be considered for BWSR Clean Water Fund, MPCA Clean Water Partnership, Section 319, LCCMR, or other funding. Outside funding is not assumed. Stormwater improvements, public amenities, property acquisition, private redevelopment, and historic or cultural elements should be tracked separately, so funding responsibilities remain clear.

### PROJECT DETAILS

Major proposed improvements include:

- Restoring and meandering portions of the stream channel to improve stability, bank stability, and public access
- Creating approximately 0.25 acre-feet of stormwater storage and infiltration beneath future gathering space
- Diverting runoff from Wayzata Boulevard into a rain garden/bioretention area to filter flows to the stream
- Routing runoff from the 24-inch storm sewer through a naturalized swale on the Pioneer Museum side
- Restoring and expanding the riparian buffer on both sides of the stream
- Creating pathways, stream crossings, overlooks, and gathering areas along the corridor

## IMPLEMENTATION NEXT STEPS

This concept affects multiple parcels under different ownership and should advance through cooperative planning, voluntary acquisition agreements, redevelopment agreements, or a combination. The feasibility concept does not represent commitments by the City or other agencies to acquire specific properties or change existing uses.

The City should establish the long-term corridor vision before redevelopment proposals. Early planning should identify the space needed for channel restoration, stormwater treatment, pedestrian access, public greenspace, and maintenance. Coordination with the Pioneer Museum will be important.

- Consider incorporating the Downtown Village Greenway vision into City long-range and comprehensive planning.
- Identify the space needs that should be preserved through future planning.
- Evaluate how the vacant City-owned parcel at Wayzata Blvd and Lake St could support the long-term greenway.
- Engage current landowners individually or as redevelopment opportunities emerge.
- Coordinate with the Pioneer Museum to evaluate ability to integrate historic interpretation, site access, visibility, landscape improvements, and public programming if broader redevelopment is determined non-viable.
- Develop a phased funding and implementation strategy when a viable land use opportunity emerges.

- Establishing a continuous green pedestrian connection from City Hall toward Nelson Lakeside Park and Long Lake
- Treatment estimates for the two sides of the stream should not be added because the concepts contain overlapping drainage. The project's broader value lies in establishing a coordinated framework for stormwater management, ecological restoration, redevelopment, public space, pedestrian circulation, and historic interpretation.
- The principal cost drivers are underground infrastructure, stream excavation and stabilization, utility coordination, building removal, access, and amenities. Property acquisition, construction, private redevelopment, and parcel assembly are not included in the cost estimate.

## OPERATIONS & MAINTENANCE

Project elements will require routine inspection and maintenance to preserve treatment capacity and safe conveyance. Naturalized areas will require vegetation management. The stream channel banks, crossings, plunge pool rock checks, and riffles should be inspected after major storms. Public amenities will require routine City or partner maintenance. Agreements should assign responsibilities among the City, MCWD, property owners, the Pioneer Museum, and future development partners.

## PROJECT DASHBOARD

### CONTRIBUTING DRAINAGE

458 acres — 88% of total Downtown MU

### WATER QUALITY

3.6 lbs of phosphorus removed annually

### SUPPORT FOR NATURAL SYSTEMS

Potential for creation of new high-quality habitat

### COMMUNITY BENEFITS

Substantial improvements to downtown public spaces and development

### CONSTRUCTIBILITY

Construction will require tree removal, easement, building removal, and potential for utility conflict

### SITE CONTROL

Direct impact to Downtown Long Lake properties

### OPERATIONS AND MAINTENANCE

Limited maintenance within existing City capabilities, private developer maintenance

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## PROJECT IDENTIFICATION

Projects were identified via two primary paths: alternatives stemming from the Roadmap, and newly identified concepts based on desktop review or discussion with City and MCWD staff.

A total of 22 potential projects were identified across multiple typologies, including new infiltration basins, conveyance improvements, retrofits or restorations, and green infrastructure improvements. A table including each opportunity, a brief description of the work proposed, contributing drainage area, imperviousness, footprint extent, and considerations of identified constraints is included as Appendix A.

The intention of this project identification phase was to identify a holistic range of water quality and public realm improvements across the entire DMU, and focus further evaluation efforts on those deemed most impactful.

Of the 22 identified projects, 11 were recommended for further feasibility evaluation under this study. This recommendation was based on a collaborative discussion between MCWD and the consultant team.

## LANDSCAPE ARCHITECTURE AND ENGINEERING

Eleven potential projects were further defined through conceptual landscape architecture and engineering design.

Using the size and characteristics of their contributing watersheds as a baseline, these alternatives were developed to target total phosphorus removal, while also leveraging adjacent areas for potential gathering spaces and accessible amenities in alignment with potential development, infiltration, and regional connection opportunities. A precedent analysis featuring inspirational projects and implementation strategies was assembled to broaden the team's perspectives and inspire creative solutions. For details, refer to Appendix B.

To support feasibility-level design, a high-level HydroCAD model of the DMU was developed, using available watershed parameters and stormwater conveyance inputs to simulate runoff from storm events of varying intensity.

The alternatives were further refined through site observations, maintenance preferences discussed with project stakeholders, and evaluation of potential utility and landowner constraints using City-provided GIS data. A feasibility-level engineering design concept has been developed for each of the 11 sites and has been included as Appendix C.

## CHARRETTE

A design charrette was held on December 10, 2025, to convene stakeholders and provide a shared vision for the study area. The workshop began with a visioning session to establish goals and objectives, followed by a precedent analysis to inspire new ideas, and finishing with a collaborative sketching session. The project team placed a strong emphasis on creative problem-solving and integrating a balanced urban ecology strategy to improve water quality in Long Lake. This half-day event encouraged open dialogue, collaboration, and a strong sense of ownership and investment in the proposed projects.

The charrette was attended by staff from the City, MCWD, HDR, and Damon Farber. Attendees included:

- Long Lake – Amanda Nowecki
- MCWD – James Wisker, Michael Hayman, Brian Beck, Rachel Baker, Veronica Sammes
- HDR – Ryan Fucci, Andrew Judd, Chris Gice, Leah Botting
- Damon Farber – Andrew Montgomery, Jeff McMenimen, Tessa Siwak

The charrette focused on the project sites that showed the most initial potential for the greatest water quality benefit and transformational change. Teams focused on the following areas:

- Downtown Village Area
- Holbrook Park
- Nelson Lakeside Park

The charrette provided an opportunity to advance project sites identified during the subwatershed assessment and project evaluation phase, rapidly explore design alternatives, and collaboratively develop innovative solutions. Not all projects that were selected for advancement during the project identification phase were assessed as part of the charrette.

After the charrette, multiple concepts were assessed further at each location for feasibility, cost, and overall benefit. Sketches developed as part of the charrette are included as Appendix D.



## MODELING ASSUMPTIONS

Water Quality Modeling using the MCWD-provided P8 model was conducted to assess the water quality benefit of proposed sites. Model outputs are included in Appendix H.

The following modeling assumptions were made to represent the performance of each of the sites in the model:

- The model was run for a 30-year period with a 1-year lead up.
- No modifications were made to existing watersheds or particle loading distributions, with the exception of dividing watersheds as part of scenarios where a proposed BMP treated only a portion of an existing watershed.
- Based on best available soils data, it was assumed that no proposed BMPs would allow for impactful infiltration.
- The impact of each BMP was measured independently in a copy of the model that maintained all other watersheds and BMPs unchanged.
- Reported phosphorus reductions represent the net improvement over existing conditions, rather than the total removal provided by an individual BMP. For retrofit and replacement projects, this accounts for the performance of the existing BMP being replaced. In addition, because the modeled watersheds are hydraulically connected, BMP benefits are evaluated based on their contribution to overall watershed phosphorus reduction, rather than pollutant removal at the BMP itself.
- A range of TP removal has been provided for some of the retrofit projects to indicate reasonable uncertainty in the existing BMP's current level of performance. Existing BMPs may be performing below their original design efficiency due to age or other factors, resulting in a range of reasonable estimates for the net improvement achieved by the proposed retrofit.

## COST OPINION

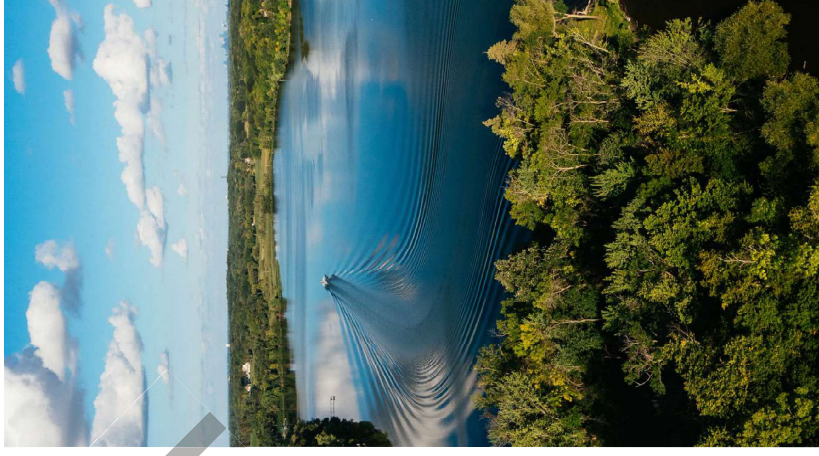
Line-item cost opinions were developed for each evaluated concept. Unit costs were sourced from recent HDR and DF construction bids or MnDOT. Costs are broken down into a few major categories, including:

- **BMP Construction** – Estimated costs to construct the BMP, as well as necessary auxiliaries.
- **Amenities Construction** – Estimated costs attributed to non-water-quality focused site elements such as park amenities.
- **Professional Services** – Estimated field services, design, and construction observation costs as a percentage of construction costs.
- **Total Project Cost** – The sum of BMP, amenities, and professional services.
- **Annual Maintenance** – Estimated maintenance cost based on BMP type and a percentage of the overall construction cost.

# EVALUATION CRITERIA

The 11 projects that were advanced to the conceptual design phase were prioritized using a weighted multi-decision criteria assessment matrix. The matrix consists of nine evaluation criteria that align with objectives identified within the Roadmap. Each project concept was evaluated and scored across each of the nine criteria. While all of the criteria are important to overall project success, the scores were then weighted based on the relative importance of each criteria in achieving the overall goals of the Roadmap and aggregated into a total score. Proposed weighting prioritizes expected water quality benefits but also considers potential feasibility and improvements for community and habitat. For example, water quality improvement potential was weighted as 25% of the overall score, while support for natural systems represents 5% of the total score. The evaluation matrix is included as Appendix E in full and is meant to be a tool to orient decision-makers on potential project benefits across the range of identified criteria to assist in prioritization. Though it is not meant to be a strict ranking, projects with higher scores are generally recommended over those with lower scores.

| Criteria                         | Description                                                                                                                                                                                                                                                                              |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contributing Impervious Drainage | Measures potential impact based on the amount of impervious drainage area contributing to the proposed project site. Sites that are located downstream of a large drainage area will score higher.                                                                                       |
| Water Quality                    | Measures a project's ability to improve effluent water quality through reductions in total phosphorus. Sites that result in more TP reductions as indicated by P8 modeling will score higher.                                                                                            |
| Support for Natural Systems      | Measures potential for project to incorporate habitat enhancing features into the design of the proposed project site. This criteria is based on the type of project proposed and proximity to existing habitat. Sites that have greater potential to enhance habitat will score higher. |
| Support for Community            | Measures a project's potential to incorporate community enhancing features align with other planned community projects or be located proximate to community gathering spaces. Sites that have greater potential to improve community value will score higher.                            |
| Constructibility                 | Consideration of site construction access, slope and excavation requirements, clearing and grubbing needs, specialty construction needs, available space, and logistics of construction activities. Sites with less constructibility constraints will score higher.                      |
| Ownership                        | Consideration of site ownership with regards to the ability for a project to be built at the site. Right-of-way projects, or projects on public property, will score more highly than those that are on private property.                                                                |
| Permitting                       | Consideration of ease of permitting requirements, and identification of potential permitting challenges that may negatively impact project cost or feasibility. Sites with less complex permitting requirements will score higher.                                                       |
| Funding                          | Consideration of potential funding opportunities based on specific project elements or foreseen outcomes, and alignment with known funding sources. Sites that may qualify for more funding opportunities will score higher.                                                             |
| Operations and Maintenance       | Measures the long-term ability of the project to maintain functionality with minimal operation and maintenance needs or anticipated replacement costs. Sites that will require simpler or less frequent operations and maintenance will score higher.                                    |



## OPERATIONS & MAINTENANCE

To extend the expected useful life and effectiveness of proposed BMPs, it is anticipated that ongoing maintenance will be required. Generalized operations and maintenance recommendations are included for each BMP. Additional site-specific maintenance considerations associated with site access or key features will be established through cooperative agreements based on ownership responsibilities, maintenance roles, organizational capacity, and program goals. Cost estimates generally assume routine City maintenance unless otherwise noted. This study does not modify existing City or MCWD maintenance responsibilities.

Detailed operations and maintenance requirements are included in Appendix H.



# ORIENTATION KEY MAP

## HOLBROOK PARK

- 1A** HOLBROOK PARK - STREAM CHANNEL  
HOLBROOK PARK: OPTION 1
- 1B** HOLBROOK PARK - FLOODPLAIN STORAGE  
HOLBROOK PARK: OPTION 2

## DOWNTOWN VILLAGE

- 2A** DOWNTOWN VILLAGE HIGHWAY POND RETROFIT
- 2B** DOWNTOWN VILLAGE GREENWAY  
DOWNTOWN VILLAGE: OPTION 1
- 2C** PIONEER MUSEUM BMP  
DOWNTOWN VILLAGE: OPTION 2

## NELSON LAKESIDE PARK

- 3A** NELSON LAKESIDE PARK STREAM RESTORATION  
NELSON LAKESIDE: OPTION 1
- 3B** NELSON LAKESIDE PARK RETENTION POND RETROFIT  
NELSON LAKESIDE: OPTION 2

## ADDITIONAL AREAS OF THE DEVELOPED CORE

- 4A** CITY MAINTENANCE FACILITY
- 4B** DANIELS STREET DIVERSION
- 4C** WAYZATA & BROWN POND DIVERSION
- 4D** SHAUGHNESSY AVE SUBSURFACE MANAGEMENT

