



**To:** MAYOR AND COUNCIL

**Work Session Item #:** III

**From:** Mark K. Nolan, AICP, Transportation Planner

**Action**

**Date:** April 1, 2014

**Discussion**

**Information**

**Subject:** Arden Park/Minnehaha Watershed District Partnership

## Action Requested:

Discussion and general direction regarding a proposed partnership with the Minnehaha Creek Watershed District (MCWD) and Living Streets "Demonstration Project" for the Arden Park D 2015 neighborhood reconstruction project.

## Information / Background:

The Living Streets Implementation Plan is currently being drafted and is anticipated to be ready for Council approval by fall 2014. However, the Arden Park D neighborhood reconstruction project scheduled for next year may be a unique opportunity to more immediately apply the vision and principals of the Living Streets Policy (adopted by Council in August 2013). Opportunities include traffic calming techniques, improved pedestrian network, streetscape enhancements, and stormwater best management practices (BMPs).

In February staff prepared a draft proposal (attached) that envisions a partnership between the City and the MCWD to provide a local Living Streets model as applied to a neighborhood reconstruction project. Staff from both agencies met twice (January and March 2014) to discuss potential partnership opportunities. The mutual goal of this effort for the City and MCWD is to benefit the neighborhood and region by implementing stormwater BMPs, which may include (but are not limited to) rain gardens, street trees and porous pavement.

Staff wishes to discuss several key related issues with Councilmembers at this work session. These include:

- The potential to narrow streets from their current width
- Edge of roadway treatment on Minnehaha Blvd.
- Potential to restrict parking to one side of the street
- Maintenance of rain gardens
- Installation of sidewalks with boulevards
- Increased service level/associated cost
- Public and stakeholder engagement

## Attachments:

Draft Proposal for Partnership with MCWD (with Appendices)

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# PROPOSAL FOR PARTNERSHIP

## Arden Park and “Arden Park D” Neighborhood Street Reconstruction

*Living Streets Demonstration Project, Joint Grant Application*

**2/21/2014 DRAFT**

### **Proposal Overview**

This draft proposal envisions a partnership between the City of Edina (City) and the Minnehaha Creek Watershed District (District) to provide a local model of the “Living Streets” reconstruction practice.

This proposal includes background information on Edina Living Streets, and calls out potential opportunities the 2015 “Arden Park D” neighborhood street reconstruction and nearby parks and natural resources. Also contained is a proposed form of partnership that suggests how the City and District can best work together.

### **Edina Living Streets**

On August 20, 2013, the Edina City Council approved the Living Streets Policy. This policy included the development of the Living Streets Plan to, in part, identify specific standards for stormwater management, incorporate outside regulatory requirements, and define the process for resident participation in street design. The development of the Living Streets Plan is currently underway, although the specific standards are still evolving.

*“Living streets balance the needs of motorists, bicyclists, pedestrians and transit riders in ways that promote safety and convenience, enhance community identity, create economic vitality, improve environmental sustainability, and provide meaningful opportunities for active living and better health. The Living Streets Policy defines Edina’s vision for Living Streets and the principles and plans that will guide implementation.”*

Environmental sustainability, flood protection and clean water are key components of the policy and the early influence of the District is a welcome addition to putting these policies into practice. The Low Impact Development (LID) goals and techniques of Living Streets are closely related to the District’s goals for abstraction/filtration, water quality, public health, water quantity, best management practices, education and communications, and recreation. Through this partnership, the District’s clean water expertise, education and outreach ability, and Master Water Steward initiative will help guide and inform Living Streets.

### **Background**

The Arden Park Area is unique in character and contains the regional resource of Minnehaha Creek. The project area is a center for community, recreation, and business activities: bordered on the north by two churches, on the northeast by the 50<sup>th</sup> and France business district, on the east by two churches, private schools and mixed business and multifamily uses, on the south by 54<sup>th</sup> Street and along the west by Minnehaha Creek and Arden Park.

In 2015 the City of Edina will reconstruct a portion of the Arden Park neighborhood. This project will be an early application the Living Streets policy and implementation plan. The integration and demonstration of clean water infrastructure should be a top priority in this creek-side neighborhood. The Arden Park reconstruction project is an opportunity to provide significant stormwater treatment for an area which currently drains directly to Minnehaha Creek, and also to demonstrate Living Streets in an area that is highly visible due to the proximity of parks, trails, Minnehaha Creek, and moderate-volume streets.

(See appendix for neighborhood map, Arden Park D project area, reconstruction schedule map, and Figures 1 and 2 in 54<sup>th</sup> Street and Arden Park Area Stormwater Management Plan)

In 2013, the City engaged the District in the planning and stakeholder engagement process centered around the 2014 54<sup>th</sup> Street and 54<sup>th</sup> Street Bridge reconstruction project. The project team then held a substantive and transparent stakeholder engagement process that shaped and informed the project design and the 54<sup>th</sup> Street and Arden Park Area Stormwater Management Plan.

### *Standard Reconstruction Process*

The standard reconstruction process proposes the rehabilitation of existing utilities and road network to meet the current service expectation. The repair of existing storm infrastructure is generally included, as is the development of an extensive network of sump drain line to solve nuisance drainage problems. The projects adhere to District rules for linear transportation projects, meet a no-net-increase standard and typically, the City voluntarily adds underground sediment capture structures.

Stormwater from the 2015 Arden Park D project area and the greater 50<sup>th</sup> and France business district currently flow directly untreated to the creek. In a standard reconstruction process, this pattern would continue with the potential for some additional sediment capture.

## **Opportunity**

### *Living Streets*

Living Streets reconstruction proposes the holistic review of existing service levels and the consideration or addition of pedestrian, bike, clean water and flood protection services. One of the primary components of Edina's Living Streets vision is the active pursuit of environmental stewardship, including setting goals for the reduction of storm water volume and unfiltered street water flows into our local waterways. Living Street applies LID techniques such as impervious surface reduction, bio-retention, filtration, sediment capture, and infiltration and reuse of stormwater. These stormwater treatments should be applied in a cost effective and strategic way to best integrate with various transportation modes and the neighborhood aesthetic.

Opportunities for sustainable infrastructure and LID are called out in the Stormwater Plan. This plan could be expanded to include cost/benefit for individual watershed source controls described as "Level 2" implementation priorities. The plan also describes the results of the stakeholder engagement process. A detailed review of the stakeholder engagement summary found unanimous support for natural area management, buckthorn removal, and conditional support for rain gardens, tree trenches, and regional native plant filtration basins. Support for these practices was conditioned on maintenance of active use green space, high quality aesthetic and safety concerns being met.

### *Parks, Recreation and Natural Resources*

Arden Park sits along the banks of the Minnehaha Creek and features active recreation in the form of playground, hockey rink, and a recreational skating rink. Connecting trails that run through the park and cross Minnehaha Creek provide passive recreation. There is a planned rehabilitation of the Arden Park shelter in 2017. Minnehaha Creek is a high quality resource in this area and is used for canoeing and kayaking and passive enjoyment. The 54<sup>th</sup> street crossing also includes a canoe portage and an area used for whitewater kayaking.

Opportunities for non-structural and regional treatments called out in the Stormwater Plan include native area restoration, buffer establishment, bio-retention, and infiltration features. The removal of buckthorn and establishment of flowered prairie and buffers were rated highly by 54<sup>th</sup> street stakeholders and synchronize well with watershed and City goals for mixes of active and passive recreation space.

### *Clean Water Service*

The Edina stormwater utility uses performance measurements to judge opportunity for clean water and flood protection improvement. Flood protection performance measures include peak rate and volume runoff discharge measured in cubic feet per second and acre-feet, respectively. Clean water performance measures include removal of sediment measured in tons and phosphorus measured in pounds. A variety of potential clean water treatments were analyzed as part of the stormwater report 54<sup>th</sup> Street Area Stormwater Management Plan, many of which appear cost effective. These potential improvements ranged from structural to nonstructural and publically owned to privately owned. Cost benefit criteria should be used across all clean water BMPs and project types to best target public investment.

### **Form of Partnership**

A partnership between the City of Edina and Minnehaha Creek Watershed District could take a variety of forms. This form of partnership envisions three main deliverables:

1. Public neighborhood street reconstruction project and Living Streets demonstration.
2. Public parks, natural resource restoration and regional BMP retrofit project.
3. Living Streets implementation plan, template and toolkit.

A variety of workload or financial resources would be required of each partner. Here are examples for consideration:

#### Minnehaha Creek Watershed District

- District grant funding for public-owned BMPs
- Preapprove cost-share formula for homeowner BMPs
- Statewide grant application and grant contract administration
- Technical assistance
- Public involvement and education assistance
- Homeowner BMP point of contact

#### City of Edina

- Public involvement and stakeholder process
- Design and engineering

- Public bid (neighborhood public system, homeowner BMP coordination)
- Public bid (park and natural resource)
- Construction contract administration
- Creation of working Living Streets template/toolkit
- Natural resource restoration project, 5-year maintenance

The extent of participation and integration of work are highly variable based on the project goals and level of consultant support for design and construction administration. Here are example minimum levels of participation:

1. Funding for detailed stormwater management plan, and sub watershed analysis.
2. Staff time for joint grant applications.
3. Staff time for education, outreach and ongoing support.

Examples of additional watershed participation may include:

1. Assistance during sub watershed assessment, neighborhood engagement, and/or stakeholder involvement.
2. Master Water Steward coordination, public education and outreach
3. Assistance and participation during design
4. Coordination with residents installing BMPs during construction
5. Participation in Living Streets implementation plan development, template and toolkit

#### *Example Schedule*

1. Consider Proposal for Partnership	February – April 2014
2. PFA Project Priority List Scoring Due	March 7, 2014
3. Professional Services Scope	April, 2014
4. Award Professional Services Contract	May, 2014
5. Sub-watershed Assessment	May - June, 2014
6. PFA Intended Use Plan Due	June 6, 2014
7. Pre-Approved Cost Share Decision	
8. Stakeholder Engagement and Prelim Design	June – Sept. 2014
9. Public Improvement Hearing	Sept – Oct. 2014
10. Clean Water Competitive Grant Due	November 2014
11. Open Bids, Award Project	Feb - March 2015
12. Start Construction	May 2015
13. Complete Construction	October 2015

#### *Conclusion*

Living Streets raises the bar for clean water, flood protection, bike and pedestrian services in street reconstruction. This reevaluation of services requires the attention and hard work of creative professionals to design safe, seamless, and attractive new infrastructure that is cost effective, increasingly sustainable and broadly supported by the local neighborhood.

The Arden Park D reconstruction project provides a unique opportunity to implement clean water practices near the banks of Minnehaha Creek and to rewrite a standard City process creating an example for future Living Streets reconstruction projects to follow. While the Living Streets Policy is a reality in Edina, the trajectory of this change depends on close collaboration between City and District, and the resulting acceptance of the local neighborhoods. We welcome your help.

Please contact any of the following staff with comments and questions

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*Appendix*

Arden Park D Neighborhood Map  
Street Reconstruction Schedule  
Edina Living Streets Policy  
Stormwater Management Plan – 54th Street and Arden Park Area (January 30, 2014)  
Maplewood Living Street Demonstration Project ([Hyperlink](#))





# City of Edina 2014-2019 Anticipated Local Bituminous Street Reconstruction

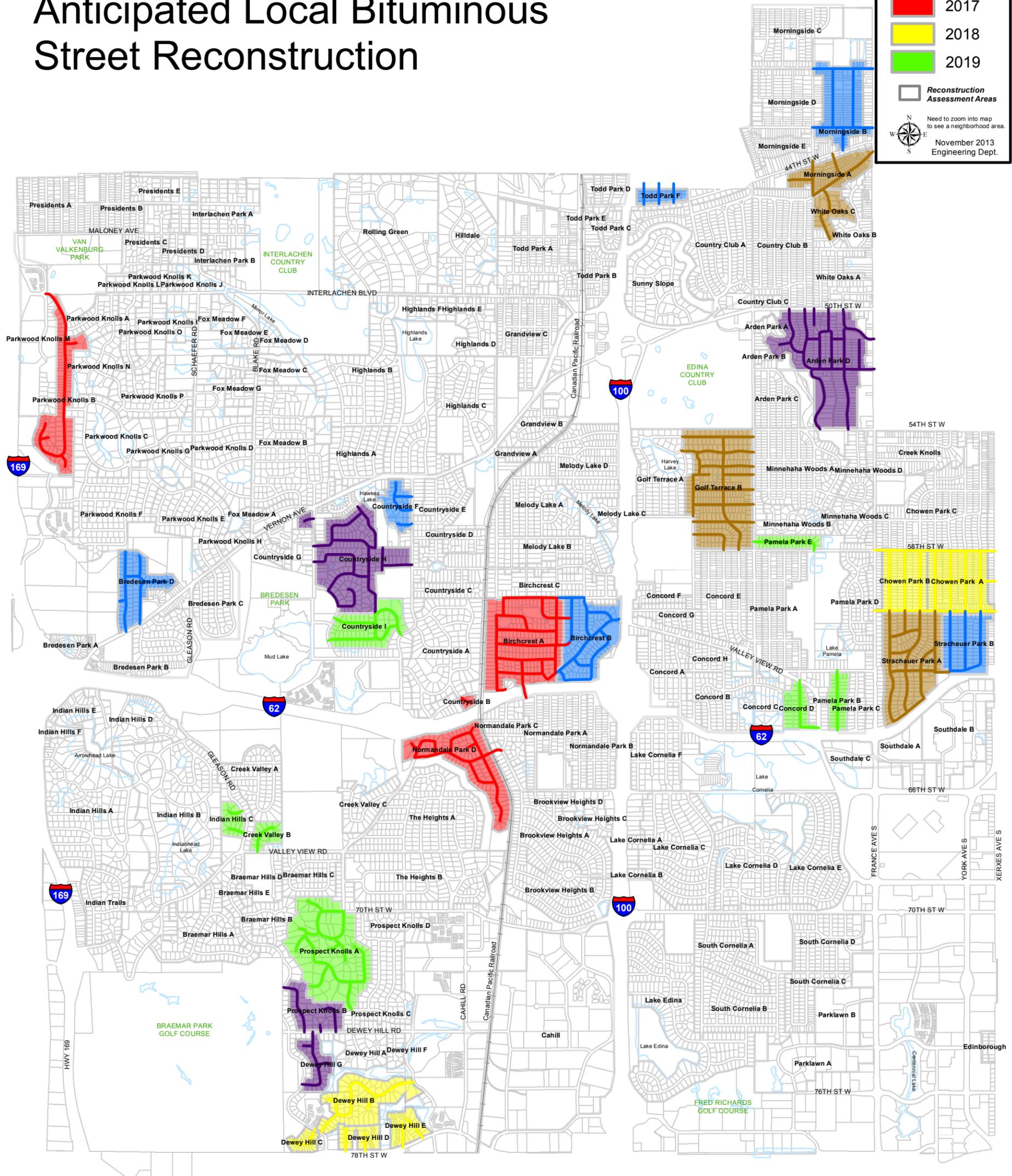
**Legend**

**Anticipated Year**

- 2014
- 2015
- 2016
- 2017
- 2018
- 2019

Reconstruction Assessment Areas

Need to zoom into map to see a neighborhood area.  
November 2013  
Engineering Dept.



## Note/Disclaimer

The dates shown on the map represent the anticipated years of construction and are subject to change based on budgetary issues, adjacent projects, resident input and other factors. Not all bituminous roadways within the City are shown. If a road is not highlighted then the potential reconstruction date is beyond the City's long term planning process.

The City of Edina's street improvement policy is to assess residents for a portion of the roadway reconstruction costs. Public utility improvements are paid for from the City's utility fund.

Extensive evaluation regarding the condition of the bituminous pavement, sanitary sewer, storm sewer and water main were used to set the priority of roadway improvements.

This map only addresses local bituminous streets and does not address State-Aid routes or concrete streets within the City.



## Living Streets Policy

### Introduction

Living streets balance the needs of motorists, bicyclists, pedestrians and transit riders in ways that promote safety and convenience, enhance community identity, create economic vitality, improve environmental sustainability, and provide meaningful opportunities for active living and better health. The Living Streets Policy defines Edina’s vision for Living Streets and the principles and plans that will guide implementation.

The Living Street Policy ties directly to key community goals outlined in the City’s 2008 Comprehensive Plan. Those goals include safe walking, bicycling and driving, reduced storm water runoff, reduced energy consumption, and promoting health. The Living Streets Policy also compliments voluntary City initiatives such the “do.town” effort related to community health, and the Tree City USA and the Green Step Cities programs related to sustainability. In other cases, the Living Street Policy will assist the City in meeting mandatory requirements set by other agencies. For example, the Living Streets Policy will support the City’s Storm Water Pollution Prevention Plan which addresses mandates established under the Clean Water Act.

The Living Streets Policy provides the framework for a Living Streets Plan. The Living Streets Plan will address how the Policy will be implemented by providing more detailed information on street design, traffic calming, bike facilities, landscaping and lighting, as well as best practices for community engagement during the design process. Lastly, existing and future supporting plans such as the Bicycle Plan, Active Routes to Schools, Sidewalk Priority Plan and the Capital Improvement Plan will help to identify which projects are priorities with respect to this Policy.

### Living Streets Vision

Edina is a place where...

- Transportation utilizing all modes is equally safe and accessible;
- Residents and families regularly choose to walk or bike;
- Streets enhance neighborhood character and community identity;
- Streets are safe, inviting places that encourage human interaction and physical activity;
- Public policy strives to promote sustainability through balanced infrastructure investments;
- Environmental stewardship and reduced energy consumption are pursued in public and private sectors alike; and
- Streets support vibrant commerce and add to the value of adjacent land uses.

### Living Streets Principles

The following principles will guide implementation of the Living Streets Policy. The City will incorporate these principles when planning for and designing the local transportation network and when making public and private land use decisions.

### All Users and All Modes

The City will plan, design, and build high quality transportation facilities that meet the needs of the most vulnerable users (pedestrians, cyclists, children, elderly, and disabled) while enhancing safety and convenience for all users, and providing access and mobility for all modes.

### Connectivity

- The City will design, operate, and maintain a transportation system that provides a highly connected network of streets that accommodate all modes of travel.
- The City will seek opportunities to overcome barriers to active transportation. This includes preserving and repurposing existing rights-of-way, and adding new rights-of-way to enhance connectivity for pedestrians, bicyclists, and transit.
- The City will prioritize non-motorized improvements to key destinations such as public facilities, public transit, the regional transportation network and commercial areas.
- The City will require new developments to provide interconnected street and sidewalk networks that connect to existing or planned streets or sidewalks on the perimeter of the development.
- Projects will include consideration of the logical termini by mode. For example, the logical termini for a bike lane or sidewalk may extend beyond the traditional limits of a street construction or reconstruction project, in order to ensure multimodal connectivity and continuity.

### Application

- The City will apply this Living Streets Policy to all street projects including those involving operations, maintenance, new construction, reconstruction, retrofits, repaving, rehabilitation, or changes in the allocation of pavement space on an existing roadway. This also includes privately built roads, sidewalks, paths and trails.
- The City will act as an advocate for Living Street principles when a local transportation or land use decision is under the jurisdiction of another agency.
- Living Streets may be achieved through single projects or incrementally through a series of smaller improvements or maintenance activities over time.
- The City will draw on all sources of transportation funding to implement this Policy and actively pursue grants, cost sharing opportunities and other new or special funding sources as applicable.
- All City departments will support the vision and principles outlined in the Policy in their work.

### Exceptions

Living Streets principles will be included in all street construction, reconstruction, repaving, and rehabilitation projects, except under one or more of the conditions listed below. City staff will document proposed exceptions as part of the project proposal.

#### Exceptions:

- A project involves only ordinary maintenance activities designed to keep assets in serviceable condition, such as mowing, cleaning, sweeping, spot repair, concrete joint repair, or pothole filling, or when interim measures are implemented on a temporary detour. Such maintenance activities, however, shall consider and meet the needs of bicyclists and pedestrians.
- The City exempts a project due to an excessively disproportionate cost of establishing a bikeway, walkway, or transit enhancement as part of a project.
- The City determines that the construction is not practically feasible or cost effective because of significant or adverse environmental impacts to waterways, flood plains, remnants or native vegetation, wetlands, or other critical areas.

#### Design

The City will develop and adopt guidelines as part of the Living Streets Plan to direct the planning, funding, design, construction, operation, and maintenance of new and modified streets, sidewalks, paths and trails. The guidelines will allow for context-sensitive designs.

#### The City's design guidelines will:

- Keep street pavement widths to the minimum necessary.
- Provide well-designed pedestrian accommodation in the form of sidewalks or shared-use pathways on all arterial and collector streets and on local connector streets as determined by context. Sidewalks shall also be required where streets abut a public school, public building, community playfield or neighborhood park. Termini will be determined by context.
- Provide frequent, convenient and safe street crossings. These may be at intersections designed to be pedestrian friendly, or at mid-block locations where needed and appropriate.
- Provide bicycle accommodation on all primary bike routes.
- Allocate right-of-way for boulevards.
- Allocate right-of-way for parking only when necessary and not in conflict with Living Streets principles.
- Consider streets as part of our natural ecosystem and incorporate landscaping, trees, rain gardens and other features to improve air and water quality.

The design guidelines in the Living Streets Plan will be incorporated into other City plans, manuals, rules, regulations, and programs as appropriate. As new and better practices evolve, the City will update the Living Streets Plan.

#### Context Sensitivity

Although many streets look more or less the same, every street is a unique combination of its neighborhood, adjacent land uses, natural features, street design, users, and modes. To accommodate these differences, the City will:

- Seek input from stakeholders;
- Design streets with a strong sense of place;
- Be mindful of preserving and protecting natural features, such as waterways, trees, slopes, and ravines;
- Be mindful of existing land uses and neighborhood character; and

- Coordinate with business and property owners along commercial corridors to develop vibrant commercial districts.

## **Benchmarks and Performance Measures**

The City will monitor and measure its performance relative to this Policy. Benchmarks demonstrating success include:

- Every street and neighborhood is a comfortable place for walking and bicycling;
- Every child can walk or bike to school or a park safely;
- Seniors, children, and disabled people can cross all streets safely and comfortably;
- An active way of life is available to all;
- There are zero traffic fatalities or serious injuries;
- No unfiltered street water flows into local waterways; storm water volume is reduced; and
- Retail streets stay or become popular regional destinations.

The City will draw on the following data to measure performance. Additional performance measures may be identified as this Policy is implemented.

- Number of crashes or transportation-related injuries reported to the Police Department.
- Number and type of traffic safety complaints or requests.
- Resident responses to transportation related questions in resident surveys.
- Resident responses to post-project surveys.
- The number of trips by walking, bicycling and transit (if applicable) as measured before and after the project.
- Envision ratings from the Institute for Sustainable Infrastructure.
- Speed statistics of vehicles on local streets.

## **Implementation**

The goal of this Policy is to define and guide the implementation of Living Streets principles. Several steps still need to be taken to reach this goal. The first step will be to develop a Living Streets Plan to guide the implementation of the Policy. The Plan will:

- Identify and implement standards or guidelines for street and intersection design, universal pedestrian access, transit accommodations, and pedestrian crossings;
- Identify and implement standards or guidelines for streetscape ecosystems, including street water management, urban forestry, street furniture, and utilities;
- Identify regulatory demands and their relationship to this Policy (ADA/PROWAG, MPCA, MNMUTCD, MnDOT state aid, watershed districts);
- Define the process by which residents participate in street design and request Living Streets improvements; and
- Define standards for bicycle and pedestrian connectivity to ensure access to key public, private and regional destinations.

Additional implementation steps include:

- Communicate this Policy to residents and other stakeholders; educate and engage on an ongoing basis;
- Update City ordinances, engineering standards, policies and guidelines to agree with this Policy;
- Inventory building and zoning codes to bring these into agreement with Living Streets principles as established by this Policy;
- Update and document maintenance policies and practices to support Policy goals;
- Update and document enforcement policies and practices to ensure safe streets for all modes;
- Incorporate Living Streets concepts in the next circulation of the City's general plans (Comprehensive Plan, Bicycle Plan, Active Routes to School Plan, etc.);
- Incorporate Living Streets as a criteria when evaluating transportation priorities in the Capital Improvement Plan (CIP);
- Review and update funding policies to ensure funding sources for Living Streets projects; and
- Coordinate with partner jurisdictions to achieve goals in this Policy.

# **Stormwater Management Plan**

## ***54th Street and Arden Park Area***

Edina, Minnesota

SEH No. EDINA 124747

January 30, 2014



Building a Better World  
for All of Us®

Engineers | Architects | Planners | Scientists

54th Street and Arden Park Area  
Stormwater Management Plan  
Edina, Minnesota

SEH No. EDINA 124747

January 30, 2014

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# Stormwater Management Plan

## 54th Street and Arden Park Area

Prepared for City of Edina, Minnesota

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### 1.0 Introduction and Project Background

The Arden Park Area is a neighborhood in northeast Edina bordered on the north by 50<sup>th</sup> Street, on the east by France Avenue, on the west by Wooddale, and on the south by 56<sup>th</sup> Street. Arden Park, an 18-acre park along Minnehaha Creek has a large centrally located presence within the primarily residential neighborhood. The park features many recreational amenities including skating/hockey rinks, a warming house, playground equipment, an unfinished baseball diamond, a grass field, and paths throughout the park and over the creek.

The City of Edina is planning to reconstruct 54<sup>th</sup> Street within the Arden Park Area from France Avenue to Wooddale Avenue and has hired SEH to develop this stormwater management plan in concurrence with the preliminary design for the street and bridge reconstruction. The collaborative and closely integrated approach of both projects leveraged a substantial and transparent stakeholder engagement plan.

The objective of this stormwater management plan is to report the consensus-based preferred solutions to stormwater runoff in the Arden Park neighborhood and requirements of the 54<sup>th</sup> Street project consistent with the regulations and policies of the City of Edina, the Minnehaha Creek Watershed District (MCWD), and Minnesota Pollution Control Agency (MPCA). This plan also contains a narrative of the results of proposed stormwater management improvement scenarios and methods of analysis used to arrive at those results for the technical partners like the MCWD and stakeholders like MCWD and MPCA.

### 2.0 Applicable Rules, Regulations, and Policies

#### 2.1 General NPDES Permit for MS4s

Minnehaha Creek is a prominent and valued natural resource in the neighborhood and is on the State of Minnesota's §303(d) list of impaired waters for fecal coliform bacteria, chloride, and dissolved oxygen, as well as due to its impaired fish community. The downstream waterbody, Lake Hiawatha also has a nutrient impairment. These impairments threaten the aquatic life and recreational uses. Many of these impairments can be partially attributed to untreated stormwater runoff from urbanized areas directly discharging into the creek through storm sewer. The Clean Water Act and U.S. Environmental Protection Agency (USEPA) regulations require that states develop Total Maximum Daily Loads (TMDLs) for waters on the §303(d) list.

The City of Edina is a permitted Municipal Separate Storm Sewer System (MS4) through The National Pollution Discharge Elimination System (NPDES) permit program. As an MS4, the

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City of Edina is required to have a Stormwater Pollution Prevention Program (SWPPP) and comply with Waste Load Allocations (WLAs) of USEPA approved TMDLs. The Minnehaha Creek-Lake Hiawatha TMDL is currently in the draft/public notice stages of the TMDL approval process and the Minnehaha Creek chloride impairment is being addressed by the Twin Cities Metropolitan Area Chloride Project.

## **2.2 NPDES Construction Stormwater General Permit**

An NPDES Construction Stormwater General Permit is required for land disturbances from construction activity of equal to or greater than one acre. Since the 54<sup>th</sup> Street reconstruction project will disturb greater than one acre of land, the aforementioned permit and the associated Stormwater Pollution Prevention Plan (SWPPP) will be required. Within the SWPPP, project appropriate erosion prevention practices, sediment control practices, inspections and maintenance, pollution prevention measures and final stabilization shall be documented. The 54<sup>th</sup> Street project will not exceed the threshold of replacing one or more acres of pervious surfaces with impervious surfaces and therefore the permanent stormwater management system requirements of the NPDES permit are not applicable.

## **2.3 MCWD Regulatory Rules**

The Arden Park Area falls within the jurisdiction of the MCWD and projects are subject to the MCWD permitting process and regulatory rules. Based on preliminary typical sections presented in the *Draft 54<sup>th</sup> Street Roadway Reconstruction Feasibility Study*, the project will create approximately 5,000 square feet of net new impervious surface. Because the 54<sup>th</sup> Street project is a linear project creating less than 10,000 square feet of new impervious surface the project is exempt from the Stormwater Management Rule. Other MCWD Rules such as the Erosion Control Rule and the Waterbody Crossing & Structures Rule will still apply.

## **2.4 City of Edina Policies**

One of the goals of the project is integrating elements of the City's Living Streets Policy and sustainable infrastructure. The goals of the Living Streets Policy include safe walking, bicycling and driving, reduced stormwater runoff, reduced energy consumption, and promoting health. To assess the sustainable infrastructure elements staff are utilizing a sustainability scoring system for this project called ENVISION™. The ENVISION™ system will help measure what effect project decisions and recommendations have on sustainability. The rating system includes credits organized into five categories: quality of life, leadership, resource allocation, natural world, and climate and risk. More details on the project's ENVISION™ evaluation are available in the *Draft 54<sup>th</sup> Street Roadway Reconstruction Feasibility Study*.

The City's *Comprehensive Water Resources Management Plan* includes goals and policies related to runoff management and flood control, water quality management, and wetland protection. Specific policies and standards applicable to the 54<sup>th</sup> Street reconstruction project include:

- New stormwater conveyance systems should be designed to convey flows from the 10-year frequency, ½ -hr storm.
- Peak flow rates limited in accordance with applicable MCWD rules
- Stormwater retention is required in accordance with applicable MCWD rules
- Stormwater retention/detention facilities must be designed according to the most current technology as reflected in the MPCA publication *Protecting Water Quality in Urban*

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*Areas*, March 2000, the Minnesota Stormwater Manual (2008), or the applicable MCWD rules, whichever are more restrictive.

### **3.0 Analysis of Alternatives**

#### **3.1 Stakeholder Engagement Feedback**

In June and July of 2013, more than 450 community members offered issues and needs for both projects through an extensive stakeholder input process. Based on that input, the consultant team developed a variety of design components to receive feedback at an August 19<sup>th</sup> workshop and through an online survey. Stormwater related design components presented at the workshop included:

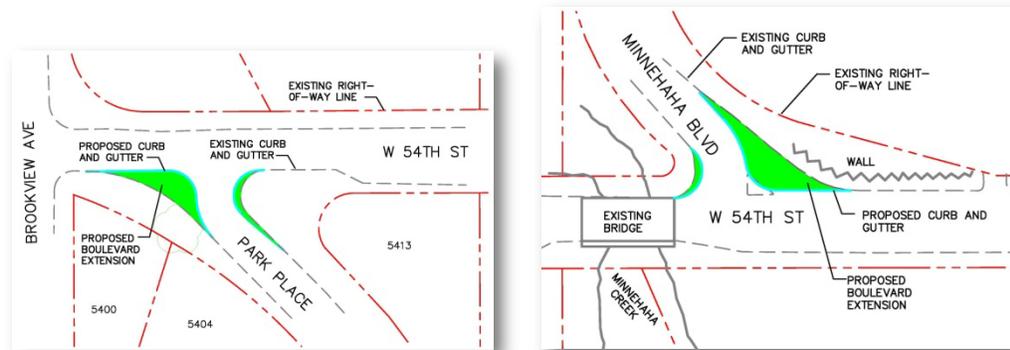
- Regional filtration basin – a large stormwater basin that does not contain permanent standing water
- Underground retention – a series of larger pipes or chambers underground for storage and slow release of runoff
- Porous paving – paving or bricks or a special mix of asphalt or concrete that has pores for water to soak through
- Green roof – a roof that is partially or completely covered with vegetation and a growing medium
- Cisterns/reuse – a system for collecting stormwater and storing it until it’s needed for other beneficial uses
- Snowmelt system – embedded electric cables or hydronic tubing under hardscapes that melt snow or ice
- SAFL baffle in sump manhole – a baffle to promote sediment and debris settling in a manhole with storage below the outlet pipe
- Grass pavers – a product for grass reinforcement of trafficked areas like overflow grass parking
- In-park filtration basin (turf) – a small grassed stormwater basin that does not contain permanent standing water
- In-park filtration basin (native plants) – a small planted stormwater basin that does not contain permanent standing water
- Catch basin inserts – device that traps trash, debris, sand, silts, and other contaminants in runoff before entering the pipe system
- Tree trenches – trees planted in amended soils and rock to capture runoff and store/treat it underground
- Rain gardens/grass swales – a planted depression or grassed swale that allows collected stormwater to infiltrate
- Educational signage – signs to educate and encourage the public to recognize water resource issues and solutions
- Buckthorn removal/reforestation – buckthorns are non-native shrubs or small trees that crowd out native plants

Overall the stakeholders had a general understanding and were supportive of the goals for stormwater management. However, a number of the design components in this category garnered a range of both positive and negative feedback. The positive comments varied, while most of the negative comments were about some of the large-scale components and focused on cost, maintenance, size and location, and aesthetics. There was a lot of feedback

on filtration design components, with generally positive feelings about including native plants. Stakeholders generally favored maintaining green space and existing park uses, and ensuring that any new design components address water safety especially in play areas.

### 3.2 54<sup>th</sup> Street Reconstruction Opportunities

The existing geometry of the intersections at Park Place and Minnehaha Boulevard creates large surface areas of pavement and intersection corners with long radius curb-lines. The proposed project will reduce the curb radii at the intersections of Park Place and Minnehaha Boulevard creating an area of green space in the boulevard extension ideal for rain gardens as illustrated below.



The project will install new concrete curb and gutter and a trunk storm sewer pipe and inlet system meeting State Aid minimum design standards to capture and convey stormwater. Reconstructing the storm sewer as part of the street reconstruction project also provides opportunities for enhancements such as a SAFL baffle in sump manholes which would be ideally located in the last on-road manholes up gradient of the creek outfall to maximize the area of stormwater treated.

#### 3.2.1 Analysis and Results

Two rain gardens at the intersections at Park Place and Minnehaha Boulevard were modeled in P8 to approximate load removals on an average annual basis. It is assumed that the rain gardens will be designed to either receive direct surface runoff through curb cuts or as offline practices with storm sewer bypass once the capacity of the rain garden is reached. It was also assumed that the rain gardens will function as an infiltration practice without an underdrain (as opposed to a filtration practice with an underdrain). The following Table 1 list the inputs assumed for the P8 model.

**Table 1**  
**P8 Model Input Parameters**

Parameter	Park Place Rain Garden	Minnehaha Boulevard Rain Garden
Hourly Precip File	Msp_4989.pcp	
Daily Air Temp. File	Msp_4889.tmp	
Particle File	Nurp50.p8p	
Start Date	1/2/1949	
Keep Date	1/2/1949	
Stop Date	8/31/1989	
Total Watershed Area (ac)	3.34	1.17
Pervious Area CN	58	58
Indirectly Connected Impervious (fraction)	0.5	0.0
Directly Connected Impervious, not swept (fraction)	0.15	0.5
Device Type	INF_BASIN	INF_BASIN
Bottom area (ac)	0.000	0.001
Storage pool area (ac)	0.009	0.012
Storage pool volume (ac-ft)	0.008	0.012
Infiltration Rate (in/hr)	0.8	0.8
Void Volume (%)	100	100
Note: Default P8 parameters were used if not indicated		

The total suspended solids (TSS) and total phosphorus (TP) annual load summary is presented in Table 2 below. In addition to providing water quality benefits, the practices also provide a combined runoff volume abstraction benefit on the order of 850 cubic feet (equivalent to one inch of volume control for approximately 10,000 square feet of impervious surface).

**Table 2  
P8 Model Results Summary**

<b>Parameter</b>	<b>Park Place Rain Garden</b>	<b>Minnehaha Boulevard Rain Garden</b>	<b>Total</b>
TSS Total Inflow (lbs/yr)	637	398	1035
TSS Surface Outflow (lbs/yr)	338	84	422
TSS Removed (lbs/yr)	299	314	613
TP Total Inflow (lbs/yr)	2.0	1.3	3.3
TP Surface Outflow (lbs/yr)	1.4	0.5	1.8
TP Removed (lbs/yr)	0.6	0.8	1.4

To estimate the potential TSS load removals provided by a SAFL baffle or similar enhanced water quality structures, a SHSAM model (modeling software provided by Barr Engineering Co.) was utilized. The key weather inputs for SHSAM were 15-minute rainfall data from Golden Valley, MN and daily temperature data for the years of 1995-2007. The MNDOT-Road Sand Particle Size Distribution was assumed at a default concentration of 200 mg/l for the water entering the structures during model simulations. The key watershed properties input into SHSAM are shown below in Table 3. The model simulations were run assuming a 4 ft diameter manhole with a sump depth of 4 ft and a 15" pipe flowing into the SAFL Baffle. The average yearly load removed and removal efficiency from 1995-2007 for proposed structure #104 was 790 lbs of TSS/yr and 31.2%, respectively. The average yearly load removed and removal efficiency from 1995-2007 for proposed structure #204 was 949 lbs of TSS/yr and 71.2%, respectively.

**Table 3  
SHSAM Watershed Input Properties**

<b>Water Quality Structure No.</b>	<b>Drainage Area (ac)</b>	<b>Impervious (%)</b>	<b>Hydraulic Length (ft)</b>	<b>Average Slope (%)</b>	<b>Pervious CN</b>
104	6.06	30	640	4.7	70
204	3.15	30	950	3.2	70

### **3.3 Arden Park BMP Opportunities**

Within Arden Park itself, a couple of key messages were heard during the input process: the need to maintain the current active use areas; the need to maintain safety in and around water areas and the desire to have systems that fit the natural look of the park. Because several of the larger trunk storm lines enter the creek within the limits of the park, the park areas present an excellent opportunity to remove pollutants from storm water runoff prior to discharging to the creek. Opportunities include a combination of infiltration/bioretenion practices at selected locations to treat street runoff or storm pipe discharges.

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Arden Park BMP opportunities are displayed in Figure 1. Locations shown on the map are intended to identify general locations. This preliminary plan is not intended to provide detailed designs for these areas that include the size, shape and planting materials. That said, input was very clear that there is a great need to maintain the active park area. To accomplish this, the recommendations of this plan are to create smaller, linear, or underground practices that provide treatment and fit the aesthetics of the park, but that take up little or no active park area.

One concept that should be explored further as future phases of stormwater improvements progress is more intense grading in the park that would raise the active park areas that are currently unusable at times due to wet soil conditions. At the same time, the outer edges of the park would be lowered to provide rain garden or shallow swales for treatment and conveyance of the stormwater around the active areas instead of directly through them. The photos below show an example of a similar project completed in a park in Maplewood. That project was developed through an extensive public input and park planning effort and has been a huge success and improvement for the local residents.



### 3.3.1 Analysis and Results

The five BMP opportunities within Arden Park identified in Figure 1 were analyzed at a planning level scale using the MIDS calculator. It was assumed that the soils were silty sand (HSG B) and the drainage catchments were residential land use with roughly 40% impervious area and 60% managed turf. Approximate pollutant removal estimates for each BMP are summarized in Table 4.

**Table 4  
Arden Park BMP Summary**

<b>BMP ID</b>	<b>Drainage Area (ac)</b>	<b>Volume Capacity (ft<sup>3</sup>)</b>	<b>Annual TP Reduction (lbs)</b>	<b>Annual TSS Reduction (lbs)</b>
Bioretention Basin 1	5.94	3420	3.20	580
Bioretention Basin 2	17.46	7170	8.80	1599
Bioretention Basin 3	5.71	5130	4.18	759
Underground Infiltration	83.99	17584	29.91	5435
Grassed Swale	7.00	4287	5.01	1050

### 3.3.2 Creek Grade Control Structure

MCWD has investigated the removal of the grade control structure in Minnehaha Creek near the 54<sup>th</sup> Street crossing. The existing structure creates unique whitewater kayaking opportunities for experienced users during high flow conditions; however, many stakeholders have expressed concern that the rapids conditions are unsafe for a majority of lesser experienced users. In addition, the structure has also been identified as a barrier to fish passage and inhibits aquatic habitat upstream. Conceptual design alternatives for improving fish passage and ecological integrity while maintaining the recreational functionality for kayakers have been evaluated and are discussed in more detail in the *Minnehaha Creek 54<sup>th</sup> Street Barrier Removal* technical memorandum dated November 22, 2013.

### 3.4 Area-Wide BMP Opportunities

The overall study area for this stormwater system review and analysis includes the area bounded roughly by France Avenue to the east, West 54<sup>th</sup> Street to the south, Wooddale Avenue to the west and 50<sup>th</sup> Street to the north. The commercial/retail area along France Avenue and north of 50<sup>th</sup> is included in the study area as it contributes storm water runoff to the creek in the northern portions of Arden Park.

One of the primary goals for expanding the study area beyond the immediate project limits of the West 54<sup>th</sup> Street project was to look for opportunities to better manage and treat stormwater that currently discharges to the creek directly with little to no treatment. A second factor was to identify opportunities to address any local street flooding in the residential areas and improve the nuisance drainage conditions in Arden Park.

Several potential improvement opportunities exist within the current drainage system and are identified in Figure 2. While additional options were discussed during the stakeholder input process, those shown in Figure 2 are the ones that had the most support and/or are located where they can be most effective at achieving the City and Watershed District goals for improved water quality.

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Opportunities range from trash/debris removal practices such as retrofitting existing manholes with sumps and SAFL Baffles to raingardens and streambank stabilization. Identified in Figure 2 for area-wide improvements are:

- Ideal SAFL Baffle locations in the last on-road manholes up gradient of the creek outfall
- Residential parcels with suitable site conditions on the low point of city blocks as priority locations of raingardens, and
- Private parcels adjacent to Minnehaha Creek as candidates for streambank stabilization projects.

In addition, the study has identified some practices that can be incorporated into the 50<sup>th</sup> and France business area and neighborhood churches as redevelopment projects occur. Figure 2 identifies a few of the options discussed with business owners during the stakeholder process.

### **3.5 Non-Structural Improvements**

Buckthorn removal throughout the park and neighborhood received unanimous and positive support through the stakeholder engagement feedback. There are significant opportunities within the park and on private parcels adjacent to the creek to remove buckthorn and restore native plant communities. Although it's difficult to numerically quantify the benefits of native plants, when used as a buffer between turf and the creek provide water quality benefits by preventing erosion, filtering polluted runoff, and discouraging geese which can contribute to elevated fecal coliform bacteria in the creek.

The 50<sup>th</sup> and France Business Association stakeholders showed a strong interest in the potential to utilize alternative deicing agents on the sidewalks and pavement which could both lessen the chloride concentration of runoff and diminish corrosion of embedded metals in concrete and thereby lengthening the life span of parking structures.

### **4.0 Recommendations and Conclusions**

The implementation of the improvements discussed within this report can be categorized on three distinct levels:

- Level 1: 54<sup>th</sup> Street Reconstruction Stormwater Improvements
- Level 2: Watershed Source Control/Non-structural Improvements
- Level 3: End-of-Pipe/Regional Treatment

A summary of the estimated benefit and cost per benefit for each of the improvements by category is provided in Table 5.

**Table 5  
Improvement Cost-Benefit Summary**

<b>BMP</b>	<b>Volume Capacity (ft<sup>3</sup>)</b>	<b>Annual TSS Removal (lbs)</b>	<b>Annual TP Removal (lbs)</b>	<b>Cost Estimate<sup>2</sup></b>	<b>\$/lb TSS</b>	<b>\$/lb TP</b>
<i>Level 1: 54th Street Reconstruction Stormwater Improvements</i>						
SAFL Baffle MH-104	NA	790	NA <sup>1</sup>	\$4,500	\$6	NA <sup>1</sup>
SAFL Baffle MH-204	NA	949	NA <sup>1</sup>	\$4,500	\$5	NA <sup>1</sup>
Park Place Rain Garden	350	299	0.6	\$5,618	\$19	\$9,363
Minnehaha Blvd Rain Garden	522	314	0.8	\$8,378	\$27	\$10,473
<i>Level 2: Watershed Source Control/Non-structural Improvements</i>						
Residential Rain Garden	TBD - Based on property owner participation, drainage area to treatment area ratio, and other factors not readily available or quantifiable					
Streambank Stabilization						
Native Restoration						
Alternative Deicing Agents						
Impervious Area Reduction						
<i>Level 3: End-of-Pipe/Regional Treatment</i>						
Bioretention Basin 1	3420	580	3.2	\$54,891	\$95	\$17,153
Bioretention Basin 2	7170	1599	8.8	\$115,079	\$72	\$13,077
Bioretention Basin 3	5130	759	4.2	\$82,337	\$108	\$19,604
Grassed Swale	4287	1050	5.0	\$348,322	\$332	\$69,664
Underground Infiltration	17584	5435	29.9	\$4,007,569	\$737	\$134,032
<sup>1</sup> Although these structures do not target phosphorus removal, they can remove phosphorus indirectly by settling out phosphorus that adheres to sediments. <sup>2</sup> Based on average construction cost per water quality volume found in Table 1 of Best Management Practices Construction Cost, Maintenance Costs, and Land Requirements (Barr Engineering, 2011)						

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Although the City does need not do any permanent stormwater management for the 54<sup>th</sup> Street project based on WD standards, clean water credits can efficiently be generated for TMDL goals within the project construction area with the cost effective Level 1 improvements.

For Level 2 improvement opportunities, the City may also choose to collaborate with MCWD on providing outreach and opportunities for homeowner raingardens and streambank stabilization projects in the priority areas identified. The City should also further explore the potential in the strongly supported non-structural BMP options identified on City managed property and right-of-way. Although the cost-benefit has not been quantified for this level of implementation, it is usually more cost-effective to prevent pollution than to treat it after it has entered stormwater conveyance systems or waterbodies.

Implementation of the Level 3 regional stormwater BMP improvements may be delivered by a couple of different approaches. First, the City may choose to implement improvements as part of a park improvement project, stand alone local stormwater improvement or through a cooperative project with the watershed district. Second, as redevelopment projects occur in the 50<sup>th</sup>-France business area and neighborhood churches, these project owners will need to develop stormwater practices that meet the requirements of the City, watershed and NPDES Permit. When onsite improvement options are limited for private redevelopment, one approach they may follow is to look at the off-site options shown in Figure 1 and work with the City and watershed to implement these projects as a complete or partial credit towards meeting their site specific stormwater management needs.

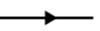
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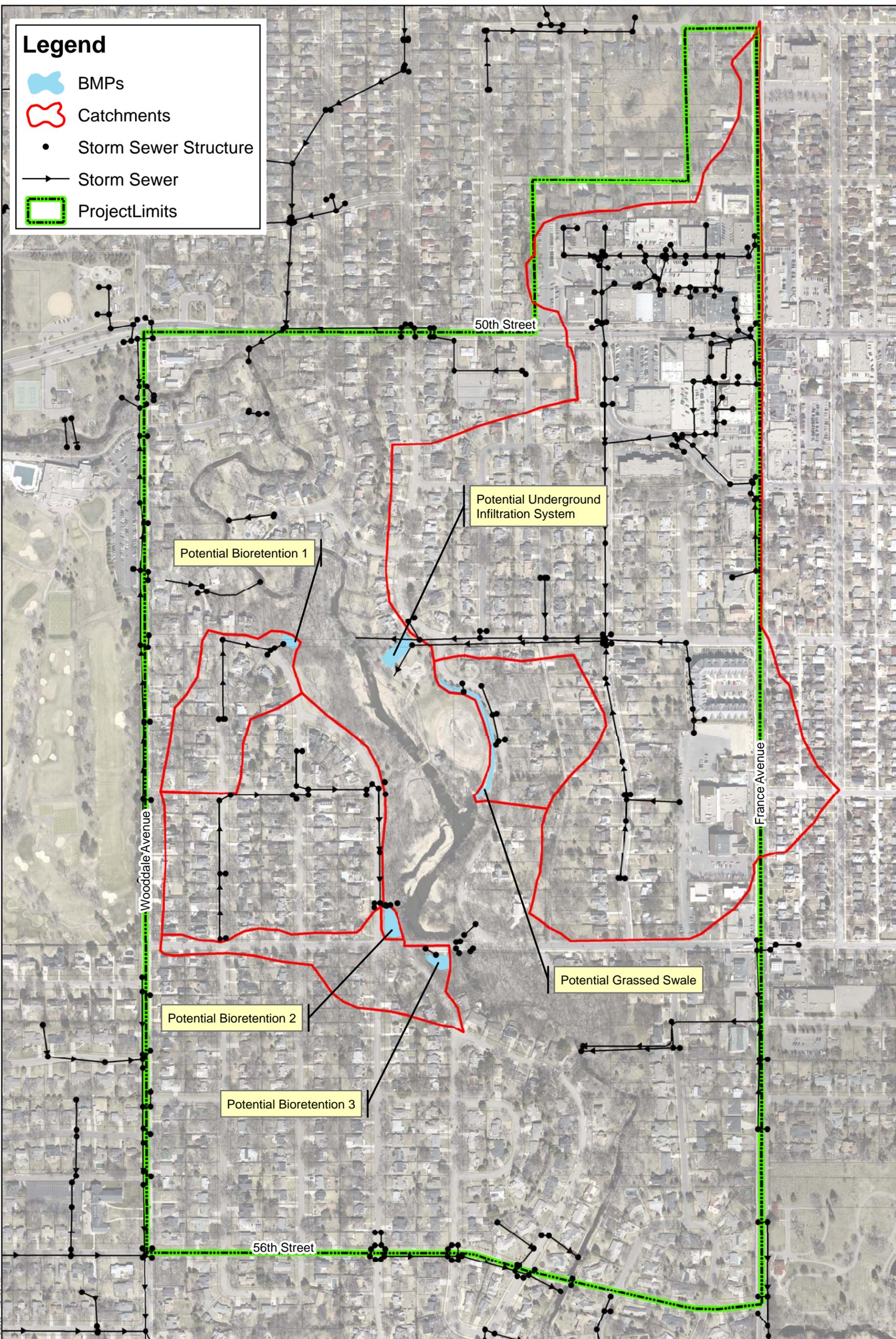
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Figure 1 – Arden Park BMP Opportunities

Figure 2 – Area-Wide BMP Opportunities

# Legend

-  BMPs
-  Catchments
-  Storm Sewer Structure
-  Storm Sewer
-  ProjectLimits



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Print Date: 12/16/2013

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Projection:  
Source:

## Arden Park BMP Opportunities

### 54th Street and Arden Park Area SWMP

Edina, Minnesota

Figure 1

This map is neither a legally recorded map nor a survey map and is not intended to be used as one. This map is a compilation of records, information, and data gathered from various sources listed on this map and is to be used for reference purposes only. SEH does not warrant that the Geographic Information System (GIS) Data used to prepare this map are error free, and SEH does not represent that the GIS Data can be used for navigational, tracking, or any other purpose requiring exacting measurement of distance or direction or precision in the depiction of geographic features. The user of this map acknowledges that SEH shall not be liable for any damages which arise out of the user's access or use of data provided.

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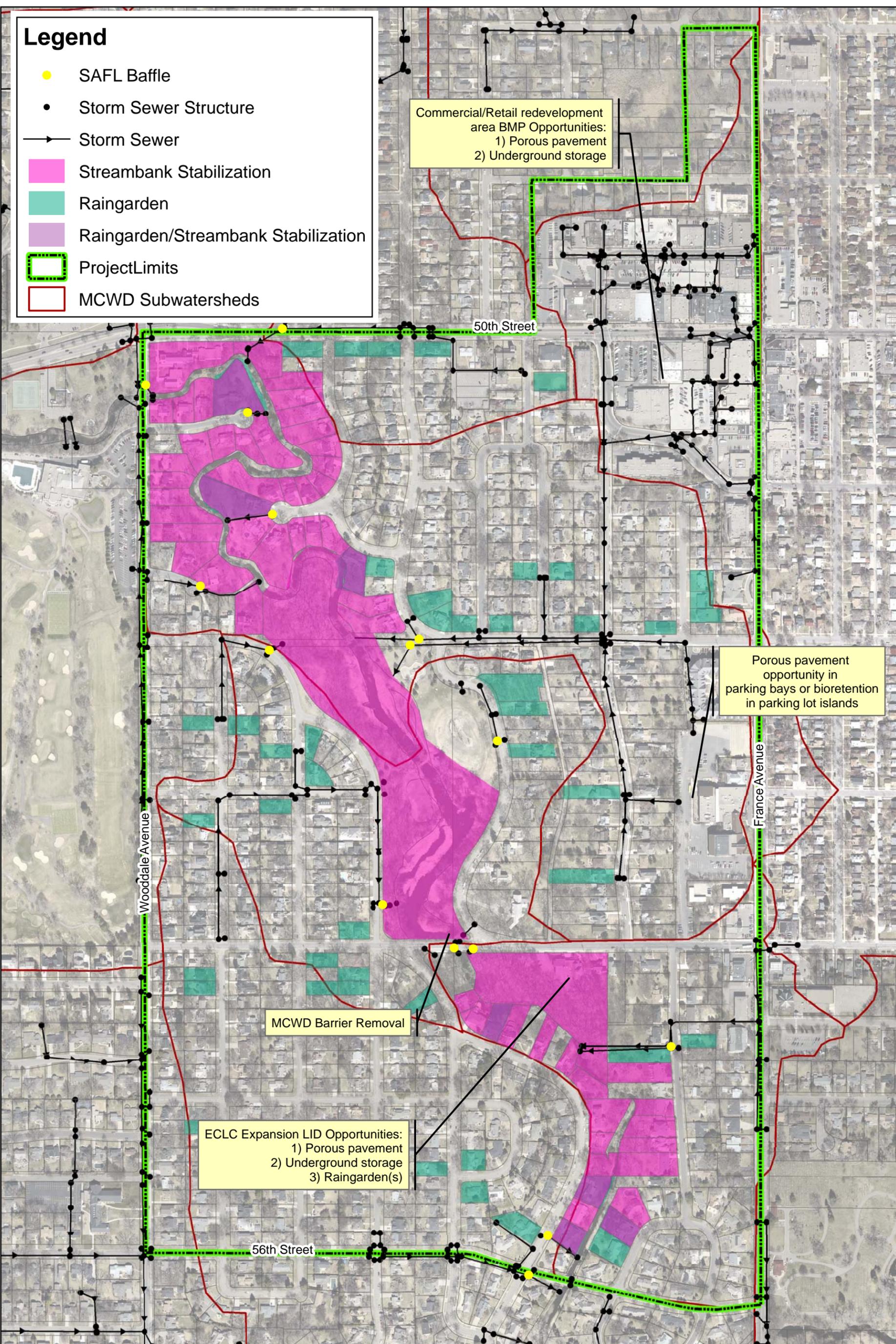
- SAFL Baffle
- Storm Sewer Structure
- Storm Sewer
- Streambank Stabilization
- Raingarden
- Raingarden/Streambank Stabilization
- Project Limits
- MCWD Subwatersheds

Commercial/Retail redevelopment area BMP Opportunities:  
 1) Porous pavement  
 2) Underground storage

Porous pavement opportunity in parking bays or bioretention in parking lot islands

MCWD Barrier Removal

ECLC Expansion LID Opportunities:  
 1) Porous pavement  
 2) Underground storage  
 3) Raingarden(s)



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## Area-Wide BMP Opportunities 54th Street and Arden Park Area SWMP Edina, Minnesota

Figure 2

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