



# The Greenway Guidebook

The Dakota County Greenway Collaborative  
Adopted September 28, 2010



Search greenway collaborative at [dakotacounty.us](http://dakotacounty.us)



## Prepared for:

A collaboration between Dakota County and the cities within Dakota County of Apple Valley, Burnsville, Eagan, Farmington, Hastings, Inver Grove Heights, Lakeville, Mendota Heights, Rosemount, South St. Paul and West St. Paul.

## Prepared by:

Hoisington Koegler Group Inc.  
123 North Third Street, Suite 100  
Minneapolis, MN 55401  
(612) 338-0800  
[www.hkgi.com](http://www.hkgi.com)



Hoisington Koegler Group Inc.

Friends of the Mississippi River  
360 North Robert Street  
Saint Paul, MN 55101  
(651) 222-2193  
[www.fmr.org](http://www.fmr.org)



Friends of the  
Mississippi River

## Contact:

John Mertens, Office of Planning and Analysis  
Dakota County, Minnesota  
(952) 891-7036  
[john.mertens@co.dakota.mn.us](mailto:john.mertens@co.dakota.mn.us)  
[www.co.dakota.mn.us/Departments/OPA/Reports/GreenwayCollaborative.htm](http://www.co.dakota.mn.us/Departments/OPA/Reports/GreenwayCollaborative.htm)

**Adopted by the Dakota County Board of Commissioners 9/28/2010.**

## Four workgroups guided the Greenway Collaborative Guidebook:

### Governance and Funding

Kurt Chatfield, Planning Supervisor, Dakota County  
Barry Bernstein, Parks Director, Hastings  
Terry Schultz, Parks and Nat Res Director, Burnsville  
Dan Schultz, Parks Director, Rosemount  
Steve Michaud, Parks Director, Lakeville  
Brian Sorenson, Program Engineer, Dakota County  
Steve Sullivan, Parks Director, Dakota County  
Brent Gustafson, Budget Director, Dakota County  
Peter Hellegers, City Planner, South St. Paul  
Allan Hunting, City Planner, Inver Grove Heights

### Greenway Design

Ben Boike, City Planner, West St. Paul  
Tim Plath, Engineer, Eagan  
Randy Distad, Parks Director, Farmington  
Dan Patterson, Planner, Dakota County  
Eric Zweber, City Planner, Rosemount  
Craig Johnson, Dakota County Parks and Open Space

### Land Protection and Stewardship

Kevin Smith, Parks Supervisor, Hastings  
Al Singer, Land Conservation Manager, Dakota County  
Tom Schuster, Parks Supervisor, Rosemount  
Tom Lewanski, Conservation Director, Friends of Mississippi River  
Brendon Slotterback, Planner, Dakota County  
Pam Dudziak, Planner, Eagan  
John Forrest, Natural Resources, Dakota County  
Chris Esser, Parks Director, South St. Paul

### Operations and Maintenance

John Mertens, Planner, Dakota County  
Matt Saam, City Engineer, West St. Paul  
Eric Carlson, Parks Director, Inver Grove Heights  
Ross Beckwith, Construction Engineer, Dakota County  
Andy Brotzler, City Engineer, Rosemount  
Juli Johnson, Parks Director, Eagan  
Kathy Bodmer, City Planner, Apple Valley  
John Hennen, Parks Supervisor, Lakeville  
Steve Skinner, Recreation Supervisor, Apple Valley  
Terry Vikla, Park Maintenance Supervisor, Dakota County  
Paul Johnson, Natural Resource Manager, Eagan



## Table of Contents

<b>I. Introduction</b>	5
<b>2. Governance and Funding</b>	15
<b>3. Land Protection and Stewardship</b>	29
<b>4. Greenway Design</b>	37
<b>5. Operations and Maintenance</b>	49





Dakota County  
Greenway Collaborative

Chapter I:  
Introduction

Introduction





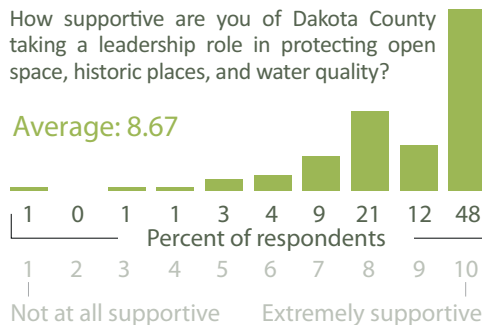
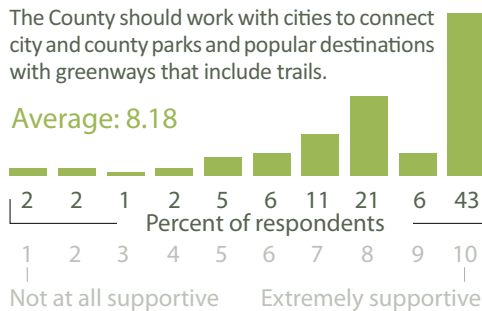
## Why Greenways?

Residents want trails, clean water and open space. A survey of residents conducted for the County’s comprehensive plan early in 2008 revealed strong support for greenway elements and the greenway concept (see figures below and the County’s [comprehensive plan](#)).

Cities in Dakota County have recognized demand for trails and have built impressive systems anchored on their parks. The city and regional parks system has provided residents with an array of recreation opportunities. Dakota County recognized demand for open space protection and land stewardship and has oriented its Park and Open Space department toward these ends. Dakota County Water Resources has repeatedly heard residents call for water quality improvement and has made great strides. The DNR, watershed districts, private nonprofits and others also have tackled water quality, open space, habitat and other objectives.

In short, all these agencies are working independently toward the shared goals, but they aren’t always coordinated or systematic. The greenway collaborative will help to coordinate these activities and allow us to do more together than we could separately.

Each partner brings its own strengths, expertise, experiences and tools to create a whole greater than the sum of its parts.



Source: Decision Resources phone survey of 400 Dakota County residents January — February 2008. Margin of error +/- 5 percentage points at 95 percent confidence.

# Dakota County Greenway Collaborative

## What do we mean by collaborative?

Cities, Dakota County and other partners can collaborate to more efficiently and effectively deliver better greenways. But what does this collaboration look like in practice? These guidelines envision two layers of a greenway collaborative. The larger group will meet less frequently — maybe once a year — to guide the effort generally and share experiences in creating the greenway system. This group is envisioned as something similar to the CONDAC transportation group. The collaborative also puts the weight of the region behind funding applications and greenway delivery, giving local projects legitimacy and demonstrated need. The greenway-specific collaboratives are segments of the larger group and contain only the germane parties. This smaller group focuses on master planning, alignment, natural resource priorities, sharing of responsibilities and operating each greenway.

### Greenway Collaborative (larger group)

**Activities:**

- Identifies collaboration opportunities
- Guides efforts
- Advises on guideline improvements
- Communicates values
- Reinforces regional importance
- Stands behind funding applications

**Participants:**

Cities, Townships, Dakota County, DNR and other partners

### Greenway-specific collaboratives

**Activities:**

- Master-plan individual greenways
- Assemble land
- Tailor greenway to each context
- Define responsibilities
- Deliver individual greenways
- Operate greenways
- Maintain greenways

**Participants:**

Cities along a particular greenway corridor, Dakota County, schools, landowners, local partners



# Lakes, Trails

## 2030

Introduction



## Dakota County Greenways 2030 Vision

The 2008 Dakota County Park System Plan solidifies a vision of an interconnected system of regional greenways through developed areas of the County. The greenway vision suggests 200 miles of regional greenway, 2/3 of which are on land currently in public or semipublic ownership.

The vision proposes more than a trail system — it suggests enhanced open space corridors that perform multiple functions and provide multiple community benefits in areas of **water quality, habitat, recreation and nonmotorized transportation**. Accommodating all four will be the goal for each greenway segment and is a focus of this document.

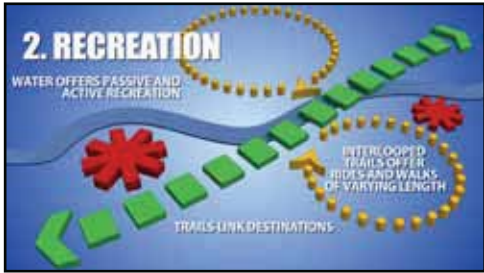




Corridors link larger hubs allowing plants and animals to thrive in a functioning ecosystem.



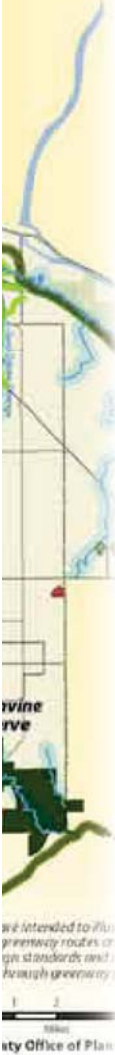
Destination trails with a natural signature tie together a seamless system of local parks, regional parks, local trails, greenways and schools.



Buffer strips, native vegetation and land management practices improve water quality and ecosystem health.



Trails with grade separation and four-season maintenance link activity centers across the county and link a feeder system of local trails.







## Guidebook Purpose

With this document, the Dakota County Greenway Collaborative takes the approach used in roadbuilding and applies it to creating a countywide network of greenways. Most of us take for granted the roadway system we use every day. It interconnects, gets us where we want to go, has a hierarchy and is maintained. The roadway system has coordinated and cross-agency structures of funding, operations and maintenance. There is no reason to believe a greenway system will require anything less.

This guidebook outlines a framework to establish regional greenways. The guidebook is organized around key activities in developing successful greenways — funding and governance, land protection and stewardship, design and operations and maintenance. Cross-jurisdictional advisory groups were organized around these topics to develop this guidebook.

## Measuring Success

Success of a mature regional greenway system will be measured around factors like recreational usage, habitat creation, reduction in vehicle miles traveled, nonlocal funding secured, miles of trail completed and others. This foundational document is focused on these success factors:

- Positioning greenway segments to be ready for implementation
- Positioning greenway segments to successfully compete for regional, state and federal funding
- Formulating projects that are infused with the core values of water quality, habitat, recreation and nonmotorized transportation

To do this in a simple way, two checklists have been created against which each greenway segment or project should be evaluated. The checklists will no doubt be refined as the Greenway Collaborative gains experience in developing greenway projects but this will provide a good start.



The first tier of evaluation is a project readiness checklist. This will help determine whether and when a greenway segment or project is ready for funding requests and planning/design resources as a regional greenway.

### ✓ Project Readiness Checklist

- Does the local community have a park/trail dedication ordinance that recognizes greenways as dedication opportunities?
- Does the local community have PUD and subdivision ordinances that identify greenways as desirable features of new development?
- Does the local community’s comprehensive plan identify a greenway for this general corridor?
- Have property ownership, natural resources, topography and other landscape features been generally evaluated to gain a preliminary sense of greenway feasibility and location?
- Have Dakota County and the local community identified this greenway segment as a priority?
- Does the greenway have a Metropolitan Council-approved master plan? Has it undergone feasibility study or design and engineering?
- Have additional funding sources been secured or identified?
- Have residents been engaged and do they support it?

The iterative framework will be used by all parties in formulating, delivering and operating greenways.





## ✓ Land Protection and Stewardship

What land protection tools can be used to secure the corridor?

Are there opportunities to restore natural areas, increase biologic diversity and improve ecological function?

Through what means can long-term stewardship of natural areas in the corridor be assured?

## ✓ Greenway Design

Does the proposed greenway meet the minimum guideline widths?

Is as much of the greenway not adjacent to roads as possible (shooting for 80 percent or better)?

Will the greenway improve water quality? through natural systems with recreational water amenities?

Will natural areas be protected as part of an interconnected system that will provide or enhance wildlife corridors?

Will the proposed greenway provide an attractive recreational experience that makes it a destination in its own right?

Will the proposed greenway provide attractive nonmotorized transportation that connects to destinations and activity centers?

## ✓ Operations and Maintenance

Have long-term costs been established or projected?



Who is best for construction and operations regardless of funding source?

How will maintenance and operations preserve and perpetuate the four functions of the greenway (transportation, habitat, water, recreation)?

Will the project ensure construction and operations are infused with multiple benefits of water quality, habitat, transportation and recreation?

Will the project leverage operational strengths of cities and the County?

## Key Terms

**Greenway:** A linear corridor planned, designed and managed to provide multiple benefits to water quality, habitat, recreation and transportation.

**Open space:** Land not occupied by buildings or dominated by pavement; typically a naturally vegetated tract of land.

**Governance:** The act of exercising authority or control.

**Land protection:** For procuring land needed to establish the greenway system and protecting greenway lands over the long-term from damage and misuse.

**Stewardship:** Closely associated with greenway “operations” with the difference being that operations is focused on the recreation utility of the greenway while stewardship targets the restoration and care of native landscapes and habitat within greenway corridors.

**Corridor:** A linear tract of land providing passage for people and wildlife.







Dakota County  
Greenway Collaborative



Chapter 2:  
Governance  
& Funding



Governance  
& Funding



## 2. Governance & Funding

Governance and funding are the keystones of the Greenway Collaborative. This chapter suggests a framework of methods by which cities, the County and other partners collaborate to build and operate greenways and an approach to funding those activities. It is recognized that the construction and operational roles played by project partner will likely vary between greenway segments.

### Objectives

- › **Institutionalize City/County collaboration and communication regarding...**
  - project prioritization
  - capital improvement planning
  - outside funding pursuits
  - land protection
  - planning/design
  - project delivery
  - operations/stewardship
  
- › **Establish a governance structure that...**
  - uses each greenway segment's planning process to define the roles of project partners
  - is opportunistic and nimble
  - builds from the strengths of each project partner



## Key Topics

**Communication:** The greenway system requires institutionalized communication channels between cities and the County. *Finding: Participants in the greenway collaborative should meet periodically to share information and expertise.*

**Ownership:** There will be numerous ownership scenarios for greenways including private, municipal and County. County ownership of regional greenways is not required, but Dakota County will need a perpetual easement, memorandum of understanding or joint powers agreement on regional trails within greenways. *Finding: Easements or other arrangements will be critical in securing funding and support for greenways.*

**Jurisdictional responsibilities:** Early discussion among project partners concludes that responsibilities for operations, maintenance, construction and other activities will vary by greenway segment. Regional trails are the jurisdictional responsibility of Dakota County, but the larger greenway corridor could be governed in many ways to suit the situation. The governance structure outlined in this chapter suggests using each master planning process to define specific responsibilities. The intent of the Greenway Collaborative governance structure is to allow flexibility to maximize greenway benefits and efficiencies. *Finding: Joint powers agreements based on individual master plans likely will be needed for each greenway.*

**Outside funding:** In many cases Dakota County, as the regional agency, will be in the best position to pursue outside funding, but determination of funding pursuits should be linked with other strategic decisions. *Finding: Greenway projects should be positioned to access funding from sources aligned with transportation, recreation, water quality and natural resource protection.*

**Opportunistic funding:** Limited windows of opportunity to secure crucial greenway land will present themselves. *Finding: Having a flexible funding source is critical to leverage funding from other agencies.*



**Coordinated capital improvement and comprehensive planning:**

Municipal and county jurisdictions prepare multi-year capital improvement plans as well as comprehensive guide plans. Since greenways will, in many cases, be financial and land use partnerships between a city and the County, plan coordination will be critical. This speaks to the importance of communication, agreeing on greenway corridors, determining priority projects and determining capital funding responsibilities. Specifics of a greenway capital improvement program (CIP) have not yet been determined. *Finding: A greenway CIP could be developed based on input from cities and the County.*

**Key Questions**

**Who makes up Dakota County greenway collaboratives?** Most of the collaboration will occur between Dakota County and cities, but school districts, watersheds, townships and federal and state agencies will also collaborate in some corridors. Collaborative partner engagement will vary based on each project, with cities generally being involved only in greenways in their jurisdiction or directly linking to them.

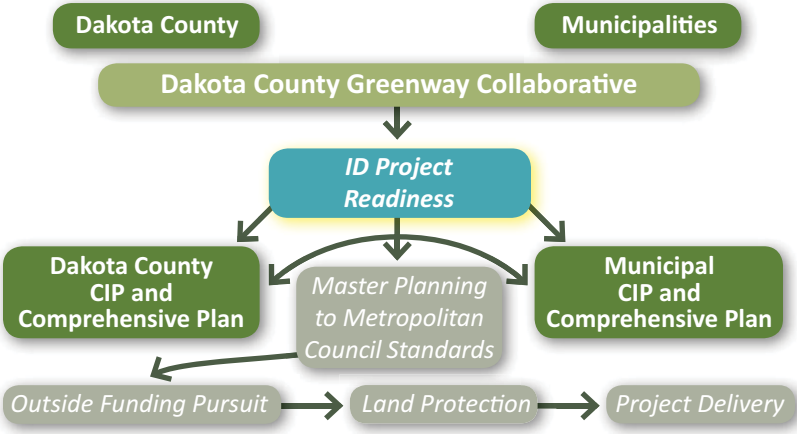
**How are priority projects determined?** The Dakota County Comprehensive Plan established general priorities for the 200-mile greenway system. At a more refined scale, projects will be prioritized by the County in a transparent process that considers readiness, funding and consistency with the greenway guidelines.

**How can comprehensive plans be aligned?** Adopted comprehensive plans should include discussion and a map of the Dakota County Greenway Vision. If the extent or location of regional greenways changes, comprehensive plans should be amended.

**Who will lead the funding pursuit, planning and implementation of greenways?** This is one of the early decisions to be made for priority projects once they are selected. Depending on specific corridor circumstances, a city or the County may lead aspects of the effort.

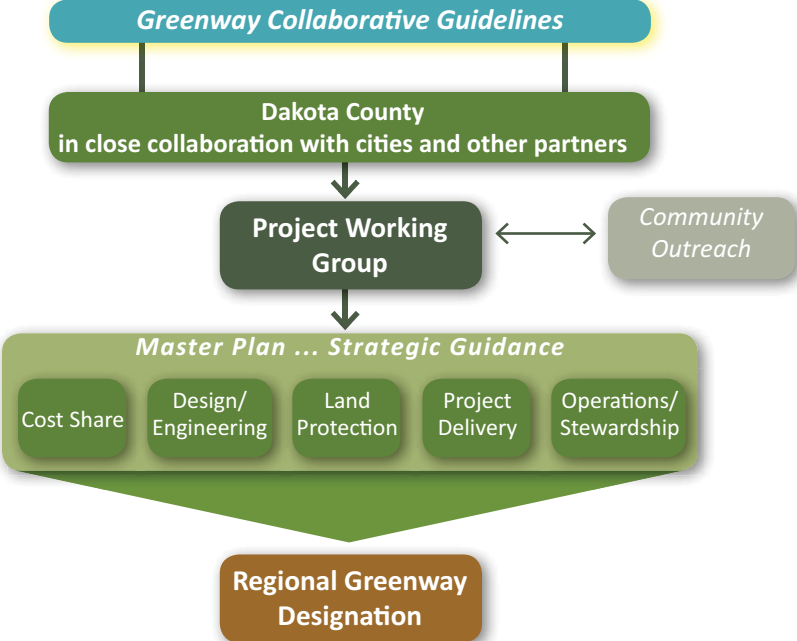
# Dakota County Greenway Collaborative

## Governance



Governance & Funding

## Master Planning







## Master Planning

Dakota County is responsible for funding and preparing master plans for regional greenways. Master plans will be developed in collaboration with the partners, other agencies and residents. Cities may consider their master plan efforts as in-kind contributions for greenways. All master plans for regional greenways are subject to County approval and must meet regional guidelines.

## Typical Cost-Share and Roles

Roles should be determined based on the strengths of each agency and the circumstances of individual greenway segments. In-kind contributions of land, easements, design, engineering, construction and maintenance and operations are encouraged. Joint powers agreements will be developed to establish predominant roles and responsibilities between the city and the county regarding cost share and funding. *Future projects will be positioned to secure state and federal funds for recreation, water and habitat. It is anticipated these sources will account for the majority of acquisition and construction costs.*

## Typical Ownership

While the greenway network will rely heavily on borrowed views and adjacencies with private and semipublic land, portions of the greenway system will have to be in public ownership to ensure public access, access to funding and natural resource protection because private land that contributes to greenway character has no legal status. Ownership mix in each corridor will vary; below are options for the publicly held portions of greenways.

Component	Ownership
30' regional trail easement	County easement, fee title, MOU or joint powers agreement
Minimum corridor (100-300')	City or County easement, fee title
Connected natural areas	City or others own fee title, County may hold easement if funded through Farmland and Natural Areas Program
Trailheads	City or County fee title



## Typical Cost-Share and Roles

Actual roles and responsibilities will vary by project and will be established by joint powers agreements

Component	Acquisition	Design/engineering	Construction/restoration	Operations/Maintenance
30' regional trail easement	County w/ city help using parks, ROW, ponding or park dedication (County will reimburse or negotiate terms)	County unless city is ready to advance project	County; cities can advance for later reimbursement by prior agreement if up to standards	County. May be contracted.
Minimum corridor (100'-300')	City can contribute existing park, park dedication, PUD, ponding, etc. Land not secured by city or others could be secured by County through grants	Shared. City or County contribution can be in-house design and engineering	County may fund natural areas in easements, city may fund active use areas within city parks	Land owner or by agreement
Connected natural areas	County helps city or owner seek funding	NA	County may assist if funded through FNAP	Land owner
Trailheads	Shared when in city parks and master-planned	Shared if facility serves joint use	Shared if facility serves joint use	Shared if facility serves joint use

## Typical Federal Transportation grant approach

Actual grant responsibilities will be developed case by case at the time of application through negotiation between the county and cities.

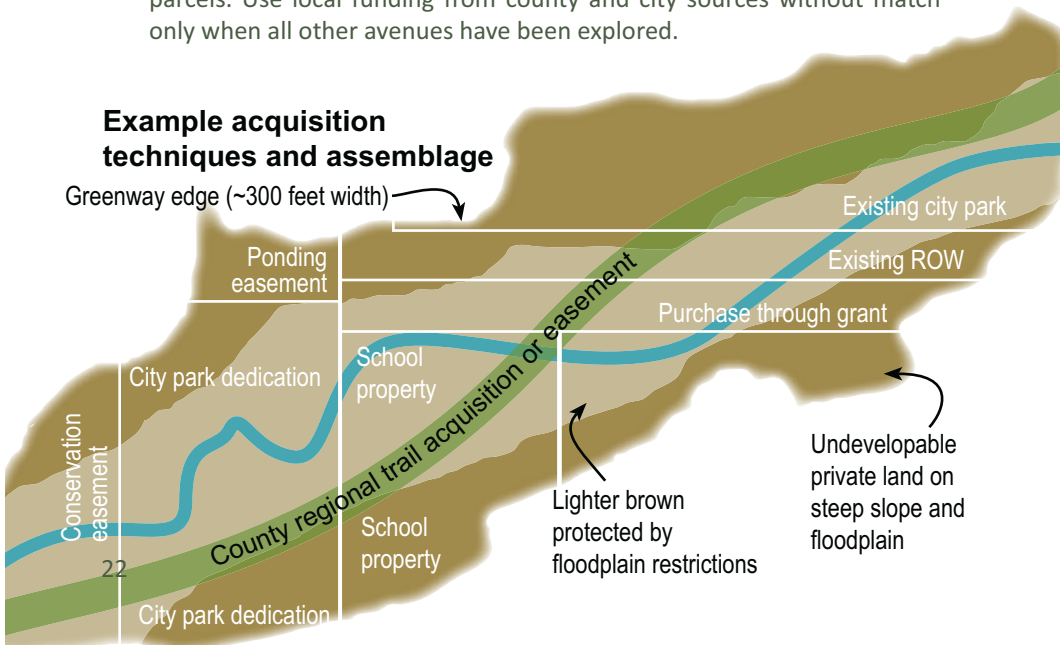
- In situations where the cities are better positioned to deliver a project:
- TE applications should be submitted by the city (with assistance from Dakota County as needed)
  - Dakota County could provide the required local funding match (20 percent of grant funds)
  - Cities could assume costs for design, engineering and construction management (may be in-house)



## Typical acquisition strategy for minimum corridor in order of priority

Governance & Funding

- 1) Use existing public land that is already secured to create corridors. No ownership change is required. Examples include existing parks, ponding areas, schools, wildlife areas and other public land.
- 2) Preserve corridors in coordination with land development. Use park dedication, ponding areas, PUDs, and subdivision requirements to assemble corridors.
- 3) Take advantage of existing land use regulations that protect open space. Public ownership may not be needed in these areas beyond the 30-foot trail easement. Examples include floodplain regulations, shoreland zoning, wetland protection areas, bluff protection areas, etc.
- 4) Strategically purchase property or easements as necessary. Leverage regional, state, and federal grants and existing land conservation programs as sources of revenue and provide local match as needed. The County may access emergency acquisition funds from Metropolitan Council for some parcels. Use local funding from county and city sources without match only when all other avenues have been explored.





## Grant Programs

A funding strategy is needed to create and preserve Dakota County’s existing and future greenways. This may include the initial capital costs and on-going maintenance costs. To move forward the County will need to be cognizant of budgeting priorities and allocation of resources. In addition to County and City funds, other sources such as partnerships and grants should be explored; examples are listed below.

### **NPS Rivers, Trails and Conservation Assistance Program**

The National Parks Service’s Rivers, Trails and Conservation Assistance Program provides technical assistance to conserve rivers, preserve open space and develop trails and greenways. The program implements the conservation and recreation mission of the National Park Service.

### **Minnesota Department of Transportation**

Reauthorization of SAFETEA-LU likely will fund transportation improvements across the U.S. for the following six years. The most used funding programs have been Surface Transportation Program Urban Guarantee funds, Congestion Mitigation Air Quality funds, Transportation Enhancement funds and Bridge Improvement/Replacement funds. These funds are overseen by MnDOT and the Metropolitan Council.

### **Minnesota Department of Natural Resources**

The Minnesota DNR is one of the most comprehensive resources when it comes to state funding for natural resources, parks and trails. Current programs provide assistance to protect and preserve open space and natural habitats. Each program varies in funding and timing. The DNR should be consulted to clarify funding availability and qualifications.

### **Minnesota Pollution Control Agency**

The MPCA provides grants that address environmental issues. Programs relevant to greenway initiatives include those that address water quality. The MPCA should be consulted to clarify funding availability and qualifications.



## **The Environment and Natural Resources Trust Fund (LCCMR)**

The Environment and Natural Resources Trust Fund is funded through state lottery proceeds. This program has helped acquire land to preserve Dakota County greenways, natural areas, water bodies and open space.

## **Clean Water, Land and Legacy Amendment**

On Nov. 4, 2008, Minnesota voters approved the Clean Water, Land and Legacy Amendment to the Minnesota Constitution, which increased the general sales and use tax rate by three-eighths of one percentage point to 6.875 percent and dedicated the additional proceeds as follows:

- 1/3 to a new Outdoor Heritage Fund to restore, protect and enhance wetland, prairie, forest and habitat for game, fish and wildlife.
- 1/3 to a new Clean Water Fund to be spent to protect, enhance and restore water quality in lakes, rivers, streams and groundwater with at least 5 percent of the fund spent to protect drinking water.
- 14.25 percent to a new Parks and Trails Fund to support parks and trails of regional or statewide significance.
- 19.75 percent to a new Arts and Cultural Heritage Fund for arts, arts education and arts access and to preserve history and heritage.

## **Watershed Management Organizations**

Local watershed management organizations provide funding to improve water quality and manage runoff.

## **Foundations and Nonprofits**

Foundations and nonprofits throughout the country and state are willing to fulfill their mission by supporting local projects. The Minnesota Council on Foundations is a great starting point for identifying local foundations. Before pursuing a foundation, it is important to recognize that each operates differently and toward its own mission. It is also important to contact a foundation early to clarify whether a project would be considered.


























# Dakota County Greenway Collaborative

## Grant Matrix

Recreation  
Transportation  
Water Quality  
Habitat

**Grant**

Minnesota Department of Transportation (MnDOT)				
<b>Reauthorization of SAFETEA-LU</b>				
<b>Safe Routes to School Program</b>				
Department of Natural Resources (DNR)				
<b>Metro Greenways Protection &amp; Restoration</b>				
<b>Natural and Scenic Area</b> To increase, protect and enhance natural and scenic areas.				
<b>Federal Recreational Trail Program</b> To encourage the maintenance and development of motorized, non-motorized, and diversified trails by providing funding assistance.				
<b>Restoration Grants</b> Restoration activities that establish or support native plant and animal communities				
<b>Protection Grants</b> Protection of high quality sites with native plant.				
<b>Local Trail Connections Program</b> To provide grants to local units of government to promote relatively short trail connections between where people live and desirable locations, not to develop significant new trails.				
<b>Outdoor Recreation Grants</b> Provides matching grants to local units of government for up to 50% of the cost of acquisition, development and/or redevelopment costs of local parks and recreation areas.				

Governance & Funding



Governance & Funding

**Grant**

 **Recreation**  
 **Transportation**  
 **Water Quality**  
 **Habitat**

<p><b>Minnesota's Landowner Incentive Program</b></p> <p>LIP provides technical and financial assistance to eligible, private landowners within LIP project areas, who are interested in enhancing habitat on their land for target species. Target species are: Plants and animals identified under state or federal endangered species laws as endangered, threatened or of special concern (listed species) and non-listed animal species with declining or vulnerable populations (Species In Greatest Conservation Need).</p>				
<p><b>Lessard - Sams Conservation Partners Legacy Grants</b></p> <p>Restoration and Enhancement projects will consist of activities that restore or enhance habitat for fish, game, or wildlife on lands permanently protected by conservation easement or public ownership. Protection projects maintain the ability of habitat and related natural systems to sustain fish, game or wildlife through acquisition of fee title or conservation easements. Land acquired in fee must be open to public hunting and fishing during open seasons. Land protection also includes preserving ecological systems and preventing future degradation of those systems.</p>				
<p><b>Roadsides for Wildlife</b></p> <p>To encourage local road authorities and landowners to use Integrated Roadside Resource Management Techniques so that ecological values (water, soil, wildlife, native plants) are considered. For example, this program provides information on state mowing laws so that there is reduction in the disturbance of nesting wildlife.</p>				

# Dakota County Greenway Collaborative

Recreation  
Transportation  
Water Quality  
Habitat

**Grant**

<p><b>Shoreland Habitat Restoration Grant Program</b></p> <p>To expand the diversity and abundance of native aquatic and shoreland plants; improve and protect the quality of shoreline habitat; enhance and protect water quality; raise awareness of the value of native shoreline and aquatic vegetation. Shoreland Habitat Block Grants are to provide cost share funding to counties, cities, watershed districts, other local units of government, conservation groups and lake associations to conduct shoreline restoration projects with native plants, to improve fish and wildlife habitat.</p>				
<p><b>Wetland Tax Exemption Program</b></p> <p>To provide a financial incentive to maintain wetlands in their natural state and to promote an awareness of wetland values.</p>				
<p><b>Native Prairie Bank Program</b></p> <p>To protect native prairie through the purchase of conservation easements, that allows the land to remain in private ownership.</p>				
<p><b>Native Prairie Tax Exemption Program</b></p> <p>To conserve native prairie by providing property tax exemptions on eligible native prairie lands.</p>				
<p><b>Reinvest in Minnesota (RIM) critical habitat match program</b></p> <p>To encourage private citizens and organizations to help fund the acquisition and development of critical fish and wildlife habitat by having their donations of land or cash matched from a special state fund.</p>				
<p><b>Parks and Trails Legacy Grant Program</b></p> <p>To support trails of regional or statewide significance.</p>				






Governance & Funding



Recreation  
 Transportation  
 Water Quality  
 Habitat

Governance & Funding

Grant

Minnesota Pollution Control Agency (PCA)				
<b>Financial Assistance for Nonpoint Source Water Pollution Projects: Clean Water Partnership, Clean Water Legacy and Section 319 Programs</b>  The MPCA provides financial and technical assistance to local government and other water resource managers to address nonpoint-source water pollution through the State Clean Water Partnership (CWP) and Federal Clean Water Act Section 319 (Section 319) programs.				
<b>Clean Water Legacy Act Surface Water Assessment Grants</b>  Surface Water Assessment Grant funds can be used to monitor the physical, chemical, biological, and/or bacteriological water quality parameters of lakes or streams.				
<b>Clean Water Legacy Act (CWLA) Funding Round Guidance for Stormwater Applications for Federal Clean Water Act Section 319 TMDL Implementation Funds</b>  Provides funding to protect, restore and preserve the quality of Minnesota's surface waters.				
Metropolitan Council				
<b>Metro Environment Partnership Grant Program</b>  The purpose of MetroEnvironment Partnership Grant Program is to improve the water quality of Metro Area lakes and rivers by reducing nonpoint source (NPS) pollution through education and implementation grants.				
Miscellaneous Grants				
<b>State of Minnesota Lottery - Environment &amp; Natural Resources Trust Fund</b>				



Dakota County  
Greenway Collaborative



Chapter 3:  
Land Protection  
& Stewardship

Land Protection  
& Stewardship





## 3. Land Protection & Stewardship

This chapter outlines the objectives, techniques and key topics associated with protecting and caring for greenways. We use the term “land protection” to mean both securing land needed to establish the greenway system and protecting the integrity of greenway lands from damage and misuse. The term “stewardship” is closely associated with greenway operations discussed elsewhere in this guidebook. The difference is that greenway operations are focused on the recreational utility of the greenway while stewardship targets care for native landscapes and habitat within greenway corridors.

### Objectives

- › Establish an interconnected open space network with high habitat value.
- › Protect and improve ecological function.
- › Remain flexible to land protection options.
- › Choose lands that offer multiple benefits.
- › Measure and monitor success.
- › Develop partnerships and engage residents.



*A Metro Greenways sign identifies an area protected by conservation easement.*



# Dakota County Greenway Collaborative

*Native plants in residential areas protect water bodies from the damages of fertilizers and other chemicals that typically run off treated turf grass lawns into storm sewers.*



## Key Topics

**Relationship between land protection and stewardship:** There is a strong relationship between the formal protection of land designated as greenway and stewardship of habitat and the natural systems on that land. Legally protecting land does not ensure its environmental health or ecological function — but stewardship does. Correspondingly, good stewardship provides no safeguards against land being sold or altered — but land protection does. A successful greenway system will address both land protection and stewardship.

**Integration with the development process:** A primary way to protect greenway corridors is to institutionalize the greenway plan into the local development process. Use of comprehensive planning, zoning, park dedication, official mapping and other strategic tools to designate and trigger greenway protection are all part of the land development process. With plans for greenways incorporated into local controls and processes, their protection will become a matter of course.

**Ecological function as one of multiple benefits:** Most communities have become accustomed to planning and building trail corridors. The Dakota County Greenway Collaborative expands the notion of “corridor” to include ecological benefits as well as recreational ones. Habitat, wildlife movement, stormwater infiltration and carbon sequestration as well as alternative modes of transportation and recreation are core objectives of greenway corridors. A natural corridor without a trail or a trail corridor

Land Protection  
& Stewardship



without habitat are fine in their own right but they are not what the Greenway Collaborative is striving for — the integration of both.

**Using greenways to increase biological diversity:** Plants provide a foundation for the ecological function of a greenway and reflect a unique landscape character. Establishing native plant communities such as prairie, savanna, woodland and wetland in appropriate locations across a greenway system supports a broader variety of wildlife, is more visually interesting and is shown to be more ecologically stable – less prone to disturbance, erosion, disease and invasion.

**The importance of flexibility:** When it comes to land protection, one size will not fit all. There will likely be a customized approach to land protection needed for each property owner. It will be important to remain flexible to the needs of various stakeholders in land protection negotiations.

**The need for on-going monitoring:** Land protection and stewardship are long-term endeavors. Situations arise with issues like encroachment or habitat damage that can be resolved easily if caught early through regular monitoring but could lead to costly repairs if not addressed. Monitoring of key vegetation, animal groups such as birds and frogs or water quality is also the prime way to measure the success of stewardship efforts.

**The strength of partnerships:** The strength of any land protection and stewardship project is greatly enhanced by the involvement of other agencies and organizations. Each group brings different perspectives that combine to create superior results. Partnerships benefit the community by getting more people involved, creating stronger connections and making education an inherent aspect of greenways. Furthermore, partnerships allow cities, the County and property owners to leverage their resources by tapping into expertise and resources they may not otherwise have.

The success of any stewardship project is dependent on residents — the people who live nearby, who know it, who bring others there and raise awareness. Without resident engagement, many stewardship projects languish. Engaging residents in multiple project phases, from planning, to installation, to monitoring brings value to the community and individuals. Building these relationships from the beginning phases can help build project support and can make all subsequent phases go more smoothly.



# Dakota County Greenway Collaborative

*Buffers are a key strategy to improve water quality with greenways*



Land Protection  
& Stewardship

## Land Protection Tools

### Park Dedication

Park dedication could be used by municipalities to secure greenway land in conjunction with city parks at the time of surrounding development. This tool is typically used by cities to fulfill neighborhood recreation needs and in many situations a greenway could meet local recreation needs while connecting residents to regional facilities. The County would either reimburse the city for the value of the park dedication used for the greenway, or otherwise come to agreement on how to reach an equitable use of park dedication.

The County may evaluate the feasibility of county-wide park dedication to augment funding for regional greenways.

### Comprehensive Planning and Zoning

Municipal land use guidance and zoning could define and help protect greenway corridors by officially designating them in comprehensive plans



and zoning codes. Establishing special zoning designation such as overlays and coupling greenway corridors with otherwise protected lands such as floodways and bluffs are a couple of common strategies.

## Official Mapping

Greenways could be officially mapped by government entities as public record of the government's intent to acquire the land for public use.

## Acquisition

There are a number of approaches to acquiring land and each has its own set of activities, steps, advantages and limitations. The major approaches are described below. There are a number of potential conservation partners, both public and private, that can assist in land acquisition.

### *Direct Purchase*

With this tool, the fee title to the property is acquired. There are often grant programs available (e.g. DNR Metro Greenways Program) and project partners (e.g. Dakota County Farmland and Natural Area Program) that can provide matching funds and/or expertise for acquisition projects.

### *Land Donation*

A landowner may choose to gift all or part of their land for greenway use. The landowner may be able to enjoy tax benefits for donating land to qualified public or conservation partner.

### *Bargain Sale*

In some cases it may be in the landowner's best interest to sell their property for something less than fair market value. By doing so, a landowner may receive tax benefits.

### *Life Estate*

This tool allows the landowner to live on the land after selling the fee title. Life estates can be structured in many different ways (e.g. the landowner can live on the land until he/she dies or any mutually agreed upon number of years). A life estate can affect the appraised value of the land.



### *Conservation Easement*

A conservation easement is a non-ownership interest in property that imposes limitations to protect natural, scenic, or open-space values; assure its availability for agriculture, forest, recreation, or open-space; protect natural resources, or air/water quality; or preserve the historic, architectural, archaeological, or cultural aspects of property. Each conservation easement is tailor made to the specific landowner and the goals of the project. Dakota County has critical experience with conservation easements.

The natural systems on which greenways will be assembled integrate greenways into the broader landscape. Prior to Western settlement, Dakota County was relatively wild and unplowed; natural forces maintained equilibrium. Native plant and animal communities evolved into an

### **Stewardship**

ecological balance like a protective shell that sustained and buffered the area's streams. It is well outside of anyone's abilities and outside anyone's intentions to fully restore the greenways to pristine presettlement conditions, but major headway within the system is feasible.

The natural resource objective for the greenway system is to strike a new and healthy ecological balance different from the presettlement condition but still a healthy context within which nature can thrive. This vision suggests improved land management with strategic habitat restoration to create a protective web of natural landscapes that once again sustain and buffer the county's streams, provide wildlife habitat and connections.

**Greenway corridors:** The first stewardship priority is restoring continuous native habitat in greenway corridors themselves. This continuous ribbon of varying widths will function as a wildlife corridor and buffer streams from damaging effects like runoff, pollution and invasive species.

**Adjoining Sensitive Lands:** The next order of stewardship priority is habitat restoration and protection of the most sensitive lands, including uplands, which link greenways to the broader landscape. These landscapes perform vital functions of preserving habitat and species diversity and stormwater

infiltration and cleansing. Prioritization of adjoining landscapes will be based on intrinsic sensitivities like erodibility, aquifer recharge, the presence of wetlands and the presence of native plant communities, in addition to landowner interest. Designated wildlife and aquatic management areas also provide important refuge for wildlife and native plants.

A Healthy Natural Framework: Stewardship of first- and second-order landscapes will reestablish a stronger habitat network that can thrive in the future. This overall habitat and open space network will have greater resilience and will provide a strong framework for future growth.

### Stewardship Techniques

Stewardship Objectives	Rationale	Stewardship Techniques
Establish high habitat value	<ul style="list-style-type: none"> <li>● Balance wildlife</li> <li>● Greater ecosystem stability (disease, erosion, invasion)</li> <li>● Visually appealing</li> </ul>	<ul style="list-style-type: none"> <li>● Use historic plant communities as guide for restorations</li> <li>● Control non-native, invasive species</li> <li>● Minimize pesticide use</li> <li>● Install native plants or seed</li> <li>● Model native plant community composition</li> </ul>
Protect and improve ecological function	<ul style="list-style-type: none"> <li>● Reduces non-native invasive species</li> <li>● Cycles nutrients</li> <li>● Invigorates native plants</li> <li>● Perpetuates native plant and wildlife communities</li> </ul>	<ul style="list-style-type: none"> <li>● Select native, local genotype species</li> <li>● Prescribed burning of suitable habitats in suitable locations</li> <li>● Substitute mowing or weeding where fire is not feasible or applicable</li> </ul>
Measure and monitor success	<ul style="list-style-type: none"> <li>● Clear indicators of project results</li> <li>● Identification of problems or emerging issues.</li> </ul>	<ul style="list-style-type: none"> <li>● Photographs</li> <li>● Survey plants and animals (birds, frogs) prior to stewardship, during and after completion. Continue indefinitely.</li> <li>● Develop responses to new concerns.</li> </ul>
Develop partnerships and engage residents	<ul style="list-style-type: none"> <li>● Strengthens the project</li> <li>● Creates more community visibility</li> <li>● Creates long-term investment of residents</li> <li>● Provides education opportunities</li> </ul>	<ul style="list-style-type: none"> <li>● Involve local and regional agencies and organizations.</li> <li>● Open-house planning sessions</li> <li>● Volunteer work events</li> <li>● Educational tours</li> </ul>

Dakota County  
Greenway Collaborative



Chapter 4:  
Greenway Design

Greenway  
Design







## 4. Greenway Design

Design is critical to a high-quality greenway system. An overarching goal of the collaborative is to move beyond trails and develop greenways with trails in them.

### Objectives

- › Create an interconnected system of greenways with a natural design signature that improves water quality, enhances wildlife habitat, provides first-class linear recreation and increases mobility.
- › Connect, enhance and interpret natural habitat.
- › Create wildlife corridors to expand wildlife range.
- › Filter and store stormwater that enters greenways.
- › Create a safe, amenity-rich trail network that meets the needs of multiple users in all seasons.
- › Create an inviting, connected, memorable and nature-based recreation system.

### Key Topics

**Design consistency:** Design consistency will be important in combining a regional greenway system with the distinct greenway segments implemented by different agencies and developers. This guidebook establishes the foundation for design consistency; early projects will serve as models with features to be reused and refined in later projects.

**Borrowed views:** “Borrowed views” suggests taking advantage of greenway-adjacent open space to expand the character and ecological function beyond what the greenway alone can accomplish. What this boils down to is colocalizing greenways with other long-term open spaces.



**Balancing multiple objectives:** Implementing a greenway system will require trade-offs. This chapter outlines greenway performance goals and techniques that are ideals in greenway design but will not all be achievable with every project. The collaborative must be mindful of the need for flexibility without losing the underlying intent of the greenway system.

**Year-round facility:** Greenways will provide year-round recreation and transportation functions. Greenways can be used for jogging, hiking, snowshoeing, nordic skiing and bird watching. With the expected continuing increase in bike commuting, greenways will also serve a year-round transportation function which will require that some greenways be maintained for bicyclists year-round. Which segments are maintained for which activities will be determined as the system develops and demand for each type of transportation and recreation is more readily gauged.

**Minimizing conflicts:** The primary greenway trail conflict points are with crossing vehicular traffic and with adjoining neighbors. The potential for conflicts in both categories should be minimized through the use of landscape buffers, grade-separated crossings and considerate design.

**Universal accessibility:** Greenway trails and walkways should provide universal access. Universal design considerations are especially critical at street crossings, in sidewalk and trail cross-section design, and in nature-based recreation and interpretation.

**Providing local access:** Neighborhood access to the greenway system should be abundant but thoughtful to minimize conflict points; direct access from private property should not be allowed.

**Wayfinding:** Wayfinding will unify the greenway system from a usability and character standpoint. Signage should be consistent across the system and should both guide people to greenways and to guide greenway users to local services and cultural destinations.

**Sustainability and environmentalism:** Greenways will be assembled in environmentally sustainable ways with a minimized negative impact on natural systems in Dakota County and beyond. Strategies include using recycled materials, pervious pavement and energy-efficient lighting.





## Greenway Typology

Three greenway categories or typologies have been defined for Dakota County regional greenways. They are categorized by the setting within which they exist. Each strives to perform the functions of water quality enhancement, habitat creation, non-motorized transportation and recreation. Because each greenway type has unique characteristics, they also have inherent strengths and weaknesses in each function.

There are references made in this section to greenway width of 300 feet. This is a dimension many habitat experts have arrived at as a minimum corridor width for establishing a healthy native plant and wildlife ecosystem when those corridors interconnect larger habitat nodes. While this is a high standard, it is valuable to understand and strive for healthy ecological function in the greenway system. Greenway collaborative members recognize that there will be instances in which portions of the greenway will be limited to significantly less than the “minimum” width. Greenway segments will be designed individually to best suit the four elements in each corridor; what works in one corridor may not in another. That said, rule of thumb minimums are provided below for each context. Greenway width is the average width per 1 mile segment (determination of segments is flexible and for width calculation need not match segment designation used for other purposes). Where multiple contexts exist within a segment, a prorated minimum width should be used. Contexts and character will be determined by partner consensus in the master planning process.

$$\text{Greenway width} = \frac{\text{area along 1-mile segment}}{1 \text{ mile}} - \text{impervious surface area}$$

**Urban greenways** are those that would typically be retrofitted into existing neighborhoods or those that are built along with development in dense, urban districts. They will typically require significant compromise on a systemwide ideal width of 300 feet. They will likely have inherent strengths in the transportation and recreation functions and greater design challenges in water quality and habitat. **Minimum width: 100 feet.**

# Dakota County Greenway Collaborative



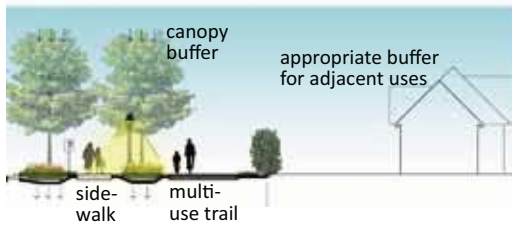
**Suburban greenways** typically are built in conjunction with developing neighborhoods and have more flexibility in location and width than urban greenways. They can take greater advantage of adjacency to natural features, ponds, streams and parks and their connection to community destinations or natural areas can be designed into the surrounding development pattern. Greenways in suburban settings have an opportunity to creatively balance the functions of water quality, habitat, transportation and recreation. **Minimum width: 200 feet.**

**Rural greenways** have the greatest opportunity to meet the 300 foot critical dimension and function as healthy habitat and water quality corridors. In this greenway type, the transportation and recreation functions would be equal to other greenway types but the greater width also allows the ecological functions. Agricultural land likely will be prominent in this greenway type. **Minimum width: 300 feet.**

Each greenway type has been diagrammed on the following pages. The diagrams are intended to illustrate inter-relationships between greenway elements and adjacent lands.



# Greenway Typology - Urban Setting



**MIN. WIDTH - 100ft**

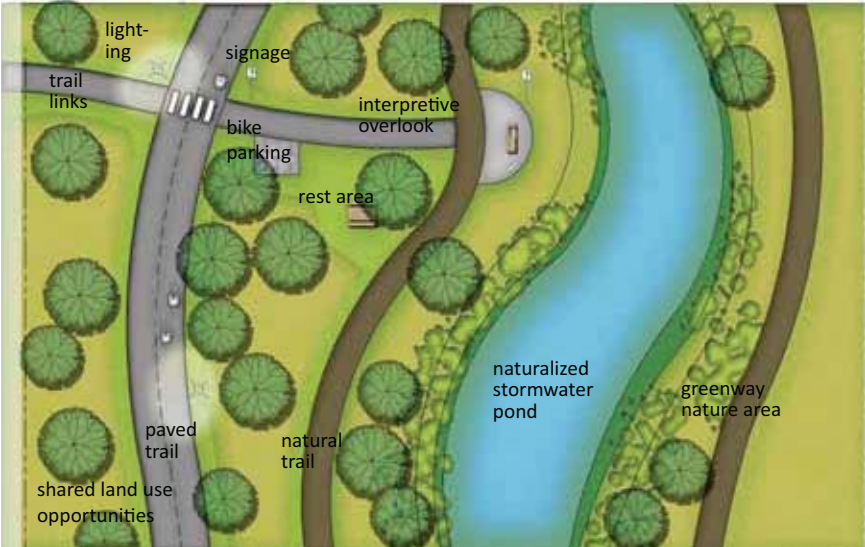
**SECTION**

**URBAN GREENWAY**

Greenway Design

# Dakota County Greenway Collaborative

## Greenway Typology- Suburban Setting



**PLAN**



**MINIMUM GREENWAY WIDTH - 200FT**

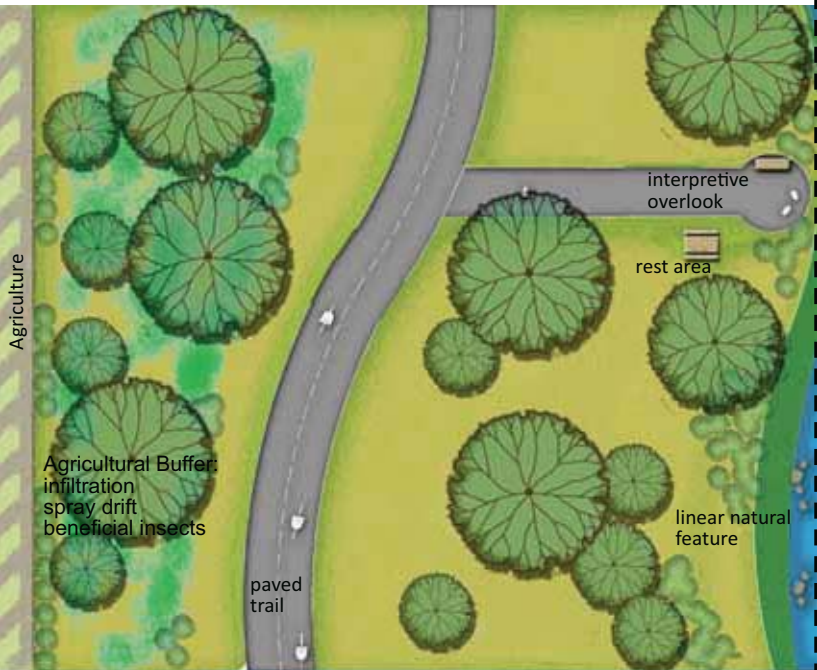
**SECTION**

**SUBURBAN GREENWAY**

Greenway Design



# Greenway Typology-Rural Setting



PLAN



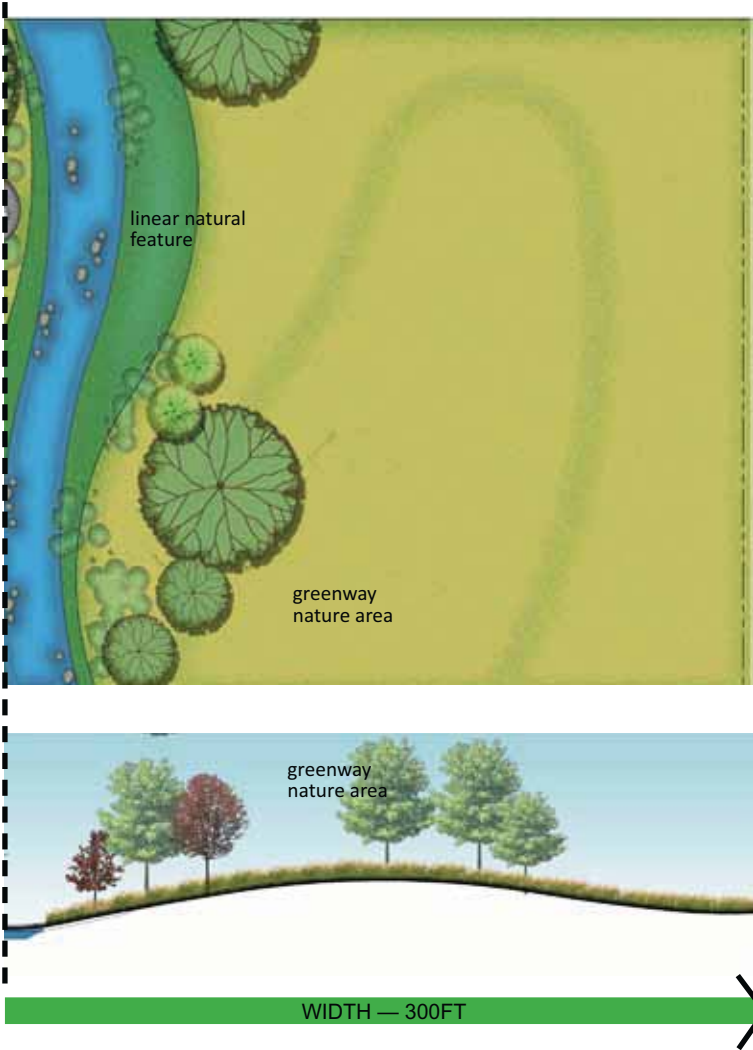
SECTION

RURAL GREENWAY

Greenway Design











# Dakota County Greenway Collaborative



Greenway Design










## Performance Goals

Topic	Urban	Suburban	Rural
<b>Corridor Location</b> 	Follow water flow and away from streets 80% of time, use to interlink activity centers	Away from streets 80% of time, follow water flow where possible, locate with natural features (wetlands, bluffs), use to interlink activity centers	Away from roads 80% of time, follow water flow where possible, locate with natural features (wetlands, bluffs), use to interlink activity centers
<b>Natural Design Signature</b> 	Native gardenesque landscaping and turf, consistent boulevard trees, follows water where possible, contemporary lighting and furnishings	Native habitat, follows water where possible, contemporary lighting and furnishings	Native plant communities, follows water where possible, contemporary furnishings
<b>Corridor Width</b> 	Minimum — 100 feet	Minimum — 200 feet	Minimum — 300 feet
<b>Borrowed Views</b> 	Public facilities, parks, schools, religious institutions, HOA common areas	Stormwater ponds, parks, schools, religious institutions, HOA common areas	DNR lands, farmland, easements
<b>Bike Trail</b> 	Separate from peds, min. 3 feet from streets, paved, 10-foot min.	Multi-use, min. 50 feet from roads, paved, 10-foot min. width	Multi-use, min. 100 feet from roads, paved, 10-foot min. width
<b>Pedestrian Walkway</b> 	Separate from bikes, min. 5' width, min. 6' from roads and bikes	Multi-use	Multi-use
<b>Other Trail Uses</b> 	Unpaved, x-c skiing where practical	Unpaved, x-c skiing, hiking	Unpaved, x-c skiing, hiking and/or horse in select locations
<b>Road Crossings</b> 	Arterial and above – grade separated, collector – vehicles stop Driveways and local streets – alternative crosswalk pavement	Arterial and above – grade separated, collector – vehicles stop Driveways and local streets – alternative crosswalk pavement	Arterial and above – grade separated, collector – vehicles stop Driveways and local streets – alternative crosswalk pavement



# Dakota County Greenway Collaborative

## Performance Goals—continued

Topic	Urban	Suburban	Rural
 <b>Trailhead</b>	Primary ones in activity centers; car/bike parking, restrooms, access to water and food; minor trailhead kiosks at neighborhood entries, spaced every 2 miles or less	Primary ones in activity centers; car/bike parking, restrooms, access to water and food; minor trailhead kiosks at neighborhood entries, spaced 2 to 3 miles or less	Locate in public open space; car/bike parking, restrooms, access to water and food, picnic facilities, spaced roughly every 5 miles
 <b>Stormwater</b>	Store and infiltrate greenway stormwater for 100-year storm, consider rainwater reuse for surrounding irrigation	Accept some stormwater from adjacent landscape, store and infiltrate greenway + stormwater for 100-year storm	Accept some stormwater from adjacent landscape, store and infiltrate greenway + stormwater for 100-year storm
 <b>Landscaping/ Habitat</b>	Opportunistic habitat generally focused on plants and animals requiring smaller ranges	Connected native plant communities, some turf; larger animals may be present	Expansive native plant communities, full range of animal groups should be present
 <b>Interpretation</b>	Each greenway segment should have interpretive theme expressed in artful way, integrate interpretation with corridor design, interpretive stops/overlooks at key corridor locations	Each greenway segment should have interpretive theme expressed in artful way, integrate interpretation with corridor design, interpretive stops/overlooks at key locations	Each greenway segment should have interpretive theme expressed in artful way, integrate interpretation with corridor design, interpretive stops/overlooks at key locations
 <b>Wayfinding</b>	Systemwide design, frequent directional signs, street signs, map kiosks, trailheads	Systemwide design, periodic directional signs, street signs, map kiosks, trailheads	Systemwide design, occasional directional signs, street signs, map kiosks, trailheads
 <b>Lighting</b>	Continuous, low-energy, pedestrian scale; enhanced at trailheads/crossings	Continuous except where deleterious, low-energy, ped-scale	Likely only at trailheads
 <b>Amenities</b>	Trash, benches, water at key locations	Picnic tables, shelter, water at minimum 5-mile intervals	Picnic tables, shelter, water at minimum 10-mile intervals



## Menu of Potential Design Techniques

This table indicates where design techniques could be considered to meet the range of habitat, water quality, transportation and recreation objectives.

Techniques	URBAN				SUBURBAN				RURAL			
	Habitat	Water Quality	Transportation	Recreation	Habitat	Water Quality	Transportation	Recreation	Habitat	Water Quality	Transportation	Recreation
Adjacencies			✓				✓					
Public Art			✓				✓					
Bike/Ped Separation		✓						✓				
Bird Blinds												✓
Vegetated Buffers	✓				✓							
Connectivity	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cultural Events			✓				✓					
Daylighting	✓	✓			✓	✓			✓	✓		
Density of Recreation			✓									
Flood Protection	✓				✓				✓			
Follow Water	✓	✓		✓	✓		✓					✓
Full Season Interest	✓				✓							
Gardens	✓				✓							
Grade Separated Crossings		✓				✓				✓		
Habitat Restoration					✓				✓			✓
Rainwater Harvesting	✓				✓							
Infiltration	✓				✓				✓			
Inter-Link Destinations			✓				✓					✓
Interpretation			✓				✓					✓
Land Forms	✓			✓								
Long Trip			✓				✓					✓
Managed Landscape	✓				✓							
Multi-Use			✓				✓					✓
Native Landscape					✓				✓			
Non-Native Landscape	✓				✓							
Pervious Pavement	✓				✓							
Platform Crossing		✓										
Productive Landscape									✓			
Rain Garden	✓				✓							
Re-naturalized Ponds	✓				✓							
Safe Crossing Lane		✓					✓					
Security		✓	✓				✓	✓			✓	✓
Sensory Landscape	✓				✓							
Separate Commuter Lane		✓										
Signage		✓	✓				✓	✓				
Stream Restoration	✓	✓			✓	✓				✓		
Trailhead		✓	✓				✓	✓				✓
Tree Canopy	✓				✓				✓			
View Preserved							✓					✓
Vines/Green Screen	✓				✓							
Wetland Restoration	✓	✓			✓	✓			✓	✓		
Ballfields			✓				✓					✓

Dakota County  
Greenway Collaborative



Chapter 5:  
Operations &  
Maintenance

Operations &  
Maintenance





## 5. Operations & Maintenance

This chapter focuses on assembling greenways and their long-term operation and maintenance. Greenway maintenance is closely tied to the topic in the earlier chapter Land Protection and Stewardship. Stewardship focuses on management of native habitat while this chapter targets operation of the active or peopled elements of greenways.

### Objectives

- › **Determine predominant operational roles within the master plan or by agreement.**
- › **Ensure the multiple benefits of water quality, habitat, transportation and recreation are infused within construction and long-term operations.**
- › **Establish greenways that are financially sustainable.**
- › **Leverage inherent operation strengths of cities and the County.**
- › **Incorporation success measures and audits into ongoing greenway operations.**

### Key Topics

**Coordinating maintenance operations:** There will be some level of cross-responsibility between Dakota County and local jurisdictions for greenway maintenance. With multi-community, cross-jurisdictional facilities like greenways, coordinating maintenance will be critical and likely will use an approach similar to the roadway system where maintenance responsibilities and level of care standards are part of the planning and design process for each greenway segment.



**Winter use:** Greenways will be at their peak use during warmer months. It is anticipated that winter will also become an active greenway season as the system matures. Year-round bicycle commuting is growing in popularity. Greenways also offer opportunities for cross-country skiing and other winter activities. Winter use brings different operational needs such as grooming, bike trail plowing and unique public safety issues. The operational needs of various winter uses needs to be incorporated along with planning for those uses.

**Lifecycle replacements:** Pavement, lights, signs, benches and other built components will wear out and need to be replaced at some point in the future. Monitoring and high-quality maintenance of all aspects of greenways should be built into the operational routine but so should assumptions about full replacement.

**Public safety:** Like maintenance, policing will be a critical coordination item between Dakota County and local jurisdictions. The Dakota County Sheriff's Office will coordinate with the local law enforcements agencies to determine appropriate policing of greenways in incorporated areas and will be responsible for greenways in unincorporated areas. Of equal importance is the level of policing required to keep greenways secure. Like many issues in greenway operations, policing should be strategized in the planning phase of a particular greenway segment and monitored.

**Wayfinding/signage:** Greenway signage is an element where uniformity across the system is of critical importance. Signage guidelines and design standards should be resolved to the extent possible with implementation of the first greenway segments and then incorporated into subsequent projects. From a maintenance standpoint, it likely will be most efficient to stock or order standard replacement signs through Dakota County that can be used by all jurisdictions with maintenance responsibilities.





**Staying true to design intent:** Greenway master plans are documents most likely to suggest how water quality, habitat, recreation and transportation should be infused into a given greenway segment. For cost or other reasons, what sometimes happens in the translation from master plan to engineered drawings to construction is the dilution of original design intent. To guard against this, master plans should be based on feasible construction methods and contain realistic construction budgets and construction drawings should continually circle back to the master plan for guidance. Once constructed, greenways are dynamic landscapes with constantly maturing plants and evolving aesthetic interests applied to them. The landscape transitions (for instance between prairie and mown turf) in a greenway could be subtle and undefined other than the plan created for it. Maintenance practices that favor one landscape type or another could have unintended impacts on greenway functionality. The ability to realign or correct maintenance patterns is an important reason to monitor greenways on an on-going basis as discussed in the Land Protection and Stewardship chapter.

To ensure consistent master plans that will qualify for funding and meet the goals of the various partners, master plans for regional greenways will be approved by Dakota County and will meet regional standards.

## Operation Responsibilities

Operational responsibilities consist of the labor, equipment and materials needed to maintain and operate greenway corridors, including the replacement or repair of damaged items. The worksheet below is intended as a coordination tool between the various entities involved in operations of a particular greenway segment. It will provide a way to discuss and work through operational needs of greenways as they are being planned.





Dakota County

Greenway Collaborative

Selected Responsibilities

	City	County	Other
<b>Recreation</b>			
Trail lighting maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Site furnishing maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interpretive signage/art maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Structures maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Garbage collection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Utility maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Utility fees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public safety patrol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Transportation</b>			
At-grade street crossings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Grade-separated road crossings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Paved trail maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sidewalk maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nonpaved trail maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trail snow plowing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ski trail grooming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intersection lighting maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Signage maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Water Quality</b>			
Rainwater collection maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Surface stormwater maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Underground stormwater maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Habitat</b>			
Intensive landscaping, incl. plant replacement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Native landscaping, incl. raingarden	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Irrigation maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mowing/Burning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Monitoring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Operations & Maintenance

Dakota County  
Greenway Collaborative



**Addendum:**

**Trail safety and experience guidelines**

Adopted by the Dakota County Board of Commissioners October 1, 2013

Experience



# **Addendum. Trail safety and experience guidelines**

August 2013

This document serves as an interim update to the Greenway Guidebook with the aim of improving user experience and safety through the use of education, enforcement, design, signage, branding and other information. These additions will be incorporated into the full document. Each section refers to where the information will be placed in the updated guidebook in **red text**.

## **Addendum objectives**

- › **Increase trail user safety**
- › **Improve trail user experience**
- › **Promote awareness of the regional greenway system**
- › **Develop uniformity in signage and user information**

## **Contents**

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>1. <b>Signs (Page 5)</b><ul style="list-style-type: none"><li>› <b>Inventory</b></li><li>› <b>Regulatory</b></li><li>› <b>Etiquette</b></li><li>› <b>Wayfinding directionals</b></li><li>› <b>Wayfinding mile markers</b></li><li>› <b>Wayfinding secondary directionals</b></li><li>› <b>Wayfinding kiosks</b></li><li>› <b>Wayfinding monuments</b></li><li>› <b>Wayfinding beyond signage</b></li><li>› <b>Branding on signs</b></li><li>› <b>Interpretation</b></li><li>› <b>Other signs</b></li></ul></li></ul> | <ul style="list-style-type: none"><li>2. <b>Speeds (Page 32)</b></li><li>3. <b>Relationship between signs and design (33)</b></li><li>4. <b>Pavement markings (37)</b></li><li>5. <b>Education (39)</b></li><li>6. <b>Enforcement (41)</b></li></ul> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



## **Guiding documents** (Greenway Design)

The following documents contain guidance on the use and implementation of signage and other strategies. Those resources under Dakota County's control will be updated based on the 2013 Physical Development maintenance study.

- › **Current Minnesota Manual on Uniform Traffic Control Devices**
- › **Current Dakota County Transportation Traffic Operations Procedures (2007 edition, to be updated in 2013)**
- › **A greenway design specification document (to be developed by Transportation in 2013)**
- › **Dakota County Parks Ordinance No. 107**
- › **The Greenway Guidebook (to be updated in 2013)**
- › **Dakota County Parks guiding documents**

## **Additional resources for consideration** (Greenway Design)

- › **Policies and practices of other jurisdictions operating within Dakota County, including the cities, townships and MNDOT**
- › **Precedence in Dakota County and other systems**
- › **Parks monument signage standards**
- › **Minnesota Best Practices for Traffic Sign Maintenance**
- › **Trail Signage Guidelines for the New York State Park System**
- › **Dakota County Transportation Plan**
- › **Dakota County Parks System Plan**



## Guiding philosophies (Greenway Design)

1. Follow the guiding documents when applicable.
2. Keep signs to a minimum to avoid sign pollution, induced disregard of signage and undesired effects to safety. Use only the signs necessary to achieve the desired effect. Balance the need for signs with the natural signature of the greenway system. When possible, consider alternatives to signage such as design, education or other media to achieve the goal.
3. Trail warning and regulatory signs should look like smaller versions of road signs to build on existing familiarity.
4. Traffic control at greenway intersections with other jurisdiction's roadways will be determined by the road authority.
5. Address the root of the need for signs with good design, maintenance when applicable to eliminate the need for signage.
6. Signs generally will be sized according to the current standards for trail use.
7. Sign use should to the extent possible be compatible with the natural signature of greenways while maintaining safety and standards.
8. Collaborate between Parks and Transportation to improve safety and behavior on greenways and park roads, especially during design and engineering.

# I. Signs

Signs and markings convey messages about right of way, prohibited behaviors, potential hazards, trail identity, interpretation and orientation. Consistent signage and cues can enhance the safety of people and property and enhance the experience of trail users.

## Sign inventory (Operations & Maintenance)

Staff from the Parks Department, Transportation Department, the Office of GIS and the Office of Planning and Analysis developed a GIS signage inventory modeled after that used for highway signs. The inventory now includes all signs on Big Rivers, Mississippi River and North Urban greenways and motor vehicle signs at Lebanon Hills Visitors Center.

The inventory will enable timely replacement of missing or damaged signs, ensure uniformity in sign use and will be integral to a sign replacement system.

## Regulatory signs (Greenway Design)

Several factors will be considered to determine whether a sign should be installed and if so which:

- Visibility on all intersection legs
- Road speeds
- Road and trail volumes
- Number of intersection legs
- Profile of trail users at each location
- Proximity to traffic generators
- Proximity to other intersections
- Other conditions variable by each location
- Trail user momentum



Sign appropriateness, appearance and location will be determined through engineering review, County practices and State/Federal guidelines. Regulatory and warning signs will be used conservatively to maintain the greenway experience and the effectiveness of the signs.





## Etiquette signs (Greenway Design)

Etiquette signs may be considered to reinforce safe trail behavior. They may be used at neighborhood gateways, trailheads and other entries to the greenway system. They may also be considered for congested areas or where improper behavior has been problematic. Other signs may be considered as needed.

Etiquette signs should be used sparingly to avoid sign pollution and to increase the signs' impact. They will be considered primarily on the busiest trail segments, such as the bluff segment of Big Rivers Trail.

Signs have a limited influence on system user behavior. Other strategies, including education (section 5) and enforcement (section 6), may be more effective at gaining compliance.

The “Share the Trail” regulatory sign family with behaviors such as “Ride Slow | Keep Right” and “Give Polite Warning” will be used mid-trail where the County receives reports of poor trail behavior and as otherwise needed.

Symbols and messages on this family of signs may be created or adapted to address particular behaviors, but in each case will retain the same format with “Share the Trail” on a yellow field with the regulatory information below in black on white.

The brown and cream “Share the Trail” sign at right will be used at trailheads, kiosks and other entrances to the trail system.





## Wayfinding signs (Greenway Design)

Wayfinding goes beyond signage to include design details, pavement markings, landmarks and environmental cues. Signage is one way to orient system users, and it happens to be one of the most visible and cost-effective.

Wayfinding signage on greenways has five sometimes competing priorities:

- Identify the greenway trail and continuity
- Identify connections to other greenways and trail systems
- Orient the greenway visitor to the surrounding context
- Identify surrounding points of interest
- Reinforce interpretation and branding

Three types of wayfinding signs are recommended for the County's greenway system:

- Directional signs
- Emergency response locator signs (mile markers)
- Kiosks

The three types complement each other and all are necessary for greenway users, parks staff and emergency response personnel. Sign types should be used only for their intended purposes — using the wrong sign type can lead to confusion among greenway and park users. Signs intended for pedestrian and bicyclist use should not be used for or directed toward motorists.

### Directional signs

These signs are used at decision points to inform users of what lies ahead at what distance in what direction. They are designed to be legible at a bicycling speed without slowing; therefore they have less information than a kiosk.

### Emergency response locator signs (mile markers)

Mile markers are the smallest and most regular on the greenway system. Their primary function is for emergency location and safety but they also provide three primary pieces of wayfinding: Trail name/identity; location on that trail; and trail system identity. Secondary wayfinding information includes distance from known points, confirmation that the trail user is on the intended trail, direction, and — with quick response (QR) codes — links to electronic media.



### **Kiosks**

Kiosks are used less often but contain the greatest depth of information. They typically are just off the trails at trailheads or greenway junctions and are intended to be read while stationary. They include system maps, rules, activity calendars, interpretation and other changeable information.

### **Wayfinding -- Directional signs**

Directional signage should generally follow the principles of the most current Minnesota Manual on Traffic Control Devices. Notable deviations include color, size and font.

#### **Control point method for destinations**

Destinations are chosen based on the control point method used by state departments of transportation. The greenway model has been modified to reflect the shorter distances covered by people when on foot and bicycle — rather than cities, states and interstates, the greenway system identifies downtowns, bridges, roads, intersections with other greenways and significant parks. In several cases multiple destinations within a mile of each other are viable control points. The more well-known or prominent destination was chosen to simplify the system.

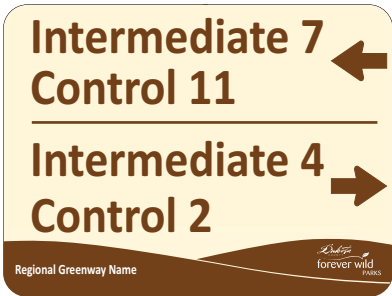
On directional signs, the nearest control point along a route is listed as the last destination in each direction. Where greenways intersect bikeable routes without identified control points, the greenway control point system should be applied to that route to determine the nearest control point of interest to greenway users. If there is not a suitable control point, an intermediate destination may be used.

Intermediate destinations between the sign location and the control point should then be listed above the control point (intermediate destinations will always be closer than control points — intermediate destinations beyond the nearest control point are not included). Sign space does not permit listing of all intermediate destinations; only those most significant to the greenway user should be listed as space allows. In other situations there may be no significant intermediate destinations between control points. In this case multiple control points may be listed.

Priority for inclusion is: Control point on greenway; control point off greenway; intermediate destination on greenway; intermediate destination off greenway.

# Dakota County Greenway Collaborative

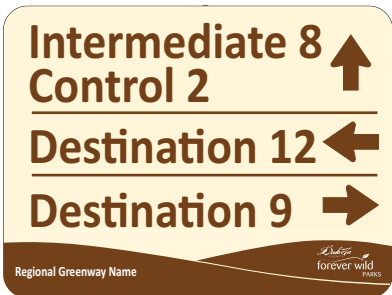
## Control point examples



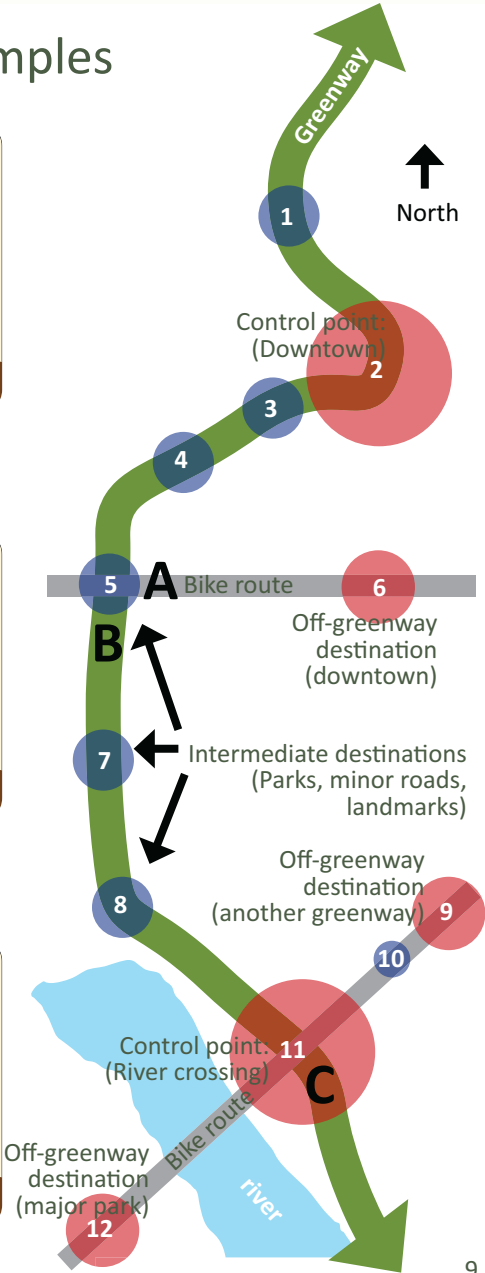
Westbound sign at location A



Northbound sign at location B



Northbound sign at location C





Control points for each master-planned regional greenway are as follows (subject to change based on trail completion and other factors):

#### **Big Rivers/Minnesota River**

- Downtown St. Paul
- I-35E Bridge
- Mendota Bridge
- I-494 Bridge
- TH 77 Bridge
- I-35W Bridge

#### **North Urban**

- I-35E Bridge
- Dodd Road
- Robert Street
- Kaposia Landing

#### **Rosemount\***

- Lebanon Hills Visitors Center
- Downtown Rosemount
- Mississippi River Trail

#### **Mendota-Lebanon**

- I-35E Bridge
- Highway 110
- Highway 55
- Lebanon Hills Visitors Center

#### **Mississippi River**

- Downtown St. Paul
- Kaposia Landing
- Wakota Bridge (I-494)
- Heritage Park (Rock Island River Pier)
- Pine Bend Bluffs SNA
- Spring Lake Park Reserve —  
Schaar's Bluff Gathering Center
- Downtown Hastings

#### **North Creek**

- Lebanon Hills Visitors Center
- Minnesota Zoo
- East Lake
- Downtown Farmington

#### **Vermillion Highlands\***

- Lebanon Hills Visitors Center
- CSAH 42
- Whitetail Woods Regional Park
- Vermillion River

#### **Lake Marion-South Creek**

- I-35W Bridge (when completed)
- Minnesota River Greenway
- CSAH 42
- Murphy-Hanrehan Park Reserve
- Lake Marion/Casperson Park
- Downtown Lakeville
- Downtown Farmington

\*The Rosemount and Vermillion Highlands greenways overlap in two segments. As a result, control points may have to be adjusted to provide the most useful information to greenway users. For example, heading south from Lebanon Hills



<b>KAPOSIA LANDING</b> 1.2 trailhead	←	Intermediate destination (with additional information)
<b>ST PAUL</b> via Concord St 4.9 <small>Line divides destination groups</small>		Control point
<b>I-494 BRIDGE</b> trailhead 1.1 <small>Arrow centered within destination group</small>	→	Intermediate destination (with additional information)
<b>HERITAGE PARK</b> 3.2 trailhead		Control point

*Distance (1/10 mile)*

Mississippi River Greenway *Dakota*  
forever wild  
PARKS

Visitors Center on the shared trail, directional signage should include distances to both downtown Rosemount and the Mississippi River Trail even though traveling from Lebanon Hills to the MRT requires first following the Vermillion Highlands Greenway as a shortcut to rejoin the Rosemount Greenway. Similar situations may arise on other greenways. In all cases the utility to the greenway user should take precedence over consistency, continuity or other considerations.

Every directional sign should include the nearest control point in the direction of travel on the regional greenway. Where greenways intersect other greenways or roads considered bikeable for a typical greenway user (e.g. roadside trail or a wide shoulder on a low-speed road that is not overly demanding physically), directional signage should include the nearest control point in that direction. If a route does not link to a significant control point, an intermediate destination may be listed.

**Destination order**

Destinations on directional signage are consistently ordered based on the following hierarchy, from top to bottom:

- Current location if used
- Straight-ahead destinations in order of distance (nearest first)
- Destinations to the left in order of distance
- Destinations to the right in order of distance
- Destinations back and to the left in order of distance
- Destinations back and to the right in order of distance





## Sign design

All arrows are aligned on the right sign column. Only one arrow should be used per group of directions and centered within the group (e.g. two destinations to the right get only one arrow) unless there is only one group of directions and centering the arrow would place it in line with one of the destinations, in which case each destination should get an arrow. This arrangement reduces the likelihood of greenway users thinking the directional arrows for the other destinations may be missing.

2-inch arrows should be straight and at 90- or 45-degree angles unless another shape or angle more clearly and simply communicates trail conditions.

The standard wayfinding sign is 18x24 inches with the Dakota County Parks rolling hills brand in brown and cream (see Dakota County Parks branding document for more information).

The main destination font is 155-point Calibri bold at 86 percent width in mixed case aligned left.

Distance is right justified to the right of the destination, followed by the arrow, which is centered with the other arrows.

Supplemental information such as trailheads and route indications should be used where useful and are 97-point intercaps at 86 percent width and 20 points below the main destination information.

Mileage to the 1/10 mile is to be included to the right of the destination information and expressed as decimals. Use a placeholder zero to the left of decimals for distances under a mile to avoid confusion or misreading of signs (e.g. 0.4 mile).

Abbreviations may be used where necessary for common words; do not use a period to indicate abbreviation.

A 4-point rule line should be placed between destination groups.

Directional sign materials and installation are covered in the Parks Department sign and materials guidelines.



### Sign location

Directional signs must balance wayfinding value and the potential for sign pollution. The first priority for greenway wayfinding is to identify the trail so users may follow it. This is simple on greenways with limited access such as the Mississippi River Trail, but becomes very complicated on more connected greenways such as the North Urban. For this reason discretion should be used to ensure greenway users can follow the trail with a minimal use of signs.

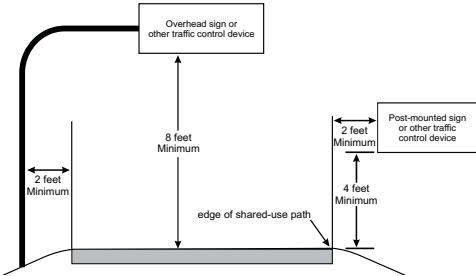
Directional signs typically are placed prior to decision points such as trail intersections or connections to nonmotorized transportation regional routes. At most greenway trail intersections with lower-order trails, only two directional signs will be necessary; one on each side of the intersection facing oncoming traffic on the greenway.

Directional signs should be placed:

- On regional greenways only
- One on each side of decision points (typically trail intersections)
- In accordance with the most recent Minnesota Manual on Uniform Traffic Control Devices and Dakota County Transportation Department standards

Where space or safety concerns do not allow sign placement, other cues — such as pavement markings, pavement materials or advance signage — should be used to at a minimum inform greenway users of the greenway route. Road-oriented directional signage complying with the most current Minnesota Manual on Uniform Traffic Control Devices may be used in situations where the Dakota County-branded signs are inappropriate.

Directional sign blanks should also be used to indicate the end of regional trails with appropriate language such as “End Big Rivers Greenway — Local trails continue” or “End Big Rivers Greenway — Begin Mississippi River Greenway.”



From the Minnesota Manual on Uniform Traffic Control Devices



## Wayfinding -- Mile markers

The most frequent use of mile markers is to orient greenway users to where they are on the system and give them a sense of how far they have to go. The signs communicate the greenway system brand to greenway users and reinforce that they are on their intended trail and moving toward their destination.

Mile markers also pinpoint a location for emergency response, improving safety for trail system users. Using the National Grid System will allow trail users to pinpoint their location to within 33 feet.

Mile marker signs will be posted generally at 0.5 mile intervals where possible or more frequently where there are many intersecting trails or where the Parks director determines a need for mile markers exists, such as to reassure visitors they are on the greenway.

The Dakota County design identifies the trail name, the trail system, additional route mileage, U.S. National Grid Location to within 33 feet, end points of the trail and a link to online media.

Dakota County mile marker signs include:

- Mileage to the nearest tenth of a mile to aid in determining location relative to the trail.
- The name of the greenway to determine location within the regional system.
- An icon and color unique to each greenway to aid in identification regardless of the greenway user's language and for quick route confirmation at bicycling speed.
- The icon or blaze of state, national or local trail systems to determine location and route on trail systems sharing the same segment.
- The Dakota County Parks logo to differentiate the greenway system from local trails.
- U.S. National Grid coordinates to determine absolute location and aid in emergency response.
- QR codes to link mobile device users to further information on the trail corridor as outlined below.

# Dakota County Greenway Collaborative

<div style="text-align: center;"> <small>mile</small>  <h2 style="margin: 0;">5.6</h2> <h3 style="margin: 0;">North Creek Greenway</h3> <p style="font-size: small; margin: 0;">MN Zoo to Farmington</p> <div style="display: flex; justify-content: center; align-items: center; gap: 5px;"> <p style="font-size: small; margin: 0;">forever wild PARKS</p> </div> <p style="font-size: x-small; margin: 5px 0;">15T WK</p> <p style="font-size: large; font-weight: bold; margin: 0;">0446 4863</p> <p style="font-size: x-small; margin: 0;">US National Grid Emergency Location</p> </div>	<p>Miles from southern or western terminus within Dakota County (install every 0.5 mile or more frequently as needed)</p> <hr/> <p>Greenway name</p> <hr/> <p>Greenway endpoints</p> <hr/> <p>Greenway icon</p> <hr/> <p>Dakota County Parks logo</p> <hr/> <p>U.S. National Grid location</p> <hr/> <p>QR code to mobile map application</p>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Greenways

**Icons and icon colors are for discussion only; final icons and colors will be identified with the Communications Department as greenways are master planned, named or signed.**

**Iconography**


Unique symbols and colors that are instantly recognizable across languages and that reflect the character of each greenway and enhance wayfinding. Where national or state trails share a trail segment, such as on the Mississippi River Greenway, the higher order trail name and iconography will be used. Greenway icons used in this document are simply for illustrative purposes and are not the final icons. Final icons and colors will be determined as individual greenways are master planned, named and branded in coordination with Communications.

**Emergency location**

U.S. National Grid location will be displayed as shown. The eight-digit codes convey location to within 33 feet and are compatible with many GPS receivers.



Multijurisdictional

Miles from southern or western terminus within Dakota County. National or state mileage, if established, will appear below in smaller type.	mile <b>10.3</b>
Greenway name	<b>Mississippi River</b> Greenway St. Paul to Hastings
Regional greenway endpoints	
National or state route name National or state route icon <i>Local routes may be identified here</i>	
Dakota County Parks logo	
U.S. National Grid location	15T WK <b>1446 3693</b> <small>US National Grid Emergency Location</small>
QR code to mobile map application	

**Quick response codes**

Mile markers should also include quick response codes (square bar codes) to link trail users directly to trail information via a smartphone or other camera-equipped handheld device. The QR codes should link to Dakota County-controlled URLs designed for mobile devices that convey:

- Location of that mile marker on a map of the greenway, the countywide greenway system and a context map.
- Location of nearest facilities such as trailheads, restrooms, water and bicycle repair.
- Location of nearest storm shelters.
- Location of points of interest such as parks and historic sites.

Use of QR codes linking to County-controlled URLs allows the County to revise information and potentially include additional media, such as audiotours, interpretation and event calendars.



# Dakota County Greenway Collaborative

As the greenway system expands, other jurisdictions might seek to have information placed on the mile markers, such as city logos, directional arrows to destinations or other such information. This type of information will not be included on greenway mile markers; destinations may at the Parks director’s discretion be included on greenway wayfinding signs.

## Materials

Freestanding mile markers are recommended to consist of adhesive sheets affixed to brown 3.2-inch by 60 inch fiberglass dual-sided markers (brand name Carsonite). In some locations the markers may be affixed to other trailside signs or objects. In all cases the markers should be 2 to 6 feet from the trail’s paved edge and not more than 4 feet from the ground to the bottom of the sign.

Carsonite was selected for its low expense, durability, safety benefits (less likely to distract motorists and it gives if a bicyclist, pedestrian or motorist strikes it), portability, small footprint and its unobtrusive visual impact.



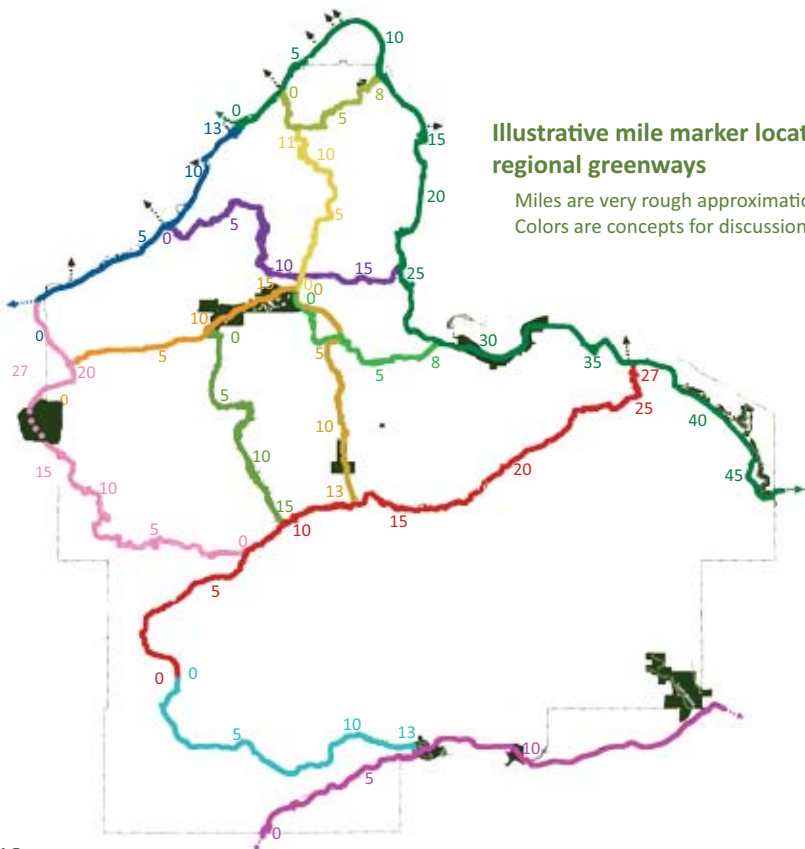
Visualization of mile marker



**Mileage system** (Operations & maintenance)

The zero mile using the drainage pattern will be at whichever terminus has the higher elevation, resulting in a mile marker system that generally follows drainage patterns. Greenways that leave Dakota County for a reasonably short distance will not “reset” to zero mile upon reentering the county; instead the miles will continue to progress, including the mileage outside Dakota County.

The river model is recommended over other options due to its connection to the landscape, relative ease of understanding and ability to discern general slope of the greenway. When applied to Dakota County, the system also has the advantage of creating several miles zero at Lebanon Hills Regional Park, the hub of the greenway system and the County’s most visited regional park.



**Illustrative mile marker locations on regional greenways**

Miles are very rough approximations  
Colors are concepts for discussion only

**Wayfinding -- Secondary directional**  
(Operations & maintenance)



At every greenway intersection with another trail or greenway, a secondary directional sign will be used. The signs reinforce the greenway route and confirm to users they are on their desired path.

**Standalone signs**

At approaches to intersections where it is not clear to a reasonable greenway user where the greenway route goes but a full directional sign is not needed, practical or safe, secondary directional signs will be used to indicate greenway direction only.

Where directional arrows stand alone, the materials, size and information are identical to mile markers, except the mile marker is replaced by a directional arrow indicating the greenway route. The signs are installed approximately 100 feet in advance of an intersection on the right side, but it should be within sight of the intersection and should not interfere with safety or regulatory signage. Conditions may warrant different placement.

Secondary directional signs should always be used in pairs to ensure both traffic directions are guided through intersections. The signs usually will have a mile marker affixed to the opposite side for confirmation that users made the desired turn and to provide mileage.

Icons and icon colors are for discussion only; final icons and colors will be identified with the Communications Department as greenways are master planned, named or signed.

At intersections where it is clear to a reasonable user that the greenway continues straight due to surface type, intersection angle, width or other visual cues, the secondary directional signs usually are not necessary.

At greenway/greenway intersections, the secondary directional sign will indicate only the greenway the user currently is on. Primary directional signs should be used to indicate the direction of the other greenway(s).



Secondary directional signs will also be used as standalone or supplemental signs to indicate the beginning and end of greenways with a legend reading “END” or “BEGIN” below mile zero or the final mileage.

On segments shared by multiple greenways, the directional arrow/mileages, icons, names and descriptions will be “stacked” between a shared parks logo, QR code and U.S. National Grid location. The greenways will be stacked in accordance with the primary directional sign system. All else being equal, the greenway with the higher visitorship will be at the top. A brown rule will separate the two greenway signs.

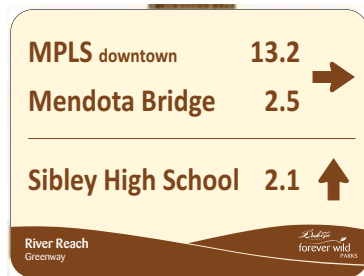
**With primary directional signs**

Secondary directional signs will be used below every primary directional sign. The secondary directional signs indicate greenway route in a manner consistent with the standalone signs to simplify the wayfinding experience. The reverse of each sign will indicate greenway mileage.

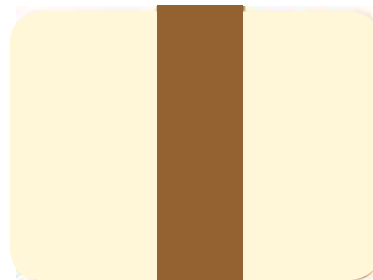
At approaches to intersections with other greenways, the greenway the user is currently on will be the one on the secondary directional sign. The other greenway will be identified on the primary directional sign and may also be indicated at an intersection kiosk.

**Interim route indicators**

Secondary directional signs may be used to indicate interim greenway routes depending on city or township approval, safety and trail presence. When used, the arrow will be orange and “interim route” in orange will replace “Greenway.”



Front



Reverse



## Wayfinding -- Kiosks

(Operations & maintenance)

Kiosks are placed throughout the greenway system and in parks. These kiosks provide information that improves safety, including maps, regulations and contact information. Although typically not as effective as on-trail signs for reminding trail users of rules and regulations, they go into more detail. Park and greenway rules posted in kiosks should be updated to reflect changes in greenway use and to encourage courteous use of facilities.

Components of greenway system kiosks include:

### System map

The greenway system map should be prominent to quickly orient system users to their general location. At this scale the map should include greenways with names and symbols, major local trails, regional nonmotorized transportation corridors, major transitways, major roads, cities, counties, rivers, major lakes and points of interest as cartography allows. The system map should include areas outside Dakota County as space allows.

### Local map

This map should communicate to trail users the trail they're on, where it goes, connections to other trails and regional nonmotorized transportation routes, rivers, local points of interest, trailheads, restrooms, overlooks, difficult terrain, interpretive nodes, streets, landmarks and other items of interest to users.

### Activities

Where space is available, kiosks may include promotional information for parks-related activities. Where space is limited, QR codes or at a minimum Web addresses should be included to link users to this information without requiring parks staff to regularly update the kiosks.

### Interpretation

Kiosks should include at least QR codes or Web addresses that offer interpretation of the greenway corridor. Where space is available, signage, displays, artifacts or other media may be included to share the greenway's cultural resources.





# Example Kiosk A information (two-panel)

**Welcome**  
Welcome to Big Rivers Regional Trail

**Trail Map**

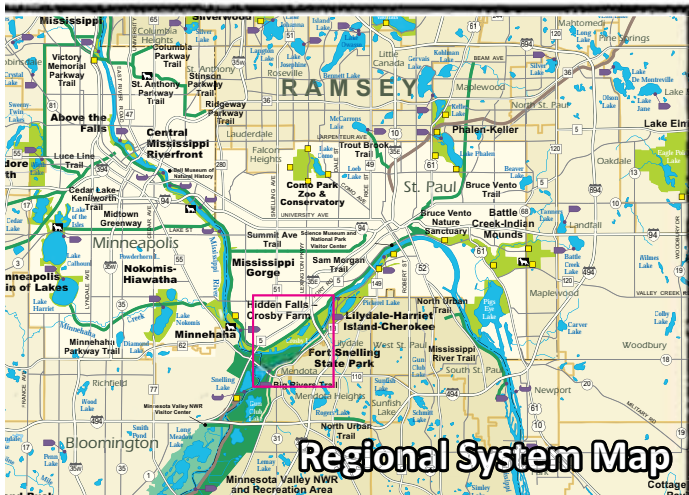
**Rules**  
**BIG RIVERS TRAIL RULES**  
OPEN 24 HOURS

**Wayfinding**  
**4.0**  
Big Foot Creek Greenway  
Miles to South St. Paul

**Explainer**  
KAPOSIA LANDING 1.2 trailhead  
ST PAUL via Concord St 4.9  
I-494 BRIDGE trailhead 1.1  
HERITAGE PARK 3.2 trailhead

**Park**  
HELP KEEP YOUR PARKS GREEN  
Buy your local Cherry Trails Cherry Tree Seedling  
\$12.50 Online

# Dakota County Greenway Collaborative



Regional System Map

## System and Event Information



Link to Web

See Park System Signage & Landscape Elements Manual for dimensions and materials



## Example Kiosk B information (one-panel)

**Welcome to Big Rivers Regional Trail**
**Welcome**  
forever wild  
PARKS

**Regional System Inset**

**Trail Map**

**BIG RIVERS TRAIL RULES**  
 OPEN 24 HOURS

**Rules**

**Wayfinding Explainer**

**Park System and Event Information**

**Link to Web**

See Park System Signage & Landscape Elements Manual for dimensions and materials



### **Rules and regulations**

- Hours
- Messages to respect and be courteous toward other trail users
- Use restrictions
- Speed restrictions
- Alcohol and other controlled substance restrictions
- Parking restrictions
- Fire restrictions
- Pet restrictions
- Trash and recyclables disposal
- Emergency contact
- Maps
- Key to wayfinding and emergency locator system

Other information typically found at kiosks includes:

- Emergency contact information
- Tutorial on using the mile marker and wayfinding systems
- Etiquette guidance
- Construction and maintenance notices
- Nearby services, particularly bike shops

### **Kiosk information material**

Content within kiosk display cases should be printed on one continuous sheet of paper, foamcore or similar high-quality material to reduce clutter and create a “cleaner” looking display. Short-duration information such as event postings can be posted over the original time-sensitive postings to avoid unnecessarily reprinting the whole display case.



## Monument signs

Monument signs identify greenways to visitors and passersby. The signs also set an expectation that the greenway is more than a simple, utilitarian trail — that it's a high-quality worthwhile experience.

The Parks Department has developed standards for these signs and installed several at park entrances and trailheads.



### Other monument signs

Where greenways cross roadways or trails, street/trail name signs should be used to identify the feature to both trail users and motorists. Using street signs, clear zones and other tactics to cue drivers and trail users that they are approaching a significant intersection can encourage safer activities. Street name signs should also be used at grade-separated crossings to aid wayfinding.

Municipal boundary signs should be used where greenways enter cities, townships, Dakota County or other features and there is not an existing road-oriented sign visible to greenway users. Simple green roadway-style signs are appropriate and defined in the Minnesota Manual on Uniform Traffic Control Devices. Higher-quality, customized municipality signs may be used at the request of the jurisdiction and with local cost share.

Monument, street name and municipal signs should be used in accordance with Minnesota Manual on Uniform Traffic Control Devices and Dakota County Transportation Department standards and practices.



## Wayfinding beyond signage

Some segments of greenway will not be suitable for signs due to physical constraints, safety or other considerations. Alternate wayfinding methods should be used to maintain a minimum level of navigability on the greenway system. Alternate measures that may be considered are summarized below.

### Pavement stenciling

Pavement stenciling can be useful where signs cannot be used. Properly used, the stencils reinforce the county's brand, let users know they are on a greenway or direct users to the greenway. Shortcomings include durability, visibility and the risk of user distraction.



When used, stencils should direct users on the greenway without excess information. Greenway icons should be used for consistency with mile markers and to ensure universal understanding as our population becomes more linguistically diverse.

### Centerlines

Centerlines could serve a role similar to that of pavement stenciling. The markings could be used to reinforce greenway alignment and branding.

### Carsonite signs

Fiberglass signposts should be investigated as a potential strategy to guide visitors on the greenway where the standard directional sign is inappropriate. The signposts have the advantage of being smaller (less likely to draw motorist attention), flexible (less likely to injure or cause damage) and adaptable to different situations and locations.

### Pavement materials

Just as drivers are influenced and guided by pavement type, greenway users are, too. Use of colored pavements, paver edging, curbs, width, inlays and other features can supplement or for short distances replace wayfinding signage.





### **Other design features**

Cues to keep visitors on greenway routes can take many forms. In some situations other methods may be considered. Examples include pavement inlays, curb, inlays, edging and greenway plantings.

## **Branding**

The countywide greenway system has adopted the Dakota County regional park system brand of forever wild. Use of this brand and visuals reinforce the connectivity with the park system and Dakota County's brand recognition.

The branding will be used primarily in monument signage, wayfinding, interpretation and mile markers. The brand will not appear on safety, warning or regulatory signage.

The park system brand has been outlined in the Dakota County Parks forever wild brand manual (2008). Standards on typeface, color, logo and treatment should be strictly followed.

## **Interpretation**

Greenways are regional destination trails offering a premier recreational experience. Interpretation of the trail surroundings, environment and local cultural resources should be part of that higher service level.

Interpretation on the greenway system should be:

- Engaging
- Informative
- Memorable
- Dynamic
- Accessible to all audiences
- Relevant to the location
- Interactive
- Up to users' expectations of media

Signs are among the most basic forms of interpretation and often are less expensive than higher quality interpretation. They are not, however, always

# Dakota County Greenway Collaborative

the most engaging, appropriate or cost-effective. They should be used as a supplement to other interpretation methods or where other methods are not available.

When signs are used as the principal interpretive media, they generally should follow the guidelines in the Dakota County Park System Signage & Landscape Elements Manual (2002) unless: the greenway user would be better served by a different sign type; a different sign would better fit the context; or the purpose would be better served by a different sign. County standards are modeled after National Park Service interpretive signs. The most used options are a 28- by 36-inch sign and a 9- by 12-inch sign.

Interpretive sign design and application will follow the theme and purpose of the interpretation. A variety of signs in addition to the National Park Service standard will be used as appropriate, including those for plant identification, smaller interpretive applications (particularly on soft surface nature trails), art walks, student projects, volunteer groups and temporary programs. In some instances separate interpretive loops may be designed and may vary significantly from typical interpretive signs. Signs may also vary based on what is being interpreted, the sign’s context, the sign’s purpose and the overall theme of an interpretive experience.

Interpretive signs, when used, should be installed at natural stopping or transition points on the greenway, or at historically relevant locations where compatible. Care should be taken to ensure the sign locations will not create a hazard from the sign itself or people gathered around the sign.



28- by 36-inch example



9- by 12-inch example



4- by 3-inch example

Interpretive signs should vary to fit the context, the message and the purpose as with these examples.



## Detour signage

Detours off greenways create multiple challenges. By their nature greenways are of higher quality and more isolated from motor vehicles than alternate routes, and sometimes are the only off-street routes within several miles. Their off-street design and higher amenity level draw people who are not as comfortable in mixed traffic. Care should be taken when creating detours to route users onto safe trails while also communicating shorter routes for those comfortable with riding/walking/skating in mixed traffic.

County staff will work with other jurisdictions to work toward the goals outlined below. Detour notification and signage in practice will vary based on many factors.

Detours from the greenway should include four information elements:

- Off-site communication. Detours should be communicated via the county's Web site, social media and at trailheads.
- Advance notice. When possible, advance signage warning of the detour dates should be placed at both ends of the detour at least two weeks in advance to alert occasional bike commuters to the detour and allow them to plan for it.
- Kiosk information. Detour information and alternate routes should be displayed at nearby kiosks on the primary trail map. If no kiosks are within a reasonable distance or there is significant traffic entering the trail between kiosks, temporary kiosks may be installed.
- Detour signage will be in compliance with the latest version of the Minnesota Manual on Uniform Traffic Control Devices.

Emergency or short-term closures and detours will occur and may not warrant or allow the full treatment of these four pieces of information. At a minimum closures should include MUTCD signage and/or detour directions at the point of closure or decision point as soon as reasonably possible.

Full trail closure should be a last resort reserved for when trails are truly impassable or an unacceptable safety risk. Often able-bodied people can pass through a construction area, washout or other hazard with little difficulty. In



these cases appropriate warning signs should be used in advance of the hazard and specifically explained at kiosks. Where necessary signage and barriers may be used to communicate and force bicyclists to dismount and walk bikes through some areas. Detours should still be designated to allow for trail users with limited mobility or who choose to avoid the hazards.

When used, detours should direct people to nearby, continuous paved off-street paths with reasonable grades safe for children and people with limited mobility. If such an alternate route is not feasible, other routes should be identified and their inadequacies clearly communicated. For example, if a detour has to place trail users on a shoulder for one mile, signage and kiosk information should say this explicitly.

Alternate detours should be included for people comfortable traveling on roads or shoulders. They need not be signed, but should be communicated at kiosks with maps and written detour information. Road conditions a cyclist might encounter should be articulated; e.g. whether there is a shoulder and number of lanes.

## Event signage

Temporary event signage may be used to communicate routes, waypoints and other items of interest to event participants. In general, chalk or other temporary trail marking devices should be used rather than signage where possible. This reduces sign clutter, reduces interference with roadways and requires less cleanup. Permanent paint shall not be used on the trail surface.

Event organizers will be responsible for developing a wayfinding system for their event and for marking or signing the route with Parks Department and Transportation Department approval where applicable.



## 2. Speeds

(Operations & maintenance)

Trail users are required to follow the County Parks Ordinance (No. 107), which currently states it is unlawful to “operate a bicycle at a speed faster than is reasonable and safe with regard to the safety of the operator and other persons in the immediate area.” The regional greenway system will not have a blanket numeric speed limit.



Information on the “safe and reasonable” speed limit will be installed at kiosks, trailheads, neighborhood gateways and other entry points. These signs will be informational as illustrated at right, referencing the County’s Parks Ordinance.



Advisory speeds may be posted as plaques beneath warning signs that specify the potential hazard.

In the regional system, only Minneapolis has a numeric speed limit (10 mph), but its system is much busier than Dakota County’s and differs in use patterns. The other regional implementing agencies have a variation of the “reasonable and safe” provision used by Dakota County.



## 3. Relationship between signs and design

### Use separation (Greenway Design)

Signage alone will not be able to regulate traffic and influence user behavior. Intersection design, separation of uses, pavement markings and other cues will be needed in some locations to ensure safe and enjoyable operation of the system. In some locations corridor width will limit the ability to separate uses or use other space-intensive strategies. In those locations limited by physical constraints, strategies such as congested area signage, additional warning signs and pavement markings may be considered.

Activities on greenways are as varied as the people who use them. Bicyclists, walkers, baby strollers, inline skaters, dogwalkers, children on bikes, scooters, in-shoe skaters, skateboarders and others have been able to safely share a single multiuse trail to this point. As the system grows and becomes more popular, some segments might benefit from painting separate lanes or having dual trails — one for walking speed activities and one for bicycling speed activities.

When a greenway should be separated by uses depends on a variety of factors, among them mode share, intersection density, whether use peaks at certain times of day and year, trail width, slope and average speeds. The complicated interplay among these factors inhibits the use of firm guidelines for establishing when a trail should be separated by mode. In general, a typical trail segment should be evaluated painted separation around 100,000 annual visits and for physical separation (dual trails) when it approaches 200,000 annual visits. Painted separation can be accomplished using solid white paint reinforced by signage and pavement markings at intersections.

Dual trails function better than a painted separation in most cases and





**Painted separation may be considered at 100,000 annual visitors**



**Physical separation or dual trails may be considered at 200,000 annual visitors**



**Dual trails may also be considered at 200,000 annual visitors**

require greater maintenance to ensure paint, signs and other cues are continuing to function. Painted separation also creates a counterintuitive situation for bicyclists accustomed to driving on the right side of the road; painted separation requires bicyclists to operate on the center of the pavement or left of center.

Separating modes need not occur over the entire length of a trail for it to significantly improve user experience. Busy segments near popular trailheads benefit most from separation. Separating at trailheads can give pedestrians a separate path for the entirety of their visit (pedestrians tend to stay nearer trailheads) and eases all trail users into the trail experience; they get a feel for how busy the trail is, what types of users are present, how fast people are traveling and generally how to behave. When painted use separation is used, sign R9-7 should be used in addition to pavement markings.



## **Grade separation** (Greenway Design)

A hallmark of the regional greenway system will be grade separated crossings at major roadways. The use of tunnels and bridges improves safety, ensures smooth traffic flow on the roadway and eliminates delay for trail users.

In many cases grade separation will not be immediately achievable for a variety of reasons, including terrain constraints, lack of funding and the need to time grade separation with other construction projects. In these situations at-grade crossings will be acceptable as interim strategies.

## **Trail-trail intersection** (Greenway Design)

Intersection design will vary based on local conditions. Several general principles can be established, however, to guide planning and design of the intersections:

- Greenways have right of way and users are not typically required to stop when intersecting lower-order trails or driveways unless circumstances warrant users to stop.
- Which trail users have right of way is determined in a similar fashion as it would be on a roadway, .
- Trail segments adjacent roads have the same right of way assignment as the parallel road.

## **Trail-roadway intersection**

(Greenway Design)

Greenway-County roadway intersections will follow Dakota County Transportation Department guidelines. Elements that can affect decisions on what crossing treatments to use include:

- Posted speed limit of the roadway
- Volumes of vehicular and pedestrian traffic
- Number of travel lanes and geometries at the intersection location



- Profile of pedestrian traffic (proportion of trail users who are elderly, children or other demographics)
- Type of roadway
- Sight distance

The jurisdiction operating the roadway will have authority over intersection design, road-oriented signage, road-oriented pavement markings and traffic control. Dakota County will recommend that the road authority adopt these guidelines for intersections with greenways or reference them as they work with the County to determine intersection treatments, signage and design.

## **Park roads** (Greenway Design)

Within MnMUTCD guidelines, Dakota County Parks trail users will be given preference over motor vehicle operators. The parks are a place for recreation, there are few roads within the parks and drivers are arriving at their destination when on a park road. In this context a “park road” is defined as a road used exclusively for park purposes and not a public roadway simply passing through a park, such as Pilot Knob Road (CSAH 31).

Park roads should be designed as part of the park arrival experience, introducing visitors to the park and transitioning from a highway experience to a recreation experience. This cannot be done with a monument sign and native plantings alone; the roadway must complement the park experience.

Transportation Department staff will be involved in planning and design of park facilities involving roads and parking lots to optimize pedestrian, bicyclist and motorist safety. Transportation staff will be engaged early in the process to ensure seemingly unrelated decisions that degrade safety are not made prior to their involvement.



## 4. Pavement markings

### **Centerlines** (Greenway Design)

A painted centerline offers several potential functions:

- Reminder to stay right.
- Clear delineation of space for passing or overtaking.
- Improved trail visibility in low light.
- Identity as the greenway system.

Centerlines may be considered as a potential design tool based on conditions on each greenway segment.

### **At intersections** (Greenway Design)

Painted crosswalks may be considered as a potential design tool at midblock and road-road intersections where grade separation is not used. Use of crosswalks will be determined by engineering judgment based on current Dakota County policies and practices as well as coordination with the road authority.

Painted crosswalks frequently do not improve safety and sometimes detract from safety. Painted crosswalks will not be used at every intersection. Other measures that may be considered include HAWK signals, traffic calming, grade separation and signage.



### Be Predictable

Travel in a consistent and predictable manner. Always look behind before changing position on the trail.



### Don't Block the Trail

When in a group, avoid using more than half the trail.



### Dog Walkers

Keep dogs under control and on a 6' non-retractable leash.



### Keep Right

Stay to the right side of the trail as is safe, except when passing another user.



### Pass on the Left

Pass others, going in your direction, on their left. Faster traffic must yield to slower and oncoming traffic.



### Give Audible Signal

When passing a frequently used warning is... "PASSING ON YOUR LEFT." A clear warning signal may be given by voice, bell or horn.



### Helmets

Bicyclists, skaters and skateboarders should always wear a properly fitted helmet.



### Stop Means Stop



## 5. Education (Operations & Maintenance)

Compliance with rules, regulations and laws can be most effectively and satisfactorily reached with education. Several methods of education will be used for the regional greenway system:

In media:

- Information on County websites
- Links to mobile information on greenways
- Potential media spots, either original or coordinated with existing spots

At trailheads and neighborhood gateways:

- Rules of the trail will be posted in kiosks
- Share the trail pamphlets will be distributed at kiosks and trailhead buildings

On signage:

- Etiquette signage will be installed (see page 6)
- Safe speed signs will be installed

From police officers:

- Officers will hand out pamphlets outlining proper trail behavior based on materials from Three Rivers Park District
- Officers will interact with borderline offenders and offenders to gain compliance

Potential additional measures to be considered:

- Bicycling clinics on regional greenways run by Parks, advocacy groups, schools or other volunteers
- Volunteer patrols to correct poor behavior
- Bicycling curricula coordinated with schools







## 6. Enforcement (Operations & Maintenance)

The laws and rules on the greenway system need enforcement to be effective. Dakota County Parks Lakes and Trails officers currently patrol the greenway system and enforce regulations through warnings and citations in addition to education.

Additional patrols likely will be necessary as the system expands and becomes more popular. Other patrol methods may also be considered, including transportation devices for officers, volunteer greenway patrols or electronic surveillance.

Regular Parks Lakes and Trails patrols will be supplemented by local law enforcement agencies for emergency response and patrols at parks or on roadways. Agreements on enforcement and patrol duties may be reached with individual law enforcement agencies as needed to provide effective and efficient law enforcement.