



North Creek Greenway

MASTER PLAN

ADOPTED BY THE DAKOTA COUNTY BOARD OF COMMISSIONERS OCTOBER 18, 2011
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North Creek Greenway

MASTER PLAN

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Introduction

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OVERVIEW

A tributary of the Vermillion River, North Creek is in the midst of a rural to suburban transformation — one that parallels the regional growth of the Twin Cities. As the landscape around North Creek develops, the corridor assumes heightened importance as a defining natural feature. This master plan portrays a vision to establish a greenway from Eagan to Empire Township, generally following the North Creek for much of the way. Like other greenways being planned in Dakota County, the North Creek Greenway is envisioned to provide multiple benefits to water quality, habitat, recreation and nonmotorized transportation.

The North Creek Greenway's 14-mile route travels through the communities of Eagan, Apple Valley, Lakeville, Farmington and Empire Township in central Dakota County. The greenway will interconnect important regional destinations including Lebanon Hills Regional Park, the Minnesota Zoo, downtown Farmington, the Vermillion River (unique in its status as a trout stream so near a major metropolitan area) and the new regional park in Empire Township as well as numerous local attractions.



The North Creek Greenway is in red.

As the first master plans to be prepared since Dakota County solidified its greenway vision in the 2008 Park System Plan, the North Creek Greenway with the Minnesota River Greenway are important milestones in Dakota County's greenway process. As such, this master plan has been prepared as a model in both approach and design signature for greenway master plans to follow.

The master plan:

- ▶ Expresses an integrated vision for recreation, nonmotorized transportation, habitat and water quality.
- ▶ Determines regional trail alignment and design.
- ▶ Provides strategies for interpretation, resource stewardship, development, land acquisition and operations.
- ▶ Estimates project costs.
- ▶ Satisfies requirements for Metropolitan Council regional destination trail and greenway planning.

Dakota County Greenway Vision

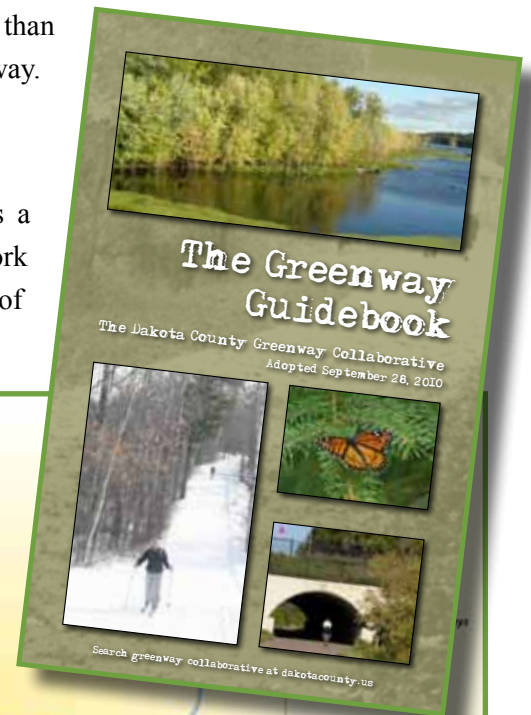
With the 2008 Park System Plan and 2010 Greenway Guidebook, Dakota County has established a progressive vision for an interconnected system of open space corridors — greenways. We need only look as far as Minneapolis' Grand Rounds to realize the powerful legacy of community benefits greenways can bestow.

Dakota County Park System Plan

The 2008 Dakota County Park System Plan established the foundation for a countywide greenway network by envisioning regional greenways that connect parks, schools, local trails and libraries through the nonrural portions of the county. Dakota County's greenway vision suggests 200 miles of regional greenways, 2/3 of which is on land currently in public or semipublic ownership. A priority is to implement more than 50 miles of greenways by 2020, including the 14 miles of the North Creek Greenway.

Dakota County Greenway Collaborative: the Greenway Guidebook

In 2010, Dakota County adopted the Dakota County Greenway Guidebook as a framework for greenway development. The guidebook establishes a framework for a collaborative approach to governance, stewardship, design and operation of greenways.



The Dakota County Greenways Vision includes the North Creek Greenway as a first priority greenway.



PLANNING CONTEXT

The North Creek Greenway runs through four cities and one township and is integrated into several concurrent efforts:

- ▶ Metropolitan Regional Parks System Plan
- ▶ 2008 Dakota County Park System Plan
- ▶ 2010 Dakota County Greenway Guidebook
- ▶ Local comprehensive plans
- ▶ Lebanon Hills Regional Park Master Plan, March 2001
- ▶ Minnesota Zoological Garden Business and Facilities Master Plan, October 2001
- ▶ 147th Street construction in Apple Valley
- ▶ Road extensions after mining in Apple Valley
- ▶ East Community Park Master Plan
- ▶ Vermillion River Re-meander Project, MnDNR
- ▶ Fairhill Park Master Plan
- ▶ Mystic Meadows Park Master Plan
- ▶ Rambling River Park Master Plan
- ▶ 203rd Street extension through Farmington

More details on these plans are in the Appendix.

1. HABITAT
HUB
CORRIDORS LINK HABITAT TYPES FOR ANIMALS AND PLANTS
GREENWAY HUBS CREATE HABITAT

2. RECREATION
WATER OFFERS PASSIVE AND ACTIVE RECREATION
TRAILS LINK DESTINATIONS
INTERLOOPED TRAILS OFFER RIDES AND WALKS OF VARYING LENGTH

3. WATER QUALITY
- BUFFER STRIPS FILTER WATER BEFORE ENTERING STREAM
- SETTLEMENT AREAS CLEAN WATER
- "DAYLIGHTED" SYSTEMS MANAGE WATER FLOW
TRAIL
BUFFER AREA
STREAM
FILTER WATER

4. TRANSPORTATION
WITH TRAILS, GREENWAYS LINK DESTINATIONS
SEPARATION FROM ROADS IMPROVES EXPERIENCE, SAFETY

Dakota County's greenway concept expands the notion of corridor to integrate habitat, recreation, water quality and nonmotorized transportation to create a countywide green infrastructure network.



GREENWAY MASTER PLANNING

The yearlong planning process was a collaborative effort of multiple agencies and jurisdictions. Dakota County led the process with advice from a technical advisory group.

Stakeholder input

A Technical Advisory Group met during each phase of master planning to provide guidance, provide insight into technical questions, explore options, identify partnership opportunities and discuss concurrent projects. In addition to providing specific guidance, the TAG institutionalized a collaborative planning process and established relationships across agencies with a stake in implementing the master plan. Five TAG meetings were held on July 14, 2010, Oct. 13, 2010, Nov. 17 2010, March 3, 2011, and May 4, 2011.

In addition to the TAG meetings, a cultural resources and interpretation workshop was held on Sept. 29, 2010, to create preliminary interpretive themes. Individual meetings also were held with key stakeholders as needed during the planning process to discuss specific issues. Meetings were held with the Minnesota Zoo staff, Fisher Aggregate, Traditions Development, and City of Apple Valley staff.

Technical advisory group

A technical advisory group met regularly, including representatives from:

- ▶ City of Eagan
- ▶ City of Apple Valley
- ▶ City of Farmington
- ▶ Empire Township
- ▶ Minnesota DNR
- ▶ Vermillion River Watershed JPO
- ▶ Minnesota Historical Society
- ▶ Dakota County Historical Society
- ▶ Dakota County Public Health
- ▶ Dakota County Parks and Open Space
- ▶ Dakota County Planning and Analysis

December 2010 open house

The first open house was Dec. 16, 2010, to gather input on the greenway trail alignment, interpretive themes and approach to natural resource and water quality improvement. Staff notified all landowners within 1/4 mile of the North Creek and Minnesota River greenways (about 1,100 people) with a brochure outlining the project and an invitation to the open house. Approximately 30 people attended.

Overall reaction to the North Creek Greenway was positive and attendees looked forward to implementation. Because the preferred greenway alignment uses existing trails and public open space, there were few issues raised about trail location. Attendees wanted to know when it will be completed?, how much it would cost?, who would maintain it? Written comments included: “keep trail on north side of Vermillion River”; “use existing trail along Johnny Cake Ridge Road”; and “great project!!!”

July 2011 open house

A second open house was held July 20, 2011, at the Dakota County Western Service Center to review the North Creek Greenway Master Plan and The Minnesota River Greenway Master Plan. All landowners within 1/4 mile of the Greenways (about 1,100 people) were mailed a brochure outlining the project and an invitation to the open house.



Seventeen attendees signed in and commented on a range of issues. Comments related to the North Creek Greenway included; interest in connection to Dakota County Technical College, as well as general enthusiasm in the greenway plans along with skepticism at the ability for the County to acquire enough money to construct the greenway.

Project website

A project website was established at www.hkgi.com/projects/dakota. An interactive greenway map and a virtual open house with materials from both open houses with an opportunity for feedback gave residents easy access to follow and contribute to the project. The draft plans also were posted on the website.

Public review

The public review draft was posted on both Dakota County's website and the greenway project website from July 21 through August for public review and comment. The public review draft was also made available to all project stakeholders: the cities of Eagan, Apple Valley and Farmington; Empire Township; the Department of Natural Resources; the Vermillion River Watershed Joint Powers Organization; the Minnesota Historical Society; and the Dakota County Historical Society.

In addition, a summary presentation was prepared for Technical Advisory Committee members to present to their organizations. Dakota County staff presented the draft plan and greenway vision to the Farmington City Council on May 16, 2011 and the Apple Valley City Council on Dec. 15, 2010. Farmington City Council was supportive of the North Creek Greenway and approved a resolution for the City to submit a federal Transportation Enhancement grant in partnership with Dakota County. Apple Valley City Council also was supportive of the greenway and later directed city staff to seek federal Transportation Enhancement funding for portions of the greenway.

RECREATION NEEDS

The North Creek Greenway will enhance access to natural areas, trails and cultural resources, which are important components of quality of life. Respondents to Dakota County's 2006 park survey cited these things among the top 25 activities residents would like to see in the County's park system. Current recreation and demographic trends suggest these needs will continue well into the future.

The Metropolitan Council's 2030 Parks Policy Plan identifies the North Creek Greenway as a regional trail search corridor to link Lebanon Hills Regional Park to the Vermillion River Greenway.

Visitors

The County must first understand who typically visits parks and trails in the county and why they visit before it can identify recreation, interpretation and education objectives. Broadly generalized profile of greenway visitors was created based on input from existing visitors to Dakota County parks and trails, from stakeholders in the master planning process and from demographics of the population within 30 miles of Dakota County (see sidebar on Page 12).



The following observations can be made about potential visitors based on comparative census data from 1990, 2000 and 2010.

- ▶ The people served by Dakota County parks and trails (those in a 30-mile radius around the parks) are becoming increasingly diverse. As recreation, interpretation and education are developed, outreach should be considered.
- ▶ There are more than half a million children enrolled in schools in the area served by Dakota County parks; more than one quarter of the population is younger than 17. Schoolchildren and families are a large group of potential greenway users.
- ▶ Less than 10 percent of the population in the area served by Dakota County is over the age of 65, but this age group is projected to increase dramatically in number and proportion in the next 20 years. This influx of baby boomers into this age category will influence interpretive and education program development.
- ▶ Based on the 2000 census, the per capita income for the U.S. was \$21,587. The per capita income for the area served by Dakota County parks was more 20 percent higher, at \$26,273. Higher incomes have historically been associated with greater participation in recreation activities.

Trends

Popularity of trail-based activities, active living, interest in nature, transportation and connectivity, aging actively, interest in history and culture and population growth are all current trends that indicate that interest in and visits to Dakota County greenways are likely to increase.

Trail Use

Trails are the No. 1 desired recreation facility in poll after poll. People of all ages and abilities can enjoy them, they are inexpensive for users and often are close to home. The Minnesota Statewide Comprehensive Outdoor Recreation Plan (SCORP) notes that the interest and demand for more trails are being felt at all levels of government. According to the 2008 Metropolitan Council Regional Parks and Trails Survey, at least two thirds of people using recreational facilities in the metro were using trails.

Biking and walking are the most popular trail uses. Half of metro park and trail users in 2008 were biking or walking. Running, inline skating and dogwalking also are popular.

Active Living

In 2009, 64.3 percent of adults in Dakota County were either overweight or obese. If the current trend continues, the percentage is expected to be 76 percent by 2020. Nationally, the obesity rate in children has tripled over the past 30 years. Today about 20 percent of school-age children are overweight or obese.

Stakeholders identified current visitors to Dakota County parks and regional trails:

- ▶ Wildlife/bird watchers
- ▶ School groups
- ▶ Seniors
- ▶ Nonmotorized commuters
- ▶ Hikers, walkers, runners, cyclists
- ▶ Anglers
- ▶ People using parks for athletics and community events/activities
- ▶ Residents
- ▶ Families
- ▶ People who have disabilities
- ▶ Foragers (fruits, flowers)
- ▶ Boaters

Stakeholders also identified potential future users:

- ▶ Groups who would benefit from increased physical activity (youth, middle-aged women and people at risk of obesity and related disorders)
- ▶ Corporate users
- ▶ Commercial and business connections
- ▶ Artists



Regular moderate physical activity can help prevent a host of disorders, including heart disease, obesity, high blood pressure, type 2 diabetes and osteoporosis. More physical activity at a population level can reduce health care costs and other costs to society.

Walking and biking are two of the simplest and most popular ways to integrate regular physical activity into daily routines, referred to as active living. Places that have physical infrastructure such as trails and programs to promote walking and biking tend to have more physically active and healthier populations.

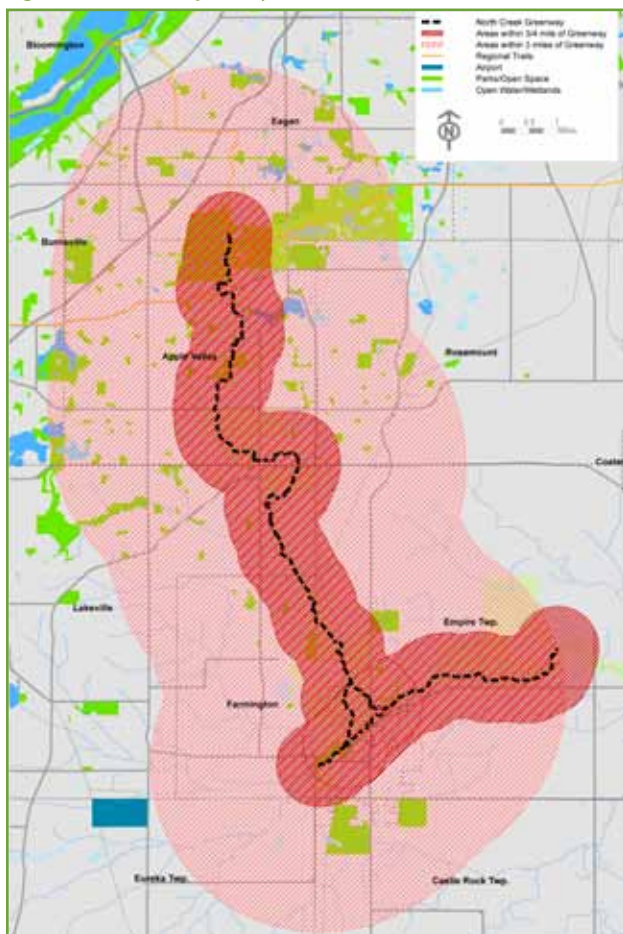
Interest in Nature

Increased sensitivity to ecological issues and the benefits of healthy ecosystems has led to people seeking more natural experiences. There also is increased interest in and opportunities for environmental stewardship such as stream and riparian restoration and the removal of invasive species. People also desire educational and interpretive programs and seek a balance of environment and recreation.

Transportation and Connectivity

Health benefits, concerns about climate change and rising energy costs have increased demand for trails and bikeways as preferable transportation options. Regional trails with grade-separated crossings offer cyclists the advantages that motorists enjoy on freeways.

Figure 13. Core and primary service areas



Connectivity to local trails is essential. The more connected the trail, the more use it will see. Connecting trails reduce the need for vehicle parking at trailheads. In 2008, half of all regional trail users arrived by bicycle or on foot (Metropolitan Council Regional Parks and Trails Survey 2008).

Engaged aging

Trail users tend to be older than park users. In 2008, 54 percent of Big Rivers Regional Trail users polled were between the ages of 45 and 64. Trail use likely will remain high as the baby boom generation ages and remains physically active — or gets more physical activity with increased leisure time — by walking, hiking or biking on trails.

Interest in history and culture

As society has become more mobile, interest in local culture and history has increased. The ability to integrate cultural, historic and environmental interpretation into the greenway will add richness to the greenway experience and attract visitors which building a sense of place.



Population

Metropolitan Council studies indicate that half of regional trail users live within 3/4 mile of the trail and 3/4 live within 3 miles of the trail. The 3/4 mile area around the trail is considered the core service area and the 3-mile area the primary service area. Communities that touch the North Creek Greenway's primary service area are some of the more densely populated in the metropolitan area. As shown in Table 14, most communities in the primary service area expect modest growth over the next 20 years.

Use forecasts

Based on Metropolitan Council 2009 visit estimates for Dakota County's North Urban Regional Trail (38,000 visits to the 2.25 mile trail), the North Creek Greenway, if opened today, could expect approximately 250,000 annual visits. The 2030 population of the communities touching the greenway's 3-mile service area is expected to increase by 38 percent. Assuming use rates are stable — a very conservative assumption — in 2030, annual visitation can be expected to be at least 345,000. The estimate does not take into account increased use based on population increases in communities outside the primary service area, current recreation trends and increased use spurred by better connectivity to other regional and local trails.

Table 14. Population forecasts for communities adjacent the North Creek Greenway. Source: Metropolitan Council Community Profiles, <http://stats.metc.state.mn.us/profile/detail.aspx?c=037>

MUNICIPALITY	2009 ESTIMATE	2030 FORECAST	% CHANGE
Apple Valley	49,376	71,200	44%
Lakeville	55,722	88,800	59%
Burnsville	61,240	65,000	6%
Empire Twp	2,336	8,500	264%
Eureka Twp	1,533	1,800	17%
Farmington	18,858	32,700	73%
Rosemount	21,521	42,000	95%
Castle Rock Twp	1,441	1,650	15%
Eagan	65,933	70,800	7%
TOTAL	277,960	382,450	38%



Existing conditions



a. Overview

The North Creek Greenway travels through the communities of Eagan, Apple Valley, Lakeville, Farmington and Empire Township. Today, the character of the greenway varies from suburban through Apple Valley, Lakeville and Farmington to rural in parts of Farmington and Empire Township. The greenway corridor links destinations including Lebanon Hills Regional Park, the Minnesota Zoo, parks, schools and commercial areas.

Archeological sites in the greenway corridor provide evidence of human settlement in the area not long after glacial retreat. European settlement began about 1850 and by the 1880s much of the area was being farmed. Suburban development began after World War II and continues today.

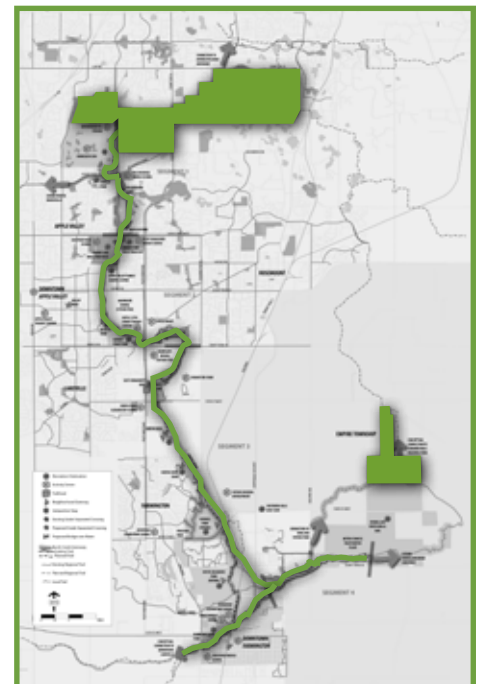
The greenway corridor is anchored by two significant natural areas: Lebanon Hills Regional Park to the north and the Vermillion River to the south. Through Lakeville and Farmington, the greenway follows North Creek, a tributary to the Vermillion River.

Greenway character

The North Creek Greenway travels 14 miles from Lebanon Hills Regional Park to the Vermillion River Modified Wildlife Management Area. On the northern end, from Lebanon Hills Regional Park to downtown Farmington, the surrounding landscape is suburban. From Lakeville's East Lake Park to downtown Farmington, the greenway has a more natural character and follows North Creek. From downtown Farmington to the Vermillion River Modified Wildlife Management Area, the greenway follows the Vermillion River through the surrounding rural landscape. The North Creek Greenway can be broken into four segments. A brief description of the character of each segment and a discussion of issues follows.

This chapter describes:

- ▶ Existing corridor character
- ▶ History of the greenway area
- ▶ Existing cultural resources
- ▶ Existing natural resources



Lebanon Hills Regional Park on the north and Vermillion River on the south frame the North Creek Greenway.

Segment 1: Apple Valley North, Lebanon Hills Regional Park to 140th Street (2.5 miles)

Segment 1 of the North Creek Greenway begins at Lebanon Hills Regional Park, travels through state property at the Minnesota Zoo and down Johnny Cake Ridge Road.



The Minnesota Zoo is a major recreation destination along the North Creek Greenway.



The existing regional trail heading south along Johnny Cake Ridge Road



Intersection at Johnny Cake Ridge Road and 140th Street West

Segment 2: Apple Valley South, 140th Street to Lakeville (3 miles)

Through Apple Valley and Lakeville the greenway traverses a suburban landscape. At the north end, the Johnny Cake Ridge Road Park area is an activity hub. From the park south to the 157th Street Transit Station, there are existing industrial and mining uses that will be redeveloped. A trail underpass below Pilot Knob Road connects the transit station to the Cobblestone Lake development, which includes a mix of residential housing types and retail such as Super Target.



Johnny Cake Ridge Park is at the center of Eastview High School, Highlands Middle School and the Apple Valley Family Aquatic Center.



157th Street Transit Station



Looking east toward Cobblestone Lake from above Pilot Knob Road underpass



Segment 3: Lakeville and Farmington North (3.5 miles)

Segment 3 of the North Creek Greenway winds through future residential developments to Lakeville's East Lake Park. South of the park, the greenway follows North Creek to Rambling River Park in Farmington.



Existing trails curve between stormwater ponds and North Creek.



East Lake



View of the Vermillion River in downtown Farmington

Segment 4: Rambling River Park Trailhead to Vermillion Highlands WMA/AMA (3 miles)

Segment 4 travels from downtown Farmington along the Vermillion River east to Empire Fields Park in Empire Township. This part of the greenway will connect with the new regional park north of the Vermillion River mWMA and AMA.



Wetlands along Vermillion River



New regional park in Empire Township



Empire Fields Park in Empire Township



b. Existing cultural resources

Figure 18. Known cultural resources

The North Creek Greenway contains two identified archaeological sites and is within one mile of another six. Most of these sites date from before European arrival. The area's rich resources have attracted people for thousands of years; additional sites likely remain undiscovered in the corridor.

About two-thirds of the corridor has not been surveyed for cultural resources. The four surveys that have been conducted are listed below. Previous investigations and known resources are at right.

The interpretation section of this plan identifies strategies to share the cultural resources of the area while protecting them. Themes include the changing landscape from the glacial retreat to early settlement to European settlement to suburbanization.

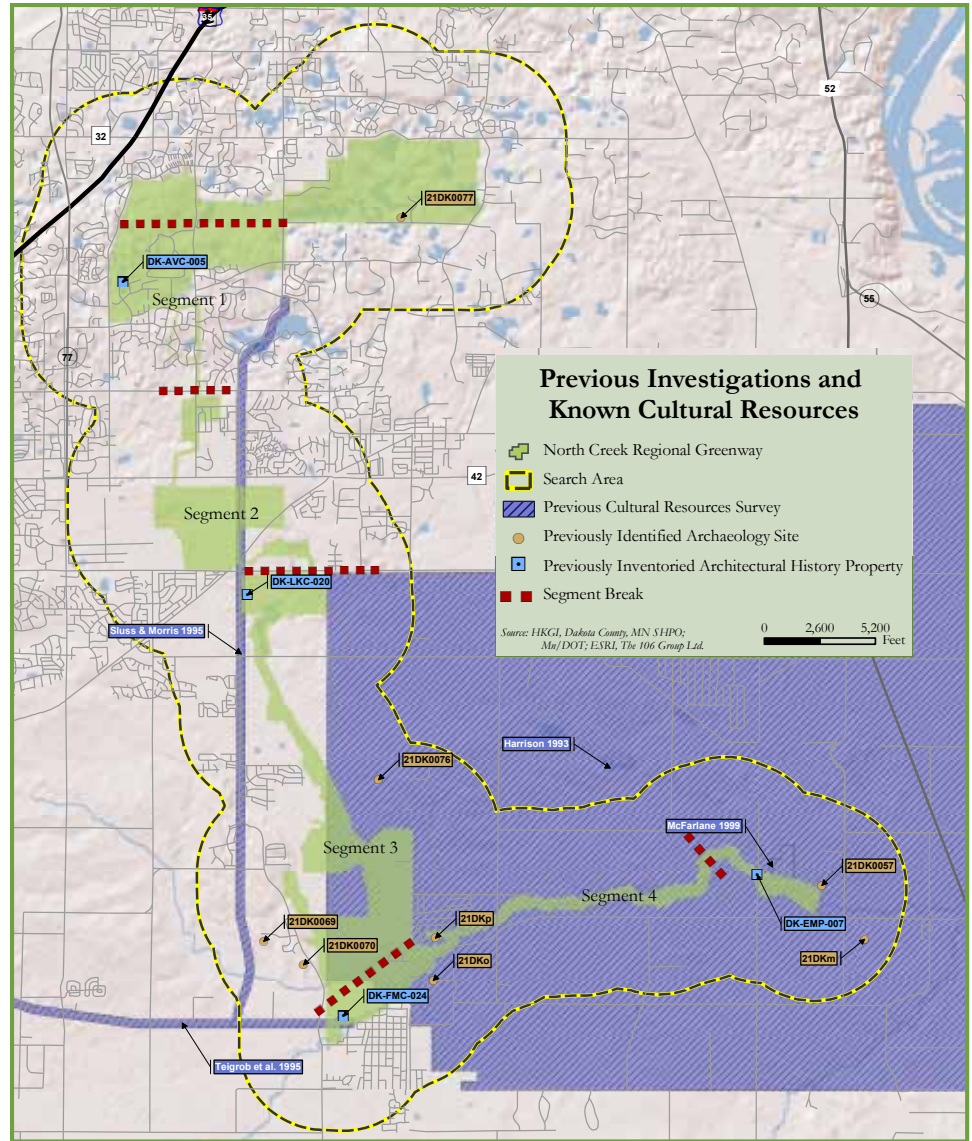


Table 18. Cultural resources surveys in the North Creek greenway

SURVEY YEAR	AUTHOR(S)	TITLE
1993	Christina Harrison	Cultural Resources Survey Dakota County Airport Study Area Volume I: The Archaeological Resources
1995	Jackie Sluss and Stacey Buck Morris	CSAH 31 Corridor Study: Cultural Resources Investigation from County Road 50 to CSAH 33, Dakota County, Minnesota
1995	Robert V. Teigrob Andrew J. Schmidt and Scott B. Meyer	CSAH 50 Reconstruction Phase I and II Cultural Resources Survey, Lakeville and Farmington, Dakota County
1999	Joseph McFarlane	Phase I Cultural Resources Investigation of the Proposed Hedberg Aggregates Sand & Gravel Mining Operation in Portions of Empire Township, Dakota County, T114N R19W Section 24



c. Existing natural resources

The natural resources along most of the North Creek Greenway are typically small, fragmented and generally linear in nature. The northern terminus, Lebanon Hills Regional Park and the Vermillion River Corridor on the south are the largest expanses of contiguous native plant communities. Within the Greenway corridor, parts of North Creek, Middle Creek and the Vermillion River are designated trout streams. The greenway connects smaller park and open space parcels along its length; these are of varying size and ecological quality.

VEGETATIVE COVER — MINNESOTA LAND CLASSIFICATION SYSTEM (MLCCS)

According to the Minnesota Land Cover Classification System and verified by field survey, The North Creek Greenway is anchored on the north by the interspersed native woodland, prairie and wetlands found in Lebanon Hills Regional Park. The North Creek floodplain is a mixture of wetlands — emergent and shrub-carr, smaller open water communities associated with East Lake and some of the stormwater management systems along the creek corridor. The North Creek and Vermillion River confluence area and the Vermillion River floodplain have extensive wetlands, which along with adjoining upland areas of the Vermillion River AMA and mWMA form an expanse of high-quality ecological communities (Figure 20).

WATER RESOURCES

Portions of North Creek, Middle Creek and the Vermillion River are designated trout streams. Stormwater runoff impacts that cause hydrologic changes, increase sedimentation and thermal impacts are all key stressors to this system. The eventual restoration of the area between Cobblestone Lake and East Lake will provide a more robust open water system in the future.

ECOLOGICAL QUALITY

Except for Lebanon Hills Regional Park, areas along the Vermillion River in Empire Township and parts of North Creek Park, the ecological quality for most of the North Creek Greenway is poor. Minnesota County Biological Survey sites of high and moderate quality are shown in Figure 20.

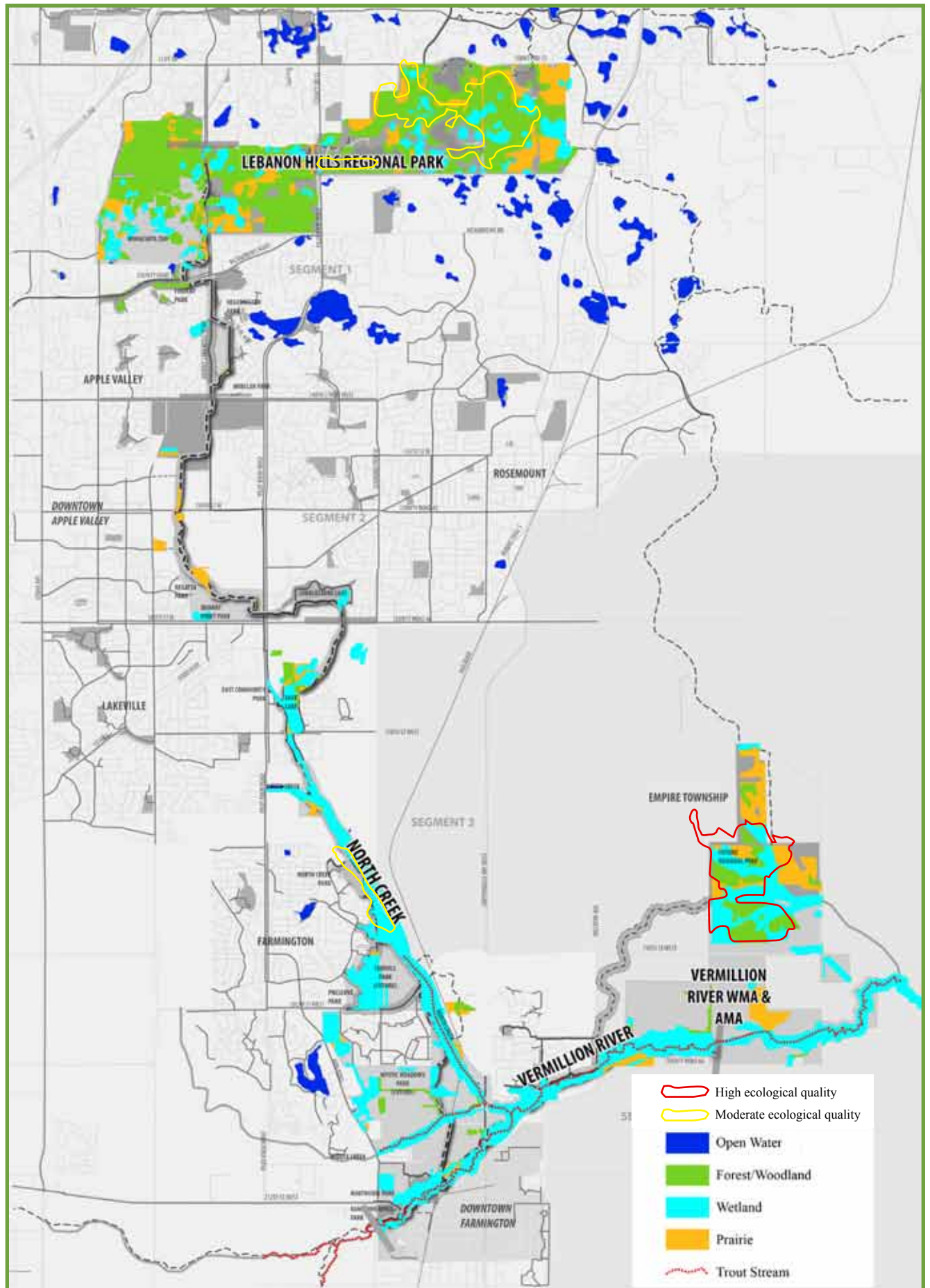
Ecological impacts

The primary ecological impact to the valley wetland systems has been due to hydrologic changes from stormwater inputs and invasion of wetlands by reed canary grass. The ecological impacts of urbanization have led to lower ecological quality. This loss of ecological quality is due to interruption of disturbance regimes (fire), invasive species colonization and habitat fragmentation from urban development patterns.

The low ecological quality of that part of North Creek Greenway from the Minnesota Zoo to north of Farmington is caused by habitat fragmentation as a result of urban roads and development patterns. The narrow linear nature of the corridor in this reach further reduces ecological quality and opportunities for significant restoration of ecological function.



Figure 20. Existing land cover along North Creek Greenway (MLCCS)



The plan

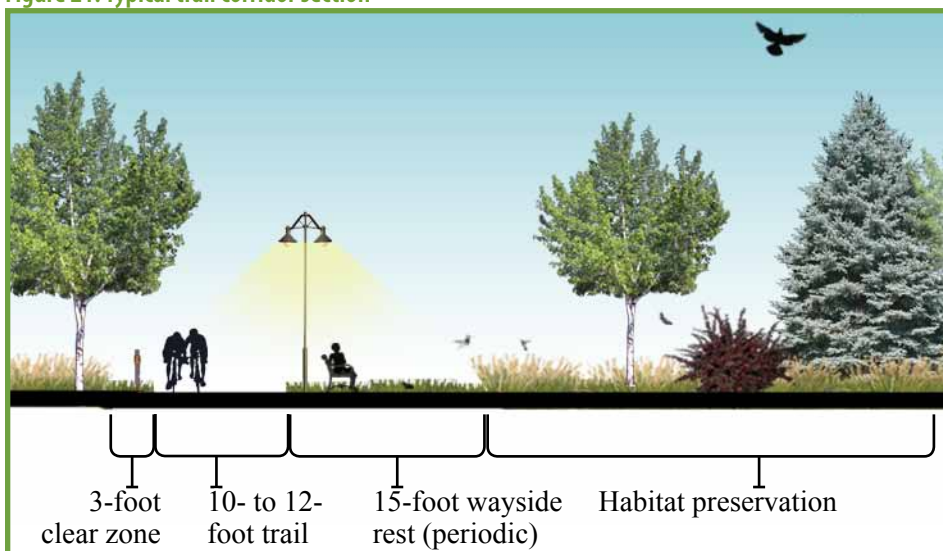


OVERVIEW

The North Creek Greenway is envisioned as a connective ribbon linking residents to natural resources and cultural destinations. The North Creek Greenway will integrate recreation, nonmotorized transportation, water quality and habitat. This chapter is the plan for the North Creek Greenway — it describes features of the greenway and projects needed. The chapter is in four sections:

- ▶ A. Development plan — Outlines the defining recreation and transportation features of the greenway.
- ▶ B. Key initiatives — Describes specific development and natural resource projects for each greenway segment.
- ▶ C. Interpretive plan — Identifies interpretive themes and sub-themes for the greenway and provides a framework for cultural and environmental interpretive elements.
- ▶ D. Stewardship plan — Addresses habitat stewardship and water resources.

Figure 21. Typical trail corridor section



Design framework

The Greenway Guidebook provides the framework for greenway design in this master plan. The following key topics are outlined in the guidebook:

- ▶ Regional trail for recreation and transportation that follows water and natural features
- ▶ Is a year-round facility
- ▶ Provides frequent trailheads and access points
- ▶ Grade separated crossings of major roads
- ▶ Has a consistent design with natural signature and high quality support facilities
- ▶ Has lighting for evening use
- ▶ Links recreation destinations and activity centers
- ▶ Acts as a spine for loop trails
- ▶ Allows for borrowed views
- ▶ Uses wayfinding as a system-wide unifying element
- ▶ Universal accessibility
- ▶ Incorporates sustainability by using recycled materials, pervious pavement and energy-efficient lighting

a. Development plan

Access to recreation is a fundamental feature of Dakota County greenways. The primary recreation feature of the North Creek Greenway is a continuous regional destination trail for nature-based recreation and nonmotorized transportation. While the greenway varies in width from 100 feet to more than 300 feet throughout the corridor, this chapter focuses on the design of the 30-foot trail corridor to create a safe, amenity-rich trail for year-round use.

Design consistency is critical in developing Dakota County greenways to create a high-quality, unified and legible system. The Greenway Guidebook identifies the elements that will be signatures of the greenway system. How the North Creek Greenway addresses each of these topics is discussed in this section.

TRAIL CORRIDOR FEATURES AND DESIGN

Design touches many facets of the trail alignment, including the relationship of the trail alignment to the larger greenway corridor, the ability to connect destinations, the presence and location of grade separated crossings and every furnishing in the greenway. Design elements and themes should be consistent throughout the corridor to assist visitors with wayfinding and greenway recognition. These themes and elements will be developed as the corridor is implemented.

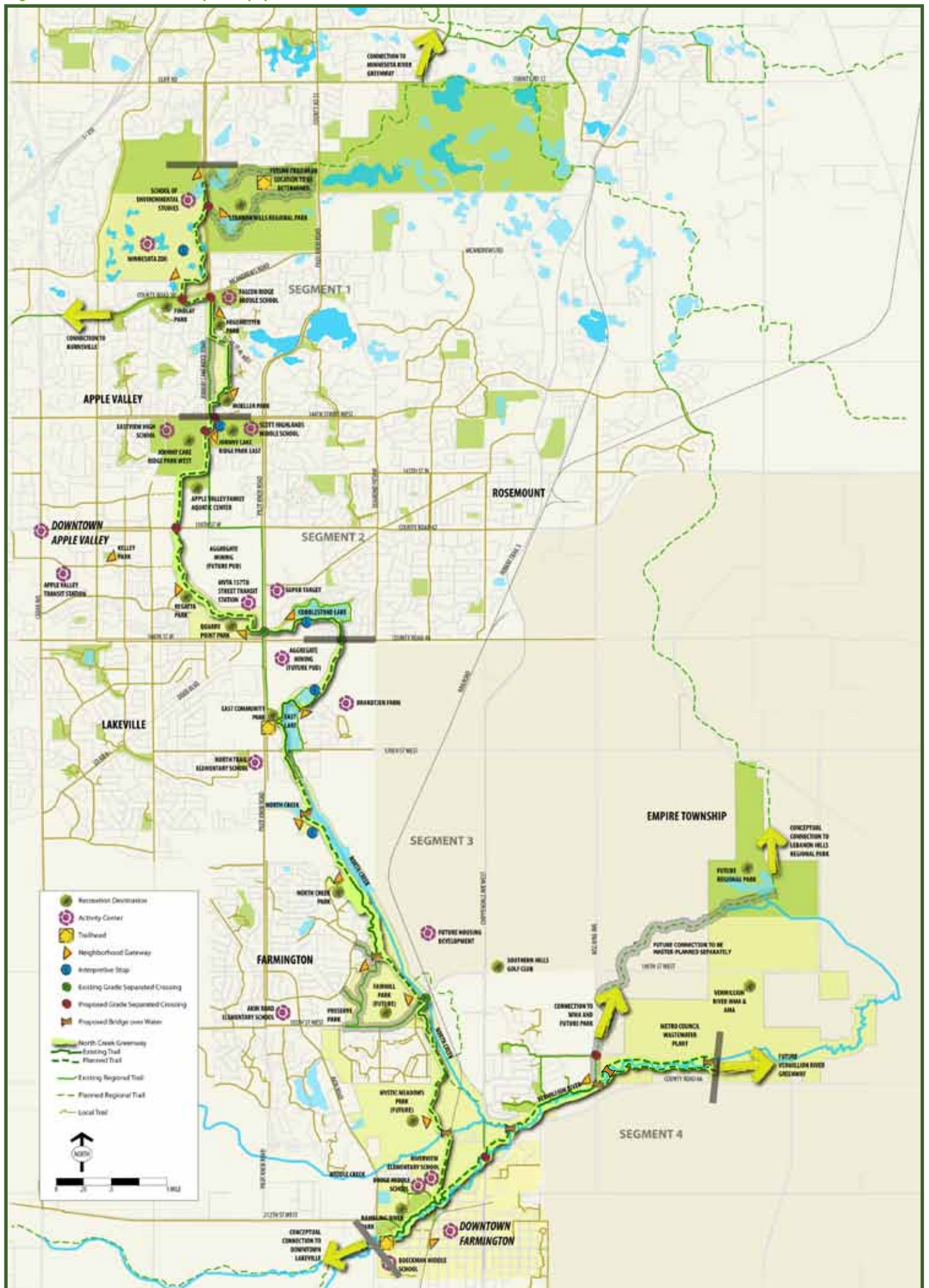
TRAIL CORRIDOR

The regional trail within the greenway corridor will be a continuous multipurpose bituminous trail designed in accordance with applicable American Association of State Highway Transportation Officials guidelines, Mn/DOT bicycle design guidelines and Dakota County trail standards. The trail will be 10 to 12 feet wide with a 3-foot grass clear zone on each side. Anticipated uses include walking, jogging, inline skating and bicycling. The trail will be cleared for winter use and where appropriate, lighted.

Figure 22. North Creek Greenway Typical Sections (not to scale)



Figure 23. North Creek Greenway concept plan



RECREATION DESTINATIONS, ACTIVITY CENTERS AND TRAIL CONNECTIONS

Inherent to the greenway vision is that the trail corridor is a connecting feature, linking recreation destinations and activity centers. Opportunities to stop along the trail to bird-watch or eat lunch are some of the unique features that will make the North Creek Greenway a regional destination drawing people from a broad area. The North Creek Greenway will be a spine for loop trails, connect to regional trails and roads and will itself serve as an important transportation route. Recreation destinations, activity centers and connections are shown below.

RECREATION DESTINATIONS



North Creek Greenway recreation destinations include Lebanon Hills Regional Park, the Minnesota Zoo, Johnny Cake Ridge parks east and west, Quarry Point Park, East Community Park, Rambling River and Northview parks in Farmington and the new regional park in Empire Township.

ACTIVITY CENTERS



North Creek Greenway activity centers include Eastview High School, Apple Valley Family Aquatic Center, Apple Valley Transit Station, the retail shopping area at Cobblestone Lake and downtown Apple Valley, downtown Farmington and several middle and elementary schools.



TRAILHEADS AND NEIGHBORHOOD GATEWAYS

Frequent access is a priority for the North Creek Greenway. Two generalized types of greenway and trail access points are recommended: Trailheads are intended for regional and local access; neighborhood gateways primarily are for local access at opportune locations. Typically, access points will be at recreation destinations, activity centers and trail intersections. Here trail users will find support facilities such as water and restrooms as well as greenway information.

Trailheads are the primary greenway access points and will accommodate people who drive, walk, bike or take transit to the greenway. They will occur every 3 to 5 miles and capitalize on opportunities to share facilities like parking and restrooms with other facilities.

Trailheads will include:

- ▶ Water
- ▶ Motor vehicle parking
- ▶ Secure bicycle parking
- ▶ Picnic areas and/or facilities
- ▶ Wayfinding and traffic control
- ▶ Local or regional trail connections
- ▶ Restrooms
- ▶ Interpretation
- ▶ Benches
- ▶ Food where there are opportunities
- ▶ Shelter and shade

Neighborhood Gateways are more frequent, local access points. They will be at convenient intervals between primary trailheads (2-3 miles or closer at logical locations). Wherever possible, facilities are shared with other uses and ideally are located where there is a complimentary recreation destination or activity center.

Neighborhood gateways will include:

- ▶ Benches
- ▶ Secure bicycle parking
- ▶ Wayfinding and traffic control
- ▶ Local or regional trail connections
- ▶ Water
- ▶ Interpretation

Depending on opportunities, neighborhood gateways may also include:

- ▶ Restrooms
- ▶ Picnicking
- ▶ Food
- ▶ Motor vehicle parking

TRAILHEADS



Source: www.downtown-eauclaire.com



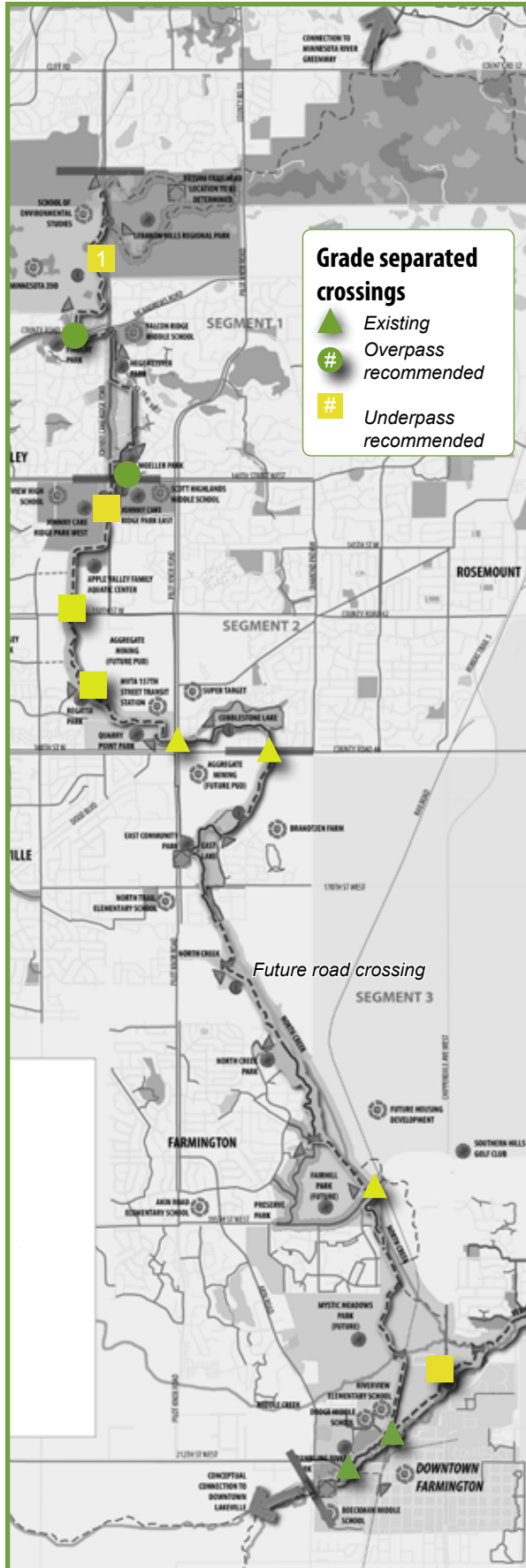
NEIGHBORHOOD GATEWAYS



Source: HKGI



Figure 26. Grade separated road crossings



ROAD CROSSINGS

Grade-separated crossings

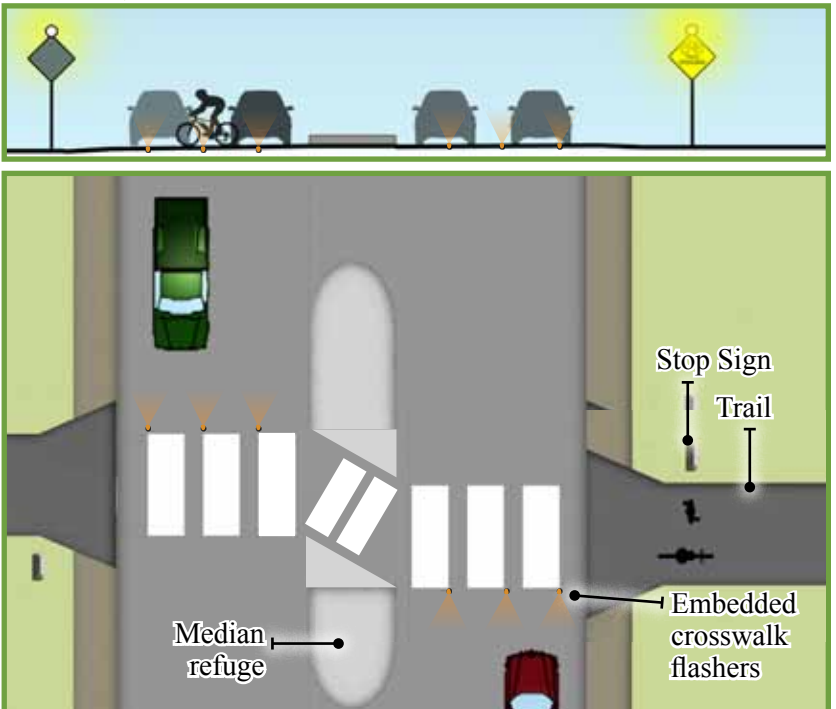
Grade-separated crossings increase safety by reducing conflicts with cars and allow for more fluid trail experience for users of all ages and abilities. To that end, grade separated crossings are suggested at all major intersections, shown in Figure 26.

At-grade crossings

When grade separated crossings are not possible on collector roads or higher, crossing should occur at controlled intersections with vehicles stopping at traffic lights or stop signs. On lower volume local roads, crossings may not be controlled with traffic lights or stop signs. In these cases, features such as pavement marking, refuge islands and bumpouts should be applied to reduce crossing distances for trail users and increase visibility for trail users and road users.



Figure 26a. Typical at-grade road crossing with median refuge



WAYFINDING

Wayfinding is the way people navigate from place to place. For the Dakota County greenway system a consistent wayfinding system is essential for orientation, navigation and safety. Signage should be consistent across the system and should guide greenway users to local services, cultural destinations, transportation connections, activity centers, recreation destinations, cities, neighborhoods and other landmarks.

SITE FURNISHINGS

One of the key features of the greenway system is having a consistent design signature for site furnishings. The site furnishings (benches, bike racks, lighting and trash receptacles) will present the desired character of greenway as part of branding and system recognition at trailheads, neighborhood gateways and other respites along the greenway.

LIGHTING

Lighting is an essential component for safety and to make the greenway functional as a transportation corridor in the winter and fall when the days are short. For safety and navigation, lighting is paramount at all greenway access points, trailheads, neighborhood gateways and trail connections. In these places, it is recommended that lighting be incorporated into initial design and construction. In areas where there is potential for high commuter use because of population density, trail connections and destinations, it is recommended that continuous trail lighting be installed.

Long-term, the greenway from Lebanon Hills Regional Park to East Lake Park in Lakeville and in Farmington from the schools through Rambling River Park should be monitored for use patterns and lighting installed when demand warrants it. East of Farmington, the greenway has a more rural character and lighting is not recommended. Figure 28 shows priority lighting areas.

ACCESSIBILITY

Dakota County is committed to offering universal accessibility at all trail facilities. The primary paved trail and all access points suggested in the master plan are located and planned for universal accessibility to provide all visitors with a meaningful experience.

SUSTAINABILITY

Sustainability is at the core of the greenway concept. Improving ecological function, habitat creation, wildlife movement, stormwater infiltration and carbon sequestration as well as facilitating nonmotorized recreation and transportation are all greenway objectives.

Wayfinding example



Figure 28. Lighting areas



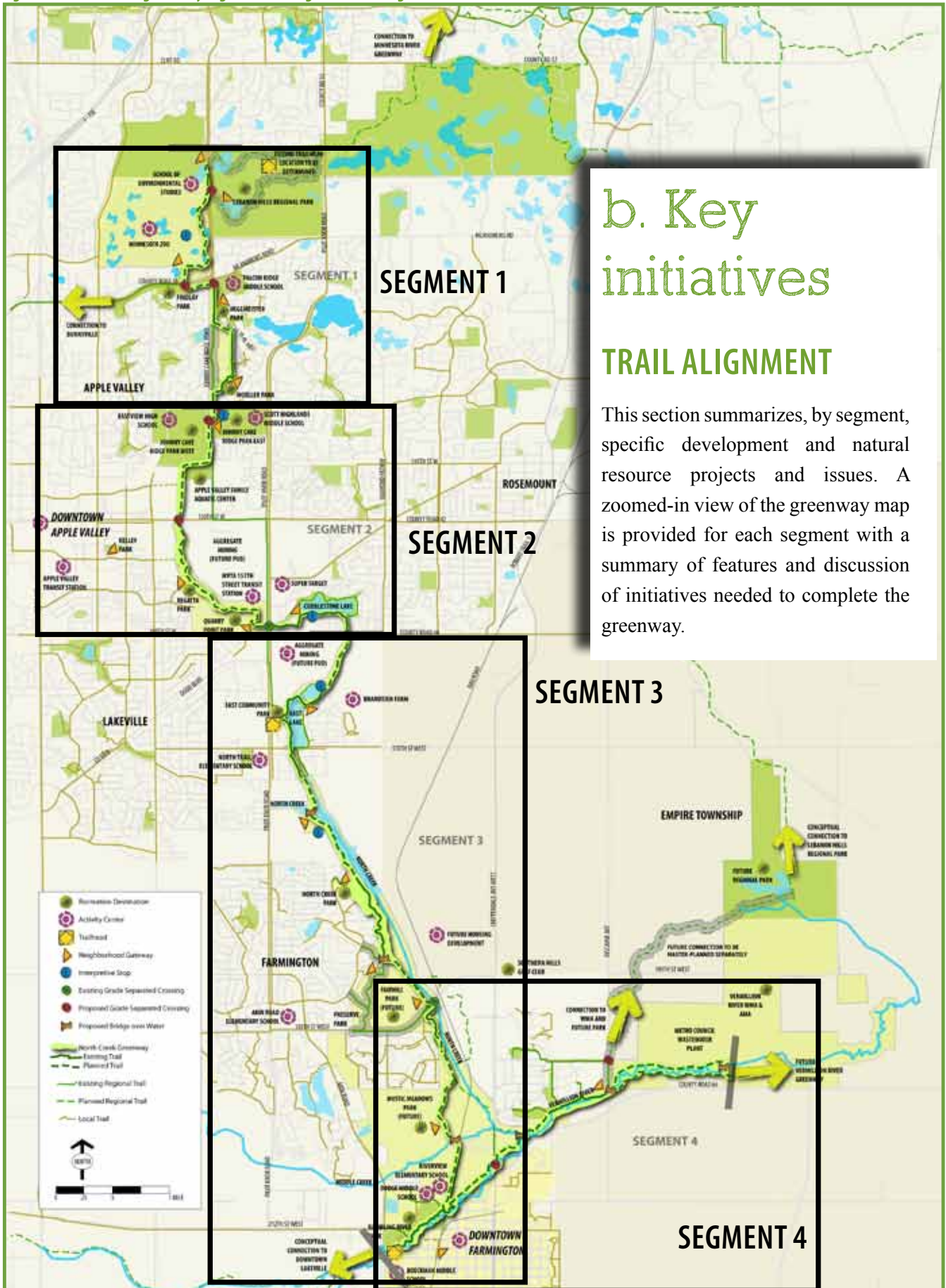
Greenways will be assembled in environmentally sustainable ways and designed to minimize impact on natural systems. Recommended strategies include:

- ▶ Protecting and restoring natural systems
- ▶ Emphasizing native plant species
- ▶ Reducing maintenance costs by promoting self-sustaining wildlife and plant communities, treating stormwater on-site
- ▶ Using recycled materials and pervious pavement when appropriate
- ▶ Using energy-efficient lighting and use of timed lighting and thermostats

The impervious nature of the trail itself will present challenges in sensitive areas. Great care will be taken to minimize and mitigate runoff impacts. The trail will not be developed where impacts — especially to trout habitat — cannot be adequately addressed.



Figure 29. North Creek greenway regional trail alignment and segments



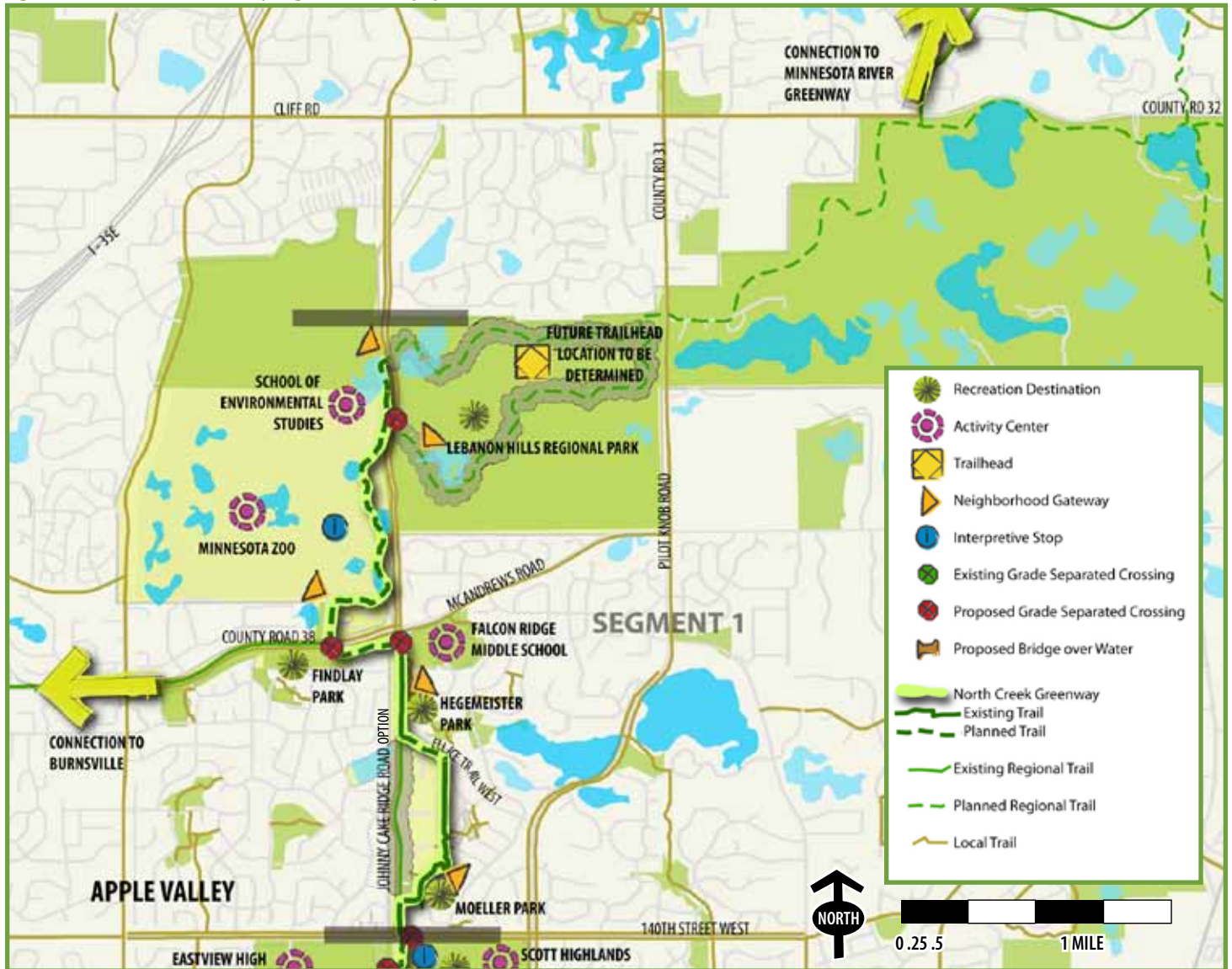
b. Key initiatives

TRAIL ALIGNMENT

This section summarizes, by segment, specific development and natural resource projects and issues. A zoomed-in view of the greenway map is provided for each segment with a summary of features and discussion of initiatives needed to complete the greenway.



Figure 30. North Creek Greenway Segment 1 concept plan



Segment 1: Apple Valley North, Lebanon Hills Regional Park to 140th Street (2.5 miles)

The north end of the greenway, Figure 30, begins at Lebanon Hills Regional Park at a neighborhood gateway on the west side of Johnny Cake Ridge Road. The greenway and trail alignment then travels south through state property at the Minnesota Zoo. This section of trail does not exist, but there are existing trails along both sides of Johnny Cake Ridge Road that would be used as interim routes until the trail can be completed offroad. South of the zoo, the greenway switches to the east side of Johnny Cake Ridge Road to link neighborhood parks and to capitalize on the opportunity to get away from the road to improve safety and user experience. Most of this trail exists today except a quarter-mile portion along Ellice Trail West.

Lebanon Hills Regional Park trailhead

A trailhead is proposed in Lebanon Hills with the location to be determined by the future master plank. This trailhead will include full trailhead facilities, including motor vehicle parking, picnic facilities, water, restrooms, interpretation and wayfinding. The trailhead will provide access to the greenway, to the park and to future greenways.



Figure 31. Lebanon Hills Regional Park through Minnesota Zoo regional trail alignment



Minnesota Zoo

The Minnesota Zoo is reconfiguring its public entry and picnic area with consideration for making some exhibits visible from outside the zoo gates. There are two regional trail alignment options through the zoo property. The first skirts the eastern edge of the property and connects to McAndrews Road / CR 38 parallel to the zoo's entry drive. The second brings the trail west into the zoo property and closer to the main entrance. Continued coordination with the zoo is needed to plan the trail alignment and to coordinate shared use of facilities such as picnic facilities, water, restrooms and secure bike parking for the benefit of zoo visitors and greenway users. Figure 31 depicts alignment options on the zoo property.





Concept image for proposed bridge over McAndrews Road, identified in Figure 31.

Ellice Trail West to Moeller Park

The greenway and trail alignment from Ellice Trail West to Moeller Park follows an existing trail on the east side of Johnny Cake Ridge Road. A trail link is needed between the trail and Johnny Cake Ridge Road along the south side of Ellice Trail West. Steep topography will need to be addressed to complete this link.

Natural resources and water quality

Lebanon Hills gateway

- ▶ Long-term management and restoration is recommended to establish native plant community in the parking lot vicinity.
- ▶ A natural signature (primarily oak savanna) will be established throughout the corridor and water will be infiltrated.

Apple Valley north

Recreation destinations

- ▶ Lebanon Hills Regional Park
- ▶ Findlay Park
- ▶ Hagemeister Park
- ▶ Moeller Park

Activity centers

- ▶ School of Environmental Studies
- ▶ Minnesota Zoo
- ▶ Falcon Ridge Middle School

Trailheads

- ▶ Lebanon Hills Regional Park

Neighborhood gateways

- ▶ Lebanon Hills mountain bike area
- ▶ Lebanon Hills Regional Park south
- ▶ Minnesota Zoo
- ▶ Hagemeister Park
- ▶ Moeller Park
- ▶ Kelley Park

Loop and connecting trails

- ▶ Connections to other greenways and trails
- ▶ Connections to Lebanon Hills Regional Park trails
- ▶ Connections to trails on CR 38 / McAndrews Road
- ▶ Connections to trails on 140th Street

Grade-separated crossings:

- ▶ McAndrews Road
- ▶ Johnny Cake Ridge Road



Apple Valley south

Recreation destinations

- ▶ Apple Valley Aquatic Center
- ▶ Johnny Cake Ridge Park
- ▶ Regatta Park
- ▶ Quarry Point Park
- ▶ Cobblestone Lake

Activity centers

- ▶ Eastview High School
- ▶ Scott Highlands Middle School
- ▶ 157th Street Transit Station
- ▶ Cobblestone Lake commercial area

Neighborhood gateways

- ▶ Johnny Cake Ridge Park
- ▶ Eastview High School/
Apple Valley Family Aquatic Center
- ▶ Regatta Park
- ▶ Quarry Point Park
- ▶ Cobblestone Lake

Loop and connecting trails

- ▶ Trails on CSAH 42
- ▶ Cobblestone Lake trails
- ▶ Trail loops in conjunction with new development

Grade-separated crossings

- ▶ Johnny Cake Ridge Road at Eastview High School
- ▶ 140th Street
- ▶ Future 147th Street
- ▶ CSAH 42/150th Street

Segment 2: Apple Valley South, 140th Street to Lakeville (3 miles)

This segment of the greenway links Johnny Cake Ridge Park, Eastview High School and Apple Valley Family Aquatic Center to Cobblestone Lake. Extending south of the Apple Valley Aquatic Center to Quarry Point Park is a future development area. Greenway alignment and design in this area will be coordinated with future redevelopment plans to create a recreation and natural resource asset. From Quarry Point Park, the greenway trail is already built and travels under Pilot Knob Road via an existing underpass and connects to the exiting trails in the Cobblestone Lake development before heading south again across 160th Street to Lakeville, via an existing underpass.

Figure 33. North Creek Greenway segment 2 concept plan

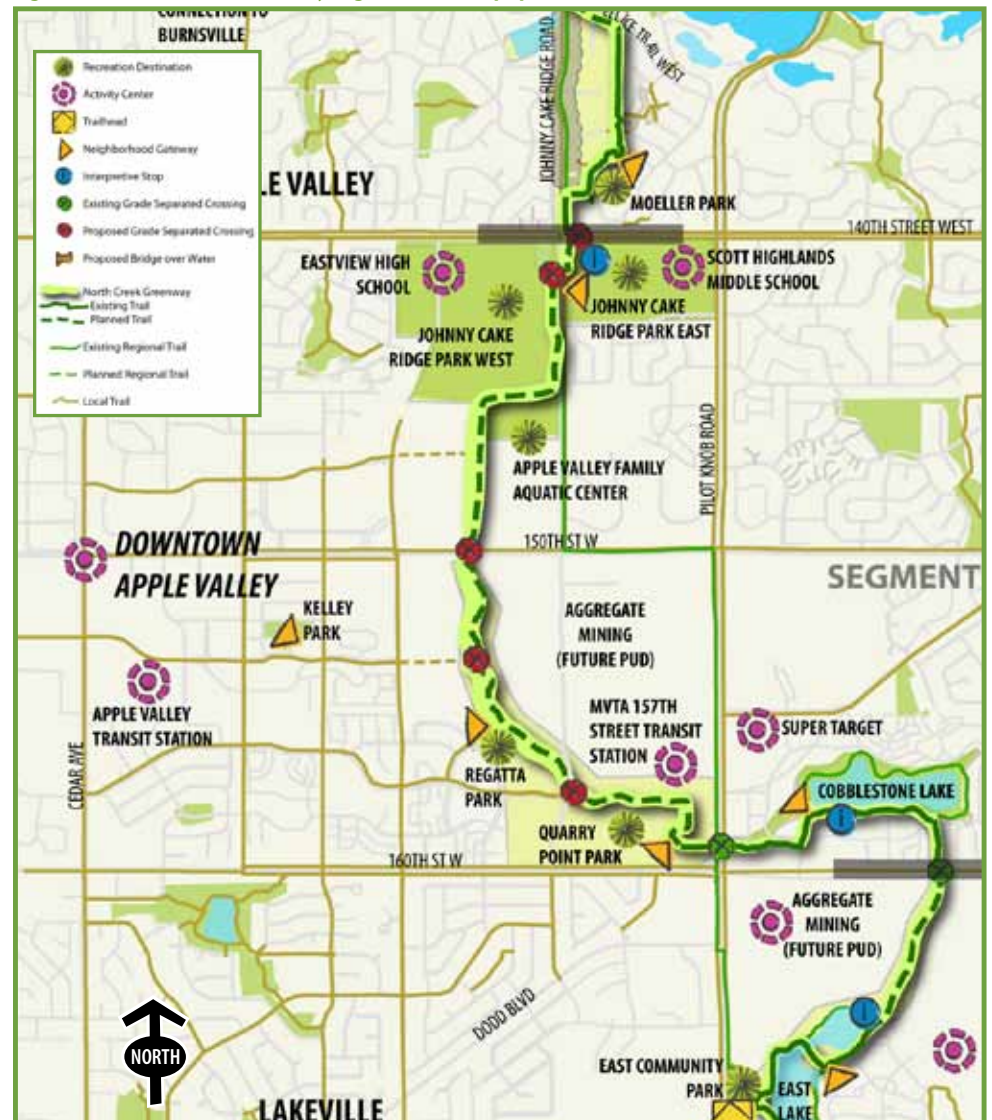
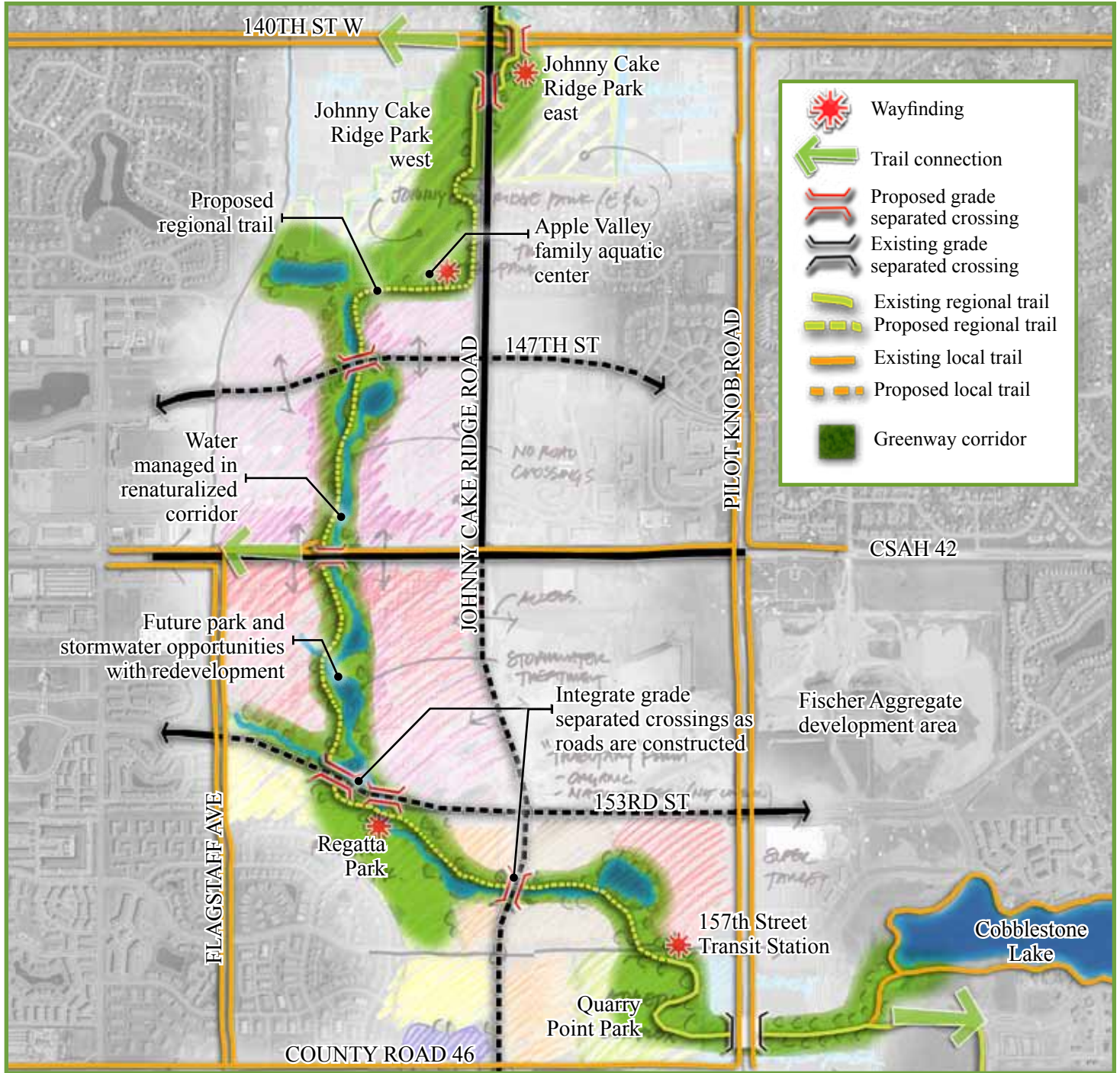


Figure 34. Johnny Cake Ridge Road redevelopment area

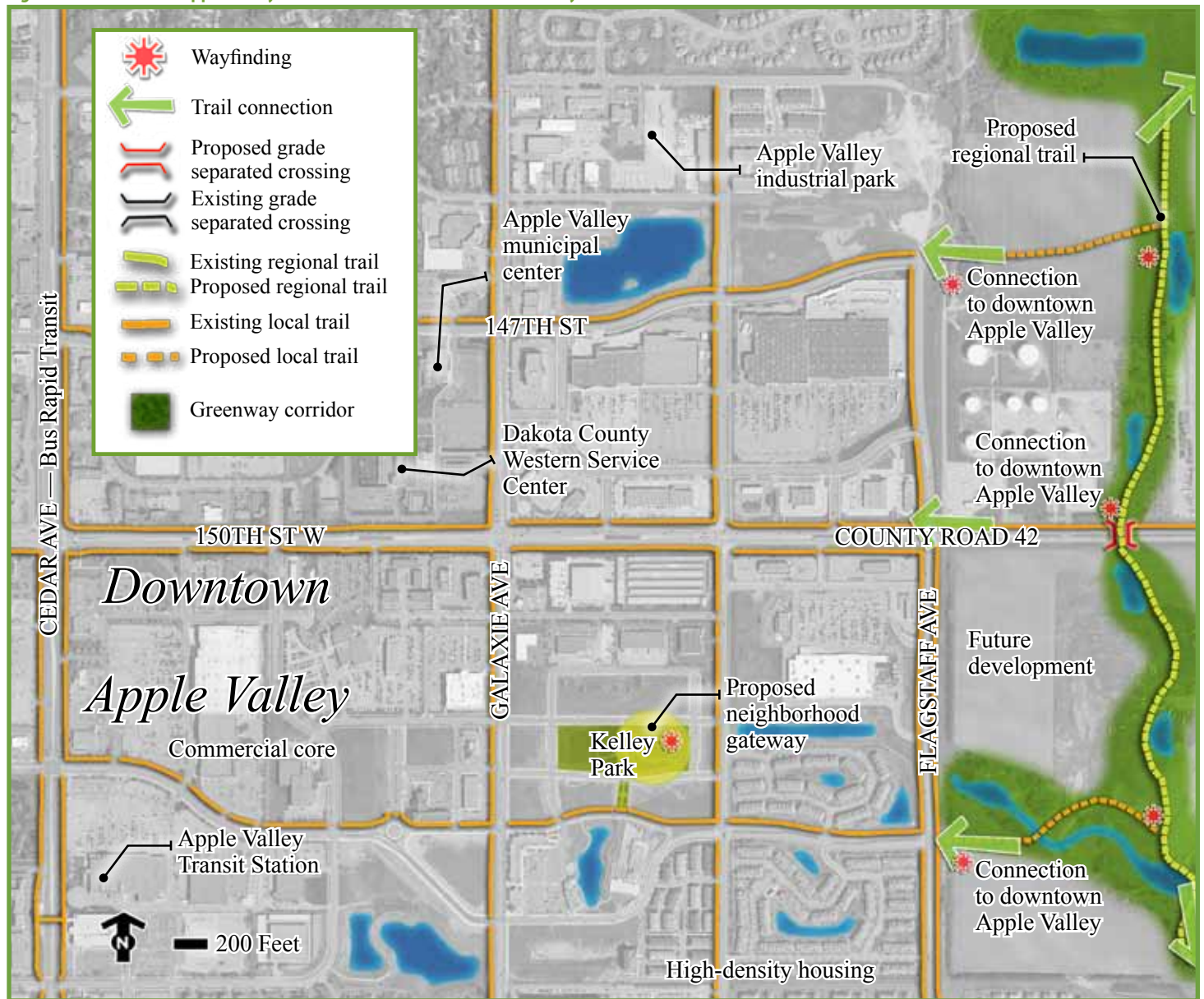


Apple Valley redevelopment area

The area from Apple Valley Family Aquatic Center to Quarry Point Park and the 157th Street Transit Station is a development/redevelopment area. This area affords the opportunity to integrate the greenway into new development. The greenway has the potential to be a prototype for future suburban greenways by integrating new parks, stormwater treatment and grade separated crossings into the greenway corridor, as shown in Figure 34.



Figure 35. Downtown Apple Valley Connections to North Creek Greenway



Connections to downtown Apple Valley

The redevelopment area offers opportunities for two future trail connections to Downtown Apple Valley. These connections would offer several convenient dining and entertainment options for greenway users. A neighborhood gateway is suggested in Kelley Park (Figure 35).

Natural resources and water quality initiatives

- ▶ Integrate habitat restoration and innovative urban stormwater treatment into the greenway from the Apple Valley Family Aquatic Center to Quarry Point Park.
- ▶ Consider options for daylighting North Creek north of Regatta Park, continuing east and south to Cobblestone Lake and East Lake.
- ▶ A natural signature (primarily oak savanna) will be established throughout the corridor and water will be infiltrated.



Segment 3: Lakeville and Farmington North (3.5 miles)

From County Road 46 / 160th Street the greenway will connect through the current mining/future development area to the Brandtjen Farm neighborhood and East Lake Park, a City of Lakeville community park. From East Lake Park to 195th Street, the greenway will follow North Creek. In this segment, much of the trail already is constructed, with a few trail gaps.

From Fairhill Park the greenway heads directly south, following North Creek about a mile. North Creek then veers east while the greenway continues south, crossing Middle Creek and following the west side of the Canadian Pacific Railway to the Vermillion River. At the Vermillion River, the greenway follows the river in both directions: west to downtown Farmington and Rambling River Park and east to a community park in Empire Township.

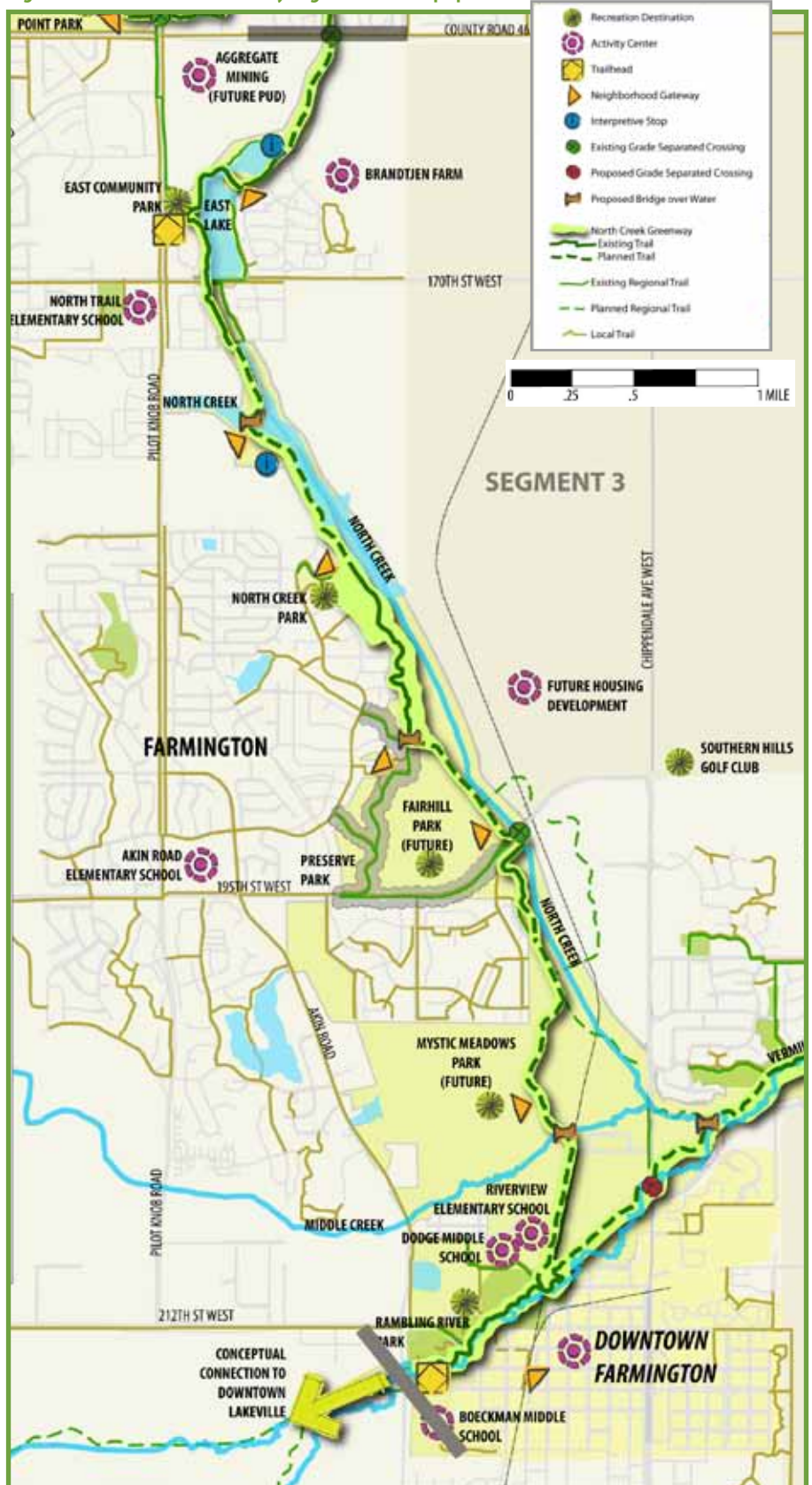
Water crossings

For this segment of the greenway, three bridge crossings will be necessary, as shown on Figure 36. Bridges will be needed to cross the north branch of North Creek in an area to be developed in the future, the wetland near 189th Street in Farmington and Middle Creek north of downtown Farmington.

Rambling River trailhead and downtown Farmington

A trailhead is recommended at the ice arena on the southwest edge of Rambling River Park. Here there are opportunities to share existing parking and restroom facilities and add picnicking, interpretation and wayfinding.

Figure 36. North Creek Greenway segment 3 concept plan



Connections to destinations in downtown Farmington are also recommended. A trail link to a neighborhood gateway at Farmington's Depot Art Park is suggested. The trail connection to this gateway is shown in Figure 37.

Natural resources and water quality

East Lake

- ▶ Continue buckthorn management.
- ▶ Perform prescribed burns on restored prairies on upland mine areas and oak woodlands.
- ▶ Address fall algae blooms in the lake.

North Creek corridor and preserve

- ▶ Restore prairie on uplands and oak woodlands on the berms to the east.
- ▶ Manage invasive vegetation along North Creek and adjacent areas.

Vermillion River and Rambling River Park

- ▶ Widen and maintain stream buffers with native plants to improve floodplain wetlands and forest quality.

Figure 37. Downtown Farmington and Rambling River Park



Lakeville/Farmington North

Recreation destinations

- ▶ East Lake Community Park
- ▶ North Creek Park
- ▶ Meadow Creek Park
- ▶ Fairhill Park (future)
- ▶ Mystic Meadows Park (future)
- ▶ Rambling River Park
- ▶ Farmington Preserve

Activity centers

- ▶ Riverview Elementary School and Dodge Middle School
- ▶ Downtown Farmington

Trailheads

- ▶ East Lake Community Park
- ▶ Rambling River Park

Neighborhood gateways

- ▶ North Creek Park
- ▶ Meadow Creek Park
- ▶ Fairhill Park (future)

Loop and Connection Trails

- ▶ East Lake loop
- ▶ Connections to Brandtjen Farm trails
- ▶ Numerous connections to city of Farmington trails

Grade-separated crossing

- ▶ TH 3 at CR 66

Segment 4: Farmington East to Vermillion River WMA/AMA (3 miles)

From downtown Farmington, the greenway follows the Vermillion River east toward the Vermillion River mWMA/AMA and the new regional park in Empire Township. This segment of the greenway will be part of the Vermillion River greenway. A neighborhood gateway is suggested at Empire Fields Park.

Segment 4 will connect with a future connection to the new regional park in Empire Township that will be master-planned separately from this document.

The regional trail alignment east of Biscayne Avenue will be developed in coordination with the MnDNR, the Metropolitan Council and Empire Township. Two options currently exist, one north of the Vermillion River and one south of the river.

Natural resources and water quality

Vermillion River corridor

- ▶ Manage buckthorn along stream corridor and floodplain
- ▶ Widen and maintain stream buffers with native plants to improve floodplain wetlands and forest quality
- ▶ Monitor areas on the north side of Vermillion River to prevent degradation of the plant communities
- ▶ Interseed and manage converted farmland that contains low plant diversity
- ▶ Add accessible fishing access at the Vermillion River

Farmington East to Vermillion River WMA/AMA

Recreation destinations

- ▶ Empire Fields Park
- ▶ Vermillion River mWMA/AMA
- ▶ New regional park

Neighborhood gateways

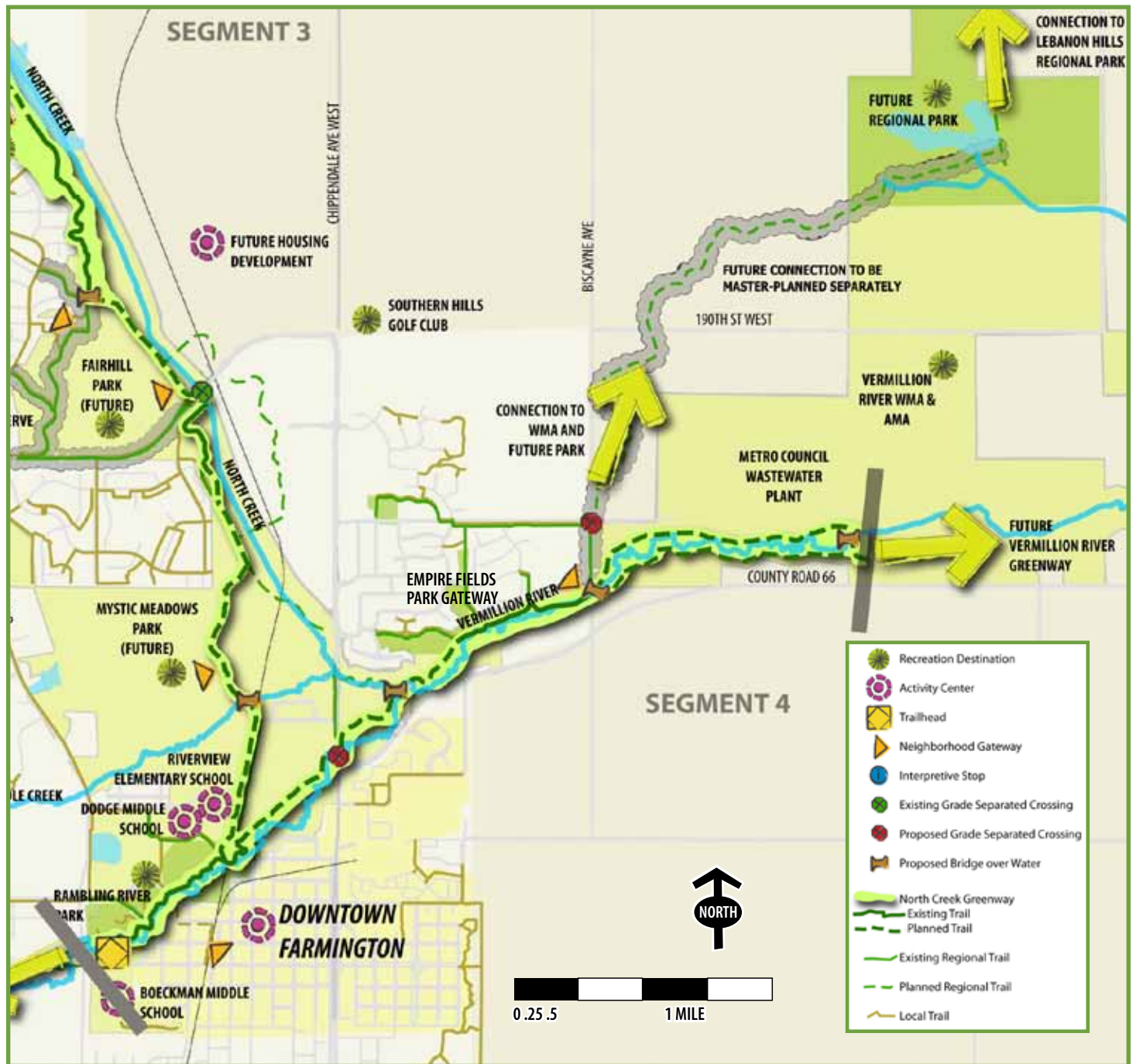
- ▶ Vermillion Highlands mWMA/AMA
- ▶ Empire Fields Park

Loop and connecting trails

- ▶ Connections to new regional park in Empire Township
- ▶ Vermillion River Greenway



Figure 39. North Creek Greenway segment 4 concept plan



c. Interpretive plan

People’s connections to culture, land, nature and community have become detached. Some cannot imagine the prairie before the metropolis, the wheat before the bread, or the world before Columbus. We forget, or never learn, the stories that define the significant places in our lives. Place-based interpretation seeks to tell the story of places or to reveal connections between social and natural systems distinctive to each site. It is an approach rooted in the belief that people can benefit from understanding the stories of the places they visit.

Dakota County has long been committed to sharing the stories of special places that comprise the county’s parks and trails. Through interpretative programs and exhibits, Dakota County strives to create awareness and appreciation of the county’s history, culture and environment. As the county expands its greenway system, interpretation for each greenway is a goal for the planning and development process.

Interpretive planning designs educational experiences that support an organization’s vision and mission. The planning process considers the place-specific historical, cultural and natural resources to be interpreted and the demographics and interests of the people who use the site in order to develop relevant messages and media in support of an organization’s mission. In the case of Dakota County, interpretation ought to support Dakota County Park’s mission: To enrich lives by providing high-quality

INTERPRETIVE THEME

Our changing lives, our changing landscape: Changes in human activity reflected in changes in North Creek Greenway.

Subthemes

A relationship with the land: Over time, human patterns of growth and development have altered the natural world around us; impacting water quality, biodiversity and the lay of the land. As we move into the future, our actions as individuals and as communities continue to impact the landscape.

Site-specific interpretation:	▶ Areas of impact on the environment
▶ Active and remnant farmland and farmsteads	»Loss of prairie, wetland, forest
▶ Brandtjen Farm	»Straightening of North Creek
▶ Abandoned railroad beds	
▶ Suburban growth	
▶ Surface water treatment	

Community connections: The North Creek Greenway landscape is a vibrant living space with homes, parks and other locations for community gathering. The North Creek Greenway connects these community spaces and the communities.

Site-specific interpretation:	▶ Eastview Athletic Complex
▶ Lebanon Hills Regional Park	▶ Eastview High School fields and swimming pool
▶ Minnesota Zoo	▶ Athletic fields
▶ School of Environmental Studies	▶ Future playgrounds, parks and athletic fields



Stewardship in action: Efforts to restore and protect the landscape are taking place along the North Creek Greenway. Native landscapes benefit water quality, foster biodiversity, create healthy soils and provide green spaces for recreation.

- | | |
|---|--|
| <p>Site-specific interpretation:</p> <ul style="list-style-type: none"> ▶ Habitat restoration ▶ Storm water treatment ▶ Identifying the components of natural or restored landscapes <ul style="list-style-type: none"> » Plants » Water systems ▶ Restoration of landscapes to benefit people <ul style="list-style-type: none"> » Soil fertility » Reduce erosion » Manage and filter runoff | <ul style="list-style-type: none"> ▶ School of Environmental Studies ▶ Re-meandering of North Creek ▶ Exploring innovative approaches to groundwater in new developments ▶ Sharing ideas for restoration of natural systems at home ▶ Downtowns of Apple Valley, Lakeville and Farmington |
|---|--|

Active living — counting the benefits: In addition to these place-based subthemes, it is recommended that interpretation in the Dakota County greenway system encourage visitors to consider the health benefits of regular moderate physical activity that they can get on greenways. Some interpretation could convey what greenways are and how they differ from standard trails. Mile markers along the trail could also serve as interpretation by linking the distance a visitor has traveled to calories burned. Interpretation could also compare the distance traveled to fuel and money saved by cycling or walking rather than driving.

recreation and education opportunities in harmony with natural resource preservation and stewardship.

In the context of the Dakota County greenways, it is important to note that fostering an understanding of the relationships between social and natural systems can lead to environmental stewardship. In other words, helping visitors understand the connections between history, culture and nature is at the core of fostering stewardship of these resources and awareness of the connections between people and nature.

RESOURCES

Historic resources in the North Creek Greenway include farmsteads and abandoned and existing railroad beds. Cultural resources include the Minnesota Zoo and the downtowns of Apple Valley, Lakeville and Farmington, which provide opportunities to shop, dine, explore and learn about the communities. Natural resources include North Creek, the Vermillion River and natural and restored habitat. Some of these cultural, historical and natural resources are on Dakota County property, but many are located on adjacent properties. Therefore, continued partnerships with adjacent property owners will be essential to developing interpretation along the greenway.

Cultural, historical and natural resources may be vulnerable and potentially compromised with increased traffic and human interaction. Resources such as unexcavated archaeological sites are culturally sensitive and susceptible to looting or vandalism if care is not taken to protect them and modern facilities. Therefore, interpretation of these resources should be sensitive to these potential impacts and work with necessary stakeholders to determine an appropriate approach to both preservation and interpretation.



KEY MESSAGES

While each greenway will have a theme based on greenway-specific resources, the entire system will be tied together with overarching themes and branding. In the absence of a systemwide interpretive plan, this master plan suggests one central message for the North Creek Greenway and supporting subthemes. If a systemwide interpretive plan is developed, the themes presented on the following pages should be revised.

RECOMMENDATIONS

Prepare a systemwide greenway interpretive plan that:

- ▶ Establishes guiding principles for systemwide interpretation
- ▶ Evaluates visitor preferences and needs related to interpretation
- ▶ Establishes systemwide goals and objectives for interpretation
- ▶ Develops systemwide interpretive themes
- ▶ Identifies interpretive themes for each greenway within the system
- ▶ Establishes consistent design standards for media throughout the system

Establish a systemwide approach to interpretation and education.

Recreation, education and interpretation are not fully discrete activities; collaboration and consistency are important across the greenway system.

Interpretive media recommendations

- ▶ Interpretive media should not impinge on the natural landscape. As much as possible, Dakota County should adopt the National Park Service's wayside exhibit approach (www.nps.gov/hfc/products/waysides/index.htm) to interpretation along the greenways. In this approach, the focus is on experiencing the landscape firsthand; interpretation is an enhancement, not the focus.
- ▶ Interpretation should be integrated into orientation signs at key locations along the greenway, such as trailheads and neighborhood gateways.
- ▶ Interpretive signs along the greenway should be considered a caption to distinct or important landscape features that a greenway user might not understand by looking at the feature on his or her own.

Establish a community advisory group.

This group would build relationships among the agencies and organizations that own adjacent property, facilitate an inclusive interpretive planning process, engage community members (especially cultural groups) and ensure that interpretation of the greenway is thematically and aesthetically cohesive. This group should participate in the development of the systemwide interpretive plan and may then meet periodically to advise Dakota County on specific interpretation questions.

In building a community advisory group, outreach to the following groups is important:

- ▶ Dakota County Historical Society
- ▶ Minnesota Historical Society
- ▶ Lakeville Area Historical Society
- ▶ Farmington Historic Preservation Commission
- ▶ Minnesota SHPO
- ▶ Office of the State Archaeologist
- ▶ School for Environmental Studies
- ▶ Minnesota Zoo
- ▶ Representatives from the cities of Apple Valley, Lakeville, Farmington and Empire Township, including members of their parks and recreation departments.




d. Stewardship plan

The linear nature of the greenway will require natural resource management strategies that are geographically targeted, cooperative and realistic. Restoration and protection efforts should be focused near trailheads, as these locations will provide the greatest opportunity for greenway users to see the results of stewardship and provide a high-quality user experience. Given the linear nature of the greenway, stewardship activities should be in cooperation with adjoining landowners, public and private. Cooperative stewardship activities likely will be easier with other public agencies, but this should not preclude the possibilities of stewardship work on adjoining private lands. All stewardship actions should be evaluated through the lens of sustainability — is the stewardship effort economically and ecologically sustainable over the long-term.

HABITAT INVESTMENT AREAS

Given the length of the greenway corridors, efforts to manage and restore the natural resources and native plant communities would be a daunting task — well beyond the ability of any one agency. In order to provide for a realistic and sustainable restoration and management of the resources, key habitat investment areas were identified for natural resource management. These habitat investment areas were prioritized and targeted to areas associated with high quality ecological resources and greenway use patterns. These areas are identified in Figure 44.

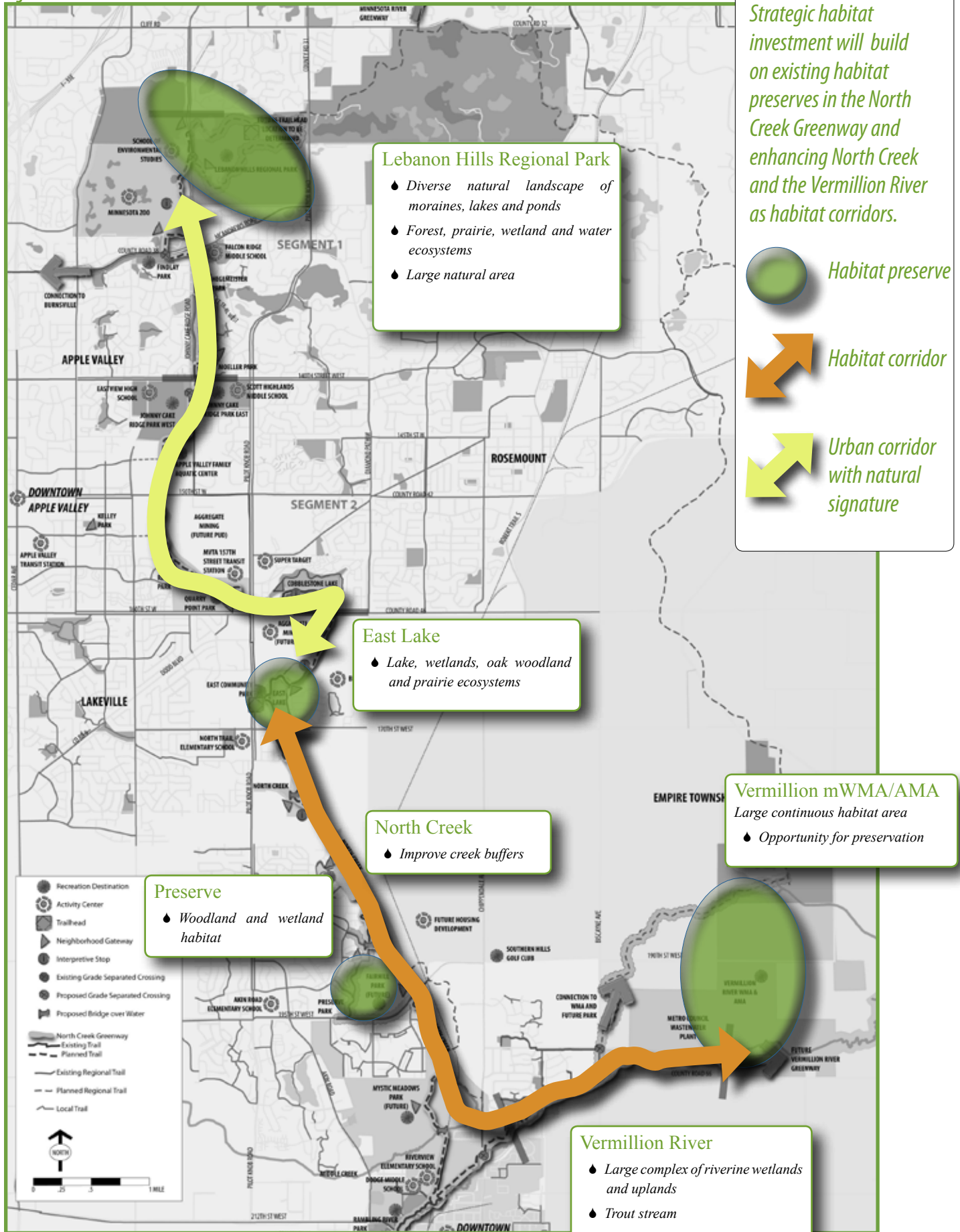
Table 43. Habitat investment strategies



HABITAT PRESERVE	HABITAT CORRIDOR	NATURAL LANDSCAPES	DESIGNED LANDSCAPES
Top priority habitat restoration/management	Second priority habitat management	Lowest landscape investment priority	High landscape investment
<ul style="list-style-type: none"> ◆ Adequate patch size/shape to sustain native plant community ◆ Contains existing remnant of native plant community ◆ Has interpretive potential ◆ Has benign surrounding uses ◆ Buffers or contains natural waters 	<ul style="list-style-type: none"> ◆ Provides connection between habitat preserves ◆ Adequate width to sustain native plant ground layer ◆ Grades allow for rainwater infiltration ◆ Buffers natural waters 	<ul style="list-style-type: none"> ◆ Primary task is to control invasive plants ◆ Managed as a natural, low-maintenance landscape 	<ul style="list-style-type: none"> ◆ Managed urban landscapes ◆ Limited habitat value ◆ Relatively small area



Figure 44. Habitat investment areas



STEWARDSHIP RECOMMENDATIONS

General considerations for stewardship activities within this investment hierarchy are organized around ecological quality, landscape position and future uses and are described in Table 52a.

Vegetation management

In native plant communities — prairie, woodlands and wetlands — invasive species removal, buffer protection or establishment and re-establishment of disturbance regimes will be the key activities. Oak savannas may need to be supplemented with tree plantings and all of the grassland systems will likely need supplemental seeding.

Site-specific actions

Lebanon Hills gateway :

Existing conditions: Parking lot set within plantation plantings with low restoration potential over the short-term.

Recommendations: Long-term management and restoration will require major effort to change plant community in the parking lot vicinity.

East Lake:

Existing conditions: This city park has restored native plant community types. The emergent wetland needs reed canary grass control — the wetland slough next to the tot lot is progressing well as are the open water marsh and lake setting with surrounding oak woodland. Some buckthorn control is under way. Restored prairies on upland mine areas and oak woodlands need prescribed burning and buckthorn control follow-up to manage regrowth. There are some problems with water quality in the lake (fall algae bloom).

Recommendations: Continue buckthorn management. Perform prescribed burns on restored prairies on upland mine areas and oak woodlands. Address fall algae blooms in the lake.



Vermillion River at Empire Fields.

Vermillion River corridor:

Existing conditions: Rambling River Park in the city of Farmington is predominantly turf grass, but the stream corridor is floodplain forest and shrub swamp — both need buckthorn management. Protection of existing streambank and floodplain plant communities is needed. The confluence of North and Middle creeks is mostly turf grass with some remnant floodplain forest. Upstream of the parking lot at Empire Fields Park are medium quality floodplains composed of forest and shrub swamp wetlands that should be buffered and managed for buckthorn invasion.



Recommendations: Manage buckthorn along stream corridor and floodplain. Widen and maintain stream buffers with native plants to improve floodplain wetlands and forest quality. Monitor areas on the north side of Vermillion River to prevent degradation of the plant communities. Interseed and manage converted farmland that contains low plant diversity.

Vermillion mWMA:

Existing conditions: Vermillion Highlands is a modified Wildlife Management Area managed jointly by the Minnesota Department of Natural Resources, University of Minnesota and Dakota County. Management and restoration of Vermillion Highlands' 2,822 acres will require coordination among these agencies.

North Creek corridor and preserve:

Existing conditions: At the medium quality wetlands and stormwater management ponds, all of the restored plant communities are weedy and either need intensive management work or a do-over on restoration. Bluegrass, thistles and other weeds are found throughout the site. Wetland, prairie and floodplain forest could be target communities for restoration. Lots of turf grass surrounds stormwater basins, second growth forest and old-field communities. Stormwater ponds have good buffer but will need better vegetation management to prevent willow and other species of trees/shrubs from overtaking the area.

Recommendations: Restore prairies on upland areas and oak woodland on the berms to the east. Manage invasive vegetation in all areas mentioned above.

SURFACE AND GROUND WATER MANAGEMENT/PROTECTION

The three trout streams require protection from thermal impacts and changes in hydrology due to stormwater runoff; this runoff can also lead to increased sedimentation and streambank instability. Wetland systems also need to be protected from inputs of untreated stormwater runoff to prevent sedimentation, eutrophication and changes to the natural water level fluctuations.

Stormwater Management Options at Trailheads

Trailhead parking lots typically are small; 10 to 20 stall lots situated within green space. This means that stormwater can be directed to drain off the paved surface onto surrounding ground where it can infiltrate. The best place to manage stormwater (regardless of where one is within the corridor) is at the point it runs off a hard surface; i.e. near every street, driveway and parking lot.

Water is a valuable resource, so it should be used to water plants rather than run off in pipes to a natural water body where it causes problems. Directing stormwater onto the ground rather than into a pipe aids the following important functions:

- ▶ Filter pollutants such as phosphorus, grease and oil through plants and soil that mitigate their effects
- ▶ Protect downstream water bodies by preventing the influx of large amounts of water. It is best to have water slowly reach a stream or lake underground via subsurface flow.



Depressed parking lot islands capture stormwater and water trees that eventually will shade the lot.





It is best to treat stormwater at its source (alongside hard surfaces).

- ▶ Protect natural water bodies by capturing pollutants at their source
- ▶ Cool stormwater before reaching trout streams
- ▶ Recharge groundwater and eventually aquifers
- ▶ Water trees and other plants at the source allowing for vigorous growth and shaded parking lots

Opportunities for stormwater management

Many practices are available to manage stormwater at trailheads. Some make more sense than others and provide greater return on investments.

Practical stormwater management practices include:

- ▶ Creating shallow depressions (raingardens) alongside parking lots and grade the parking lot to tip in that direction
- ▶ Creating planted depressed parking lot islands to capture stormwater
- ▶ For small parking lots surrounded by green space running the water onto the surrounding grass (ideally prairie)
- ▶ Around parking lots, planting trees to capture and evaporate rainwater on their leaves and create pores in the soil with their roots to allow water to soak in. Trees also shade pavement to keep it cooler in the summer
- ▶ Planting prairie plants around parking lots — they function much like trees (minus the shading). They are especially useful on clay soils, where they drive roots deep and facilitate stormwater infiltration

Stream restoration considerations

Stream restoration and stabilization should be designed by multidisciplinary teams that include expertise in engineering, hydrology, aquatic and restoration ecology, geomorphology, soil science and policy/permitting.

Each stream project design should follow these guidelines:

- ▶ Construct the channel to accommodate current and future processes
- ▶ Maintain bed load movement
- ▶ Restore pools and riffles to the stream
- ▶ Reduce stresses on the banks
- ▶ Provide for floodplain connection
- ▶ Reduce flooding
- ▶ Improve water quality

All stream restoration/stabilization should have definitive end points that consider:

- ▶ Where there is horizontal and vertical control
- ▶ Where the forces of the stream are no longer unstable
- ▶ Where one can successfully design a robust solution to end on (like a riffle)

Ensuring these guidelines are followed — especially in point or localized segment fixes — will ensure the project does not unravel from upstream or downstream.





Implementation & management

4



OVERVIEW

This master plan is a long-range vision for recreation, transportation, water quality and habitat improvements for the North Creek Greenway. Accomplishing this vision depends on multiagency collaboration. Without continued coordination among the communities it is unlikely the greenway could be realized as envisioned. Working collaboratively will enable Dakota County, cities and other agencies to leverage resources to build, operate and maintain the greenway.

While the 30-foot regional trail corridor will be the jurisdictional and operational responsibility of Dakota County, the larger greenway corridor will be governed in many ways depending the situation. Similarly, responsibilities for land acquisition, construction, stewardship, operations and maintenance will depend on the particularities of each segment.

PHASING AND PRIORITIES

The North Creek Greenway will be implemented in phases. Greenway segments have been prioritized into first priority projects, second priority projects and long-term projects (Table 50). It is anticipated that first priority projects will be built in advance of second priority projects, but the master plan remains flexible so that any project can be implemented as partnership or funding opportunities arise.

- ▶ First priority projects are those that are needed to create a continuous, functional greenway experience. It is intended that recreation, water quality, nonmotorized transportation and natural resource elements be integrated into the greenway at the time of initial construction.
- ▶ Second priority projects will enhance the greenway experience. These are things such as grade separated crossings and trailhead development.
- ▶ Long term projects are in areas where the greenway will be built along with future development or redevelopment and continuous lighting.

In cases where gaps in the regional trail exist and alternative trail connections can be made on existing trails, interim routes will be designated until the preferred alignment can be assembled.

This chapter outlines approaches for greenway implementation, including:

- ▶ Phasing and priorities
- ▶ Land protection and stewardship
- ▶ Operations
- ▶ Funding
- ▶ Capital and operational budgets

LAND PROTECTION AND STEWARDSHIP

Dakota County’s greenway concept incorporates recreation, transportation, ecological and water quality components in a 100- to 300-foot corridor secured through two approaches:

Land protection — protecting land essential to make the greenway usable. For the North Creek Greenway, this means securing land needed for the trail corridor and trailheads.

Land stewardship — the care of native landscapes and habitat within the greenway.

Land protection

It is essential that Dakota County secure lands for the minimum 30-foot trail alignment and trailheads. Parcels within the North Creek corridor where protection is needed are shown on Figure 53. Three categories of land are shown: land owned by Dakota County, land owned by other public entities and privately held land. For land owned by other public agencies, Dakota County will need to permanently protect the trail corridor and trailheads for regional trail use with easement or joint powers agreements. For land that is privately owned, the County will need to acquire the trail corridor for public use. Table 50a summarizes the approximate number of acres of land needed for protection. Land protection strategies include: park dedication, direct purchase with resale of land not required for the trail, permanent easements, land donation, bargain sale, life estate and negotiations with cities and developers. Table 52a highlights several techniques for protecting land in different ownership scenarios.

Table 50. North Creek Greenway priority projects

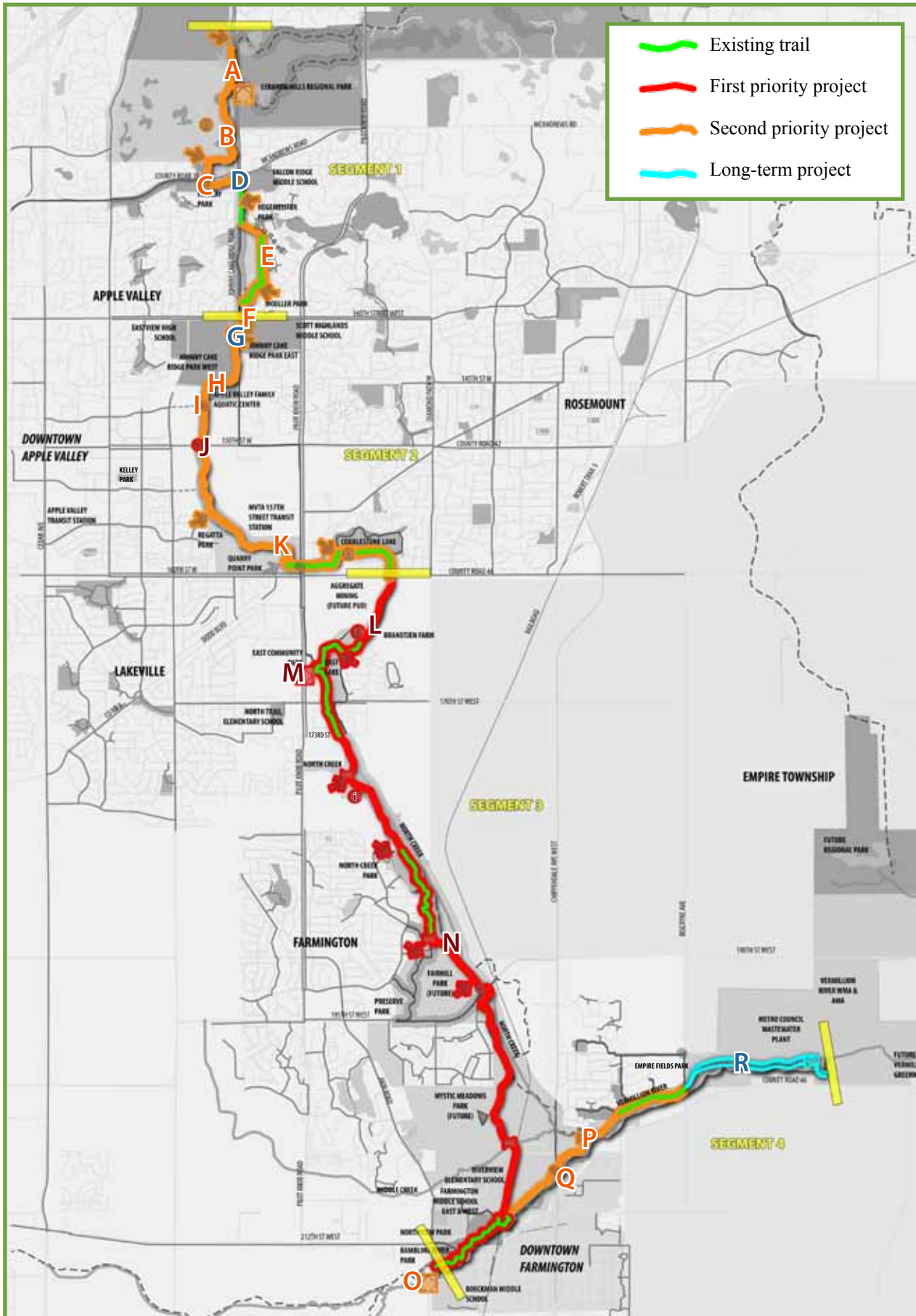
PROJECT	PRIORITY	POTENTIAL TRIGGERS/ PARTNERS
<i>Segment 1: Apple Valley North, Lebanon Hills Regional Park to 140th Street</i>		
A Lebanon Hills Gateway and Trailhead	2nd	
B Minnesota Zoo Trail and Gateway	2nd	
C Grade separated crossing of McAndrews Road	2nd	
D Grade separated crossing of Johnny Cake	long-term	
E Greenway from McAndrews Road to 140th St W	2nd	
<i>Segment 2: Apple Valley South, 140th Street to Lakeville</i>		
F Grade separated crossing of 140th St W	2nd	
G Grade separated crossing of Johnny Cake Ridge Road	long-term	
H Greenway from 140th St to 150th St/CR 42	2nd	
I Grade separated crossing of 147th St	2nd	
J Grade separated crossing of CR 42	1st	
K Greenway from 150th St/CR 42 to CR 46	2nd	to be completed with redevelopment
<i>Segment 3: Lakeville and Farmington</i>		
L Trail Segment from CR 46 to East Lake	1st	
M East Lake Trailhead	1st	
N Trail 170th St to Rambling River Park	1st	
O Rambling River Trailhead	2nd	
<i>Segment 4: Along Vermillion River to Empire Township</i>		
P Greenway along Vermillion River to Biscayne Ave	2nd	
Q Grade separated crossing at Chippendale Ave/TH3	2nd	
R Greenway from Biscayne Ave to Vermillion River WMA	long-term	

Table 50a. Current land ownership of 30-foot wide regional trail easement

SEGMENT	DAKOTA CO.	PUBLIC	PRIVATE	TOTAL
1	1.4 acres	5.7 acres	3.5 acres	10.6 acres
2	0.3 acres	4.8 acres	8.8 acres	13.9 acres
3	1.3 acres	11.8 acres	17.6 acres	30.7 acres
4	-	4.4 acres	-	4.4 acres
TOTAL	3.0 acres	26.7 acres	29.9 acres	59.6 acres



Figure 51. North Creek Greenway priority projects



Land stewardship

The natural resource objective for the greenway system is to maintain or create a healthy context within which nature can thrive. The first stewardship priority is restoring continuous habitat within the greenway corridors. The second is habitat restoration and protection of the most sensitive lands, including uplands that link greenways to the broader landscapes. Generally, Dakota County will not be the lead agency in stewardship activities outside the 30-foot trail corridor and trailheads, but will work as steward partners with local jurisdictions, agencies and private landowners with funding and expertise.

MANAGEMENT AND OPERATIONS

Like other aspects of the greenway, management and operations will be a collaboration between the County, cities and other partners. Responsibilities will vary by greenway segment. While this master plan defines general responsibilities for each greenway segment, formal joint powers agreements between Dakota County and collaborating agencies will need to be needed to outline specific agency responsibilities. These agreements will outline who has control of the trail right-of-way as well as who will operate and maintain the trail and how they will do it. Table 56 provides a framework for anticipated agency roles in ownership, design and engineering, construction, restoration, operations and maintenance.

Management

The Dakota County Parks and Open Space Department is charged with operation of the County's parks system and will be the lead agency for coordinating

Table 52. Land protection costs

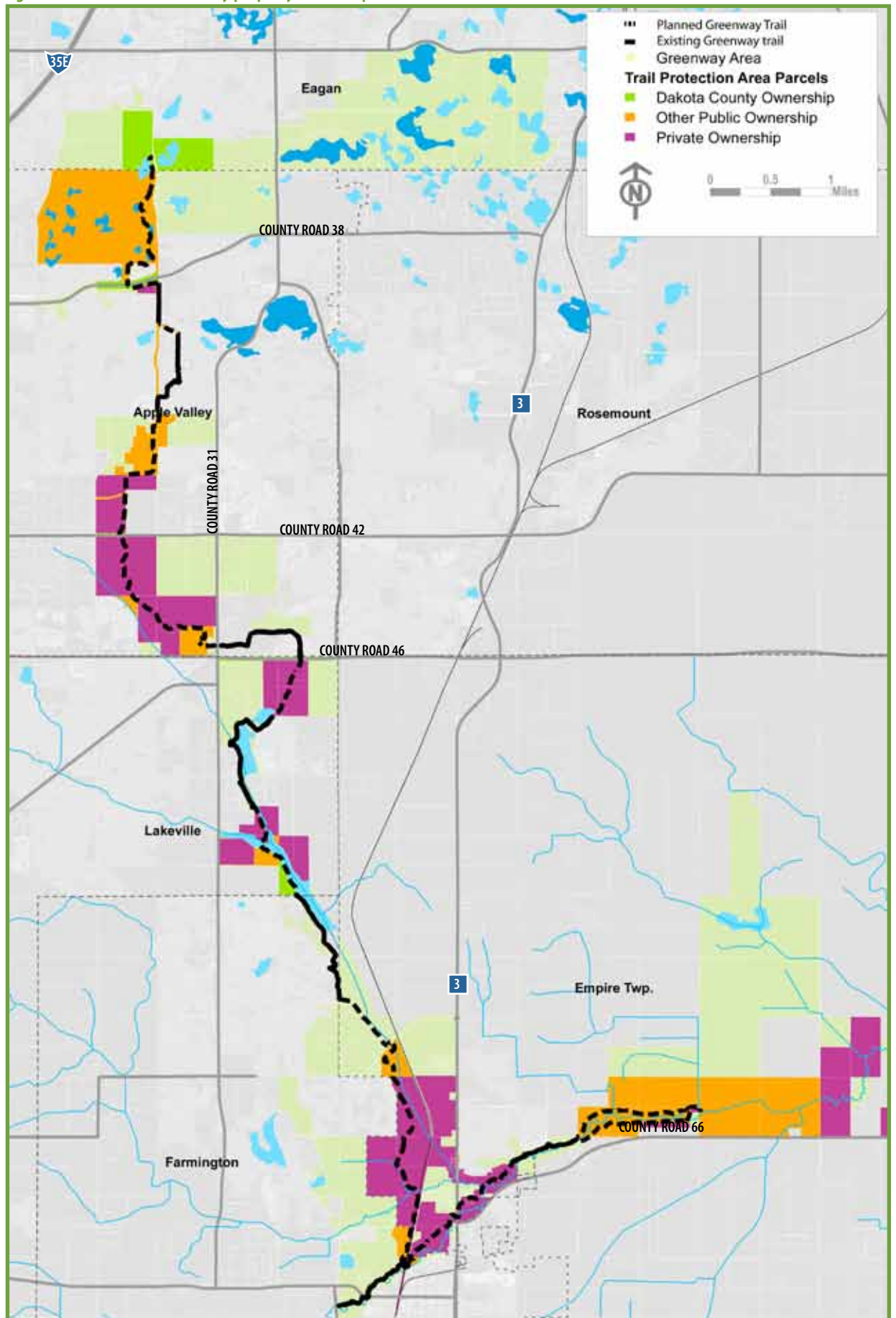
SEGMENT	PRIVATELY OWNED LAND (LINEAR FEET)	COST
1	5,140	\$ 462,600
2	12,850	\$ 1,156,500
3	25,600	\$ 2,304,000
4	-	-

Table 52a. Land protection and stewardship tools

TOOL	DAKOTA COUNTY RIGHT OF WAY		OTHER PUBLIC LAND		CURRENT PRIVATE LANDS	
	30-foot regional trail easement or trailhead	100- to 300-foot greenway	30-foot regional trail easement or trailhead	100- to 300-foot greenway and neighborhood gateways	30-foot regional trail easement or trailhead	100- to 300-foot greenway
County easement			✓	✓	✓	✓
County fee title			✓		✓	
Other public agency acquisition						✓
Use agreement	✓	✓	✓	✓		
Stewardship partnerships				✓		✓



Figure 53. North Creek Greenway property ownership



greenway and management operations. The Dakota County Board of Commissioners establishes policies and goals for the park system and through an annual budget provides capital and operating funds for the department. The Park and Recreation Advisory Committee, appointed by the Board of Commissioners, advises the County on park and recreation trail issues.

General operations

Dakota County Parks and Open Space Department will be responsible for the operation of the 30-foot regional trail corridor. Where there are opportunities for operational partnerships, Dakota County will enter a joint powers agreement with partner agencies (potential partner agencies are identified in Table 56). The Parks and Open Space Department employs a staff of permanent employees and seasonal employees adequate to maintain the system. Volunteers assist with outdoor education programs, patrol, park clean-ups and special events. Contractual agreements also are in place with outside agencies for some maintenance and natural resource work.

Dakota County recognizes that as facilities expand, it will need to increase staffing. Based on operations and maintenance staffing for current Dakota County regional trails, it is anticipated that when the regional trail within the North Creek Greenway is complete, an additional 0.5 full time employee park keeper (1,000 hours of labor) and 0.5 to 1 seasonal FTE (1,000 to 2,000 hours) will be needed.

Operating hours

The regional trail through North Creek Greenway will be open 24 hours for transportation purposes. Operating hours for the wider greenway, including trailheads and neighborhood gateways, likely will be sunrise to sunset. Hours may vary and change seasonally based on the type of use and presence of lighting. Dakota County will work with local jurisdictions to reconcile differences between greenway hours and hours of local parks the greenway travels through.

Maintenance

Maintenance of facilities and lands is essential to protect public investment, enhance natural resource quality and achieve the County's goals of providing recreational users clean, safe, enjoyable year-round experiences. The Dakota County Parks and Open Space Department has a clearly defined maintenance program and reporting hierarchy led by the manager of park development and maintenance, who reports to the parks director.

Regular maintenance activities for the greenway will include:

- ▶ Sign maintenance
- ▶ Trash collection
- ▶ Sweeping and blowing
- ▶ Trail repair
- ▶ Bridge repair
- ▶ Trailhead facility repair and maintenance
- ▶ Mowing
- ▶ Tree trimming
- ▶ Winter trail clearing

Pavement management

Pavement deteriorates as it ages. Regular pavement maintenance can prolong the lifespan of the greenway trail in a cost effective manner. Table 55 outlines recommended activities.



Ordinances

Public use and enjoyment of the County park system is controlled by Ordinance 107, Park Ordinance, which was last revised June 3, 1997. The ordinance incorporates pertinent Minnesota statutes and addresses the following issues:

- ▶ Regulation of public use
- ▶ Regulation of general conduct
- ▶ Regulations pertaining to general parkland operation
- ▶ Protection of property, structures and natural resources
- ▶ Regulation of recreational activity
- ▶ Regulation of motorized vehicles, traffic and parking

Enforcement and security

Visitors are informed of park and trail rules and regulations through strategically located kiosks and signs that address specific information about hours, trails, permitted and prohibited activities, fees and directions. Dakota County Parks, Lakes and Trails officers will patrol the park in motor vehicles, on bicycles and on foot. Officers will also educate visitors and enforce ordinances. Local law enforcement and public safety agencies will be responsible for emergency and criminal complaints within the greenway.

Public awareness

Dakota County's Parks and Open Space Department will continue working with the County's Dakota County Communications Department to promote awareness and use of the County's parks and greenway system. Many tools are available to promote awareness of Dakota County parks and greenways including, but not limited to, websites, direct mail, press releases, brochures, on-site promotion, monument signage along roads, wayfinding within greenways and parks and paid advertising.

Dakota County also collaborates with cities, businesses, the Metropolitan Regional Parks System and others to promote its facilities, programs and services and educate the public about its resources.

Conflicts

The surrounding land uses and the greenway are generally compatible and no conflicts outside of norm affect the viability of master plan recommendations. Minor conflicts will occasionally arise from private encroachment or neighboring residents' sensitivity to greenway, recreation or maintenance uses. Dakota County will work with individual landowners to resolve these issues case by case.

Table 55. Pavement management activities

YEAR	MAINTENANCE ACTIVITY
0	Original construction of the paved trail
3	Sealcoating
7	Routine maintenance — crack filling, patching, minor curb repairs
11	Routine maintenance — crack filling, patching, minor curb repairs
13	Sealcoating
16	Routine maintenance — crack filling, patching, minor curb repairs
20	Total reconstruction



Public Services

No significant new public services will be needed to accommodate the greenway. Proposed trailheads and neighborhood gateways are served by the existing road network. If utilities are not accessible at gateways and trailheads, options such as solar-powered lighting, self-composting toilets or wells will be considered. Stormwater will be treated on site. Accommodations for later installation of continuous trail lighting will be considered at initial trail construction.

FUNDING

Funding for initial capital cost and ongoing operations and maintenance costs is essential for a successful greenway. Funding will be a collaboration among the County, cities, U.S. Fish and Wildlife Service and the MnDNR, with an emphasis on seeking outside funding such as through federal transportation enhancements grants. Cost-share roles will be determined by the strengths of each agency and circumstances of each project. In-kind contributions of land, easement, design, engineering, construction and maintenance and operations are encouraged and will be outlined in joint powers agreements among agencies.

It is anticipated that most future capital projects will be well positioned to secure regional, state and federal funds for recreation, transportation, water and habitat and that these sources will account for a majority of capital construction costs. In many cases, but not all, Dakota County, as the regional agency, will be in the best position to pursue outside funding. Examples of outside funding sources include:

- ▶ National Park Service Rivers, Trails and Conservation Assistance Program
- ▶ Minnesota Department of Transportation
- ▶ Minnesota Department of Natural Resources
- ▶ Minnesota Pollution Control Agency
- ▶ The Environment and Natural Resources Trust Fund
- ▶ Clean Water, Land and Legacy Amendment funds
- ▶ Watershed management organizations
- ▶ Foundations and nonprofits
- ▶ Statewide Health Improvement Program or similar

Table 56. Greenway implementation agency roles

COMPONENT	LAND PROTECTION	DESIGN/ ENGINEERING	CONSTRUCTION/ RESTORATION	OPERATIONS/ MAINTENANCE
Segment 1: Apple Valley North, Lebanon Hills Regional Park to 140th Street				
Regional trail and trailheads (30-foot corridor within larger greenway)				
Lebanon Hills Regional Park trailhead	Dakota County	Dakota County	Dakota County	Dakota County
Minnesota Zoo greenway	Use agreement with Minnesota Zoo	Partnership: Dakota County, Minnesota Zoo	Partnership: Dakota County, Minnesota Zoo	Partnership: Dakota County, Minnesota Zoo
Regional trail from McAndrews Road to 140th Street	Use agreement with city of Apple Valley	Partnership: Dakota County, Apple Valley, future developers	Partnership: Dakota County, Apple Valley, future developers	Partnership: Dakota County, Apple Valley
Greenway corridor (100 feet to 300 feet)				
Greenway corridor	Minnesota Zoo, private landowners, school district, city of Apple Valley	Landowner	Landowner	Landowner



COMPONENT	LAND PROTECTION	DESIGN/ ENGINEERING	CONSTRUCTION/ RESTORATION	OPERATIONS/ MAINTENANCE
Segment 2: Apple Valley South, 140th Street to Lakeville				
Regional trail and trailheads (30-foot corridor within larger greenway)				
Regional trail from 140th Street to Lakeville	Use agreement with city of Apple Valley	Partnership: Dakota County, Apple Valley, future developers	Partnership: Dakota County, Apple Valley, future developers	Partnership: Dakota County, Apple Valley
Greenway corridor (100 feet to 300 feet)				
Greenway corridor	Private landowners, school district, city of Apple Valley	Landowners	Landowners	Landowners
Segment 3: Lakeville and Farmington				
Regional trail and trailheads (30-foot corridor within larger greenway)				
Regional trail corridor through Lakeville	Use agreement with city of Lakeville	Partnership: Dakota County, city of Lakeville, future developers	Partnership: Dakota County, city of Lakeville, future developers	Partnership: Dakota County, city of Lakeville
East Lake trailhead	Use agreement with city of Lakeville	Partnership: Dakota County, city of Lakeville	Partnership: Dakota County, city of Lakeville	Partnership: Dakota County, city of Lakeville
Trail corridor through Farmington	Use agreement with city of Farmington	Partnership: Dakota County, city of Farmington	Partnership: Dakota County, city of Farmington	Partnership: Dakota County, city of Farmington
Rambling River trailhead	Use agreement with city of Farmington	Partnership: Dakota County, city of Farmington	Partnership: Dakota County, city of Farmington	Partnership: Dakota County, city of Farmington
Greenway corridor (100 feet to 300 feet)				
Greenway corridor	City of Lakeville, city of Farmington, private landowners	City of Lakeville, city of Farmington, private landowners	City of Lakeville, city of Farmington, private landowners	City of Lakeville, city of Farmington, private landowners
Segment 4: Farmington and Empire Township				
Regional trail and trailheads (30-foot corridor within larger greenway)				
Trail corridor Vermillion River Empire Township boundary	Use agreement with city of Farmington	Partnership: Dakota County/city of Farmington	Partnership: Dakota County, city of Farmington	Partnership: Dakota County, city of Farmington
Trail corridor Farmington boundary to Biscayne	Use agreement with Empire Township	Partnership: Dakota County/Empire Township	Partnership: Dakota County, Empire Township	Partnership: Dakota County, Empire Township
Trail corridor from Biscayne to Vermillion Highlands mWMA/AMA	Use agreement with Metropolitan Council Wastewater Plant	Dakota County/Empire Township	Dakota County/ Empire Township	Dakota County/Empire Township
Greenway corridor (100 feet to 300 feet)				
Greenway corridor	Private landowners, city of Farmington, Empire Township, Metropolitan Council wastewater treatment plant	Private landowners, city of Farmington, Empire Township, Metropolitan Council wastewater treatment plant	Private landowners, city of Farmington, Empire Township, Metropolitan Council wastewater treatment plant	Private landowners, city of Farmington, Empire Township, Metropolitan Council wastewater treatment plant



Funding for operating and maintaining the 30-foot regional trail easement and trailheads primarily will be Dakota County's responsibility. Annual operating costs are funded through the County's general fund and from regional park allocations from the Metropolitan Council. In situations where there are efficiencies in local jurisdictions performing maintenance and operations, Dakota County will enter a joint powers agreement outlining responsibilities and cost sharing.

CAPITAL AND OPERATIONAL BUDGETS

Estimated costs in 2011 dollars for land protection, development costs and annual operations and maintenance are included in Tables 59, 63 and 63a.

Table 52 estimates land protection costs. Because land protection strategies might include direct purchase with resale of land not required for the trail, permanent easements, land donation, bargain sale, life estate and negotiations with cities and developers, is very difficult to accurately project total acquisition costs. Estimated costs assume land protection of a 30-foot trail corridor on land that is currently privately owned with an average cost of \$90 per lineal foot.

Table 59 includes budgets for capital investments, the priority of the investment and project partners. The table identifies the full anticipated construction costs of the plan elements. It is not anticipated that Dakota County will be responsible for the full cost of improvements outlined; funding will be a collaboration between the County and partner agencies. Most capital projects also will be well positioned to secure regional, state and federal funds for recreation, transportation, water and habitat.

While the table identifies priorities for capital projects, development will occur as funding becomes available and at the discretion of the Dakota County Board.

Table 63 identifies annual maintenance and operations costs for the 30-foot trail corridor including gateways, trailheads and grade separated crossings for each greenway segment. It includes yearly amortization of costs for major capital maintenance or full facility replacement approximately every 20 years.

Table 63a identifies natural resource projects and costs in the greenway. It is assumed that all projects will be led by partner organizations and the scope and partner roles will vary.



Table 59. North Creek Greenway capital development estimates

ITEM	DESCRIPTION	QTY	UNIT	UNIT COST	1ST PRIORITY	TOTAL		LONG-TERM	POTENTIAL PARTNER OPPORTUNITIES
						2ND PRIORITY			
SEGMENT 1: Apple Valley North, Lebanon Hills Regional Park to 140th Street									
A	Lebanon Hills Gateway and Trailhead								location and cost to be determined with Lebanon Hills Master Plan
	Lebanon Hills Trailhead						\$ 500,000		
	Lebanon Hills Gateway							by others	
	Gateway along Johnny Cake Ridge Road								
	assumes 2 benches, 1 bikerack, 1 trailhead/gateway sign with interpretation, 2 waste receptacles, 1 water fountain and 1 pedestrian light					Lump sum	\$ 35,000		
	A Subtotal						\$ -	\$ 535,000	\$ -
B	Minnesota Zoo Greenway								Minnesota Zoo and School of Environmental Studies
	(Lebanon Hills to McAndrews/Johnny Cake Ridge Rd)								
	NEW TRAIL: Minnesota Zoo Segment (includes minor fencing, retaining, and basic water management)	8,500	Feet	\$ 60			\$ 510,000		
	Signage/Wayfinding (assumes 4 wayfinding - interpretive per mile)	8,500	Ln Ft	\$ 2			\$ 17,000		
	Landscaping/Habitat Management (assumes 200 trees per mile and 12.5 acres prairie per mile)	2,000	Ln Ft	\$ 10			\$ 20,000		
	Site Furnishings (assumes one bumpout with benches and interpretation per mile)	8,500	Ln Ft	\$ 4			\$ 34,000		
	Underpass of Johnny Cake Ridge Road	1	tunnel				\$ 350,000		
	Gateway at Minnesota Zoo								
	assumes 2 benches, 1 bike rack, 1 trailhead/gateway sign with interpretation, 2 waste receptacles, 1 pedestrian light and 1 water fountain					Lump Sum	\$ 35,000		
	B Subtotal						\$ -	\$ 966,000	\$ -
C	Overpass at McAndrews Road, entrance to MN Zoo								City of Apple Valley and Minnesota Zoo
	C Subtotal					Lump Sum	\$ -	\$ 2,100,000	\$ -
D	Overpass of Johnny Cake Ridge Road south of McAndrews								City of Apple Valley & MNDOT
	D Subtotal					Lump Sum	\$ -	\$ 1,000,000	
E	Greenway from McAndrews Road to 140th St W								City of Apple Valley
	NEW TRAIL: Segment along Ellice Trail West (includes minor fencing, retaining, and basic water management)	970	Feet	\$ 60			\$ 58,200		
	Signage/Wayfinding (assumes 4 wayfinding - interpretive per mile)	6,850	Ln Ft	\$ 2			\$ 13,700		
	Landscaping/Habitat Management (assumes 200 trees per mile and 12.5 acres prairie per mile)	6,850	Ln Ft	\$ 10			\$ 68,500		
	Site Furnishings (assumes one bumpout with benches and interpretation per mile)	6,850	Ln Ft	\$ 4			\$ 27,400		
	Gateway (Hegemeister Park & Moeller Park)								
	(assumes 2 benches, 1 bike rack, 1 trailhead/gateway sign with interpretation, 2 waste receptacles, 1 pedestrian light and 1 water fountain)	2	Each	\$ 35,000			\$ 70,000		
	E Subtotal						\$ -	\$ 237,800	\$ -
	PRIORITY SUBTOTAL						\$ -	\$ 3,838,800	\$ 1,000,000
	SEGMENT 1 TOTAL						\$	4,838,800	



ITEM	DESCRIPTION	QTY	UNIT	UNIT COST	1ST PRIORITY	TOTAL		LONG-TERM	POTENTIAL PARTNER OPPORTUNITIES
						2ND PRIORITY			
SEGMENT 2: Apple Valley South, 140th Street to Lakeville									
F	Overpass at 140th St W								City of Apple Valley
	<i>F Subtotal</i>				\$ -			\$ 1,000,000	
G	Overpass at Johnny Cake Ridge Road south of 140th St W								City of Apple Valley
	<i>G Subtotal</i>				\$ -			\$ 350,000	
H	Greenway from 140th St to 150th St/CR 42								Fischer Sand and Aggregate Co. & City of Apple Valley
	NEW TRAIL: Segment from 140th St to 150th St (includes minor fencing, retaining, and basic water management)	6,600	Ln Ft	\$ 60				\$ 396,000	
	Signage/Wayfinding (assumes 4 wayfinding - interpretive per mile)	6,600	Ln Ft	\$ 2				\$ 13,200	
	Landscaping/Habitat Management (assumes 200 trees per mile and 12.5 acres prairie per mile)	6,600	Ln Ft	\$ 10				\$ 66,000	
	Site Furnishings (assumes one bumpout with benches and interpretation per mile)	6,600	Ln Ft	\$ 4				\$ 26,400	
	Lighting (\$5K pole every 75 Ft)	6,600	Ln Ft	\$ 65				\$ 429,000	
	Gateway at Johnny Cake Ridge Park (assumes 2 benches, 1 bike rack, 1 trailhead/gateway sign with interpretation, 2 waste receptacles, 1 pedestrian light and 1 water fountain)							\$ 35,000	
	Stormwater Amenities								by others
	<i>H Subtotal</i>							\$ 965,600	in coordination with redevelopment
I	Underpass at 153rd St.								City of Apple Valley
	<i>I Subtotal</i>				\$ -	\$ 150,000	\$ -		
J	Underpass of CR 42								City of Apple Valley
	<i>J Subtotal</i>				\$ 700,000	\$ -	\$ -		
K	Greenway from 150th St/CR 42 to CR 46								Fischer Sand and Aggregate Co. & City of Apple Valley
	NEW TRAIL from CR 42 to Transit Station (includes minor fencing, retaining, and basic water management)	8,500	Feet	\$ 60				\$ 510,000	
	Signage/Wayfinding (assumes 4 wayfinding - interpretive per mile)	13,690	Ln Ft	\$ 2				\$ 27,380	
	Landscaping/Habitat Management (assumes 200 trees per mile and 12.5 acres prairie per mile)	13,690	Ln Ft	\$ 10				\$ 136,900	
	Site Furnishings (assumes one bumpout with benches and interpretation per mile)	13,690	Ln Ft	\$ 4				\$ 54,760	
	Gateway (Regatta Park & Cobblestone Lake)								
	Gateway at Regatta Park (assumes 2 benches, 1 bike rack, 1 trailhead/gateway sign with interpretation, 2 waste receptacles, 1 pedestrian light and 1 water fountain)	2	Each	\$ 35,000				\$ 70,000	
	Stormwater Amenities								by others
	<i>K Subtotal</i>				\$ -	\$ 799,040	\$ -		in coordination with redevelopment
	<i>PRIORITY SUBTOTAL</i>				\$ 700,000	\$ 1,914,640	\$ 1,350,000		
	SEGMENT 2 TOTAL				\$	3,964,640			



ITEM	DESCRIPTION	QTY	UNIT	UNIT COS	TOTAL			POTENTIAL PARTNER OF
					1ST PRIORITY	2ND PRIORITY	LONG-TERM	
SEGMENT 3: Lakeville and Farmington								
L	Greenway from 160th St/CR 46 to East Lake/170th St							Cobblestone Lake LLC
	NEW TRAIL: Segment from CR 46 to East Lake (includes minor fencing, retaining, and basic water management)	2,770	Ln Ft	\$ 60	\$ 166,200			
	Signage/Wayfinding (assumes 4 wayfinding - interpretive per mile)	7,500	Ln Ft	\$ 2	\$ 15,000			
	Landscaping/Habitat Management (assumes 200 trees per mile and 12.5 acres prairie per mile)	7,500	Ln Ft	\$ 10	\$ 75,000			
	Site Furnishings (assumes one bumpout with benches and interpretation per mile)	7,500	Ln Ft	\$ 4	\$ 30,000			
	<i>L Subtotal</i>				\$ 286,200	\$ -	\$ -	
M	East Lake Trailhead							City of Lakeville
	assumes benches, bike rack, 25-stall parking, picnic tables, picnic shelter and restrooms, signage, waste receptacles, water fountain and landscaping			Lump sum	\$ 300,000			
	<i>M Subtotal</i>				\$ 300,000	\$ -	\$ -	
N	Greenway from East Lake/170th St to Rambling River Park							Smith Family Partnership, Brandt Farms Ltd Partnership, City of Lakeville, City of Apple Valley, Mid McMahon, Helen Fischer, City of Farmington, etal.
	NEW TRAIL: 170th St to Rambling River Park (includes minor fencing, retaining, and basic water management)							
	173rd St to North Creek Park	6,715	Ln Ft	\$ 60	\$ 402,900			
	bridge over North Creek (assumes 10 ft wide)	1	Each	\$ 50,000	\$ 50,000			
	Fairhill Park to Farmington	13,770	Ln Ft	\$ 60	\$ 826,200			
	bridge over North Creek (assumes 10 ft wide)	1	Each	\$ 50,000	\$ 50,000			
	Signage/Wayfinding (assumes 4 wayfinding - interpretive per mile)	29,740	Ln Ft	\$ 2	\$ 59,480			
	Landscaping/Habitat Management (assumes 200 trees per mile and 12.5 acres prairie per mile)	29,740	Ln Ft	\$ 10	\$ 297,400			
	Site Furnishings (assumes one bumpout with benches and interpretation per mile)	29,740	Ln Ft	\$ 4	\$ 118,960			
	Gateways (North Creek, south of 173rd St: North Creek Park, Fairhill Park North, Fairhill Park South)							
	assumes 2 benches, 1 bike rack, 1 trailhead/gateway sign with interpretation, 2 waste receptacles, 1 pedestrian light and 1 water fountain	4	Each	\$ 35,000	\$ 140,000			
	<i>N Subtotal</i>				\$ 1,944,940	\$ -	\$ -	
O	Rambling River Trailhead							City of Farmington, MNDOT
	assumes 2 benches, 2 bike racks, 8 picnic tables, 1 small picnic shelter with concrete slab, 1 trailhead/gateway, 1 vehicle oriented landmark sign, 1 water fountain)			Lump sum		\$ 200,000		
	<i>O Subtotal</i>					\$ -		
	<i>PRIORITY SUBTOTAL</i>				\$ 2,531,140	\$ 200,000	\$ -	
	SEGMENT 3 TOTAL				\$	2,731,140		



ITEM	DESCRIPTION	QTY	UNIT	UNIT COST	1ST PRIORITY	TOTAL		LONG-TERM	POTENTIAL PARTNER OPPORTUNITIES
						2ND PRIORITY			
SEGMENT 4: Farmington and Empire Township									
P	Greenway along Vermillion River to Biscayne Ave								
	Downtown Farmington Gateway								City of Farmington, Empire Township
	assumes 2 benches, 1 bike rack, 1 trailhead/gateway sign with interpretation, 2 waste receptacles, 1 pedestrian light and 1 water fountain		Lump Sum				\$ 35,000		
	NEW TRAIL (includes minor fencing, retaining, and basic water management)	7,000	Ln Ft	\$ 60			\$ 420,000		
	Signage/Wayfinding (assumes 4 wayfinding - interpretive per mile)	10,050	Ln Ft	\$ 2			\$ 20,100		
	Landscaping/Habitat Management (assumes 200 trees per mile and 12.5 acres prairie per mile)	10,050	Ln Ft	\$ 10			\$ 100,500		
	Site Furnishings (assumes one bumpout with benches and interpretation per mile)	10,050	Ln Ft	\$ 4			\$ 40,200		
	Empire Fields Gateway								
	assumes 2 benches, 1 bike rack, 1 trailhead/gateway sign with interpretation, 2 waste receptacles, 1 pedestrian light and 1 water fountain		Lump Sum				\$ 35,000		
	P Subtotal				\$ -	\$ 650,800	\$ -		
Q	Underpass at TH 3 south of Middle Creek								MNDOT, Empire Township, and private property owners
	Q Subtotal				\$ -	\$ 375,000	\$ -		
R	Greenway from Biscayne Ave to Vermillion River WMA								Metropolitan Council Environmental Services, Empire Township, MNDNR
	NEW TRAIL (includes minor fencing, retaining, and basic water management)	6,160	Ln Ft	\$ 60			\$ 369,600		
	Signage/Wayfinding (assumes 4 wayfinding - interpretive per mile)	6,160	Ln Ft	\$ 2			\$ 12,320		
	Landscaping/Habitat Management (assumes 200 trees per mile and 12.5 acres prairie per mile)	6,160	Ln Ft	\$ 10			\$ 61,600		
	Site Furnishings (assumes one bumpout with benches and interpretation per mile)	6,160	Ln Ft	\$ 4			\$ 24,640		
	R Subtotal				\$ -	\$ -	\$ 468,160		
	PRIORITY SUBTOTAL				\$ -	\$ 1,025,800	\$ 468,160		
	SEGMENT 4 TOTAL				\$ 1,493,960				
	GREENWAY CONSTRUCTION TOTAL				\$		13,028,540		
	Contingency @ 10%				\$		1,302,854		
	Design/Engineering at 18%				\$		2,345,137		
	GREENWAY TOTAL				\$		16,676,531		



Table 63. Greenway operations and maintenance costs

ITEM DESCRIPTION	QTY	UNIT	Annual Operations and Maintenance		Annual Amortized Cost for Capital Maintenance/Facility		TOTAL
			UNIT COS	SUBTOTAL	UNIT COS	SUBTOTAL	
SEGMENT 1: Apple Valley North, Lebanon Hills Regional Park to 140th Street							
Lebanon Hills Trailhead	1	LS	\$ 15,000	\$ 15,000	\$ 25,000	\$ 25,000	\$ 40,000
Trail Corridor and Gateways	3	Miles	\$ 10,000	\$ 30,000	\$ 15,000	\$ 45,000	\$ 75,000
Grade Separated Crossings - Overpass	2	EA	\$ 5,000	\$ 10,000	\$ 100,000	\$ 200,000	\$ 210,000
<i>1 Subtotal</i>				\$ 55,000		\$ 270,000	\$ 325,000
SEGMENT 2: Apple Valley South, 140th Street to Lakeville							
Trail Corridor and Gateways	4	Miles	\$ 10,000	\$ 40,000	\$ 15,000	\$ 60,000	\$ 100,000
Grade Separated Crossings - Overpass	1	EA	\$ 5,000	\$ 5,000	\$ 100,000	\$ 100,000	\$ 100,000
Grade Separated Crossings - Underpass	8	EA	\$ 5,000	\$ 40,000	\$ 100,000	\$ 20,000	\$ 100,000
<i>2 Subtotal</i>				\$ 85,000		\$ 180,000	\$ 300,000
SEGMENT 3: Lakeville and Farmington							
East Lake & Rambling River Trailheads	2	LS	\$ 15,000	\$ 30,000	\$ 25,000	\$ 50,000	\$ 80,000
Trail Corridor and Gateways	7	Miles	\$ 10,000	\$ 70,000	\$ 15,000	\$ 105,000	\$ 175,000
<i>3 Subtotal</i>				\$ 100,000		\$ 155,000	\$ 255,000
SEGMENT 4: Farmington and Empire Township							
Trail Corridor and Gateways	3	Miles	\$ 10,000	\$ 30,000	\$ 15,000	\$ 45,000	\$ 75,000
Grade Separated Crossings - Underpass	1	EA	\$ 5,000	\$ 5,000	\$ 100,000	\$ 20,000	\$ 100,000
<i>4 Subtotal</i>				\$ 35,000		\$ 65,000	\$ 175,000
GREENWAY TOTAL				\$ 275,000		\$ 670,000	\$ 1,055,000

Table 63a. Natural resource projects

ITEM DESCRIPTION	QTY	UNIT	CAPITAL PROJECTS		YEARLY MAINTENANCE		PARTNER OPPORTUNITIES
			UNIT COST	TOTAL	UNIT COST	BUDGET	
SEGMENT 1: Apple Valley North, Lebanon Hills Regional Park to 140th Street							
Lebanon Hills Regional Park Habitat & Water Quality Management							
Natural Resource Management	Natural resource projects and strategies to be determined per the Lebanon Hills Regional Park Master Plan						
SEGMENT 2: Apple Valley South, 140th Street to Lakeville							
Habitat Water Quality Creation in Development / Redevelopment Areas							
Integrate habitat restoration and innovative urban stormwater treatment into the greenway from the Apple Valley Aquatic Center to Quarry Point Park. Consider options for daylighting North Creek north of Regatta Park, continuing east and south to Cobblestone Lake and East Lake.	Specific projects and costs to be determined along with design for development and redevelopment						Private Developers, City of Apple Valley, Vermillion River Watershed JPO
SEGMENT 3: Lakeville and Farmington & SEGMENT 4: Farmington and Empire Township							
East Lake Trailhead							
Continued buckthorn management with STS crews	24	Acre	\$ 2,000	\$ 48,000	\$ 350	\$ 8,400	City of Lakeville, Vermillion River Watershed JPO
Prescribed burns on upland restored prairies	14	Acre	\$ 150	\$ 2,025	\$ 300	\$ 4,050	
Investigate fall algae bloom in the lake	1	LS		\$ 10,000	Cost TBD based on investigation		
<i>Subtotal</i>				\$ 60,025		\$ 12,450	
North Creek Corridor							
Restore prairies on upland areas and oak woodlands	15	Acre	\$ 2,600	\$ 39,000	\$ 300	\$ 4,500	City of Farmington, Vermillion River Watershed JPO
Manage invasive vegetation	15	Acre	\$ 300	\$ 4,500	\$ 300	\$ 4,500	
North Creek Streambank Restoration	20,000	Ln Ft	\$ 87	\$ 1,740,000	0.40	\$ 8,000	
<i>Subtotal</i>				\$ 1,783,500		\$ 17,000	
Rambling River Park and Vermillion River							
Manage buckthorn along stream corridor and floodplain	113	Acre	\$ 350	\$ 39,550	\$ 350	\$ 39,550	City of Farmington, Empire Township, Vermillion River Watershed JPO, Dakota County Farmlands and Natural Areas, Private Landowners
Widen and maintain stream buffers with native plants	19,500	22 acre	\$ 3,600	\$ 79,200	\$ 350	\$ 6,825,000	
Monitor areas on north side of Vermillion River to prevent degradation of plant communities	60	Acre			\$ 50	\$ 3,000	
Interseed and manage converted farmland that contains low plant diversity	40	Acre	\$ 2,600	\$ 104,000	\$ 125	\$ 5,000	
<i>Subtotal</i>				\$ 222,750		\$ 22,275	
TOTAL				\$ 2,066,275		\$ 51,725	



Appendix:

Planning context



PLANNING CONTEXT

In its 14-mile length, the North Creek greenway travels through three municipalities and one township. As such, there are many concurrent planning efforts that impact the North Creek Greenway.

Metropolitan Regional Parks System

The Metropolitan Council oversees planning and metropolitan funding across the seven-county metropolitan region for the regional parks, trails and open space. Dakota County is one of 10 implementing agencies for the Metropolitan Regional Parks System. As an implementing agency the County owns, maintains and operates regional facilities and is eligible for funding and assistance from the Metropolitan Council. As of 2011, Dakota County owns and manages seven parks and three regional trails.

Local comprehensive plans

The North Creek Greenway has been identified in the 2030 comprehensive plans for Apple Valley, Lakeville and Farmington.

Lebanon Hills Regional Park master plan, March 2001

The master plan for Lebanon Hills Regional Park balances resident use and ecological preservation and protection. For recreational development, the plan emphasizes trails with dispersed trailheads. Two trailheads are suggested near Johnny Cake Ridge Road, the existing mountain bike trailhead on the east side of Johnny Cake Ridge Road to the Wheaton Pond trailhead (currently undeveloped) east of Johnny Cake Ridge Road. An underpass crossing of Johnny Cake Ridge Road is suggested about midway between the trailheads.

Minnesota Zoological Garden Business and Facilities Master Plan, October 2001

The Minnesota Zoo is renovating its main entrance at the southeast portion of the property.

147th Street construction

The city of Apple Valley plans to connect 147th Street from the Johnny Cake Ridge Road to Pilot Knob Road.

East Community Park master plan

The city of Lakeville is developing East Community Park on the northwest corner of East Lake. Phase 1, which includes ballfields, a small playground and parking area, is complete. Phase 2 includes a large parking area, restrooms, a performance stage, picnic shelter and environmental reserve and wetland improvements.

Vermillion River re-meander project, MnDNR

The MnDNR has plans to re-meander a portion of the Vermillion River in Empire Township north of CSAH 66 between Biscayne Avenue and CR 79.

Fairhill Park master plan

The city of Farmington has plans for a community park with a community center on the west side of North Creek just north of the future 195th Street extension. The primary focus of the park is an athletic complex with baseball, softball and soccer fields with trails on both sides of North Creek.

Mystic Meadows Park master plan

The city of Farmington plans a future athletic complex west of the greenway corridor between 195th Street and downtown Farmington.

Rambling River Park master plan

The Vermillion River runs through Rambling River Park in the city of Farmington. Today, Rambling River Park has a trail along the northwest side of the river. The master plan shows potential trail connections to downtown Farmington and creek crossing locations.

203rd Street

Long term, the city of Farmington transportation plan shows 203rd Street crossing the greenway corridor connecting Akin Road to Chippendale Avenue.



NORTH CREEK GREENWAY

MASTER PLAN

2011

