Minnetonka Boulevard (*County Road 5*) Design Plan

Submitted to: *Hennepin County*
City of Minnetonka
City of St. Louis Park
City of Hopkins

December 30, 2008

HART HOWERTON
Planners • Architects
Landscape Architects
Interior Designers

WSB & Associates, Inc.

Minnetonka Boulevard (*County Road 5*) Design Plan

Submitted to: *Hennepin County*
City of Minnetonka
City of St. Louis Park
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Date: **December 30, 2008**

Submitted by: **Hart Howerton**
150 West Lake Street, Suite 104
Wayzata, MN 55391
Telephone: 952-476-1574
Fax: 952-476-1573
www.harthowerton.com

WSB & Associates, Inc.
701 Xenia Avenue South, Suite 300
Minneapolis, MN 55416
Telephone: 763-541-4800
Fax: 763-541-1700
www.wsbeng.com

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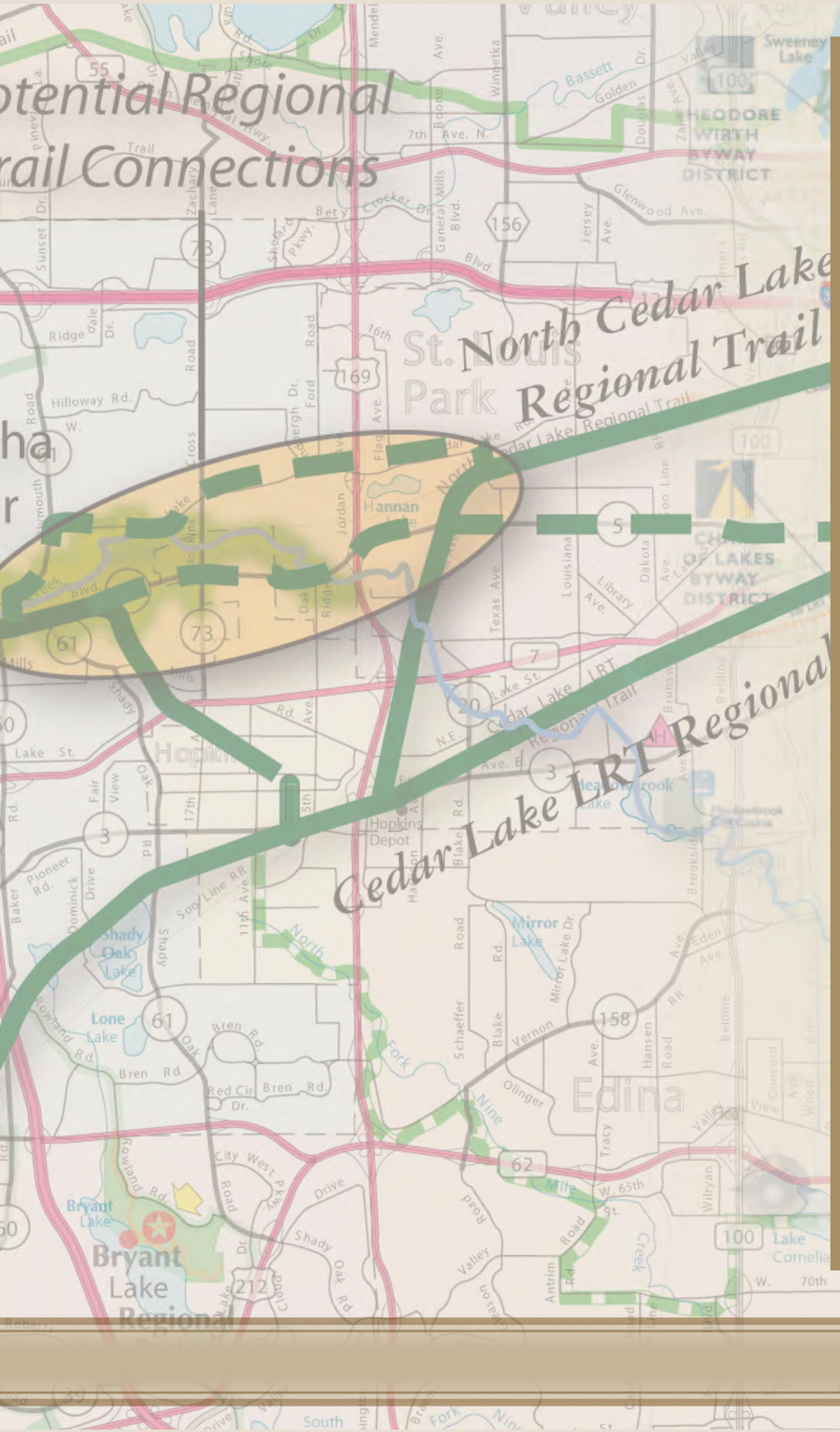


Executive Summary:

The Minnetonka Boulevard (County Road 5) Design Plan is a collaboration between Hennepin County and the cities of Minnetonka, Hopkins and St. Louis Park to conceive a travel corridor that addresses the needs of a variety of commuting, recreational and local travelers. The Design Plan seeks to capitalize on the opportunities offered by the natural setting, cultural resources and location between major lakes and adjacent regional trails. The extent of this study, from Interstate 494 on the west to a point just east of State Highway 100 on the east, includes a key segment of the road that links two city halls and establishes a core from which the design concepts that are developed could be further extended east and west.

The Design Plan was initiated by researching background information and analysis about the current environment of Minnetonka Blvd., and by developing a number of opportunities for potential improvements that could be made along the corridor. Public comments were sought on the subjects of how the road functions, its appearance and how local citizens were using it. They were also asked to identify which potential improvements they would give the highest (or lowest) priority to. The top four priorities for improvements that were mentioned by the public were:

1. **Pedestrian Safety Improvements**
2. **Continuous East-West Bike Route**
3. **Multi-Modal Scenic Corridor ("Link to the Lakes")**
4. **Additional Tree Planting/Landscaping**

While there are currently no plans for road reconstruction on Minnetonka Blvd., there are numerous other projects that are moving forward on properties and roadways that lie adjacent to or intersect it. As a result, there may be opportunities to implement the plan over time as these related projects go forward, and as the various cities and County find additional fiscal resources. To this end, the design plan is intended to identify important functions of the Boulevard and how they could best be improved. This information will serve as a springboard for future planning by the County and Cities sponsoring the study.

It is beyond the scope of this study to propose a detailed and engineered layout for the entire length of the study area, or to resolve all of the potential conflicts between stakeholders, property owners and agencies who have an interest in the roadway. Rather, **the intent is to develop a set of general principles and a range of ideas that would address the goal of the County and Cities to describe a street that considers multiple modes of transportation and various reasons for traveling on it, from commuting, to recreation, to local shopping.** Based on a positive response received at the two public meetings, an overall theme of "Link to the Lakes" should be considered, which ultimately could extend from Lake Minnetonka to the Minneapolis Grand Rounds. In addition, the overall idea of making Minnetonka Boulevard as a **"Scenic Corridor"** was strongly endorsed.
The Design Plan recommendations are presented in diagrammatic form for the entire study area and on several prototype plans that describe the recommendations at some of the key intersections along the corridor. Some assumptions about the relative cost of various proposed improvements are also included.

The first of two diagrammatic plans, entitled "**Bike and Trail Improvement Opportunities**", describes these four general design principles:

1. **Provide for a continuous on-street bike route**
2. **Enhance pedestrian crossings, especially at primary intersections**
3. **Create better connections to regional trails**
4. **Provide additional bike and transit support facilities**

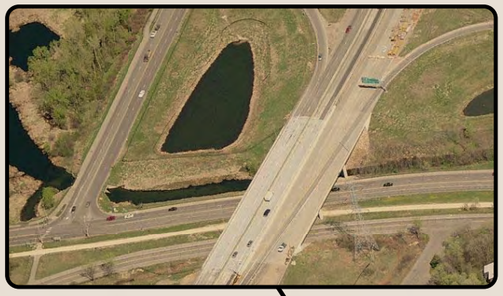
The second diagrammatic plan, entitled "**Landscape and Streetscape Opportunities**", describes these five general design principles:

1. **Emphasize the natural landscape by framing views and by installing new plantings within the road ROW and on adjacent institutional properties**
2. **Use formal arrangements of trees and lighting in commercial areas only**
3. **Use landscape as the main unifier along the corridor; allow other features to change between districts to reflect their unique identities**
4. **Develop a hierarchy of gateways, at highway interchanges, commercial districts and at pedestrian crossings, to reinforce regional & City identity**
5. **Identify opportunities to improve views of Minnehaha Creek by thinning out vegetation and to improve access for recreational users of the Creek and open space areas.**

The prototype plans describe these recommendations in more detail at major intersections such as Plymouth Rd and Texas Ave.; at the Hwy 169 interchange and at neighborhood intersections such as at Hampshire Ave. Additionally, several important goals for a future Hwy 100 bridge crossing have been included.

Due to the limited scope of this study, several "areas of further study" have been identified that will require additional master planning thought, engineering effort, public input or agency review before the final form of ideas suggested in this report can be verified. For example, a major goal of the Design Plan is to encourage a continuous on-street bike route, consistent with both city policy and county standards. There may be obstacles to achieving this in some areas due to grading constraints or ROW width limitations. Potential solutions are suggested in this study, including the purchasing of additional ROW or a reduction in traffic lane dimensions. Ultimately, the preferred solution will be determined at the time of implementation for a given segment of the corridor, based on local factors and interests.
Ultimately, the preferred solution will be determined at the time of **implementation for a given segment of the corridor, based on local factors and interests.**

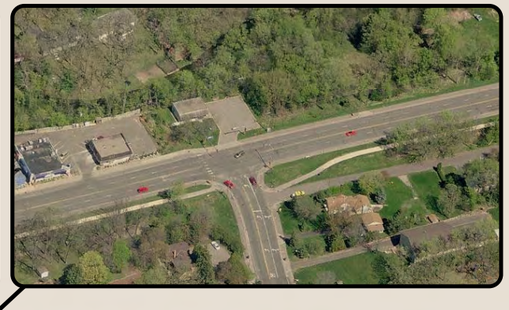
Minnetonka Boulevard & I-494



Minnetonka Boulevard & Baker Road

Minnetonka Boulevard & Plymouth Road

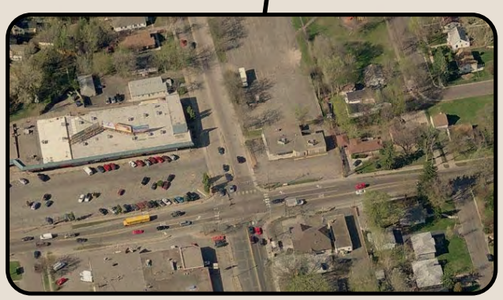
Minnetonka Boulevard & Shady Oak Road



Minnetonka Boulevard & Co. Road 73

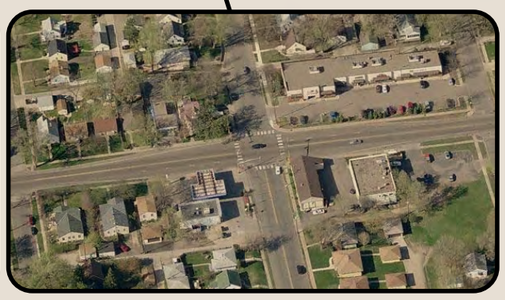
Study Area - Minnetonka Boulev

Minnetonka Boulevard & Hwy. 169



Minnetonka Boulevard & Texas Avenue

Minnetonka Boulevard & Louisiana Avenue



Minnetonka Boulevard & Dakota Avenue

Minnetonka Boulevard & Hwy. 100

vard (Co. Road 5) Design Plan

Background Data:

The Minnetonka Boulevard (County Road 5) corridor is rich in history, passing by or through many natural and cultural resources. Information regarding the historical background of the corridor and the adjacent Minnehaha Creek has been documented. Pre-existing plans for the development of parks, trails and creek access have also been catalogued and reviewed, as have projected land use maps and other city planning documents.

The most significant history along the Minnetonka portion of the Boulevard occurs at the Mills District, which was originally the site of a saw mill; later a flour mill. These two important economic resources in the early settled history of the area were both located on the Creek just east of Plymouth Rd. A railroad depot was also located at Plymouth Rd, south of the Creek and a rail spur served the flour mill, extending along the current Burwell Drive. A mill pond took up part of the Burwell House site, storing logs that were floated down from Lake Minnetonka. This area was also important to Native Americans as a crossing point on an ancient trail that extended from the Shakopee area to Lake Mille Lacs.

Image: Minnetonka Historical Society

Burwell House

- Built in 1883
- Currently a City owned historical site

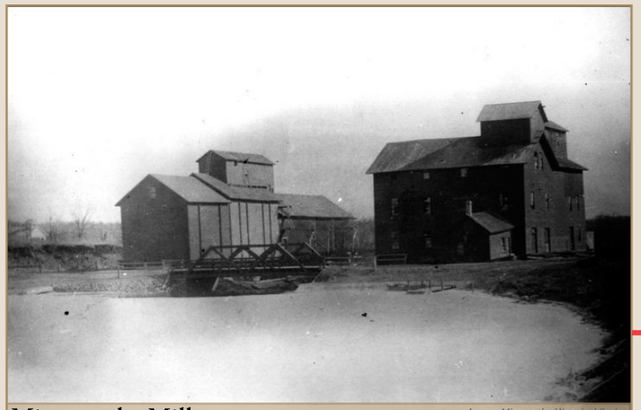


Image: Minnetonka Historical Society

Minnetonka Mills

- Saw Mill (1852-1860), Flour Mill (1869-1895)
- Currently the location of a City owned park featuring a gazebo

Image: Minnetonka Historical Society

Minnetonka Town Hall

- Built in 1906
- Sold to Minnetonka Community Church in 1970

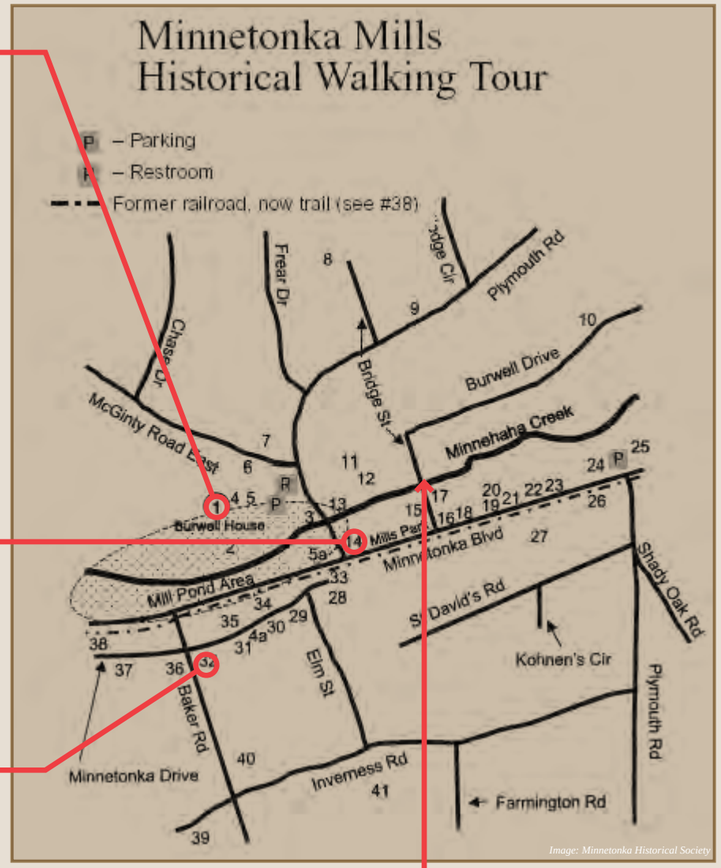


Image: Minnetonka Historical Society

Bridge Street

- Historic Native American Indian trail crossing

Image: Minnetonka Historical Society

Minnetonka - 1916

- Bicycle Trail built by Hennepin County in the 1890's along Minnetonka Boulevard from Minneapolis to Deephaven.

Image: Minnetonka Historical Society

Minnetonka Boulevard - 1916

- Boulevard diverts south of railline (currently TRPD trail) between Baker Road & Plymouth Road

Texa-Tonka Shopping Center - 1960

Image: St. Louis Park Historical Society

Texa-Tonka Shopping Center - 2008

Texa-Tonka Lanes - 1960

Image: St. Louis Park Historical Society

Texa-Tonka Lanes - 2007

Image: St. Louis Park Historical Society

Minnetonka Park Mall - 1960

Image: St. Louis Park Historical Society

Minnetonka Park Mall - 2007

Image: St. Louis Park Historical Society

- In 1896, Minnetonka Boulevard was a narrow bicycle path.
- In July of 1913, Charles M. Loring requested permission to plant elm trees on Minnetonka Boulevard from Minneapolis to Lake Minnetonka.
- In 1913, the railroad bridge at Brunswick Avenue was built (rebuilt in 2008).
- Minnetonka Boulevard was paved in 1952.
- The bridge at Minnetonka Boulevard and Aquila was built in 1960, and rebuilt in 2007.
- In 2009, a campaign to restore Lilac Way (Hwy. 100) will begin by asking individuals & businesses to sponsor lilac shrubs to be planted throughout the corridor.

Lilac Park

Image: NPS

- Built as part of a series of parks through the WPA by local stonemasons
- Unique stone "beehive" fireplaces were constructed for use by park-goers.
  - One remains intact today.

Highway 100 Roadside Parks

Image: St. Louis Park Historical Society

- Structures fashioned from limestone cut along the Minnesota River
- Due to highway expansion projects over the years, most structures have been removed. However, pieces of the stone have been retained by MNDOT.

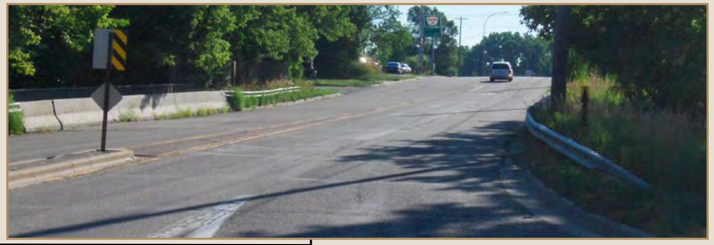
Remaining Beehive Fireplace - Lilac Park

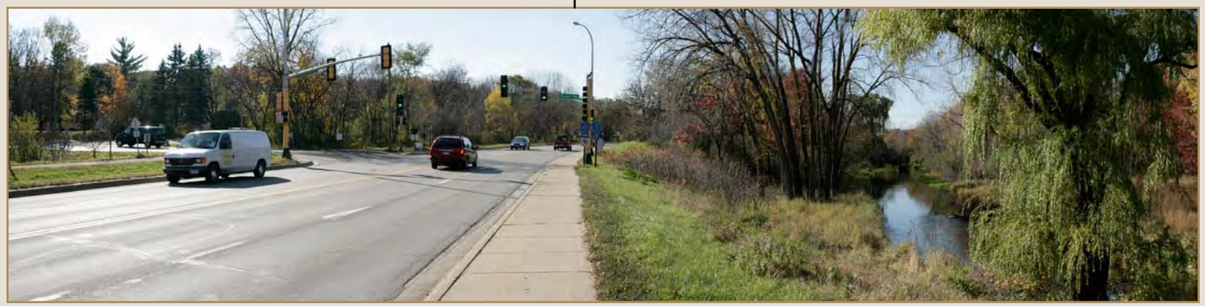
Image: St. Louis Park Historical Society

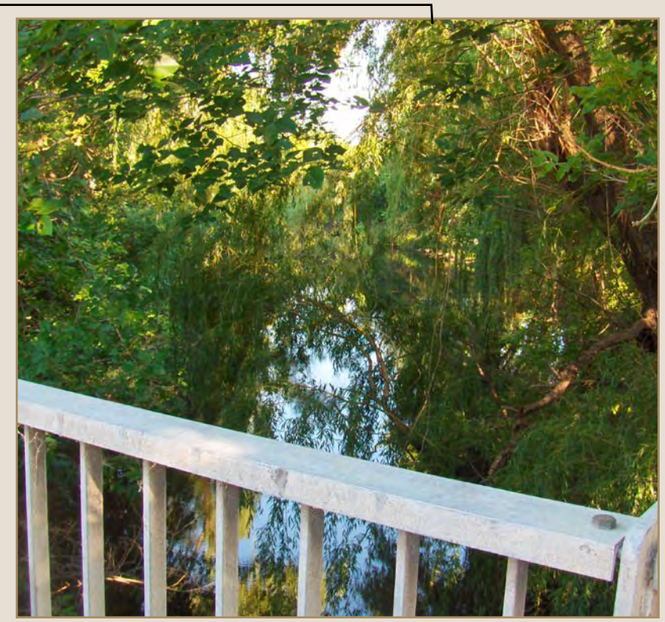
Removed Stone - MNDOT Graveyard

Image: www.restorelilacway.com

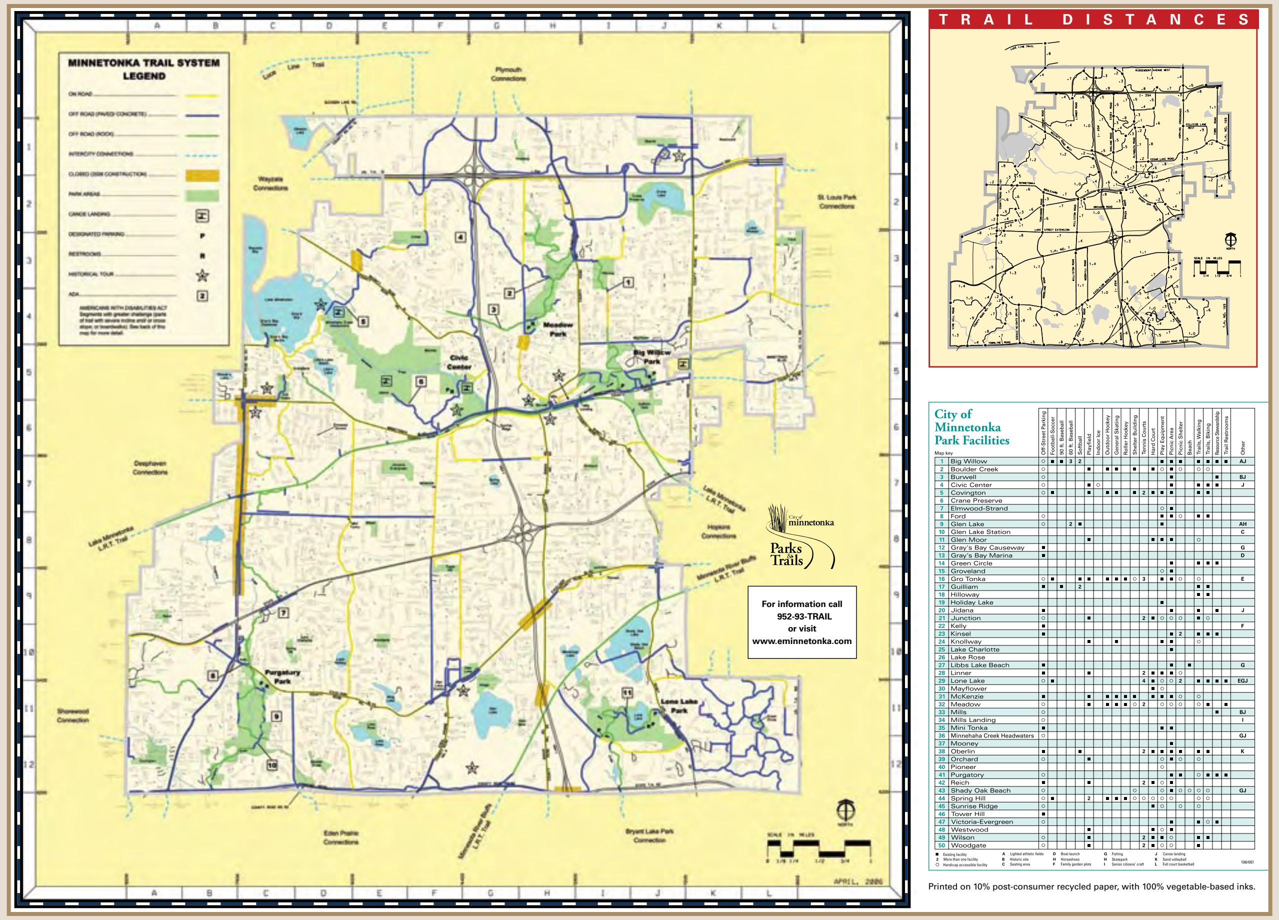
Related St. Louis Park History



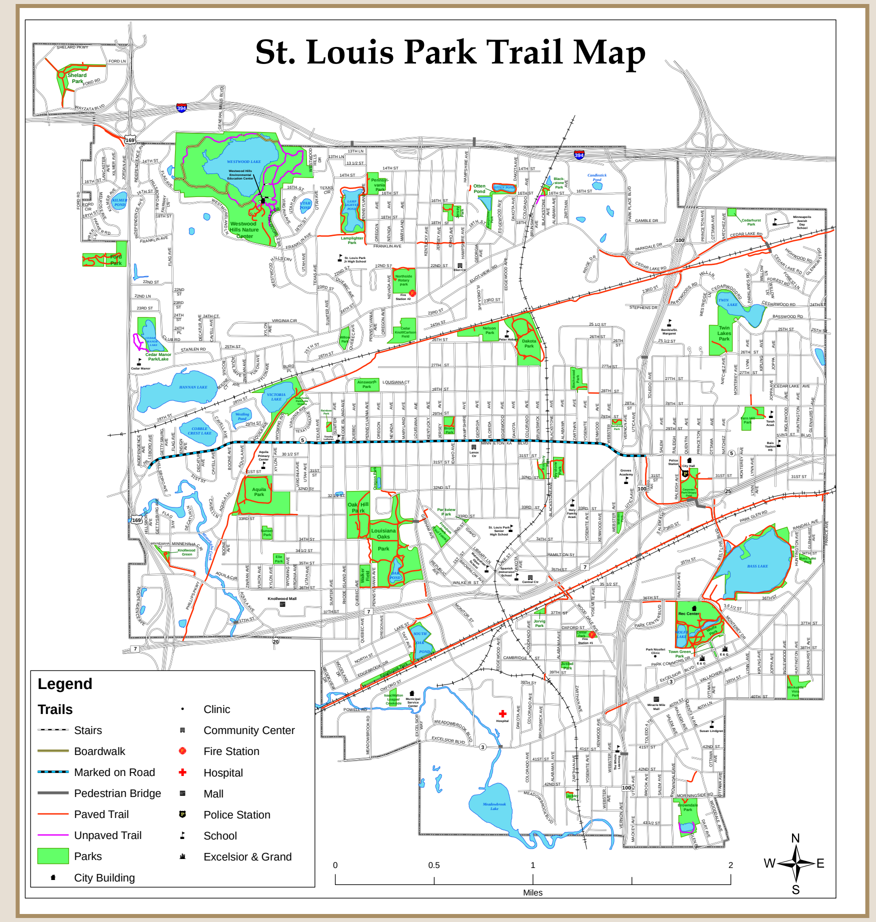




Minnehaha Creek - represents a unique natural asset for the portion of the corridor between I-494 and Hopkins Crossroad, where it runs along side of the roadway or a short distance away. In this area the creek contributes to the forested character of the roadway corridor. Where dense shrubbery has been removed, the Creek corridor greatly extends the travelers viewshed. The Creek presents opportunities for complementary recreational uses such as overlooks, trails and canoe landings that are positive for users of the Creek and users of the roadway. By giving consideration to the Creek as a visual and recreational asset, with special stopping points, view corridors, and recreational access, it will improve the character of the road and adjacent land uses.

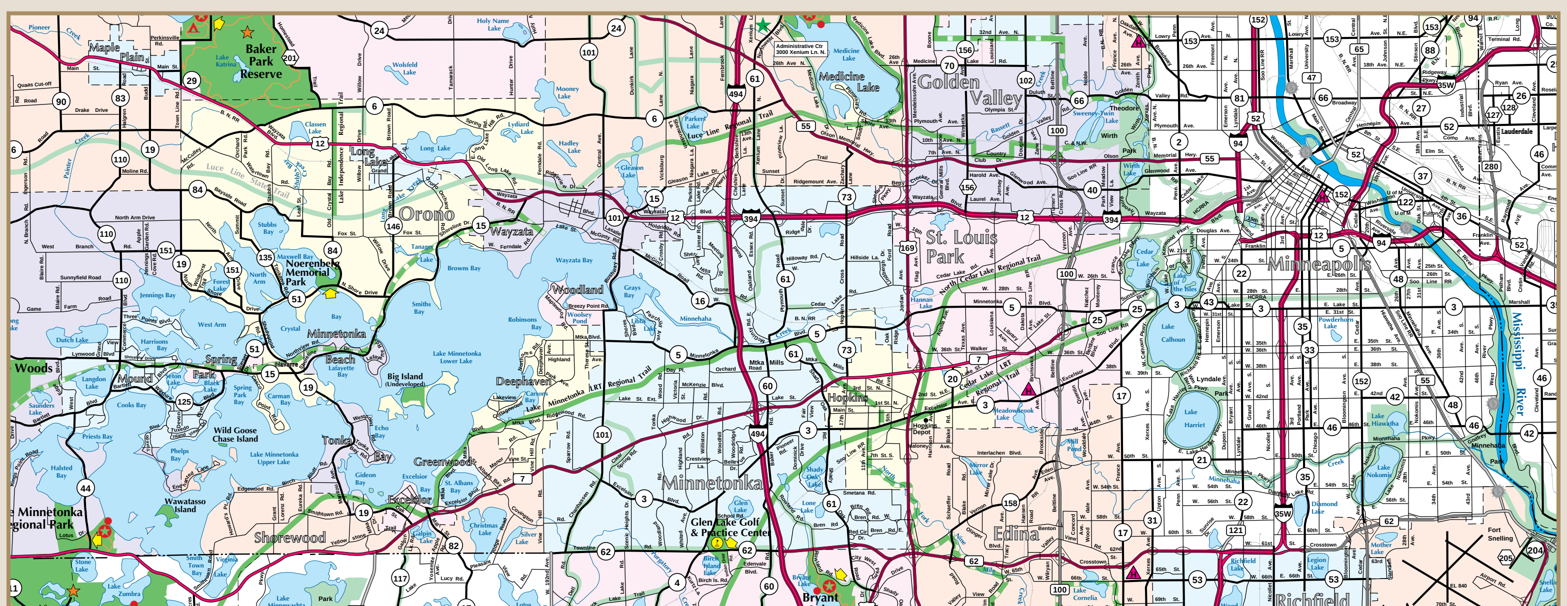


Minnetonka

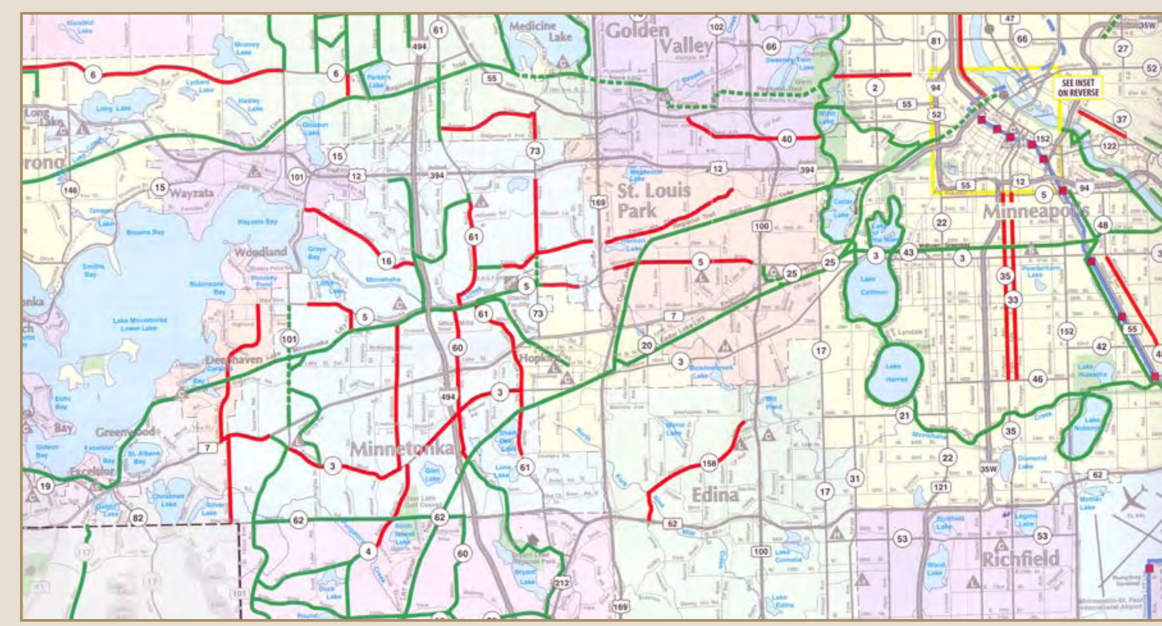


Saint Louis Park

Minneapolis

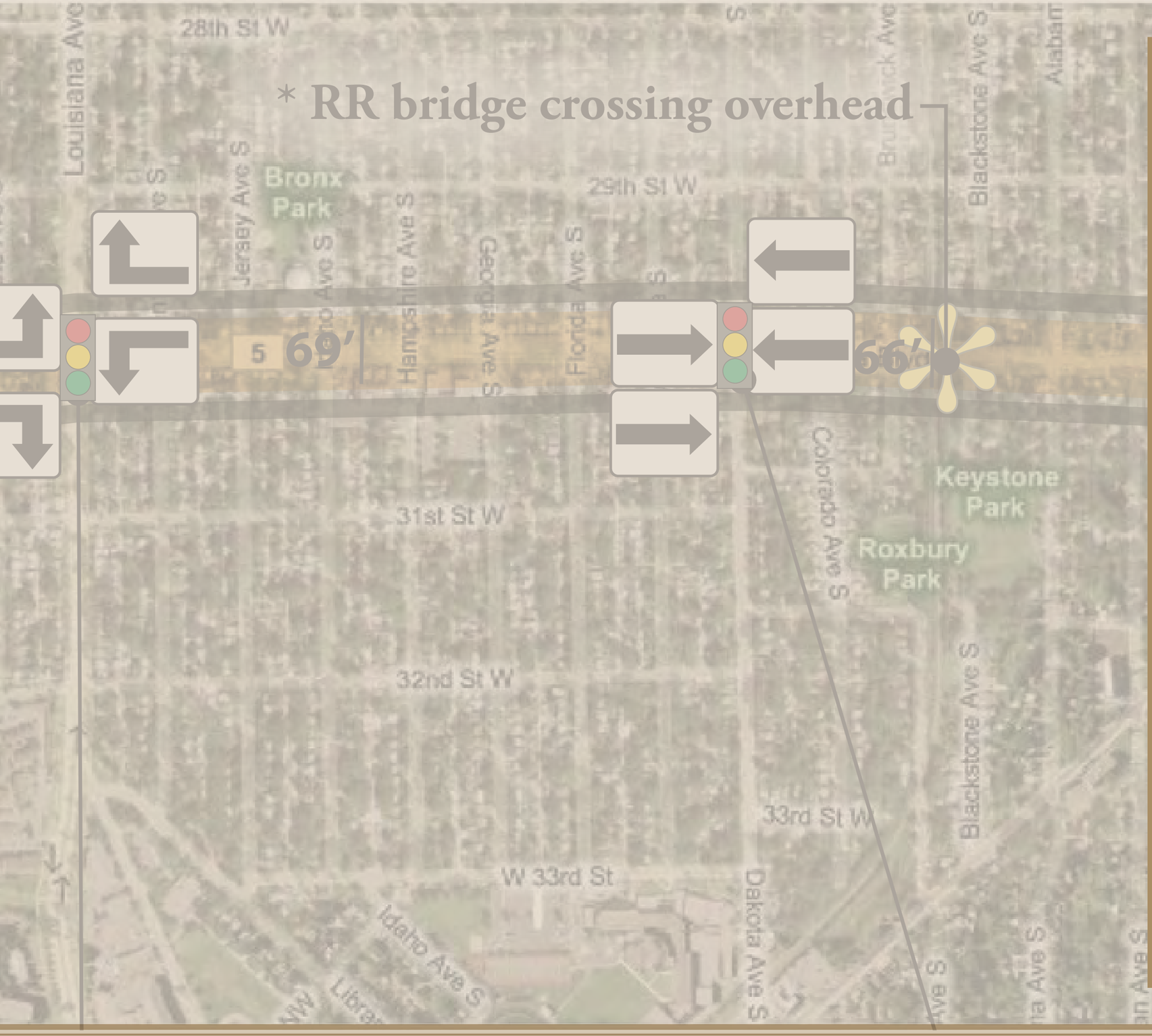


Three Rivers Park District



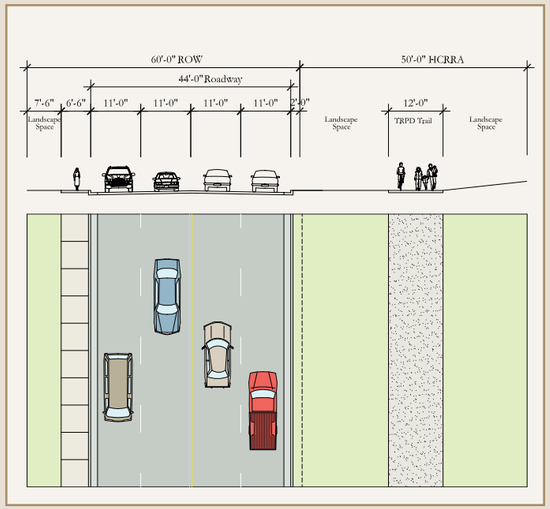
Hennepin County

* North Cedar Lake Trail crossing (bridge over trail)

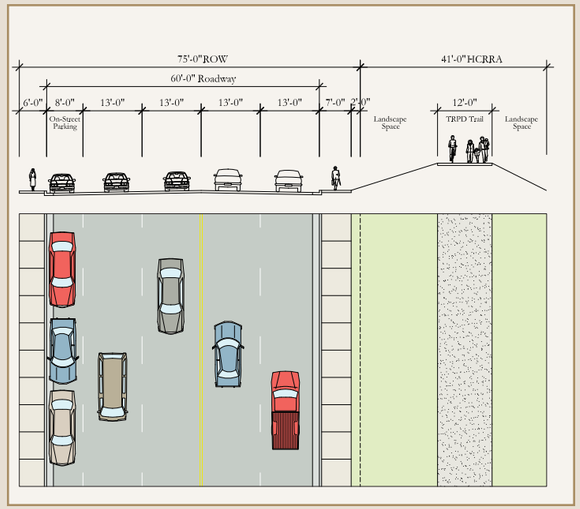


Corridor Analysis:

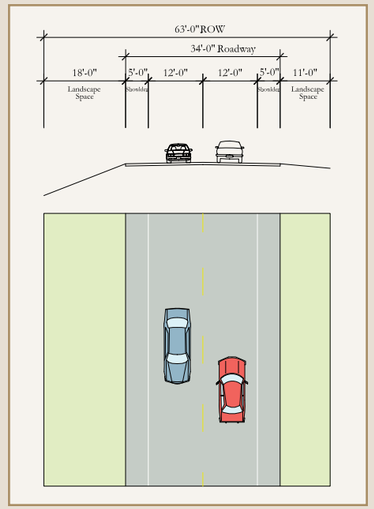
In order to fully understand the Minnetonka Boulevard (County Road 5) corridor, studies have been done to examine many of the physical, jurisdictional, environmental and experiential opportunities and constraints. Six specific studies are shown, covering *Roadway Conditions* (physical characteristics), *Character*, *Adjacent Land Uses* (complementary features that contribute to the overall corridor experience), *Local & Regional Trails*, *Bike Trail Crossings* (specific examination of how trails are impacted by the roadway), and *Transit*. When analyzed, each study provides specific opportunities. Local citizens were asked to contribute to the design process by assisting in the selection and prioritization of these opportunities. A summary of public input is included in a later chapter of this report.



Section A



Section B



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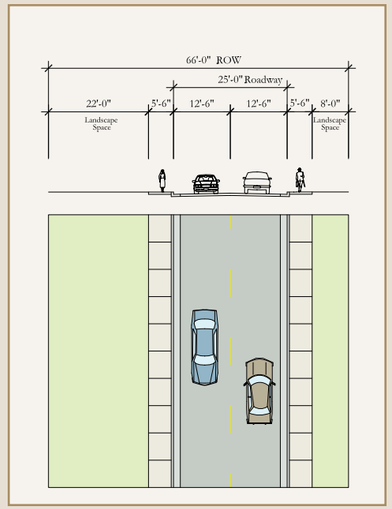
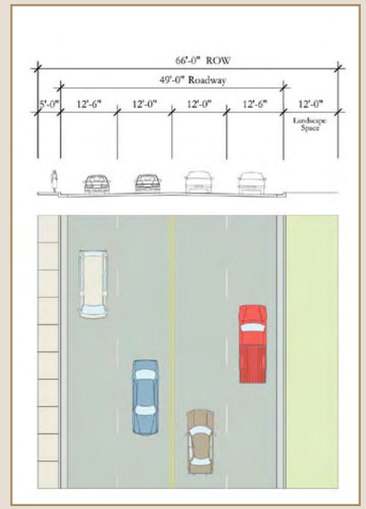


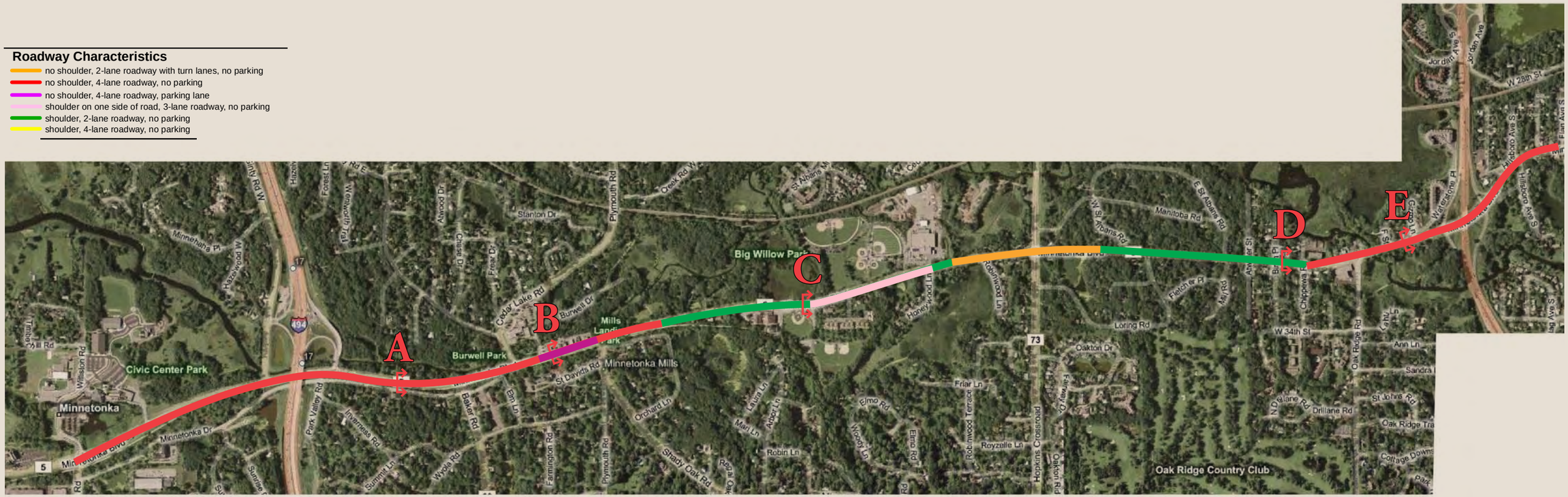
Section D



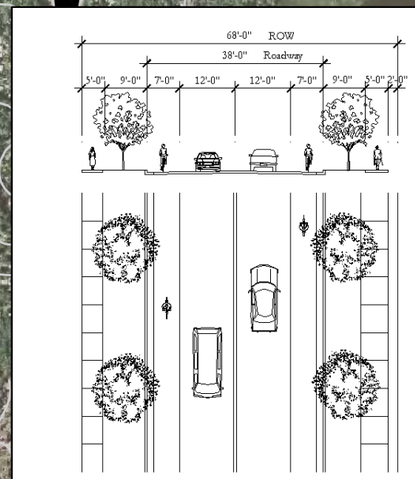
Section E

Roadway Characteristics

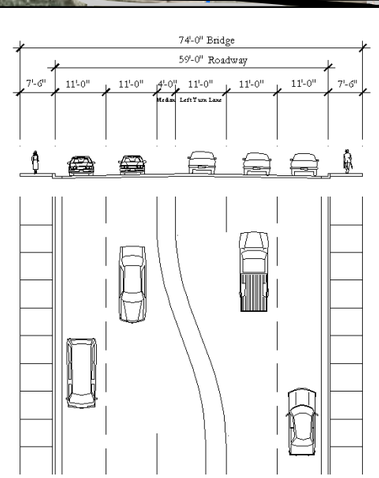
- no shoulder, 2-lane roadway with turn lanes, no parking
- no shoulder, 4-lane roadway, no parking
- no shoulder, 4-lane roadway, parking lane
- shoulder on one side of road, 3-lane roadway, no parking
- shoulder, 2-lane roadway, no parking
- shoulder, 4-lane roadway, no parking



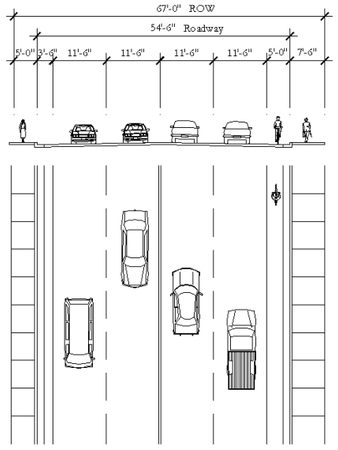
Minnetonka



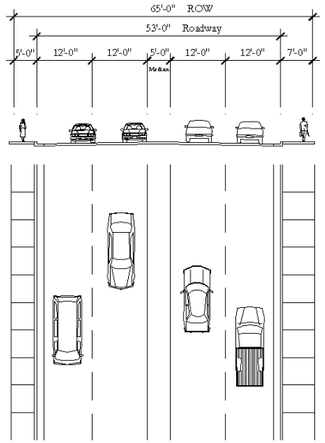
Section F - Existing Conditions
Minnetonka Blvd. near Idaho Avenue S



Section G - Existing Conditions
Minnetonka Blvd. - Hwy 100 bridge



Section H - Existing Conditions
Minnetonka Blvd. near Raleigh Avenue S



Section I - Existing Conditions
Minnetonka Blvd. near Lynn Avenue S

Section A
Section B
Section C
Section D

Cedar Lake Rd
Hannan Lake
Victoria L.
BNSF Railway
Cobble Crest L.
Texas Ave S
Louisiana Ave S
Dakota Ave S
CP Railway
100
5
25
A
B
C
D

0 0.15 0.3 Miles

Roadway Characteristics

- no shoulder, 2-lane roadway with turn lanes, no parking
- no shoulder, 4-lane roadway, no parking
- no shoulder, 4-lane roadway, parking lane
- shoulder on one side of road, 3-lane roadway, no parking
- shoulder, 2-lane roadway, no parking
- shoulder, 4-lane roadway, no parking

- primary arterial
- minor arterial or collector
- other roadway

- pinch point
- off-road bikeway
- railroads

St. Louis Park

Sections - Existing Conditions

Traffic Summary:

Introduction:

Minnetonka Boulevard is a 2-4 lane roadway with a variety of typical design sections. Between I-494 and Shady Oak Road, Minnetonka Blvd is a 4-lane, undivided roadway. Between Shady Oak Road and Oak Ridge Road, Minnetonka Boulevard narrows to a 2-lane configuration (including a short 3-lane section near Big Willow Park). Minnetonka Boulevard is a 4-lane roadway with turn lanes between Oak Ridge Road and Th-169. Between TH-169 and Lake Street W, Minnetonka Boulevard is a 2-lane roadway with turn lanes at major intersections. East of Lake Street W, Minnetonka Boulevard is a 4-lane roadway. Speed limits on Minnetonka Boulevard range between 30-40 miles/hour.

Existing Traffic Volumes:

Year 2007 traffic volumes were obtained from MnDOT Traffic Volume Maps for Minnetonka Boulevard and the following intersecting roadways:

- Baker Road
- Plymouth Road
- Shady Oak Road
- Hopkins Crossroad
- Oak Ridge Road

2005 traffic volumes were obtained form MnDOT Traffic Volume maps for the following intersecting roadways:

- Texas Avenue South
- Louisiana Avenue South
- Dakota Avenue South
- West Lake Street
- Ottawa Avenue South

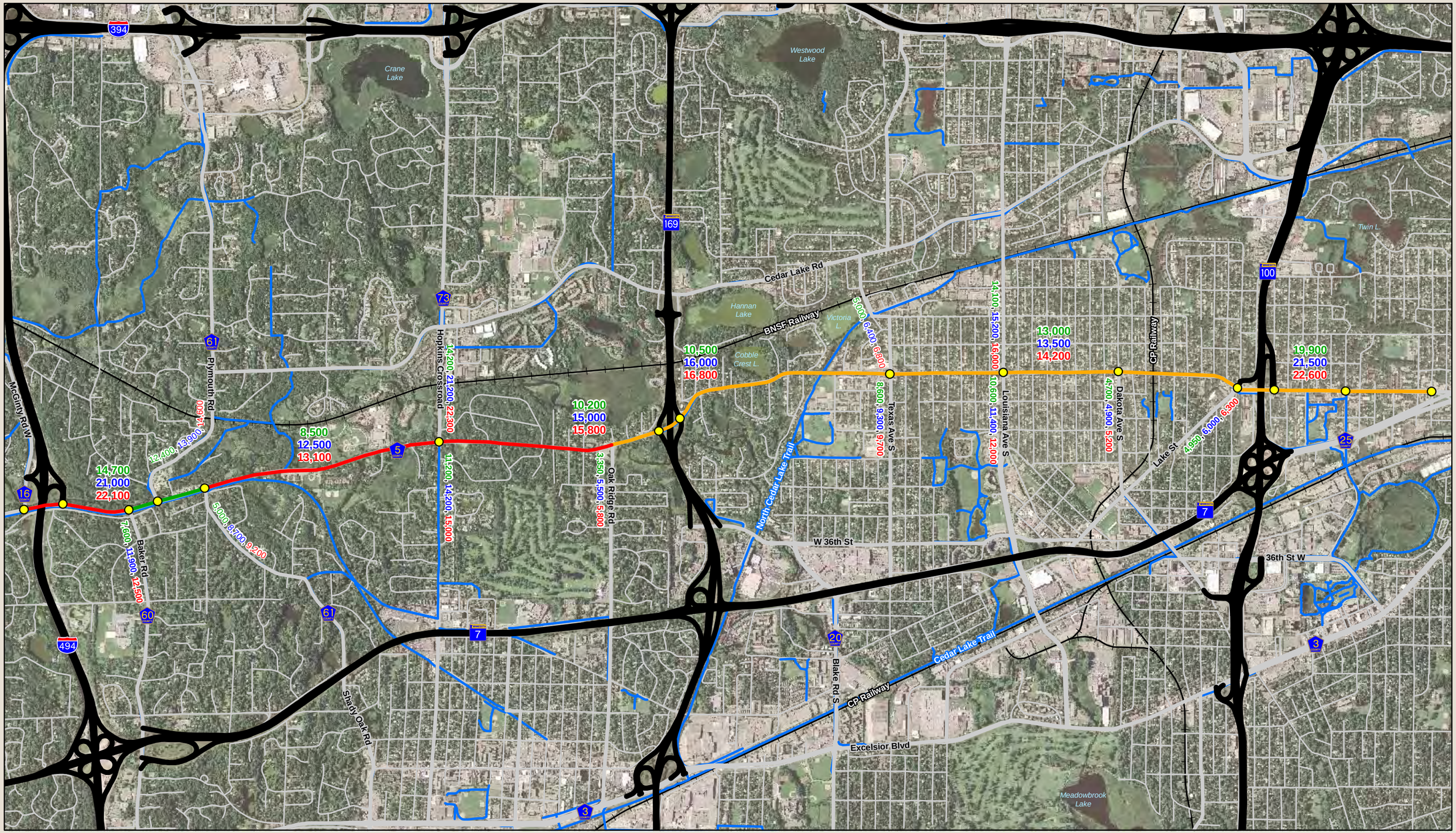
The Average Annual Daily Traffic (AADT) on Minnetonka Boulevard ranges from 8,500 to 19,900. The largest volume (19,900) is just east of TH-100 while the smallest (8,500) is between Shady Oak Road and Hopkins Crossroad. Traffic volumes on Minnetonka Boulevard tend to be larger near TH-100, TH-169, and I-494 and smaller on the sections of Minnetonka Boulevard further from the Principal Arterials. The 2005-2007 AADT volumes are displayed on **Figure 1**.

Traffic Forecasts:

The 2020 traffic forecasts were developed using the Hennepin County Travel Demand Model and were provided by Hennepin County. The model was used to develop system-wide forecasts for the study area. The model is calibrated to produce 2020 traffic projections using a capacity constrained roadway network and estimated 2020 socioeconomic data. The Hennepin County Travel Demand Model was not modified from its base form for this study and retains the roadway network, socioeconomic data and Transportation Analysis Zones (TAZs) from the base model.

On three roadway segments, the Hennepin County model projections were less than the most recent (2005 or 2007) MnDOT traffic counts. These three segments were Texas Avenue S (south of Minnetonka Boulevard) and Louisiana Avenue S (both north and south of Minnetonka Boulevard). In these three locations, an annual 0.5 percent growth factor was applied to the 2005 traffic counts to arrive at reasonable 2020 forecasts. 0.5% was assumed to be a reasonable growth factor based on the growth shown in the Hennepin County model throughout the entire study area between the 1995 projections and the 2010 projections. The 2020 daily traffic forecasts are displayed on **Figure 1**.

The 2030 forecasts were produced by applying a 0.5 percent annual growth factor to all 2020 forecasts. Because the land surrounding Minnetonka Boulevard and the intersecting streets is largely developed, relatively little traffic growth is anticipated throughout the upcoming years. The 2030 daily traffic forecasts are displayed on **Figure 1**.



Hennepin

WSB & Associates, Inc.

0 0.25 0.5 Miles

Speed Limit

- 30 mph
- 35 mph
- 40 mph

SOURCE: MnDOT, Hennepin County Travel Demand Model, WSB & Associates, Inc.

2005 - 2007 Daily Traffic Count (AADT)
2020 Daily Traffic Forecast
2030 Daily Traffic Forecast

- primary arterial
- minor arterial or collector
- other roadway
- signalized intersection
- off-road bikeway
- railroads

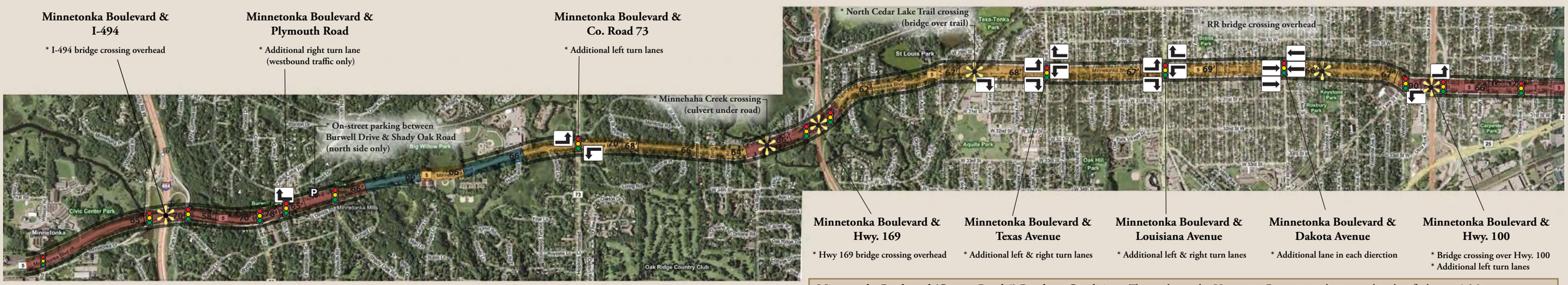
NOTE: 2030 Forecasts assume a 0.5% annual growth rate from 2020 Forecasts. 2020 Forecasts assume a 0.5% annual growth rate from 2005 or 2007 counts where data is inconsistent.

Speed Limit & Traffic Volume
Minnetonka Boulevard
Figure 1

Study Area - Minnetonka Boulevard (Co. Road 5) Design Plan

NTS

HART HOWERTON
Planners • Architects
Landscape Architects
Interior Designers



Minnetonka Boulevard (County Road 5) Roadway Condition - The road is under Hennepin County jurisdiction and is classified as an A Minor Arterial-Reliever. It functions as a route for short to medium length trips within Hennepin County and as an alternative route to TH 7 and I-394. Through various segments, the public right of way varies in width from 65 to 90 feet and the road width varies between two lane from Shady Oak Rd. to Oak Ridge Rd. and from Hwy 169 to Hwy 100, to four lane from I-494 to Shady Oak Rd. and from Oak Ridge Rd. to Hwy 169. Available generalized traffic data shows that the roadway is congested during rush hours in the I-494 Interchange area.

Roadway Conditions - Minnetonka Boulevard (Co. Road 5) Design Plan

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Interior Designers

Minnetonka Boulevard (County Road 5) Roadway Character - The character of the road varies greatly, from rural sections, having no curbs or sidewalks, near Big Willow Park, to urban residential sections having curbs, boulevards, sidewalks and street trees elsewhere. These varying conditions will create opportunities for special character zones within the three cities and numerous districts, but will also pose challenges to concepts and goals that require continuity along the roadways entire length. The presence of large trees overhead and on adjacent land provides the most consistent element of character along the length of the corridor and creates a sense of a parkway traveling through a forest.

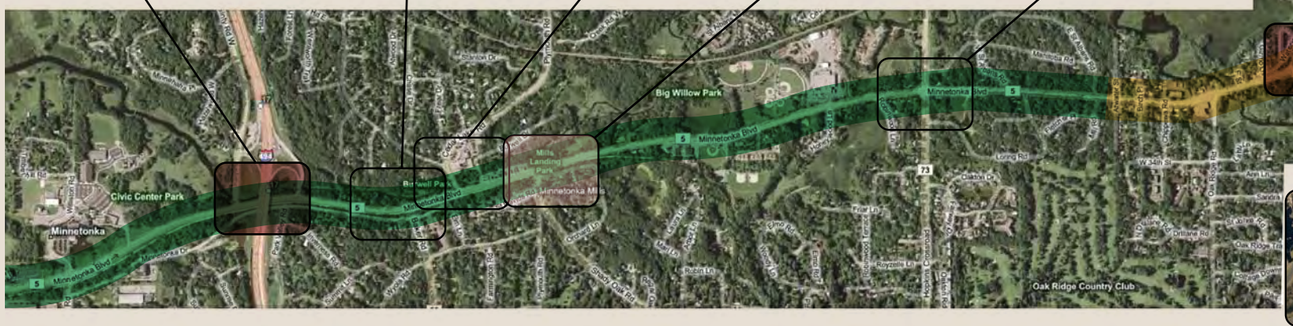
Minnetonka Boulevard & I-494

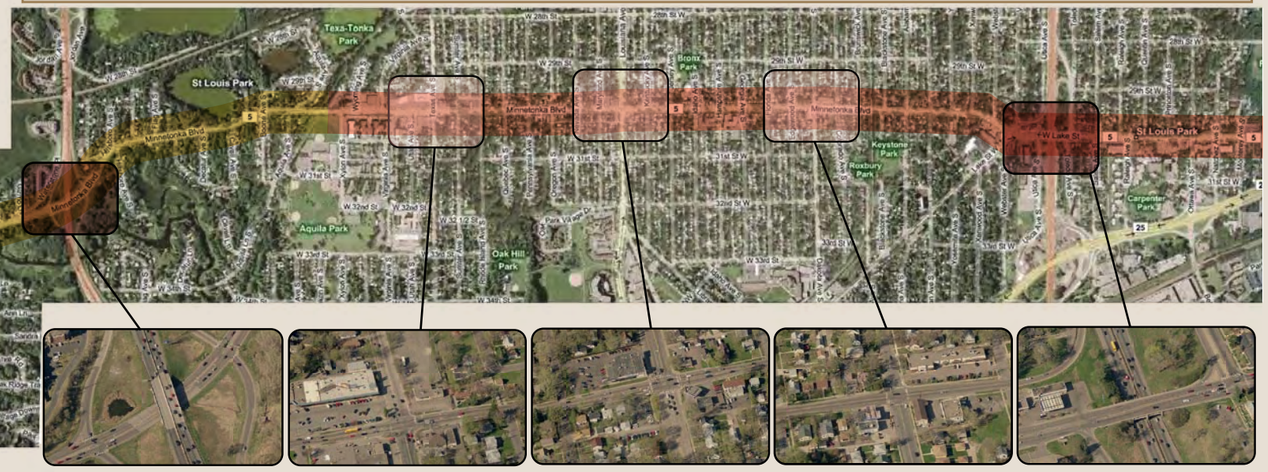
Minnetonka Boulevard & Baker Road

Minnetonka Boulevard & Plymouth Road

Minnetonka Boulevard & Shady Oak Road

Minnetonka Boulevard & Co. Road 73





Minnetonka Boulevard & Hwy. 169

Minnetonka Boulevard & Texas Avenue

Minnetonka Boulevard & Louisiana Avenue

Minnetonka Boulevard & Dakota Avenue

Minnetonka Boulevard & Hwy. 100

* Includes both curbed & non-curbed road sections
* Meandering trails
* Sidewalks at commercial areas only
* No residential driveways
* Dense "natural" vegetation
* Low visibility of homes from road

* Curb & gutter road section
* Intermittent asphalt sidewalks
* Some residential driveways present
* Moderately dense "natural" vegetation
* Moderate visibility of homes from road

* Curb & gutter road section
* Sidewalks & grass boulevards
* Some residential driveways present
* Moderate vegetation / street tree plantings
* High visibility of homes from road

Rural **Road Character** *Urban*

Major Highway Intersection

Commercial Intersection

Other Gateway Intersection

Character Study - Minnetonka Boulevard (Co. Road 5) Design Plan

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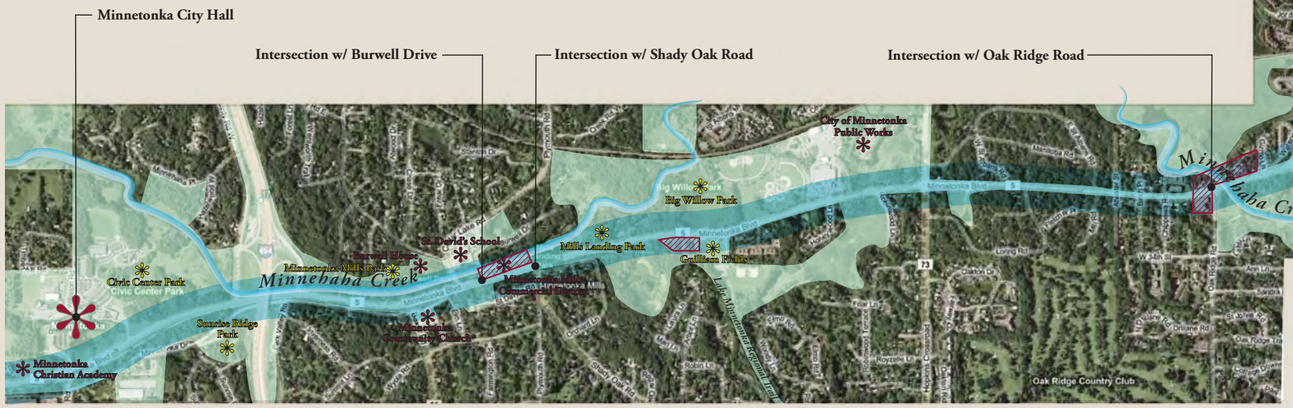
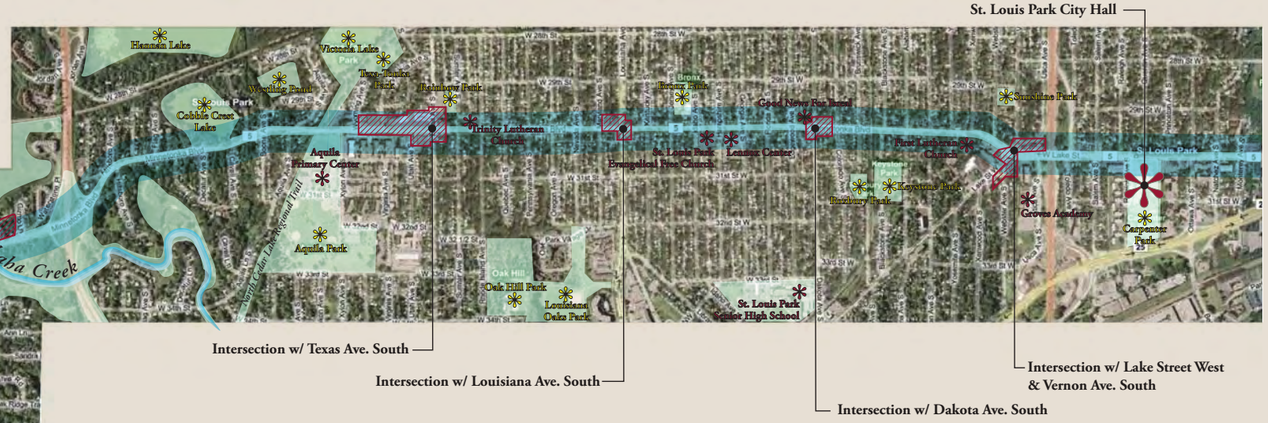
Landscape Architects
Interior Designers





Complementary Adjacent Land Uses / Community Resources

Commercial Property

Minnetonka Boulevard Corridor

Park / Natural Feature

Civic / Institutional Resource

Minnetonka Boulevard (County Road 5) Adjacent Land Uses - Land uses along the corridor vary from parks and natural spaces, historic districts, commercial and office districts and residential areas. There are many areas adjacent to the roadway which are publicly owned or are institutional land uses. These areas typically have a natural or highly landscaped character and also extend the viewshed of the road corridor, contributing to the forested character. Residential areas vary from large lot single family homes in the western areas-with large yards facing the street, to small, urban lot neighborhoods in the east-with charming, bungalow styled homes. The character of the commercial districts is typically auto-oriented, i.e.: strip malls with parking lots in front or corner gas stations, and it appears that they have not been significantly updated, with a few exceptions. The overall variety of land uses creates opportunities for special character zones that will lead to a more vibrant and unique corridor.

Adjacent Land Uses - Minnetonka Boulevard (Co. Road 5) Design Plan

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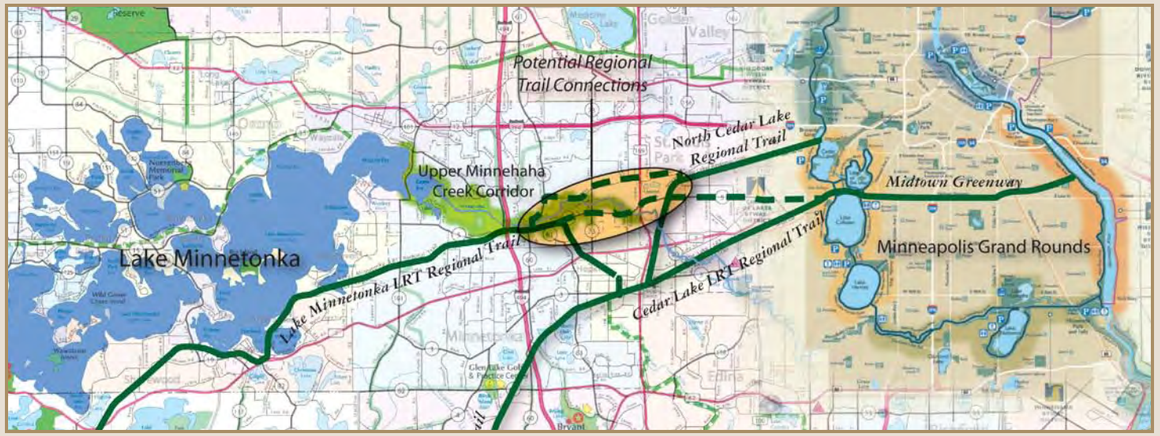
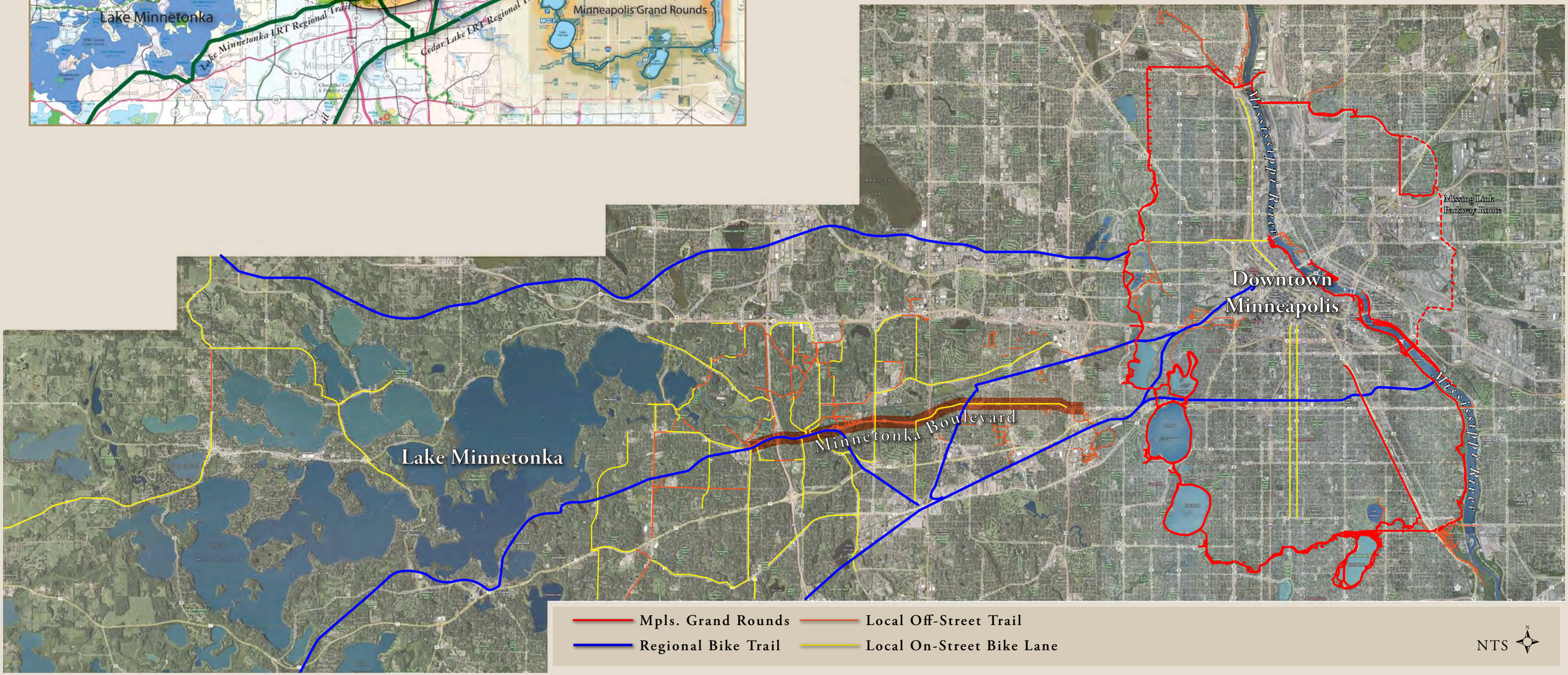
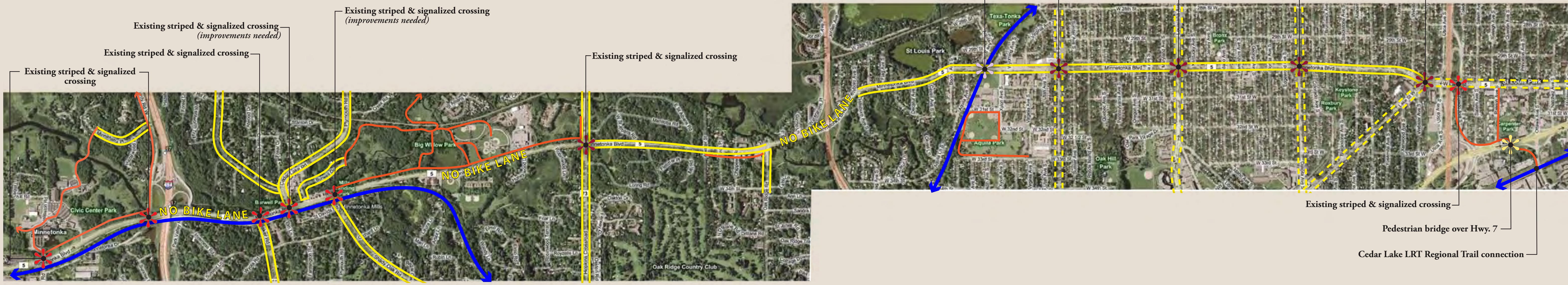


The Regional Trail and Bikeway System - Trails and bikeways are community resources that provide recreational and transportation options and connections between cities, neighborhoods, land uses and recreational sites. Hennepin County, Three Rivers Park District and the cities of Minnetonka, Hopkins and St. Louis Park have all completed master plans for trail and bikeway systems that intersect or run nearby to the Minnetonka Boulevard (County Road 5) corridor and together they represent an extensive network of local and regional routes connecting Minnetonka Blvd. to all parts of these cities.

Another significant opportunity is the potential to relate these trails to the Minneapolis "Grand Rounds" network, creating a trail that extends all the way from Lake Minnetonka to the Mississippi River. To accomplish this, it would require the completion of a trail segment along Minnetonka Blvd. between the intersections of the Lake Minnetonka LRT Regional Trail, near Shady Oak Road and the North Cedar Lake Regional Trail, near Aquila Avenue. This would require upgrading on-road bike lanes between these points or creating a new off-road trail link.



Local & Regional Trails



2-way Crossing
3-way Crossing
4-way Crossing
Grade-Separated Crossing (Bridge)
Grade-Separated Crossing (Tunnel)

Designated On-Street Bike Route
Proposed On-Street Bike Route
(St. Louis Park Active Living & Trails Plan)
Existing Off-Street Trail
Regional Trail

Minnetonka Boulevard (County Road 5) Bikeway and Trail Conditions - Along Minnetonka Boulevard (County Road 5) there are many gaps in the bikeway and trail system, due to a narrow roadway, curb cuts, grade drop offs and a lack of signage that makes continuous pedestrian or bicycle travel difficult. Many of the intersections have pedestrian and bikeway crossings that could be improved for safety.

Bike & Trail Conditions - Minnetonka Boulevard (Co. Road 5) Design Plan

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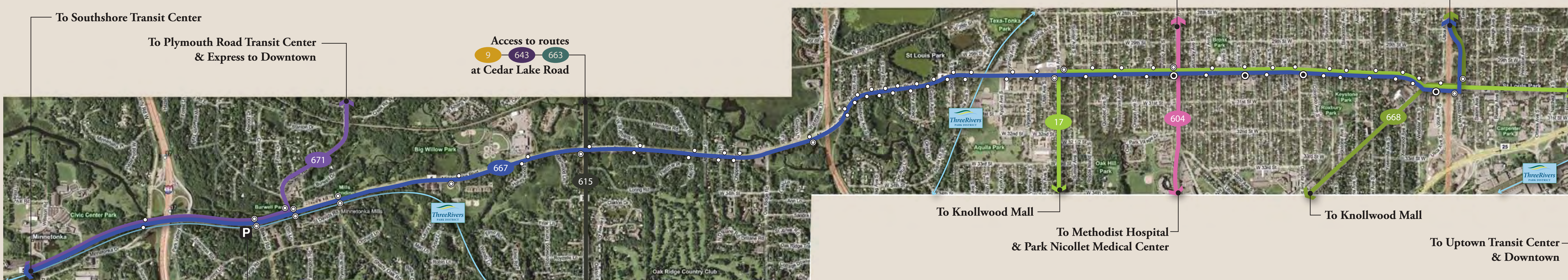

Bus Stop & Shelter
Bus Stop & Bench
Bus Stop

Minnetonka Boulevard (County Road 5) Transit Facilities - Local and commuter bus routes along the corridor are operated by MetroTransit and include lines 671, 667 through Minnetonka, 667 through Hopkins and 667, 17 and 668 through St. Louis Park. Lines 615 and 604 cross the corridor at Hopkins Crossroad and at Louisiana Ave. Lines 9, 643 and 663 terminate at a transit hub just to the north on Hopkins Crossroad. A park and ride lot exists on the south side of Minnetonka Blvd. at Baker Road. There are a total of four bus shelters on the corridor and several additional stops with benches. The shelters are not heated.

Transit - Minnetonka Boulevard (Co. Road 5) Design Plan

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LANDSCAPE ARCHITECTS
INTERIOR DESIGNERS

Analysis Summary:

• The corridor has a strong landscape character defined by the existing tree canopy and adjacent creek and wetlands. This distinguishes it from other east/west roadways such as Hwy 7 and I-394.

• The road currently varies from 2 to 5 lanes and road capacity is generally adequate for the projected traffic, except at I-494, which may require left turn lanes in the future.

• The road passes through a variety of land uses with a character that changes between rural, forested, suburban and urban.

• There are several main roads intersecting the corridor, with important neighborhood commercial districts. The commercial districts have parking lots and facades facing the Boulevard that could be updated.

• The corridor passes by numerous different neighborhoods and business districts that could be identified with unique signs, banners and gateways.

• Highway interchanges at I-494, Hwy 169 and Hwy 100 interrupt the continuity of the corridor and create conditions which will need special attention. They also offer unique opportunities for landscaping and gateways.

• Where Minnehaha Creek meets Minnetonka Blvd., it provides opportunities for recreational access such as overlooks, canoe landings, trailheads and impressive vistas from the road.

• There are opportunities to improve and expand regional and local trail and bikeway connections within the corridor, which are presently inconsistent and often in conflict with autos. Pedestrian crossings at major intersections are not always safe.

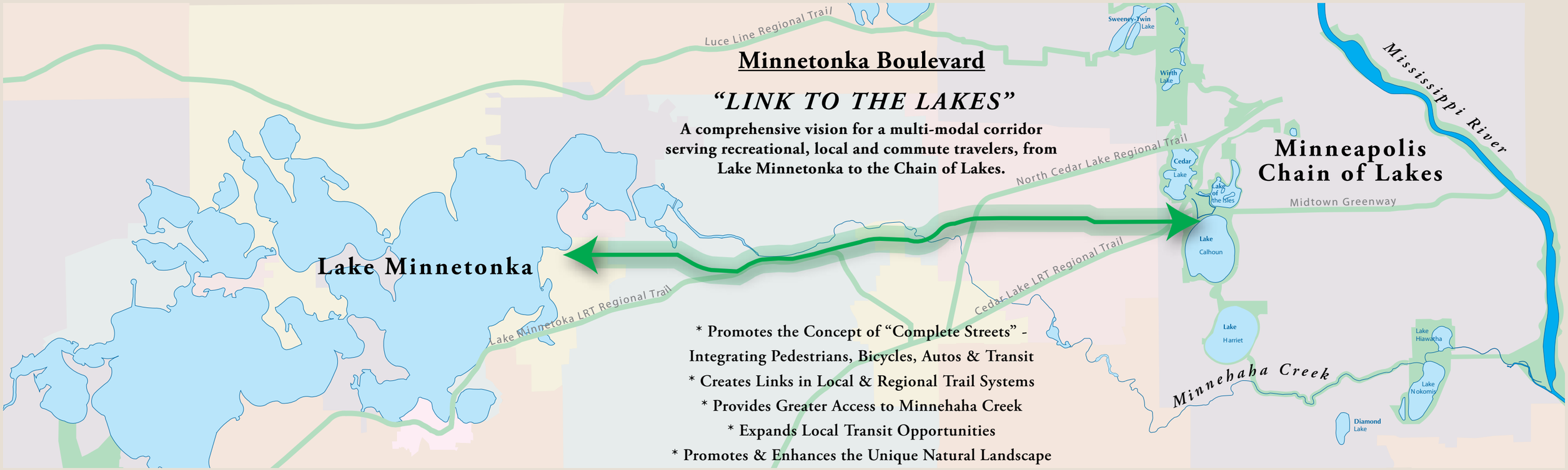
• There are several bus transit lines that run within the corridor, but facilities for parking and waiting are limited.

• The corridor could be developed as a scenic drive, becoming a recreational destination linking parks, open spaces and civic facilities, as far away as Lake Minnetonka and the Minneapolis Chain of Lakes.

• The corridor has an interesting history that could be presented through various signs, fixtures and artworks.

Project Opportunities:

Many opportunities for improving the Minnetonka Boulevard (County Road 5) corridor can be imagined, both functionally and experientially. The corridor already has many distinct natural and cultural features to draw from, including the *Minnehaha Creek*, the historic *Minnetonka Mills District*, and a mature tree canopy throughout. Recognizing this, there are opportunities to build upon these features and provide additional amenities that support the various functions of the corridor, including autos, transit, commuter and recreational bikers, and pedestrians. Such opportunities include, *Pedestrian Safety* features, *Bicycle Support Facilities*, improved *Streetscape Design*, *Gateway Design*, *Interpretive Features*, *Improved Creek Access* & *Water Quality Improvements*. Under the theme of "*Link to the Lakes***", Minnetonka Blvd. could someday become a significant recreational connection between Lake Minnetonka and the Minneapolis Chain of Lakes.**



Multi-Modal Scenic Corridor Concept

A "Complete Street" accommodates all users of the roadway corridor and promotes safe and convenient transportation options and access for all people.

- Offers a full range of travel choices
- Connects to a network that offers choices
- Is fully accessible to all: kids, seniors and people with disabilities
- Supports & contributes to life in pleasant, convenient neighborhoods
- Walking & bicycling help prevent obesity, diabetes, high blood pressure & colon cancer.
- Reduces traffic volume
- Reduces environmental impact


Photo: www.pedbikeimages.org/Dan Burden

- 52% of people want to bike more than they do now.

-America Bikes Poll

- 55% of people would rather drive less and walk more

-STPP Poll

- About 1/3 of all Americans do not drive
  - -21% of Americans over 65
  - -All children under 16
  - -Many low income Americans cannot afford automobiles

Complete streets are roadways designed and operated to enable safe, attractive, and comfortable access and travel for all users. Pedestrians, bicyclists, motorists and public transport users of all ages and abilities are able to safely and comfortably move along and across a complete street. Complete Streets also create a sense of place and improve social interaction, while generally improving property adjacent land values.

For more information see:
www.completestreets.org

Poorly Designed Street

Improved Street Design - (employing Complete Street concepts)

*2000 FHWA Guidance:
"Bicycling and walking facilities will be incorporated into all transportation projects unless exceptional circumstances exist."

Complete the Streets

Pedestrian Safety

There are a number of strategies that can be used to improve the safety of pedestrians and bicyclists as well as promote a more pleasant environment for adjacent land owners. Some of these include:

Potential Tools for Minnetonka Boulevard:

Pedestrian Refuge Island
- Provides safer crossings for children, seniors & people with disabilities
- Helps to reduce speed of vehicles

Reduced Curb Radii
- Reduces speed at which cars turn corners
- Decreases distance for pedestrians to cross intersections

Alternative Paving Treatments at Crosswalks
- Provides visual cue to drivers

Signalized Crosswalk
- Provides added visibility and promotes pedestrian safety

Crosswalk Flags
- Provides greater visibility of crossing pedestrians

Countdown Clocks
- Greatly reduces auto & pedestrian collisions

Speed Detection Sign
- Advisory warning for motorists to control speed

Accessible Pedestrian Signal (APS)
- Audible indicator for pedestrian crossing
- Provides increased accessibility for the blind

Potential Tools for Neighborhood Cross-Streets:

Reduced Curb Radii
- Reduces speed at which cars turn corners
- Decreases distance for pedestrians to cross intersections

Curb Bumpout
- Decreases intersection crossing distance for pedestrians
- Potential for landscaping
- Protects parked cars

Curb Extensions
- Decreases intersections crossing distance for pedestrians
- Potential for landscaping

Alternate Paving Treatments at Crosswalks
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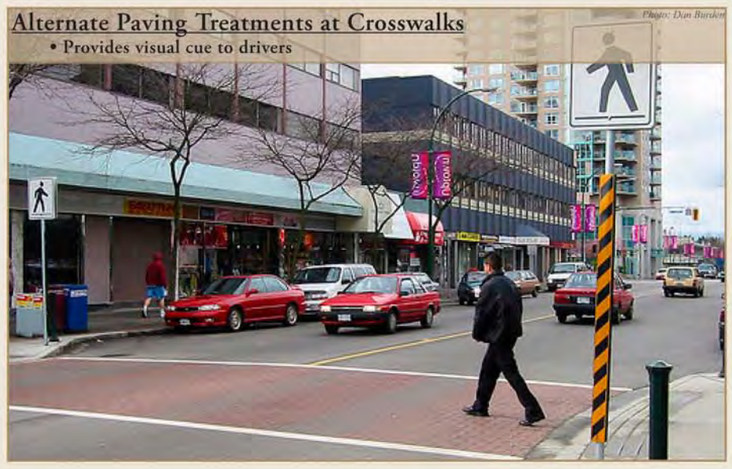

Alternate Paving Treatments at Crosswalks

- Provides visual cue to drivers

Countdown Clocks

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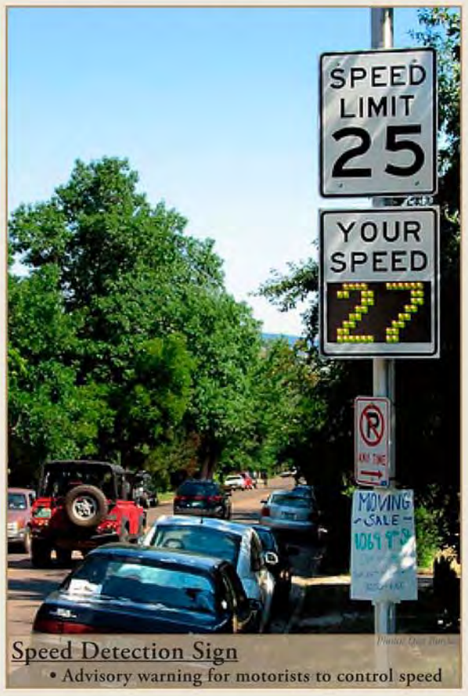


Speed Detection Sign

- Advisory warning for motorists to control speed

Bike Support Facilities

Providing adequate bicycle facilities promotes bicycle commuting as well as increased recreational use. When effectively partnered with public transit, the bicycle offers a greater diversity of transportation options.

"The installation of secure bicycle parking at transit stops, combined with targeted bicycle facility investments...can be expected to increase suburban transit use significantly in many communities."

National Walking & Biking Study
FHWA (1992)

Some specific examples of bike support facilities include:

Bicycle Repair / Retail Shop

- Repair & Maintenance Services
- Bicycle sales
- Parts & gear

Vertical Storage Racks

- Provides increased storage capacity in small areas

Bike Shelter

- Provides protection from the elements
- May be accompanied by kiosks, maps, signage, advertising, etc.

Custom Bike Racks

- Add to street interest & complement streetscape

Bike Lockers

- Provided on a rental basis
- Available at many Park & Ride and downtown locations

Bike-Share

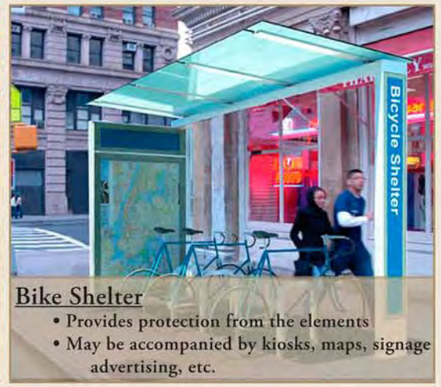
- Partnerships with health care companies to provide bicycles & kiosks
- Bicycle use is free, with credit card deposit
- Bicycles can be checked out and returned to any kiosk throughout the area, but are required to be returned within 24 hours of checkout
- Kiosks are electronic (some solar-powered) and require no attendant

Bike-Transit Center

- Provide secure parking with on-duty attendant.
- Bicycle related retail, rental, repair, and share/loan programs
- Bicycling and transit information center
- Potential for changing room and/or shower facilities
- Incorporates public art and state-of-the-art technology

Vertical Storage Racks

- Provides increased storage capacity in small areas



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- Available at many Park & Ride and downtown locations

Landscape Treatments

There are many ways to enhance the visual quality of the Minnetonka Boulevard (County Road 5) corridor, including streetscape treatments, interpretive features and gateways. Gateways occur at major road crossings where there are changes in land use, neighborhood boundaries or city boundaries. Gateways are important as symbolic points of reference for those who identify with the surrounding area. The study corridor includes City gateways at I-494, Hopkins Crossroads, Hwy 169 and Hwy 100. Additionally, the corridor provides many opportunities to recognize adjacent neighborhoods and commercial districts through signs, lighting, tree planting, decorative fencing and other streetscape design motifs. There is also opportunity for the incorporation of artistic and cultural interpretive features throughout the corridor.

Sidewalk Cafes

Photo: www.pedbikeimages.org/Dan Burden

Alternative Paving & Crosswalk Treatments

Image from the Metropolitan Design Center Image Bank.
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Unique Light Fixtures

Photo: www.pedbikeimages.org/Dan Burden

Hanging Planters

Custom Signage

Recreational Signage

Newspaper Corals

Landscaped Median

Photo: www.pedbikeimages.org/Dan Burden

Meandering Sidewalk

Street-Side Plaza

Street Furniture

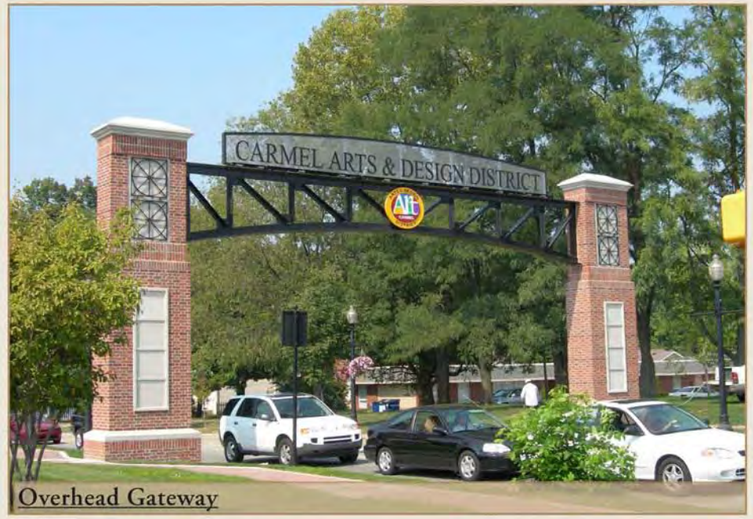
Photo: www.pedbikeimages.org/Dan Burden

Custom Bus Shelter

Photo: www.pedbikeimages.org/Dan Burden

Informational Kiosks

Median with Monumentation



Overhead Gateway

Overhead Gateway

Landscape

Sculpture

Pillar & Landscaping

Flags & Banners

Sculpture

Landscaped Arbor with Seating

Pillar & Monumentation

Historical / Cultural

Sculptural / Artistic

There is an opportunity to incorporate historical and cultural as well as sculptural and artistic features into the corridor. There are locations along the corridor, such as the Burwell House in the Minnetonka Mills District, that serve as a historical and cultural node. Artifacts that relate to the milling history could be placed at key locations to promote the history and culture of the area. There may also be an opportunity to reuse some of the limestone pieces dismantled from the benches and picnic tables of Lilac Park in St. Louis Park. Other opportunities exist to promote landscape art throughout the corridor through the use of natural materials or sculptures that imitate natural forms and functions.

In a further attempt to provide a "Link to the Lakes", a rubber-wheeled trolley system could be introduced along Minnetonka Boulevard, like the one that is operated seasonally by the Chamber of Comerce in Wayzata. This would recreate the connection that once existed between Minneapolis and Lake Minnetonka through the streetcar system of the early 1900's.

Water Resource Improvements

In a sense, every street is a stream. The stormwater run-off from our streets ultimately ends up in our lakes and rivers. We should be aware of this and make efforts to treat stormwater at its source. Many techniques exist for treating stormwater that will ultimately improve the water quality of our lakes and streams, reduce run-off and recharge aquifers. This is especially important on Minnetonka Boulevard as Minnehaha Creek runs directly adjacent to it for a large portion of the corridor. Improving the water quality of Minnehaha Creek will help to promote the further utilization of the Creek for recreational activities, including canoeing and wildlife viewing.

Envision Minnetonka Blvd. as a "Green Street"

In addition to the actions being undertaken by the Minnehaha Creek Watershed District and Cities to improve stormwater treatment facilities, further water quality can be made by promoting and/or implementing the following on Minnetonka Boulevard.

- *Streambank restoration in appropriate areas*
- *Stormwater management techniques and water quality improvement practices*
  - *Raingardens*
  - *Bio-swales (along roads or in curb bump-outs)*
  - *Filter strips*
  - *Pervious pavers*
  - *Green roofs on adjacent buildings*
- *Increased awareness of water quality impacts to the Creek and beyond:*
  - *Informational kiosks at key points*
  - *Emblems on storm sewer inlets (No Dumping)*
  - *Custom man hole covers, well heads, etc.*
  - *Signage at outfalls*

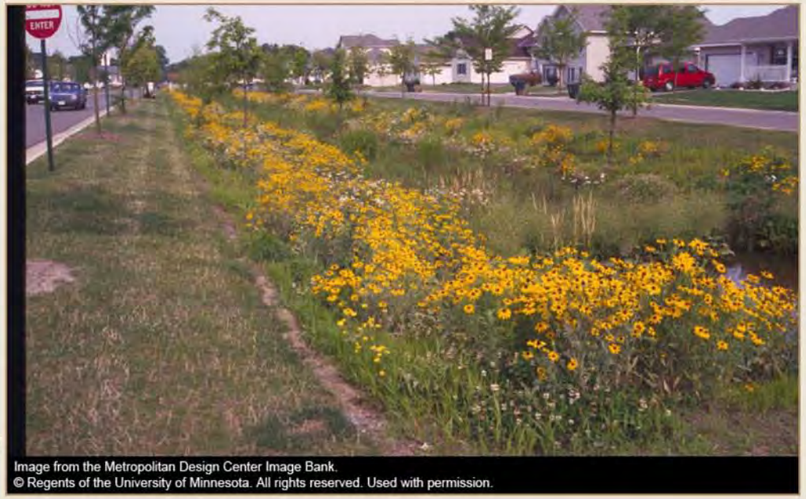
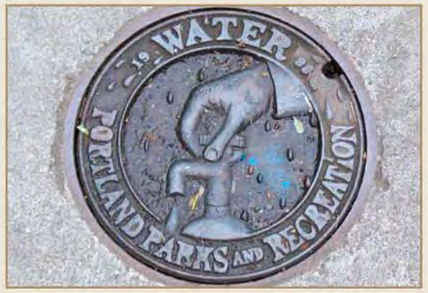
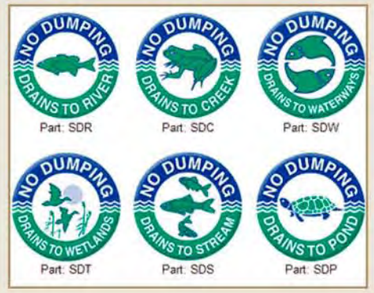
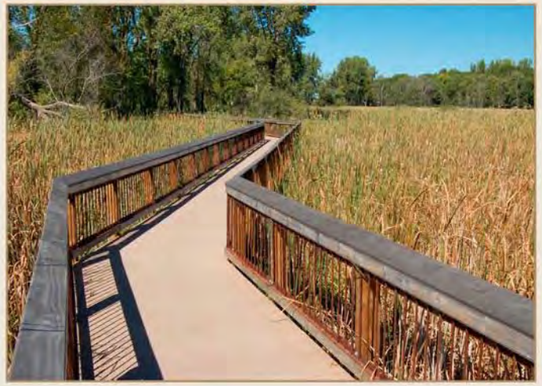


Image from the Metropolitan Design Center Image Bank.

Informational Sign







There are support facilities for creek users throughout the City of Minnetonka, where the Creek runs relatively parallel with Minnetonka Boulevard. These includes canoe launches, landings, overlooks and parking facilities. These facilities also extend beyond the border of Minnetonka, throughout the length of the entire creek corridor.

The Minnehaha Creek Watershed District has developed a Canoe Route Map, promoting the utilization of the Creek. The Three Rivers Park District also promotes the use of the Creek through an annual canoe rental and shuttle program between Headwaters Park and County Road 73 (Hopkins Crossroad) during the spring.

There is an opportunity to further support the use of the Creek through :

- *The enhancement of current facilities with*
  - *additional trailheads*
  - *landscape improvements*
  - *added storage facilities*
  - *additional parking*
  - *added amenities (benches, drinking fountains, restrooms, trash bins, etc.)*
- *Creek-view overlook platforms*
- *Habitat restoration - promote wildlife and wildlife viewing opportunities*
- *Increased visibility of the Creek by creating view corridors and adding signage*
- *Creek recognition features at crossing points*

Creek Utilization Opportunities

Public Input & Open House:

On Tuesday, October 21, an open house and public presentation was made for the communities of St. Louis Park, Hopkins and Minnetonka. The intent of this open house was to propose ideas for improving the Minnetonka Blvd. corridor and gathering public opinion. Included in the presentation was background information and analysis about the current environment of Minnetonka Blvd. A number of opportunities for potential improvements that could be made along the corridor were also presented.

Comments were gathered on the subjects of how the road functions, its appearance and how people use it. The public was also asked to identify which potential improvements they would give the highest (or lowest) priority to. It was stressed that while there are currently no plans for road reconstruction on Minnetonka Boulevard, there are numerous other projects that are moving forward on properties and roadways that lie adjacent to or intersect it. Some of these include: Plans to improve recreational access to Minnehaha Creek; Plans to improve bikeways and trails; the MnDOT Highway 100 interchange project and private development proposals. These projects will have an impact on Minnetonka Blvd. Conversely, there may be opportunities to implement portions of this plan as these related development projects go forward. For this reason, a comprehensive look at Minnetonka Blvd. is timely.

The input that was received and summarized on the following page helped us gain an understanding of the important functions of the Boulevard and how it could best be improved to support the wide variety of uses and adjacent properties.

Two separate meetings were held in tandem. The first meeting was targeted at St. Louis Park residents, the second accommodated Minnetonka and Hopkins residents. Open house notices were mailed out to residents within each community and special interest groups such as bicycle clubs were also informed.

Turnout was good, with roughly 30 people attending each session. All attendees were asked to fill out a survey, ranking their priorities for the corridor. The survey and project exhibits were also posted on the internet in an effort to reach citizens who could not attend the presentation. The top priorities were similar for residents of each community with slight differences in the ordering. A complete listing of priorities for each community can be found in the appendix.

The cumulative ranking of the top priorities are as follows:

1. Pedestrian Safety Improvements
2. A Continuous East/West Bike Lane
3. A Multi-Modal Scenic Corridor
4. Additional Tree Planting & Landscaping

Top 4 Priorities

1. Pedestrian Safety Improvements
2. Continuous East/West Bike Lane
3. Multi-Modal Scenic Corridor
4. Additional Tree Planting/Landscaping

Minnetonka Boulevard (County Road 5)
OPPORTUNITY RATING FORM

WHAT PRIORITY WOULD YOU GIVE THE FOLLOWING POTENTIAL IMPROVEMENTS? (1=HIGHEST, 12=LOWEST)

	PRIORITY RATING (1-12)
1. MULTI-MODAL SCENIC CORRIDOR	_____
2. CONTINUOUS EAST/WEST BIKE LANE (ON-ROAD)	_____
3. COMMUTER BIKE SUPPORT FACILITIES	_____
4. RECREATIONAL (OFF-ROAD) MULTI-USE TRAILS	_____
5. PEDESTRIAN SAFETY IMPROVEMENTS	_____
6. TRAFFIC FLOW IMPROVEMENTS	_____
7. IMPROVED TRANSIT FACILITIES	_____
8. CITY AND COMMUNITY GATEWAY IDENTIFICATION	_____
9. COMMERCIAL PROPERTY UPGRADES	_____
10. ADDITIONAL TREE PLANTING/LANDSCAPING	_____
11. IMPROVED CREEK ACCESS & VIEWING OPPORTUNITIES	_____
12. CORRIDOR HISTORY INTERPRETIVE FEATURES/ARTWORKS	_____

PLEASE ANSWER THE FOLLOWING QUESTIONS:

I LIVE IN (CIRCLE): St. Louis Park Hopkins Minnetonka Other

I CURRENTLY USE MINNETONKA BLVD FOR (CIRCLE ALL THAT APPLY):
Commuting-Auto Commuting-Transit Commuting-Biking Local Auto Trips
Sidewalks Access To Recreation Access to Creek Other (Please Specify)

DO YOU OWN OR RENT PROPERTY ON MINNETONKA BLVD?
Own Home Own Commercial Property Rent Home/Apt Lease Commercial

WHAT OTHER IDEAS OR COMMENTS DO YOU HAVE ABOUT THE MINNETONKA BLVD. CORRIDOR? (FOR ADDITIONAL ROOM, PLEASE USE THE BACK OF THE SHEET**)**

Open House Survey Results

Design Plan:

It is beyond the scope of this study to propose a detailed and engineered layout for the entire length of the study area, or to resolve all of the potential conflicts between stakeholders, property owners and agencies who have an interest in the roadway. Rather, the intent is to develop a set of general principles and a range of ideas that would address the goal of the County and Cities to describe a street that considers multiple modes of transportation and various reasons for traveling on it, from commuting to recreation to local shopping. Based on a positive response received at the two public meetings, an overall theme of "Link to the Lakes" should be considered, which ultimately could extend from Lake Minnetonka to the Minneapolis Grand Rounds.

To provide a framework for this vision, the following Design Plan recommendations are presented. First, in diagrammatic form, are two plans that show how the recommendations would be applied over the entire study area. These are followed by several prototype plans that describe how the design features would be planned out in more detail, at some of the key intersections along the corridor. Some assumptions about the relative cost of various proposed improvements are included at the end of the chapter.

Of the two diagrammatic plans that show the entire study area, the first is entitled "Bike and Trail Improvement Opportunities" and describes these four general design principles:

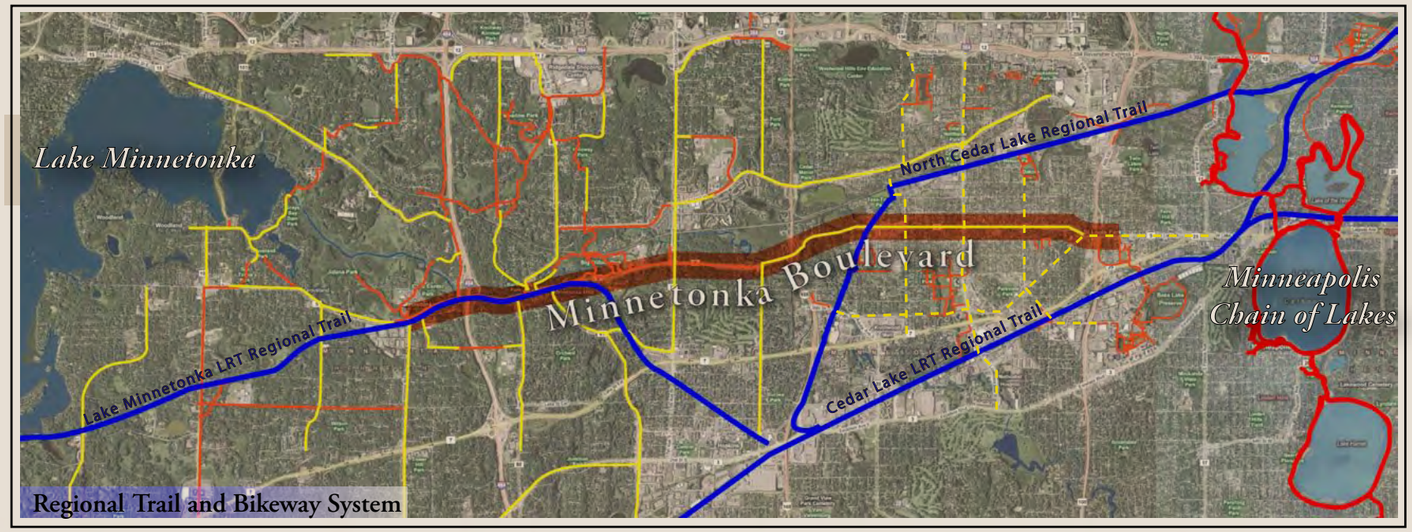
1. **Provide for a continuous on-street bike route**
2. **Enhance pedestrian crossings, esp. at primary intersections**
3. **Create better connections to regional trails**
4. **Provide additional bike and transit support facilities**

The second diagrammatic plan is entitled "Landscape and Streetscape Opportunities" and it describes these five general design principles:

1. **Emphasize the natural landscape by framing views and by installing new plantings within the road ROW and on adjacent institutional properties**
2. **Use formal arrangements of trees and lighting in commercial areas only**
3. **Use landscape as the main unifier along the corridor; allow other features to change between districts to reflect their unique identities**
4. **Develop a hierarchy of gateways, at highway interchanges, commercial districts and at pedestrian crossings, to reinforce regional identity**
5. **Identify opportunities to improve views of Minnehaha Creek by thinning out vegetation and to improve access for recreational users of the Creek.**

The prototype plans describe these recommendations in more detail at major intersections including Plymouth Rd and Texas Ave.; at the Hwy 169 interchange and at a neighborhood intersection; Hampshire Ave. Additionally, several important goals for a future Hwy 100 bridge crossing have been included.

Due to the limited scope of this study, several "areas of further study" have been identified that will require additional master planning thought, engineering effort, public input or agency review before the final form of ideas suggested in this report can be verified. For example, a major goal of the Design Plan is to encourage a continuous on-street bike route, consistent with both city policy and county standards. There may be obstacles to achieving this in some areas due to grading constraints or ROW width limitations. Potential solutions are suggested in this study, including the purchasing of additional ROW or a reduction in traffic lane dimensions. Ultimately, the preferred solution will be determined at the time of implementation for a given segment of the corridor, based on local factors and interests.

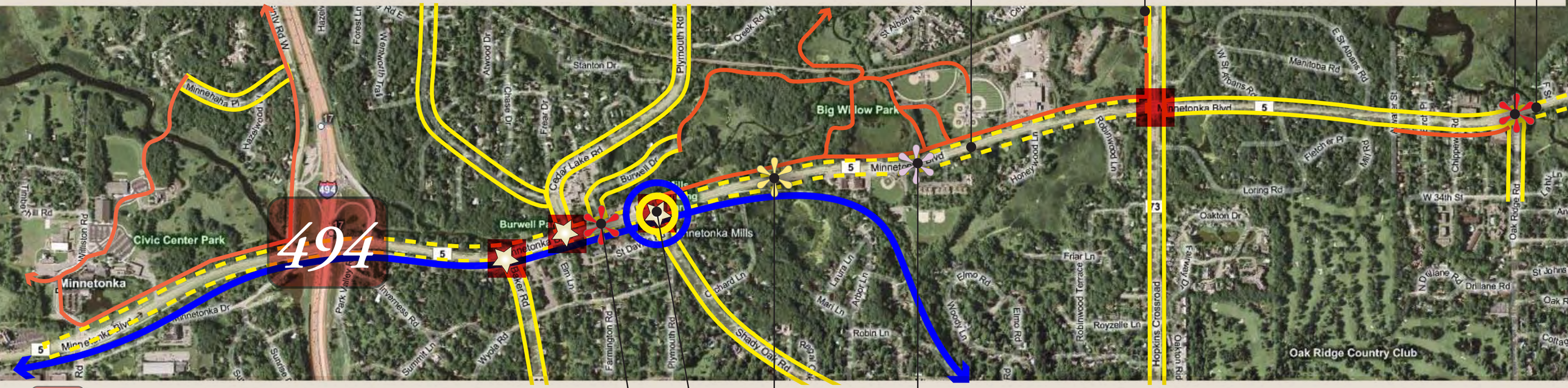


Proposed on-street bike route extension
(Minnetonka City Hall to Hopkins Crossroad)

Potential future trail extension
(Connection to bus stops at Cedar Lake Road)

Replacment bridge over Creek needed to allow for on-street bike route and sidewalks

Intersection improvements needed



Potential pedestrian tunnel

Potential pedestrian bridge

Improvements needed to establish better connections between on-street bike routes, recreational trails, the Minnetonka Mills District and Lake Minnetonka LRT Regional Trail

Intersection improvements needed

Major Highway Interchange - These interchanges act as gateways for automobile traffic entering the corridor. Significant improvements are needed to ensure bicycle & pedestrian safety.

Primary Road Intersection - Minnetonka Blvd. is intersected by other high-moderate volume roads at these locations. Improvements are needed to ensure bicycle & pedestrian crossing safety.

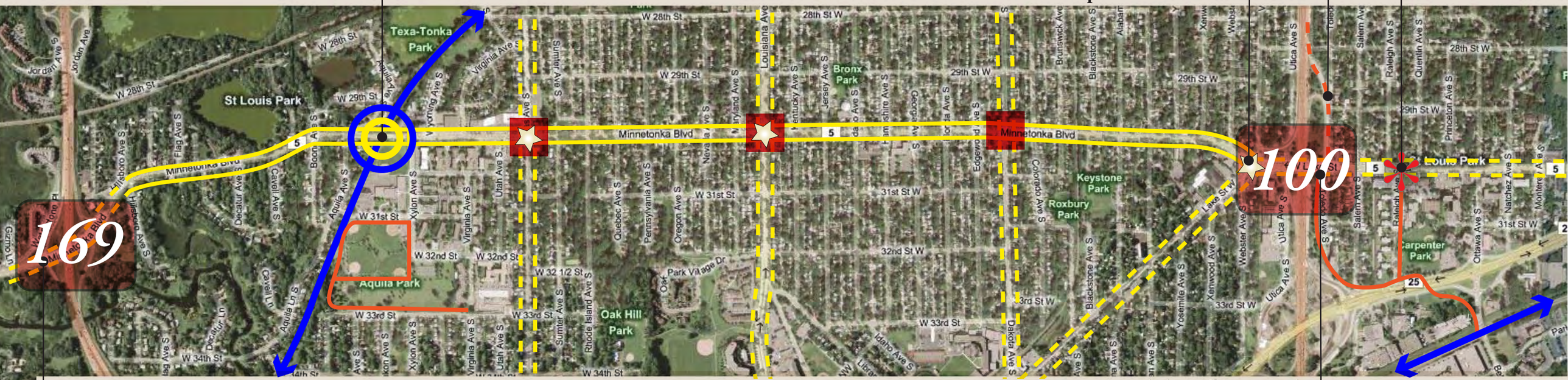
Other Intersection\Crossing - These points indicate other significant intersections and crossings with lower traffic volumes. The need for improvements will need to be evaluated on a case by case basis.

Regional Trail Connection Point - These points indicate opportunities for improved regional trail access. Emphasis should be placed on safe and convenient access.

Bike Support Facility Improvements - These areas could benefit from upgrades or installation of additional support facilities.

- Designated On-Street Bike R
- Proposed On-Street Bike Rou
- Existing Off-Street Trail
- Regional Trail

Bike & Trail Improvement Opportunities - Mi



Corridor Improvements

Continuous On-Street Bike Route:

Much of the eastern portion of the Minnetonka Blvd. includes an on-street bike route. Closing the gaps in the on-street bike route and extending them west to Minnetonka City Hall is a high priority. This will create a continuous west-east bike thoroughfare, create connections to regional trails, link the city halls of Minnetonka & St. Louis Park and promote the overall concept of "Link to the Lakes." Signage and striping improvements will be made throughout the entire length of the corridor to promote a consistent theme.

Intersection and Crossing Improvements

Major Highway Interchanges:

Due to existing bridges and increased traffic volume, there are significant challenges to ensure bike safety. To ensure bike safety, special attention needs to be paid to potential bike lane and right-turn lane conflicts. Alternative paving treatments should be used at these locations to enhance pedestrian crossing safety as well as provide gateways to the corridor. In addition to ensuring a well-signed and siganlized intersection, these locations should also incorporate the use of countdown timers.

Primary Road Intersections:

Due to high-moderate volume at these intersections, a number of safety provisions might be employed. Countdown clocks and alternative pavings should also be considered for pedestrian crossings. Reduced curb radii, curb bumpouts & curb extensions could be used to reduce the speed at which cars turn corners and reduce the crossing distance for peds. Crosswalk flags may also be considered at intersections with high pedestrian activity.

Other Intersections:

The improvements to these intersections may be very similar to that of the "Primary Road Intersections." Because of their lower volume, certain traffic calming techniques may be better suited here. These will need to be evaluated on a case by case basis.

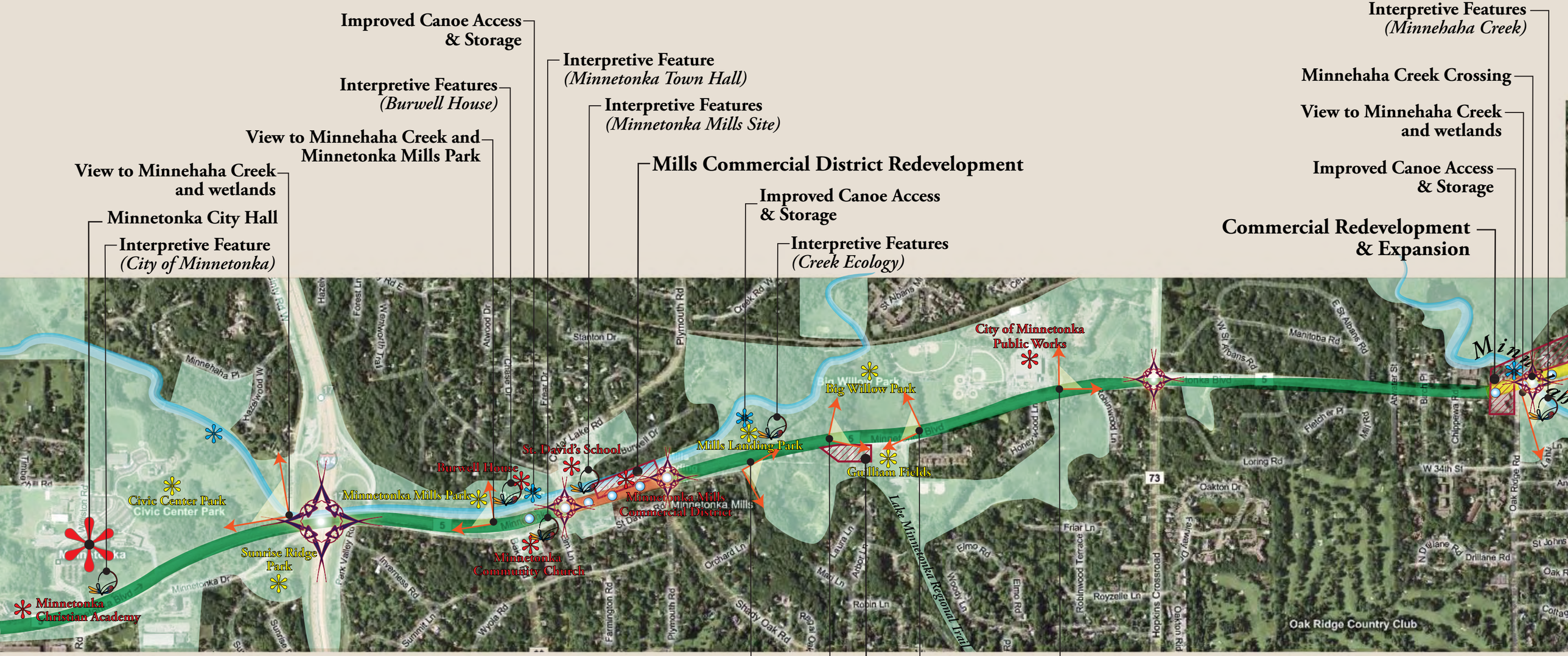
Other Crossings:

Crossings may be needed for locations other than intersections, such as at certain bus stops and areas that have pedestrian activity on both sides of the road. Solutions that could address this situation include grade-separated crossings (bridges & tunnels), pedestrian refuge islands, signalized and/or raised crosswalks and a mid-block narrowing of the road. These options will need to be evaluated on a case by case basis.

Bike Support Facility Improvemets:

These locations recieve high bicycle traffic due to intersecting trails, adjacent commercial areas, and transit stops. Investments should be made to further support the use of bicycles for transportation and recreation. Improvements may include bike racks, bike lockers & shelters. A bike transit center could also be considered, which has the potential to include a bike-share program.

nnetonka Boulevard (Co. Road 5) Design Plan



- Complementary Adjacent Land Uses / Community Resources
- Commercial Property
- Park / Natural Feature
- Civic / Institutional Resource
- Creek Access
- Interpretive Feature(s)
- Gateway
- Improved Street Lighting
- Significant Viewshed

View to wetlands
View to Big Willow Natural Area
Commercial Redevelopment
View to Big Willow Natural Area
View to wetlands

Landscape & Streetscape Opportunities - Min

Gateways:

The improvement of gateways reinforces the notion of the corridor and can be accomplished in many ways, including landscaping, signage, sculptural pieces, and overhead markers. The size and scale of gateways will respond to their location. Gateways at the major highways will provide much grander statements than those at smaller intersecting streets. Gateways into Minnetonka may take on a more rural character while those to St. Louis Park will have a more urban feel.

Interpretive Features:

Public art and interpretive features lend a unique character to communities. These features can draw from historical events and places or simply be celebrations of art and landscape. General locations are identified for locating such features. However, careful consideration should be made to determine the size, scale and "fit" of these features to their location.

Street Lighting:

Street lights contribute to the overall character of the corridor during the day as well as at night. Thematic lamposts can be selected, incorporating signage and landscape planters. There is opportunity for these lamposts to retain a commonality that supports the corridor as a whole in addition to providing specific identification to certain communities, neighborhoods or districts. Street lighting should be considered from the pedestrian scale and light levels should be chosen to provide safe usage of the corridor, but not disrupt the rural character of many locations.

Viewsheds:

The abundance of natural and scenic resources along the corridor provide many locations where outstanding views can be found. In some areas this naturally exists. In other areas, the landscape needs to addressed to achieve this. This may include selective cutting and clearing of shrub layers and understory and additional planting to frame views. These decisions will need to be specific to each location.

Commercial Redevelopment:

Most commercial properties along the corridor are located at the identified intersections and vary in size and condition. Many could benefit from updates to their facades and improvements to their overall appearance. In some cases, redevelopment of entire commercial intersections may be desirable. In these cases, there is a lot of opportunity to cooperate with developers to help contribute to the quality of the overall corridor. Redevelopment opportunities will need to be further examined.

Tree Planting Strategy

Informal — Formal

Landscape Frame Planting:

Many areas along the corridor retain a very rural and natural feel. Minimal planting is required in these areas, and in some cases no planting may be required at all. The trees in these areas are intended frame the corridor and frame views to adjacent natural features, including Minnehaha Creek and wetlands. Buckthorn removal may be needed in some areas as well as selective cutting of understory vegetation.

Street Tree Planting:

The more "urban" areas of the corridor require a more manicured and formal planting scheme. This predominately occurs in the eastern portion of St. Louis Park, but may also be appropriate at certain commercial districts. Tree planting in these areas should reflect a typical 40ft. on-center street tree planting scheme along both sides of the road. Tree selection for these areas should also reflect a more formal character.

netonka Boulevard (Co. Road 5) Design Plan

Minnetonka Boulevard & Plymouth Road

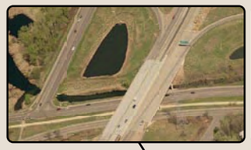
Minnetonka Boulevard & Highway 169

Minnetonka Boulevard & Texas Avenue

Minnetonka Boulevard & Hampshire Avenue

Minnetonka Boulevard & Highway 100

Minnetonka Boulevard & I-494

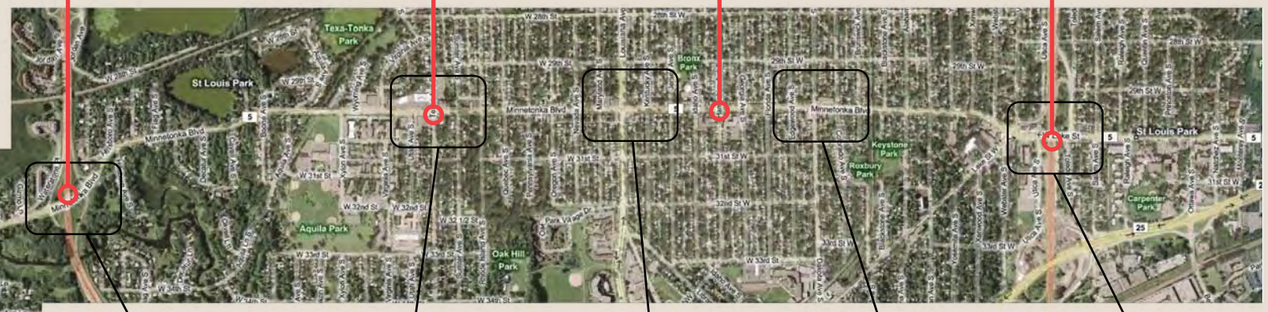


Minnetonka Boulevard & Baker Road

Minnetonka Boulevard & Plymouth Road

Minnetonka Boulevard & Shady Oak Road

Minnetonka Boulevard & Co. Road 73



Minnetonka Boulevard & Hwy. 169

Minnetonka Boulevard & Texas Avenue

Minnetonka Boulevard & Louisiana Avenue

Minnetonka Boulevard & Dakota Avenue

Minnetonka Boulevard & Hwy. 100

Prototype Intersection Key

Minnetonka Blvd and Plymouth Rd – Minnetonka, MN

Major Intersection Improvement Recommendations:

General: This prototype and illustrated concept represent recommendations for a typical major intersection either within the City of Minnetonka, or in other cities where intersections are framed by natural landscape open space context.

Vehicular Road Concepts:

- Enhance the visual quality of the intersection to give distinction and character through the use of special pavement detailing
- Create strong visual recognition to vehicle drivers that the intersection is a crossing point for pedestrians and bicyclists by clear delineation of crosswalks using special pavement patterns and colors

Pedestrian Corridor Concepts:

- Create pedestrian scale corner plazas at road intersection with special paving, pedestrian scale lighting, and landscape framework
- Use special crosswalk signalization systems
- Connect the intersection to other sidewalk and trail systems
- Incorporate other pedestrian components to embellish the intersections including benches, bus stops, trash receptacles, landscape, directional signage, and high quality materials.

Surrounding Framework:

- Create an overall landscape concept that frames the intersection, reinforces the "Scenic Corridor" image and integrates the various trails and adjacent land uses. Street trees on Minnetonka Blvd are part of this treatment
- Use landscape to provide color, seasonal change and spatial definition
- Allow views to interesting elements such as Minnehaha Creek and create alternative trail connections to cross roads
- Provide special lighting fixtures and indirect lighting concepts to enhance the scenic corridor
- Link cross walks and roadside plazas to local and regional trail pedestrian / bicycle systems

Prototype: *Minnetonka Blvd. & Plymouth Road*

Minnetonka Blvd and US Highway 169 – Minnetonka / St. Louis Park, MN

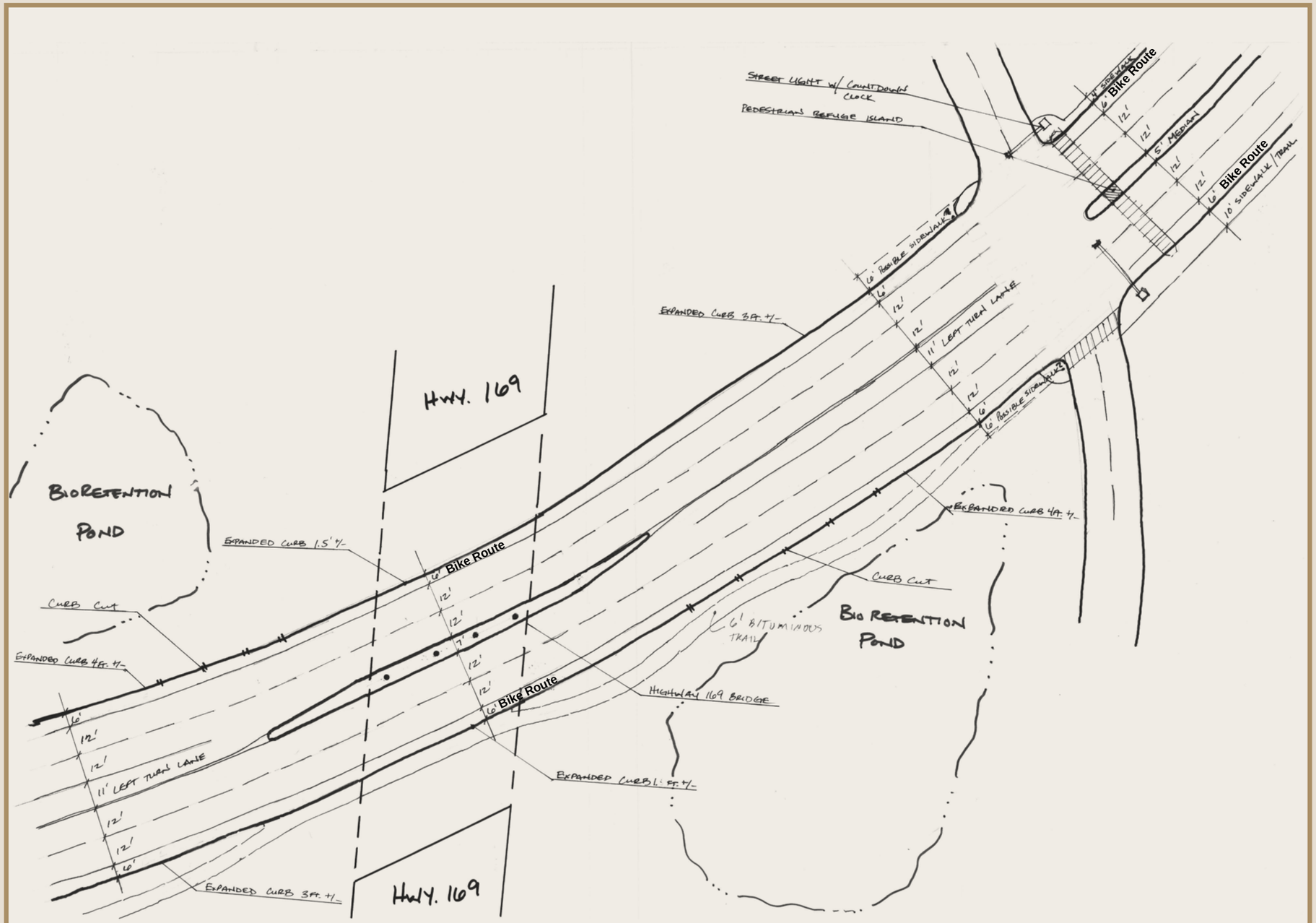
Improvement Recommendations - City Gateway:

General: This prototype and illustrated concept represents recommendations for enhancement of one of several major city arrival "Gateways" that occur where a major regional road system, including Interstate Freeways and State Highways, intersects with Minnetonka Blvd. These are special opportunity areas to not only create a high quality arrival experience for residents and visitors, but also allows the ability for an enhanced woodland and open space environment that can support the idea of a "Scenic Corridor" for Minnetonka Blvd.

Recommended Goals and Design Principals:

- Develop a comprehensive, large scale landscape master plan for the entire intersection of the Interstate or State road corridor system with Minnetonka Blvd. This plan should include all of the entrance and exit ramps, as well as all land contained within the Right of Way beginning with the point where the ramps intersect with the actual Freeway.
- Develop the plan to include a major restoration of woodland and a more natural, informal landscape image. This should included dense tree areas as well as meadow clearings. Allow all roadways to have an experience of moving through this great landscape setting.
- Use the plant material to visually mitigate the pragmatic, engineered slopes and other slope and storm water conditions that have been created in support of the major freeway.
- Develop the landscape concept to allow Minnetonka Blvd to be the visually strongest landscape corridor, allowing the freeway to have the appearance of moving through the Minnetonka Blvd landscape. At present, the freeway corridor interrupts the visual flow and character of Minnetonka Blvd.
- Allow new trails and sidewalks to meander through the new woodland landscape
- Provide clearly delineated road crossings with large painted stripping on the road surface where cars, pedestrians and bicycles intersect.
- Take special design consideration to mitigate the areas under the existing bridges including the slope embankments and the negative image that currently exists.
- Provide special lighting fixtures and indirect lighting concepts on trees to enhance the scenic corridor and support the experience of driving on Minnetonka Blvd.
- Allow entry monuments or signs to be placed at exit ramps to announce the arrival of people in the respective city where the intersection occurs.
- Basically, the intent is to create an overall landscape context that reinforces the "Scenic Corridor" image and integrates the adjacent residential and community land uses. Use landscape to also provide color, seasonal change and spatial definition.

Landscape Concept: *Minnetonka Blvd. & Hwy. 169 Interchange*



Minnetonka Blvd and US Highway 169 Bridge / On & Off Ramps

Intersection Improvement Recommendations:

General: This plan represents recommendations for the roadway and bicycle route on Minnetonka Blvd at Highway 169.

General Conditions, Guidelines and Design Principle Recommendations:

- Hennepin County long term goals for Minnetonka Blvd calls for the development of a continuous bike route on both sides of the road.
- Current conditions for bicyclists create a dangerous condition where existing bike route or shoulder on Minnetonka Blvd. disappear in the area of the Highway 169 overpass bridge structure. Recommendations for improvements in this area include the establishment of a continuous Bike Route or shoulder in this area to allow for safe movement of bicyclists.
- To allow 12 foot wide vehicular travel lanes to remain, one alternative recommendation would be to lessen the width of the median island in the center of the road that supports the structural columns. A six foot wide bike route / shoulder lane could then be constructed on the outer lanes on both east and west bound lanes.
- Where sidewalks would occur, the sidewalk would be situated immediately adjacent to the roadway curb, with the potential for a short retaining wall on the up hill side to mitigate the current slope embankment beneath the bridge superstructure.
- Should the center median island not be allowed to be reduced in size, then the roadway profile would need to be widened to accommodate the 6 foot wide bicycle route / shoulder resulting in a higher retaining wall section where the curb or sidewalk meet the current slope embankment beneath the bridge superstructure.
- At entry and exit on-ramps, painted crosswalk graphics should be incorporated onto the respective road surfaces if continuous sidewalks / trails become necessary. Pedestrian crossing signalization should be integrated with the pedestrian sidewalk upgrades.
- Sidewalks that occur along the Minnetonka Blvd Corridor in these areas should be aligned to meander through the new proposed landscape setting and be kept as far away from the road as possible. The intent is to take advantage of the open space opportunities and create a more park like experience for users.

Prototype: *Minnetonka Blvd. & Hwy. 169*

Minnetonka Blvd and Hampshire Av. / Georgia Av. – St. Louis Park, MN

Neighborhood Cross-Street Improvement Recommendations:
General: This prototype and illustrated concept represents recommendations for enhancement of typical neighborhood residential cross – street connections along the Minnetonka Blvd. Corridor.

Vehicular Road Concepts:

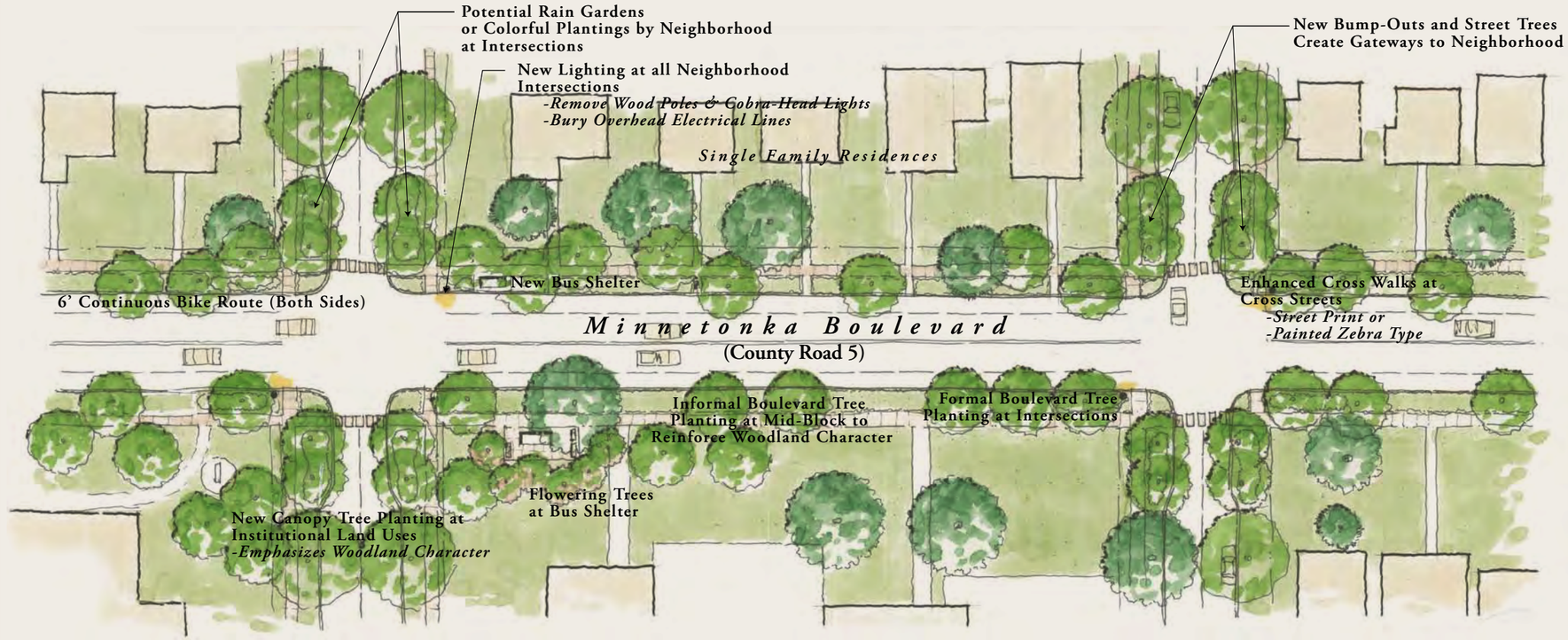
- Improve Minnetonka Blvd to incorporate normal vehicular travel lanes as well as bicycle routes on both sides of the street.
- Where neighborhood roads intersect with Minnetonka Blvd., install bump outs at the entry of each neighborhood roads to create an entry "gateway" expression to the various neighborhoods. Incorporate street trees into the bumpouts to enhance sense of an entry portal. Narrowing of the entrance to the neighborhood road is also a traffic calming solution.
- Create clear delineation of crosswalks using painted stripping connecting the neighborhood road sidewalks.

Pedestrian Corridor Concepts:

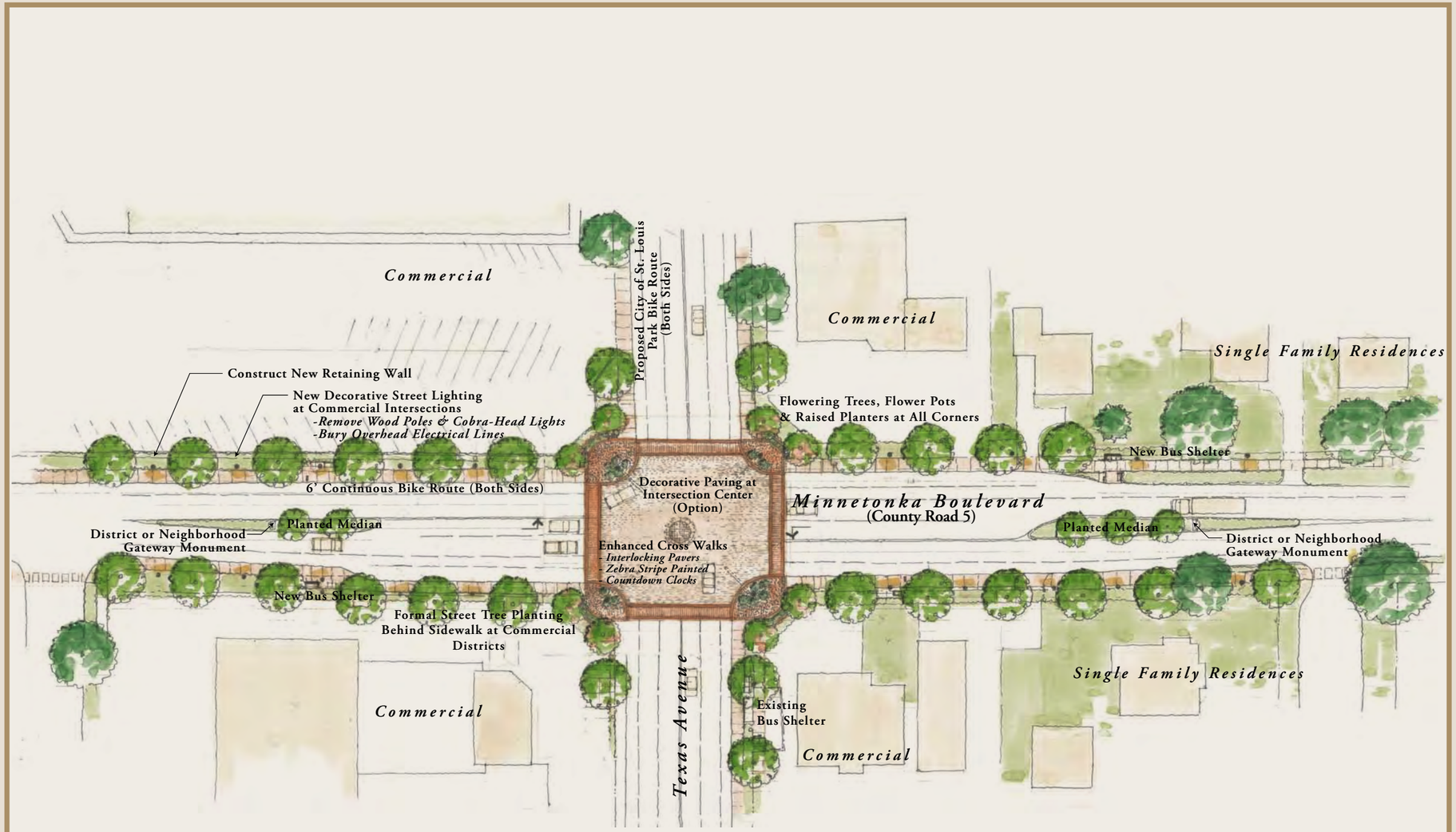
- Create drop curbs where the sidewalks meet the neighborhood roads for easy movement of people, bicycles and prams.
- Incorporate lighting at all neighborhood intersections for safety and designation of the entry.
- Incorporate other pedestrian scale components to embellish the road experience where appropriate including upgraded bus stops, associated trash receptacles, landscape, directional signage, and high quality materials.

Surrounding Framework:

- Develop a comprehensive street tree program for Minnetonka Blvd. that introduces new trees where necessary to reinforce the concept of the scenic corridor and provides street tree maintenance throughout.
- Bury the existing power lines to allow an enhanced corridor image.
- Remove wood poles and Cobra overhead lights
- Create an overall landscape concept that reinforces the "Scenic Corridor" image and integrates the adjacent residential and community land uses. Street trees should be arranged in informal patterns in contrast to the landscape treatment at the major intersections.
- Where special community elements front onto Mtka Blvd such as schools, churches, parks or open space elements, develop the landscape design to visually incorporate these places as extensions of the Minnetonka Blvd Scenic Corridor.
- Use landscape to provide color, seasonal change and spatial definition.
- Provide special lighting fixtures and indirect lighting concepts on trees to enhance the scenic corridor and support a more pedestrian oriented environment
- Work with the adjacent private residential neighborhood homeowners to develop their yards to reinforce the goals of the scenic corridor.



Prototype: *Minnetonka Blvd. & Hampshire / Georgia Avenue*



Minnetonka Blvd and Texas Avenue – St. Louis Park, MN

Major Intersection Improvement Recommendations:

General: This prototype and illustrated concept represents recommendations for a typical major intersection within St. Louis Park or other cities along the Minnetonka Blvd corridor where community retail establishments abut the street and form a more urban statement.

Vehicular Road Concepts:

- Enhance the visual quality of the intersection to give distinction and character through the use of special pavement detailing
- Create strong visual recognition to vehicle drivers that the intersection is a crossing point for pedestrians and bicyclists by clear delineation of crosswalks using special pavement patterns and colors
- Create center planted islands to support reservoir turn lanes while also providing space for planting and other amenities.
- Develop the corner "mini plaza" to not only support pedestrian safety, but to also enhance the visual framework of the intersection

Pedestrian Corridor Concepts:

- Create pedestrian scale corner plazas at road intersection with special paving, pedestrian scale lighting, landscape framework, signage, benches, etc.
- Use special crosswalk signalization systems
- Develop the cross walks, corner mini plazas and the central paving area as a whole visual composition
- Incorporate other pedestrian scale components to embellish the intersections including upgraded bus stops, trash receptacles, landscape, directional signage, and high quality materials.

Surrounding Framework:

- Create an overall landscape concept that frames the intersection, reinforces the "Scenic Corridor" image and integrates the adjacent urban land uses. Street trees on Minnetonka Blvd are part of this treatment arranged in a more formal pattern.
- Include planting in the center of the road to slow traffic and create a sense of a "gateway" to this community retail area
- Develop the intersection and the adjacent retail uses to form more of a "village" expression than of a strip mall
- Use landscape to provide color, seasonal change and spatial definition
- Provide special lighting fixtures and indirect lighting concepts on trees to enhance the scenic corridor and support a more pedestrian oriented environment
- Ultimately, work with retail tenants to create more pedestrian oriented environments with more landscape and coordinated lighting and signage supportive of the whole intersection

Prototype: *Minnetonka Blvd. & Texas Avenue*

Minnetonka Blvd and US Highway 100 –
St. Louis Park, MN

Improvement Recommendations - City Gateway:

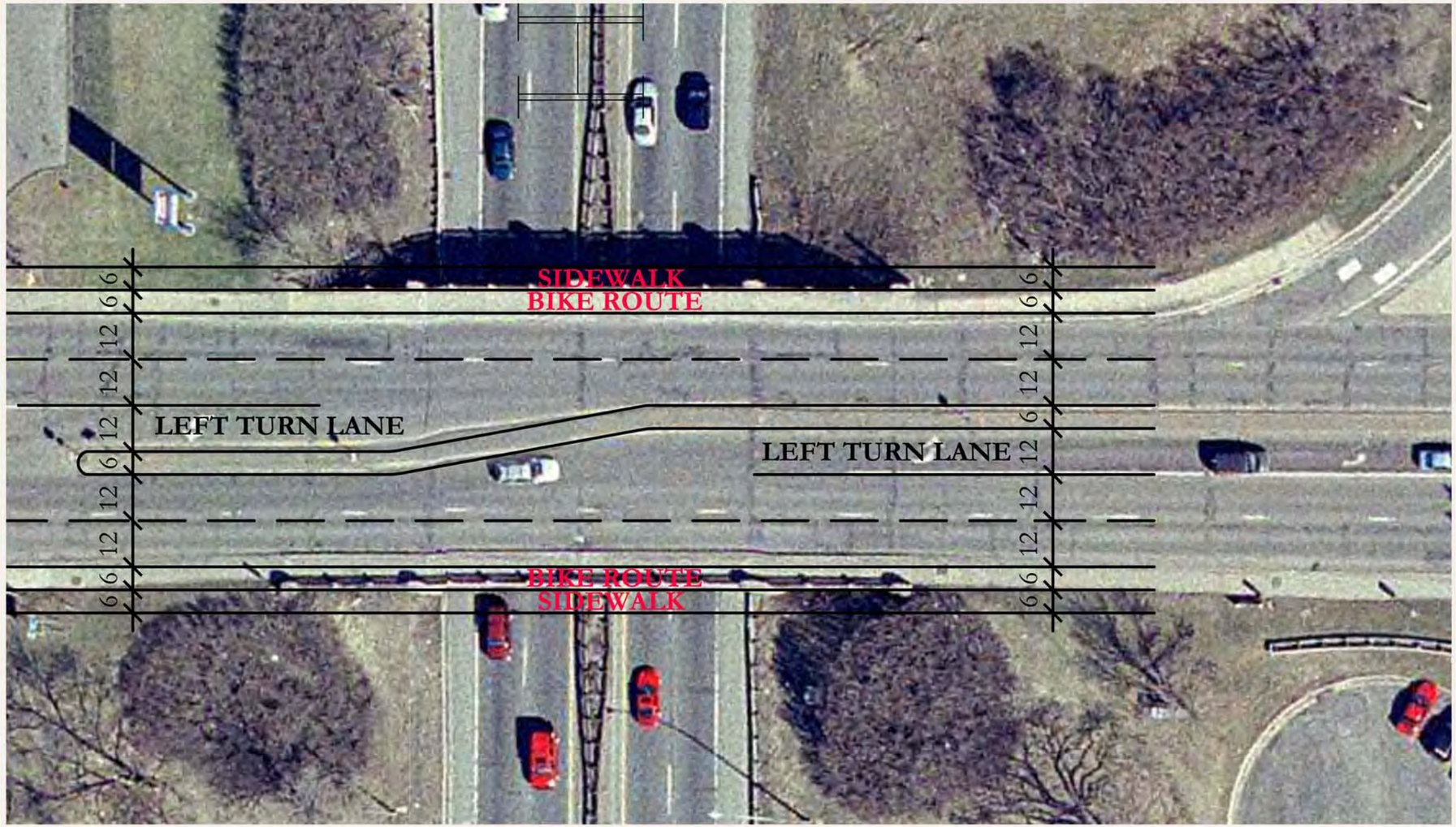
General: This plan represents recommendations for the intersection and overall bridge zone where Minnetonka Blvd crosses Highway 100. It is the understanding of this study team that the Highway 100 Bridge may be scheduled to be replaced by MNDOT in the future. However, this may or may not occur. Therefore, recommendations are described for the bridge and intersection whether the bridge remains or is replaced.

General Conditions, Guidelines and Design Principle Recommendations:

- Hennepin County long term goals for Minnetonka Blvd calls for the development of a continuous bike route on both sides of the road. However, current conditions do not accommodate a bike route and sidewalk on both sides of the road.
- The east and south side of the bridge is an extremely important bicycle connection route to tie to the Cedar Lake LRT Regional Trail, which is the regional bike way route connecting to Minneapolis and the western suburbs. This connection is poorly marked, and is a somewhat awkward alignment and physical connection between Minnetonka Blvd. and the Cedar Lake LRT Regional Trail.
- Recommendations for the current situation are as follows:

  o Allow the sidewalk and bike route to share the same path as a very temporary measure if the replacement bridge is going to occur in the immediate future. And, adjust the south / east corner with a small mini park and clear bikeway connecting link to the regional trail to the south. Provide a regional bike trail map and clear directional signage.

  o If the Bridge is to remain for a long period of time, an alternative idea would include the addition of a new bicycle bikeway of six to eight feet in width, set on the outside of the bridge on only the south side of the existing bridge, that would be supported by brackets attached to the existing bridge structure. The existing sidewalk would then be devoted exclusively to pedestrians, allowing clear definition between the two uses. Establishment of a small mini park and directional mapping system in the south east corner, together with a clear connection to the regional trail connection would also be imperative as part of this approach.

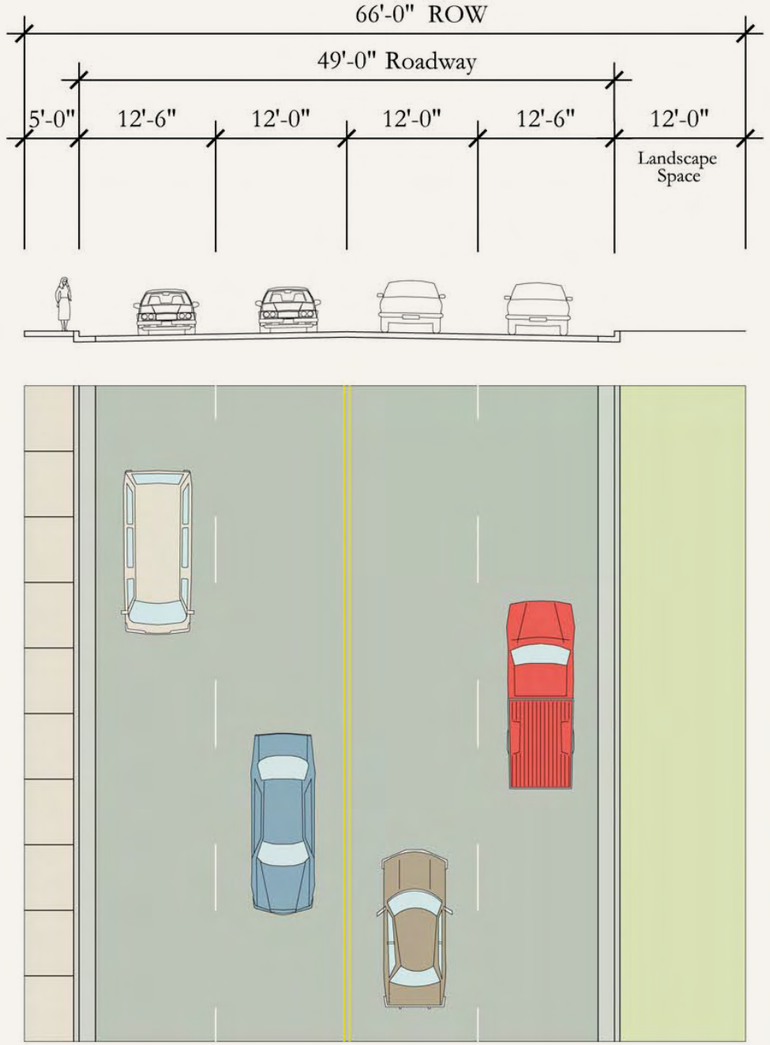


o Preservation of the art deco architectural character and upgrade of the bridge railings and walking surfaces would also be important if the bridge is to remain.

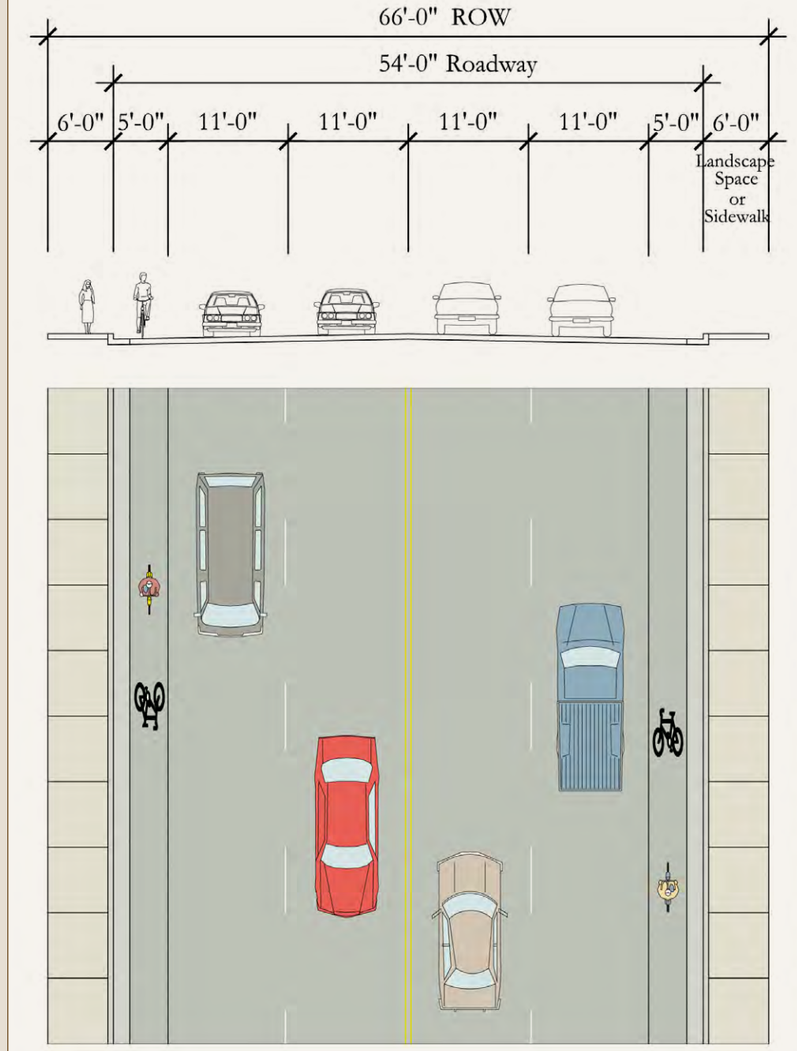
o If the new bridge construction is anticipated, we recommend that separated bicycle lanes and pedestrian walkways be incorporated on each side of the proposed bridge. Allow the cross walks on Minnetonka Blvd to remain on the east end of the bridge only, and tie the bike connections to the cross walks as well as to the Cedar Lake LRT Regional Trail connection. Develop a mini park as well as regional trail map and directional signage exhibits at the south east corner of the bridge.

o In any of the bridge alternatives described above, the landscape framework should be planned and designed for the entire area as one composition. The on and off ramps should be considered "Gateway Entrances" to the City of St. Louis Park, and should be developed so they express a celebrated arrival. Planting should be of a scale that is in keeping with the scale of the major roadways. Therefore large deciduous and evergreen trees should be used as well as lower level plantings to embellish the bridge and the corridor. In addition, the Highway 100 corridor has an historical landscape precedent as a corridor of flowering lilacs. This corridor was called "Lilac Way" and existed between Golden Valley and St. Louis Park. Re-establishment of this historical landscape pattern should be the goal of any new landscape plan. Large lilac shrub massing should therefore be part of the present or future Minnetonka Blvd landscape approach.

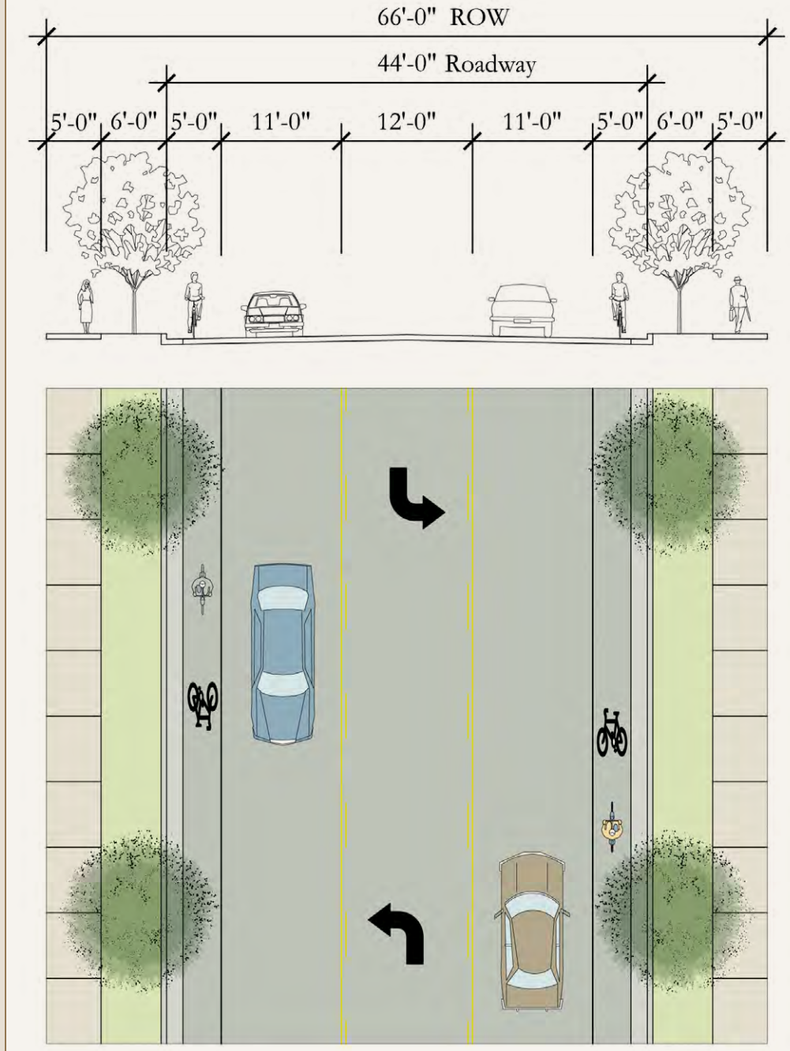
o Finally, the Minnetonka Blvd / Highway 100 Bridge also have historical precedent related to its architectural character as well. Any new bridge proposal would be a great opportunity to celebrate St. Louis Park heritage. It is the contribution of this type of landscape and architectural enhancement that will truly foster the experience of Minnetonka Blvd as a "Scenic Corridor."



Existing Condition
Minnetonka Boulevard near Gizmo Lane

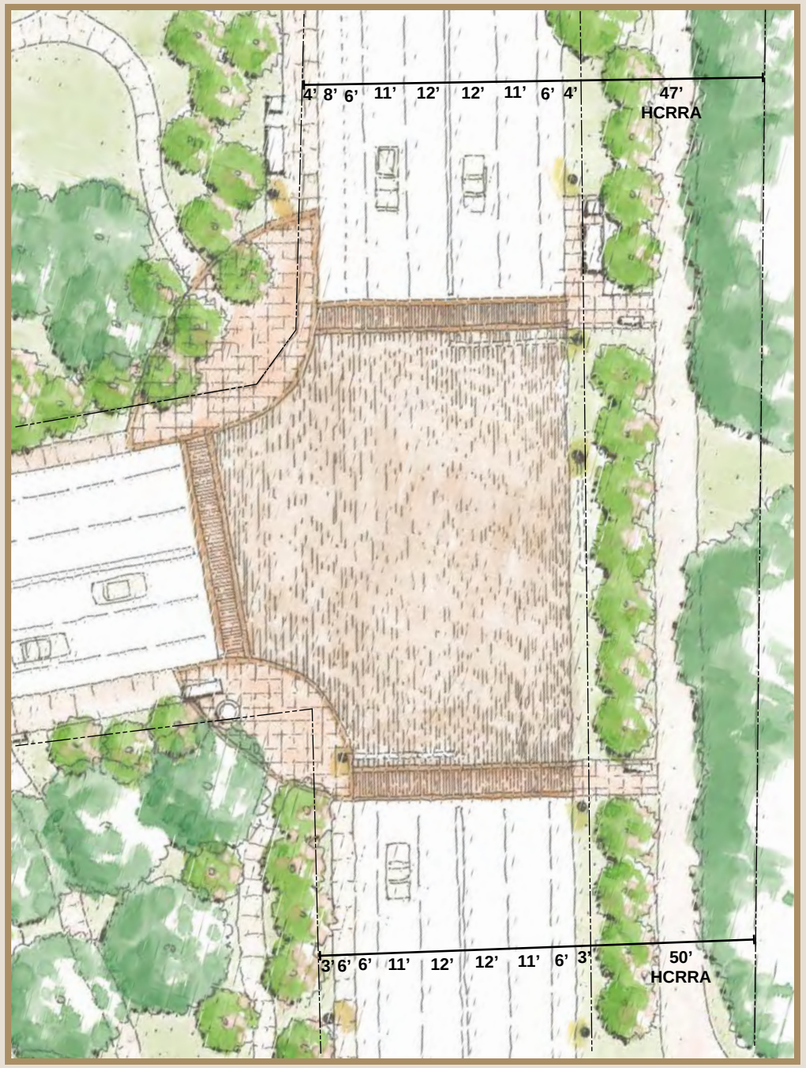


Option 1
Narrowed traffic lanes, increased roadway width
Added on-street bike lanes & sidewalks



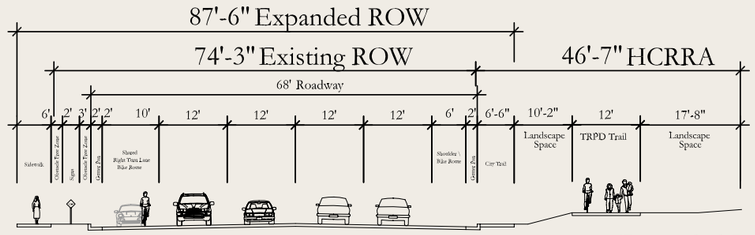
Option 2
"Road Diet" - Reduce traffic lanes from 4 to 3
Added on-street bike lanes, sidewalks & planted blvd.

**Option only applicable in areas of low ADT volumes*

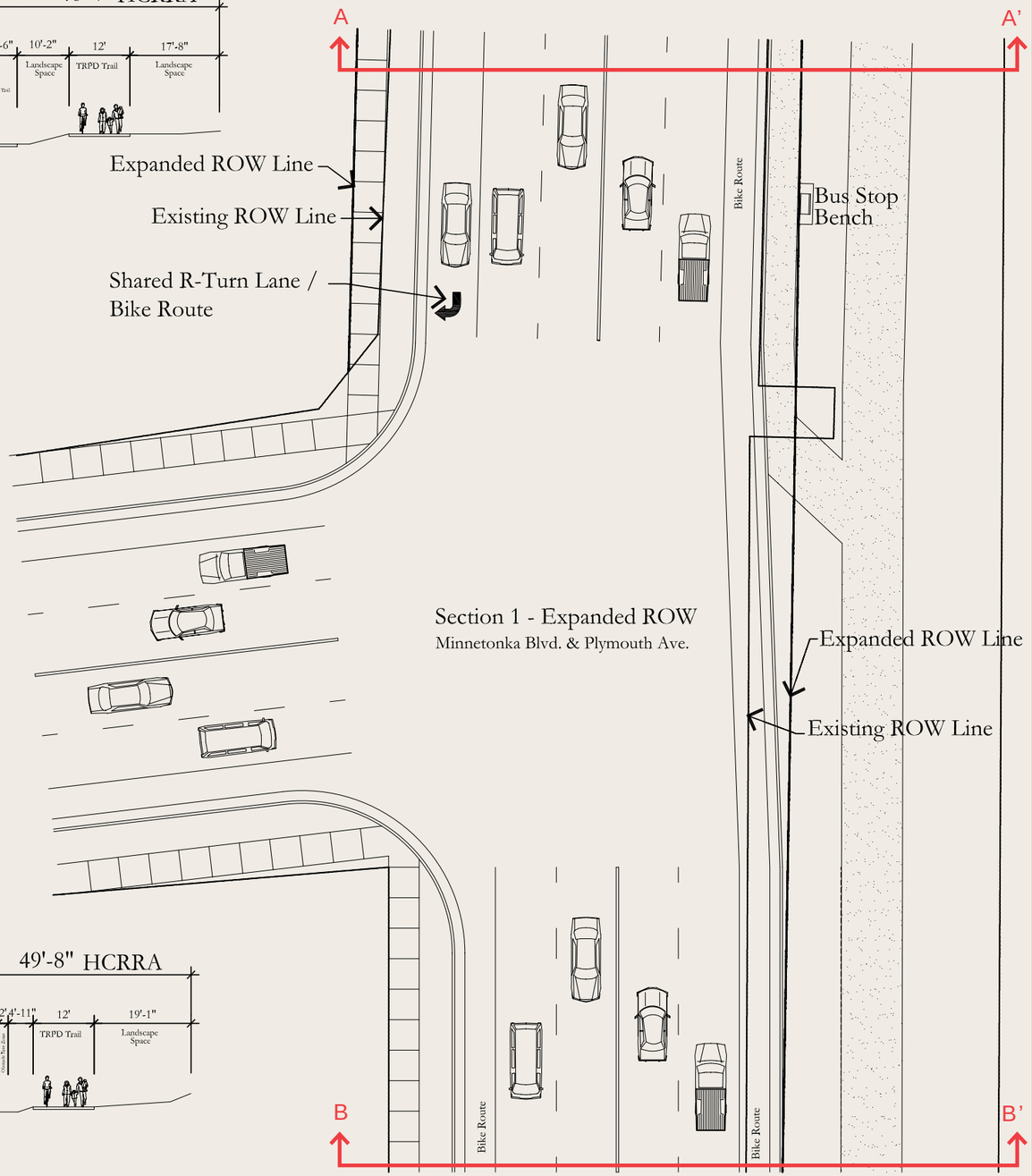


Existing ROW To Remain

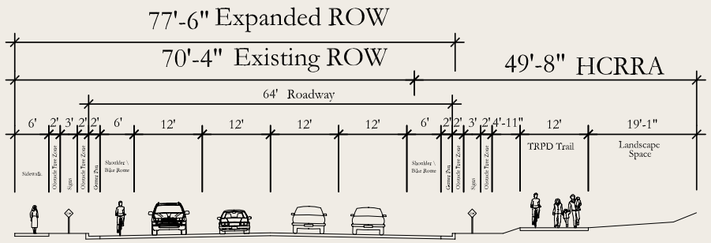
Supporting the adopted County and City policy of incorporating continuous bicycle travel routes on both sides of the road, two alternatives exist that would allow this policy to be implemented in many places along the Minnetonka Blvd corridor for fulfilling this expectation. The first alternative maintains the existing ROW and assumes no need to acquire additional adjacent land area. The potential issue that results from this approach is that it does not fulfill existing County road or ROW standards. The second alternative follows current Hennepin County Dimensional Standards. However the result of this approach is the need for an expanded ROW from the current conditions to fulfill the adopted bike route policy while also maintaining the County's current vehicular standards. As various intersections and roadway sections begin any improvement process, the County, City, public and adjacent landowners will need to grapple with these issues to ultimately come up with a workable,.viable resolution.



Section A-A'



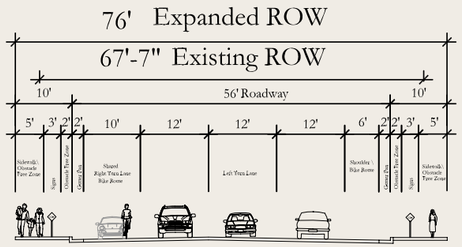
Section 1 - Expanded ROW
Minnetonka Blvd. & Plymouth Ave.



Section B-B'

Hennepin County Dimensional Standards

Street Dimension Prototypes: *Minnetonka Blvd. & Plymouth Road*



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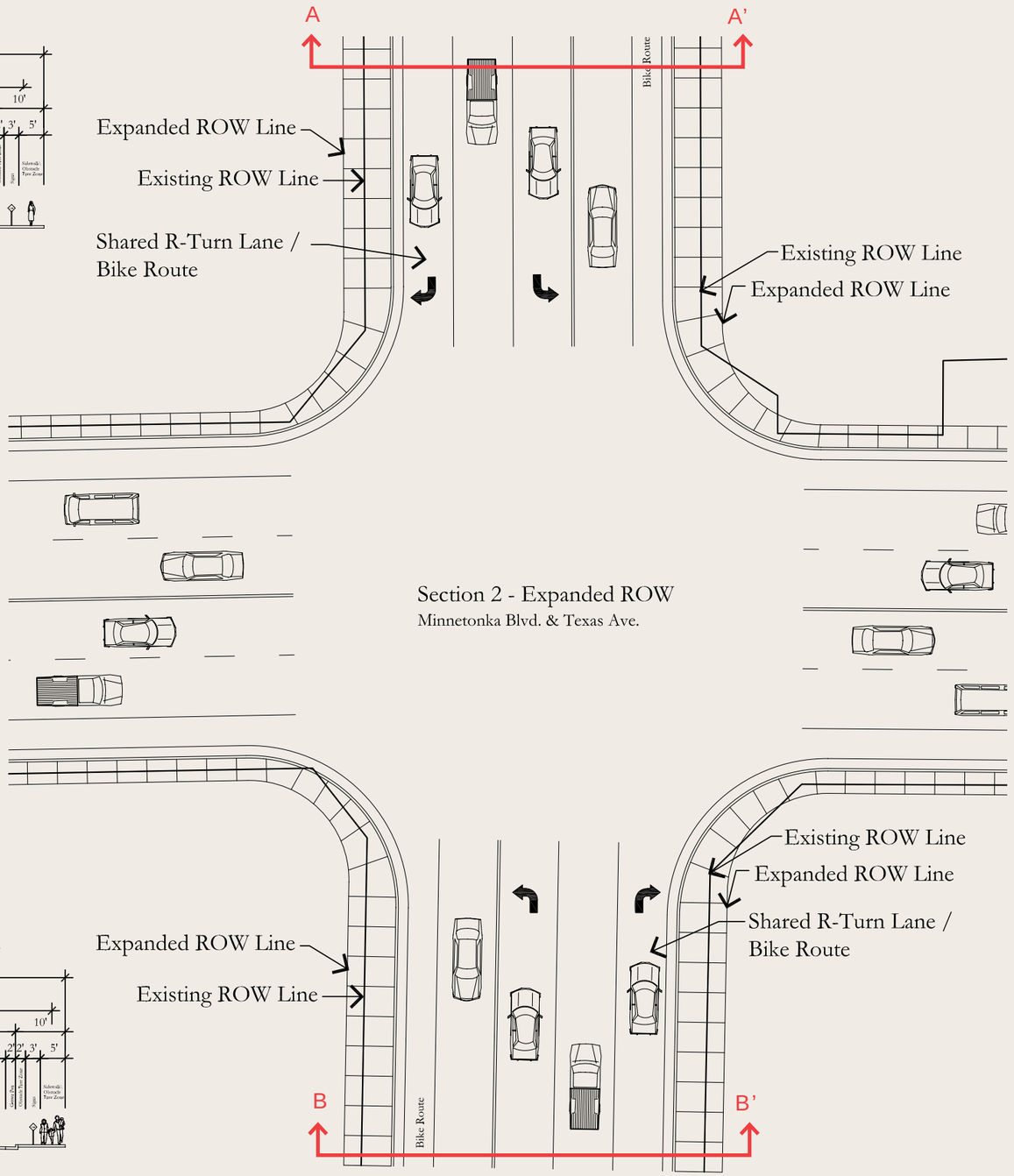
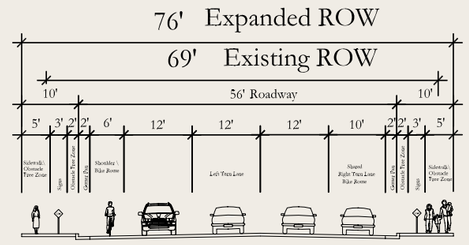
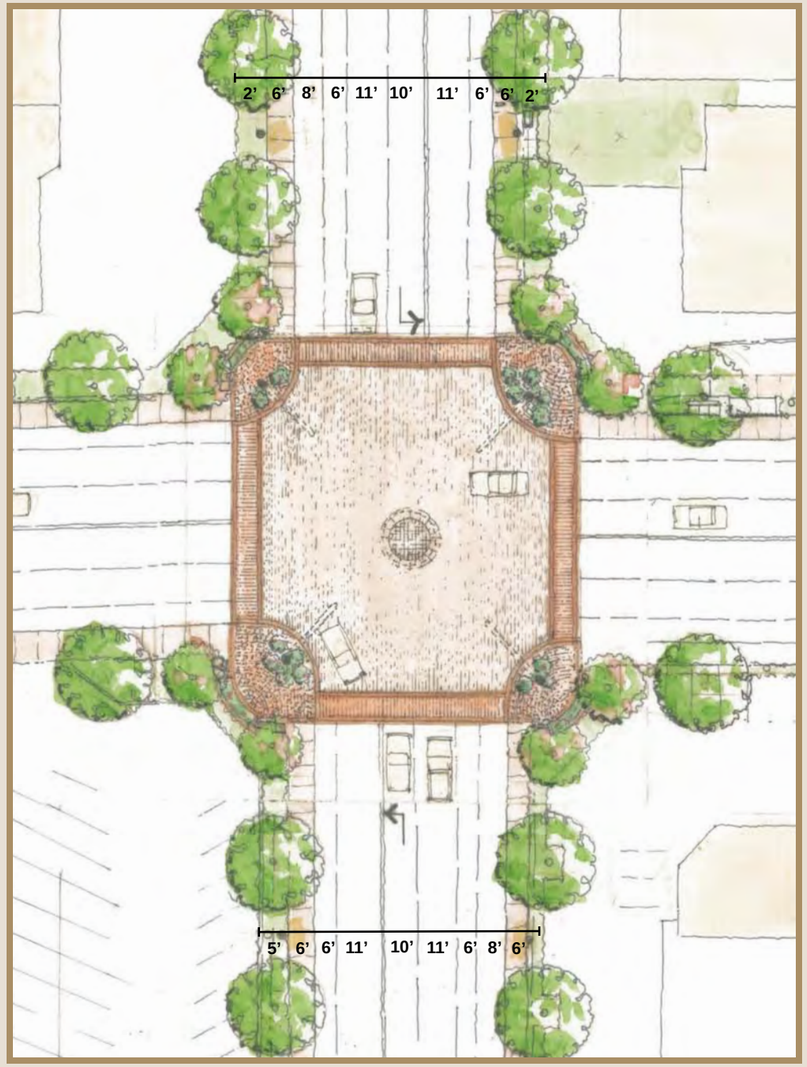


Section 2 - Expanded ROW
Minnetonka Blvd. & Texas Ave.



Section B-B'

Hennepin County Dimensional Standards



Existing ROW To Remain

Supporting the adopted County and City policy of incorporating continuous bicycle travel routes on both sides of the road, two alternatives exist that would allow this policy to be implemented in many places along the Minnetonka Blvd corridor for fulfilling this expectation. The first alternative maintains the existing ROW and assumes no need to acquire additional adjacent land area. The potential issue that results from this approach is that it does not fulfill existing County road or ROW standards. The second alternative follows current Hennepin County Dimensional Standards. However the result of this approach is the need for an expanded ROW from the current conditions to fulfill the adopted bike route policy while also maintaining the County's current vehicular standards. As various intersections and roadway sections begin any improvement process, the County, City, public and adjacent landowners will need to grapple with these issues to ultimately come up with a workable,.viable resolution.

Custom Signage

Informational Kiosks

Unique Light Fixtures

Street Lighting

Commercial Dist. Lighting


Landscaped Bus Shelter


Newspaper Corals

Detail design thought has been developed for various key intersections and right-of-way areas within the Minnetonka Boulevard Corridor including plan design and suggested material selections. Collectively, we refer to these as Streetscape Elements. Prototypical designs have also been developed as actual plan layouts, and are included in other sections of this study report. This section deals with the actual physical choices of materials that would support those plan design ideas.

To understand how materials and design can be thought about for the Minnetonka Corridor, this study team has developed a set of conclusions and guidelines that are the basis for how all design direction should occur. These can be summarized as follows:

• First and foremost, it has been established that Minnetonka Boulevard should be considered as a **"Scenic Corridor,"** and not just an east / west running roadway.

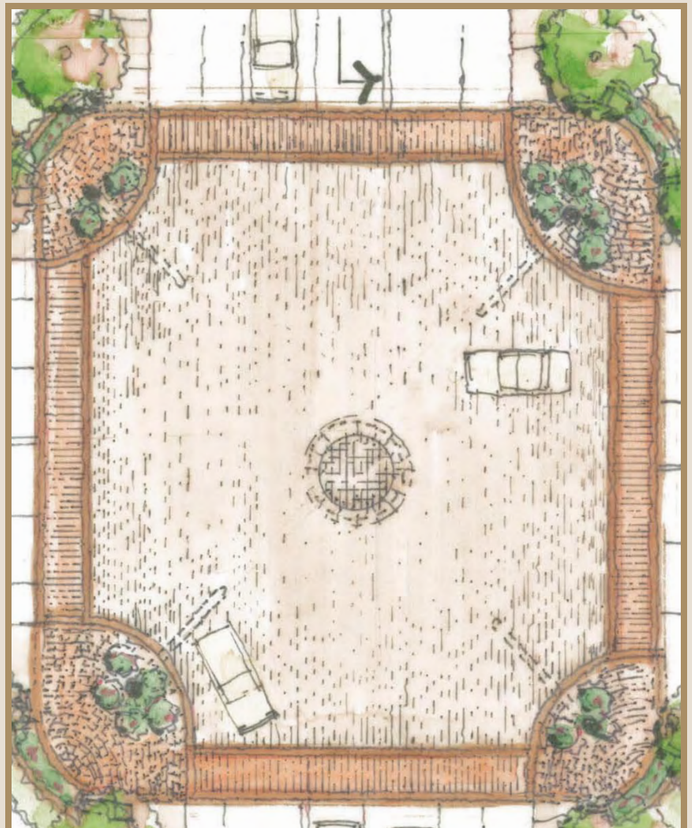
• Other road systems, including I - 394 and Highway 7, are higher speed, commuter corridors that are different in scale and character to Minnetonka Blvd. As a result, Minnetonka Blvd offers the unique opportunity to be a true neighborhood and interlinking community roadway that not only handles motorized vehicles, but bicycles and pedestrians as well, at all levels of use. It is a vital link that operates at many levels of use. *...Continued on page 56*

Suggested Streetscape Element Palette

Striping

Alternate Paving Treatments at Crosswalks

Photo: Dan Burden



Landscaped Median

Photo: Dan Burden

Landscaped Median

Photo: www.pedbikeimages.org/Dan Burden

Photo: Dan Burden

Curb Bumpout with Ornamental Planting

Curb Bumpout with Rain Garden

Alternative Paving & Crosswalk Treatments

Image from the Metropolitan Design Center Image Bank.
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...from page 54.

Any planning and design along the corridor should therefore embody strong emphasis for all levels of use. Design should also encourage design response that fosters a sense of the respective neighborhoods, be supportive of a more urban village character development, emphasize and draw out the wonderful experiential qualities that occur along the corridor, and should place equal value and safety on pedestrian, bicycle and vehicular usage.

• Because Minnetonka Blvd runs through a number of cities, special districts, and a wide variety of diverse conditions along the length of the corridor, it is the opinion of this team that their not be a uniformity of details throughout, but rather a commonality of purpose and shared sense of more generalized goals and guidelines. **To this end, it is thought that all entry monumentation, light fixtures, paving or corner details, etc. do not need to look alike or be consistent throughout the corridor. What should be consistent, is the thought that each community or city should have the same common goal approach of being pedestrian oriented in scale and detail, as well as responsive to the context of the areas within which they occur. Safety would be a consistent theme throughout.** Each area would then be different in how they are designed and detailed. The level of quality of the specific design response would also be subject to the respective available budgetary allowance.

• For special major intersections in city center areas, we propose that surface road pavements and special pedestrian sidewalk minim park areas, including cross walks, be constructed with interlocking brick paving. See the respective prototype drawings for patterns and extent of the paving.

• For all other crosswalks throughout the corridor, we propose painted zebra stripping in all areas where street crossings are deemed safe and are supported by special pedestrian signalization systems.

• For light posts in special intersection and village areas, we propose that more ornate pedestrian scale type lighting be used that will also create better lit zones that are safer for people while adding detail and quality to these special village zones. Light fixtures should also have the potential to support hanging planters as well as banners or flags.

• City or district areas should also incorporate entry monument type features that reinforce the sense of where the district begins and ends. Elements such as newspaper vending machines and other pedestrian support elements such as maps or directional signs should also be grouped and designed as special elements within the context of the village areas. The detail of the monuments and signs should also be reflective of the character and heritage of the specific city or district.

• Planted street dividers should also be incorporated at special intersections and village areas to further define the district as well as serve as a traffic calming device.

• Where bus shelters or benches occur, incorporate trees and other plant material to give these elements a setting within which they can sit while providing year round interest for the users while also maintaining a safe environment.

All of the elements shown under Streetscape Elements are intended as examples of the design intent. There are multiple ranges of patterns, material types and colors that would be appropriate within each setting. As specific areas become ready for improvement, the appropriate design solution would grow out of the context of the specific improvement area.

STREETSCAPE ELEMENTS-TYPICAL UNIT COSTS

ITEM #	PROPOSED STREETSCAPE FEATURE	TYPICAL UNIT COST	UNIT	DESCRIPTION
1	LANDSCAPE PLANTING AND RESTORATION			
A.	EXISTING TREES - PRUNING TYPE II	$3,000	Acre	PRUNE TO SHAPE AND FRAME VIEWS
B.	EXISTING TREES - REMOVAL	$450.00	Each	REMOVE AND HAUL TREE AND STUMP-ALLOWANCE
C.	PLANTED TREE - RIPARIAN SPECIES	$80.00	Each	ASSUME BARE ROOT STOCK, MIXED SIZES - 1/2 TO 2 INCH CAL.
D.	PLANTED TREE - UPLAND SPECIES	$400.00	Each	ASSUME B AND B STOCK, MIXED SIZES - 2-1/2 INCH CAL. AVG.
E.	PLANTED TREE - ORNAMENTAL SPECIES	$275.00	Each	ASSUME B AND B STOCK, MIXED SIZES - 2 INCH CAL. AVG.
F.	PLANTED TREE - EVERGREEN SPECIES	$350.00	Each	ASSUME B AND B STOCK, MIXED SIZES - 6 FT. HEIGHT, AVG.
G.	PLANTED SHRUBS -WETLAND EDGE	$15.00	Each	ASSUME BARE ROOT STOCK, MIXED SIZES - 1/2 TO 1 INCH CAL.
H.	PLANTED SHRUBS - EVERGREEN	$50.00	Each	ASSUME B AND B STOCK, 5 GAL CAN SIZE
I.	PLANTED SHRUBS -ORNAMENTAL	$30.00	Each	5 GAL. SIZE SHRUBS W/MULCH
J.	PERRENIAL BEDS	$9.00	Each	1 GAL. SIZE PERENNIALS IN BEDS W/MULCH
K.	MASSED BULBS	0.25	Each	MIXED TYPES-MATERIAL ONLY, INSTALLATION BY VOLUNTEERS
L.	SODDED LAWNS	$2.75	Sq. Yds.	INCLUDES 4" TOPSOIL
M.	AUTOMATIC IRRIGATION SYSTEM - LARGE AREAS	$6.00	Sq. Yds.	LARGE LAWN AREAS
N.	AUTOMATIC IRRIGATION SYSTEM - SMALL AREAS	$10.00	Sq. Yds.	SMALL LAWN AREAS, SHRUBS AND FLOWERS BEDS
2	VEHICULAR PAVEMENTS			
A.	ENHANCED INTERSECTION-INTERLOCKING PAVER	$60	Sq. Yds.	CONCRETE UNIT PAVER OVER SAND AND AGGREGATE
B.	ENHANCED INTERSECTION-BIT. PAVING W/CHIPS	$20	Sq. Yds.	CUSTOM CHIP SEAL FINISH - ROLLED AND BROOMED
C.	ENHANCED CROSSWALK-INTERLOCKING PAVER	$60	Sq. Yds.	CONCRETE UNIT PAVER OVER SAND AND AGGREGATE
D.	ENHANCED CROSSWALK-ZEBRA STRIPE ONLY	$6,000	Allow	PAINTED CROSSWALK OVER EXIST. PAVING, PER INTERSECTION
E.	BIKE ROUTE STRIPING	$4.50	Lin. Ft.	INCLUDES STRIPING, SIGNAGE
3	PEDESTRIAN PAVEMENTS AND PLAZAS			
A.	CONCRETE WALK W/ENHANCED FINISH	$55	Sq. Yds.	4" SLAB W/GRAN. BASE, ENHANCED SCORING-30" O. C.
B.	CONCRETE WALK W/ENHANCED COLOR AND FINISH	$65	Sq. Yds.	4" SLAB W/GRAN. BASE, ENHANCED SCORING AND INTEGRAL COLOR
C.	CONCRETE WALK W/STANDARD FINISH	$45	Sq. Yds.	4" SLAB W/GRAN. BASE, STD. SCORING-5' O.C.
D.	BITUMINOUS PEDESTRIAN PATH W/CHIPS	$25	Sq. Yds.	CUSTOM CHIP SEAL FINISH MATCHING ROADS
E.	STONE CLAD PLANTER WALLS-24"HIGH	$320	Lin ft.	INCLUDE CONCRETE CORE WALL W/FOOTING AND STONE CAP
F.	WOOD ARBOR	$15,000	Each	POSSIBLE AT SOME CORNERS-HEAVY WOOD TIMBER CONSTRUCTION
4	GATEWAY MONUMENTS AND SIGNS			
A.	CUSTOM STONE GATEWAY SIGN	$20,000	Each	ALLOWANCE
B.	INFORMATION SIGNS - WOOD W/STONE BASE	$5,000	Each	ALLOWANCE FOR INTERPRETIVE AND DIRECTIONAL SIGNS
5	LIGHTING			
A.	TALL STREET LIGHT AT INTERSECTIONS	$5,000	Each	DECORATIVE FIXTURE, 30 FT. MOUNTING HEIGHT
B.	MID-LEVEL STREET LIGHT AT COMMERCIAL DISTRICTS	$8,000	Each	DECORATIVE FIXTURE, 20 FT. MOUNTING HEIGHT
C.	CUSTOM GATEWAY LIGHT	$1,000	Each	GROUND MOUNTED UPLIGHT
D.	TREE UPLIGHT	$800	Each	100-150W KIM HID FIXTURE
E.	CANOPY MTD. LIGHT	$1,000	Each	100-150W KIM HID DOWNLIGHT FIXTURE
6	OUTDOOR FURNISHINGS			
A.	WOOD BENCHES	$800	Each	5 FOOT TEAK
B.	TRASH RECEPTACLES	$800	Each	MATCH BENCHES
C.	WOOD PLANTERS	$800	Each	TEAK
D.	PLANTER POTS	$500	Each	PRECAST CONCRETE OR TERRA COTTA, TYP.
7	ART AND INTERPRETIVE FEATURES			
A.	ENGRAVED ELEMENTS TO BE DETERMINED			COST TO BE DETERMINED
8	OTHER IMPROVEMENTS			
A.	COUNTDOWN CLOCK	$25,000	Allow	ALLOWANCE PER INTERSECTION
B.	ENHANCED BUS SHELTER	15,000	Allow	ALLOWANCE FOR CUSTOMIZATIONS, EACH SHELTER

Streetscape Feature Unit Costs

Discussion of Further Study:

It is beyond the scope of this study to propose a detailed and engineered layout for the entire length of the study area, or to resolve all of the potential conflicts between stakeholders, property owners and agencies who have an interest in the roadway. Rather, the intent is to develop a set of general principles and a range of ideas that would address the goal of the County and Cities to describe a street that considers multiple modes of transportation and various reasons for traveling on it, from commuting to recreation to local shopping. Due to the limited scope of this study, several "areas of further study" have been identified that will require additional master planning thought, engineering effort, public input or agency review before the final form of ideas suggested in this report can be verified. Some of these include:

1. A major goal of the Design Plan is to encourage a continuous on-street bike route. There may be obstacles to achieving this in some areas due to grading constraints or ROW width limitations. Potential solutions, as suggested in this study, include the purchasing of additional ROW or a reduction in traffic lane dimensions. Further study and discussion is required in this area, including a thorough analysis of local conditions.

2. The existing bridge over the Minnehaha Creek within the City of Minnetonka also presents a challenge to achieving a continuous bike route. Further study is required as to whether a reduction of traffic lanes from 4 to 3 could be accommodated, or whether a replacement of or addition to the structure is possible.

3. The existence of overhead electric lines has a strong negative impact on the visual character of the corridor in numerous locations. The removal or burying of these lines should be pursued.

4. Improvements proposed within any of the state highway interchange areas would require the cooperation of MnDOT, who has not approved any of the ideas presented.

5. As redevelopment of commercial properties occurs along the corridor, the relationship of proposed building to the street should be considered. In particular, the presence of parking lots between the street and existing buildings has a negative impact on the visual character of the street and alternatives should be considered that bring the buildings closer to the street.

6. The extension to the east and west of the improvements recommended in this study, beyond this study area, represents a significant future opportunity to achieve the "Link to the Lakes" goal that has been identified and endorsed in the public meetings.

7. The feasibility of a grade-separated crossing at Minnehaha Creek, beneath Plymouth Rd. will require further study.

8. The possibility of a privately operated rubber tired trolley running along Minnetonka Blvd. was suggested, similar to the one operating in the City of Wayzata. Further study would be required to determine interest/feasibility.

9. Potential locations for rain gardens have been suggested. While these locations are consistent with designs that have been implemented in other cities, no detailed study of storm sewer piping or street grading has been done for this project.