

Red River Greenway Study

Approved

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Prepared by the Fargo-Moorhead Metropolitan Council of Governments (Metro COG)
Technical Planning Support from SRF Consulting Group



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Introduction, Intent & Background

At the request of its member communities Metro COG programmed the Red River Greenway Study in its 2007 UPWP. The Greenway Study covers an area relatively adjacent the Red River from 124th Avenue South and 100th Avenue North in North Dakota. The limits of the Study in Minnesota are 110th Avenue North to 120th Avenue South. No official Red River Greenway has been designated by any local governmental units. For planning purposes only the Greenway Study will define the existing Greenway as those publicly owned spaces, uses, and facilities which are in proximity to the Red River. A more definitive definition of the Red River Greenway planning concept is outlined later. Map 1 demonstrates the Red River Greenway Study Project Area. The Red River Greenway Study provides alternatives for expanding the Greenway which follows the Red River through a large portion of the urban area. The Greenway Study identifies issues and opportunities regarding future system expansion. The study outlines existing social and environmental issues which present themselves along the corridor, both in terms of limitations (e.g. floodway/plain, property access, etc.) and opportunities (e.g. existing or planned community facilities, cultural/historical land markers, and/or other interpretive enhancements).

The Greenway Study will focus on the development of northerly and southerly extension of the existing Greenway System. The intent of adding northerly and southerly extensions to the Greenway System is to expand a safe and efficient transportation corridor of shared use facilities for commuting bicyclists, in-line skaters and pedestrians. The study will look to fill gaps within the existing network as identified by the Metropolitan Bike and Pedestrian Plan. Attention will be paid to ensure symmetry between future proposed concepts and the current Greenway. While focusing primarily on transportation, the Greenway Study focuses on ancillary issues such as floodway mitigation, habitat preservation, and connecting related community facilities and activity centers. The Greenway Study provides a framework for moving forward with Greenway expansion by providing information into a number of areas, including:

- Demonstrates the conceptual alignment for the northerly and southerly extensions of the Greenway System.
- Demonstrate the need for new river crossings and connections to the larger metro/regional bicycle and pedestrian network.
- Develops typical section designs for how the Greenway would be designed, and suggests alternative design standards for specific segments based on unique environmental/property owner considerations.
- Conceptual design protocol related to trail related facilities such as trail heads, river access (i.e. portages), community facilities, interpretive facilities, etc.

- The study will prioritize improvements (i.e. a staging plan) for programming for either design or construction.

Existing Red River Greenway

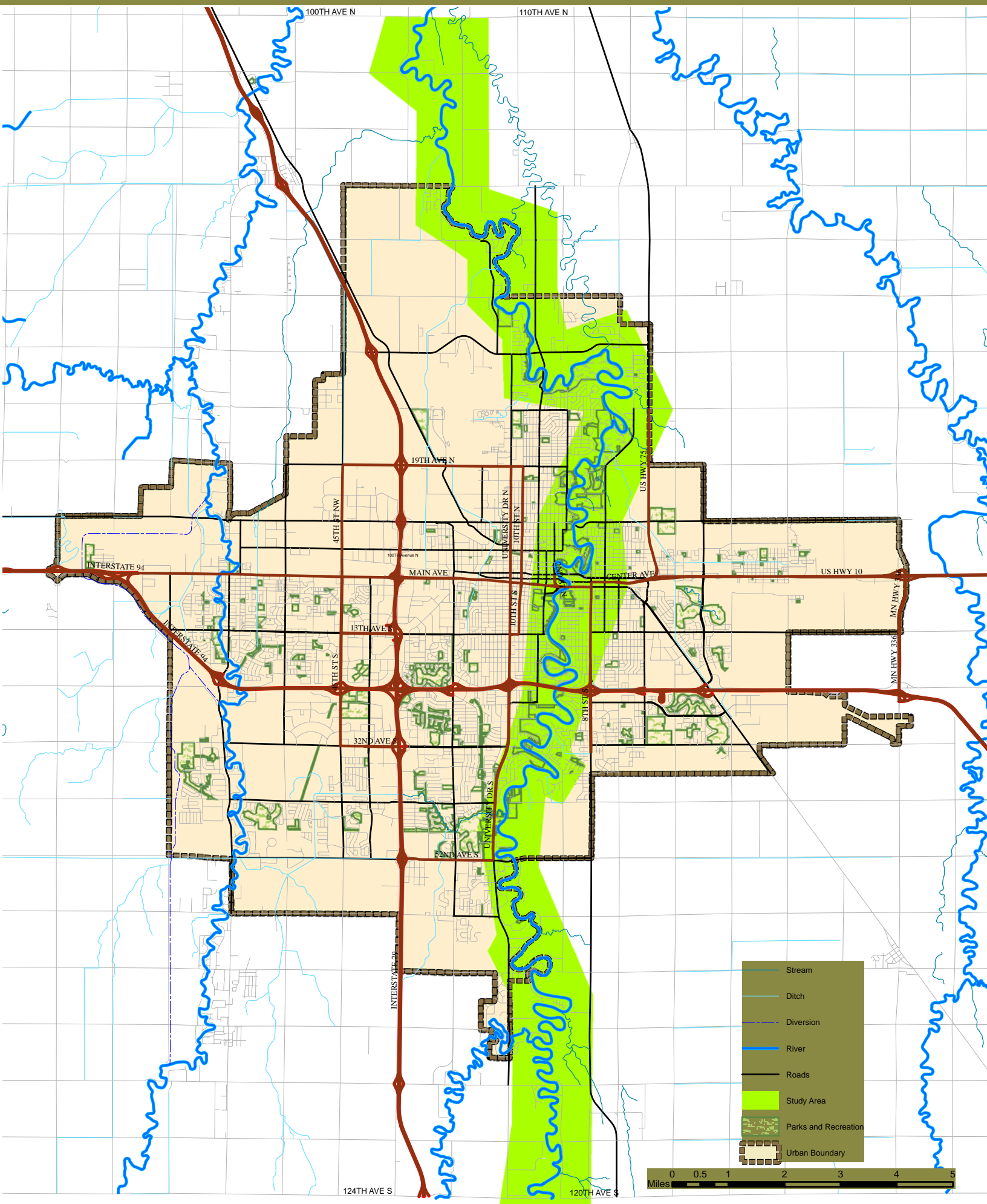
The existing Red River Greenway as defined in this planning process is a connected network of publicly owned spaces, uses, and facilities from Lindenwood Park (I-94) in the south to approximately Cass County Road 20 in the north. The general composition of the Red River Greenway is one of open green spaces and parks with an eight to ten foot shared use path system allowing for recreational bicycle riding, running and walking. In the winter these open spaces are used for cross-country skiing and snowshoeing. The shared use path which exists within the Red River Greenway connects into and out of neighborhoods. As noted earlier, no official Red River Greenway has been designated by any local governmental units. For planning purposes only the Greenway Study will define the existing Greenway as those publicly owned spaces, uses, and facilities which are in proximity to the Red River, as defined in Map 2.

There are numerous areas to access the River's edge for bird watching or fishing along the Red River Greenway. Trees are a major component of the existing greenway, providing shelter for wildlife and creating numerous sources of shade if someone would like to sit and have a picnic along the River. The existing greenway provides boat launching facilities in several locations making boating a feasible and easy activity. Camping facilities are available in Lindenwood Park. There are three pedestrian/bicycle bridges that connect North Dakota and Minnesota within the existing greenway. These bridges have received consistent use and are used by local citizens anywhere between June and October if water levels on the Red River allow.

One example of such a connection is the Lindenwood/Gooseberry Bridge which offers excellent connectivity to both Lindenwood and Gooseberry Mound Park as well as providing an excellent connection for those considering heading west toward the 13th Avenue Corridor or heading north to Fargo's and Moorhead's downtown areas. There are parking lots which provide access for those greenway users arriving by automobile. At least one of these parking lots acts as a location for a local farmers market. At the present time use of the greenway after dark is not allowed. Community events are held on the Greenway such as River Arts Program held in Davy Park in Moorhead, The Red River Run, a portion of the Fargo Marathon, the Red River Water Festival, the Race the Red Canoe/Kayak Race and the FM area Art Burn. A winter festival has been held in Moorhead at M.B. Johnson Park in years past and may be revived in the next few years as M.B. Johnson Park facilities are enhanced. The existing greenway has excellent emergency service access and is built to withstand motor vehicle travel.

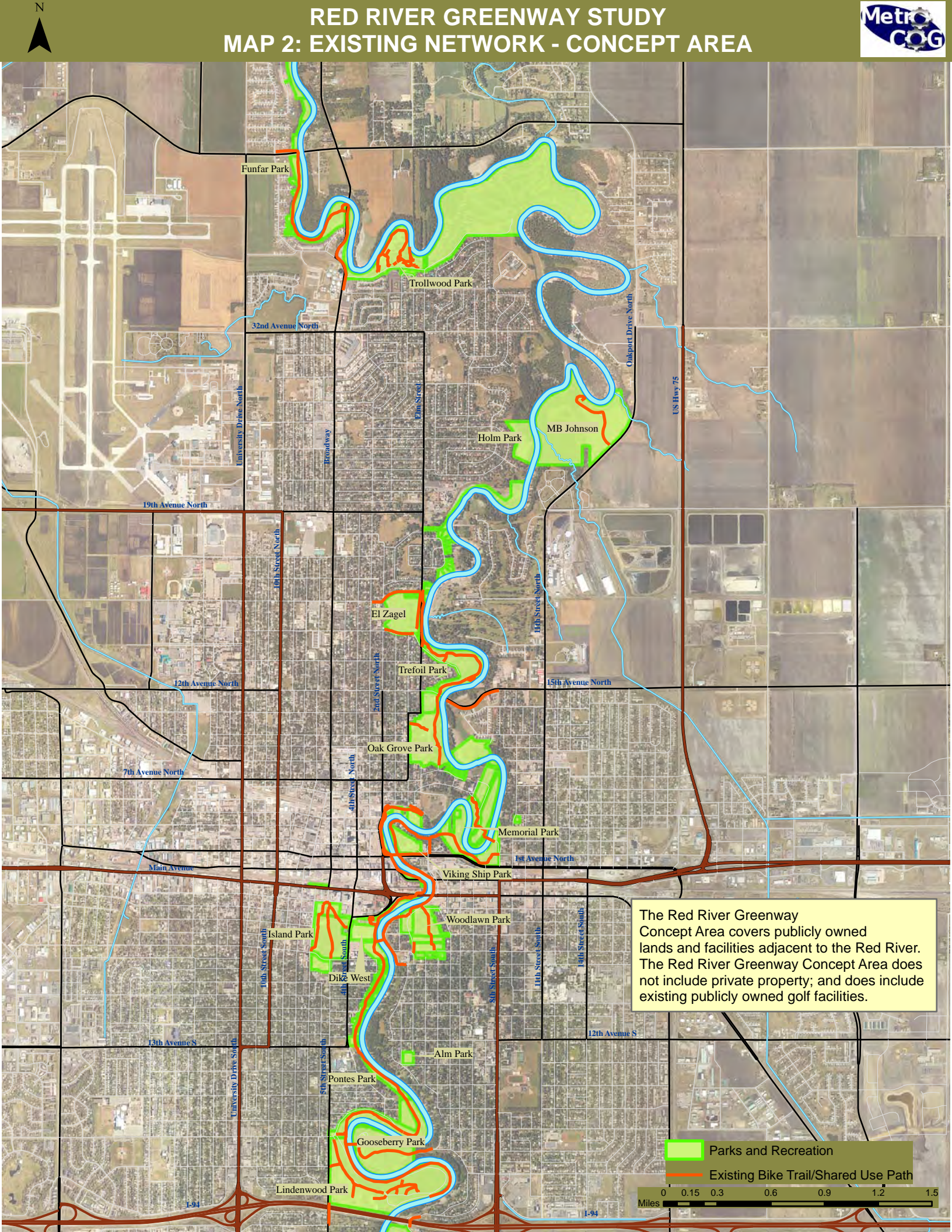
RED RIVER GREENWAY STUDY

MAP 1: STUDY AREA



RED RIVER GREENWAY STUDY

MAP 2: EXISTING NETWORK - CONCEPT AREA



The Red River Greenway Concept Area covers publicly owned lands and facilities adjacent to the Red River. The Red River Greenway Concept Area does not include private property; and does include existing publicly owned golf facilities.

Parks and Recreation

Existing Bike Trail/Shared Use Path

Background & History

The Red River of the North has a long history as a transportation corridor as well as a recreational amenity. The late 1800s saw Moorhead and Fargo establish themselves as centers of commerce through the use of the Red River of the North as a transportation corridor. Residents of both cities utilized the River for recreational activities such as swimming and fishing. Jumping forward to the 1970s and 1980s the attitude toward the River (as far as recreating in it and near it) had changed significantly. The Red River was seen as something dangerous and dirty. A non-profit organization (River Keepers) was formed in the early 1990s to educate the public as to the assets of the River and to stimulate interest in the River. Coordinated efforts between Moorhead, Fargo, as well as Metro COG, local recreation and safety agencies, and River Keepers have brought a resurgence of interest and activity along the banks and on the waters of the Red River of the North. With this resurgence in interest has come the enhancement and expansion of the Greenway on the Red River in the Fargo-Moorhead Metropolitan area.

Several studies of the Red River of the North have been undertaken to better understand the nature of the Red River, the impact of surrounding development upon the river and the resources and opportunities the River offers. What follows is a narrative of each and list of pertinent recommendations as related to the Red River Greenway. Please note: bullet points in italics have not been implemented to any extent nor does the order of the bullet pointed items suggest any kind of prioritization.

Red River Action Plan (1989)

The 1989 Red River Action Plan was undertaken to develop an action plan that addressed existing development projects and identified the need for future activities and actions within the corridor. The plan identified a variety of ongoing and planned projects, and immediate, short range, medium range and long range actions to meet the identified needs. The actions recommended in the immediate time frame primarily dealt with policies, maintenance, safety, and facilities. Bullet points in italics have not been implemented to any extent. Recommended actions that dealt with expansion and enhancement of the Red River Greenway are as follows:

Immediate Project Recommendations

- Construct bikeway paths and pedestrian/bicycle bridge projects which are currently planned for.
- *Prepare detailed Red River corridor site development plans.*
- *Designate a joint corridor advisory committee to be called the Red River Advisory Committee of COG.*
- Establish policies for coordination of corridor facilities and development.
- Establish and support a corridor safety improvement program.
- *Establish and finance a coordinated maintenance and cleanup program for the entire corridor.*
- Designate specific corridor areas as natural areas for preservation and future enhancement.

- *Prepare detailed Red River corridor site development plans.*
- Restrict development in areas of unstable channel slopes.

Short Range Actions

The short range actions address programming and facilities. Those addressing expansion or enhancement of the Red River Greenway are as follows:

- Extend Bikeway system on Fargo and Moorhead sides of the corridor, and widen existing bike paths.
- Expand and promote wintertime activities on a regular basis.
- *Establish a program of land acquisition and right-of-way dedication for corridor facility development and management.*
- Install floatable/portable docks for fishing enhancement.
- Install small boat ramps and boat portage facilities.
- Install additional lighting for security surveillance.
- Install historical markers at selected locations within the corridor.
- Install additional park benches and picnic tables at locations of greatest benefit.
- Sponsor cultural, entertainment, and recreational events on a regular basis.
- *Establish properly designed sanitation facilities at selected locations within the corridor.*

Medium Range Actions

The medium range actions relate to dams, programming and facilities. Those addressing expansion or enhancement of the Red River Greenway are as follows:

- *Consolidate pedestrian/bikeway system by constructing additional pedestrian/bike bridges at Lemke/River Oaks Parks and M.B. Johnson Park.*
- Acquire property on Clay County side of corridor across from Trollwood Park for expanded park development, additional parking facilities for major Trollwood events, and a connecting pedestrian bridge.
- Examine in-channel modification for the enhancement of fish habitat.
- *Provide special handicapped facilities within the corridor.*

Long Range Actions

The long range actions address water supply, flood control, maintenance, land use and transportation. Those addressing expansion or enhancement of the Red River Greenway are as follows:

- Establish new and/or better flood control measures.
- *Enable utilization of higher density residential and mixed developments within the River corridor.*
- Enable and encourage multi-modal transportation opportunities in the River corridor.

Regional Urban/Design Assistance Team (1989)

The 1989 Red River Visions Study was conducted by the Regional Urban/Design Assistance Team of the American Institute of Architects. The study supported the idea that the Red River was an under-utilized and under-appreciated natural resource. The study provided recommendations related to three specific areas: a comprehensive vision for development and management of activities on the Red River; recommendations for specific programs and activities; and a strategy for rediscovering the river frontage that included an economic development strategy and development concepts.

Development and management recommendations

- Recommendation that only non-commercial vessels be allowed on the River and that they be non-motorized or propelled electric motors.
- Re-establish a supralittoral zone of natural riparian vegetation 50 to 100 feet in width along the River to return the river edge to a native condition.
- Re-establish upland habitat along the River.
- Avoidance of large, heavy structures and maintain built facilities in flood areas.
- Closely monitor water quality factors upstream and attempt to influence officials in those areas to reduce the inputs of pollutants to the Red river.
- Encourage the modification of the existing Middle Dam and the old North Dam.

Recommendations for specific programs and activities

- Different kinds of contact points need to be established, maintained, and activated by programming and use.
- Wildlife habitat should be enhanced along the River.
- The current lack of shared use path connections on current public land should be resolved as soon as practical.
- Emphasis on path development should be on continuity of trail use.
- For future parcels annexed into the city, or for all new river front subdivisions, retention of at least one trail and riverside maintenance easement should be a prerequisite to approval.
- Take advantage of opportunity sites along the River (open land that is out of the floodplain).
- Provide opportunities for year-round use of corridors along the River (e.g. cross country skiing, bicycling, ice skating, bird watching, etc.).
- Emergency access plans should be in place for all locations along the River.
- Contingency plans should be in place for emergency access.
- Maintenance access should be maintained along the River.
- Encourage and support special events and festivals along and on the Red River
 - Red Fest (Summer River Festival)
 - “A Taste of the Red”
 - White Fest (Winter River Festival)

Recommendations for rediscovering the river frontage that include an economic development strategy and development concepts are as follows:

- Recommendation of Outdoor Living Room in downtown Fargo-Moorhead
 - Southern portion of the site east of the Civic Center could be redeveloped into a landscaped urban riverfront plaza.
 - Developments of portable buildings for restaurants, dining by the water, dining on the water with use of small party boats
- Development of a Performing Arts Center near the Red River
- Entertainment along the River (dinner theater and restaurants)
- Construction of Pathways along the River
- Dike East Redevelopment
- Farmers Market

Fargo-Moorhead Downtown Framework Plan Update (2007)

The Downtown Framework Plan builds on existing Downtown plans for Fargo and Moorhead. The intention of the plan is to provide a physical framework for the development of both downtown areas. A key element of the Plan is to establish a strong connection on 2nd Avenue North to the River. The Red River Corridor Plan was created from this study and would become the impetus for Fargo's Riverfront Development Master Plan effort. Several design principals, goals and objectives are stated in Chapter IV of the Downtown Framework:

- Embrace the Red River
- Improve and Promote Riverfront Open Space

The Red River continues to be used as a social and cultural venue for many different groups in all four seasons. The presence of the Hjemkomst Center continues to play a significant role in supporting seasonal events as do the existing shared use paths along the Red River.

Fargo Riverfront Development Master Plan (2002)

The intent of this document is to provide a Master Plan for Fargo's riverfront development in an area between Oak Grove Park and Dike East. The plan recognizes the riverfront as one of the greatest assets within Fargo and Moorhead. The plan provides a coordinated strategy for improvements of the corridor that will increase its value to the citizens of the community; ensure that development will be complementary to and compatible with development within Moorhead. Developments in this plan have and continue to occur thus moving this downtown riverfront plan forward.

Four-Community Sports Facility Framework Plan for the Metropolitan Area (2005)

The Four-Community Sports Facility Framework Plan for the Metropolitan Area offers statistically significant evidence that there is a regional desire to increase the mileage of shared use paths in the Fargo-Moorhead area as well as a willingness to pay for the added mileage. It was discovered through this study that residents of the FM area felt that walking/bicycling/hiking trails were among the most needed and wanted facilities in this region. When respondents were asked what facilities they would be most willing to fund the responses were as follows:

Funding Priorities

Respondents were asked what they would be most willing to fund with tax dollars. Once again the survey delivered a consistence message regardless of what city the responses came from. Facilities that people would be most willing to fund with tax dollars were:

Renovate walking and biking trails

Develop a new indoor recreation center

Development of new trails

Metro Bike and Pedestrian Plan (2006)

Chapter 5 *Plan Recommendations* provides short and long range improvement projects. The short and long range plans were developed through a process in which four screening factors were met for each project. The four screening factors are as follows: Technical soundness, Environmental Sensitivity, Financial feasibility, and social acceptability. Short and long range projects have been further prioritized as priority 1, 2 or 3 projects. Priority 1 projects are a part of the identified Principal Metropolitan Bicycle network¹ and are recommended for implementation prior to other selected projects. Priority 2 projects are potential future connections to the principal bike network or are identified alternate routes to the principal bike network. They are recommended for implementation when:

- Priority 1 project have been completed; or
- When a principal bikeway network project is not implemented due to unexpected reasons, the alternate route is recommended for implementation

Priority 3 projects are long range projects recommended for implementation once Priority 1 and Priority 2 projects have been completed. These projects are mostly extraterritorial connections to the principal bike network. Fargo improvement projects 29 and 247 relate directly to connections across the Red River. Project 29 is a bridge across the Red River between 19th Avenue North in Fargo and 28th Avenue North in Moorhead and a shared use path connecting Elm street to the Red River. Project 29 is tied to Moorhead project 226. Project 226 is a shared use path along 28th Avenue North from 11th Street to the Red River. Fargo project 247 which will be a shared use path will be located on 52nd Avenue South and will tie into Clay County State Aid Highway 12. Moorhead projects 102 and 294 will also increase access to the Red River. Project 102 will be a bridge at 32nd Avenue in Fargo and River Haven Road in Moorhead. Project 294 will be a bicycle and pedestrian bridge at 40th Avenue in Fargo crossing over the Red River to the new Trollwood Performing Arts site. Funding for project 294 was sought in 2007 but no funds were granted. All above mentioned projects are categorized as priority 1 projects.

¹ Projects in the 2000 Metropolitan Bicycle and Pedestrian Plan were reviewed for consideration in the new project list. Projects not listed in the consistency review but listed in the 2004 MTP were added to the new project list. Other potential projects were added through feedback from local planning and engineering staff as well as through public input. Financial review of projects took place as well as constraint of short range projects. Projects with identified revenue resources were placed in the short range list. Four screening factors were then applied (Technical soundness, Environmental Sensitivity, Financial feasibility, and social acceptability) then put into a tertiary prioritization list.

Chapter 3 of the Metropolitan Bike and Pedestrian Plan lists goals and objectives for the Fargo-Moorhead Bicycle and Pedestrian Network that relate directly to the Red River Greenway. The goals and objectives are broken down into the following categories: engineering and planning, education, encouragement and enforcement. Additions to a formally recognized Red River Greenway would meet several of the goals and objectives of the Fargo-Moorhead Bicycle and Pedestrian Network. Goal One of the Plan is to improve bicycle and pedestrian network connectivity.

The addition of segments of shared use path and/or bridges across the Red River would increase access to parks on both sides of the River. Goal Three of the Plan is to enhance safety features of the bicycle and pedestrian network. The addition of shared use paths along the Red River offers moderately skilled bicyclists non-road options for riding their bicycles. Goal Four of the Plan is to develop a regional trail system. The development of additional shared use paths along the Red River towards M.B. Johnson Park, the new Trollwood site and Iwen Park would add several significant destinations to the regional trail system.

The development of a greenway system would also meet several objectives of the Plan by identifying and establishing new locations for bicycle and pedestrian bridges across the Red River and Sheyenne River, ensuring good connectivity of bicycle network with schools, colleges and universities, parks, and large public use facilities. The preference being for shared use paths and bicycle lanes, encouraging right of way for bicycle facilities in newer developments, encouraging design elements which reduce automobile and bicycle/pedestrian conflicts, increasing coordination of metro trails with regional rural trails and connecting satellite communities to the metro area.

Existing Comprehensive Plans, Zoning and Growth Plans

Fargo, Moorhead, Cass County and Clay County all have comprehensive plans, subdivision regulations, and zoning policies that affect the potential for Greenway expansion along the Red River. Moorhead has two growth area plans and Fargo has one growth area plan. These documents all support provisions for flood mitigation and the expansion of the Greenway systems for bicycle and pedestrian movement. Historically the local governments have allowed development that abuts the Red River of the North. This has reduced accessibility to the Red River and increased flood mitigation expenses for all agencies. Since 1997 there has been a strong push to keep development away from the Red River to reduce the expenses involved in the destruction of private property along the Red River.

What follows is a brief review of each of the affected governmental entities planning approach toward the Red River, specifically in relation to a Greenway. Generally speaking all agencies are supportive of the provision of open space for flood mitigation and the expansion of a Greenway along the Red River.

Fargo

Fargo's Comprehensive Plan offers support for continued recreation and transportation linkages along the Red River that would promote connectivity between neighborhoods and allow for enhanced regional connectivity between public spaces. The Comprehensive Plan also states that the City should work with the Park District to acquire riverfront property within and beyond City limits. Fargo's zoning efforts have created a very private environment against the River. Much of the land zoned against the River is single-family residential thus removing public access opportunities within the urbanized area of the City. Fargo's Growth Plan speaks to the desire to develop a greenway for flood mitigation purposes. Ultimately, Fargo has made much of the land directly adjacent to the River in its urbanized area unavailable to the public.

Moorhead

Moorhead's Comprehensive Plan recognizes the Red River as a community asset. The Plan speaks of the parks and recreation system as part of the public realm. Moorhead has a *Southeast Growth Area Plan* (GAP) of which only one growth area abuts the River. This particular growth area will have a continuous greenway along the Red River. The Oakport area is growing and will be annexed by Moorhead in 2015. The Oakport planning process is supportive of a Greenway along the River. This has come about due to flood mitigation efforts that will be implemented in the next few years to protect properties within the Oakport Township. The *North Moorhead/Oakport Township Growth Area Plan and Alternative Urban Areawide Review* recognize the desire of citizens for a continuous open space system that will provide access to the Red River and the need to secure lands adjacent to the Red River for floodplain management. Historically, Moorhead has zoned land against the Red River as low or medium density residential. Recent redevelopment efforts around downtown have allowed for higher density residential and mixed use development.

Cass County

Cass County, North Dakota has developed a setback policy through its subdivision ordinance which shows clear intent to reduce the cost of flood mitigation efforts of the past and the expense of buy-outs that have occurred due to flood damage to private property along the Red River of the North. In 2006, a setback policy of 450 feet from the River centerline was established within the County on all new development along the River. Cass County has established a policy guideline within its Comprehensive plan that allows for conservation easements along the Red River. The policy has been integrated into the County's subdivision ordinance to allow for the preservation of natural vegetation along the Red River.

Clay County

Clay County, Minnesota recognizes the recreational and economic benefit of the Red River of the North in its comprehensive plan. The Plan states that the Red River offers excellent catfish and walleye fishing which benefits the county's economy. Clay County Land Use Code does have a setback of 200 feet for buildings in the vicinity of streams and rivers.

Oakport Joint Powers Area

The Oakport Joint Powers Area (OJPA) is overseen by the Joint Powers Board (JPB) made up of elected officials from Moorhead, Clay County and Oakport Township. The JPB is responsible within the Joint Powers Territory for exercising planning and land use control authority pursuant to the Joint Powers Agreement. The OJPA is made up of three tracts. Tract one and two abut the Red River. Tract one includes Riverside Cemetery and M.B. Johnson Park. Tract two includes the properties directly north of M. B. Johnson Park all the way north to 70th Avenue. The City of Moorhead will accept deeds of dedication for a fifty foot easement for the development of a bicycle and pedestrian path and for maintenance of the river bank. It is the intention of the City of Moorhead to install the bicycle and pedestrian shared use paths as close to the Red River as is feasible. Upon the effective date of annexation of Tract two, the City of Moorhead at its discretion will acquire, for just compensation, those bicycle and pedestrian easements which have not been previously dedicated.

Significant Park Plans

The Fargo Park District does not have a planning document that speaks to strategic park land development. The Park District weighs out each opportunity to develop park land by cost, physical feasibility and need. One could say that Fargo's Comprehensive Plan is the Park District's de facto planning document that supports greenway development and flood mitigation efforts through the preservation of green space along the Red River.

The Regional Park Framework Plan for the City of Moorhead is the most recent and comprehensive document to review the needs of Moorhead's park system. The Plan supports enhancement of M.B. Johnson Park which sits against the Red River and is underutilized. The Plan makes the recommendation that the roadway shoulders of County State Aid Highway (CSAH) 3 should be maintained so that bicyclists and pedestrians can continue to use this facility as a way to get to the Park.

A recommendation is also made for a shared use path along CSAH 3 for enhanced connectivity from local housing developments to the Park. An updated park development plan for M.B. Johnson Park is being developed by SRF Consulting Group, and will take Greenway expansion into its site plan. The Plan mentions the Trollwood Performing Arts and Regional Park. Construction of this park began in 2007 and should be complete by the spring of 2009. The Trollwood site plan does allow for a shared use path system that will help to connect land north and south of it along the Red River.

Greenway Expansion, Utility and Purpose/Need

The primary intent of the Greenway Study is to identify a strategy for the extension of the existing Greenway system. Based on a review of existing conditions data and stakeholder input the study area has been broken into four segments.

Segment 1 is the northerly extension of the Red River Greenway from its current termini at Trefoil Park (15th Avenue N) to the existing Trollwood Site in Fargo (Approximately Wall Street Avenue in Moorhead).

Segment 2 is the southerly extension of the Red River Greenway from its current termini at Lindenwood Park (Fargo)/Gooseberry Park (Moorhead) to the River Keepers Living Lab at 58th Avenue South in Fargo. The dominant feature of Segment 2 is the new Trollwood Performing Arts School at 50th Avenue South in Moorhead (40th Avenue South in Fargo); however, given the undeveloped nature of the areas south of Trollwood, segment 2 is extended to 58th Avenue South.

Segments 1 and 2 should be considered corridors which can undergo implementation in the short to mid-range timeframe. Build out of the Red River Greenway into segments 1 and 2 would connect existing RRG system to urbanized or urbanizing areas of the metro area. Implementation of segments 1 and 2 adds seven significant destination points to the Red River Greenway: the future Trollwood Performing Arts School, the current Trollwood site (which has been identified as an opportunity site), Iwen Park, M.B. Johnson Park, Probstfield Farm, the Oakport buyout areas, and River Oaks Park.

Beyond segments 1 and 2 the Red River Greenway is viewed more conceptually and the short to mid-range intent turns to flood protection and riparian setback. Segment 3 would be the southern extension of the RRG system beyond segment 2. Segment 4 would be the northern extension of the Red River Greenway beyond segment 1. Significant transportation issues in segments 3 and 4 are corridor preservation and system connectivity.

Segments 3 and 4 are considered corridors which would undergo implementation in the long term. However, short to midterm implementation strategies exist for both segments. There is measurable development which has occurred in both segments 3 and 4. There is opportunity in both segments to set the stage for corridor preservation for the Red River Greenway through the platting process.

Corridor Utility

Based on consultation with the public, land owners and project stakeholders, the utility of the Greenway system was narrowed down to four uses and functions.

- The Red River Greenway system will be that of a transportation corridor for bicyclists and pedestrians. The Red River Greenway will serve as a continuous bicycle and pedestrian corridor linking several significant community facilities along and adjacent to the Red River. As a continuous north south corridor, the

Red River Greenway will also serve a commuter corridor for residents who choose bicycling or walking as a mode of transportation.

- The Red River Greenway as a year round facility will aim to provide year round recreational opportunities by allowing for cross-country skiing and snow shoeing.
- The Red River Greenway serves as an educational and interpretive resource by showcasing the importance of the Red River to the larger region. To that end, the Red River Greenway will aim to interpret significant cultural and historical aspects which exist along the Red River.
- The Red River Greenway will serve as a tool for local government entities to implement flood protection plans and riparian set back standards as well as develop opportunities for public and private groups and agencies to educate the public in matters of riparian restoration, care of the River and other environmental topics. Setback and flood protection achieved through the Greenway system will be most pronounced in segments 3 and 4 of the corridor.

Purpose and Need

The purpose of the Red River Greenway expansion is to extend the existing Greenway system which runs from Lindenwood (Fargo/Gooseberry Park [Moorhead] to Trefoil Park (15th Avenue North in Fargo). *The Four-Community Sports Facility Framework Plan for the Metropolitan Area, Regional Framework Plan, November 2005* is a statistically significant study that demonstrates that there is a very real desire to see more miles of shared use path in the Fargo-Moorhead region. Beyond this fact is the willingness to be taxed to support this type of regional amenity.

The purpose of the Red River Greenway expansion is to further the flood protection and river setback goals of regional governmental entities by allowing for the creation of extensions to the present greenway system that provide flood mitigation and prevent development under a specified distance from the River to prevent flooding of private properties as well as accelerated slope failure and riverbank erosion, (Red River Action Plan, Recommended Courses of Action, pg. XII-2).

The need for the Red River Greenway expansion is based on the desire of Fargo-Moorhead residents to have more shared use paths in the Fargo-Moorhead region (*Four-Community Sports Facility Framework Plan for the Metropolitan Area, Regional Framework Plan, November, 2005*). The need for the Greenway system expansion is based on the need to increase connectivity within the Fargo-Moorhead bikeway system, (*2006 Metropolitan Bicycle and Pedestrian Plan, Section 3.1 Bicycle and Pedestrian Issues and Needs*).

The need for the Red River Greenway expansion is based on the need to encourage non-motorized means of transportation. With growing concerns about healthy lifestyles, lessening dependency on automobiles, energy efficiency, air quality and roadway congestion, it is essential to promote non-motorized means of transportation (*The 2006 Metropolitan Bicycle and Pedestrian Plan, The Vision*).

Issue Identification/Analysis

Growing the Red River Greenway is a complex and valuable goal. There are many issues involved and numerous agencies acting as stakeholders. The identification of issues has come directly from the Red River Greenway Study steering committee, the Focus Group and public input. What follows is a listing of the issues identified as part of the planning process and a narrative analysis of each.

Property Access

Access to riverside property in the City of Fargo is limited by private land ownership. In the Red River Greenway study area there are upwards of 1,000 private property owners. Feedback from the first public input meeting demonstrated that some landowners do not want a shared use path in their backyard figuratively or literally. Loss of privacy is of primary concern for those opposed to shared use path construction adjacent to their property. As well, private property owners express a concern about negative effects on resale value of properties near shared use paths. Other public comments spoke to an understanding that growth of the Red River Greenway would enhance the available recreation and commuting options.

Analysis

Privacy has been a major issue for property owners in the Red River Greenway planning process. The intent of the Red River Greenway Study is to connect public lands to each other wherever possible to reduce the complexity of the planning process and to meet the needs for property owner privacy. This planning approach has proven valuable in reducing the concerns of those property owners involved in the Red River Greenway planning process. Meetings have been set up with property owners to obtain greater feedback on their feelings and the potential options for conceptual alignment of the greenway. A detailed Property Access Analysis was conducted (see page 24) to assist in better understanding the property ownership issues related the Red River Greenway expansion.

SRF Consulting prepared conceptual drawings that graphically demonstrate ways to reduce the visual invasion of a shared use path. Appendix 3 demonstrates various conceptual alternatives for illustrative Trail Cross Section. The intent of these graphics is to demonstrate the how expansion of the Red River Greenway may look in a number of different contexts.

Development of Pedestrian/Bicycle Bridges

Planning for future pedestrian/bicyclist connections across the Red River is a reasonable and foreseeable development as the Cities of Fargo and Moorhead continue to grow along the Red River. Connecting pedestrians and bicyclists to parks, educational institutions, historical and cultural nodes adds value to future bridges since there is a duality of use between recreation oriented uses and commuter connections.

Analysis

Working with the public and the project steering committee Metro COG identified a number of possible bridge crossings within the study area. It was decided a feasibility analysis of five bicycle and pedestrian bridge crossings should be conducted. Five potential bicycle/pedestrian bridge locations were selected for further analysis. The locations are as follows:

1. Northern end of M.B. Johnson Park;
2. V.A. Hospital connection with the Riverside Cemetery in Moorhead;
3. Connection between Lemke Park and River Oaks Park (32nd Avenue);
4. Connection at the new Trollwood site and (40th Avenue);
5. Iwen Park/52nd Avenue Area

SRF Consulting prepared an evaluation of these locations and has provided a preliminary understanding of the feasibility and cost for a structure at each location. The analysis is contained in Appendix 2. Additional bridge crossings are suggested for consideration within the study area, however were not prioritized for detailed analysis at this time. Those bridges are demonstrated further in Appendix 1 and 2.

Limited Access to Fargo and Moorhead Parks

There are 16 Fargo Park District properties directly adjacent to the Red River within the City of Fargo. Eleven of these facilities are parks. During the summer, parks along the River open at 7 a.m. and close at nightfall. In the winter, the parks along the River open at 7 a.m. and close at nightfall. Limited access to the shared use path system presents a strong discouragement for those who would consider commuting by foot or bicycle after regular hours of operation. Moorhead has 11 parks along the Red River of the North. Hours of operation are 10:30 a.m. to 10:00 p.m.; with M.B. Johnson being open until 11:00 p.m. For those individuals who work third shift, legal access to the shared use paths is not possible thus discouraging bicycle commuting.

Analysis

Few citizens have stated an interest in legal access to the shared use paths along the Red River after nightfall. Those who have stated an interest do so for night fishing or bicycle commuting access. The Fargo Park District and Moorhead Park Department have spoken of limited funds for lighting shared use paths and the security issues that go with making public property available after nightfall. Making parks available for night use causes greater levels of due care by an agency thus increasing budgetary needs and liability issues. It does not appear at this time that either Fargo Park District or the Moorhead Park Department are in a financial position to offer full nighttime access to shared use paths or bicycle and pedestrian bridges that cross the Red River. Further analysis of the public's desire to use shared use paths at night along the Red River and further review of liability laws may reveal potential options for making all or some of the shared use paths along the River available for nighttime use.

Flooding

Much of the land that is immediately adjacent to the River is in the floodplain. This is not unusual and does not prevent the addition of a shared-use path in these areas. Building in a floodway or floodplain does create limitations on the availability of the shared use path due to seasonal flooding. Presently, the shared use path found in the Mid-Town Dam area is flooded on a seasonal basis. The Fargo Parks District and the Moorhead Park Department have staff time and equipment available to clean the shared use paths and parking lots, though there have been concerns about the quality of the cleaning efforts. Flooding is a natural process within the confines of a river based greenway. Building at an elevation that would keep the shared use path out of flood waters most of the year is the preference of the Cities of Fargo, Moorhead and their respective park agencies. The 24 foot flood elevation has been discussed as the upper limit of most nuisance floods. This number came out of several steering committee meetings and has been settled on for the time being.

Analysis

SRF Consulting prepared a broad feasibility analysis which included the issue of flooding within the study area. Appendix 1 outlines the flooding issues as related to each of the study segments 1 and 2. Overall, the location of new shared use facilities along the Red River will likely be in areas which flood during the spring (and during heavy rains). Where feasible, it is recommended that future paths be placed outside of the 24' flood elevation.

Bank Stability

Bank stability along the Red River is variable with areas of slumping and erosion as well as stable bank conditions. Areas of active slumping may need to be avoided which may limit the feasibility of extensions of shared use path in certain areas adjacent to the River. The outside edges of river banks are more prone to erosion than the inner banks thus strategies to keep a shared use path on the inside edges may be more helpful for long-term preservation of a shared use path along the River.

Analysis

There is no formally adopted study that has discussed and noted unstable banks along the Red River. Metro COG has worked on the understanding that the farther away from the river bank the shared use paths sit the less likely slumping will be an issue. Metro COG has taken into account the setback distance of 200 feet for the City of Moorhead and 100 feet for the City of Fargo as well as the setback distance of 450 feet for Cass County. SRF Consulting prepared a broad feasibility analysis which included the issue of steep grades and slopes within the study area. Appendix 1 outlines these issues as related to each of the study segments 1 and 2.

Setback Regulations

The City of Fargo has a minimum setback requirement of 100 feet from the floodway line. This requirement pertains to Fargo's extraterritorial area as well. Cass County has a setback requirement of 350 feet from the River centerline. The City of Moorhead does not have a setback regulation while Clay County has setback of 200 feet for buildings in

the vicinity of streams and rivers. The Minnesota Department of Natural Resources (DNR) has several setback distances. The DNR requires a 150 foot setback along transitional rivers, a 100 foot setback along tributaries in agricultural and urban areas and 200 foot setback on remote sections of river. Discontinuity between setback requirements makes the development of a continuous greenway difficult at best since there is no mechanism for preservation of lands directly adjacent to the River for greenway development.

Analysis

Based on conversations with steering committee members, there is support for a standardized setback that would help to alleviate flood mitigation costs associated with allowing development that directly abuts the Red River. At this time there are four different setback requirements within the metropolitan region. A lack of standardized setback requirements makes the expansion of the Red River Greenway difficult if not impossible. Unity in supporting a standardized setback could save hundreds of thousands of dollars in flood mitigation expenses.

Recreational Opportunities

There are many recreational opportunities to partake in while on or near the Red River of the North in the Fargo-Moorhead region. At the present time it is known from bicyclist and pedestrian counts that bicycling, walking and in-line skating are extremely popular within the existing greenway. As the Fargo Marathon grows in popularity it is likely that levels of running will increase within the existing greenway. The Red River Greenway in its present condition allows for continuous recreational activity for several miles in each direction allowing for the type of experience many bicyclists, pedestrians and runners need and or want for maximum pleasure and utility. The Red River Greenway provides an excellent setting for winter activities as well as summer activities. Winter activities noted by the Steering Committee and public feedback were cross-country skiing and snowshoeing. Cross-country skiing and snowshoeing are both activities that benefit from a continuous, connected network of trails. The desire to maintain and develop the region's trail systems has been noted in *The Four-Community Sports Facility Framework Plan for the Metropolitan Area*.

Analysis

The availability of the shared use paths within the Red River Greenway can vary widely between years. The existing Red River Greenway is utilized on an individual basis as well as a group basis. Utilization of the existing greenway for community events is moderate with room for many more events. The consensus of the Red River Greenway Steering Committee is that non-motorized use of the RRG will continue to be the focus in additions of the RRG that lie in urbanized areas of Fargo and Moorhead. In rural areas equestrian use may be considered depending on further public input.

Educational Opportunities

There are several educational facilities/opportunities that are found along the Red River that are not accessible by the Red River Greenway as it exists today. The Fargo Lion's Conservancy Park and the Living Lab are educational facilities that provide opportunities to learn about the Red River and the wildlife that make the Red River their home. Connections to the Fargo Lion's Conservancy Park and the Living Lab could potentially get school children riding bicycles to science oriented educational facilities while practicing safe cycling skills as well as increasing their activity levels thus potentially reducing the chances of obesity. Creating increased access to a science facility could allow for numerous teachable moments to, at and from the destination itself, thus increasing the educational output of such a trip. Also, access to these facilities could reduce the number of school buses on local roads reducing the release of air pollutants and saving the Fargo School District and possibly the Moorhead School District educational funds. As development increases along the Red River it is reasonable to expect there to be a continued and possibly increased effort in preserving and conserving the resources of the Red River. It is likely that more environmental learning centers and teaching facilities will be created along the banks of the Red River providing more learning opportunities for local school children. The Probstfield Living History Farm is a prime example of an underutilized educational resource within the Red River Greenway.

Analysis

The Red River has numerous opportunities for outdoor education opportunities. The flora and fauna are generally undisturbed and are easy to locate. There is room for more small demonstration sites where examples of riparian habitat could be studied; shoreline re-vegetation efforts could be discussed. The existing greenway is literally a laboratory of local flora and fauna that is under utilized. Interpretive stations would be one way to provide learning opportunities at a low cost while providing significant amounts of information about the nature of the River and its shoreline.

Balanced Use

Greenways can serve as recreation and transportation corridors. Based on discussions with steering committee members and input from public meetings it is clear that there are strong expectations that future additions of the Red River Greenway will serve both these purposes. As the Scope of Work states, the primary function of this study is to provide alternatives for the routing of a shared use path along the Red River. Along with this focus is the understanding that, where and when possible, the shared use path will sit in a greenway corridor so that flood mitigation efforts may be implemented.

Analysis

The Red River Greenway is used as a recreational facility and also as a commuter route for bicyclists and pedestrians. The Red River Greenway provides excellent access to Fargo's and Moorhead's downtowns. As the downtown area densifies with new jobs and residents it is likely that the Red River Greenway will play a growing role in becoming a viable commuting route for many more citizens. The bicycle and pedestrian bridges add significant utility to the Red River Greenway and will continue to do so. It can be argued that the Greenway is not the shortest distance to the downtown area; it can also be argued that its "inefficiencies" lead to efficiencies. The Red River Greenway more circuitous

route offers more opportunity for attaining daily exercise needs while commuting to work by bicycle or by foot. The RRG offers numerous connections to neighborhoods which add to its recreational and commuting utility. As additions are added to the Red River Greenway it will be critical to market the additions as enhancements to a regional transportation system as well as a regional recreation system.

Expansion Opportunity Sites

As part of the issue identification process for the Red River Greenway Study a handful of existing community facilities presented themselves as *Expansion Opportunity Sites* along the Red River Greenway. These sites are considered critical to helping support and justify the expansion of the Red River Greenway. Those sites identified support uses which are complementary to the Red River Greenway. The potential expansion of the Red River Greenway will help increase access to the sites and further assist in developing their utility. What follows is a brief narrative describing these sites and areas. Map 3 demonstrates the location of the *Expansion Opportunity Sites*.

Trollwood North

As Trollwood moves its operation to its new location at 50th Avenue South in Moorhead, the existing Trollwood offers the potential for a new community facility which may assist in supporting, or which may be supported by an expanded Greenway. A number of low impact and flood resistant uses are possible at this site. The existing Trollwood site could be a possible northern trail head within an expanded Red River Greenway. The Trollwood site is situated strategically in relation to future Red River Greenway expansion areas.

Trollwood South

The new location for Trollwood on 50th Avenue in Moorhead will be a key origin and destination of an expanded Red River Greenway. The new Trollwood location is an anchor for the expansion of the Red River Greenway system to the south and the same community synergy which is bringing the new Trollwood location to fruition can likely be tapped to assist in expanding the Red River Greenway to the new site.

Iwen Park

Located on 52nd Avenue South (Fargo), Iwen Park offers public access to the Red River and has a disc golf course. As the Red River Greenway builds out Iwen Park likely will play the role as a southern trail head for the Greenway. Given that Iwen Park contains a public water access the Park can serve water users as well. A closer look at the areas adjacent to Iwen Park (the intersection of University Drive and 52nd Avenue) exposes the potential for a consolidation of a number of public owned lots. The City currently owns 16 parcels (flood buy-outs) on 49th Avenue South and will soon own the remaining parcels at the northeast corner of the intersection of University Drive and 52nd Avenue. The connection of these City owned parcels and Iwen Park would allow for the creation of a fairly substantial green space along the river. Given the flooding in the area, the space could be envisioned as a low intensity passive recreation area.

M.B. Johnson Park

Located north of Moorhead on 11th Street (County Road 3) M.B Johnson Park is a substantial recreational facility, albeit fairly undeveloped. An expanded Red River Greenway will help to bolster the function of M.B. Johnson by providing easier access for residents. At the same time the geographic location of M.B. Johnson assists in justifying the extension of the Red River Greenway to the north. The City of Moorhead recently completed a Regional Park Framework Plan which includes M.B. Johnson Park. Based on the Regional Park Framework Plan the City is now pursuing a more detailed planning effort for M.B. Johnson Park.

One of the barriers to the success of M.B. Johnson park is its relative disconnect from the larger community. The planning process being conducted by the City and the Greenway Study aims to expand access to M.B. Johnson from the north and the south. M.B. Johnson Park is situated such that it could readily serve the recreational needs of residents of both Fargo and Moorhead. As Moorhead grows to the north M.B. Johnson will play role in more of the day-to-day recreational needs of Moorhead residents. With improved connectivity from the north, M.B. Johnson could also play a recreational role for residents in the Oakport area, which will be annexed into Moorhead early in the next decade. At present, the Facility is landlocked due in part to the difficulty in reaching the park on foot or by bicycle. At Red River Greenway build out, M.B. Johnson can be seen as the mid-point in the northern expansion of the Greenway.

Probstfield Farm

The Probstfield Living History Farm (PLHF) is a well-known historical site that has the potential to be a major feature along an expanded Greenway. The Farm is located north of Moorhead along 11th Street (County Road 3). The Farm is run by a non-profit board consisting of a number of community members. PLHF currently allows the site to be used for on-site interpretative and educational activities by area schools. The Farm includes an organic community garden, as well as a number of the original buildings from the Probstfield farmstead. In the coming years the Probstfield Farm aims to expand its function as an interpretive facility for the community at large and will slowly be renovating a number of its historic elements. As is the case with M.B. Johnson the PLHF is disconnected from the larger community. However given its relation within the larger Red River Greenway concept, the PLHF is ideally situated.

Oakport Flood Protection Area

As part of the Oakport Flood Protection Project a number of properties in the Oakport area are being purchased by the Buffalo-Red River Watershed (BRRW). Based on input from the BRRW it appears a number of these properties would be available for conversion to public open space to assist with the Greenway concept. A number of the properties to be purchased for the flood protection project would be ideally situated in relation to the Trollwood site in North Fargo. A multipurpose greenway can be envisioned along the river for those areas behind (unprotected) the proposed flood protection. Given the predominately rural character of Oakport, agrarian and or equestrian features could be showcased with Red River Greenway expansion in this area.

River Oaks Park

River Oaks Park is located at the end of River Oaks Point in Moorhead (Approximately 40th Avenue South). River Oaks Park is situated such that it is directly across the river from Lemke Park (32nd Avenue) and is in close proximity to the South Dam. The public input process identified a possible need for a bicycle and pedestrian bridge at this location. A bridge at the River Oaks Park would facilitate east-west pedestrian movements south of I-94 for residents of both Fargo and Moorhead. East-west bicycle and pedestrian movements in this area will likely become more frequent as Moorhead grows to the south and as the new Trollwood facility becomes operational.

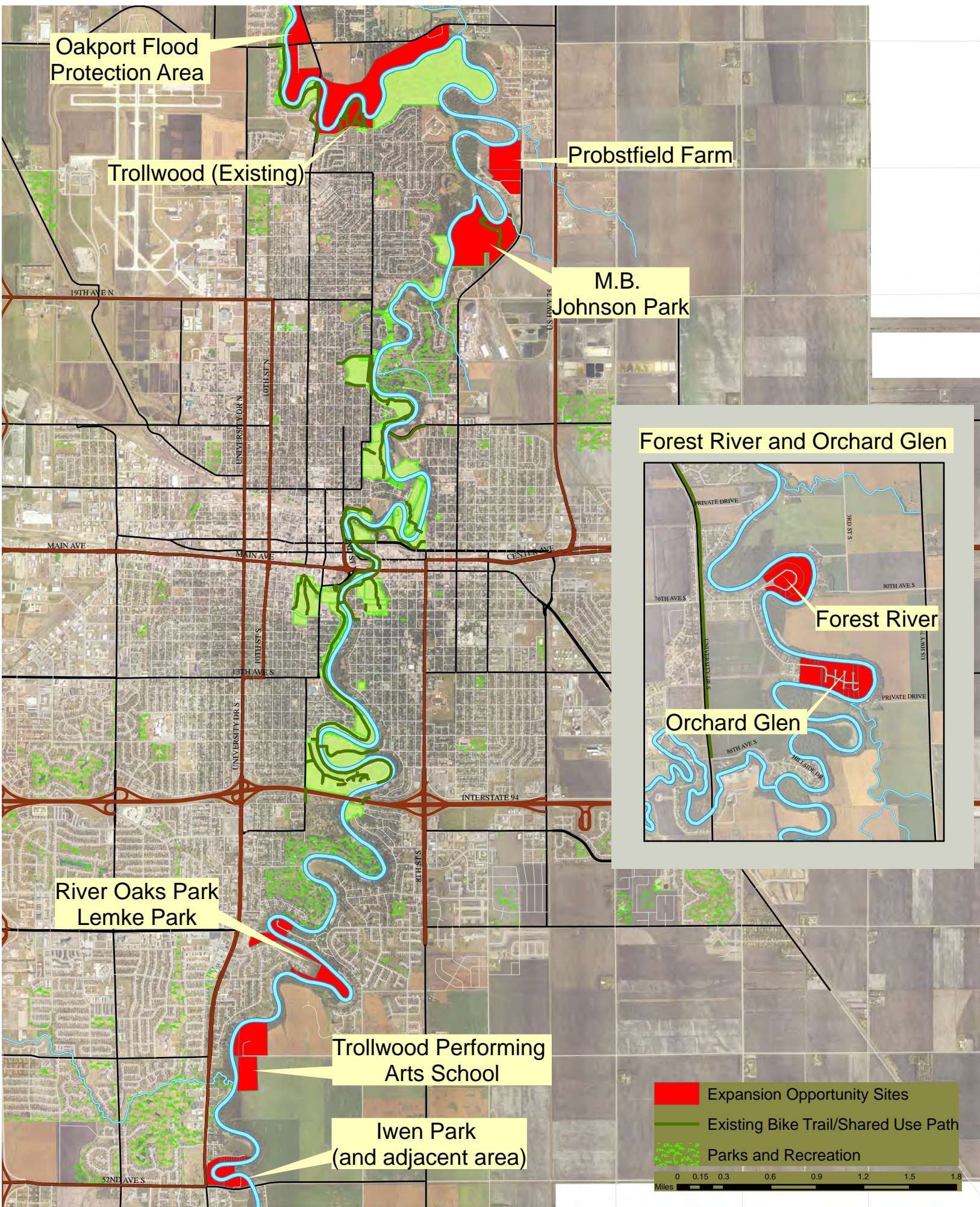
The placement of a bicycle and pedestrian bridge at River Oaks Park may also serve to elevate awareness of River Oaks Park as a recreational facility. Currently the park is underutilized given its fairly remote location. Given recent flood buy-outs the City of Moorhead owns almost the entire peninsula around River Oaks Park. Currently properties are leased to adjacent property owners for maintenance and upkeep. The possibility for an expanded recreational resource in this area may be preempted by the need for a future bike and pedestrian bridge due to the landlocked nature of River Oaks Park. It is possible that River Oaks Park may be enhanced without a bicycle and pedestrian bridge. In either case the River Oaks Park area is considered a highly valuable part of the Greenway concept.

Orchard Glen & Forest River

Both locations are located south of the metro area and were bought out after the 1997 flood. Ownership of these areas is likely to be transferred to the Fargo Park District from Cass County in the near future. Both sites offer the potential for significant recreational opportunities in the years to come. Ensuring long term access into and out of the facilities will help ensure future utility of the parks. Publicly owned open space, which is left passive in nature and relatively secluded from the larger community, is often times adopted by adjacent residents as de facto private property. The strategy with both of these facilities is to ensure a long term vision of public access that will be acknowledged by adjacent residents and community members.

RED RIVER GREENWAY STUDY

MAP 3: EXPANSION OPPORTUNITY SITES



Property Access Analysis

The extension of the Red River Greenway has been broken into four segments. Each of the four segments has been further broken into sub areas. An analysis has been conducted for each of the sub areas to the property access issues of Red River Greenway expansion. To assist in more fully understanding the limitations and opportunities of expansion of the Red River Greenway System, an access code has been given to each sub area. The access code applies to the ability to secure lands adjacent to the river for addition of new greenway. While several sub areas receive an access code of yellow or red, continuity of bicycle and pedestrian movements are facilitated through existing shared use paths or on road facilities. The codes are as follows:

- Green – Access is understood to be highly probable based on a review of ownership issues or based on public comments received through the planning process.
- Yellow – Access is questionable based on ownership issues or based on public comments received through the planning process; or there is a mix of green and red access codes with in the sub area.
- Red – Access is unlikely based on ownership issues, or based on public comments received through the planning process.

Segment 1

Segment 1 runs from approximately 15th Avenue North (Fargo) to 70th Avenue North (Clay County)/52nd Avenue North (Fargo). Segment 1 contains several areas where the feasibility of greenway expansion is possible. The extension of the Red River Greenway northward from 15th Avenue has the opportunity to access several publicly owned properties. These properties easily accommodate the Red River Greenway. The northerly extension of Red River Greenway into Segment 1 has been broken into a six sub areas.

Sub areas A-C are on the Fargo side of the Red River, and sub areas D-F are on the Moorhead/Clay County side of the River. The access assessment for each sub area is based on ownership issues, technical and environmental issues, and comments received through the public input process.

- A) Sub area A runs from 15th Avenue North to the northern boundary of the Veterans Administration (VA) property line. Sub area A is a mix of City of Fargo and Fargo Park District owned land. The area is currently being altered with a flood protection project which will include both flood walls and earthen levies.

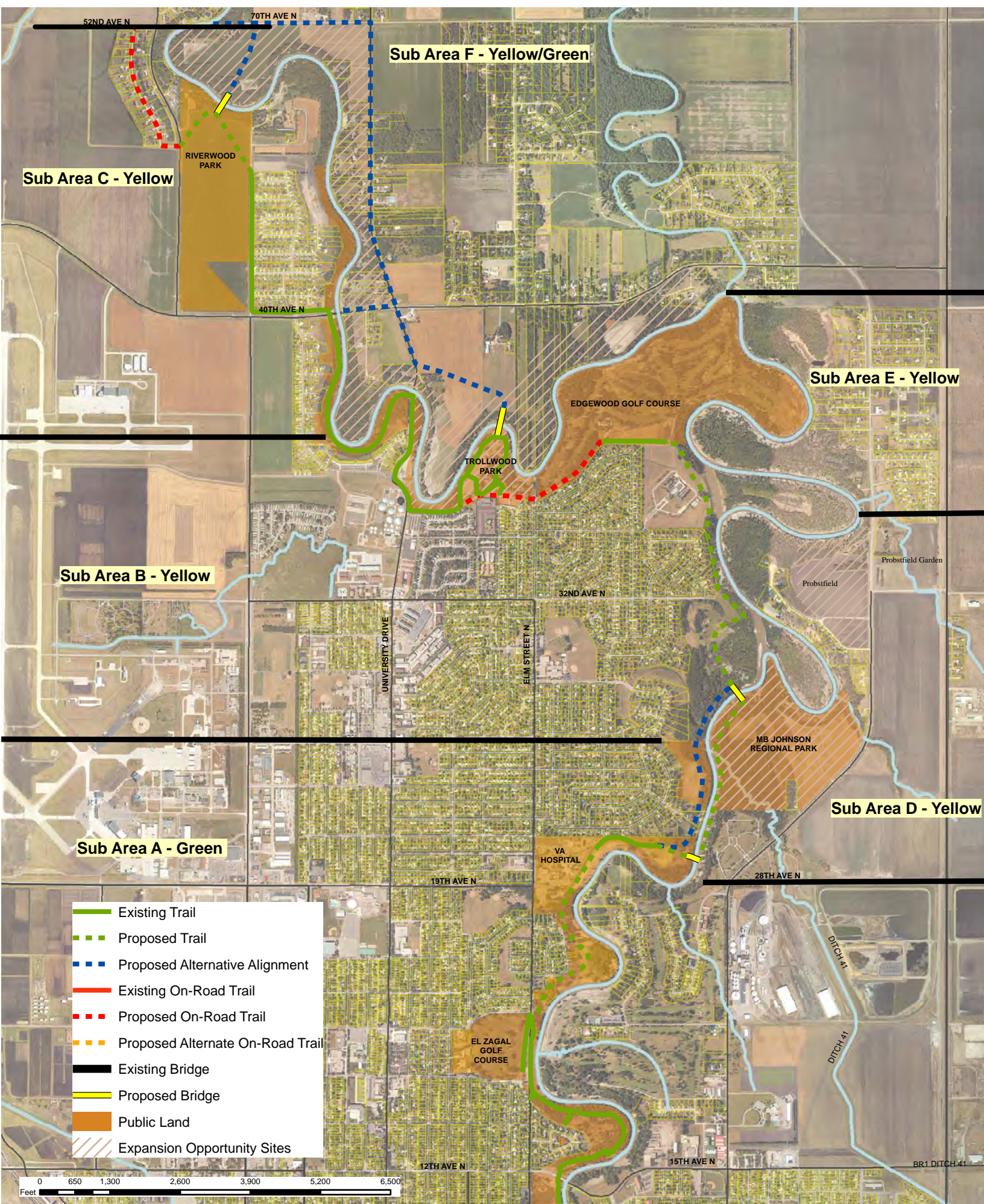
Analysis

Extension of the Greenway is considered highly probable in segment A and has been given an access code of green. The sub area consists of purely public property, either Fargo Park District or City of Fargo. The addition of the Ridgewood Flood Protection Project also adds potential to the area.



RED RIVER GREENWAY STUDY

MAP 4: SEGMENT 1 - ALIGNMENT ANALYSIS



- B) Sub area B runs from the VA Property line north to the southern edge of the Edgewood Golf Course. Sub area B contains five distinct property situations. Heading north from the VA Sub area B contains three private residential parcels which abut the Red River. North of the residential parcels is Holm Park which is owned by the Fargo Park District. North of Holm Park is a large private parcel which is heavily wooded and undeveloped. North of the privately held undeveloped parcel is Park District land which runs behind 11 residential properties on Peterson Parkway and Eagle Street.

North of the Park District land is a parcel of land owned by the City of Fargo which runs behind the Cardinal Muench Seminary. The parcel is part of a flood protection project which provides a cut through channel to bypass the adjacent oxbow on the river. North of the City owned parcel is a small piece of the Cardinal Muench Seminary property.

Analysis

Sub area B has been given an access code of yellow. The ownership along the sub area is a mix of public and private. Negative comments have been received from property owners in the sub area. However, three areas of public land do exist, one of which is Holm Park. As is discussed later, continuation of Segment 1 may require the placement of a bridge at the northern end of sub area A to connect with sub area D.

- C) Sub area C runs from the Edgewood Golf Course to 52nd Avenue North (Fargo). The southern portion of the sub area C is the Edgewood complex. To the north of Edgewood is Trollwood Park and the Trollwood Performing Arts School. Sub-area C already contains an existing shared use path from the Trollwood Park north to the CR 20. The existing shared use path uses existing Park District land. North of CR 20 there is Park District land which runs behind a residential subdivision from 41st to 47th Avenue North.

Analysis

It is not deemed possible to extend the Red River Greenway across the Edgewood property. Given access limitations in sub area B a northerly continuation of the Greenway into sub area C from the south may not be likely. Sub Area C has been given an access code of yellow. None the less, the Red River Greenway may continue into sub area C from sub area E. To accommodate north south bike-ped movements in this area the existing access road to Edgewood (Golf Course Road) could be used to facilitate the continuation of the Red River Greenway. From Trollwood Park northward an existing shared use path follows the Red River to CR 20. To respect bank stability issues existing plans for shared use path north of CR 20 have been scrapped in favor of 'native' trail on the park District parcel north from CR 20 to 47th Avenue. Either way, property ownership issues will not allow for a continuous facility from the Park District Parcel to Riverwood Park. The City of Fargo has programmed a shared use facility along CR 20 to University Drive and then northward to Riverwood Park. As shown in Map 4, a bike/pedestrian

bridge has been sited at the northern tip of Riverwood Park. The siting of a bridge here would facilitate east-west movements in the area.

- D) Sub area D runs from the Riverside Cemetery north to southern edge of the Probstfield property. Sub area C contains 3 very distinct areas of property. The southern part of sub area C is Riverside Cemetery. North of Riverside Cemetery is M.B Johnson Park. North of M.B. Johnson Park are nine privately held properties which abut the Red River.

Analysis

Sub area D has been given an access code of yellow. Sub area D is seen as a critical link north of the Greenway given property ownership issues on the Fargo side of the river. The major access issue in sub area D is the Riverside Cemetery and the nine private properties immediately north of M.B. Johnson. Access onto the M.B. Johnson property is considered a positive by the City of Moorhead. However, no negative comments have been received from the private property owners in sub area D.

- E) Sub area E runs from the southern tip of the Probstfield property north to approximately 57th Avenue. The dominant feature of Sub areas E is the Probstfield property. To its north is fairly vacant land which is privately held. The northern portion of sub area E contains eight privately held residential parcels which abut the Red River.

Analysis

Sub area E has been given an access code of yellow. All the property in the sub area is privately held. Sub area E is also considered a critical link in the northern expansion of the greenway given the property ownership issues on the Fargo side. The majority of sub area E is undeveloped and appears highly suitable for the extension of the Red River Greenway. The existing Growth Area Plan (GAP) for this area calls for future "open" or "park space" in the middle section of sub area E.

- F) Sub area F runs from 57th Avenue north to 70th Avenue. The dominant feature of sub area F is the Oakport Flood Protection project. In the very near future a portion of the parcels which abut the river in sub area F may be purchased as part of the Oakport Flood Protection project.

Analysis

Sub area F has been given an access code of yellow. The majority of the land in the sub area is privately held. There are several parcels in the sub area which are currently owned by the Buffalo-Red River Watershed. Based on information received by Metro COG, several properties in sub area F will eventually be bought out as part of the Oakport Flood

Protection Project. All of the river property in sub area F will be outside of the Oakport project and so the expansion of the Red River Greenway in this area is considered likely.

Segment 2

Segment 2 extends from the Lindenwood/Gooseberry Park area to Iwen Park at 52nd Avenue South (Fargo)/60th Avenue South (Moorhead). On the Fargo side of the Red River private development exists almost entirely throughout Segment 2. In Fargo the extension of the RRG system will depend on the use of existing shared use and on road facilities. The Moorhead portion of Segment 2 offers more opportunity for the expansion of the RRG system. Much of the area south of 46th Avenue has yet to be platted or will soon be entering the platting process.

Segment 2 is broken into six sub areas. Sub areas A – C are in Moorhead/Clay County. Sub areas D-F are in Fargo. **Map 5** highlights the Segment 2 sub areas and accessibility analysis.

- A) Sub area A runs from Gooseberry Park to 49th Avenue South. The river front in sub-area A is fully developed. A feature of sub area A is River Oaks Park which is geographically aligned with Lemke Park in Fargo.

Analysis

The river front in sub area A is fully developed. Sub area A has been given an access code of red. Sub area A has the ability to facilitate north-south movements on road from Gooseberry to 40th Avenue South and via a shared use path south of 40th Avenue to 46th Avenue. In the next year additional shared use paths will extend south along 3rd Street to 50th Avenue and then west along 50th Avenue to the new Trollwood facility. It is recommended that a connection be created between River Oaks Park and Lemke Park via a new bicycle and pedestrian bridge. This connection would provide for increased east to west connectivity which is not currently available.

- B) Sub area B runs from 49th Avenue South back to the River and south to 50th Avenue. The northern portion of this sub area is privately held and is undergoing residential subdivision. The southern portion of sub area B consists of the Bob Fogel Riparian Area and the new Trollwood Performing Arts School.

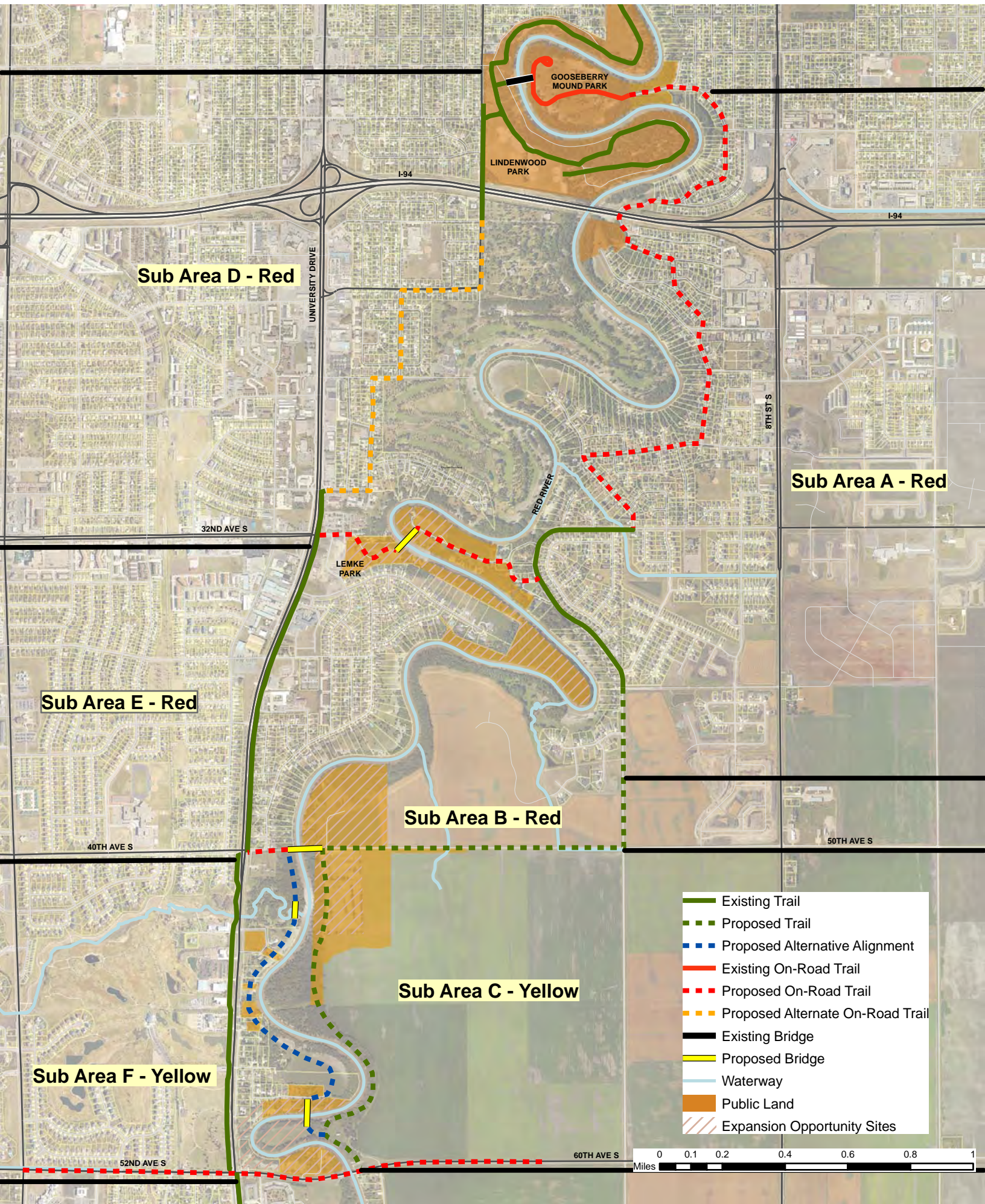
Analysis

The river front in sub area B is partially platted. Based on public input this area has been given an access code of red. The area would be ideal for implementation of a river path, however property owner feedback has been negative in the areas north and east of Trollwood site and the Bob Fogel Riparian Area. Additionally, given the soon to be completed shared use path along 3rd Street and 50th Avenue, a river path in sub area B may be redundant. However, developments south of 50th Avenue may allow for extension and expansion of a bicycle and pedestrian system.



RED RIVER GREENWAY STUDY

MAP 5: SEGMENT 2 - ALIGNMENT ANALYSIS



Sub Area D - Red

Sub Area A - Red

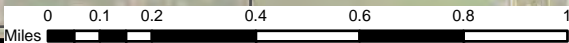
Sub Area E - Red

Sub Area B - Red

Sub Area C - Yellow

Sub Area F - Yellow

- Existing Trail
- Proposed Trail
- Proposed Alternative Alignment
- Existing On-Road Trail
- Proposed On-Road Trail
- Proposed Alternate On-Road Trail
- Existing Bridge
- Proposed Bridge
- Waterway
- Public Land
- Expansion Opportunity Sites



- C) Sub area C runs from 50th Avenue to 60th Avenue. The northern portion of sub area C is the new Trollwood Performing Arts School. South of the Trollwood site is private land which is in agricultural production.

Analysis

Sub area C is predominantly undeveloped with the only exception being a rural residential lot to the north of 60th Avenue. The area is given an access code of yellow based on mixed input from adjacent property owners. The area to the east of sub area C will likely be developed in the coming three to five years so securing the alignment of a pathway in this area is critical. A bicycle and pedestrian bridge is recommended for sub area C. Based on property owner input, an alignment south of 40th Avenue (Fargo) is preferred. A bridge alignment at 40th Avenue (Fargo)/50th Avenue (Moorhead) is considered central to the current master plan for the Trollwood facility. It is possible that a new bridge could be aligned with the Fargo Lions Conservancy Park. An alignment in this location may allow for connection with the Milwaukee Trail. The extension of the Red River Greenway is highly likely across the Trollwood site, and in fact will be part of the overall transportation network of the site. The Alignment south of the Trollwood site will require additional deliberation with private property owners.

- D) Sub area D runs from Lindenwood Park to 32nd Avenue South. Sub area D is primarily developed along the river front. The two primary features of sub area D are the Fargo Country Club and Riverside Cemetery. There are seven parcels along the river off of Southwood Drive which are owned by the City of Fargo. The Milwaukee Trail also runs the length of this sub area approximately ½ mile to west.

Analysis

Sub area D has been given an access code of red. River access in sub area D is not feasible given property owners issues. Sub area D will follow an on-road alignment from Lindenwood to 32nd Avenue South. At or near 32nd Avenue South a bicycle and pedestrian bridge is recommended to connect with River Oaks Park. There is the possibility for a bicycle and pedestrian bridge at 32nd Avenue via 11th Street.

- E) Sub area E runs from 32nd Avenue South to 40th Avenue South. Sub area E is fully developed along the river front with residential uses. An existing shared use path runs the length of this corridor parallel to University Drive. The Milwaukee Trail runs the length of this sub area approximately ½ mile to the west.

Analysis

Sub area E is given an access code of Red. With the exception of the Lemke Park easement behind Harwood Estates, there is no public access to the river in sub area E.

- F) Sub area F runs from 40th Avenue South to 52nd Avenue. There is a dated shared use path in this sub area which runs along University Drive. This area is partially developed and features the Lion Conservancy Park as well more than 20 properties owned by the City of Fargo. Sixteen of these city owned properties are clustered

together on the eastern end of 49th Avenue South. The remainder of the City owned lots abut University Drive.

Analysis

Sub area F is given an access code of Yellow. North-south bicycle and pedestrian movements are currently facilitated by the Milwaukee Trail. The Milwaukee Trail runs from approximately the 25th Street/I-94 Interchange to Rose Creek Golf Course. Sub areas E and F also contain an existing shared used path parallel to University Drive between 32nd Avenue and 52nd Avenue. The section of shared use path between 40th and 52nd Avenue is programmed to be reconstructed in 2010. However, the potential for river access in sub area F is possible given the amount of publicly owned land within the sub area. Of note are the City of Fargo owned parcels adjacent to University Drive and the clustering of parcels at the end of 49th Avenue. Sub area F will include a bicycle and pedestrian bridge somewhere between 40th Avenue and Lions Conservancy Park.

Segment 3

Segment 3 runs from 70th Avenue North (Clay County)/52nd Avenue North (Fargo) to 110th Avenue North (Clay County)/100th Avenue North (Cass County). On the Clay County side of the Red River Segment 3 is almost exclusively agricultural in nature, with no residential subdivision. On the Fargo/Cass County side of the river Segment 3 has been subdivided into residential uses north to 76th Avenue North. Beyond 76th Avenue Segment 3 on the Cass County side of the river is in agricultural uses. Segment 3 is broken into three sub areas. Sub area A is the entirety of the Clay County portion. Sub area B and C make up the Cass County/Fargo portion of Segment 3.

- A) Sub area A consists of the entirety of the Clay County portion of Segment 3. Sub area A is almost exclusively undeveloped and agricultural in nature. While there are no subdivided residential developments along the river in sub area A, there are nine existing rural residential uses strewn through out the sub area. Some of these residences are also working farmsteads.

Analysis

Sub area A is given an access code of green. While there is sporadic rural residential and farm related develop adjacent to the river, the majority of the sub area is un-developed. No comments were received from land owners in sub area A. A bicycle and pedestrian bridge is recommended in sub area A. This bridge would provide access across the river near 64th Avenue North (Fargo) and east-west connectivity for developments on the Fargo side of the river in Segment 3.

- B) Sub Area B runs from 52nd Avenue North to 76th Avenue North. With the exception of a few small areas, Sub area B has been subdivided into residential lots.

Analysis

There is very little potential for greenway expansion in sub area B due to the degree of subdivision which has occurred adjacent to the River. Access in this area has been given a red code. There are a few exceptions where river access may be possible, including the

bike and pedestrian bridge location just north of 64th Avenue. Sub area B would likely be served by on road facilities and through the implementation of the Greenway on the Clay County side.

- C) Sub Area C runs from 76th Avenue North to 90th Avenue North. Sub area C is in primarily agricultural uses and has not experienced any residential subdivision along the Red River.

Analysis

Sub area C is undeveloped with the only exception being the area north of 76th Avenue North. Due to the lack of development along the river sub area C has been given an access code of green.

Segment 4

Segment 4 of the Red River Greenway Study runs from 52nd Avenue South (Fargo)/60th Avenue South (Clay County) to 124th Avenue South (Cass County)/ 120th Avenue South (Clay County). The Clay County portion of Segment 4 is primarily in agricultural uses with little or no residential subdivision along the Red River. The Fargo-Cass County portion of Segment 4 has undergone measurable residential subdivision along the Red River.

Segment 4 has been broken down into four sub areas.

- A) Sub area A runs from 60th Avenue South 90th Avenue South in Clay County. The northern $\frac{3}{4}$ of a mile of sub area A has been subdivided into residential lots. South of this initial clustering of residential uses, there is very little residential subdivision in the sub area. However, there is a clustering of five residential lots north of 80th Avenue and five rural residences, some of which are likely working farmsteads.

Analysis

Sub area A has been given an access code of green. No comments from property owners were received. Given the fairly undeveloped nature of the area the expansion of the Greenway in this area seems feasible. There may be situations where the alignment would have to be off the River to accommodate existing property ownership issues. Orchard Glen and Forest River are two primary features of this sub area. Bicycle and pedestrian bridges are shown at those locations to facilitate access to those areas.

- B) Sub area B runs from 90th Avenue South to 120th Avenue South in Clay County. This sub area contains no residential subdivisions along the Red River. The area however contains six rural residences, some of which are likely farmsteads.

Analysis

Sub area B has been given an access code of green. No comments from property owners were received. Given the fairly undeveloped nature of the area the expansion of the greenway in this area seems feasible. There may be situations where the alignment would have to be off the river to accommodate existing property ownership issues.

- C) Sub area C runs from 52nd Avenue South in Fargo to 88th Avenue in Cass County. Sub area C has been measurably subdivided through out. With the exception of Orchard Glen and Forest River, the majority of river front property in sub area C is subdivided into residential lots. A shared use path follows University Drive/CR 81 for the duration of Sub area C.

Analysis

Sub area C is given an access code of red given the large amount of subdivision which has occurred adjacent to the river. North-south continuity will be facilitated along the existing shared use path along University. Orchard Glen and Forest River are two primary features of this sub area. Bicycle and pedestrian bridges are recommended to facilitate access to these areas.

- D) Sub area D runs from 88th Avenue to 124th Avenue in Cass County. About 50% of sub area D has been subdivided into residential lots. The remainder of the sub area is in agricultural uses.

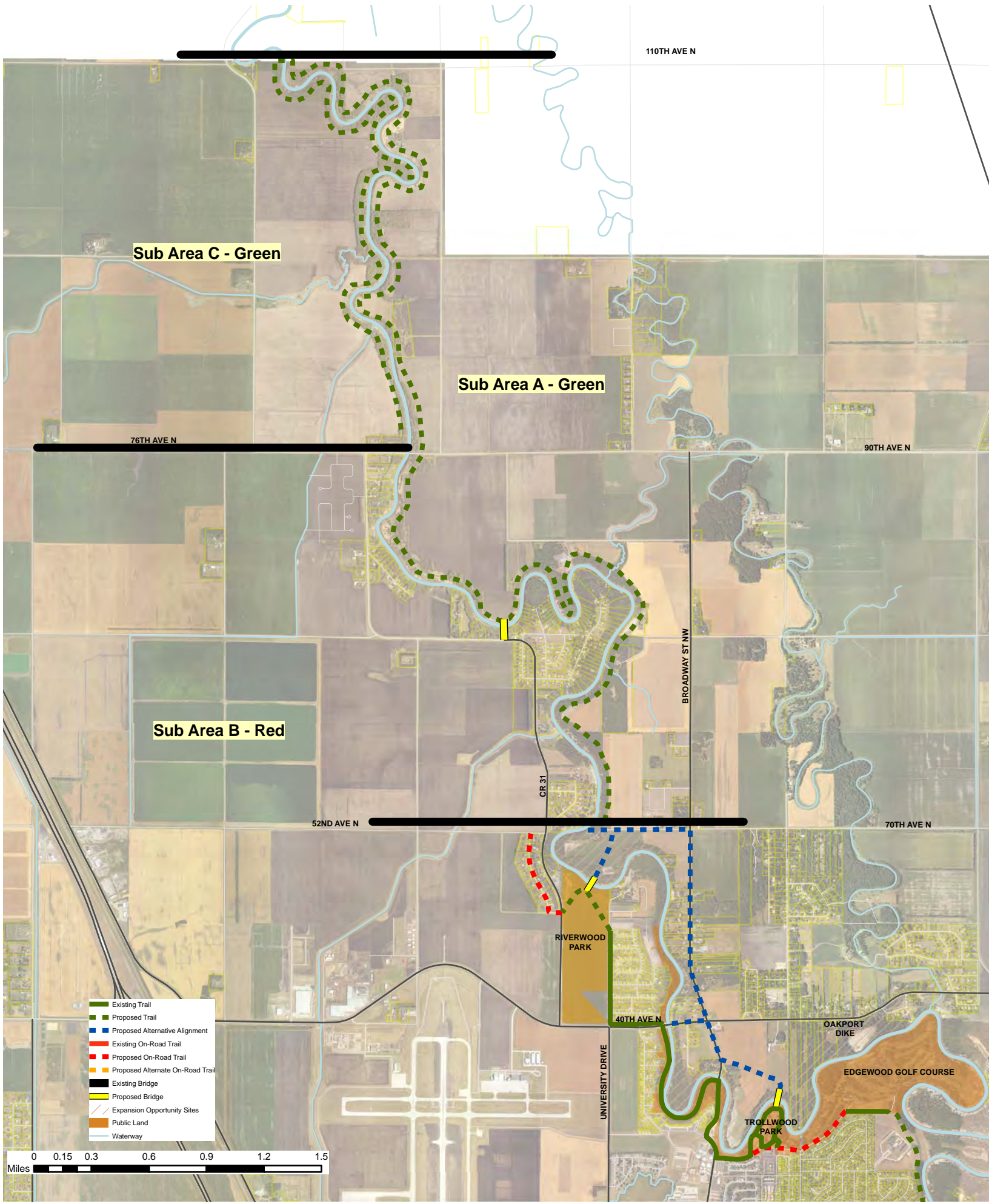
Analysis

Sub area D is given an access code of yellow. While some areas have been developed, there are undeveloped areas within sub area D that show the potential for greenway expansion.



RED RIVER GREENWAY STUDY

MAP 6: SEGMENT 3 - ALIGNMENT ANALYSIS



Sub Area C - Green

Sub Area A - Green

Sub Area B - Red

110TH AVE N

76TH AVE N

90TH AVE N

BROADWAY ST NW

CR 31

52ND AVE N

70TH AVE N

RIVERWOOD PARK

40TH AVE N

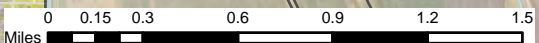
OAKPORT DIKE

EDGEWOOD GOLF COURSE

TROLLWOOD PARK

UNIVERSITY DRIVE

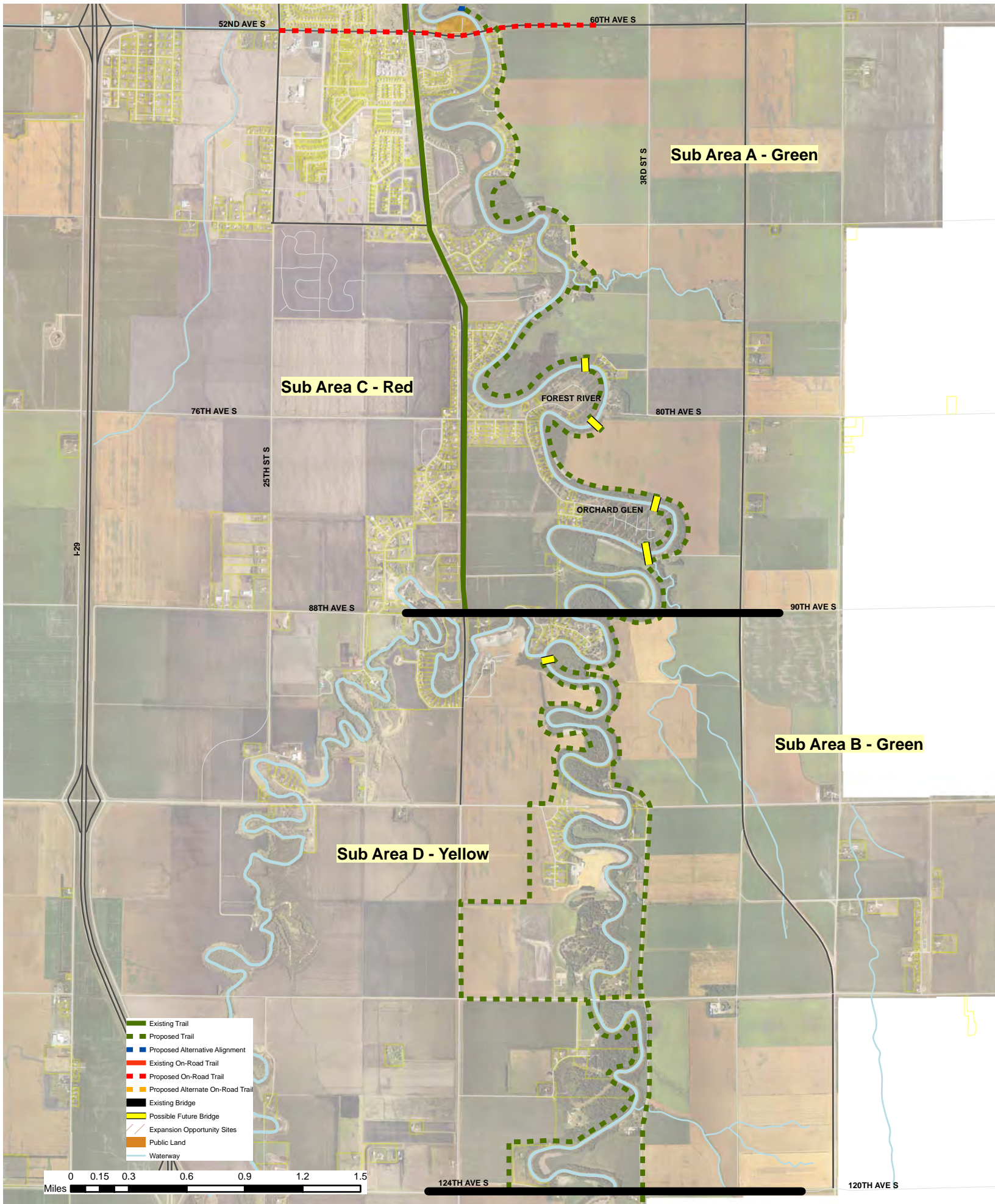
- Existing Trail
- Proposed Trail
- Proposed Alternative Alignment
- Existing On-Road Trail
- Proposed On-Road Trail
- Proposed Alternate On-Road Trail
- Existing Bridge
- Proposed Bridge
- Expansion Opportunity Sites
- Public Land
- Waterway





RED RIVER GREENWAY STUDY

MAP 7: SEGMENT 4 - ALIGNMENT ANALYSIS



Recommendations & Action Plan

Implementation Priority Plan

The following prioritization table has been developed for the five bridge locations analyzed as part of the Red River Greenway. The prioritization table should be used as communities seek local, state, and Federal resources.

Red River Greenway Bridge Priority Table

Priority Ranking*	Proposed Bridge	Location	Bridge Type	Length	Access	Estimated Cost**
1	40th Ave S/Trollwood	River Mile 460.4	Steel Truss	250'	ND: Private MN: Private	\$1,100,000
2t	MB Johnson	River Mile 446.3	Steel Truss	210'	ND: Private MN: Public	\$970,000
2t	Riverside Cemetery	River Mile 447	Steel Truss	285'	ND: Public MN: Private	\$1,050,000
3	Lemke Park/River Oaks Park	River Mile 458	Steel Truss	260'	ND: Public MN: Public	\$1,050,000
4	South River Estates (Iwen Park)	River Mile 441.5	Steel Truss	230'	ND: Public MN: Private	\$995,000

t - These two bridge locations are ranked jointly as the number 2 priority due in part to the possible need for either one or both depending on future right-of-way acquisition.

* Moorhead indicated that after priority 1 and 2, it would make investments in existing bridge infrastructure.

** These cost estimates assume hydraulic lift systems, which make up 400,000 of the cost on each bridge.

The following prioritization table has been added to the Red River Greenway expansion elements outlined in Segments 1 and 2 of the study area. The prioritization table should be used as communities seek local, state, and Federal resources.

Red River Greenway Expansion Priority Table

Priority Ranking	Segment	Location	Access
1	North 15th Avenue - VA Hospital	ND	Public
2	50th Avenue South (3rd Street - Trollwood)	MN	Public
3t	Riverside Cemetery - MB Johnson	MN	Private/Public
3t	VA Hospital - MB Johnson	ND	Private/Public
4	MB Johnson – Edgewood Golf Course	ND	Private/Public
5	Trollwood - 50th Avenue	MN	Private/Public

t - These two segments are ranked jointly as the number 3 priority due in part to the interchangeability of them depending on future right-of-way acquisition.

Greenway Coordination, Planning, Analysis

The continued build out of the Red River Greenway will require ongoing communication and coordination between Fargo, Moorhead, Cass County, and Clay County, including River Keepers, and the Fargo Park District. Past Red River Studies have recommended the formation of a joint corridor advisory committee in order to ensure uniform and coordinated programming of the Red River Greenway.

The Red River Greenway Study recognizes the merit of such a committee, however cautions against additional bureaucracy and potential establishment of false expectations. That said, it is recommended that a core group of technical, planning, and programming staff from affected agencies and jurisdictions meet at least once annually to assess the state of the Red River Greenway. Metro COG should convene the meeting and also prepare an annual consistency report of progress made towards implementation of the major elements of the Red River Greenway Study. Such report would be provided annually to the Metro COG Policy Board and other agencies not directly represented through Metro COG.

So as to facilitate the recommendation above, Metro COG should annually allocate resources as part of its Unified Planning Work Program (UPWP) to ensure necessary technical assistance regarding the Red River Greenway. Preferences should be given to those projects and or needs which are considered a high priority in terms of planning and or on issues of coordination.

Support for Existing Public Lands

Existing public lands and easements earmarked as public space often return to de facto private property if not overtly kept in public use. A good example is the Lemke Park area south of 32nd Avenue South (Fargo). The existing Fargo Park District easement behind the residential properties along University Drive (north of 40th Avenue/CR 20) needs to remain clearly demarcated to ensure public use of the space in perpetuity. River Oaks Park is identified as an *Expansion Opportunity Site* as part of the Red River Greenway Study. Maintenance and expansion of the River Oaks Park area is important to ensure it remains a visible public space within the community.

Along these same lines Cass County and the Fargo Park District should move quickly to establish a framework for the transition of both Forest River and Orchard Glenn to public parks. The longer these areas remain passive open space, the higher the likelihood adjacent property owners begin to view these areas as private property. In proximity to the transfer of these properties, a public process should be initiated which invites adjacent property owners (on both sides of the River) into the discussion of how these spaces transition to useable public space. The Fargo Park District would be further encouraged to develop site plans for both Orchard Glenn and Forest River.

Opportunity Site Expansion

Site opportunity studies should be conducted at three locations within the study area. One is Trollwood Park. The space is flood prone but would lend itself to a future public use which is passive in nature. Given the possible connection to the Oakport area, Trollwood Park can be envisioned as part of larger open space complex.

Once right of way acquisition is complete on the Oakport Flood Protection Project, an assessment of the lands should be conducted. The assessment should look at the types and kinds of public uses which may be possible in those areas owned by the Buffalo-Red River Watershed (BRRWS). The BRRWS has indicated a willingness to convert these areas into useable open space; including the potential to eventually transfer ownership to another public agency. Given the areas rural nature, it may lend itself to a unique type of recreational activity. As well, the connection to Trollwood Park offers the opportunity for the development of a large and diverse open space complex.

The public lands in and around Iwen Park offer the potential for additional passive open space along the Red River. Future analysis should look at these areas and determine what options exist for creating more useable public open space. This becomes especially positive if shared use path development occurs in the area. Future consideration could be given for the possible expansion of disc golf course at Iwen Park across the River to Moorhead.

Operations, Maintenance and Future Funding

The Red River Greenway Study focuses on the creation of new facilities. However, preservation and maintenance of the existing network is critical. Fargo, Moorhead, and the Fargo Park District should establish and finance a coordinated maintenance and cleanup program for the entire corridor. As part of the Comparative Maintenance Analysis Metro COG has been asked to do in 2009, Metro COG should also focus on maintenance issues concerning the shared used system within the Red River Greenway.

Resources from sources such as the Federal Transportation Enhancement Program, the Safe Routes to School Program and miscellaneous recreational grant programs should be sought to continue the programming of shared use facilities along the Red River. Support for biking and running facilities was a top priority in the *Four Cities Recreational Framework Study*. Based on this support for new facilities local funding sources should be identified to assist in supporting expansion of facilities along the Red River, in support of and in the absence of Federal dollars.

Greenway Preservation

Communities should establish a program of right-of-way dedication to allow for expansion of the Red River Greenway. As well, right-of-way dedication should be used in support of flood mitigation, preservation of river vegetation, and bank stabilization efforts. The right of way dedication program should be attached within existing land development and subdivision ordinances of affected jurisdictions, in this Cass County,

Clay County, Fargo, and Moorhead. A right-of-way dedication policy should be uniform on both sides of the Red River. Cass County's current ordinance is a model worth expanding to other communities, and provides two worthy examples for duplication by Clay County, Fargo, and Moorhead. Ideally, right-of-way dedication is achieved through the platting process as part of a community's subdivision ordinance.

Within its subdivision ordinance Cass County allows itself the *option* for the dedication of trails and linear parks through the platting process for areas adjacent to the Red (and Wild Rice) River. Cass County sets a specific width requirement for the dedication of linear parks (75 feet) and trails (15 feet). Excerpts from *Cass County's Subdivision Ordinance* (Section 616.08) which discusses the *Trails and Linear Parks* dedication are included in Appendix 5. It is recommended that the Cass County ordinance language be considered by Fargo, Moorhead, and Clay County. Language similar to the following would be suggested for inclusion within each jurisdiction's ordinance, thus setting the stage for right-of-way dedication specifically for future public open space:

All proposed subdivisions adjacent to the Red River of the North are hereby required to provide open space for a public greenway for the purposes of flood mitigation and public recreation. Open space provided is to be included as a portion of the setback required (with reference to setback requirement) and must be reasonably adaptable for use for park recreational purposes, taking into consideration such factors as size, shape, topography, geology, access, and location of the open space land.

River Setback Policy

Cass County requires a setback of 450' from the Red (and Wild Rice) River. Setback from all other blue line perennial water courses also requires the 450 foot setback; or the setback is to be equal to the vertical differences between the top of the bank and the river bottom (plus any additional flood plain elevation requirements) multiplied by eight. The setback policy is outlined in Section 610 of the *Cass County Subdivision Ordinance*, which is included in Appendix 5.

The Cass County setback policy stipulates a *minimal* disturbance zone which is the first 350' from the water course centerline. The minimal disturbance zone does allow for the placement of bike paths, walking trails, and other multi-use paths. The next 100' beyond the minimal disturbance zone is the *limited* disturbance zone, which also allows for the placement of bike paths, walking trails, and other multi-use paths. It is recommended that other jurisdictions consider adoption of a similar setback policy within their respective development codes and ordinances.

Appendix 1

Red River Greenway Corridor: Broad Feasibility Evaluation

Broad Feasibility Evaluation of the Red River Greenway Corridor

Study Intent

The intent of the Red River Greenway Evaluation is to determine the feasibility of additional trail development along the Red River in the Fargo-Moorhead metropolitan area. Greenway trails already exist from Lindenwood Park to Trefoil Park. The geographic focus of this evaluation covers Segments 1 and 2 of the proposed Red River Greenway extending from 52nd Avenue North, Fargo to 52nd Avenue South, Fargo. The evaluation considers existing physical constraints including topography, river flood elevations, impacts to vegetation, and existing and potential river crossings.

Methodology

The Red River Greenway Evaluation team used a Geographic Information System (GIS), aerial photographs and field verification to analyze several issues that may impact greenway trail development along the Red River. These issues included:

- Steep slopes
- Floodway impacts
- Adjacent private parcels
- Existing trails
- Vegetation impacts
- Existing and proposed river crossings
- Road widths
- Road right-of-way widths

Steep Slopes. To determine the location of steep slopes within the evaluation area, GIS data was used to identify three classifications of slopes: 0-5%, 6%-10%, >10%. Slope data was analyzed in an offset corridor of 300 feet from both sides of the centerline of the Red River. Steep slopes suggest construction and cost issues due to increased grading, vegetation impacts and erosion issues.

Floodway. FEMA floodway data was used to identify the Red River floodway. Floodway impacts suggest construction and usability issues due to frequent flooding.

Adjacent Private Parcels. Parcel data from Clay County, Minnesota and Cass County, North Dakota was used to identify private and public parcel locations. Private parcels suggest cost and construction issues because there may be a need for easement acquisitions.

Existing Trails. Trail data from the cities of Fargo and Moorhead was used to identify the locations of existing trails. Existing trails may require additional construction and may have increased cost implications to bring trails up to current Mn/DOT and AASHTO standards.

Vegetation Impacts. A combination of aerial photograph analysis and field verification was used to determine impacts to existing vegetation of proposed greenway segments. Vegetation impacts suggest cost and construction issues related to tree removal and increased potential for erosion.

River Crossings. River crossings were identified in the Red River Greenway Study conducted by the Fargo-Moorhead Metropolitan Council of Governments (Metro COG). Vegetation cover, river and floodway width and adjacent parcels were analyzed for each river crossing. Bridge location and design will be analyzed further in a future task of this project. Bridge construction suggests cost and construction issues but may provide opportunities to create contiguous trail segments.

Trail Design Standards. The American Association of State Highway and Transportation Officials (AASHTO) and Mn/DOT design standards were used as guidelines for this study. Basic elements of these standards include the following:

- Ten foot trail width
- Two foot clear zones on both sides of trail
- 100' minimum turn radii
- 3:1 side slopes
- Five percent maximum grade, typical
- Up to 11% grade for short stretches

The Metro COG Red River Greenway Study divided the proposed greenway corridor into four segments, each with several sub segments. This evaluation covers Segment 1, which includes sub segments 1A, 1B, 1C, 1D, 1E & 1F and Segment 2, which includes sub segments 2A, 2B, 2C, 2D, 2E & 2F.

In addition to the analysis of issues listed above, the evaluation team identified other issues that may impact trail development. These issues included:

- Other topographic features such as ravines and stream crossings
- Road crossings

These issues were identified using aerial photographs and by utilizing the comprehensive data compiled earlier in the evaluation.

Results

The evaluation of the proposed Red River Greenway corridor suggests that there are no major physical impediments to extending the Red River Greenway in Fargo and Moorhead. In some locations, existing trails may need to be improved to meet current trail standards. In other locations, the greenway trail may share a roadway or be constructed within a road right of way.

There are several factors impacting potential trail alignments. The ability to obtain easements on private parcels for trail use and bridge construction costs are two issues that will need to be addressed.

Impacts to existing vegetation is also a factor that may affect a potential trail alignment. New independent trails may require removal of trees, vegetation on steep slopes and vegetation within the floodway, which may increase the potential for erosion. Existing trails and trails within road right of ways may have little or no impact on existing vegetation.

The following are summaries of trail feasibility in each sub-segment. (+) indicates a positive attribute, and (-) indicates a negative attribute.

Segment 1

Sub Areas A-C are on the Fargo side of the Red River and Sub Areas D-F are on the Moorhead side of the river.

Sub Area 1A runs from 15th Avenue North to the northern boundary of the Veterans Administration property.

- Steep Slopes (equal to or greater than 10%): 72% of land adjacent to the river
- Floodway: 100% of the proposed trail corridor
- + Private Parcels: One percent of land abutting the river
- + No roadway crossings
- One trail bridge needed (over Red River at Riverview Cemetery)

+ Independent trail alignment

Sub Area 1B runs from the VA property north to the southern edge of the Edgewood Golf Course.

- Steep Slopes: 78% of land adjacent to the river
- Floodway: 100% of the proposed trail corridor
- + Private Parcels: 38% of land abutting the river
- + No roadway crossings
- One trail bridge needed (over Red River to MB Johnson Regional Park)
- + Independent trail alignment
- Trail would need to cross private land
- Negative comments previously received from private landowners

Sub Area 1C runs from the Edgewood Golf Course to 52nd Avenue North (Fargo).

- Steep Slopes: 73% of land adjacent to the river
- + Floodway: 33% of the proposed trail corridor
- + Private Parcels: Existing and proposed trails utilize public land or road right of ways
- One roadway crossing (Golf Course Ave NE)
- + Existing independent trail
- Existing trail is eight feet wide and does not meet current trail design standards
- + Existing trail utilizes two bridge crossings under Broadway N and 40th Ave N
- + No trail bridges needed

Sub Area 1D runs from Riverside Cemetery north to the southern edge of the Probstfield property.

- Steep Slopes: 82% of land adjacent to the river
- Floodway: 100% of the proposed trail corridor
- Private Parcels: 39% of land abutting the river
- + No road crossings
- + No trail bridges needed
- + Access to MB Johnson Regional Park

Sub Area 1E runs from the southern tip of the Probstfield property north to approximately 57th Avenue.

- Steep Slopes: 79% of land adjacent to the river
- Floodway: 100% of the proposed trail corridor
- Private Parcels: 100% of land abutting the river
- + No road crossings
- + No trail bridges needed

Sub Area 1F runs from 57th Avenue north to 70th Avenue.

- Steep Slopes: 76% of land adjacent to the river
- Floodway: 100% of the proposed trail corridor
- Private Parcels: 97% of land abutting the river
- One road crossing needed (CR 22/Wall Steet Ave. NW)
- + No trail bridges needed

Segment 2

Sub Areas A-C are on the Moorhead side of the Red River and Sub Areas D-F are on the Fargo side of the river.

Sub Area 2A runs from Gooseberry Park to 49th Avenue.

- + Steep Slopes: No steep slopes
- + Floodway: 13% of the proposed trail corridor
- + Private Parcels: Existing and proposed trails are within road right of way
- On road trail required
- Twelve road crossings required
- + No trail bridges needed

Sub Area 2B runs from 49th Avenue South back to the River and south to 50th Avenue.

- Steep Slopes: 80% of land adjacent to the river (alternate trail alignment only)
- Floodway: 76% of the proposed trail corridor (alternate trail alignment only)
- Private Parcels: 55% of land abutting the river (alternate trail alignment only)
- One trail bridge needed over ravine (alternate trail alignment only)
- Two road crossings needed (S. River Haven Rd, 50th Ave SW)
- On-road trail required on S. River Haven Rd and 50th Ave SW

Sub Area 2C runs from 50th Avenue to 60th Avenue.

- Steep Slopes: 94% of land adjacent to the river
- Floodway: 100% of the proposed trail corridor
- Private Parcels: 55% of land abutting the river
- + No road crossings
- + No trail bridges
- + Independent trail alignment

Sub Area 2D runs from Lindenwood Park to 32nd Avenue.

- + Steep Slopes: No steep slopes
- + Floodway: Existing and proposed trails are outside the floodway
- + Private Parcels: Existing and proposed trails are within road right of way
- On-road trail required
- Six road crossings required
- + No trail bridges

Sub Area 2E runs from 32nd Avenue South to 40th Avenue South.

- + Steep Slopes: No steep slopes
- + Floodway: Existing trail is outside the floodway
- + Private Parcels: Existing and proposed trails are within road right of way
- + Existing trail
- + Independent trail alignment
- + No trail bridges needed (possible pedestrian bridge over Red River at Lemke Park)
- Six road crossings required

Sub Area 2F runs from 40th Avenue South to 52nd Avenue.

- + Steep Slopes: Existing trail is not impacted by steep slopes
- + Floodway: Existing trail is outside the floodway
- + Private Parcels: Existing trail is within road right of way
- + Existing trail
- + Independent trail alignment
- + No trail bridges needed
- Three road crossings required
- Alternate shared use trail alignment would be within floodway
- Alternate shared use trail alignment would be in areas of steep slopes
- Alternate shared use trail alignment would cross private parcels

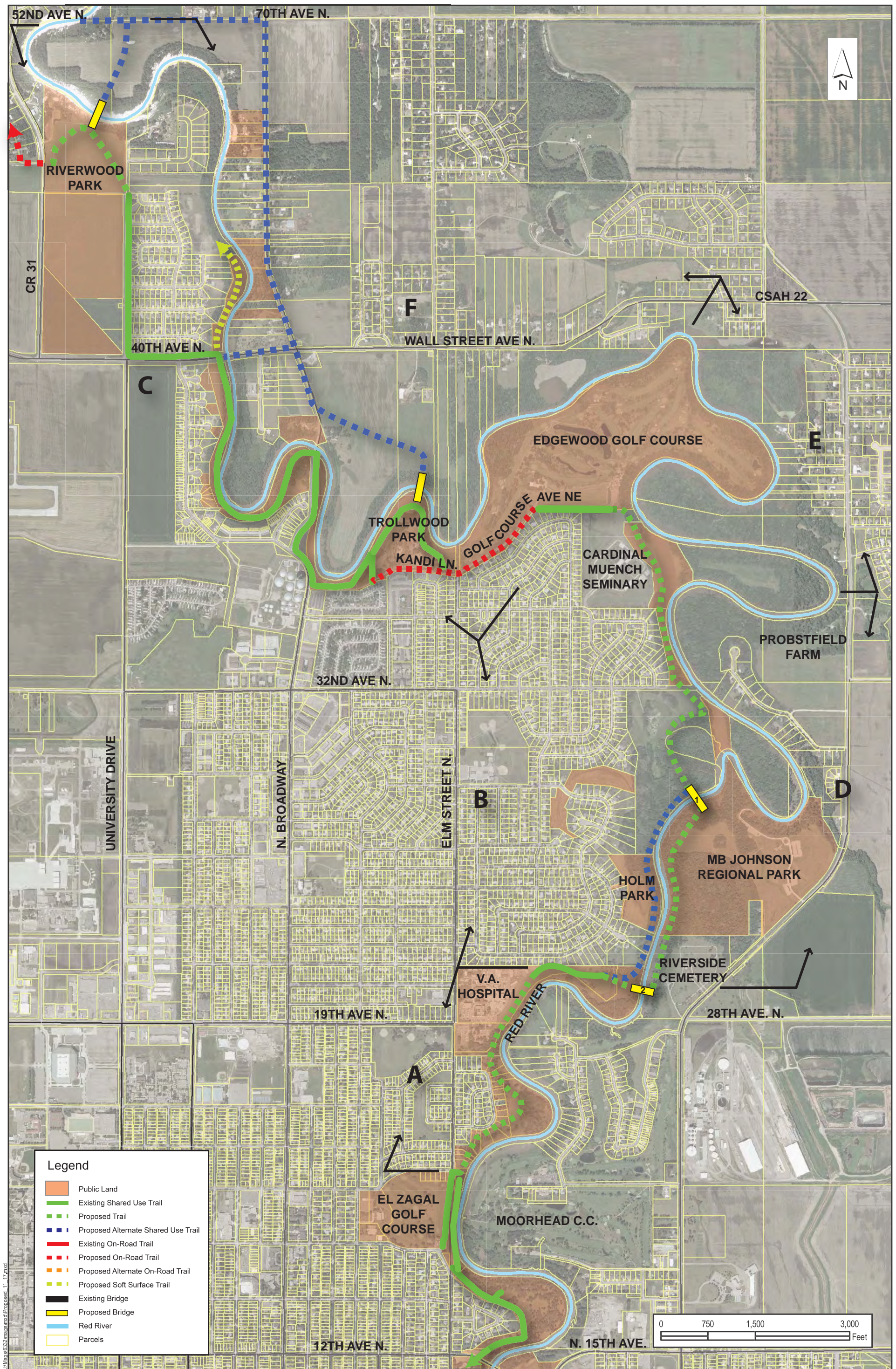
Description of Recommended Trail Alignments

Segment 1

The Red River Greenway trail alignment should utilize existing trail segments and should take advantage of the publicly owned land along the Red River. Steep slopes and numerous private parcels make Sub Segments E and F undesirable for a trail along the east bank of the Red River in this area. In Sub Segment C, on the Fargo side, the existing trail from Riverwood Park to Trollwood Park work as a multi-use trail but should be upgraded to meet current trail standards, which call for a ten foot wide trail. South of Edgewood Golf Course, in Sub Segment B, there are two public parcels that will provide good trail access along the Red River. Adjacent to the public land are two private parcels, one being the Cardinal Muench Seminary that will be important partners in trail development. At this point, a trail bridge could span the Red River to provide access to MB Johnson Regional Park in Sub Segment D. The trail would follow the east bank of the river until the south edge of the Riverview Cemetery at which point, a second trail bridge would carry the trail over the Red River to public land adjacent to the VA Hospital. An alternative trail alignment on the Fargo side would connect through Holm Park on its way to the VA Hospital. Public land access on the Fargo side of the Red River in Sub Segment A south of the VA Hospital is good and although it is within the floodway, a trail could be constructed that connects with the existing trail at El Zagal Golf Course.

Segment 2

An on-road trail through Sub Segment A on the Moorhead side of the Red River that connects with the existing independent trail on S. 40th Avenue will be necessary because the land along the red river is all in private ownership and has steep slopes along its bank. An alternative trail alignment in Sub Segment D could utilize two existing independent trails; one that extends from Gooseberry Mound Park to the I-94 Bridge and the trail along the east side of S. University Drive. Both existing trails are currently 8 feet wide and should be improved to current trail standards, including 10 foot widths. An on-road trail facility would be needed to connect these two trail segments. The S. University Drive trail extends south through Sub Segments E and F but does not have any connection with the Red River and would not be a very scenic trail. On the Moorhead side of the Red River, an on-road trail could connect with the existing independent trail along S. River Haven Road in Sub Segment A and then along 50th Avenue SW (Moorhead) in Sub Segment B west to the new Trollwood Performing Arts School. The existing trail along S 40th Avenue and S. River Haven Road is currently 8 feet wide and should be upgraded to current trail design standards. An alternate alignment through Sub Segment B would bring the trail along the river bank, above the steep slopes and away from the existing riparian forest south to the Trollwood site. This alignment would cross private land and would require at least one trail bridge to cross a ravine. South of the Trollwood School site, the trail could follow the edge of the riparian forest across private land south to 60th Avenue SW. An alternate shared use trail in Sub Segment 2F would bring a trail along the west bank of the Red River. This area has steep slopes and is within the floodway. Although there are several large public land parcels in the area, easements would be required to cross several private parcels. A trail bridge may be required to span rose coulee to make this trail segment a viable option.





Appendix 2

Red River Greenway Bridge Analysis

Bridge Locations Evaluation

Introduction

The intent of the Red River Greenway Evaluation is to determine the feasibility of additional trail development along the Red River in the Fargo-Moorhead metropolitan area. Greenway trails already exist from Lindenwood Park to Trefoil Park. The geographic focus of this evaluation covers Segments 1 and 2 of the proposed Red River Greenway extending from 52nd Avenue North, Fargo to 52nd Avenue South, Fargo.

SRF Consulting Group, Inc. (SRF) evaluated five potential bridge locations along the Red River including MB Johnson Regional Park, Riverside Cemetery, Lemke Park/River Oaks Park, 40th Avenue South (Fargo), and South River Estates (Fargo) (**Figures 1 & 2, Site Location Maps**).

The bridge evaluation process consisted of the following:

- Identify bridge crossing location
- Identify the 10-year and 50-year flood elevations
- Identify permitting agencies for bridge construction
- Prepare bridge design standards
- Propose a bridge type
- Identify site issues such as river width, site access, bridge approaches
- Preliminary bridge cost estimate

52nd Avenue S./60th Avenue SW Bridge

The existing 52nd Avenue S./60th Avenue SW Bridge across the Red River south of Iwen Park does not have dedicated pedestrian access. Future bridge improvements should include ten-foot, dedicated pedestrian lanes on both sides of the bridge.

Previous Reports

SRF conducted a Lifespan & Replacement Study of the Fargo-Moorhead Bicycle/Pedestrian Bridges for the Fargo-Moorhead Council of Governments (Metro COG) in February 2005. The three bridges covered in the report included the Lindenwood/Gooseberry Bridge, the Oak Grove/Memorial Bridge and the Mid-Town Floating Bridge. Existing conditions and alternative solutions were identified for each bridge.

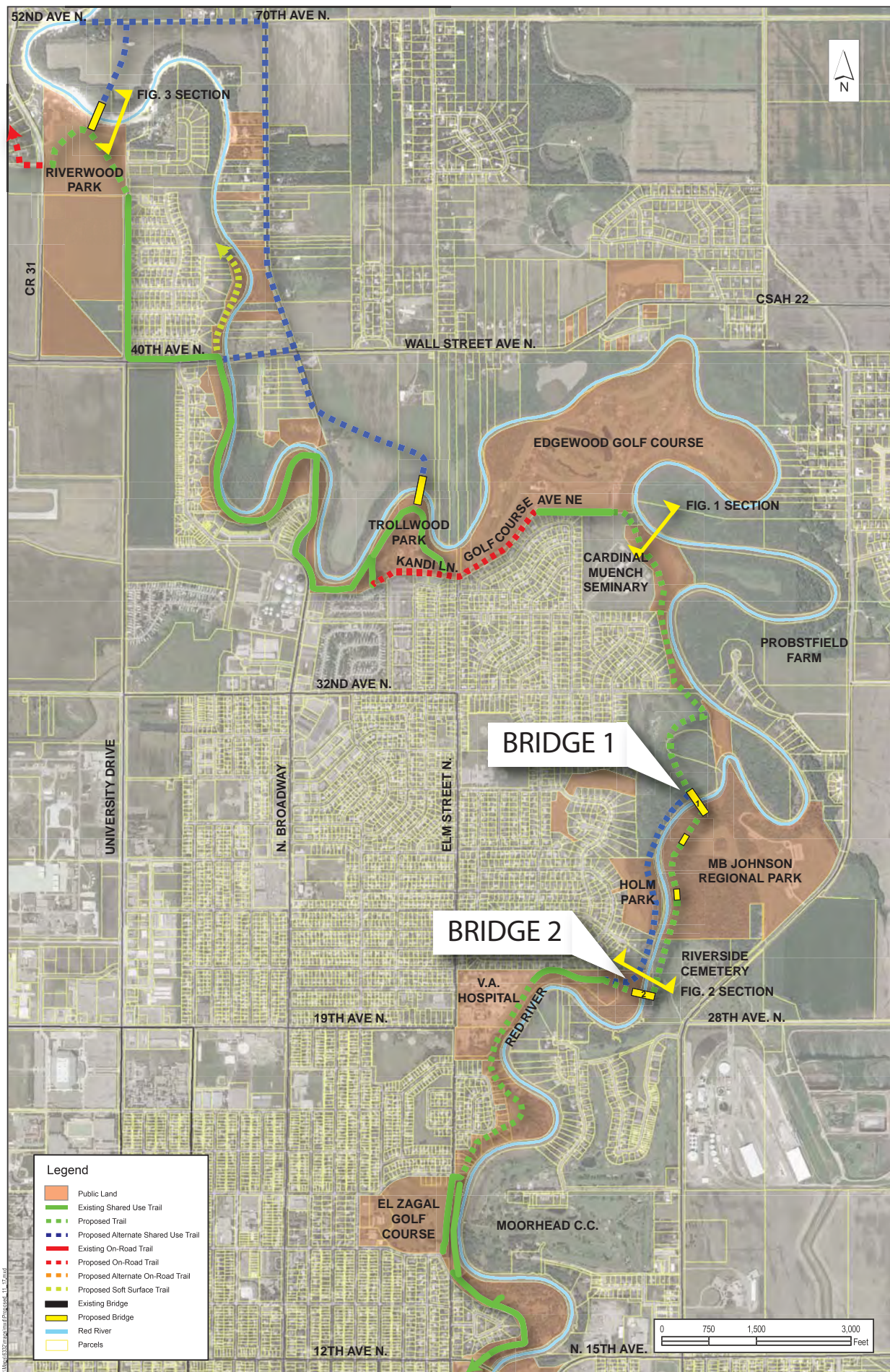
Flood Data

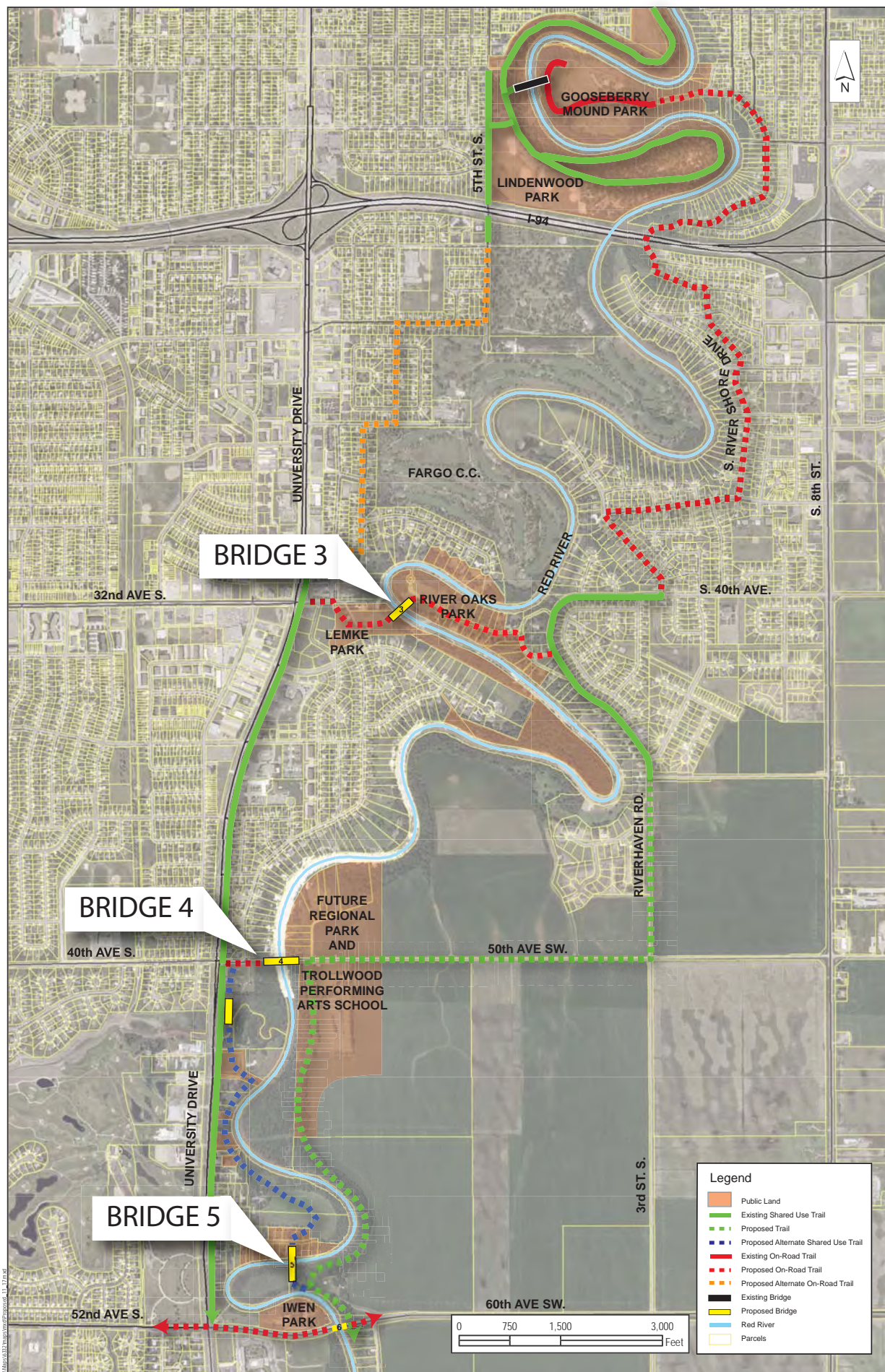
SRF contacted the Minnesota Department of Natural Resources (Mn DNR) and the United States Geological Survey (USGS) to gather flood data and surface water daily statistics for the Red River of the North. USGS surface water daily statistics were recorded at Gage 05054000 on the Red River. This information is referenced throughout this report and is graphically represented on the bridge elevation graphics. SRF used the 31-year average high water level for April from the USGS data as a benchmark for the study. Non-flood river levels in April are the highest throughout the year. Using the FHWA Urban Drainage Design Program, SRF calculated the average depth of flow in April at each proposed bridge site. Bridge abutments are shown no less than three feet above the April ordinary high water (OHW) level.

Recommended Bridge Type

Several bridge types were reviewed for the proposed Red River Greenway bridge study including concrete beam, steel beam, glu-lam beam, prefabricated steel truss and a lift bridge. The preferred bridge type for the long spans over the Red River is a prefabricated steel truss bridge. The benefits of a prefabricated truss bridge include:

- Maximum clear spans of up to 250 feet for a half-through H-section bridge and 325 feet for a full-through box bridge
- Relatively light weight



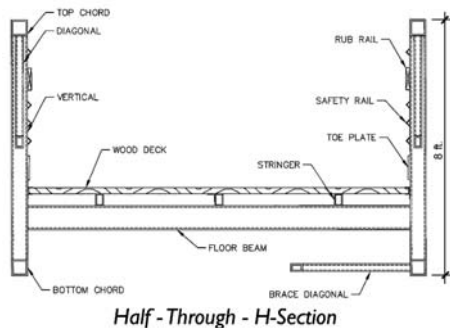


- Delivered to job site in sections where they are assembled and lifted by crane onto steel towers and concrete piers
- No piers in the river
- The use of earthen fill or ramps for bridge approaches will need to be determined on a case-by case basis during the design development phase of individual bridge projects. Further analysis and agency review is required to determine which option will be best suited to each specific site.

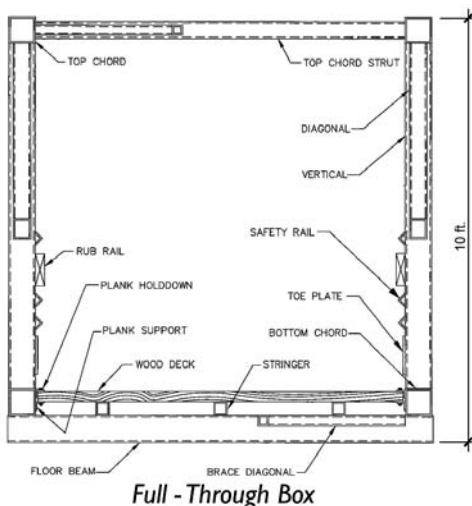
Existing elevations and bridge site evaluations indicate lift bridges would allow the structures to be raised in anticipation of high-water events and thus increase their use throughout the year. An electric lift system would allow an operator to raise and lower the bridge when high-water is imminent. The lift structure would consist of a vertical truss system, which would house the lifting mechanism. The lifting mechanism would consist of a cable hoist powered by a hydraulic lift or electric motor. This system would lift and lower both ends of the bridges simultaneously. Significant abutment foundation construction would be required for the vertical lift system. Of the \$400,000 vertical lift cost, approximately \$150,000 would be required at each bridge to provide the foundation construction that would provide the option of installing the vertical lift system at a later date.

The bridge lengths required to cross the Red River are too great for concrete, steel or glu-lam beam bridges. Concrete beam bridges require on-site construction and have a maximum clear span distance of 140 feet. Steel beams can reach much longer spans but both steel and concrete beam bridge weights would not be feasible with a lift bridge.

Figure 3: Typical Prefabricated Steel Truss Bridge Sections



Source: Continental Bridge



Source: Continental Bridge

Bridge #1: MB Johnson Park

Bridge Location

The bridge site at MB Johnson Regional Park is located upriver from the park boat landing at approximately river mile 446.3. East bank parcels are owned by the City of Moorhead as MB Johnson Regional Park. The west bank parcel is in private ownership **(Figure 4)**.

River/Flood Issues

The flood elevations at the proposed MB Johnson Regional Park bridge site are as follows:

- 10-year: 887.4
- 50-year: 894.5
- 100-year: 895.4
- 24-foot flood elevation: 882.0

Design Standards

- Abutment design: A concrete abutment on each end of the bridge that would also support the approach ramps. The vertical truss towers with concrete piers will support the other end of the approach ramp and the main bridge span. Additional piers for the approach ramps may be required.
- Bridge approach: Prefabricated truss ramps not to exceed 5% slope. Length will vary depending on existing elevations.
- Deck width: 12 feet
- Deck surface: wood plank
- Railing height: 54 inches
- Bridge piers in the Red River are not feasible

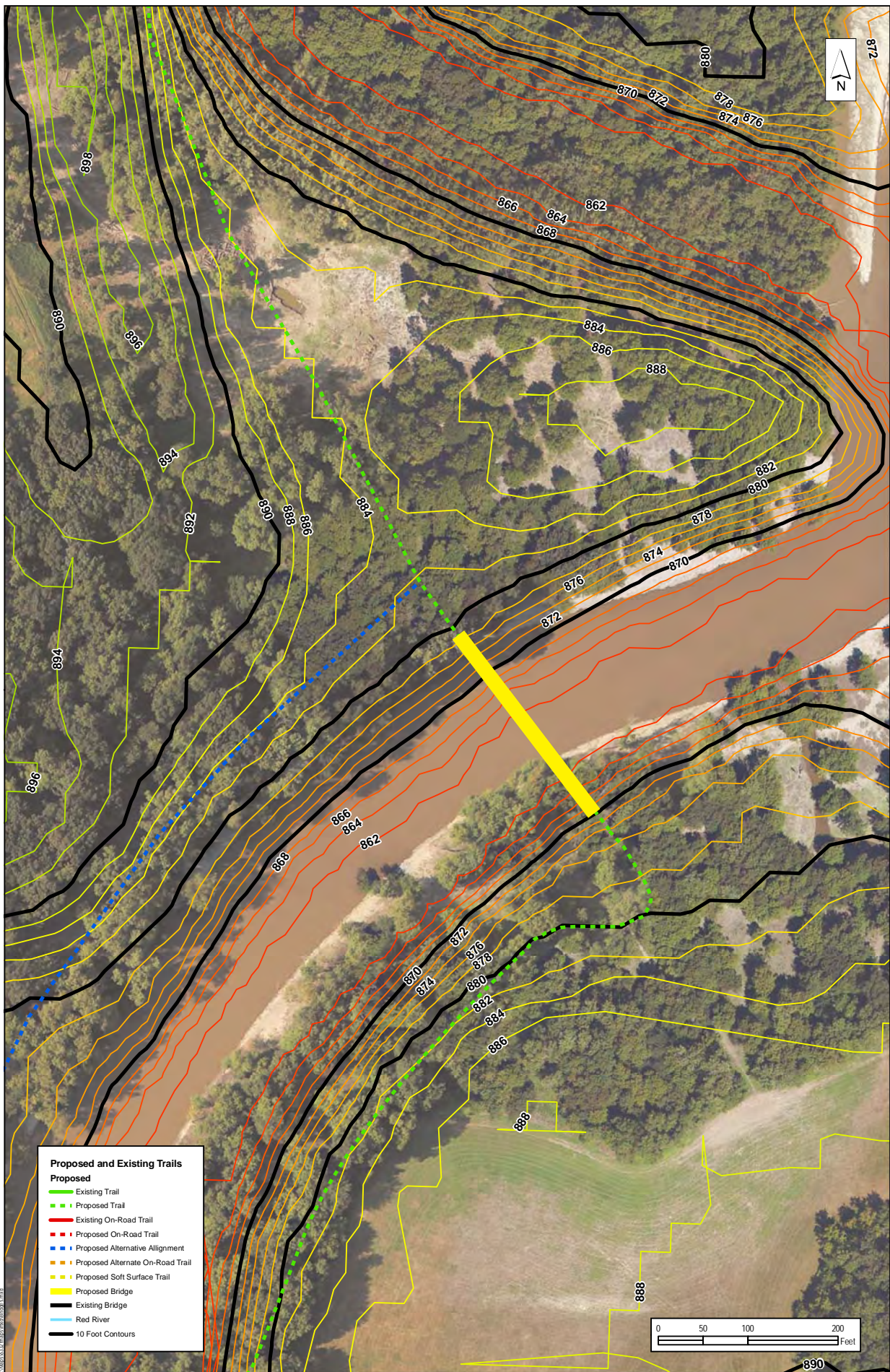
Bridge Type

- Prefabricated steel truss bridge

Site Issues & Opportunities

- Bridge span length: 210 feet (Base of abutment elevation: 874.0)
- Site access
 - Within the ten-year flood plain
 - Wooded side slopes
 - Rural character

(Figure 6 Bridge Site Elevations)



MB JOHNSON BRIDGE LOCATION (BRIDGE #1)
 RED RIVER GREENWAY
 Fargo-Moorhead Metropolitan COG

Figure 4

Bridge #2: Riverside Cemetery

Bridge Location

The bridge site at Riverside Cemetery is located upriver from MB Johnson Regional Park at approximately river mile 447.0 and is adjacent to Riverside Cemetery on the Moorhead side of the river. The west bank parcel is owned by the City of Fargo (**Figure 5**).

River/Flood Issues

The flood elevations at the proposed Riverside Cemetery bridge site are as follows:

- 10-year: 888.3
- 50-year: 895.3
- 100-year: 896.1
- 24-foot flood elevation: 877.9

Design Standards

- Abutment design: A concrete abutment on each end of the bridge that would also support the approach ramps. The vertical truss towers with concrete piers will support the other end of the approach ramp and the main bridge span. Additional piers for the approach ramps may be required.
- Bridge approach: Prefabricated truss ramps not to exceed 5% slope. Length will vary depending on existing elevations.
- Deck width: 12 feet
- Deck surface: wood plank
- Railing height: 54 inches
- Bridge piers in the Red River are not feasible

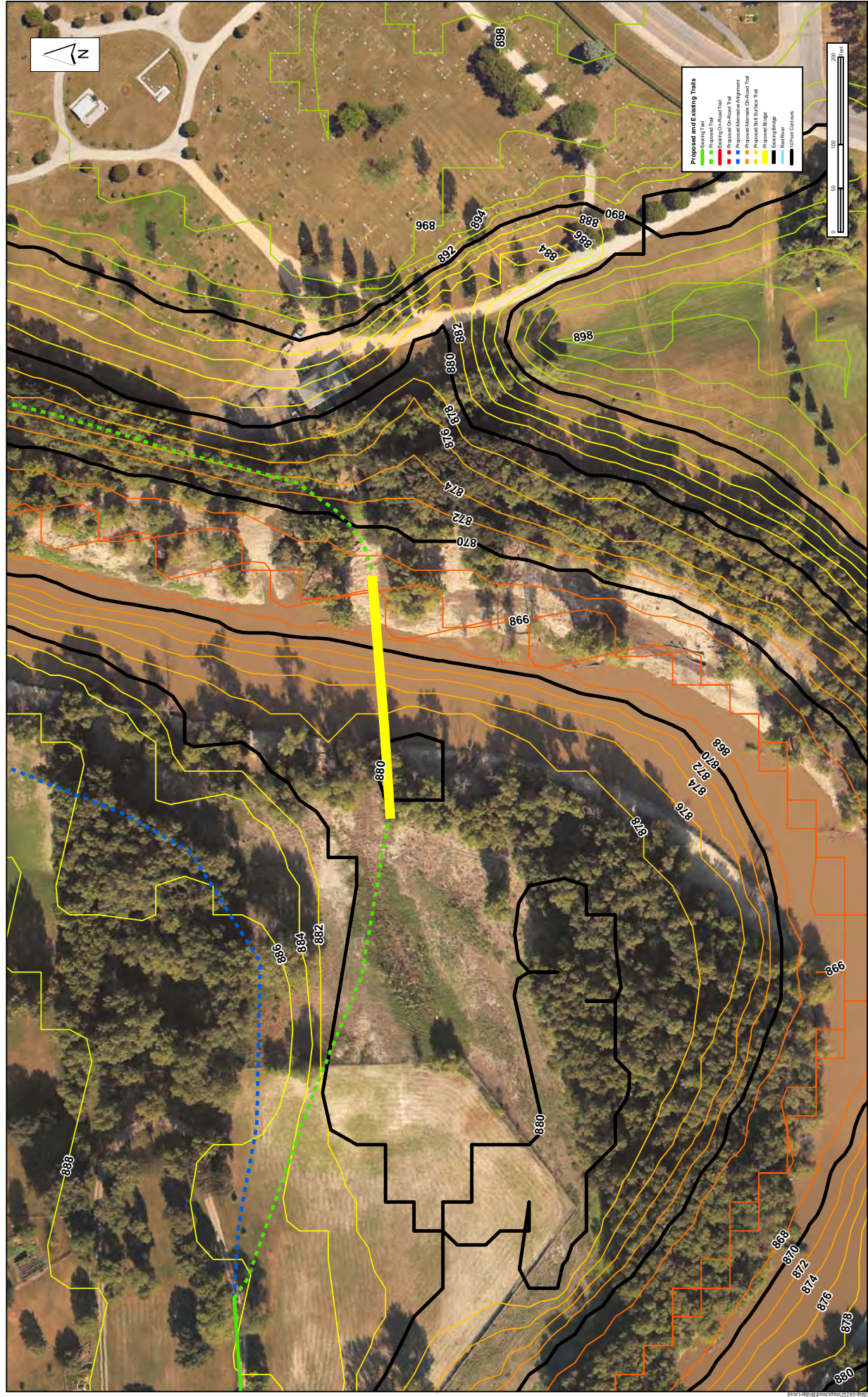
Bridge Type

- Prefabricated steel truss bridge

Site Issues & Opportunities

- Bridge span length: 250 feet (Base of abutment elevation: 877.0)
- Site access
 - Within the ten-year flood plain
 - Wooded side slopes on the Moorhead side and lightly wooded floodplain on the Fargo side
 - Rural character

(Figure 6: Bridge Site Elevations)



RIVERSIDE CEMETERY BRIDGE LOCATION (BRIDGE #2)

RED RIVER GREENWAY
 Fargo-Moorhead Metropolitan COG



Bridge #3: Lemke Park/River Oaks Park

Bridge Location

The proposed Lemke Park/River Oaks Park Bridge site is located between Lemke Park in Fargo and River Oaks Park in Moorhead at approximately river mile 458.0. The cities of Fargo and Moorhead own the parcels adjacent to the proposed bridge crossing site **(Figure 7)**.

River/Flood Issues

The flood elevations at the proposed Riverside Cemetery bridge site are as follows:

- 10-year: 893.3
- 50-year: 900.2
- 100-year: 891.4
- 24-foot flood elevation: 887.9

Design Standards

- Abutment design: A concrete abutment on each end of the bridge that would also support the approach ramps. The vertical truss towers with concrete piers will support the other end of the approach ramp and the main bridge span. Additional piers for the approach ramps may be required.
- Bridge approach: Prefabricated truss ramps not to exceed 5% slope. Length will vary depending on existing elevations.
- Deck width: 12 feet
- Deck surface: wood plank
- Railing height: 54 inches
- Bridge piers in the Red River are not feasible

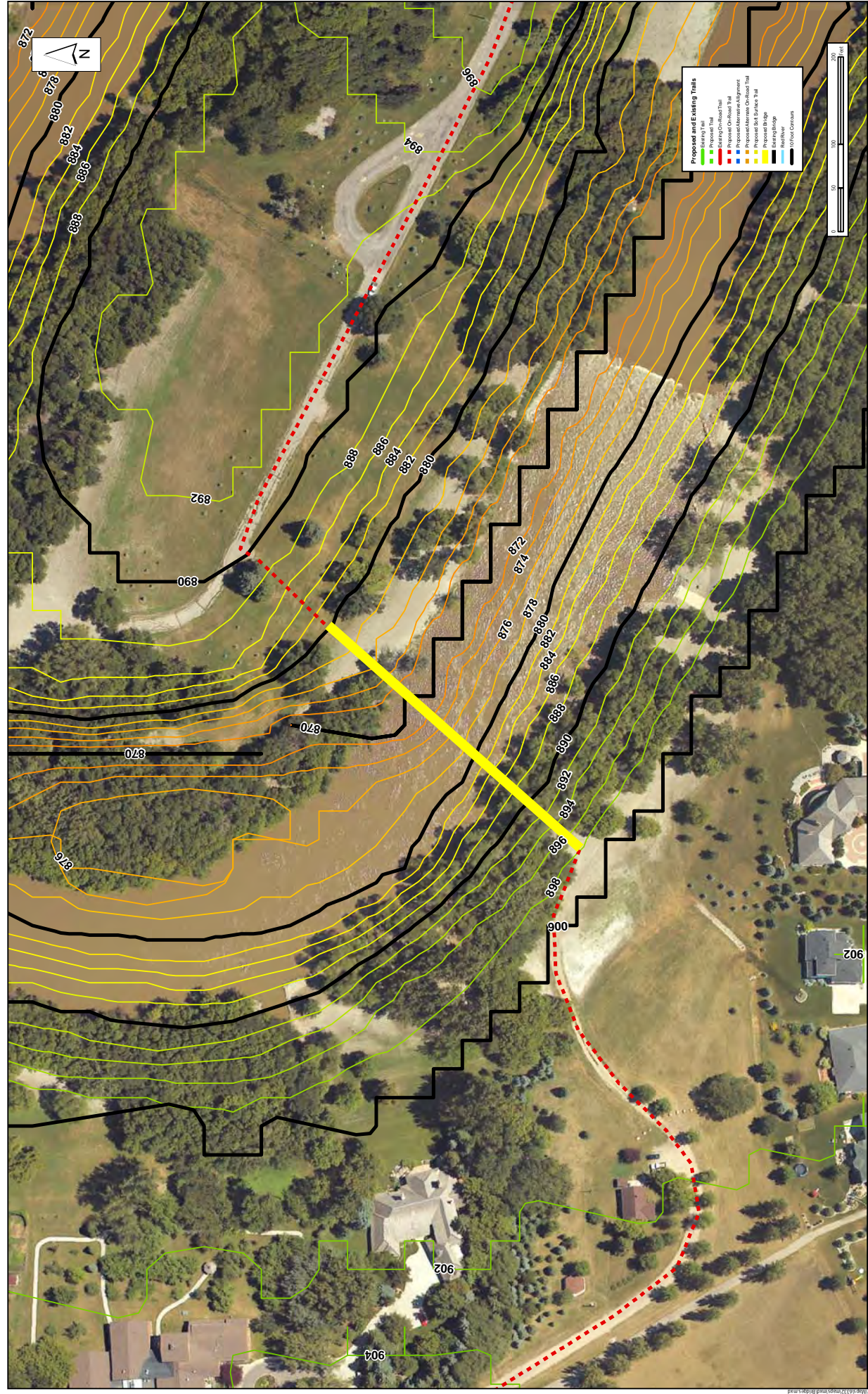
Bridge Type

- Prefabricated steel truss bridge

Site Issues & Opportunities

- Bridge span length: 250 feet (Base of abutment elevation: 883.0)
- Site access
 - Within the ten-year flood plain
 - The immediate channel banks are forested and give way to park-like turf areas that are open and moderately sloping toward the river.
 - Park trails and roads are situated near proposed bridge site.

(Figure 9: Bridge Site Elevations)



SRF
Sewer & Water Division
City of San Francisco

LEMKE PARK/RIVER OAKS PARK BRIDGE LOCATION (BRIDGE #3)

RED RIVER GREENWAY
Fargo-Moorhead Metropolitan COG

Figure 7
4/23/08

Bridge #4: 40th Avenue South (Fargo)

Bridge Location

The proposed 40th Avenue South Bridge site is located at approximately river mile 460.4 at the site of the new Trollwood Performing Arts Center and future Moorhead regional park. 40th Avenue South in Fargo and 50th Avenue Southwest in Moorhead meet at the Red River at the proposed bridge location. The parcel on the west side of the river in Fargo, south of 40th Ave S. is in private ownership. The parcel on the east side of the river, south of 50th Ave. SW is in private ownership. However, just north of 50th Ave SW and east of the private parcel are parcels owned by the City of Moorhead (**Figure 8**).

River/Flood Issues

The flood elevations at the proposed Riverside Cemetery bridge site are as follows:

- 10-year: 894.3
- 50-year: 901.3
- 100-year: 902.6
- 24-foot flood elevation: 888.9

Design Standards

- Abutment design: A concrete abutment on each end of the bridge that would also support the approach ramps. The vertical truss towers with concrete piers will support the other end of the approach ramp and the main bridge span. Additional piers for the approach ramps may be required.
- Bridge approach: Prefabricated truss ramps not to exceed 5% slope. Length will vary depending on existing elevations.
- Deck width: 12 feet
- Deck surface: wood plank
- Railing height: 54 inches
- Bridge piers in the Red River are not feasible

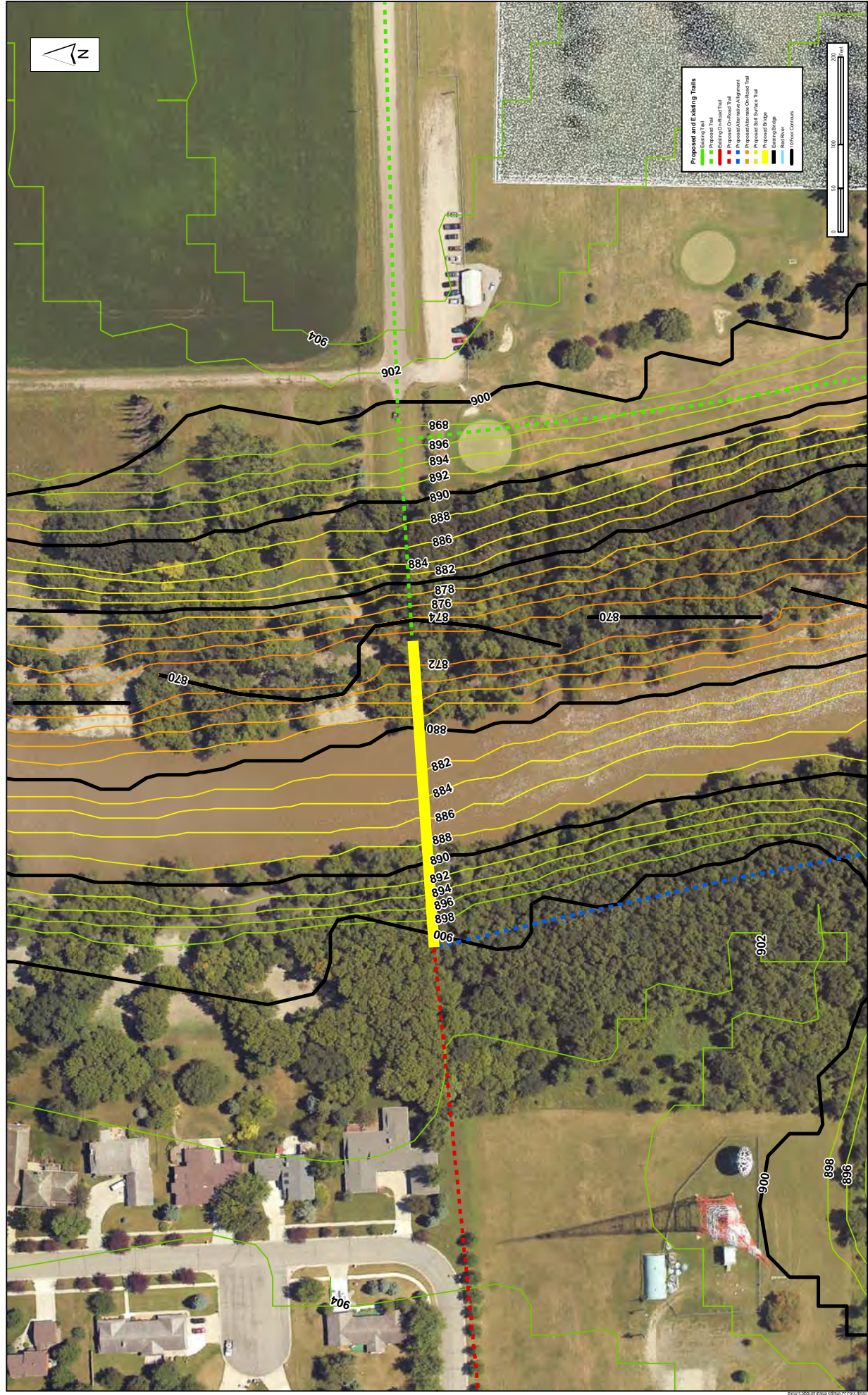
Bridge Type

- Prefabricated steel truss bridge

Site Issues & Opportunities

- Bridge span length: 250 feet (Base of abutment elevation: 884.0)
- Site access
 - Within the ten-year flood plain
 - Wooded side slopes on both banks of the Red River
 - Rural character

(Figure 9: Bridge Site Elevations)



40th AVENUE SOUTH (FARGO) BRIDGE LOCATION (BRIDGE #4)

RED RIVER GREENWAY
Fargo-Moorhead Metropolitan COG



Figure 8

4/23/08

Bridge #5: South River Estates

Bridge Location

The proposed South River Estates Bridge site is located at approximately river mile 461.5. The parcels on the Fargo side of the Red River are publicly owned by the City of Fargo. The parcel on the Moorhead side of the river is in private ownership **(Figure 10)**.

River/Flood Issues

The flood elevations at the proposed Riverside Cemetery bridge site are as follows:

- 10-year: 895.1
- 50-year: 902.2
- 100-year: 903.4
- 24-foot flood elevation: 889.7

Design Standards

- Abutment design: A concrete abutment on each end of the bridge that would also support the approach ramps. The vertical truss towers with concrete piers will support the other end of the approach ramp and the main bridge span. Additional piers for the approach ramps may be required.
- Bridge approach: Prefabricated truss ramps not to exceed 5% slope. Length will vary depending on existing elevations.
- Deck width: 12 feet
- Deck surface: wood plank
- Railing height: 54 inches
- Bridge piers in the Red River are not feasible

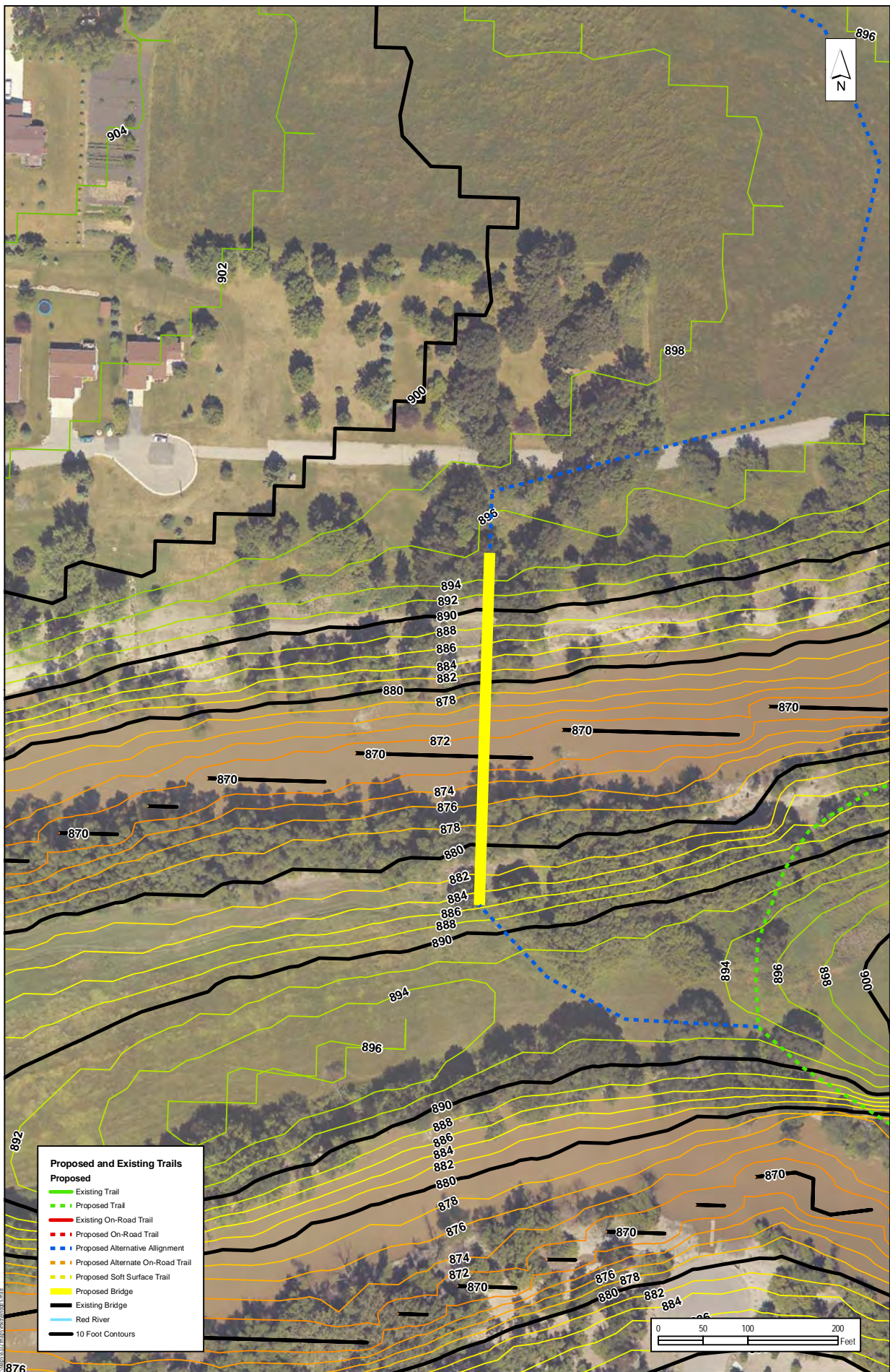
Bridge Type

- Prefabricated steel truss bridge

Site Issues & Opportunities

- Bridge span length: 230 feet (Base of abutment elevation: 884.0)
- Site access
 - Within the ten-year flood plain
 - Wooded side slopes on both sides of the Red River that transition to agricultural land beyond the riparian woods.
 - Rural character

(Figure 11: Bridge Site Elevations)



SOUTH RIVER ESTATES BRIDGE LOCATION (BRIDGE #5)
 RED RIVER GREENWAY
 Fargo-Moorhead Metropolitan COG

Figure 10

Permitting

The following table identifies a preliminary list of permits that may be required for bridge construction and the state or federal agency that issues the permit.

Table 1: Permitting Agencies

AGENCY	STATE	PERMIT	NOTES
Buffalo - Red River Watershed District	MN	Construction Permit	Necessary for construction activity.
Minnesota Pollution Control Agency (EPA)	MN	National Pollution Discharge Elimination System Phase II Permit	Necessary if greater than one acre of disturbance.
Minnesota Department of Natural Resources	MN	Mn/DNR Work Permit	Necessary for work below OHW.
Minnesota Department of Natural Resources	MN	LOMR	Necessary for changes to floodplain mapping.
Clay County Soil and Water Conservation District	MN	Wetland Conservation Act Permit	May be necessary for wetland impacts.
City of Moorhead	MN	Grading/Erosion Control Permit	Necessary for construction activity.
United States Corps of Engineers	MN/ND	Wetland Conservation Act Permit	May be necessary for wetland impacts.
North Dakota Department of Health	ND	National Pollution Discharge Elimination System Phase II Permit	Necessary if greater than one acre of disturbance.
North Dakota State Water Commission	ND	LOMR	Necessary for changes to floodplain mapping.
North Dakota State Water Commission	ND	TBD	Impacts to waters of the state.
Cass County Soil and Water Conservation District	ND	Wetland Conservation Act Permit	May be necessary for wetland impacts.
City of Fargo	ND	Erosion and Sediment Control Permit	Necessary for construction activity.

Table 2: Preliminary Cost Estimate

	MB Johnson	Riverside Cemetery	Lemke/River Oaks Park	40th Avenue South (Fargo)	South River Estates (Fargo)
Prefabricated steel truss bridge	\$557,000	\$625,000	\$625,000	\$625,000	\$591,000
Lift towers/mechanisms	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000
Annual operations cost to lift and lower bridge	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000
TOTAL	\$961,000	\$1,029,000	\$1,029,000	\$1,029,000	\$995,000

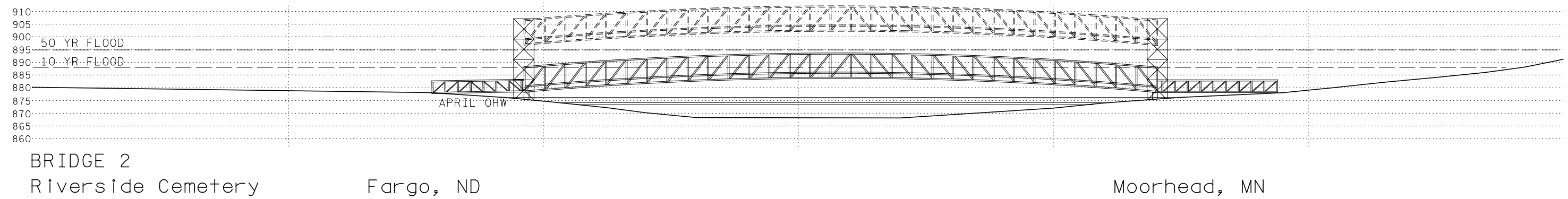
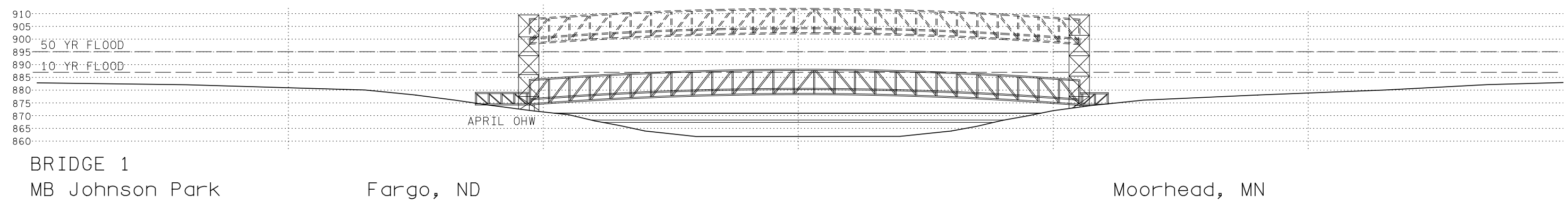
Notes:

1. Assume bridges are 12 feet wide.
2. Allowance of \$200,000 for construction of abutments included in estimated bridge cost.
3. Lift towers and mechanisms estimate is based on the 2005 SRF Bridge Replacement Study.
4. Annual operations estimate is based on the 2005 SRF Bridge Replacement Study.

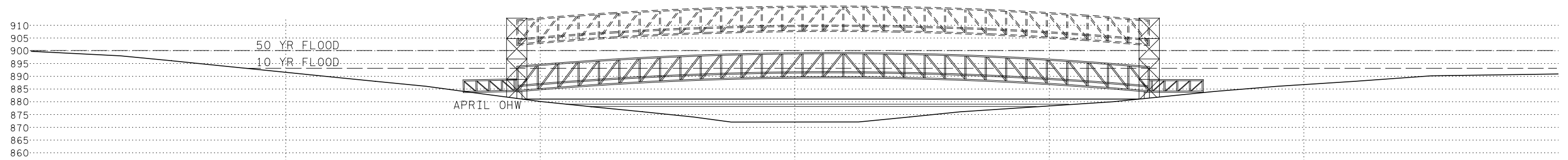
Table 3: Summary Matrix

Proposed Bridge	Location	Bridge Type	Length	Access	Estimated Cost
MB Johnson Park	River Mile 446.3	Steel truss	210 Feet	ND: Private MN: Public	\$961,000
Riverside Cemetery	River Mile 447.0	Steel truss	250 Feet	ND: Public MN: Private	\$1,029,000
Lemke Park/River Oaks Park	River Mile 458.0	Steel truss	250 Feet	ND: Public MN: Public	\$1,029,000
40th Avenue South (Fargo)	River Mile 460.4	Steel truss	250 Feet	ND: Private MN: Private	\$1,029,000
South River Estates (Fargo)	River Mile 441.5	Steel truss	230 Feet	ND: Public MN: Private	\$995,000

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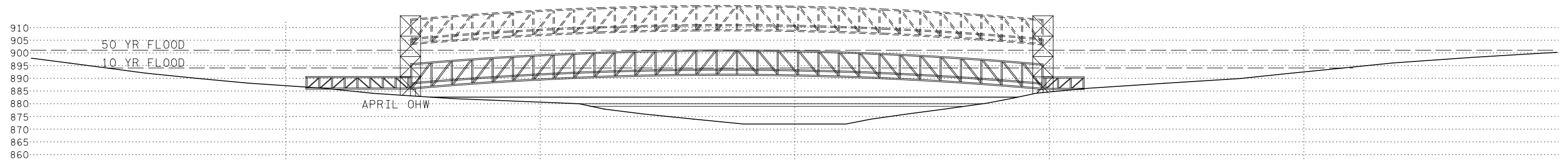
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BRIDGE 3

Lemke/River Oaks Park Fargo, ND

Moorhead, MN



BRIDGE 4

40th Avenue (Fargo) Fargo, ND

Moorhead, MN



BRIDGE SITE ELEVATIONS

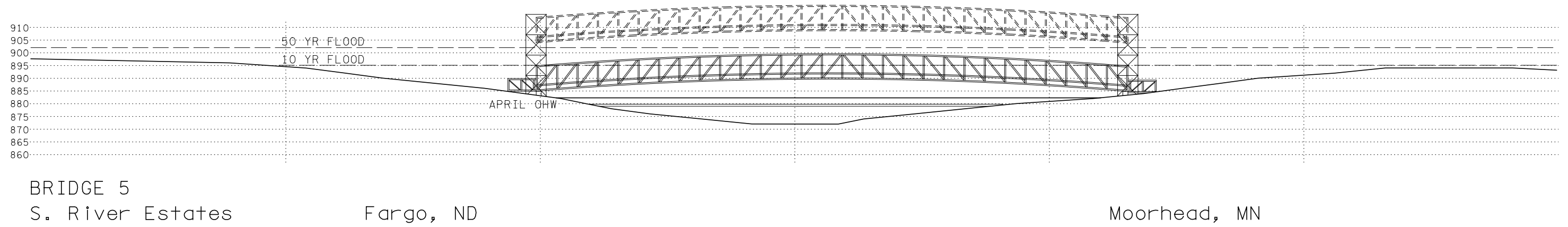
RED RIVER GREENWAY

FARGO-MOORHEAD METROPOLITAN COUNCIL OF GOVERNMENTS

Job #
5/27/2008

Figure 9

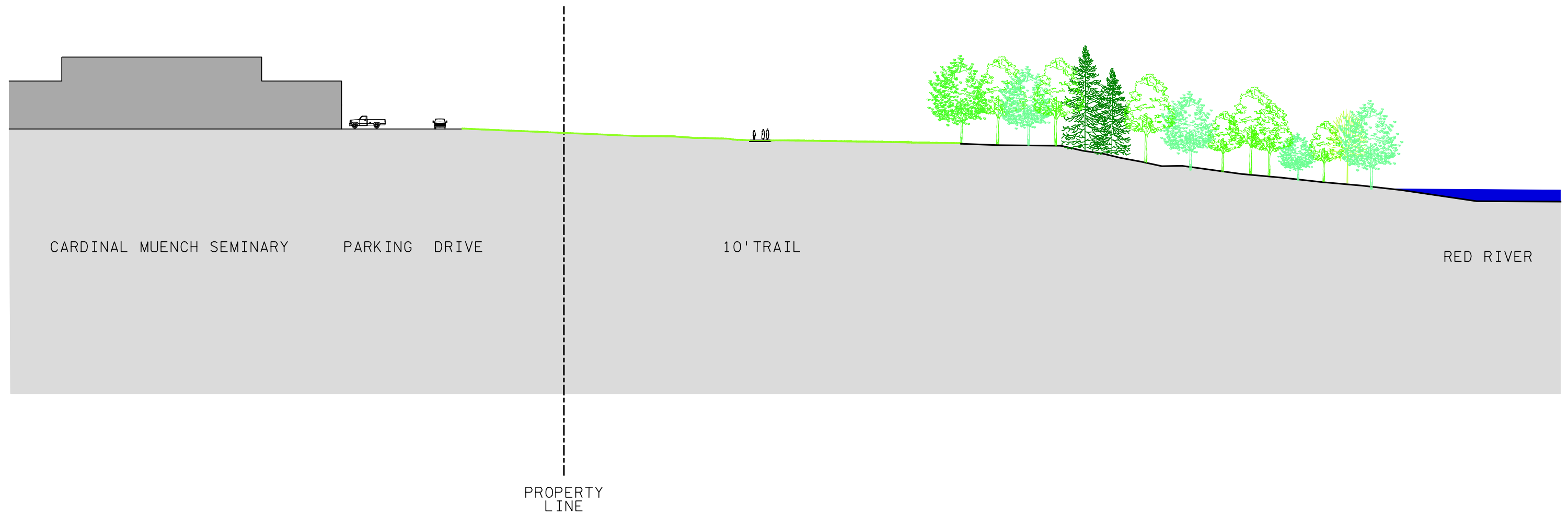
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Appendix 3

Red River Greenway Typical Trail Section

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CARDINAL MUENCH SEMINARY SECTION

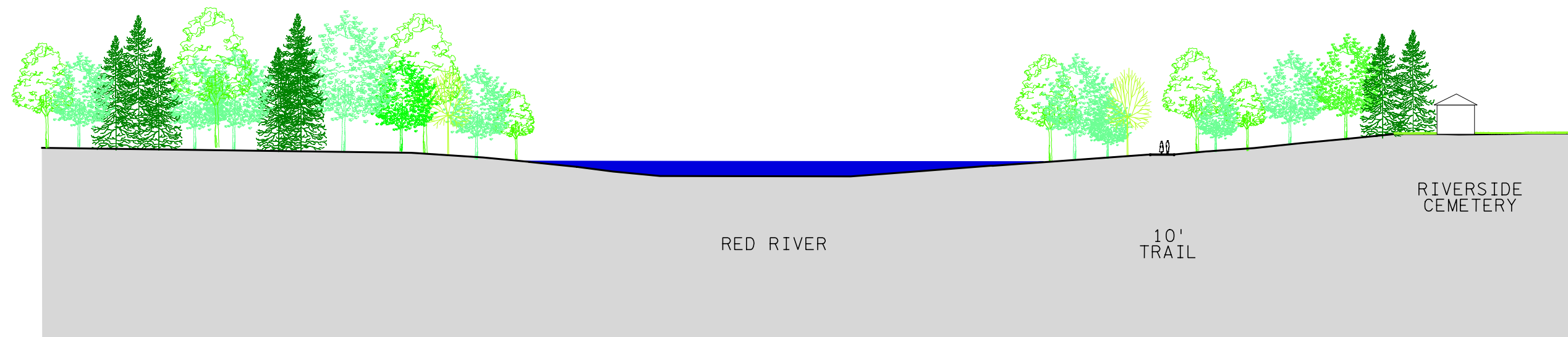
RED RIVER GREENWAY

FARGO-MOORHEAD METROPOLITAN COUNCIL OF GOVERNMENTS

Job #6332
5/29/2008

Figure 1

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NOTE:
RIVERSIDE CEMETERY
PROPERTY EXTENDS
TO RIVER

0 25 50
scale in feet

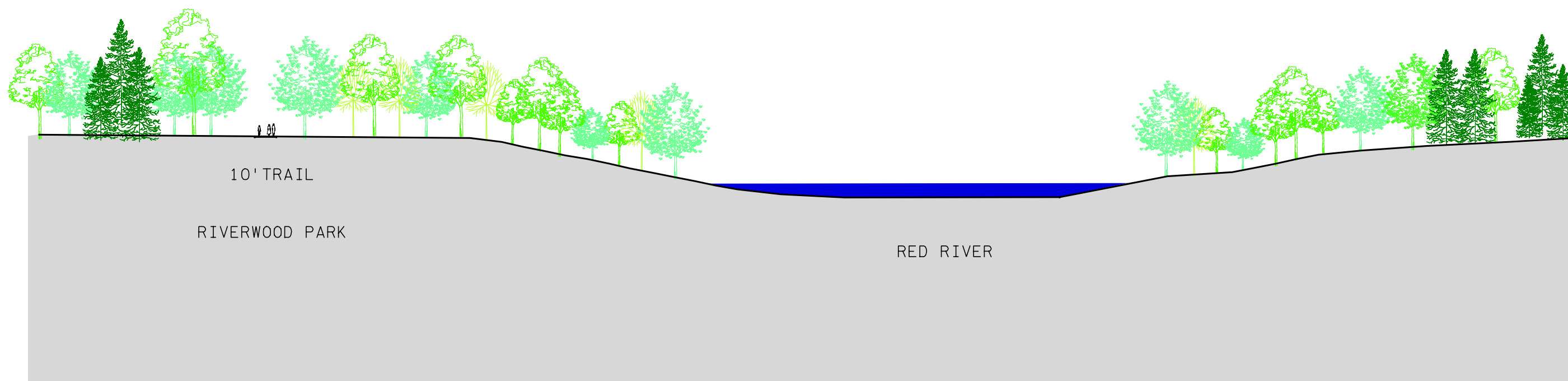


RIVERSIDE CEMETERY SECTION
RED RIVER GREENWAY
FARGO-MOORHEAD METROPOLITAN COUNCIL OF GOVERNMENTS

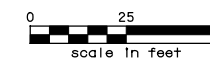
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Figure 2

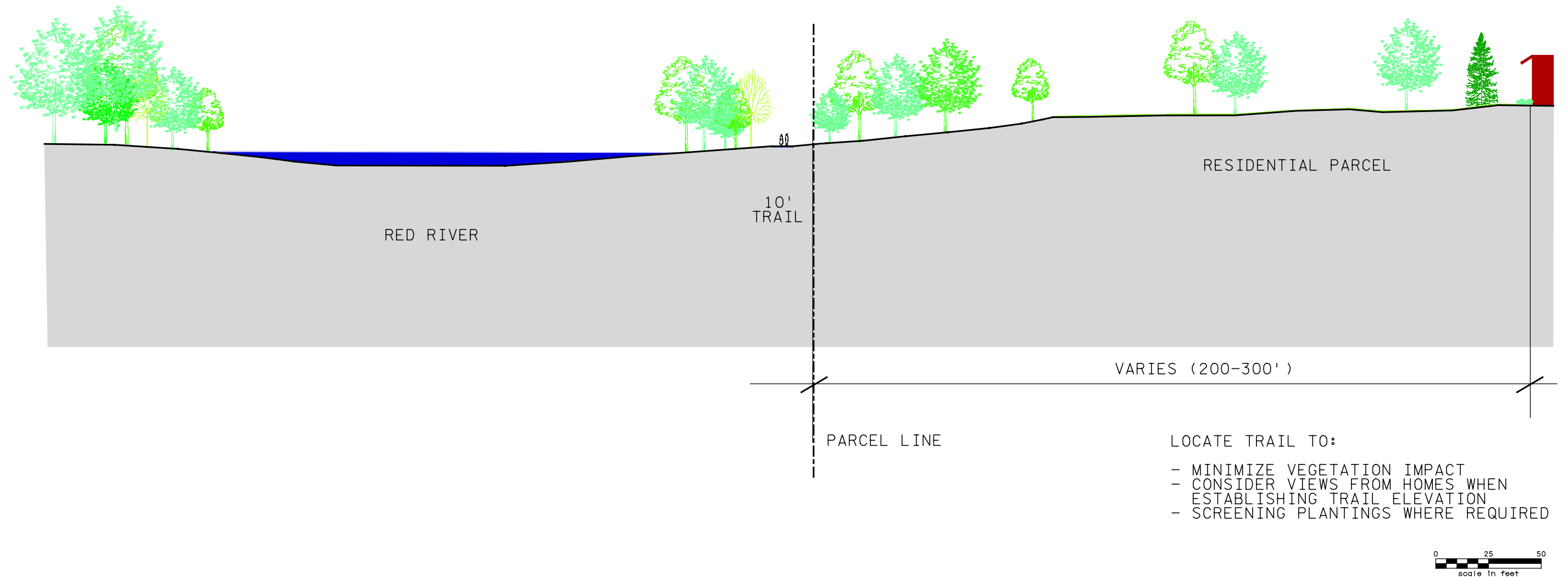
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NOTE:
RIVERWOOD PARK
PROPERTY EXTENDS
TO RED RIVER



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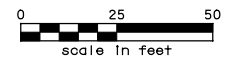
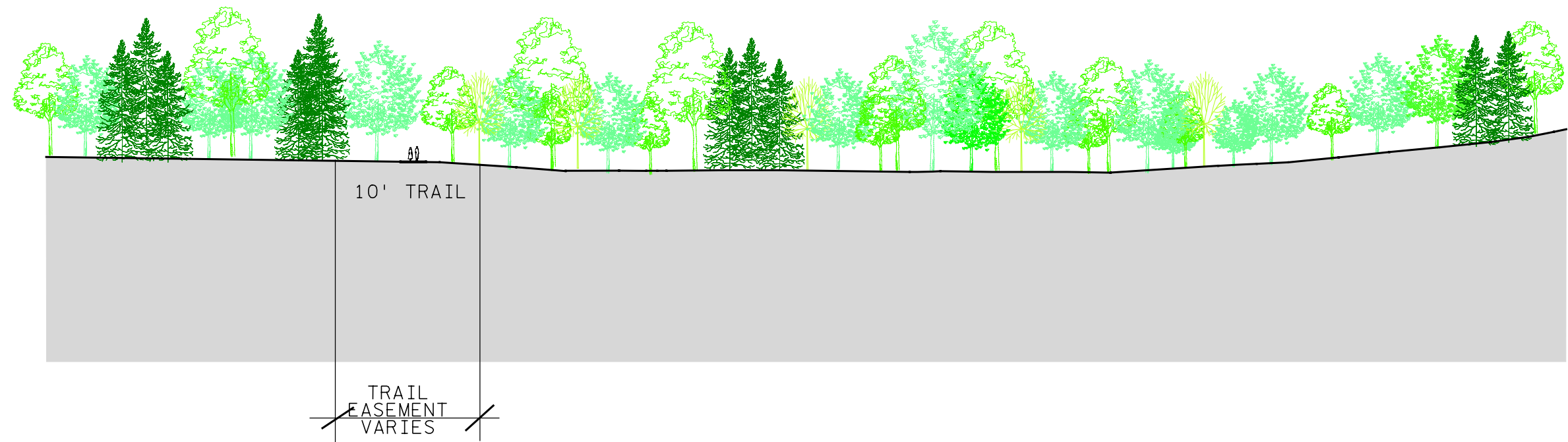


Figure 5

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scale in feet

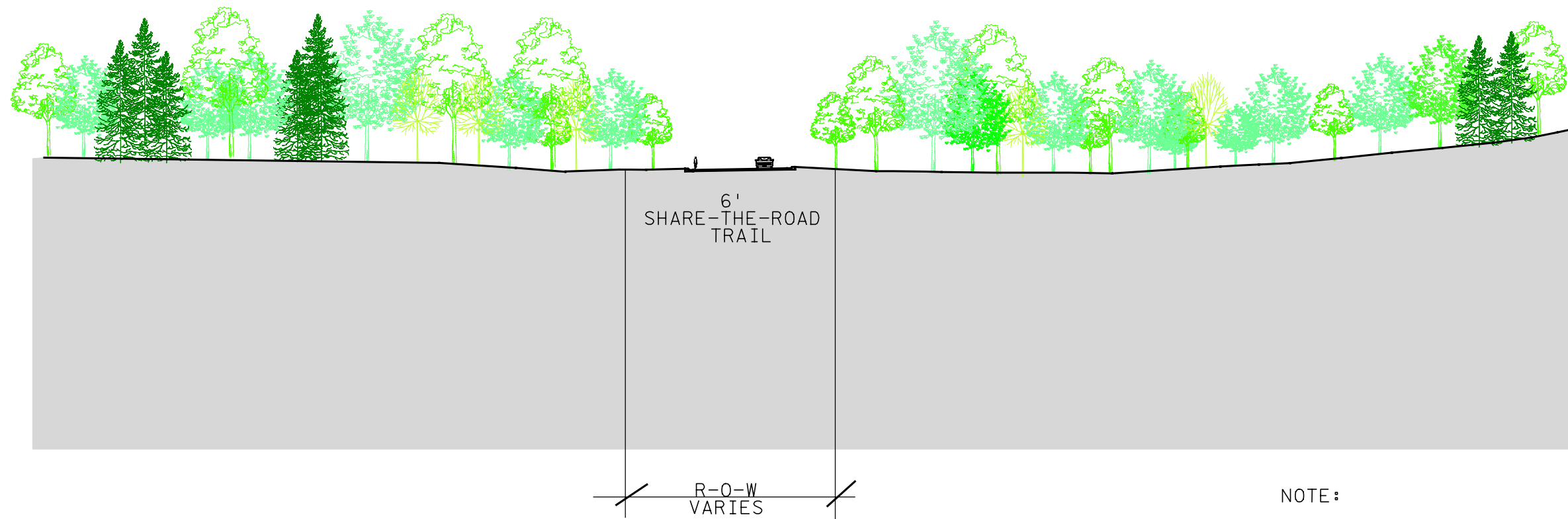


TYPICAL RURAL TRAIL
RED RIVER GREENWAY
FARGO-MOORHEAD METROPOLITAN COUNCIL OF GOVERNMENTS

Job #6332
4/23/2008

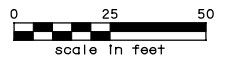
Figure 6

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NOTE :

- PREFERRED SIDEWALK BOTH SIDES
- SIDEWALK ONE-SIDE MINIMUM

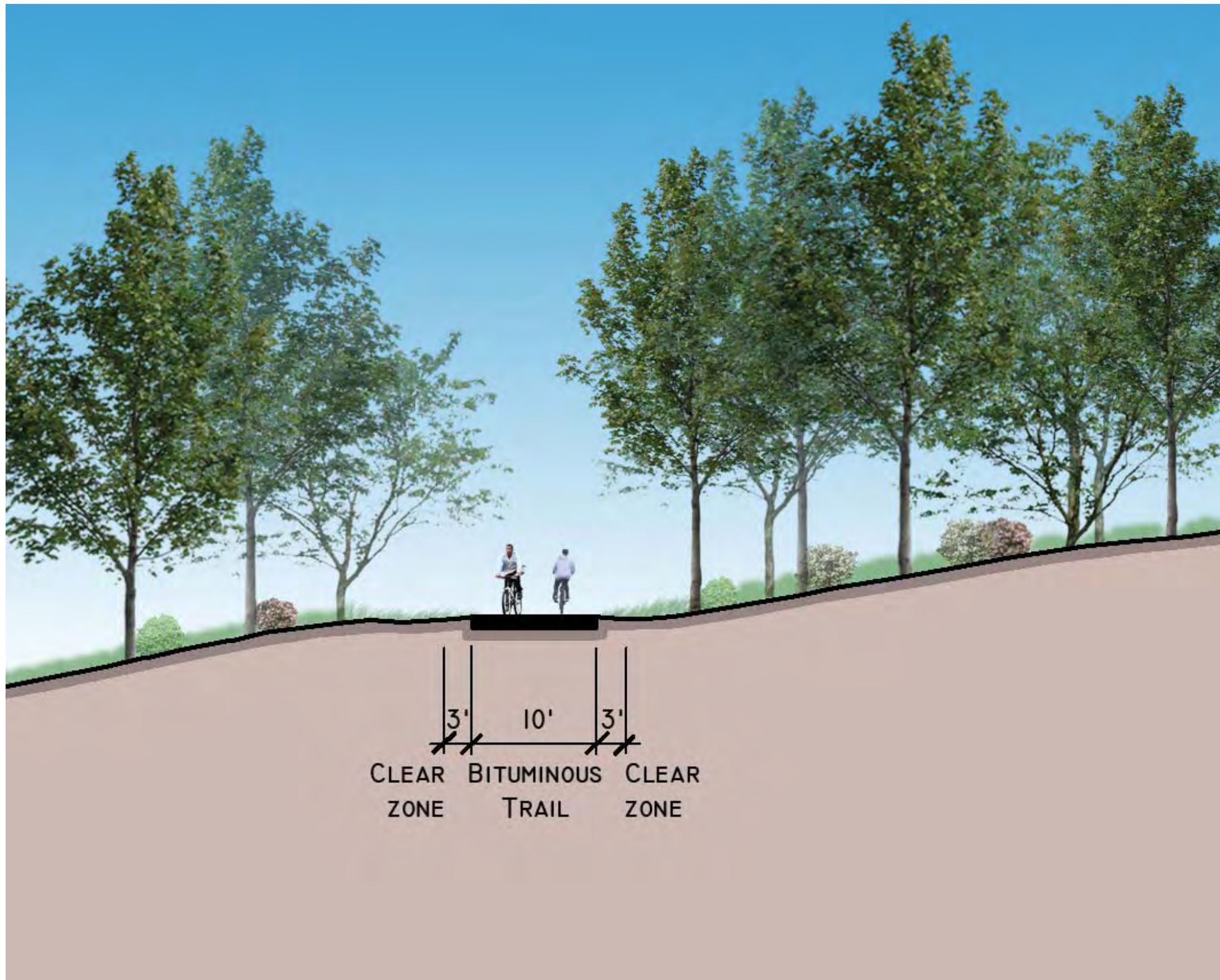


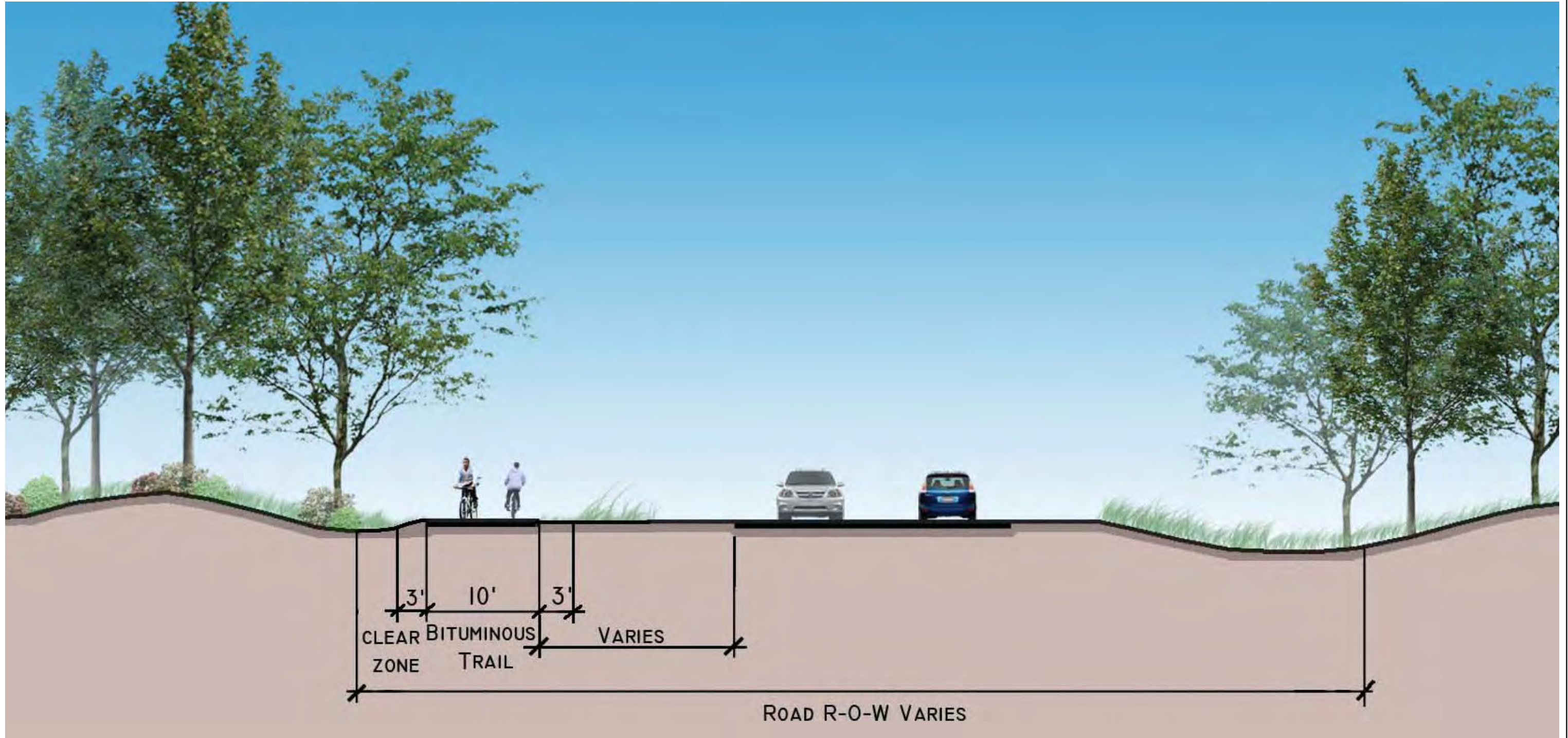
TYPICAL SHARE-THE-ROAD SECTION

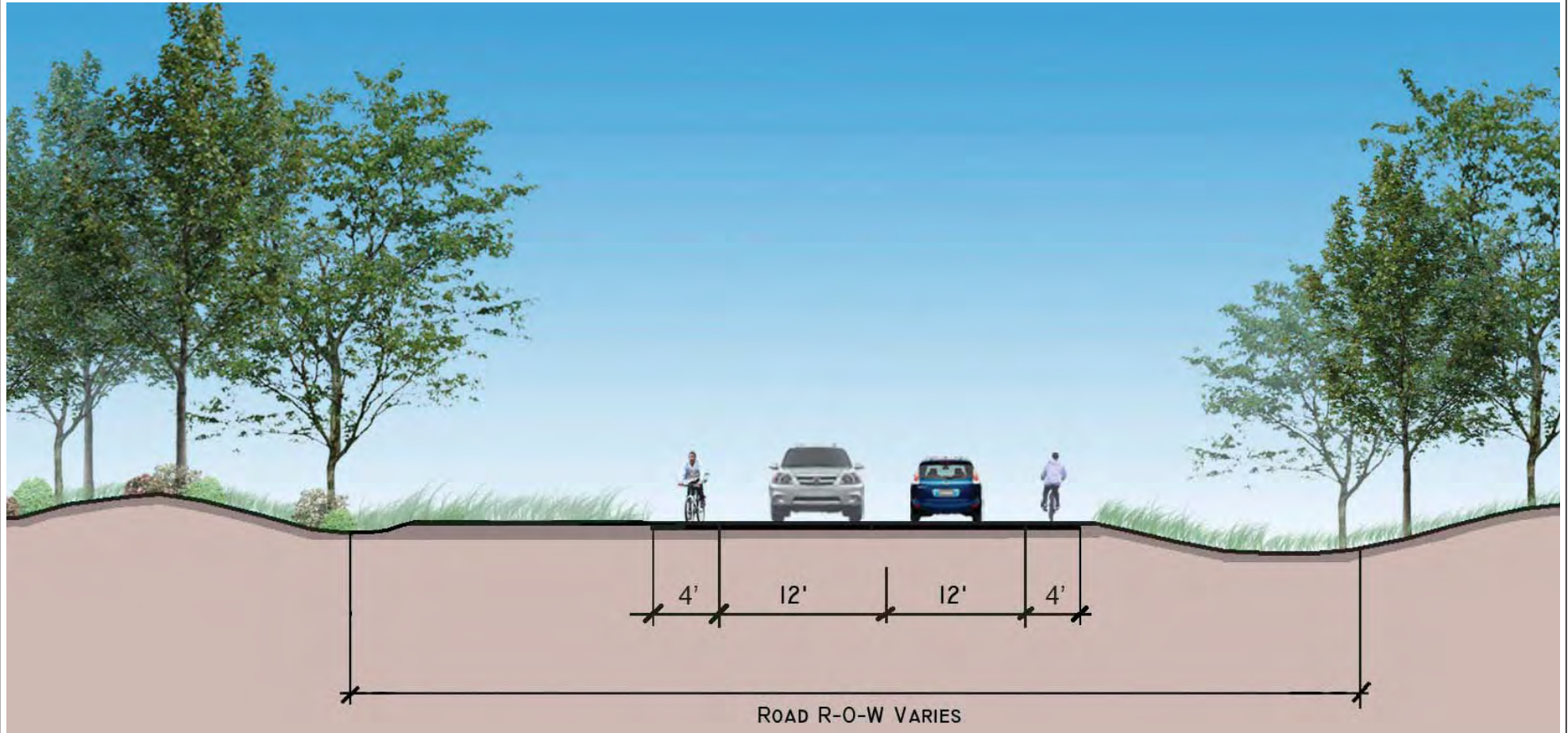
RED RIVER GREENWAY
FARGO-MOORHEAD METROPOLITAN COUNCIL OF GOVERNMENTS

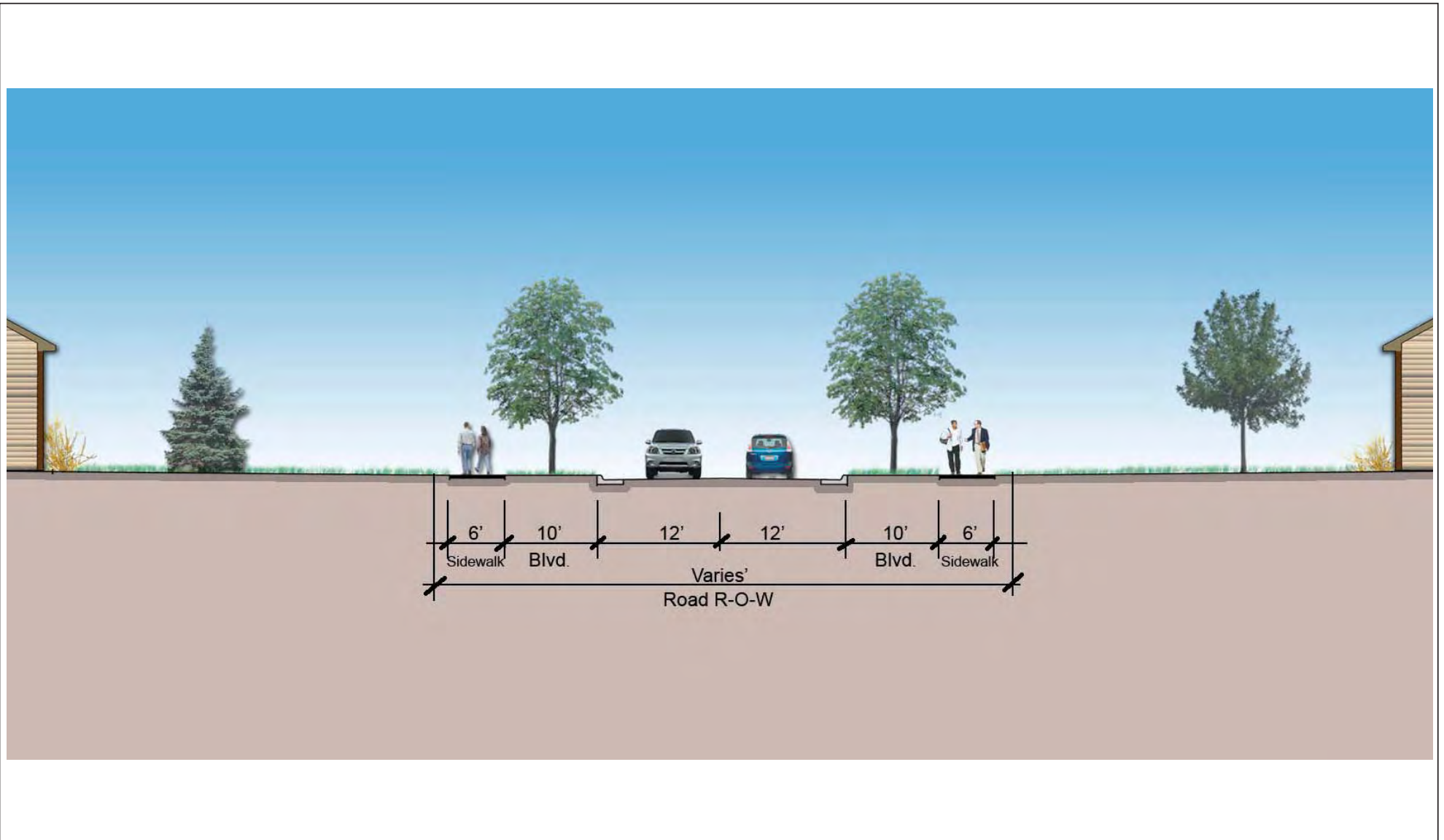
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4/23/2008

Figure 7









Appendix 4

Summary of Historic Sites along the Red River Greenway Corridor

Appendix 5

Cass County Subdivision Ordinance

SECTION 610

Watercourse Setbacks.

- 610.01. Purpose.** All proposed subdivisions adjacent to blue line perennial watercourses, as identified on the most recent version of a 1:100,000 or 1:24,000 USGS quadrangle, and other steep slopes shall be designed to minimize the potential for slumping, bank failures and land slides and the associated damage to structures, property and aesthetics.
- 610.02. Setbacks.** Applicants proposing subdivisions adjacent to blue line perennial watercourses, as identified on the most recent version of a 1:100,000 or 1:24,000 USGS quadrangle, shall delineate building control lines on the recorded plat limiting certain activities and land uses in these designated areas.
- 610.03. Building Control Lines.** Except as provided in Section 610.04 of this Ordinance, all subdivisions shall provide the following building control lines, measured horizontally and perpendicular from the centerline of the watercourse towards the proposed development, regulating the use and activities within these building control lines in accordance with Sections 610.05 and 610.06 of this Ordinance:
- A. Minimal Disturbance Zone Setback: three hundred and fifty (350) feet for the Red and Wild Rice rivers. All other blue line perennial watercourses Minimal Disturbance Zone Setback may be based on the three hundred and fifty (350) foot setback or be equal to vertical difference between the top of bank and the river bottom (plus any additional flood plain elevation requirements) multiplied by eight (8).
 - B. Limited Disturbance Zone Setback: beginning at the outer edge of the Minimal Disturbance Zone Setback and extending one hundred (100) feet.
- 610.04. Alternate Method of establishing the Minimal Disturbance Zone Setback.** As an alternative to using the established Minimal Disturbance Zone Setback along the blue line perennial watercourses, an applicant may request to use a site specific Minimal Disturbance Zone Setback, determined as a result of a detailed geotechnical investigation. The investigation must be performed by a registered professional engineer and testing firm acceptable to the County Engineer. Sufficient number of soil borings must be performed and at appropriate locations to provide a representative sampling of the site. The soils report and determination shall use accepted engineering/ASTM evaluation methods including, but not limited to, triaxial shear test in a supersaturated condition. Borings must be of sufficient depth to allow evaluation of the soils within the Upper Brenna Formation. Report recommendations shall use a minimum

1.3 factor of safety. The County reserves the right for the County Engineer or Planning Commission to reject proposed alternate building control lines.

A. The alternate Minimal Disturbance Zone Setback shall meet the requirements set forth in Section 610.05 of this Ordinance.

B. The Limited Disturbance Zone Setback (*see Section 610.06*) shall be required for all subdivisions employing the alternate method of establishing the Minimal Disturbance Zone Setback.

610.05. Minimal Disturbance Zone Setback. All property within the minimal disturbance zone calculated in accordance with Section 610 of this Ordinance shall conform to the following regulations:

A. No permanent structures shall be allowed except the following:

(1) Stairways, Lifts and Landings - Stairways and lifts are the preferred alternative to major topographic alterations for achieving access up and down steep slopes to watercourses. Stairways and lifts must meet the following design requirements:

(a) Stairways and lifts shall not exceed four (4) feet in width on residential lots and eight (8) feet in width for commercial properties or public open-space recreational properties. Residential lots are permitted one stairway or lift and one facility to provide watercourse access for the physically challenged. The number of accesses for commercial or public open-space shall be determined on a case-by-case basis by the Planning Commission.

(b) Landings for stairways and lifts on residential lots shall not exceed thirty-six (36) square feet in area. Landings no larger than sixty-four (64) square feet shall be used for commercial properties, public open-space recreational properties.

(c) Canopies or roofs shall not be allowed on stairways, lifts, or landings.

(d) Preferably, stairways, lifts and landings would be constructed above the ground on posts or pilings.

Stairways, lifts and landing may be placed into the ground, provided they are designed and built in a manner that ensures control of soil erosion.

- (e) Facilities such as ramps, lifts or mobility paths for the physically challenged to achieve watercourse access shall not exceed four (4) feet in width for residential lots and eight (8) feet in width for commercial properties or public open-space recreational properties.
 - (f) Stairways, lifts and landings shall not prevent or limit the use of public paths or public or private non-motorized vehicle lanes or any other easements.
- (2) Roads, bridges, trails, storm drainage, stormwater management facilities and utilities are permitted within the minimal disturbance zone provided that an alternatives analysis has clearly demonstrated that no other feasible alternative exists and that minimal disturbance will take place. These structures shall be located, designed, constructed and maintained to provide maximum erosion protection, to have the least adverse effects on wildlife, aquatic life and their habitats and to maintain hydrologic processes and water quality. Following any disturbance, the impacted area shall be restored.
- (3) Bike paths, walking trails, or other multi-use paths.
- B. No additional fill shall be allowed, except fill required to plant new trees or vegetation pursuant to Section 610.05 (G) of this Ordinance
 - C. No grading shall be allowed, except grading for bank restoration in areas experiencing bank slumping.
 - D. No excavating shall be allowed, except excavating required to plant new trees or vegetation pursuant to Section 610.05 (G).
 - E. On-site septic systems and drain fields shall not be permitted.
 - F. Irrigation systems shall not be permitted.
 - G. Alterations of vegetation and topography shall prevent erosion into public waters, fix nutrients, preserve watercourse natural aesthetics,

preserve historic values, prevent bank slumping and protect fish and wildlife habitat. Removal or alterations of vegetation is allowed according to the following standards:

- (1) Intensive vegetation clearing shall not be allowed.
- (2) Vegetation previously disturbed or disturbed during the construction of the development or dwellings shall provide native riparian vegetation cover.
- (3) Replacement of native riparian vegetation with non-native species shall not be allowed.
- (4) Limited clearing of trees and shrubs and cutting, pruning and trimming of trees to accommodate the placement of stairways and landings, access paths and watercraft access areas, as well as providing a view to the watercourse from the principal dwelling unit or dwelling site, provided that:
 - (a) The removal of vegetation shall be limited to a width less than six (6) feet to provide the placement of a stairway or path access to watercourse for residential lots. The removal of vegetation shall be limited to a width less than ten (10) feet to provide the placement of a stairway or path to provide access to watercourse for commercial properties or public open-space recreational properties.
 - (b) The removal of vegetation shall be limited to a width less than six (6) feet for facilities such as ramps, lifts or mobility paths for physically challenged to achieve watercourse access on residential lots. The removal of vegetation shall be limited to a width less than ten (10) feet for facilities such as ramps, lifts or mobility paths for physically handicapped persons to achieve watercourse access for commercial properties or public open-space recreational properties.
 - (c) The removal of vegetation shall be limited to an area less than forty-nine (49) square feet for stairway and life landings on residential lots. The removal of vegetation shall be limited to eighty-one (81) square feet for landings used for commercial properties or public open-space recreational

properties.

- (d) Limited pruning of trees limbs to afford a view of the watercourse from the principal dwelling unit or dwelling site shall be permitted and shall be performed in conformance with good nursery and landscape practices. The complete removal of trees or intensive vegetation clearing to afford a view of the watercourse shall not be permitted.
- (e) The screening of structures, vehicles or other facilities as viewed from the watercourse, assuming summer leaf-on conditions, is not substantially reduced.
- (f) Along rivers, existing shading of water surfaces is preserved.
- (g) The above provisions are not applicable to the removal of trees, limbs or branches that are dead, diseased, or pose safety hazards.

610.06. Limited Disturbance Zone Setback. All property within the minimal disturbance zone calculated in accordance with Section 610 of this Ordinance shall conform to the following regulations:

A. No permanent structures shall be allowed except the following:

- (1) Stairways, Lifts and Landings - Stairways and lifts are the preferred alternative to major topographic alterations for achieving access up and down steep slopes to watercourses. Stairways and lifts must meet the following design requirements:
 - (a) Stairways and lifts shall not exceed four (4) feet in width on residential lots and eight (8) feet in width for commercial properties or public open-space recreational properties. Residential lots are permitted one stairway or lift and one facility to provide watercourse access for the physically challenged. The number of accesses for commercial or public open-space shall be determined on a case-by-case basis by the Planning Commission.

- (b) Landings for stairways and lifts on residential lots shall not exceed thirty-six (36) square feet in area. Landings no larger than sixty-four (64) square feet shall be used for commercial properties, public open-space recreational properties.
 - (c) Canopies or roofs are not allowed on stairways, lifts or landings.
 - (d) Preferably, stairways, lifts and landings would be constructed above the ground on posts or pilings. Stairways, lifts and landing may be placed into the ground, provided they are designed and built in a manner that ensures control of soil erosion.
 - (e) Facilities such as ramps, lifts or mobility paths for the physically challenged to achieve watercourse access shall not exceed four (4) feet in width for residential lots and eight (8) feet in width for commercial properties or public open-space recreational properties.
 - (f) Stairways, lifts and landings shall not prevent or limit the use of public paths or public or private non-motorized vehicle lanes or any other easements.
- (2) Roads, bridges, trails, storm drainage, stormwater management facilities and utilities permitted within the provided that an alternatives analysis has clearly demonstrated that no other feasible alternative exists and that minimal disturbance will take place. These structures shall be located, designed, constructed and maintained to provide maximum erosion protection, to have the least adverse effects on wildlife, aquatic life and their habitats and to maintain hydrologic processes and water quality. Following any disturbance, the impacted area shall be restored.
 - (3) Bike paths, walking trails, or other multi-use paths.
 - (4) One accessory building not to exceed one hundred and twenty (120) square feet.

B. No additional fill shall be allowed.

- C. No grading shall be allowed, except grading for bank restoration in areas experiencing bank slumping.
- D. On-site septic systems and drain fields shall not be allowed.
- E. Irrigation systems shall not be allowed.
- F. Existing wooded areas shall conform to the regulations set forth in Section 614.02 of this Ordinance.

610.07. Delineation and Recordation of Watercourse Setbacks.

- A. All Final Plats prepared for recording shall:
 - (1) Show the extent of any minimal or limited disturbance zone setbacks on the subject property by metes and bounds and be labeled as "Minimal Disturbance Zone Setback" or "Limited Disturbance Zone Setback"
 - (2) Provide a note to reference the minimal or limited disturbance zone setbacks stating, "There shall be no clearing, grading, construction or disturbance of soil and/or native vegetation except as permitted by the Cass County"
 - (3) Provide a note to reference any protective covenants governing all minimal or limited disturbance zone setbacks, "Any minimal or limited disturbance zone setbacks shown hereon is subject to protective covenants which may be found in the land records and which restrict disturbance and use of these areas."
- B. All minimal or limited disturbance zone setbacks must be protected during development activities. Prior to the initiation of development activities, the minimal and limited disturbance zone setbacks shall be surveyed and iron pins set in the ground on side lots lines and adequate visibility of the minimal or limited disturbance zone setbacks shall be provided by staking and flagging.
- C. Minimal or limited disturbance zone setbacks shall be maintained through a declaration of protective covenant, which is required to be submitted for approval by the Planning Commission. The covenant shall be recorded in the land records and shall run with the land and continue in perpetuity.
- D. All lease agreements must contain a notation regarding the presence

and location of protective covenants for minimal or limited disturbance zone setbacks and which shall contain information on the management and maintenance requirements for the minimal or limited disturbance zone setbacks for the new resident.

- 610.08. Conflict with Other Regulations.** Where the standards and management requirements of this setback are in conflict with other laws, regulations, ordinances and policies regarding streams, steep slopes, erodible soils, wetlands, floodplains, timber harvesting, land disturbance activities or other environmental protective measures, the more restrictive requirements shall apply.

SECTION 611

Erosion and Sedimentation.

- 611.01. Erosion and Sedimentation.** All subdivision applications which involve grading or excavation disturbing one (1) or more acres of land shall conform to the following requirements and those requirements established by the North Dakota Department of Health.

- A. No changes shall be made in the contour of the land; no grading, excavating, removal, or destruction of the topsoil, trees or other vegetative cover of the land shall be commenced within a proposed subdivision tract until such time that a plan for minimizing erosion and sedimentation control has been reviewed by the Planning Commission and County Engineer.
- B. The following measures are effective in minimizing erosion and sedimentation and shall be included where applicable in the control plan using the North Dakota Department of Transportation (NDDOT) *Erosion and Sediment Control Handbook*, as it presently exists or may hereafter be amended.

- (1) Stripping of vegetation and grading shall be kept to a minimum;
- (2) Development plans shall preserve significant natural features, cut and fill operations shall be kept to a minimum and plans shall conform with the topography so as to create the least erosion potential and adequately handle the volume and velocity of surface water runoff.
- (3) Whenever feasible, natural vegetation shall be retained, protected and supplemented.
- (4) The disturbed area and the duration of exposure shall be

616.07. Existing Trails. When a subdivision is traversed by or abuts an existing public trail, customarily used by pedestrians and/or equestrians, the applicant shall make provision for the continued recreational use of the trail subject to alterations of the course of the trail within the boundaries of the development under the following conditions:

- A. The points at which the trail enters and exits the tract shall remain unchanged.
- B. The proposed alteration exhibits quality trail design according to the generally accepted principles of landscape architecture.
- C. The proposed alteration does not run coincidentally with the paved road intended for use by motorized vehicles.
- D. The land set aside for the continuation of such existing trail may be included within the amount of park and open space land required by Section 616.02 herein.

616.08. Trails and Linear Parks. The Planning Commission may require, as a condition of Final Plat approval the dedication and improvement of trails and linear parks, proposed subdivisions along the Red and Wild Rice rivers will generally be required to provide a constructed trail on an easement or dedicated land along the river. The dedication and improvement of trails and linear parks may be credited toward the park and open space land requirement described in Section 616.02 of this Ordinance, provided such trails and linear parks meet the following standards:

- A. Actual dedications of land of linear parks shall be a minimum width of seventy five (75) feet.
- B. The minimum right-of-way width of an easement containing a trail which crosses private land shall be fifteen (15) feet. In all cases, however, such easements must provide for public use at reasonable times.
- C. Trails shall have a vertical clearance of no less than ten (10) feet.
- D. Width of the trail surface may vary depending upon type of use to be accommodated, but in no case shall such width be less than ten (10) feet.
- E. Trails shall be shall be constructed according to the specifications set forth in Appendix 10.
- F. Developer shall constructs trail within one (1) year of the recording of

the plat.

G. Trail meets applicable requirements set forth in Section 616.08 of this Ordinance.

H. Location and length of trail approved by the Planning Commission.

616.09. Municipal Fund Reimbursement. A municipality may from time-to-time decide to purchase land for parks in or near the area of actual or potential development. If a municipality does purchase park and open space land for a neighborhood, community, or regional park, using the definition provided in this Ordinance, subsequent park and open space land dedications within that area may, upon agreement with the applicant, be in cash only and shall be calculated on a percentage basis to reimburse the municipality's actual cost of acquisition and/or cost of development of such land for park and open space purposes. The cash amount provided to the municipality which purchased the land shall be calculated in accordance to Section 616.03 of this Ordinance. Once the municipality has been reimbursed entirely for all such park and open space land, this subsection shall cease to apply and the other subsections of this section shall again be applicable. The reimbursed value shall be based on the purchase price of the land plus all other actual costs for streets, on-site utilities and other improvements (or an estimate of such actual costs provided by the municipal engineer).

616.10. Additional Recreation Reservations. The provisions of this section are minimum standards and shall not be construed as prohibiting a developer from dedicating or reserving other land for recreation purposes in addition to the requirements of this Ordinance.

616.11. Private Reservation of Land. Notwithstanding anything contained in the above sections, the applicant may, with the consent and approval of the Planning Commission, elect to fulfill the open space requirements through the private reservation of a recreation area.

A. Those developments proposing a private park, open space, or trail or if the park, open space and/or trail not accepted for dedication by a local governing entity shall be accompanied by an agreement establishing the respective rights and obligations of each lot owner. All park agreements shall be signed, notarized and recorded with the Final Plat and shall include the following elements and when warranted additional language to protect the interest of each party:

- (1) That maintenance of the designated open space is the responsibility of the applicant, a home owners' association, a condominium unit owners' association, or other recognized conservation organization.