

Trail Master Plan

Burnsville, Minnesota



SEH No. A-BURNS9813.00

September 7, 2000

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I hereby certify that this report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.



Glen Van Wormer, P.E.

Date: September 7, 2000 Reg. No.: 9089

Reviewed by: Famula Maki 9/7/00
Date

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September 7, 2000

RE: Burnsville, Minnesota
Trail Master Plan
SEH No. A-BURNS9813.00

Mr. Randy Oppelt
Park and Public Works Director
City of Burnsville
Central Maintenance Facility
13713 Frontier Court
Burnsville, MN 55337

Dear Mr. Oppelt:

Short Elliott Hendrickson Inc.[®] (SEH) is pleased to provide you with this final report and layout of the Trail Master Plan for the City of Burnsville. The plan is a result of a careful analysis of the needs of trail users within the City of Burnsville and coordination with adjacent communities' plans and those of the region. It reflects on the potential desires for trail usage and incorporates the existing system.

The process that developed the plan provided for public input through neighborhood meetings, special meetings, and a Council workshop. The plan has been reviewed on a number of occasions and should provide the City with a systematic method of determining the needs of trails in the City for the next several decades.

The next step is the implementation of the plan, and some suggestions are provided in the report. While some refinement of the trail system through implementation is desirable, we believe that the overall Trail Master Plan will provide the network of routes that will best meet the needs of the City.

We enjoyed working with the City and others in putting the plan system together, and appreciate the significant input that you have had into it. If you have questions regarding the background information, the process, or the results, please contact us.

Sincerely,

A handwritten signature in black ink that reads "Glen Van Wormer". The signature is written in a cursive, flowing style.

Glen Van Wormer, P.E.
Manager, Transportation Engineering Group



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Appendix

Trail Master Plan

Prepared for Burnsville, Minnesota

1.0 Introduction

1.1 Background

Some of the community visioning and planning efforts in the City of Burnsville have identified the need for a Comprehensive Trail System within the City. These efforts included Partnerships for Tomorrow, Heart of the City, and different streetscape projects. The City has recognized some trail needs and has provided several improvements to the system such as a trail link to the Minnesota River and a trail joint project along Highway 13, Nicollet Avenue, and McAndrews Road. However, many of these efforts have been somewhat independent of an overall Comprehensive Trail Master Plan.



Many communities have found an ever increasing use of trails that have been installed either by the City or by another agency. The Gateway Trail from St. Paul into rural Washington County has seen tremendous ridership gains and is

now at a point of needing to be widened. Recreational trails, such as the Luce Line, Root River, and others, are notoriously busy at certain times. The DNR has a significant program providing for recreational trail use. Trails throughout Minnesota, Wisconsin, and other midwestern states are busy from spring through fall.

Often neighborhoods or neighbors initially opposed to a potential nearby trail are among the regular users. Trails (and sidewalks) built along roads where few pedestrians or bicyclists were present previously, are now quite busy.

The fitness and wellness concerns have led to significant amounts of trail based exercise, from leisurely lengthy walks, often by seniors, to strenuous workouts by all age groups. These types of users are frequently mixed on the same trail.

Trails are also used more frequently for different types of trips and by all types of different users. Inline skaters, sometimes in groups or teams, use trails for workouts. Families, including children still with training wheels on bikes, share trails with those riders looking for a multi-mile workout. This has led to a trail system needing to provide for a myriad of users and purposes.

As a result, it is necessary to develop a system to bring together all of the elements of the users, the destinations, the modes, and the traffic conflicts and concerns.

1.2 Vision

Burnsville transportation end statement is “People find Burnsville a community with an effective, multi-modal transportation system connecting people and goods with destination points.” The trail system has been deemed a critical element of the Burnsville community. It can be more than a transportation element, serving also as a mode of drawing neighborhoods together, connecting diverse land uses in a friendly environment, and providing additional recreation capabilities within the community.

2.0 Trail Master Plan Development

2.1 Basic Elements of a Trail Plan

Development of a trail plan is more than just connecting dots and drawing lines on a map. It is understanding who will be using the trail, for what purpose, what the origins and destinations are, and determining how the plan can provide a complete trail system connecting destinations and other trail systems. The additional elements of a plan are the analysis of traffic impacts and conflicts and the determination of maintenance capabilities. Finally, the plan needs public input to be successfully developed.

Too often, a trail plan is developed for a single mode of user. However, it is not practical to try to accommodate all users simultaneously. It is necessary to understand who might be using specific elements of a trail, for what purpose, and, to some degree, in what volume.

2.1.1 Users

Trails are often designed for bicycle use and frequently they are one of the main users. Bicycle riders generally either have a specific destination in mind or are looking for a relatively long route on a system. Bikes may be used for a specific purpose such as a trip to a park or a school. They are also used for commuting or for trips to and from commercial establishments. However, one of the main functions of a bicycle trail system is to provide for recreational use. Some users are content with a simple four to six mile ride, starting and ending at an origin, such as a home. Other riders are looking for more strenuous activity and may plan a 10 to 20 mile route. Obviously, this would include trips into adjacent communities or rides on the regional trail system. The mobility of the metropolitan area residents and the availability of numerous trails, both within and outside the metropolitan area, frequently will take these trail users to different portions of the area. However, there are a number of users who will use the Burnsville trail system as part of their trip. Finally, there are the long trail riders who are using it as either a method of fitness or who are into the longer trail rides, frequently upwards of 40 to 50 miles. These riders quite frequently will look for semi-rural or rural areas where they will be unimpeded by conflicts for long distances.

Pedestrians frequently use the same trail system although their trips are usually quite a bit shorter. Residents frequently will use a sidewalk or trail system as a method of activity. Trails can connect origins and destinations, but there is a limitation on distances most people will walk.

More recently, the rollerblades or short skis (blades) are used for training or fitness purposes. These users will frequently take trips of several miles, and require a smoother surface and less interaction with streets and other conflicts. In addition, they frequently will require a wider trail due to the use of either poles or a skating technique.

Obviously, one would not plan for inline skaters in areas where there are frequent driveways for commercial establishments or where there is heavy use by pedestrians or family bike riders.

2.1.2 Destinations

The second basic element of a trail plan is to determine the destinations that may be used by some of the various modes of users. Obvious destinations include parks with some type of activity that could either be related to the same mode of transportation or might merely be for passive or active uses. A similar destination would be a school for either a school activity or school ground function.



A lesser thought of destination is a commercial facility. Frequently, bicycles are found around convenience stores and fast-food restaurants. Trips to these types of establishments are generally shorter in length and can

sometimes be accommodated on an existing sidewalk system or on lower volume streets.

An infrequently used destination is employment. Although winter time bike use is extremely limited in Minnesota, there are some individuals who will attempt to use bicycles for trips to work year around. The use in the summer is generally confined to warmer days and often by temporary school age employees. It is frequently difficult to provide for an employment route through a trail system, since frequently these will be the “diehard” riders who will use the lane of traffic or the shoulder of a road as opposed to a trail system unless the trail is rather uninterrupted by any other type of user or conflict.

2.1.3 Systems

It is important to develop a system of trails. The trail system should connect destinations with the user’s origin and may also be used to connect various destinations. Connections between parks with trails is one example.

It is also desirable to connect the Burnsville system to other systems in Bloomington, Eagan, Apple Valley, Lakeville, and Savage. The Burnsville system must be compatible with those developed by Dakota County, as well as Hennepin and Scott Counties. Continuity with the regional system, such as the proposal to develop a trail along the Minnesota River, is desirable. Finally, it is desirable to provide systems for different users. Longer bicycle trips might be well served by connecting the 35W trail to the Cedar Avenue river crossing via a Black Dog Road trail. While this would serve the commuter and recreational biker, it might see very few pedestrians other than those who drive to it to walk along the river. Conversely, a sidewalk system through an area serving senior citizen housing might be more adequate than a lengthy loop of a trail system.

Also important in destination of a trail plan is the potential impacts of traffic. Running a trail system through an industrial park where there are frequent trucks backing up or heavy peak hour use of the road

system by employees is undesirable. Similarly, running a trail through a heavy commercial area, such as some of the commercial area adjacent to the Burnsville Center, would result in numerous conflicts. Thus, the system must recognize the potential conflicts with various types of traffic in attempt to provide a system that is relatively free of these potential hazards.

An often overlooked consideration in developing a trail plan is maintenance. The determination needs to be made of the importance of sweeping and plowing the trail system. This again is an offset of the analysis of the users and destinations, and some type of priority system could be setup. It is also necessary to recognize that trails will need periodic surface restoration and a growing trail system will require greater funding for maintenance.

2.1.4 Public Involvement



A final element of a trail plan is the necessity of getting public involvement in the development of the trail, but also in providing information to the users of the system itself. Maps, which can either be publicly or privately provided, are essential so that Burnsville residents and others have access to the system. Signing along the trails is also necessary so that users do not have to frequently consult a map to determine where they are and where they should be turning. Good examples exist in the established trail systems, such as along the Root or Cannon Rivers.

Finally, a trail plan must fit into an existing system. Wherever expenditures have been made to develop a trail system, it needs to be incorporated into the proposed system. It needs to be coordinated with the Park System Plan and connect to the trails within the park system. This has a benefit of utilizing established systems within the park, but also reducing the necessity of traveling on City streets next to a park or providing parking for vehicles carrying bicycles to use a park system.

It should also be recognized that parks can be a part of the larger trail system and diverting trail users from a system running along a street to go through a park may be desirable.

2.2 Analysis of Users

As indicated in the development of the trail system, the users must be clearly understood so that the type of trail can be properly established. Surface smoothness, lack of conflicts, width, grades, and other elements are all a reflection on who will be using the trail and for what purpose.

If the purpose is to get to a specific destination, then the trail system must reflect not only a connection between the origin and destination, but also the elements at the destination. For example, if the destination is a park, the trail should connect to the park trail system. Or if the destination is Burnsville Center, the trail should connect to a pedestrian entrance and bike racks should be provided. There must be coordination with school, commercial establishments, or employment areas. Thus, a trail for a destination purpose must be designed to complete that purpose.

Much of the use of trails today is by individuals interested in wellness and fitness. Walking has become a preferred method of fitness for many, especially those who are advanced in age. While a walking trail through a park on a gravel surface might suit an individual using walking as a fitness mode, seniors using a short walking route are looking for a smooth surface, lack of conflicts with bicycles and inline skaters, limited grades, and especially a short loop route. Thus, the trail near a senior development would be different than that established in a neighborhood likely to have a number of younger families.

As stated earlier, trails are used for recreation and frequently for longer distance bike rides or blade use. Certain portions of the system will reflect primarily on recreational use, such as a trail along the Minnesota River or a connection to Murphy-Hanrehan Park Reserve.

The trail system must also reflect on the potential for other types of modes other than the normal three that are considered; pedestrians, bicycles, and inline skaters. In some areas, wheelchairs will be mixed in with the users. The trails may be utilized for therapy by mobility challenged individuals who will require perhaps the same surface as inline skaters, but who will react to other traffic slowly. Skateboards, strollers, and other methods may frequently be mixed. Recognizing the significant difference between a wheelchair user and a fitness minded inline skater, it may be desirable to consider some alternate routes for the two uses.

There are also users or potential users who are excluded or who will not use the system. Motorized vehicles, including snowmobiles, are prohibited by City Ordinance from operating within the City.

It should be recognized that not all sections of the trail system will accommodate all types of users. It may be that the users will self select the proper trail system just by the type of trail that is provided. Where there is a conflict, an alternate method to provide for one of the modes may be desirable. As an example, high speed bikers who used to use the Mahtomedi-Stillwater trail along County Road 12 are now accommodated on a paved shoulder. This has removed some serious conflicts between pedestrians and family bikers with the high speed fitness oriented biker.

3.0 Trail System

3.1 Existing System

The City of Burnsville has an extensive City sidewalk system. Sidewalks are in place on each side of most of the streets in the City's arterial system. There are also a number of sidewalks along collector streets and those streets serving several of the schools and parks. However, most of the sidewalks are 5 feet in width and designed primarily for pedestrian activities.



The City also has a number of trail sections in place. These include an extensive system along County Road 11, the specific trail along I-35W south from Black Dog Road, and the connection from Highway 13 and Nicollet Avenue towards McAndrews Road. There are also extensive trails in some of the parks, and in combination with the sidewalk system, will provide an opportunity for off-road travel by pedestrians and to some degree bicycles.

Most segments of the trail system can be incorporated into the Trail Master Plan since they have been aligned with destinations of various types.

Some existing sidewalk sections can be incorporated into the trail system where volumes are low. Sections of sidewalk can be temporarily used as part of the trail system until funding and priorities permit full development of the trail system. Other sections of existing sidewalks will not be a part of the trail system, but still serve desirable purpose of providing a route for pedestrians out of traffic.

Some trail plans have been in existence as parts of Transportation Plans or other Facility Plans. They may have been thoughtfully developed as part of another planning component. They need to be updated to reflect the significant change in users and to reflect the changes in systems throughout the metropolitan area.

3.2 Trails in Adjacent Communities

As part of their Comprehensive Plan updates, surrounding communities have been developing trail systems.

3.2.1 Savage

The City of Savage has a plan for parks, greenway corridors, and natural resources prepared in April 1998. Some trails are already in place, such as the trail along Glendale Avenue and parts of County Road 42, and a second trail meandering through a residential neighborhood south of County Road 42. A major proposal is for a trail following the Credit River between County Road 42 and the Minnesota River.

Direct connections affecting Burnsville include an existing trail from Canterbury Park to the north edge of Sunset Pond. Savage also intends to develop a trail along Murphy-Hanrehan Park's north border connecting to Burnsville Parkway. A connection is proposed along County Road 16 and an additional trail connecting to the Kraemer Nature Reserve in Burnsville. This particular trail would provide continuity through the park system to Butler Park and ultimately the proposed Credit River Trail.

All five connections provide critical connections to Burnsville. The Murphy-Hanrehan Park and the Credit River Trail can be destinations for area residents. The County Road 42, existing Sunset Pond connection, and even the County Road 16 connection can provide continuity of systems throughout the Dakota-Scott area.

3.2.2 Lakeville

The City of Lakeville has similarly developed a trail and park map and system. In conjunction with Dakota County, they have established a trail system along some of the major county roads including County Road 5 and County Road 46. Their plans call for continuation of a multi-purpose trail on either side of County Road 46 from County Road 5 east. This would provide connections via County Road 5 into Burnsville and connection at Lac Lavon Drive. The final connection is a sidewalk on Maple Island Road to the Burnsville City limits. This could connect to the trail already provided in the Burnsville park system. This would also provide a connection to a trail and sidewalk system in a Lakeville park northeast of I-35W and County Road 46.

3.2.3 Apple Valley

The City of Apple Valley has a number of trails in existence along east-west roadways connecting to Burnsville. The primary connection is via the County Road 11 trail in Burnsville and Apple Valley near 140th Street and McAndrews Road. Apple Valley has a trail along Palomino Drive east from County Road 11 and along McAndrews Road leading past the zoo. There is also a trail system along all of 140th Street connecting to a number of other potential destinations in Apple Valley. Final connections impacting Burnsville are along County Road 42, although the system is incomplete, and along County Road 46.

From a Burnsville system standpoint, the in-place County Road 11 trail provides existing connections into the Apple Valley system. County Road 42 trail connecting the Southcross Drive may be an important link in the future system in Burnsville.

3.2.4 Eagan

The City of Eagan also has a number of trail segments, although most are either sidewalks or proposed. The City has an existing sidewalk along Diffley Road connecting County Road 13 and the Metcalf School. They are also proposing roadway corridor trails along Slater Road, which would connect to Burnsville Parkway and along either side of Cliff Road connecting into Burnsville.

Many of the City's existing trails are adjacent to roadways in the central area of the community, although they do connect a number of parks and other destinations. The most logical connection is via Cliff Road, which will provide access to off-road trails at Galaxie Avenue, Johnny Cake Ridge Road, and other north-south streets connecting to other trails.

3.2.5 Region

There are also some trail systems of regional significance. A proposal has been put forth to provide a trail along the Minnesota River from



Fort Snelling into Scott County. The trail as proposed would be on either side of the river and the Dakota County segment would coincide with Black Dog Road through much of Burnsville. It would also provide an opportunity to coordinate development

of trails and the amphitheater and Quarry Park areas between Burnsville and regional trails.

A second connection is between the Minnesota Zoo and Murphy-Hanrehan Park. Three alternates have been identified and all three would coincide with potential trails to be developed in Burnsville.

In addition to trails being proposed by other communities and agencies, there are a number of publications that have looked at trails and streets and tried to design them into a series of tours or trail rides throughout the metropolitan area and Minnesota. One such route indicates a 25-mile route throughout Burnsville that incorporates the County Road 11 trail, River Hills Drive, Burnsville Parkway, and Southcross Drive. Trails put together in text like this will have some indication of their appropriateness for inclusion in the Burnsville Trail System.

3.3 System Development

While it is possible to use observations, knowledge of existing uses, or other methods to develop a “connect the dots” type of development for a trail plan, it is more desirable to systematically identify origins, destinations, desire lines, and restraints, and develop a system based on this theoretical concept. This can then be modified to reflect existing trails, potential constraints, and system connections to develop a trail system. This method was used in development of the Burnsville Trail Master System.

Destinations were developed using comprehensive land use designations. Four specific types of land uses were utilized as destinations. These included schools, parks, employment areas generally coming from industrial uses, and commercial developments that could either be a commercial or an employment attraction. Each of these was developed by layering out the specific land use onto a specific map. Thus, each school, each park, and each concentration of commercial or employment areas was easily identifiable on separate maps.

The residential developments within the City were then divided into 52 separate “neighborhoods”. These neighborhoods were designated primarily by using portions of the street system to cordon off each area. Each area or neighborhood would then have a centroid from which most trips could be based.

The park plan was then further defined to identify those parks that would be of City-wide interest. Neighborhood parks that have services duplicated in other parks were disregarded in the trail plan development. The parks of City-wide interest were then connected by a line on the map from the center of the park to the center of each

neighborhood centroid. This resulted in a map with a significant number of lines fanning out from each park. Using the various major parks, a series of lines were combined and bent to conform to the street or trail system that is in place. As an example, a number of neighborhoods from the southeast area of Burnsville can be connected to Terrace Oaks Park by bending the desire lines to conform to the alignment of County Road 11. By forcing the lines along the existing trail, many of the desires can be met by the in place system. Similarly, desire lines from the west central portion of Burnsville to Terrace Oaks Park are somewhat restricted by access across the freeway. Once they are connected to either a crossing at Burnsville Parkway or McAndrews Road, they can be assigned to alternate routes to reach the park. By reversing the process and using either Sunset Pond, CamRam and Murphy-Hanrehan Parks, similar, but reversed desire lines from the east central neighborhoods can follow along some of the same routes. Finally, these routes can be combined into a single map with designated routes to connect neighborhoods to parks. By further bending these to provide convenient access to neighborhood parks, multi-purpose residential park connections can be met with a minimum number of trails.

Similarly, individual schools can be aligned with adjacent neighborhoods. Schools, however, have shorter distances of attraction and would require less “cross-city” trail use. Again, they were primarily aligned with the immediate adjacent neighborhoods likely to be origins of school trips.



Employment centers were similarly designated, but routes leading into the centers were carefully determined. These routes were then connected back to a system of trails that would lead back to the neighborhoods. Recognizing that many of the employment trips will be by bicyclists preferring to use the road system rather than a trail system, modifications were minimal to provide these connections.

Finally, the commercial areas were designated by access from the immediate neighborhoods for small convenience-type centers and

along a longer system leading to major centers, such as the Burnsville Center, Sioux Trails Center, or the Heart of the City area.

Once these trail systems were refined based on desires, they were then modified one additional time to reflect in-place trails, restraints to construction, and a better spacing of the trail system. As an example, desire lines will follow along 130th Street east of Nicollet Avenue for many of the connections. However, continuity with the Heart of the City system and with some existing trails and desire lines using Burnsville Parkway and Kennelly Road would make Burnsville Parkway a better connection between I-35W area and County Road 11. In addition, the Civic Center Drive trail connection at the south to 134th Street affords an additional connection to County Road 11. Thus, the 130th Street connection through a residential neighborhood was dropped in favor of easier to build and more uniformly spaced connections along Burnsville Parkway and 134th Street. A few similar adjustments were made in other areas.

The result is a basic trail system that is comprised primarily of off-street trails adjacent to major roads, but taking advantage of those existing components in the park system. Connections are shown for future extensions to the quarry area and in the amphitheater area.

Some lower volume on-street or even sidewalk trails connections can be made where it would be difficult to provide a 10-foot trail or the demand and priority may be lower. These include an on-street system south of Crystal Lake, some connections along 134th Street and a few other areas.

Finally, the trail system was bent or changed as necessary to make connections with other communities. The specific trails were added to the Kraemer Nature Preserve to provide a connection into Savage. Because the only active connection into Eagan is along Cliff Road, a trail segment was added in the Burnsville portion of Cliff Road.

The trail system plan map is attached to this report. This map includes the trail system developed as part of this Trail Master Plan study and shows many of the existing trails in parks that can be incorporated in to recreational riding and walking. Neighborhood connection trails (existing) are also shown on the map.

The trail system plan map also shows a potential future trail following the Dan Patch rail line from Savage to Lakeville. Currently, the track is used very infrequently, but is being considered as a commuter rail route. If the commuter rail route does not materialize and the normal rail use ceases, use of right-of-way for a trail is possible.

The City has a number of paved trails within the park system ranging from a short segment in Neill Park to the Sunset Pond loop. These are

used primarily for recreation, although some can be incorporated into the base system. The in-park trails or loops are shown separate from the base system.

The trail system map shows on-street trail connections. There are sidewalks along some of the connections, primarily in the areas north of McAndrews Road. Along others, there are no sidewalks, and all users must use the street. None of these connections currently has designated use lanes on the street. There may be wide edge lines painted on the street, but these have no official designation for bicycle or pedestrian use.

While on-street bike trails can be marked, they are not practical for medium to high volume streets or for multipurpose uses. Bicyclists are required to follow driving rules and ride to the right. Thus, a marked trail on both sides of the street is required. Pedestrians must walk facing opposing traffic, including bicycles. Thus, they also will be on both sides of the street, sharing the area with bicycles. Parked cars, delivery vehicles, service vehicles, and right turning vehicles compete for the same space. This may work if the volume of use is low for all types of use, and therefore, the conflicts are few. Once the number of conflicts become higher, an off-street, multipurpose trail is generally the best solution. Even where the conflicts and uses are low, there is still a concern with parked or turning vehicles interfering with bikes and pedestrians.

A marked “bike lane” should have restricted parking as bicyclists will assume it is exclusively for their use. This creates problems at intersections for right turning vehicles and in residential areas where on-street parking is expected. A standard bike lane is almost 5 feet in width and with lanes on both sides, 10 feet of pavement is devoted to bikes. The marked bike lane must also be outside areas of the street where parking is allowed and should be separated from right turn lanes. Observations of marked bike lanes (painted symbols and lines) in downtown Minneapolis show considerable motorist and bicycle rider confusion at intersections with right turn lanes or with a designated parking lane, but no parked vehicle.

One option is to create a shared lane thereby having bicyclists share it with parked vehicles, turning vehicles, etc. With low volumes, conflicts are low and confusion over use is less. For shared lanes, no bike markings are appropriate. Bicycle route signs can be used that only provide directional guidance to the bicyclists.

The City currently does many locations with a white edge line painted on the street. If this is at least 4 feet from the curb, it can help by providing a sense of separation between vehicles and bicyclists/pedestrians, but it does not constitute a bike lane. It does not

have official designation, special signing, or marking, but it is of benefit. With limited parking use and low volumes of traffic, bicyclists, pedestrians, and others can use the street with reasonable safety.



There are many existing sidewalks in the City that provide a safe walking area for pedestrians and can accept some of the alternate mode uses. However, they may not fit into the base trail system that reflects multipurposes and multimodes.

They are still important in that they provide pedestrians with a walking area out of traffic, connect with some specific destinations, such as schools, and provide for local recreational walking. They are not shown on the Trail Master Plan map unless they fit in to the citywide trail plan development defined in this study. The complete existing sidewalk system is shown on a separate map.

3.4 Public Involvement

A considerable effort was put forth to provide opportunities for the public to become involved in the development of the system. Open houses were held specifically for the Trail Master Plan on July 6, 1999 and November 16, 1999. These were in conjunction with a Park and Natural Resource Committee meeting which also provided input. A meeting was held at a joint City Council workshop and a Park and Natural Resource Committee on January 25, 2000. The trail system concepts, primarily in terms of goals and overall objectives, were also discussed at other Park and Natural Resource Committee meetings, at open house meetings relative to the parks plan, and at a Park and Natural Resource Committee meeting in April 1999.

The City also held a series of neighborhood meetings in the summer of 1999. Parks and trails were discussed at these meetings and comments were brought back to the staff and consultants working development of the Trail Master Plan.

The comments received throughout these open houses and the discussions at the committees could be condensed into several common themes. These themes included the following:

- Trails are an important element of our community.
- Our current trail system is inadequate.

- The trail system should access parks.
- It should also access other important destinations in the City.
- Our system should connect with neighboring systems.
- Separate trails for walkers and bikers should be provided, or if that is not possible, the trail should be wide enough to permit multiple uses.
- Off-road trails are preferable for most uses.
- Maintenance of trails is important including sweeping in the warm season months, snowplowing in the winter, and maintaining the surface in good condition.
- Need to provide public information on trails including a map.

Most of these common theme comments from citizens were incorporated into the Trail Plan through the systematic approach that was utilized. Some, such as the separate trails for walkers and bikers, are desirable, but not practical given the restraints of right-of-way along much of the trail system.

4.0 Design Considerations

4.1 Design Requirements



As indicated earlier, specific portions of the trail should be designed to meet the needs of the expected users. However, the amount of variation or additional width that can be incorporated is often a function of available right-of-way and construction funding.

Recognizing the diversity of modes using a trail system, the standards and guidelines for bikeway design issued by the Minnesota Department of Transportation (Mn/DOT) and other groups recognize the need for some additional width and for some design speed considerations. Attached is a summary of guidelines for off-road bikeways published by Mn/DOT that shows a typical off-road design section. The section is approximately 10 feet in width and provides a basic clear zone and shoulder on either side. An 8-foot wide trail has been used in areas of restricted right-of-way. Maximum grade is approximately 8% with a “landing area” near

intersections. Recognizing that inline skaters may also be using the trail, grades and curves are a special consideration.

Mn/DOT's booklet on planning and design guidelines, published in 1996, is 57 pages in length. By contrast, their guidelines several years ago consisted of less than 10 pages. The process of planning and designing trails is constantly changing, and designs for trails to be built should reflect the standards in effect.

It has almost universally been reflected that off-street bike trails are preferred to on-road bike systems. The off-road trail will provide for two-way traffic for pedestrians, bicycles, and the other users where the on-street trail has to have a component on either side to reflect the needs of both. Pedestrians and bicycles would also be opposing each other continuously to comply with the rules of the road. In addition, on-road systems are often confronted with parked vehicles, and there is constant friction with motorized traffic, especially at intersections.

To safely develop an off-road trail does require careful design considerations and the standards and guidelines of Mn/DOT need to be adhered to unless there is a specific exemption for which there are extenuating circumstances. For practical purposes, a 10-foot wide section should be used throughout the Burnsville trail system.

Because of increased use by inline skates, a smooth surface, generally bituminous, is desired.

4.2 Maintenance

As indicated earlier, maintenance is critical in the usability of a trail system. Sand from adjacent streets or dirt and debris blown onto the trail will occur. Inline skaters require a smooth surface for safe travel and especially for braking. Thin wheeled bicycles should not utilize trails that have loose material on top of hard surface. For these reasons, periodic sweeping of those longer sections of trails must be part of the system.

Snow removal is a requirement wherever year-round trails are to be used. This means the standards for design must have some area adjacent for snow storage. In addition, careful design of intersections must be done to provide for snow storage to eliminate snow bank sight distance restrictions. A policy decision should be made as to what types of trails need to be plowed and maintained for year-round travel. Snow removal may also be necessary where distances between street and trail are minimal.

In addition, there is a requirement of surface maintenance. This means methods of patching, creating joints, and other surface restoration must be carefully considered. Patching can create a break in the smooth

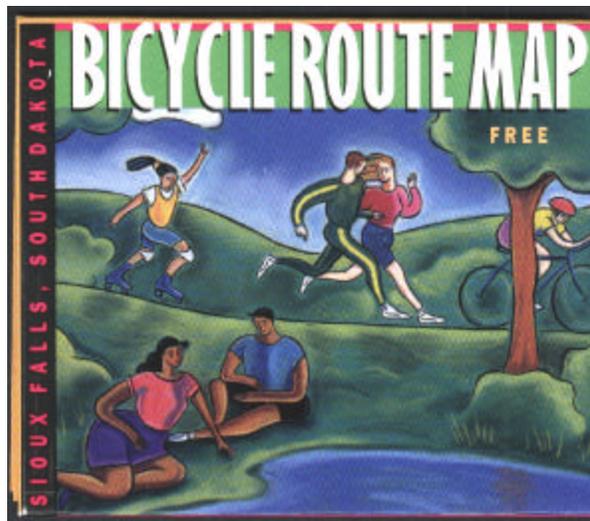
surface for inline skaters and some bumps for bicycle riders. Patches installed on trails need to be smoother than those installed on streets.

The City of Burnsville has developed some snowplowing and maintenance guidelines for sidewalks. A similar system for trail systems should be developed as the system is expanded.

Alternate winter time uses of the trail should also be considered. There has been demand for use of trails by cross country skiers which is in conflict with snowplowing to provide for pedestrians and other types of activity.

An often unthought of requirement along trails is the need to mow or otherwise control of vegetation that may encroach on the trail system. Low hanging branches have been known to strike bicycle riders, creating hazards, and even accidents. Although litter is seldom left behind by bicycle riders on trails, local systems have accumulated some debris from a few bicycle riders or from motorists on the adjacent street or pedestrians using the same system. A continual effort to pickup trash along the trails and especially to remove animal waste is essential in maintenance efforts. Because of these additional costs, it may be desirable to establish a specific trail maintenance portion in the City's budget.

4.3 Public Information



Several types of information need to be provided to users of this system. The most frequently requested device is a map to assist in providing recreational users with an idea of routes to choose. This can be issued strictly for the City of Burnsville or can be done in conjunction with other Dakota County and

Scott County communities. Recreational bikers will frequently cross City lines, and the availability of system maps for inter-city travel should be considered.

The map can be generated from an GIS system, but needs to be of the type that can be taken with a rider.

A second major element of information is the signing system. Along many of the trails, such as the Root River, there are a series of signs providing destination information. It would not be possible to provide comprehensive signing for the complete Burnsville system as proposed. However, some recreational routes, such as the Black Dog route, the County Road 11 trail, or even a “circle of Burnsville” could be signed. The remainder of the routes could be followed by use of a map.

Public information will also require warning and traffic control signs and pavement markings. This should be done based on a separate engineering study, to provide both continuity of warning signs, and specific signs as trails are installed.

A major problem or concern with some off-system trails is the number of locations where they cross public streets. Where stop signs have been installed, they are frequently ignored and yet are necessary to properly control traffic. The City needs to establish a policy relative to the installation of stop signs. It will also be necessary to provide periodic enforcement of the stop signs, especially at hazardous locations. Efforts of the Department of Natural Resources and several local police departments along the Gateway Trail have led to a higher rate of compliance, although the compliance rate continued to be less than desirable.

5.0 Implementation

Implementation should be based on funding, priorities, and system connections. The base trail system is 60 miles in length, and includes 57 miles of off-street bituminous trails and 3 miles where existing streets and/or sidewalks will be utilized. The City currently has 20.5 miles of existing bituminous trails, some of which may need upgrading to wider widths to meet current design desires. Twenty-four miles of the routes shown on the base trail system currently have sidewalk that could be utilized in the interim for some modes. Other portions of the trail plan will require complete development of a trail where none exist. There will be approximately 36.5 miles of new trail constructed. The chart in the Appendix shows more details on both the work needed and the costs. It also shows the cost of potential overpasses for the trail system at Highway 13.

The priority of the system needs to be determined through some future detailed studies. However, it appears that the missing connections, where there is no existing trail or sidewalk and where the trail is a critical element in a loop for recreation or a major desire line, need to be highest priority. The volume of traffic anticipated to use an existing sidewalk can be used to help prioritize those conversion segments and also to establish priorities between updating sidewalks to trails and adding trails where none exist. It is possible that some sidewalk

segments may be adequate for a considerable period of time and would receive a low priority rating. In addition, priorities will be affected by the available funding sources.



The City has used a number of financing methods. Trail segments have been funded through the Capital Improvement Program (CIP) and some have been matched with grants, such as Highway 13, Nicollet Avenue, and McAndrews Road trail segment. Funding trails through the CIP does provide an ongoing trail improvement program. Other trail improvements have been constructed as part of street improvements. The existing construction of a trail along Kennelly Road actually permitted a change in the initial base trail system and

also provided an opportunity to use an alternative funding source. Developments or redevelopments, such as the Heart of the City or Streetscape, also provide opportunities to incorporate trails into the funding and planning systems. Specific developments, such as the proposals for the Northwest Quadrant of the City, will also provide funding sources since the trails can be incorporated into the development.

Future funding will see the continued use of those sources currently used and potentially the addition of specific trail funds from the DNR or from various transportation funding sources. Having the base trail system well defined will provide an opportunity for more favorable grant and funding submittals.

Although there was a considerable amount of public input opportunities throughout the development of the plan, it would also be necessary to utilize public involvement in the implementation processes. This can be done through continued open houses or public meetings, or developing a special advisory committee to work with the funding sources and implementation of the master plan. A special committee given goals, guidelines, parameters, and restrictions could provide priorities consistent with recommendations of the report and with standards. The Trail Master Plan in this report shows the system in general terms. The committee would need to refine the system

looking at intersections, which side of the road the trail should be on, specific trail widths, and details of coordination within and through parks. Obviously, the work of the group or committee should be coordinated with existing committees, such as Parks and Natural Resources. In addition, the committee can review financing alternatives and provide a financial plan back to the City.

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Appendix

SUMMARY OF MINIMUM DESIGN STANDARDS & GUIDELINES FOR OFF-ROAD BIKEWAYS

11/26/96

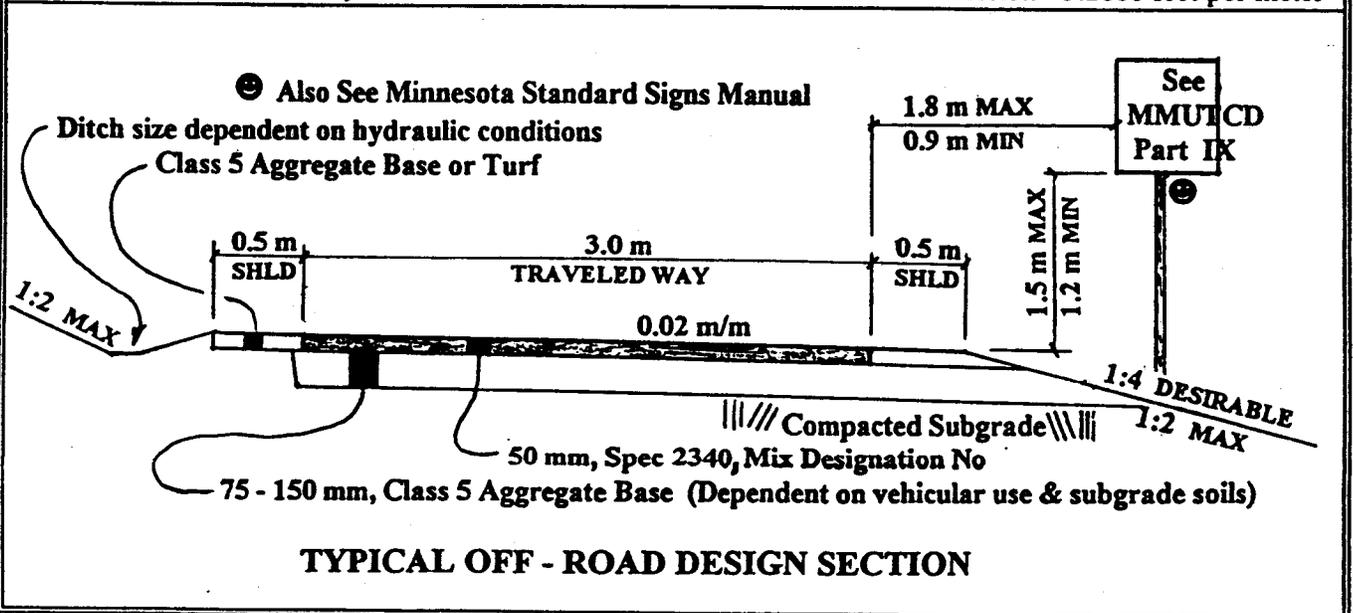
<p>DESIGN SPEED: <u>30 km/h</u></p> <p>Use <u>50 km/h</u> for: grades longer than <u>150 m AND > 4%</u>, from the uphill point where the <u>grade=4%</u> to <u>150 m</u> past the downhill point where the <u>grade becomes < 4%</u>.</p>	<p>WIDTH: <u>3.0 m</u> combined bike/ped path <u>2.5 m</u> two-way bike only <u>1.5 m</u> one-way bike only <u>3.0 m</u> bridge/ underpass</p> <p>✓ widen if on sharp curve or steep grade</p>
<p>VERTICAL CLEARANCE: <u>3.0 m</u></p>	<p>SHOULDER: <u>0.5 m</u></p> <p>✓ provide edgeline if shoulder paved the same</p>
<p>GRADES: <u>8.3% max.</u></p> <p>✓ provide at least a 3 m landing with max. 2% grade at intersections</p>	<p>CLEAR ZONE: <u>0.5 m</u> from edge of traveled way</p> <p>✓ separation distance to road see MBM Fig. 5-3.0A & B</p>
<p>DRAINAGE: Use <u>bicycle safe inlet grates</u></p> <p>✓ see St Pl M4152 & M4154 ✓ use 2% cross-slope ✓ intercept drainage on high side with ditch ✓ minimum culvert dia. = 450 mm (18")</p>	<p>INSLOPE: <u>1:2</u> (rise:run)</p> <p>✓ 1:4 desirable ✓ if 1:3 or steeper, see MBM Fig. 5-9.0B for use of safety rail (min. 1.4 m high)</p>

Traffic Control Devices (ie: signs & pavement markings) shall be installed in accordance with the Minnesota Manual on Uniform Traffic Control Devices (MMUTCD)
A traffic control layout should be in the plan or submitted with the plan.

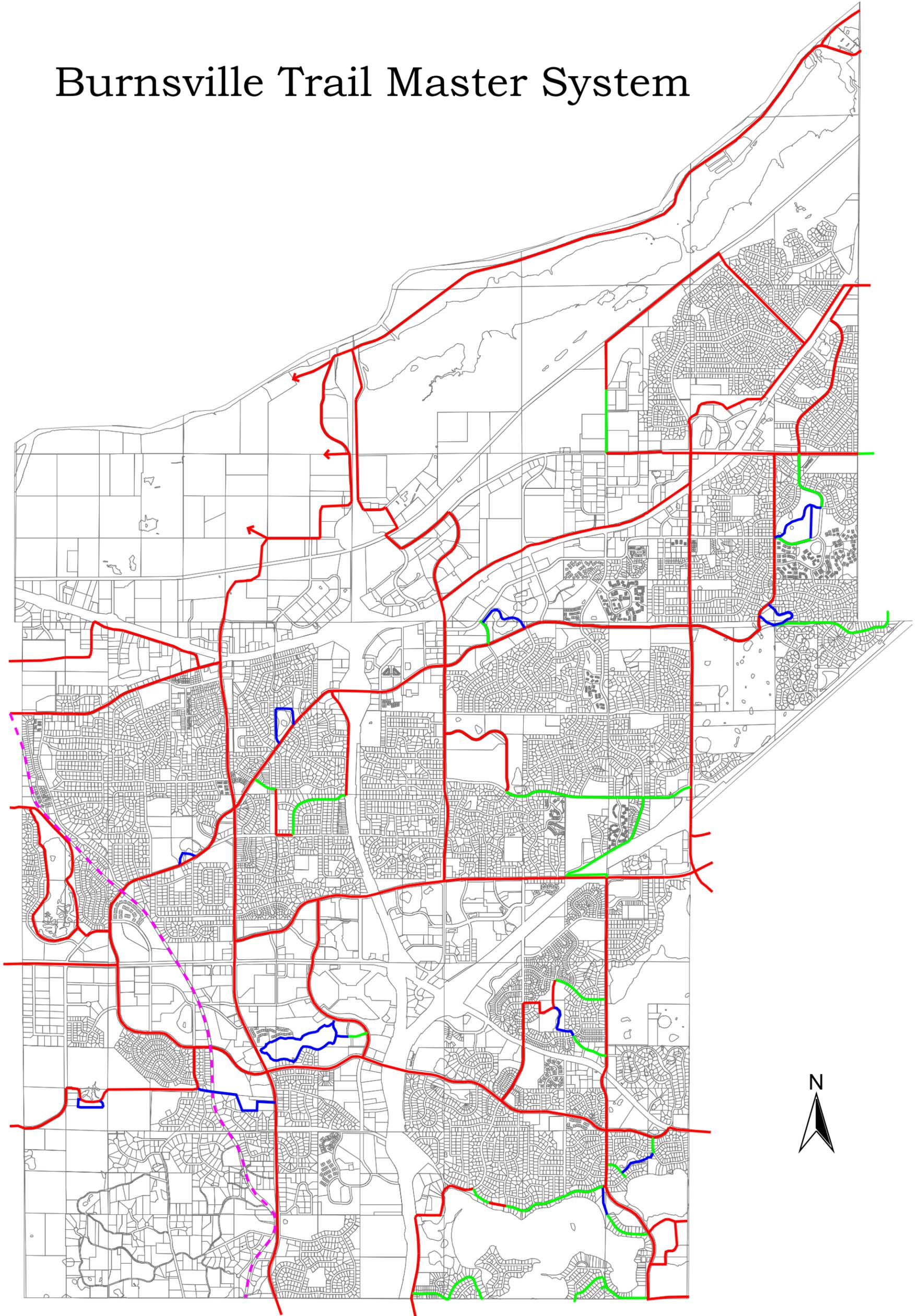
Minimum Standards are in **BOLD & UNDERLINED** text: If standards are not met and using...
 ...State Aid funds ⇒ request a variance in accordance with State Aid Rules 8820.3300
 ...Federal Aid funds ⇒ request design exception in accordance with State Aid Project Development Manual

MBM = Minnesota Bikeway Manual dated June 1996

Metric conversion = 3.2808 feet per meter



Burnsville Trail Master System



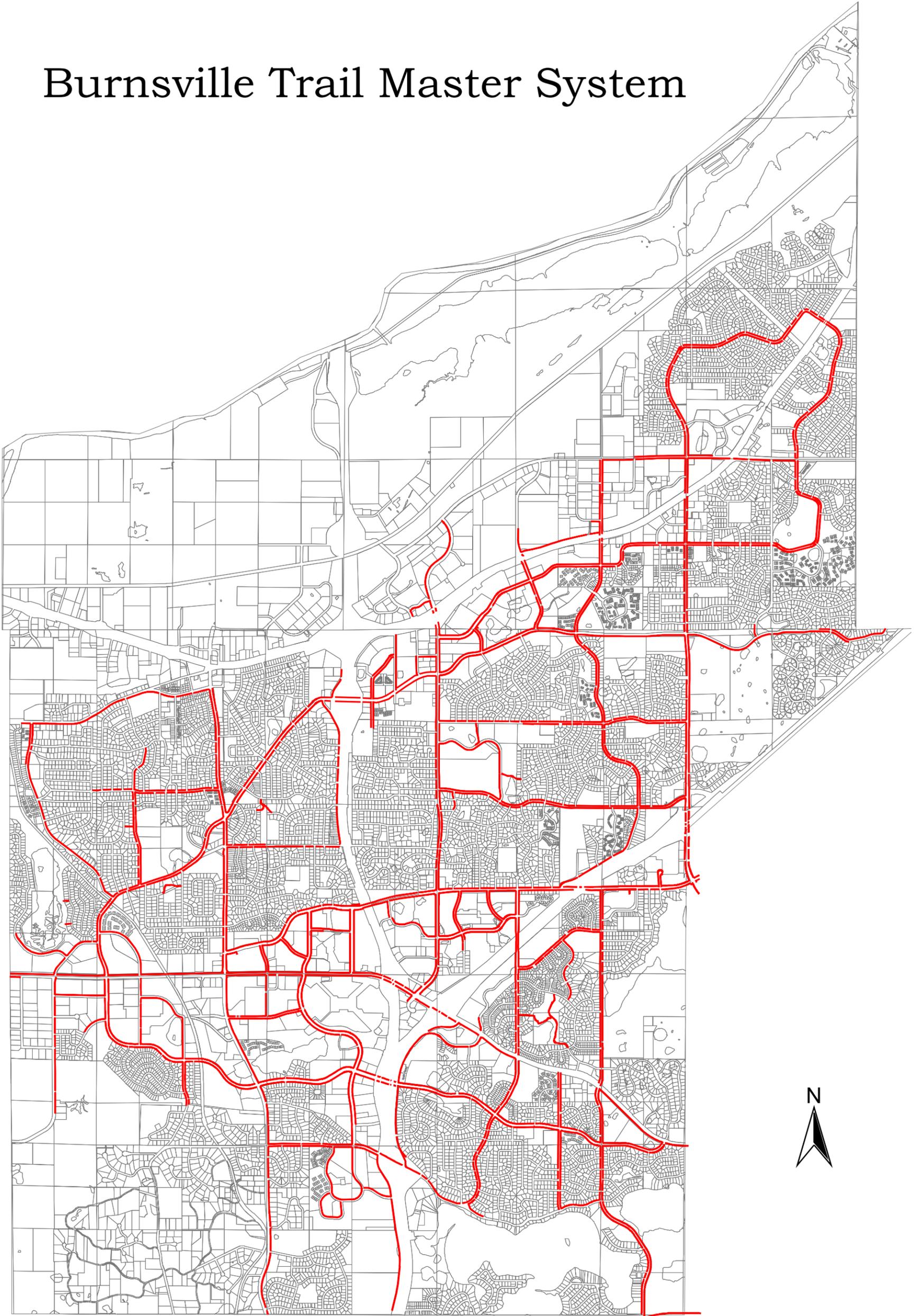
Map Printed: 07/07/2000
rlb

3000 0 3000 6000 Feet

- Base Trail System
- On Street Trail Connections
- Future Trail on Railroad R/W
- In Park Trail or Connection



Burnsville Trail Master System



Map Printed: 07/07/2000
rlb

3000 0 3000 6000 Feet



— Sidewalk



COST ESTIMATES FOR BASE TRAIL SYSTEM

COST PROJECTIONS	
- Cost Per Mile - Difficult Areas (14 mi.)	\$ 211,000
- Estimated Cost for Difficult Areas	\$2.95 Million
- Cost per Mile - Easy Areas (22.5 mi.)	\$ 148,000
- Estimated Cost for Easy Areas	\$3.3 Million
- Cost Per Mile for Sidewalk Removal (24 mi.)	\$ 27,000
- Estimated Cost for Sidewalk Removal	\$ 650,000
- Total Estimated Cost for System	\$6.9 Million

COST FOR HIGHWAY 13 OVERPASSES / UNDERPASSES	
- Diffley Road	\$ 760,000
- Nicollet Avenue	\$ 767,500
- County Road 11	\$ 886,500
- County Road 5 - Construct with Interchange	Part of Project