

DAKOTA COUNTY PEDESTRIAN AND BICYCLE STUDY

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ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

PURPOSE OF THE STUDY

In 2017, Dakota County began a study process to create a unified vision for countywide walking and bicycling networks and identify policies, strategies and tools to encourage active living and improve community health.

The primary purposes of this study are to address non-motorized transportation content required for the Dakota County 2040 Comprehensive Plan and recommend bicycling and walking content to be considered in the Dakota County 2040 Transportation Plan update (2019).

This study focuses on infrastructure priorities and supporting strategies and policies for integration of walking and bicycling modes into the Dakota County transportation network. In addition, it highlights awareness, education, enforcement, and evaluation efforts that bolster infrastructure investments.

BENEFITS OF INVESTING IN ACTIVE TRANSPORTATION

We all need to travel to meet every day needs such as getting to work and school, accessing affordable healthy food, and accessing health care. In Dakota County, the roadway network provides safe and convenient transportation for those with personal vehicles. However, one-third of the population does not drive/own a car, and walking, biking and transit infrastructure is less complete than the road network. People who cannot afford a car, people with disabilities, and people who choose not to or are unable to drive face transportation hurdles that make meeting basic needs time consuming, inconvenient, stressful, and sometimes dangerous.

Active transportation is part of the solution to chronic health conditions that many residents face. Chronic conditions are four of the top five leading causes of death in Dakota County. Regular physical activity can decrease risk for major chronic diseases such as heart disease, type 2 diabetes, stroke, and certain types of cancer, as well as mental health problems. Active transportation is a simple way to integrate regular physical activity into daily routines. Communities that invest in physical infrastructure and programs to promote active transportation tend to have more physically active and healthier populations. In many Dakota County communities, incomplete or non-existent trail and sidewalk connections, infrequent transit service, and long distances between destinations are barriers to active transportation.

CHALLENGES FOR WALKING AND BICYCLING IN DAKOTA COUNTY

- Current walking and bicycling networks are incomplete.
- Access to a vehicle is a necessity to reach many destinations. Gaps in the walking and bicycling networks heavily impact vulnerable populations who do not drive.
- The Dakota County network is not always connected with city systems.
- Many County roadways have higher speeds. Higher speed roadways tend to be less safe for pedestrians and bicyclists.
- Crossings of County roads continue to be challenging for pedestrians and bicyclists.
- Winter maintenance practices are inconsistent across the walking and bicycling network.
- Suburban and rural land use patterns increase distances people must walk and bike to reach destinations.
- New developments are implementing land use patterns and transportation infrastructure that primarily serve travel by personal vehicles.
- Many County residents, workers and visitors are unaware of the existence of bicycle and pedestrian networks.
- There is no centralized source for information about walking and biking in Dakota County.
- Programs and education are needed to support the use of walking and bicycling infrastructure.

KEY ISSUES ADDRESSED IN THE STUDY

Designing for all ages and abilities

Pedestrian and bicycle facilities should be designed for use by people of all ages and abilities.

Confident bicyclists who are comfortable riding in traffic represent a small minority of the population. Most people (adults and children) prefer bicycling on the trail network. Through community engagement for the study, we heard a strong preference for trails. Most people feel comfortable and safe when they are able to bicycle on facilities that are physically separated from vehicle traffic. The bicycle network should serve the majority of people who prefer separation from car traffic, while providing on-street options to serve people who prefer riding on the road.

Pedestrians require well-maintained sidewalks and multiuse trails. Road crossings are important to pedestrian safety and should be accessible to people with mobility and visual limitations, as required by the Americans with Disabilities Act (ADA). Pathways that serve all pedestrians should be level, smooth, and clear of vegetation, snow, and other obstacles.

Improving safety at crossings of County Highways

County highways are usually higher-speed roads that provide for a balance between motor vehicle mobility and access. The function of vehicle mobility can conflict with pedestrian and bicyclist needs to cross these roads. Perceived and real safety concerns can discourage crossing of County highways. The study identifies areas where pedestrian and bicycle demand intersect with potential crossing barriers, as these locations may be candidates for crossing improvements.

BICYCLE AND PEDESTRIAN GAP PRIORITIZATION PROCESS

Dakota County has built 245 miles of multiuse trails and sidewalks within its right of way in the past 40 years. In that time, County policy evolved from building a trail on one side of highways to building a trail on both sides. Despite completing much of the system, critical gaps remain.

Prioritization of remaining gaps is based on:

- Population density
- Employment density
- Age (population under 18 and over 65)
- Presence of schools
- Presence of shopping and services
- Households without vehicles
- Traffic volume
- Posted highway speeds
- Number of travel lanes
- Presence of transit
- Along the Regional Bicycle Transportation Network

Prioritized gaps for the pedestrian and bicycle networks are shown in Figures 1 and 2. The pedestrian and bicycle gap analysis prioritization is based on 2017 conditions and does not depict future conditions or future development. Existing gaps may be addressed with County highway reconstruction projects or as stand-alone projects in partnership with cities. In the future, the priority of gaps may change as development or redevelopment occurs. It is current Transportation Department practice to fill these gaps, where practical, along with road improvements that support new development and redevelopment.

Figure E- 1: Bicycle Gaps on County Highways

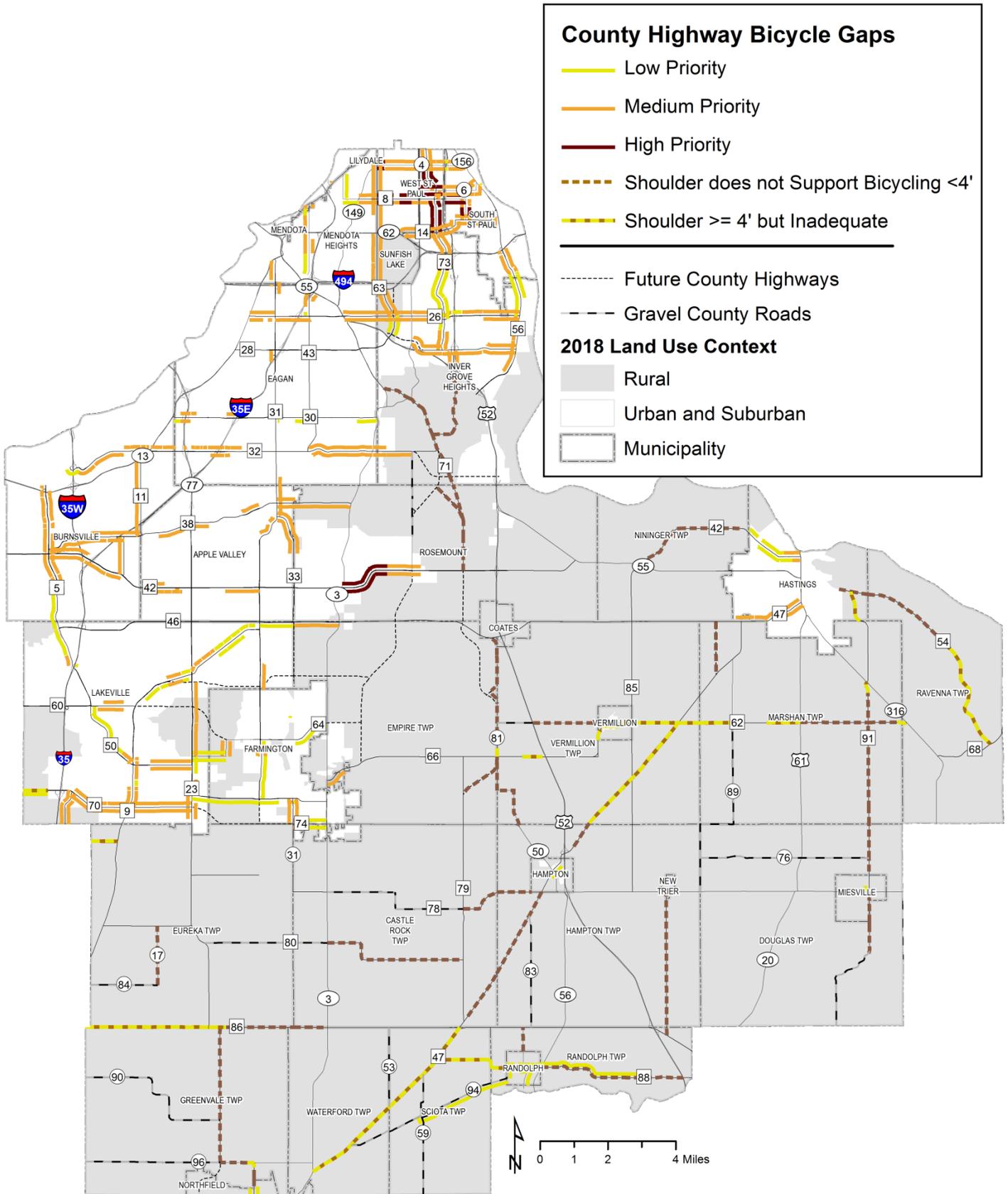
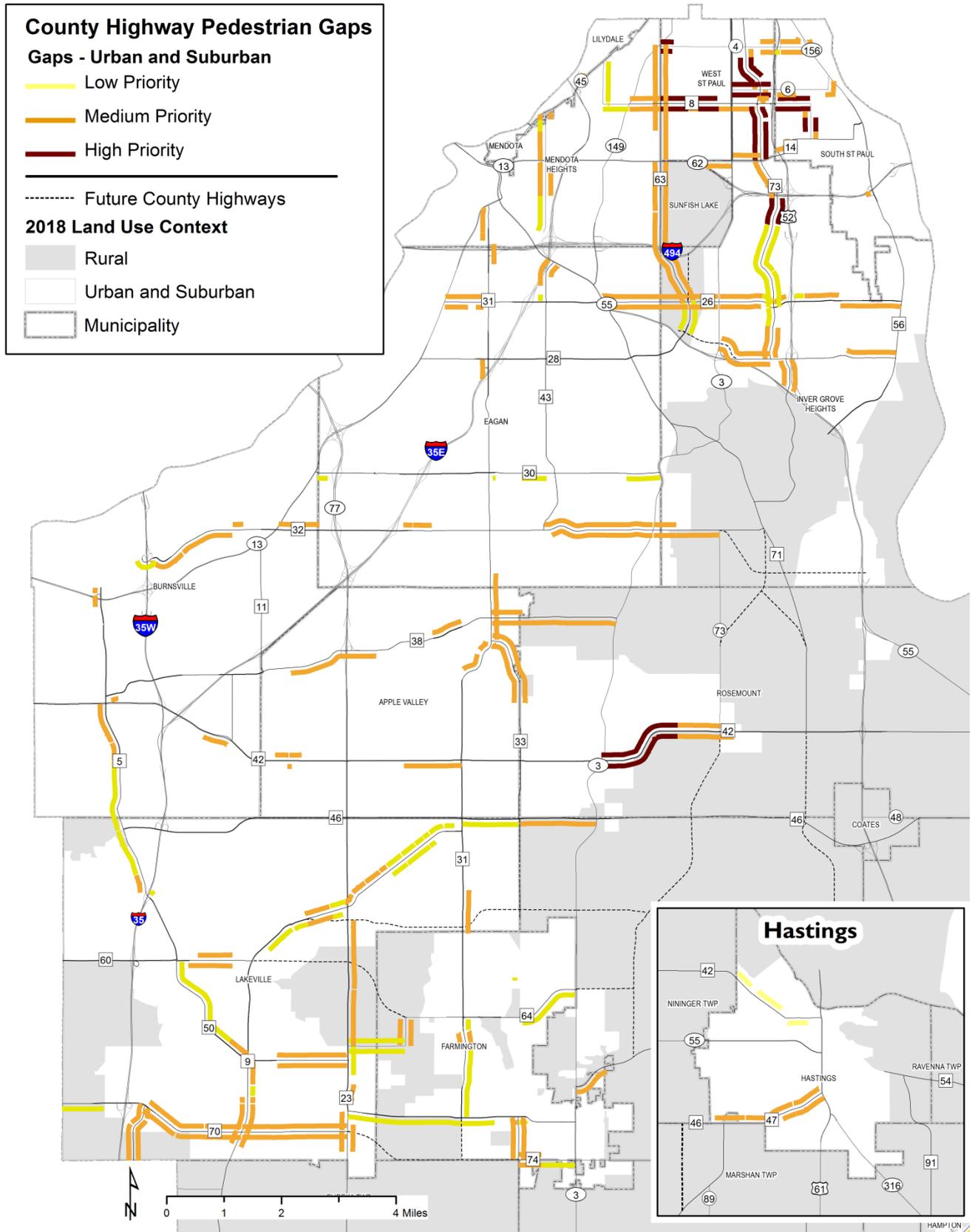


Figure E-2: Pedestrian Network Gaps, Urban and Suburban Areas



HIGHLIGHTS OF RECOMMENDED STRATEGIES AND PRACTICES

- Assess pedestrian and bicyclist needs as part of regular roadway and development processes.
- Consider construction of pedestrian and bicycle facilities in conjunction with all highway projects based on needs and context.
- Construct trails where there are existing gaps, where practical (34 miles).
- Work with Cities to build trails in priority areas independent of highway projects.
- Provide off road trails in urban areas, shoulders in rural areas, and on-road bike facilities only under special circumstances.
- Design crossings to reduce the risk faced by pedestrians and bicyclists.
- Monitor and consider emerging transportation planning, design, and implementation practices.
- Make context sensitive investments in the pedestrian and bicycle networks.
- Ensure adequate funding for pedestrian and bicycle networks.
- Design and install infrastructure with maintenance needs in mind.
- Continue to encourage local investments in the walk and bike system.
- Partner with law enforcement to address behaviors that impact safety for walking and bicycling, such as speeding and distracted driving.
- Provide education for pedestrians, cyclists, and motorists regarding safe travel behavior and rules of the road.

- Designate a county bicycle and pedestrian coordinator to manage implementation of the study.

NEXT STEPS

The findings and recommendations of the Bicycle and Pedestrian Study will be considered for incorporation into the Dakota County 2040 Transportation Plan when it is updated in 2019.

There are some topics brought up by the Project Management Team and the public during this study process that cannot be evaluated and addressed fully without considering transit and vehicle modes. Evaluation of the topics listed below will be considered within the context of the full transportation plan update.

Topics for further consideration within the Dakota County 2040 Transportation Plan update planning process include, but are not limited to:

- Coordination of walk/bike improvements with mill and overlay projects.
- Coordination with cities to fill trail gaps.
- Revise the contiguous plat ordinance to explicitly include pedestrian and bicycle infrastructure as part of the county road network.
- Communication related to ped bike facility closures and detours.
- Pedestrian and bicycle signage.
- Lighting for year round use and safety.
- Support facilities such as landscaping, surface treatments, benches, and fencing.
- Funding for pedestrian and bicycle facilities.
- Policies including maintenance and cost sharing.

INTRODUCTION

CHAPTER

1

INTRODUCTION

In 2017, Dakota County began a study to create a unified vision for countywide walking and bicycling networks and identify policies, strategies and tools to encourage active living and improve community health.

The primary purposes of this study are to address non-motorized transportation content required for the Dakota County 2040 Comprehensive Plan and recommend bicycling and walking content to be considered in the Dakota County 2040 Transportation Plan update (2019).

This Study focuses on infrastructure priorities and supporting strategies and policies for integration of walking, rolling, and bicycling modes into the Dakota County transportation network. In addition, it touches on awareness, education, enforcement, and evaluation efforts that bolster infrastructure investments. Through the Study, the County aims to expand opportunities for walking for everyone and to serve residents who are interested in bicycling but concerned about sharing the road with cars. These interested but concerned bicyclists likely make up a considerable amount of the County's population.

A pedestrian is classified as anyone on foot or using a manual or motorized wheelchair. Scooters, tricycles, or other similar devices used by a person with a disability as a substitute for walking are included in the definition of wheelchairs. Electric wheelchairs are permitted anywhere pedestrian use is allowed.

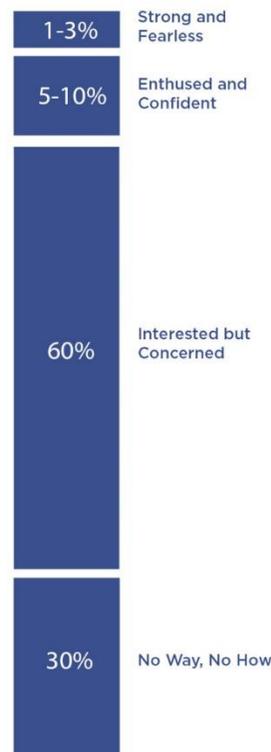
Figure 1-1: The Four Types of Bicyclists

Strong and Fearless - This group is willing to ride a bicycle on any roadway regardless of traffic conditions. They are comfortable taking the lane and riding in a vehicular manner on major streets without designated bicycle facilities.

Enthused and Confident - This group of bicyclists is willing to ride in most roadway situations but prefers to have a designated facility. They are comfortable riding on major streets with a bike lane.

Interested but Concerned - This group is more cautious and has some inclination towards bicycling, but is held back by concern over sharing the road with cars. They are not very comfortable on major streets, even with a striped bike lane, and prefer separated pathways or low traffic neighborhood streets.

No Way, No How - This group comprises residents who simply aren't interested at all in bicycling and may be physically unable or don't know how to ride a bicycle, and they are unlikely to adopt bicycling in any way.



Based on work by Geller, Roger; City of Portland, Portland Bureau of Transportation, "The Four Types of Cyclists," 2004. <http://www.portlandoregon.gov/transportation/44597?a=237507>

This group may bicycle for recreation but are unlikely to use a bicycle as their main means of transportation (Figure 1: The Four Types of Bicyclists).

The Study begins with analysis of existing conditions for biking and walking in Dakota County, highlighting analyses of pedestrian and bicycle demand, health, traffic stress, and safety. The Study reviews the substantial public engagement that shaped the Study and shares key themes from the public input.

Chapter 2 covers recommendations related to walking and bicycling for consideration in the update to the Dakota County 2030 Transportation Plan, which is anticipated to begin in 2019. The chapter includes the importance of walking and bicycling for health, safety, environment, and quality of life. It goes on to discuss the County's role in walking and bicycling and to prioritize existing bicycle and pedestrian infrastructure gaps. The final section covers pedestrian and bicycle strategies, and policies. Though the focus of the chapter is on integrating walking and biking into the County highway and transit system, topics related to other systems, such as Dakota County Greenways are addressed when they overlap and intersect with the transportation system.

Why Invest in Active Transportation?

We all need to travel to meet every day needs such as getting to work and school, accessing affordable healthy food, and accessing health care. In Dakota County, the roadway network provides safe and convenient transportation for those with personal vehicles. However, one-third of the population does not drive/own a car, and walking, biking and transit infrastructure is less complete than the road network. People who cannot afford a car, people with disabilities, and people who choose not to or are unable to drive face transportation hurdles that make meeting basic needs time consuming, inconvenient, stressful, and sometimes dangerous.

Active transportation is part of the solution to chronic health conditions that many residents face. Chronic conditions are four of the top five leading causes of death in Dakota County. Regular physical activity can decrease risk for major chronic diseases such as heart disease, type 2 diabetes, stroke, and certain types of cancer, as well as mental health problems. Active transportation is a simple way to integrate regular physical activity into daily routines. Communities that invest in physical infrastructure and programs to promote active transportation tend to have more physically active and healthier populations. In many Dakota County communities, incomplete or non-existent trail and sidewalk connections, infrequent transit service, and long distances between destinations are barriers to active transportation.

Active transportation integrates physical activity into daily routines such as walking or biking to destinations such as work, grocery stores or parks. Active transportation policies and practices in community design, land use and facility access have been proven effective to increase physical activity.

Source: Minnesota Department of Health Promoting, Active Transportation Fact Sheet, March 2012

STUDY PROCESS AND PUBLIC INVOLVEMENT

Development of the Study was continuously guided by a project management team of Dakota County staff and partner agency staff and informed by two phases of public engagement events. As shown in Figure 2, the study process began with analysis of existing conditions and walk/bike system recommendations, followed by research into policies, strategies, and best practices to support walking and biking in the County, and ended with preparation of the Study.

Figure 1-2: Project Schedule



Community engagement, including public events, presentations to the Planning Commission and County Board, and meeting with the Project Management Team, continued simultaneously with research and analysis tasks.

Planning Commission

Updates were presented to the Dakota County Planning Commission at milestones during the process. Issues raised by Planning Commission include:

- Concern about safety of on-road bike lanes and ability for cyclists and drivers to co-exist without physical separation, particularly on roads with higher speed limits
- Importance of coordinating with local and state systems
- Education for drivers and cyclists about safe behavior and following the rules of the road
- Need for enforcement of traffic laws

Project Management Team

The project management team was made up County Staff from the transportation, planning, and public health departments and representatives from MnDOT, the Metropolitan Council and the Cities of Inver Grove Heights, Apple Valley, Burnsville, Rosemount, and South St. Paul.

The project management team raised key issues for consideration in the study development process. These issues are addressed in Chapter 2 of the study and include:

- System continuity
- The relationship between facility types, safety, and levels of traffic stress

- Barriers and crossings
- City/County cost sharing
- Year-round operation and maintenance of the system
- Support facilities such as benches
- Encouragement, education and enforcement

Figure 1-3: Open House on a Dakota County Trail



Community Engagement

The first phase of community engagement occurred from July through October 2017. The purpose was to engage a representative cross section of Dakota County residents, businesses, and the general public to collect meaningful input, build consensus, and generate excitement for walking and biking in Dakota County. The second phase, to allow opportunity to comment on the Draft Study occurred from June to August 2018.

In total, there were twenty engagement activities with more than 850 people reached. Events were conducted using various formats including an open house, pop-up style events, listening sessions, intercept flyers, an online survey, and ability to comment on the Draft Study on-line.

In addition, the project team directly connected with over 30 community organizations and business (e.g., neighborhood groups, bike shops, major employers, etc.).

Events were planned to leverage existing groups, networks, and high traffic areas. The open house and pop-up events were structured to provide information and collect input in an informal setting, whereas the listening sessions and walking groups were structured to allow an opportunity for

participants to provide information on existing conditions, gaps and barriers, and preferred facility types for walking and biking, in the format of their existing meeting structure. Engagement events are listed in Table 1: Engagement Events on the following page, and highlights of public input are listed in Table 2: Community Engagement General Comments

Table 1-1: Phase 1 Engagement Events

	Name	Date	Approx. No. of Participants	Target Populations
1	Living Longer and Stronger, West St. Paul	Thurs, July 20 2017	12	Older Adults
2	50+ Adult Walking Group, West St. Paul	Wed, Aug 2 2017	13	Older Adults
3	Prince of Peace, Burnsville	Tues, Aug 8 2017	15	Lower income, families, general public
4	Dakota County Fair, Farmington	Tues, Aug 8– Wed, Aug 9 2017	25	General public
5	Big Rivers Trail Open House, Mendota Heights	Thurs, Aug 10 2017	35	General public, trail users
6	Ecua-Volley at Redwood Park, Apple Valley	Tues, Aug 15 2017	20	Latino populations, families, children
7	Lake Marion Greenway Open House, Burnsville	Wed, Aug 23 2017	15	General public
8	Burnsville Mosque, Burnsville	Fri, Aug 25 2017	60	Somali populations
9	Intercept Flyers, Various Locations	Thurs, Sept 7 2017	35	Walkers and bikers
10	Pedal the Parks and Lakeville Art Festival, Lakeville	Sat, Sept 16 2017	30	General public, bikers
11	ALMAS Student Group, Henry Sibley High School	Tues, Oct 10 2017	27	Students
12	Phase 1 Online Survey Map	Mon, Jul 10– Mon, Oct 2, 2017	192	General public
13	Phase 1 Online Survey	Mon, Jul 10– Mon, Oct 2 2017	151	General public
14	Thompson Reuters Survey	Tues, Nov 14– Mon, Dec 18	55	Thompson Reuters Staff
15	Kaposia Days	Sun, June 24	25	General public

2018				
16	Lakeville Farmer's Market	Wed, June 27	30	General public
2018				
17	Dakota County Fair	Thurs, Aug 9	50	General public
2018				
18	Draft Plan – On Line Review	June – August	108	General public
2018				
19	Community organization contacts	Ongoing	30+	Community groups
20	Individual Comments	Ongoing	5	General public

Table 1-2: Community Engagement General Comments

Highlight	Recommendation
Many people requested information regarding walking and biking routes in the form of online, paper, and trailhead maps.	Create a central place for finding recommended routes online and widely distribute paper route maps. Update trailhead maps.
People, especially older adults, were sensitive to cracks in the pavement, litter on the ground, and snow and ice.	Produce consistent maintenance standards for sidewalks and trails throughout the county.
Most people were concerned with the safety, comfort, and health of walkers and bikers. Some were apprehensive about walking by themselves or walking at night without visible gear. Others were interested in the health benefits of walking and biking.	Administer educational programming to focus on sidewalk and road rules for all transportation users throughout the county. Continue to support programs that promote healthy lifestyles.

Table 1-3: Community Engagement Facility Type Comments

Highlight	Recommendation
<p>Most people prefer that walkers and bikers have separated facilities from cars, especially on high-traffic roads. Participants overwhelmingly preferred trails, followed by wider sidewalks for pedestrians and buffered bike lanes for bicycling.</p>	<p>Create a mixture of walking and biking facility improvements that provide separation from vehicle traffic.</p>
<p>Many people are concerned about the safety of crossings intersections in high-traffic areas, particularly at locations without existing traffic control. Existing traffic signals can be spaced prohibitively far apart and often lack crosswalks and sidewalk connections.</p>	<p>Provide safe and convenient locations for pedestrians and bicyclists to cross roadways.</p>
<p>Some people favor improving pedestrian facilities on local roadways. There is a desire for sidewalks along and across higher-traffic roadways. There is also a desire for enhanced connections from neighborhoods to the existing walk/bike networks, particularly to and from parks/recreational areas.</p>	<p>Explore opportunities to encourage the development of pedestrian and bicycle facilities on the local roadway network, particularly along and across high-traffic roads. Prioritize connections to existing walk/bike networks along routes to activity centers such as parks.</p>
<p>Many people preferred shade and scenic walks with natural features. Scenic walking and biking bridges were especially favorable.</p>	<p>Protect and enhance the county's natural environment through policy and maintenance. Add trees near sidewalks and trails.</p>
<p>Many people want walking amenities such as benches, garbage cans, aesthetic features (e.g., landscaping), and even bathroom facilities. These amenities are especially important for older adults.</p>	<p>Add amenities to existing walking facilities. Support the addition of new walking amenities with the construction of new trails and sidewalks.</p>

Table 1-4 Draft Study Comments

Category	Highlight
<i>General comments</i>	Commenters appreciated that the County is studying how to improve walking and biking at a high level, and appreciated that the County is soliciting public input on the plan. Many felt the study is comprehensive and thorough.
	Commenters felt the focus on serving people of all ages and ability levels was appropriate. Feeling unsafe walking and biking with children was a common concern.
	Some commenters were concerned about the cost of building and maintaining bicycle and pedestrian facilities.
	Several people think walking and biking is important for exercise and health. Several focused on the importance of walking and biking for their children and for their families.
	Some commenters would like the County to support education and encouragement efforts around walking and biking, in addition to engineering.
	Many people are concerned about cyclist behavior: not wearing visible clothing, not obeying traffic laws, potential conflicts with vehicles.
<i>Facility Types</i>	Many commenters prefer that walkers and bikers have separated facilities from cars, especially on high-traffic roads. Some commenters would like to have the option of using on-road facilities.
	Many commenters worry about the safety of crossing in high-traffic areas, at highway ramps, in locations without traffic control, and at roundabouts. Commenters perceive that traffic congestion is increasing.
	Commenters requested underpasses and overpasses to avoid traffic on busy roads.
<i>Location Specific*</i>	Many commenters highlighted the need for a shared use path along Flagstaff near Farmington High School.
	Some commenters mentioned the new Vikings facility as a significant development that is not included in the plan.
	Highway 3 is a significant barrier for people walking and biking.
	Commenters want better access to Lebanon Hills. Many do not want paved trails within Lebanon Hills.
	Improvements to Cliff Road are a high priority.
	Several commenters want to see better walking and biking facilities in West Saint Paul.
	Several people asked when the Mississippi River Trail would be paved and said they are looking forward to it being completed.
	Some noted that the trees on 205th street near lake Marion need to be trimmed.

STUDY CONTEXT

The Dakota County Pedestrian and Bicycle Study builds on multiple regional, county, city, and school plans that provide recommendations and identify infrastructure priorities related to biking and walking. Overall, previous plans reveal a strong desire at every level of government to make bicycling and walking safe, comfortable, and convenient transportation and recreation options in Dakota County. Coordinated efforts across departments and jurisdictions are important to maximizing the impact of active transportation investments and ensuring that the transportation system satisfies both regional and local needs.

The Metropolitan Council, through its regional Transportation Policy Plan, has established a Regional Bicycle Transportation Network (RBTN) with prioritized alignments and corridors. The goal is to create a regional bikeway network to improve bicycle transportation conditions and to encourage bikeway implementation. The Council's Transportation Advisory Board (TAB) has aligned federal Transportation Alternatives funding with the RBTN.

Dakota County is one of 10 Metropolitan Parks System implementing agencies. As such, the County, with Metropolitan Council support, plans, builds, and maintains the regional trail system within the County. Regional Trail corridors provide recreational opportunities throughout the metropolitan areas. Parts of the regional trail network, especially in the urban areas, may also serve as commuting routes for bicyclists. As of 2018, 175 miles of regional greenways within Dakota County are existing or planned. An additional 50 greenway trail miles are identified as regional search corridors and can be brought into the regional system upon completion of a master plan.

At the local level, the cities of Rosemount, West St. Paul, South St. Paul, and Apple Valley have all developed pedestrian and bicycle plans. These plans identify several policies and practices requiring collaboration with Dakota County, such as year-round maintenance, curb ramp replacement, encouragement and education programming, annual pedestrian and bicycle counts, and funding. They also identify desired improvements on Dakota County roadways and trails. The elements of these plans relevant to Dakota County were included in the process of developing recommendations for this study.

At Dakota County, multiple departments have a role in supporting active transportation. The County Transportation Department is responsible for integrating biking and walking modes into the County transportation system. The Parks Department plans and operates the County Greenway network of regional and county trails, as well as trails and programs within parks. The Public Health Department and the Office of Planning facilitate Active Living Dakota County (ALDC). ALDC is a partnership between the County and the County's 11 largest cities to make it easier for residents to integrate biking and walking into everyday life. The Dakota County Health Department also manages

the Simple Steps Walking Program, provides training for residents who want to start walking groups, and facilitates safe routes to school planning.

EXISTING SYSTEM



Dakota County has steadily been integrating pedestrian and bicycle modes into its transportation network over the last 40 years. In that time, the County has built nearly 250 of multi-use trails and sidewalks within its right of way. In addition, there are 187 miles of County roadways with paved shoulders. Within the urban and suburban areas, only 34 County Highway miles are without a trail or sidewalk on at least one side of the road. Gravel road bicycling is also popular in Dakota County. The Miesville FiftySix is an annual ride on mostly gravel roads in southern Dakota County. There are over 400 miles of County roadways.

Dakota County residents, workers, and visitors are using bicycle and pedestrian facilities. While data on usage rates is limited, Dakota County's bi-annual count of bicyclists and pedestrians revealed a 26 percent increase in the number of cyclists at four count sites from 2014 to 2016. Notably, the number of female cyclists nearly doubled from 2014 to 2016. Counts and Census data show a decrease in adult pedestrian activity but counts show a slight increase in the number of children walking.

Public support for increased investment in walking and bicycling is strong in Dakota County. Eighty percent of respondents to the 2017 Comprehensive Plan Survey said that bicycle and pedestrian trails are very important or somewhat important to attracting people to live in Dakota County and retaining current residents. Seventy-three percent said it is very important or somewhat important that Dakota County add more sidewalks, bike lanes, and trails.

ANALYSIS

Three levels of analysis of the system was conducted to inform strategy and policy updates and prioritization of future County investments. First, the pedestrian and bicycle demand analysis revealed areas of where there is likely to be high need for walking and bicycling facilities. Second, the health analysis assessed the prevalence of chronic conditions and mental health challenges as well as access to food and physical activity levels. Third, the systemic safety analysis shed light on safety issues for people walking and bicycling along and across county roads, and the level of traffic stress analysis examined levels of comfort for bicyclists on County roadways

Below is a summary of analysis prepared to understand the County context and system and to frame the Study's discussion of demand, needs, and potential investment priorities.

Pedestrian and Bicycle Demand Analysis

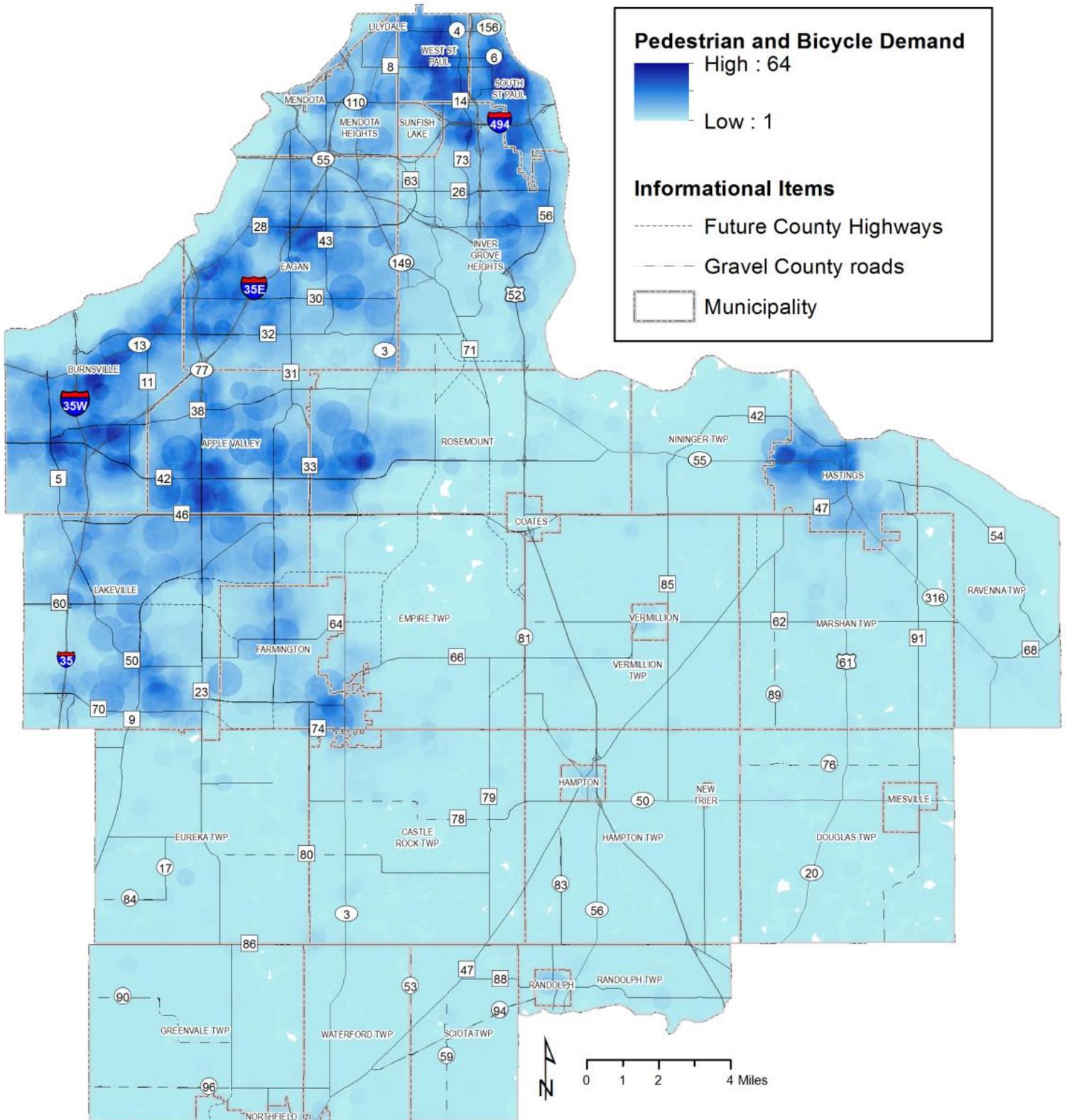
The purpose of the pedestrian and bicycle demand analysis was to understand where there are land uses that generate pedestrian and bicycle demand and where there are populations within Dakota County who are more reliant on walking and bicycling for transportation and/or experience barriers to walking and bicycling. The demand analysis, shown in Figure 1-4, is based on the factors listed below.

- **Population density** –number of people, mapped by US census block.
- **Employment density** – number of people employed at business locations, mapped at ¼ mile.
- **Presence shopping** – square footage of businesses generating customer traffic, such as health clinics and retail services, mapped at ¼ mile.
- **Areas with concentrations of children and/or older adults** – population density of people 17 and under and 65 years and older mapped by US census block group.
- **Schools** - number of students attending each school, mapped at ½ mile.
- **Households with no access to a vehicle** –households without vehicles, mapped by US census tract.
- **Presence of transit** –transit centers, park and ride locations, and bus stops on local and express routes, mapped at ¼ mile.

Each factor was assigned a score of 1-10, based on potential for pedestrian and bicycle demand. Each factor was weighed equally. Scores were totaled and mapped using GIS software. Darker blue areas indicate higher pedestrian and bicycle demand (a higher total score).

The demand analysis is based on existing population and land uses. The Metropolitan Council projects that Dakota County's population will grow from the 2016 population of 417,486 to 514,050 in 2040. Demand for pedestrian and bicycle infrastructure is expected to grow along with population growth in places that experience new development or redevelopment.

Figure 1-4: Pedestrian and Bicycle Demand Analysis



Findings

The analysis identified concentrations of people who are more reliant on walking and bicycling for transportation and destinations that generate walking and biking trips. The highest concentrations are located in northern and western Dakota County, as well as Hastings (Figure 4: Pedestrian and Bicycle Demand Analysis)

Impact on the Study

The pedestrian and bicycle demand analysis informed the proposed Dakota County pedestrian and bicycle network and prioritization of gaps. Priority is highest for completing the walk and bike network in areas where there is the greatest demand for walking and bicycling. The demographic factors also informed community engagement. The project team led targeted outreach to populations that are more likely to walk and bike for their daily transportation needs.

Health Analysis

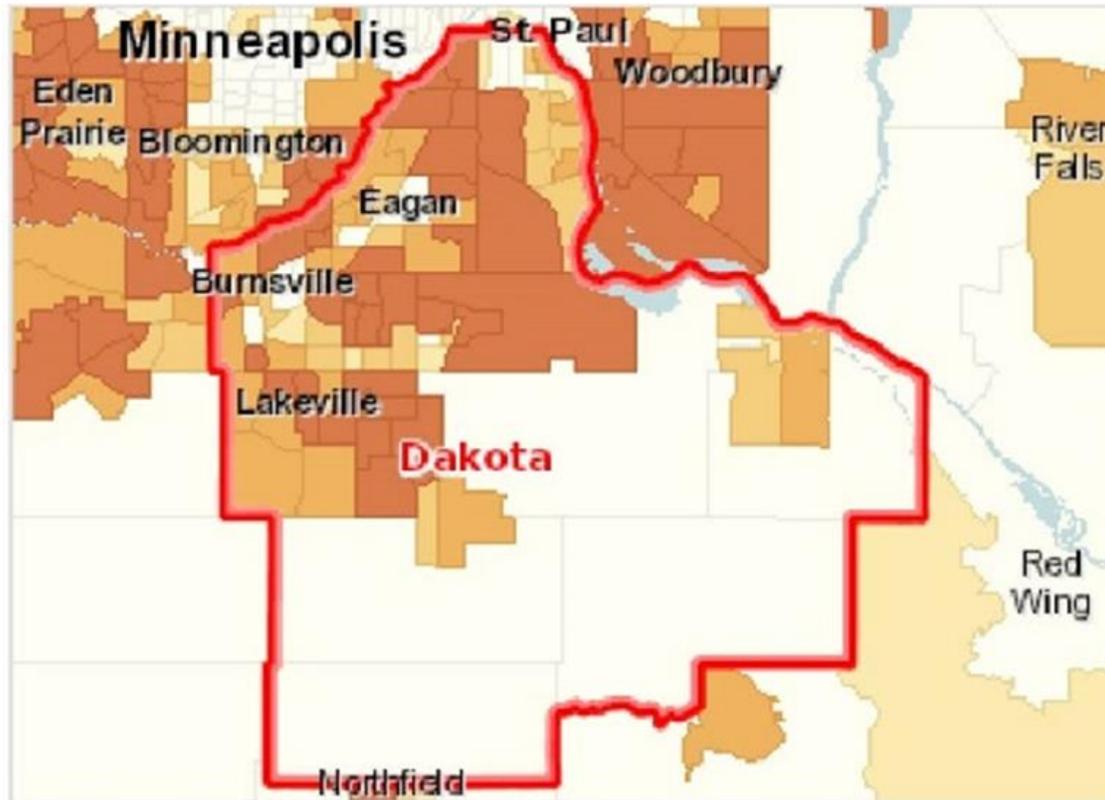
The purpose of the health analysis was to understand health conditions of Dakota County residents. The analysis was focused on four health topics: overweight/obesity, physical activity, food access, and mental health.

Findings

The health analysis was conducted using data available at the County level. Findings of the analysis include:

- Overweight: 37.5 percent of adults in Dakota County are considered overweight, similar to state and national rates
- Obesity: 26.1 percent of adults are considered obese, similar to state and national rates.
- Physical activity: 78 percent of adults are meeting the recommended 150 minutes per week of physical activity, while only 29-42 percent of youth are meeting the recommended 60+ minutes per day.
- Mental health: 20 percent of adults have been told that they have depression. 35-46 percent of 8-11th graders report feelings of depression.
- Food access: 37 percent of county residents have low food access. Low food access is measured by low-income census tracts where a substantial percentage of residents live more than 1 mile (urban) or more than 10 miles (rural) from a supermarket. This is higher than state (28 percent) and national (22 percent) rates.

Figure 1-5: Population with Limited Food Access



Population with Limited Food Access, Percent by Tract, FARA 2015



Image source: <https://www.communitycommons.org/>

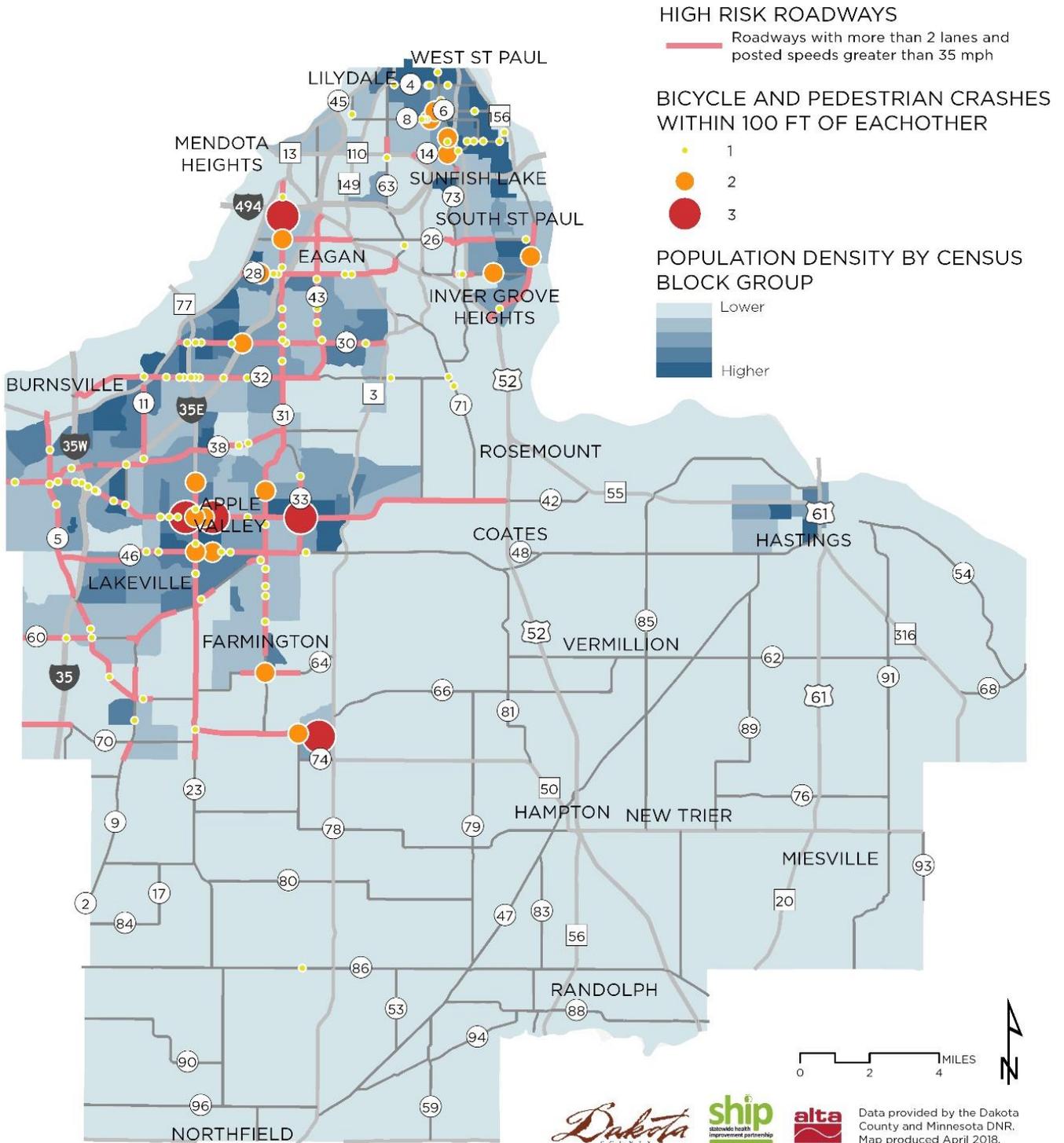
Impact on the Study

By providing more opportunities for walking and bicycling, the County can play a role in addressing these health issues. Walking and bicycling are easy ways for people to be physically active and can reduce risk of overweight/obesity, which is related to chronic illnesses such as heart disease, cancer, stroke, respiratory disease, and diabetes. Walking and bicycling are also associated with improved mental health and reduced risk of anxiety and depression. The Study addresses these issues by designing bike and walk facilities for all ages and abilities and extending the bike and walk network in areas with low food access.

Systemic Safety Analysis

A systemic safety analysis was completed to understand safety issues for people walking and bicycling along and across county roads. The analysis included reviewing crash data for crashes involving people walking and bicycling from 2011-2015. However, existing crashes do not provide a full picture of safety issues for people walking and bicycling. The lack of documented crashes at

Figure 1-6: Systemic Safety Analysis results



certain locations may indicate that people are unwilling to walk or bike in these locations because they do not feel safe. To identify locations where there may be safety concerns but no documented crashes, the analysis identified patterns and crash risk associated with different infrastructure conditions. This analysis can support a proactive approach to improving bicycle and pedestrian safety. The results of the crash analysis are shown in Figure 6.

Findings

On Dakota County roadways, there were 159 crashes involving people walking or bicycling (between 2011-2015). This represents 1.8 percent of all crashes on County roads. The American Community Survey estimates that 1 percent of Dakota County residents walk or bike to work. It is important to note that Census figures underestimate walking and bicycling activity, since people walk or bicycle for recreation and transportation to non-work destinations.

Youth (ages 17 or younger) were involved in 30 percent of pedestrian crashes and 27 percent of bicycle crashes. Based on available pedestrian and bicycle count data, it appears that youth are overrepresented in bicycle and pedestrian crashes. Crashes were concentrated in urban areas of Dakota County.

Most crashes (65 percent) took place on urban multi-lane roadways with speed limits 40 mph or greater (26 percent of all roads). Based on the systemic safety analysis, these roadways present greater safety risks for people walking and bicycling. Most of these roadways are in areas with higher population density.

Impact on the Study

The safety analysis indicates that separation of people walking and biking from vehicular traffic is important to overcome the high stress nature of the County's roadway network. The Study proactively addresses bicycle and pedestrian safety by recommending an expanded network of off-street trails along county roads, particularly along roadways with greater safety risks. The Study prioritizes investments in infrastructure improvements in areas with greater safety risks. Additionally, the Study recommends infrastructure, education, and enforcement to improve youth walk and bike safety.

Level of Traffic Stress Analysis

Comfort and perceived safety are strongly tied to bicycling and walking behavior. If people do not feel comfortable or safe bicycling and walking, they are unlikely to walk or bike for transportation or recreation. The Level of Traffic Stress (LTS) analysis focused on understanding the level of bicyclist comfort on existing roads, trails, and bikeways along Dakota County roads. This analysis does not include facilities away from roads, such as greenways, which in many cases are less stressful than trails along County roads.

Figure 1-7: Level of Traffic Stress Typology



LTS scores were assigned to county roads based on the presence of a bikeway, posted speed limit, shoulder width, traffic volumes, traffic signals, and number of vehicle traffic lanes. An LTS score of 1 was assigned to roadways that are comfortable for most adults and children to bicycle, typically roadways with separated off-street trails. LTS 1 roadways are County roadways that are the least stressful for bicycling.

However, as noted above, trails along County roads may be more stressful for bicyclists than Dakota County regional greenway trails due to stress associated with trail intersections with driveways and roadways, as well as the noise, wind, and lack of shade that can negatively impact the experience of bicycling along high-traffic roadways. LTS 2 roadways are comfortable for most adults, and LTS 3 roadways are generally comfortable for experienced bicyclists. An LTS score of 4 was assigned to high-speed, high-traffic roadways without bikeways because very few people are comfortable bicycling in these conditions.

The apparent discrepancy between the Bicycle Level of Traffic Stress and Bicycle Gaps maps in rural areas (Figure 2-8) is due to a difference in inputs. The Bicycle Level of Traffic Stress map takes traffic volumes into account in addition to paved shoulder widths. Rural roadway segments with inadequate shoulders (less than 4'), are shown as LTS 2 if traffic volumes are low. They are shown as LTS 3 and 4 as traffic volumes increase (see table below).

Table 1-1 . Scoring criteria for rural roadways with posted speeds greater than or equal to 45mph

Daily Volume (vpd)	Paved Shoulder Width			
	0 – <2 ft	2 - <4 ft	4 – <6 ft	≥ 6 ft
<400	LTS 2	LTS 2	LTS 2	LTS 2
400 - 1500	LTS 3	LTS 2	LTS 2	LTS 2
1500 - 7000	LTS 4	LTS 3	LTS 2	LTS 2
> 7000	LTS 4	LTS 4	LTS 3	LTS 3

Some generally comfortable facilities like shared use paths are rated as LTS 3 or 4 because they connect to intersections that are uncomfortable. Final LTS scores received by Dakota County roads are based on a concept known as the “weakest link principle”. Both intersections and segments were analyzed for their relative comfort and safety. The score for each roadway link reflects the segment or intersection score that is *most stressful*. That is, if an intersection score of 4 is assigned to a roadway (because it is difficult to cross), but the segment itself receives an LTS 2 score, the final score the link receives is an LTS 4.

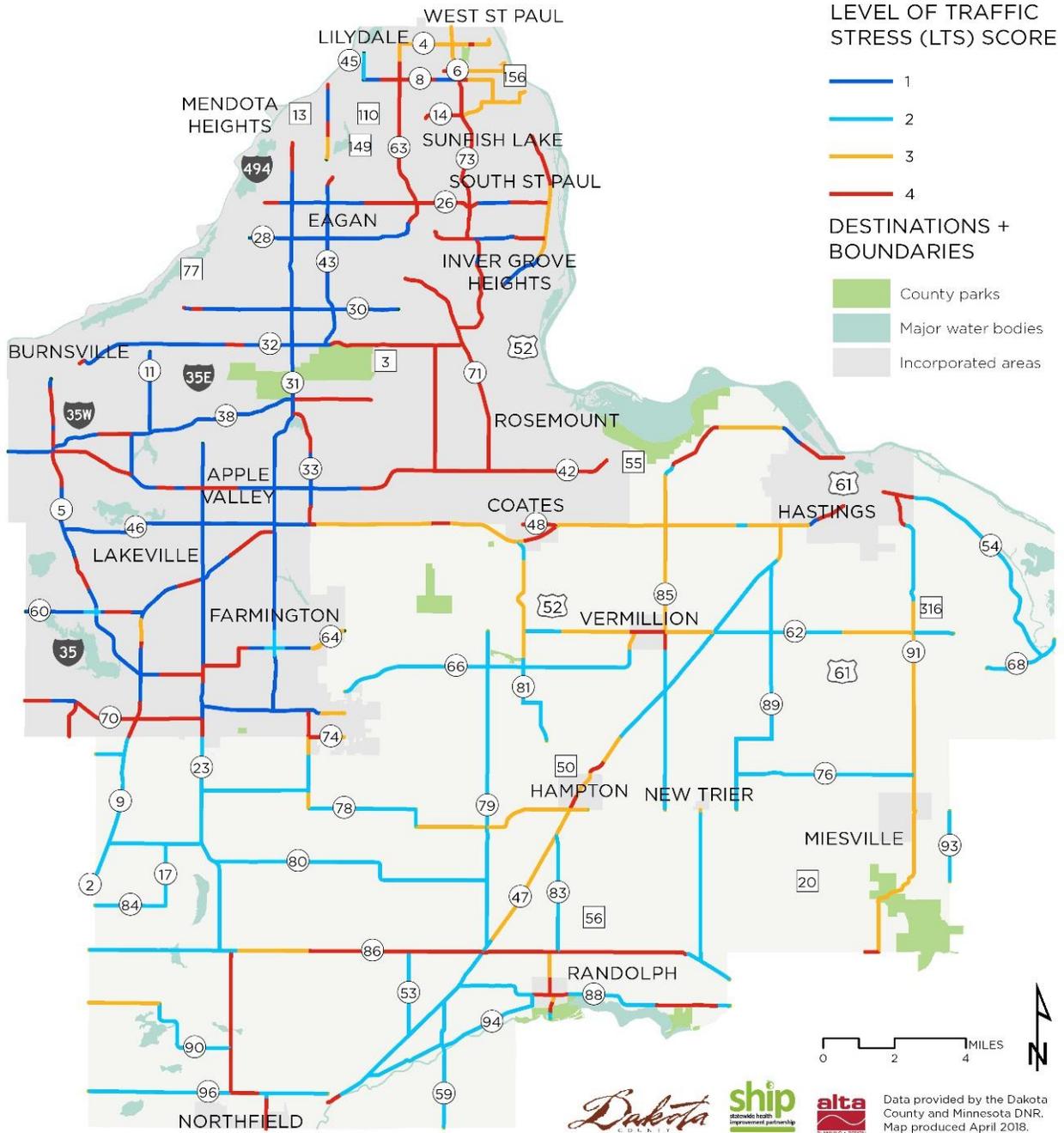
Findings

Though Dakota County has a significant number of miles of low stress roadways, high speed/volume roads and trail gaps affect the usability of the system. Roadways with the lowest level of traffic stress (LTS 1) are located in northwestern Dakota County, particularly in cities with developed trail systems such as Eagan, Apple Valley, and Lakeville. Roadways with LTS 2 scores are mostly located in the rural communities in southern Dakota County. In rural Dakota County, roadway shoulders are generally comfortable for adults bicycling. The results of the LTS analysis are shown in Figure 1-8.

Impact on the Study

The LTS analysis identified areas where existing roadways and trails are already comfortable for bicycling. Especially in incorporated areas, trails play an important role in providing low stress ways to travel along County roads. The proposed bicycle and pedestrian network aims to connect roadways that are already comfortable for bicycling to create a network that serves a wide range of bicyclists.

Figure 1-8: Bicycle Level of Traffic Stress



INTEGRATING PEDESTRIAN AND BICYCLE MODES INTO THE COUNTY TRANSPORTATION SYSTEM

CHAPTER

2

INTEGRATING PEDESTRIAN AND BICYCLE MODES INTO THE COUNTY TRANSPORTATION SYSTEM

INTRODUCTION

This chapter addresses how Dakota County can integrate pedestrian facilities, trails, and bikeways into its transportation system. It presents a summary of the importance of pedestrian and bicycle transportation, discusses the County role in providing active transportation, and recommends pedestrian and bicycle supportive strategies and policies to include in the 2040 Dakota County Transportation Plan. The content is based on the idea presented in the 2030 Dakota County Transportation Plan that “*The County will integrate pedestrian and bicycling modes into the transportation system to provide for safe, timely, and efficient connections between communities, activity generators and employment centers.*”

The content in this chapter is a starting point for further discussion about the County role in pedestrian and bicycle transportation and relevant strategies and policies. This discussion will continue as Dakota County prepares its 2040 Transportation Plan in 2019. There are some topics brought up by the Project Management Team and the public during this planning process that cannot be evaluated and addressed fully without considering transit and vehicle modes. Evaluation of the topics listed below, as well updates to the content in this chapter, will be considered within the context of the update of the full transportation plan.

Topics for further consideration within the Dakota County 2040 Transportation Plan update planning process include, but are not limited to:

- Coordination of walk/bike improvements with mill and overlay projects.
- Coordination with cities to fill trail gaps.
- Revise the contiguous plat ordinance to explicitly include pedestrian and bicycle infrastructure as part of the county road network.

-
- Lighting for year round use and safety.
 - Support facilities such as landscaping, surface treatments, benches, and fencing.
 - Funding for pedestrian and bicycle facilities.
 - Policies including maintenance and cost sharing.

IMPORTANCE OF PEDESTRIAN AND BICYCLE TRANSPORTATION

Supporting walking and bicycling for transportation is important for the health, safety, and quality of life of all Dakota County residents. Walking and bicycling are growing forms of transportation and even those using other modes, like transit and personal vehicles, begin and end their trips as pedestrians. The modes produce almost no pollution, require minimal infrastructure compared to other modes, are exceedingly affordable and benefit the walker or bicyclist with physical activity.

Dakota County's transportation system has developed so that today, driving even a short distance is often more attractive than walking or biking. The County's roads usually have enough capacity to allow faster speeds, making auto travel easy but making pedestrian or bicycle travel across or along these roads less attractive. The key is improving bicycling and pedestrian networks and environments in the county, in close coordination with all other modes of travel.

Bike and pedestrian facilities are an important element of a safe and efficient transportation system, particularly along the County's high-volume, high-speed facilities. Residents use these facilities for transportation and recreation. Bicycle and pedestrian transportation provides the following benefits to the county.

Environmental Sustainability

Walking, biking and rolling (wheelchairs, scooters, strollers, etc.) are the most environmentally sustainable personal transportation modes. The federal Energy Information Administration estimates 2/3 of petroleum in the nation is used for transportation — non-motorized transportation modes directly use zero petroleum.

Safe Routes for Youth and Older Adults

Youth and older adults are more likely to rely on walking and biking. The average age of county residents is increasing. The number of people 65 and older is expected to more than quadruple between 2000 (26,250) and 2040 (125,000). Planning for trails, sidewalks and transit provides older adults with an alternative to driving a vehicle and allows children to walk and bike to destinations, including school. A robust non-motorized transportation network can keep older adults connected to the rest of society. The Living Longer and Stronger nonprofit coalition in West St. Paul revealed that mobility via multiple modes is a priority for older adults.

Active Living and Health

Active Living integrates physical activity into daily routines such as walking or bicycling for recreation, occupation, or transportation. Physical activity is an important way to reduce the risk of obesity, high blood pressure, diabetes, stroke, heart disease, certain types of cancers, depression, and anxiety. Communities designed to promote safe and connected active transportation and recreational opportunities are positively associated with greater levels of resident physical activity and consequently, improved health.

In 2006, Dakota County formed Active Living Dakota County, a partnership between Dakota County and the cities within the County to address physical inactivity and its relationship to the transportation system. Efforts to date have included:

- Pedestrian and bicycle demand analysis
- Gap analysis and prioritization, referenced in this chapter
- Wayfinding
- Bicycle and pedestrian master plans in South St. Paul, West St. Paul, Apple Valley, and Rosemount
- Greenway planning and development
- Safe routes to school planning
- Training and workshops for City and County Staff
- Public engagement
- Feasibility studies for active living projects throughout the County
- Grant writing for implementing pedestrian and bicycle infrastructure projects

Improved Transportation Options

A non-motorized network and transit opportunities provide mobility for those who otherwise would have to rely on another person's vehicle. These circumstances include age (too young or too old), financial ability to own a vehicle, health conditions and personal choice.

Quality of Life

County residents have consistently supported development of the pedestrian and bicycle network. The 2006 Park System Plan survey found that many respondents wanted more paved trail connections between parks and neighborhoods. Results from the 2017 Dakota County 2040 Comprehensive Plan Residential Survey also indicate strong support with 73 percent of respondents supporting investment in trails and 80 percent feeling pedestrian and bicycle trails are important to attract and retain residents. Public engagement for the Dakota County Pedestrian and Bicycle Study confirmed resident desire for walking and bicycling infrastructure for both recreation and transportation.

Safety

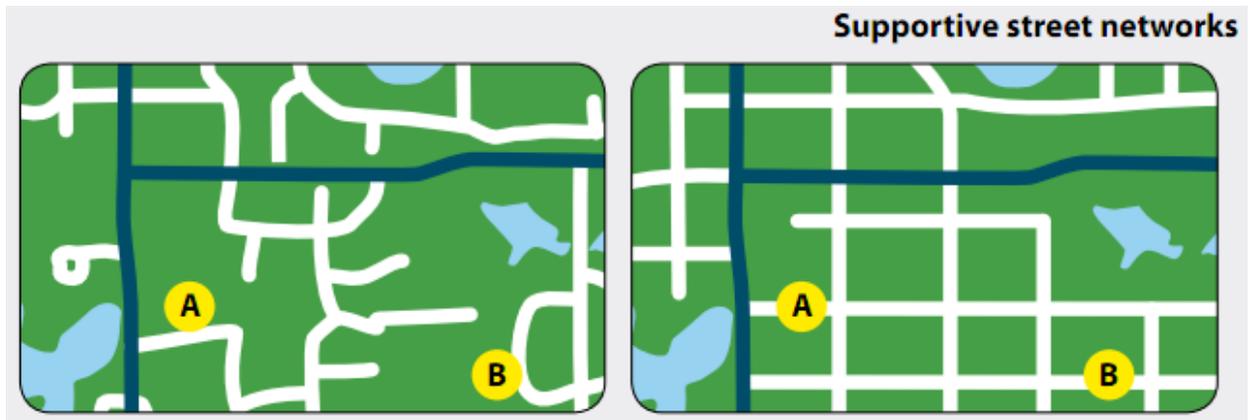
Utilization of safe and efficient pedestrian facilities as an integral part of the transportation system is an important component of overall transportation safety. The growing number of residents using the transportation system creates an increasing potential for pedestrian and vehicle conflict, particularly on higher-volume, higher-speed roadways. Approximately 60 percent of people are interested in bicycling but are concerned about safety. More comfortable and safe facilities encourage more people to walk and bicycle for transportation and recreation.

Through the Pedestrian and Bicycle Study process, Dakota County residents expressed a strong preference for safe facilities that are separated from vehicular traffic.

COUNTY ROLE IN PEDESTRIAN AND BICYCLE TRAVEL

Pedestrians and bicyclists share destinations with motorists. Many of these destinations are on the County highway system, particularly commercial areas, schools, employment centers, regional parks, greenways, and rural centers. The County highway system is in many cases the most direct option for pedestrians and bicyclists, and in some cases it is the only option. Many suburbanized areas of Dakota County lack a connected road network that would allow pedestrians and bicyclists to travel off the County system. This makes the County highway system the only choice in many instances.

Pedestrians and bicyclists also interact with vehicular traffic on County highways when crossing these corridors. Motorists, pedestrians, bicyclists and transit users all require safe crossings with as little delay and detour as possible.



Moving Along Highways

Pedestrian and bicycle facilities should be designed for use by people of all ages and abilities. The existing pedestrian and bicycle network in Dakota County is shown in Figure 2-1 on page 2-5. The existing network is made up of sidewalks and shared use trails in the urban portion of the county. In

the rural areas, shoulders on County Highways support bicycling. In Figure 2-1, shoulders that meet width per guidance from the *March 2007 MnDOT Bikeway Design Manual, Table 4-2, Bikeway Design Selection for Rural Cross Section* are identified as ‘Shoulder Supports Bicycling’. Also identified on the map are shoulders that are greater than or equal to 4’, but are narrower than recommended by the MnDOT Bikeway Design Manual.

Bicyclists and pedestrians use different facilities based on ability and type of movement. The cyclist classification based on ability type can be useful in determining appropriate facility types. Below are two common classification systems.

In 1994 the Federal Highway Administration developed general categories of bicyclist types. Group A riders travel over 15 mph and should operate in travel lanes and shoulders to improve safety for all users. Group B riders have less experience and generally are recreational riders who operate safely on roadside trails. Group C riders are children, who are safest on the trail network.

In 2004, the Portland Office of Transportation published a report describing four general categories of cyclists (Figure 1-1). *Strong and Fearless* riders are willing to ride a bicycle on any roadway regardless of traffic conditions. The *Enthusied and Confident* group is willing to ride in most roadway situations but prefers to have a designated facility like a bike lane. *Interested but Concerned* riders are not comfortable on major streets and prefer separated pathways or low traffic neighborhood streets. This group makes up the largest share of the population, roughly 60 percent. The *No Way, No How* group comprises residents who are unlikely to adopt bicycling in any way.

The bicycle network should serve the majority of riders who prefer separation from car traffic, while providing on-street options to serve riders who prefer riding on the road.

Pedestrians require well-maintained sidewalks and multiuse trails and safe road crossings with ADA-compliant curb ramps and pedestrian signal indications. Pathways that serve all pedestrians should be level, smooth, and clear of vegetation, snow, and other obstacles.

Potential system improvements to meet the needs of all bicycle riders, pedestrians, wheelchair users and motorists are discussed below.

Trail system improvements

- Designing for trail traffic at intersections, especially: sightline considerations; increasing visibility of pedestrians and cyclists; and minimizing the size and number of conflict points.
- Alignment of curb ramps at intersections and to keep trail traffic parallel to travel lanes.
- Designing of curb ramps in accordance with ADA guidelines.
- Inclusion of wayfinding where auto-oriented signage is insufficient (e.g., to indicate preferred routes and trail gaps).
- Facilitation and encouragement of trail connections from County trails to adjacent buildings and destinations, including through the plat review process.

Road system improvements

- Consideration of pedestrian and bicycle needs in safely designing intersection improvements.
- Geometric changes to existing roads to improve pedestrian and bicycle visibility and safety at intersections.
- Inclusion of shoulders.
- Traffic control devices as appropriate to support pedestrian and bicycle facilities.

Crossing Highways

County highways are usually higher-speed roads that provide for a balance between motor vehicle mobility and access. The function of vehicle mobility can conflict with pedestrian and bicyclist needs to cross these roads. Perceived and real safety concerns can discourage crossing of highways.

During the study process, participants identified over 50 locations that are barriers or where crossing improvements are desired. Locations on County Roads identified by more than one participant include:

- CSAH 14/Medota Rd E & Christenson Ave, Inver Grover Heights/West St. Paul
- CSAH 28/Yankee Doodle Rd & Promenade Ave, Eagan
- CSAH 32/Cliff Road and Dodd Road, Eagan
- CSAH 30/Diffley Rd & Dodd Rd, Eagan
- CR 43/Lexington Ave & Wilderness Run Rd, Eagan
- CSAH 38/McAndrews & 126th St, Apple Valley
- CSAH 42 and CSAH 23/Cedar Ave, Apple Valley
- CSASH 46/160th St W & CSAH 23/Cedar Ave, Apple Valley
- CSASH 46/160th St W & Elm Creek Lane, Apple Valley
- CSASH 46/160th St W & CSAH 33/ Diamond Path, Apple Valley
- CSAH 56/Concord St S & Poplar St E, South St. Paul
- CSAH 60/185th St & Jamaica Path, Lakeville

Figure 2-2 on page 2-9 depicts County Highways with posted speeds greater than 35 MPH and more than 2 lanes. These potential crossing barriers are overlaid on the pedestrian and bicycle demand analysis (pages 1-10 to 1-11). Areas where pedestrian and bicycle demand intersect with potential crossing barriers may be candidates for crossing improvements.

Considerations to address crossing concerns include:

- Grade-separated crossings (bridges or tunnels). Grade separated crossings should be evaluated as part of pedestrian and bicycle network needs when considering roadway

improvement projects. Due to their expense, these measures should be used at targeted locations on the County system, such as on multilane roads with speeds greater than 35 mph, at intersections with greenways, and in areas of high pedestrian demand, to provide safe pedestrian and bicycle crossings to schools.

- Existing grade separations such as those for roads and waterway crossings should be considered and evaluated for pedestrian and bicycle networks, including the greenway system.



Coordination with Local Communities

To better develop opportunities for county residents to walk and bike, the County should work closely with local communities to improve conditions. The following should be considered when addressing non-motorized travel needs.

- Destinations — such as parks, activity centers and trails.
- Safe Routes to Schools – biking and walking infrastructure, including grade separated crossings within school walk areas
- Networks — connections free of barriers such as railroads, busy roads, water bodies, hills, and isolated areas.
- Density — non-motorized transportation becomes more efficient and convenient in mixed-use areas.
- Safety — consider traffic safety in infrastructure decisions.
- Security — consider personal safety and security in infrastructure decisions.

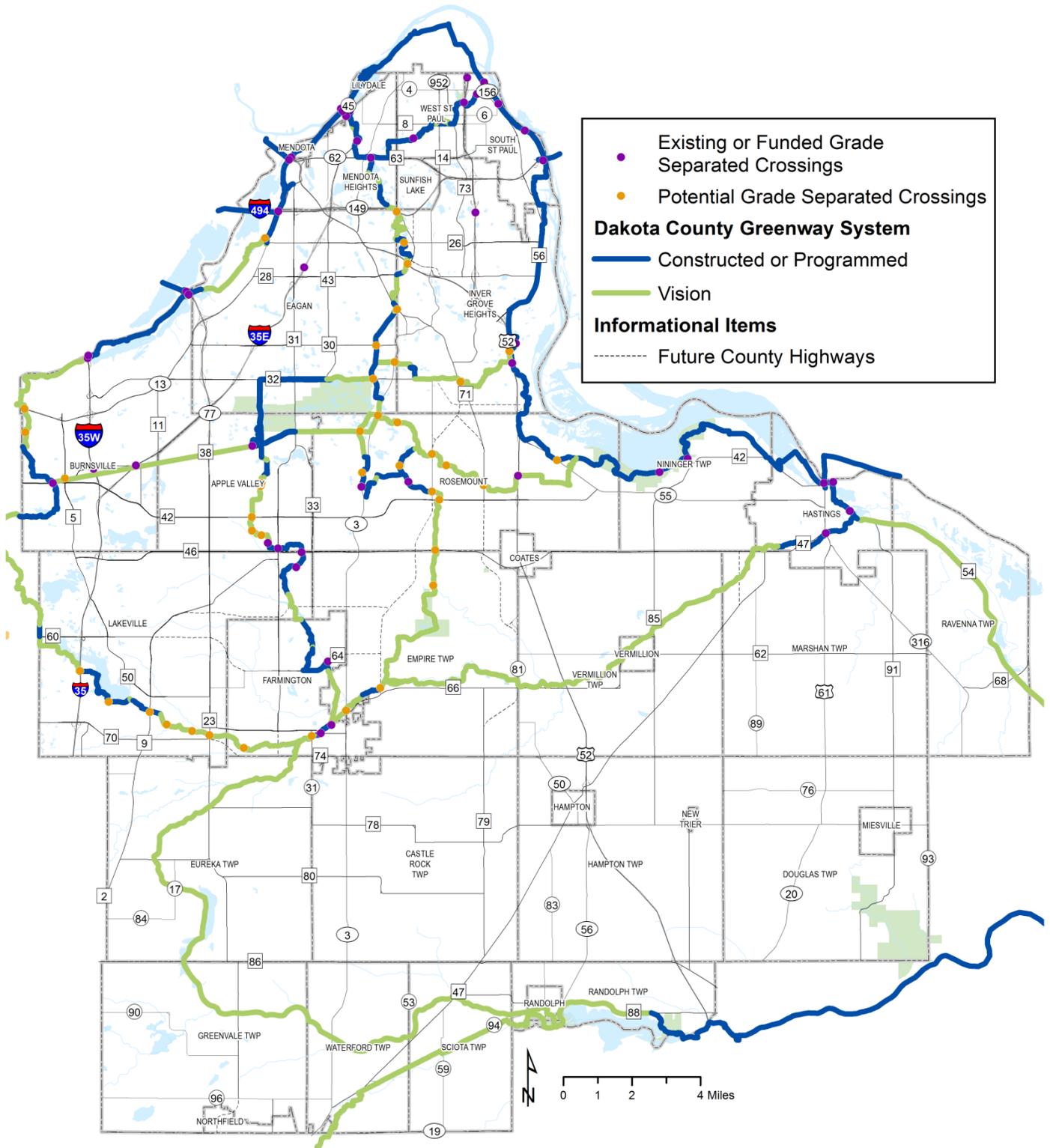
Countywide Greenway System

The County has invested approximately \$60,000,000 in its 200 mile greenway system over the last 10 years and has adopted eight master plans for individual corridors. The County Greenway greenway system encompasses the Regional Trail System within Dakota County, and connects to regional and state trails in adjacent counties.

The Dakota County Greenway system is shown in Figure 2-3 on page 2-11. Greenways include a shared use trail and, for the most part, are located or planned away from roadways, but in some cases they will share right of way with roads, and in all cases they will cross County highways. The greenway system as planned will require grade-separated crossings of County highways, often coinciding with waterway crossings.

This non-motorized transportation system will continue to supplement the current roadside trail network and in many places be preferred transportation corridors for bicyclists, pedestrians and wheelchair users. In addition to non-motorized transportation, the system will enhance recreation, water quality and habitat.

Figure 2-3 Dakota County Greenway Trails



Regional Bicycle Transportation Network (RBTN)

The Regional Bicycle Transportation Network (RBTN) is established in the Metropolitan Council 2040 Transportation Policy Plan. The goal of the RBTN is to create a network of on-street bikeways and off-road trails to improve conditions for bicycle transportation at the regional level and to encourage planning and implementation of future bikeways by cities, counties, parks agencies, and the state, in support of the network vision. The Metropolitan Council's Transportation Advisory Board has aligned federal Transportation Alternatives funding with the RBTN. The RBTN is made up of Tier 1, the highest priority for regional planning and investment, and Tier 2, which are lower priority. Alignments indicate specific routes and corridors are search areas for specific routes.

In the urban and suburban portions of the County, more complete inclusion of greenway trails in the RBTN would support Metropolitan Council RBTN goals. Dakota County greenway trails often include regional trails, link to state, local, and national bikeway networks. Greenway trails provide direct routes to many RBTN destinations as well as to local schools, parks, and commercial destinations. Planned grade separated crossings along greenways at County and State highways will provide safe crossings for a broad range of cyclist abilities.

There are some areas where RBTN adjustments may better meet local needs while still functioning within the regional system. Areas highlighted in Figure 2-4 on page 2-13 represent places where Dakota County can work with the Metropolitan Council and the local jurisdiction to determine if future modifications to the RBTN are beneficial.

Dakota County will continue to work with the Metropolitan Council to plan and implement pedestrian and bicycle facilities on the RBTN as roadway and trail project opportunities allow. Shared-use trail gaps on the RBTN within Dakota County occur on County, State, and City roads and are shown in Figure 2-5 on page 2-14.

State Highways

State Highways in Dakota County are important for pedestrian and bicycle system connectivity. State Highways provide connections between county and local roads and provide access to local destinations such as community centers, regional trails, and schools. Pedestrian and bicycle facilities along State and Interstate Highways are essential for connectivity to trails across the Minnesota and Mississippi Rivers. State Highways are usually higher speed roads where perceived and real safety concerns can discourage walking and biking along and crossing of highways. Due to higher speeds and traffic volumes, all State highways in Dakota County are barriers for local pedestrian and bicycle networks. Specific locations identified by multiple participants through Community engagement in this planning process include: State Highway 316, Hastings; State Highway 61, Hastings; Robert Street (State), West St. Paul; State Highway 13 in Burnsville and Eagan; State Highway 62 (110),

Mendota Heights; State Highway 3 throughout the county, and State Highway 149, Inver Grove Heights. Shared use trail gaps on the State system in Dakota County are identified in Figure 2-5.

Figure 2-4: Metropolitan Council Regional Transportation Network (RBTN)

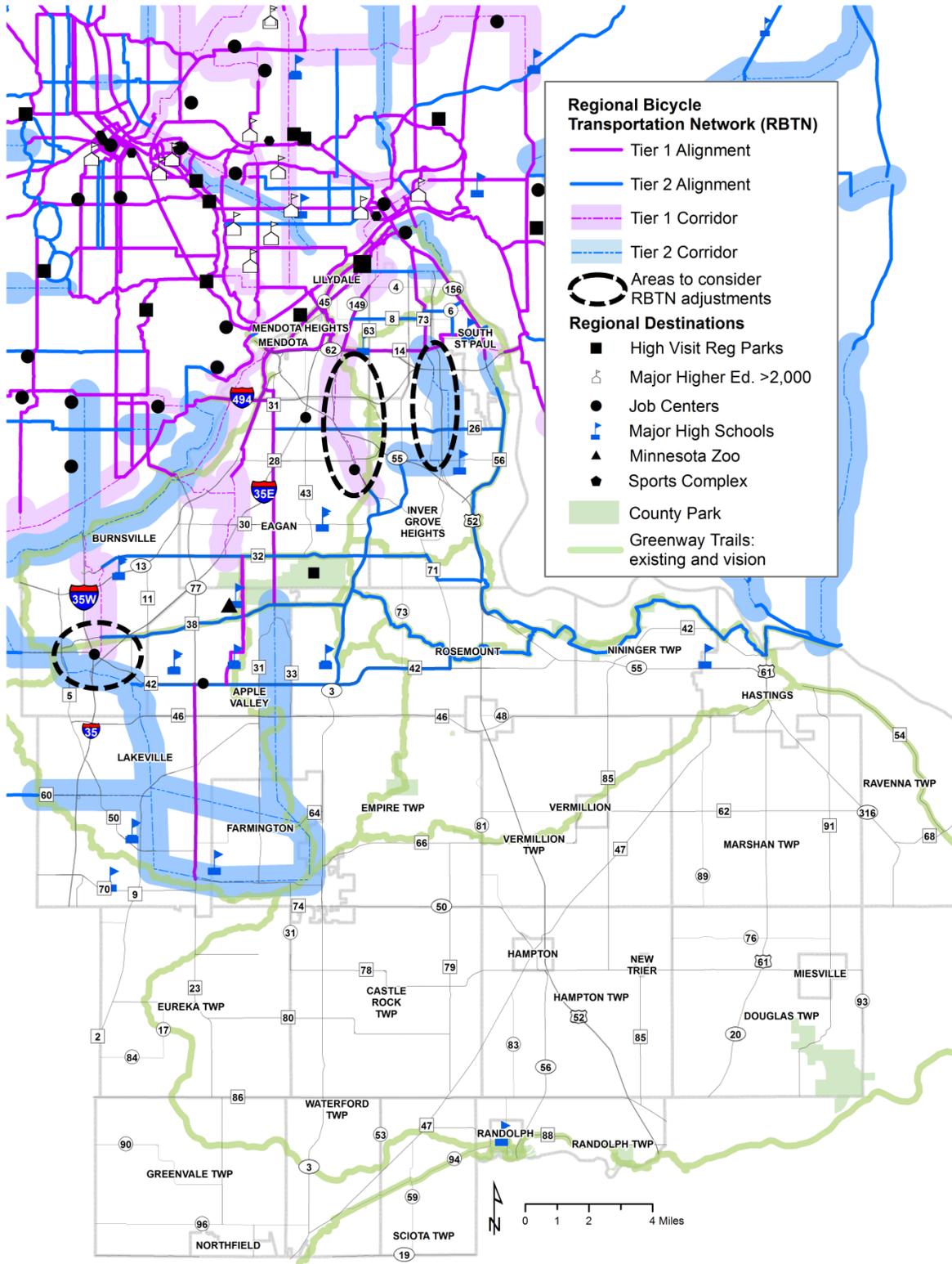
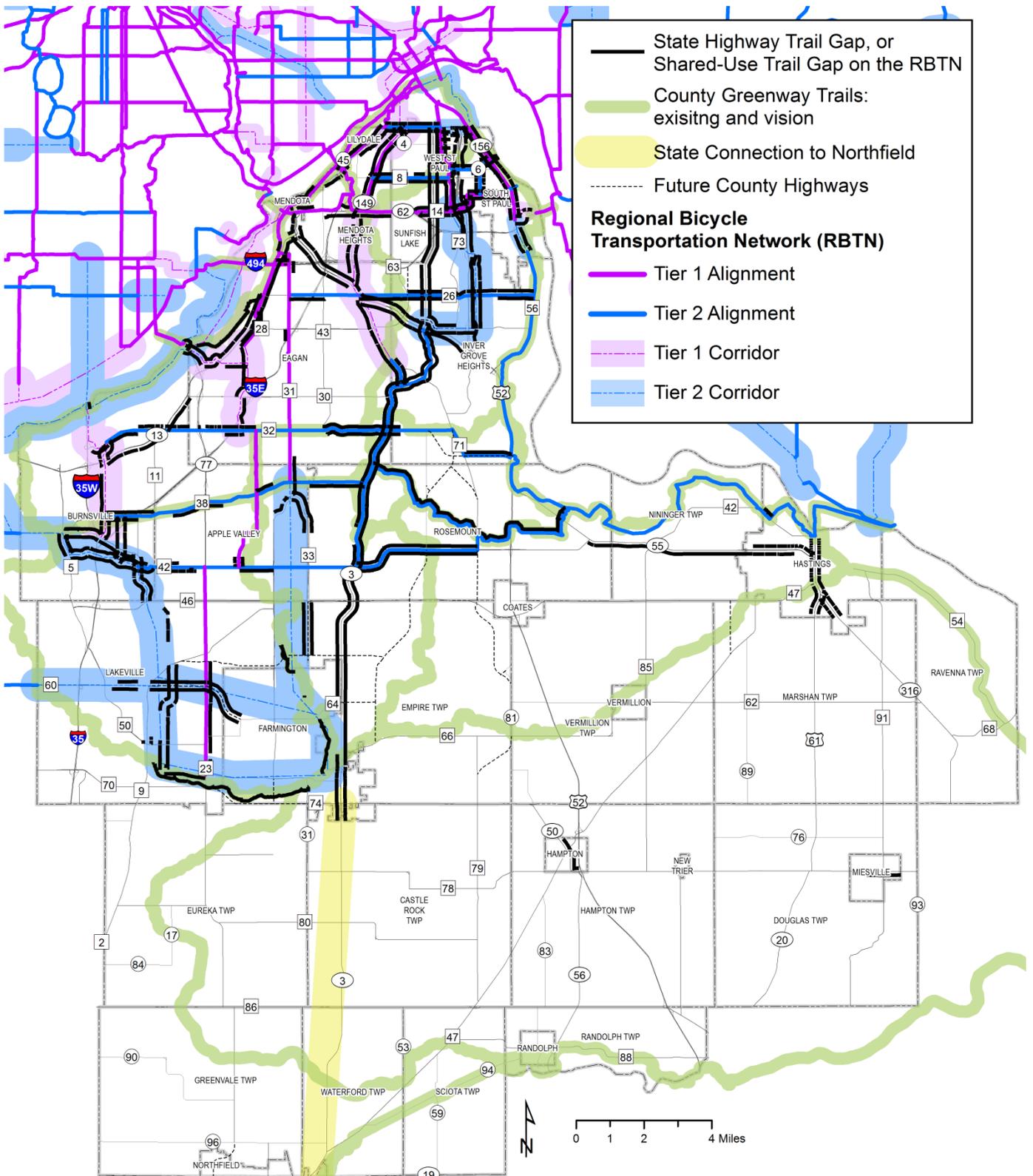


Figure 2-5: Shared-Use Trail Gaps Regional Bicycle Transportation Network (RBTN)



Complete Streets and Context-Sensitive Design

Dakota County evaluates the needs of all users, including bicycle and pedestrian needs, as part of the planning process for all County transportation improvement projects. This approach is intended to safely accommodate transportation system users regardless of what mode they have chosen. Pedestrian and bicycle facilities will vary based on anticipated and observed demand, safety concerns, land use context and constraints. Figure 2-6 provides pedestrian and bicycle facility guidance based on land use context.

Figure 2-6: Bicycle and Pedestrian Facility Guidance

BICYCLE AND PEDESTRIAN FACILITY CONTEXTUAL GUIDANCE				
PREFERRED FACILITIES	STREET CLASS	LAND USE	POSTED SPEED LIMIT	TRAFFIC VOLUMES
SIDEPATH/TRAIL ●●●●	COLLECTOR ARTERIAL	URBAN-SUBURBAN/ RURAL CENTERS	ALL	ALL
SIDEWALK* ●●●●	LOCAL COLLECTOR ARTERIAL	URBAN-SUBURBAN/ RURAL CENTERS	LOWER	ALL
SHOULDER ●●●●	COLLECTOR ARTERIAL	RURAL**	ALL	LOWER

LEGEND

SEPARATION	
●●●●	Minimal Separation
●●●●	Moderate Separation
●●●●	Good Separation
●●●●	High Separation

*On roadways with higher traffic volumes and speeds, a sidepath/trail can serve both walking and bicycling

**Shoulders can supplement sidepaths/trails in urban areas

Source: AASHTO Guide for the Development of Bicycle Facilities

BICYCLE AND PEDESTRIAN FACILITY CONTEXTUAL GUIDANCE				
ON-STREET FACILITIES TO CONSIDER*	STREET CLASS	LAND USE	POSTED SPEED LIMIT	TRAFFIC VOLUMES
BIKE LANE ●●●●	COLLECTOR ARTERIAL	URBAN-SUBURBAN/ RURAL CENTERS	LOWER	LOWER
BUFFER SEPARATED BIKE LANE ●●●●	COLLECTOR ARTERIAL	URBAN-SUBURBAN	LOWER	LOWER-MODERATE
BARRIER SEPARATED BIKE LANE ●●●●	COLLECTOR ARTERIAL	URBAN-SUBURBAN	LOWER-MODERATE	MODERATE

LEGEND

SEPARATION	
●●●●	Minimal Separation
●●●●	Moderate Separation
●●●●	Good Separation
●●●●	High Separation

*When preferred facilities are not practical and alternate routes are not practical.

Source: AASHTO Guide for the Development of Bicycle Facilities

Sidepath /Shared use trails should nearly always be planned for two-way bicycle travel and pedestrian use. When shared use trails are not practical on County Highways, alternate routes on nearby parallel City streets should be considered. If alternate routes are not practical, on-road facilities can be considered, based on context.

Facilities that experience a large mix of user types or high volumes of pedestrian and bicycle use will benefit from design to minimize conflicts. Treatments to reduce conflicts should be considered on a case by case basis and could include: wider shared-use paths; addition of a center stripe to separate, clarify and organize direction of travel, and providing separate spaces for pedestrians and bicyclists.

Emerging Technologies

Emerging technologies like electric scooter share, dockless bike share, electric-assist bikes, autonomous vehicles, and electric skateboards are providing new mobility options and changing how public rights-of-way are used.

Electric bikes come in many forms and include:

- Pedal assist: electric motor only provides assistance when the rider is pedaling, and stops providing assistance at speeds above 20 mph.
- Throttle on demand: electric motor may be used without pedaling, and stops providing assistance at speeds above 20 mph.
- Speed pedelec: electric motor only provides assistance when the rider is pedaling, and stops providing assistance at speeds above 28 mph. Equipped with speedometer.

Electric bicycles travel at an average speed of 10.5 mph, 2.25 mph faster than non-electric bicycles. An electric-assisted bicycle with pedals and a motor that cannot exceed 20 mph is considered a bicycle under Minnesota state law.

The impacts of new mobility technologies may include increased numbers of trips, increased transit-shed, more options for people of all ages and abilities, decreased car trips, and decreased personal ownership of mobility devices. Risks include increased speed differentials on shared facilities and overcrowding of existing bicycle and pedestrian infrastructure. While new technologies continue to rapidly evolve and all the risks and benefits are not yet known, the County can anticipate new users and higher levels of usage as it builds bicycle and pedestrian facilities. It is prudent to build active transportation facilities to preferred widths (rather than minimum widths), to provide separation between bicycles, pedestrians, and cars, and to improve safety at intersections.

Awareness

Because bicycle and pedestrian networks are developed and maintained by State, County, and Cities, it can be difficult for the public to find information about networks, routes, projects, or to know where to submit concern. In Dakota County, there is no centralized source for information about walking and biking. Considerations to address this are:

-
- Creation of a centralized source (such as a webpage) for information about walking and biking in the County. Content could include maps, information about walking and biking programs and groups, links to state, county, city websites, notice about upcoming projects and route closures, and safety information.
 - Develop and publicize a way for residents to submit maintenance and safety concerns related to walking and bicycling, such as a web form. Include a process to report back to residents in a timely manner.
 - Update, print, and distribute the Dakota County Bike and Walk Map in printed and electronic format.

Network Connectivity

Dakota County has built 245 miles of shared-use trails and sidewalks within its right of way in the past 40 years. In that time, County policy evolved from building a shared-use trail on one side of highways to building a shared-use trail on both sides. Trails and sidewalks in Dakota County are shown in Figure 2-1 on page 2-6. Despite completing much of the system, critical gaps remain. In this plan, pedestrian gaps are locations along County Highways lacking a sidewalk or shared use trail. Bicycle gaps are locations along County Highways in the urban areas where there is not a shared use trail. Bicycle gaps in the rural areas are defined as locations where shoulder width is less than recommended based on guidance from the 2007 MnDOT Bikeway Design Manual, *Table 4-3, Bikeway Design Selection for Rural Cross Section*. This width varies 5'-10' based on land use, speed limit, Average Daily Traffic (ADT), and number of travel lanes.

The gaps were identified and prioritized in 2012 as part of the Dakota County 2030 Transportation Plan. Between 2012 and 2018, steady progress was made in increasing network connectivity by filling gaps. Figure 2-8 on page 2-19 and Figure 2-9 on page 2-20 depict the updated 2018 pedestrian and bicycle gaps.

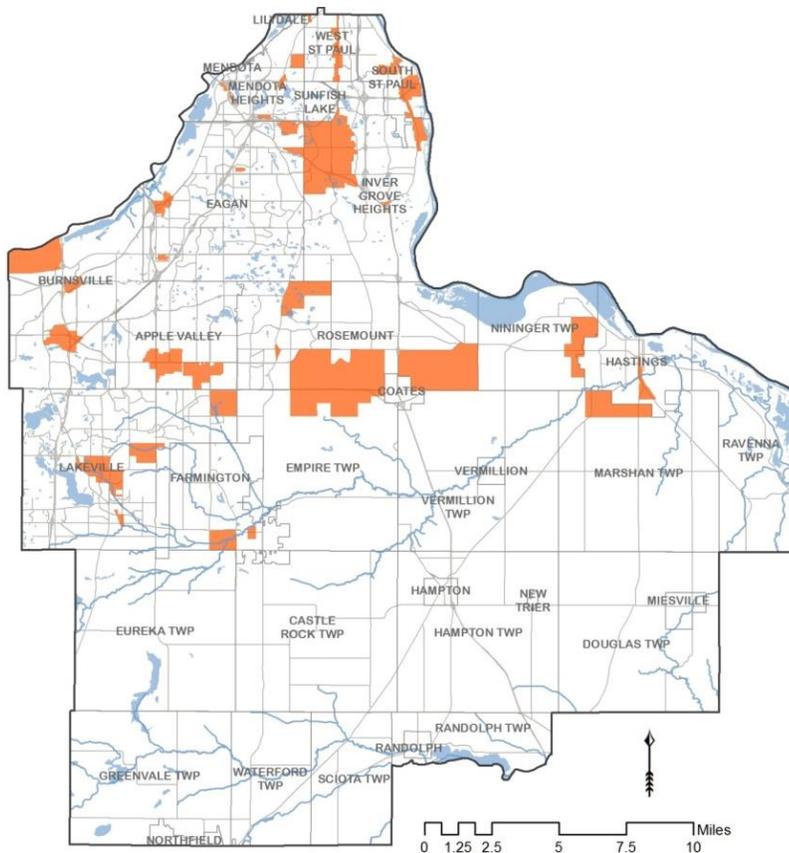
Prioritization is based on:

- Population density
- Employment density
- Age (population under 18 and over 65)
- Presence of schools
- Presence of shopping and services
- Households without vehicles
- Traffic volume
- Posted highway speeds
- Number of travel lanes
- Presence of transit
- Along the Regional Bicycle Transportation Network

The pedestrian and bicycle gap prioritization is based on existing conditions in 2017 and does not depict future conditions or future development. It is current Transportation Department practice to fill gaps, where practical, along with road improvements that support new development and redevelopment. Gaps may be addressed with County highway reconstruction projects or as stand-alone projects in partnership with cities. Pedestrian and bicycle needs in Areas currently experiencing redevelopment, such as the Vikings Campus in Eagan, will be addressed in conjunction with road improvement projects. Areas guided for growth by cities between now and 2040 are shown in Figure 2-7.

The planned pedestrian and bicycle networks along County highways are shown in Figure 2-10 and on page 2-21 and Figure 2-11 on page 2-22. Pedestrian facilities and bikeways may be constructed, where practical, as the urban and suburban area expands and in conjunction with road construction. Shared-use trail, separated from the road, is the preferred facility as it accommodates both pedestrians and cyclists. In the rural areas, bicycle supportive shoulders are the recommended facility type. Pedestrian and bicycle facility types in all areas of the county will be determined during project design based on land use context, guidance and policies in the adopted Dakota County Transportation plan, and State Aid standards.

Figure 2-7: City Identified Growth Areas in 2040 Comprehensive Plans
 Figure 2-8: Dakota County Pedestrian Gaps: Urban and Suburban Context



See Appendix C for detailed maps

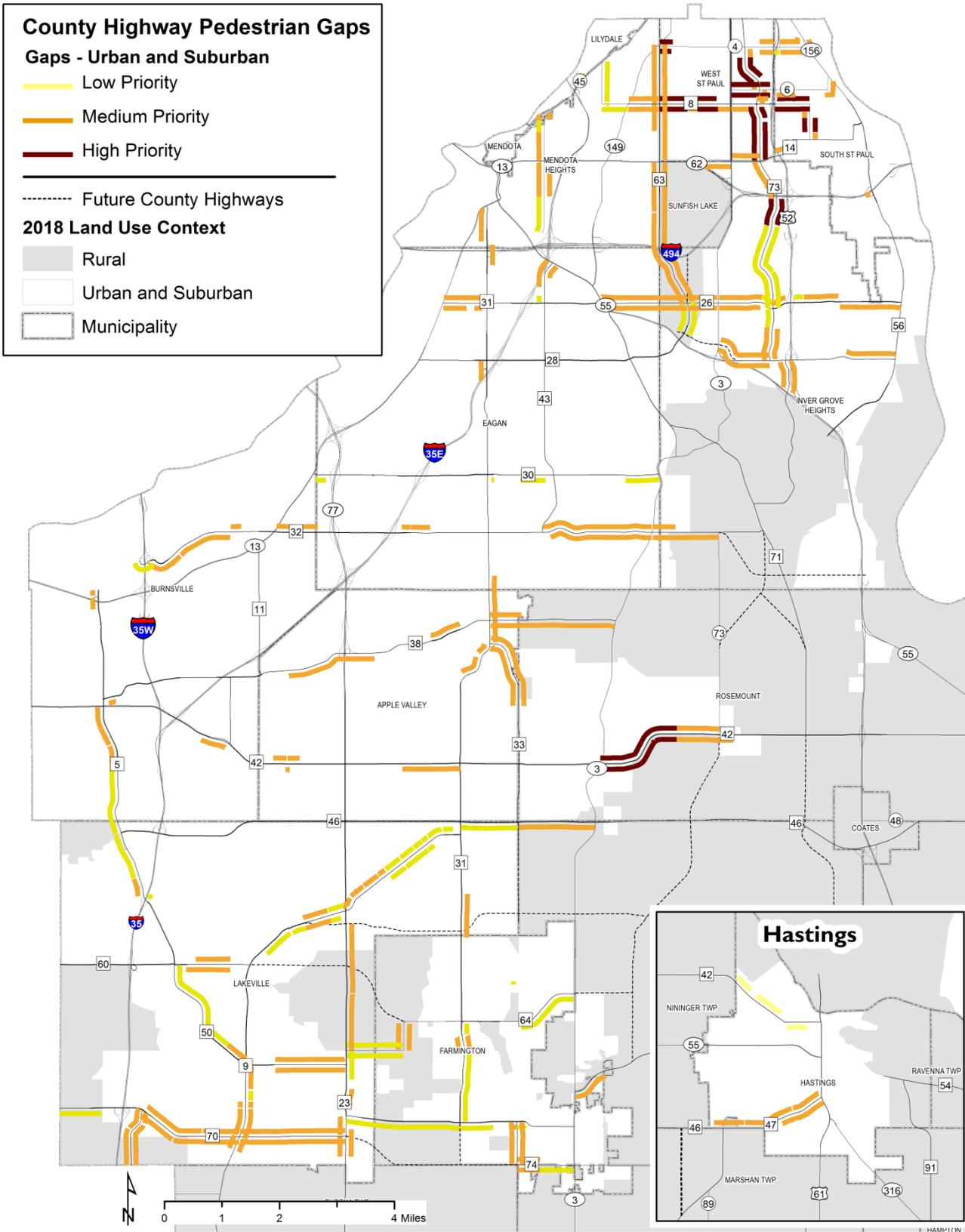


Figure 2-9: Dakota County Highway Bicycle Gaps

See Appendix C for detailed maps

County Highway Bicycle Gaps

- Low Priority
- Medium Priority
- High Priority
- - - Shoulder does not Support Bicycling <4'
- - - Shoulder >= 4' but Inadequate

- - - Future County Highways

- - - Gravel County Roads

2018 Land Use Context

- Rural
- Urban and Suburban
- Municipality

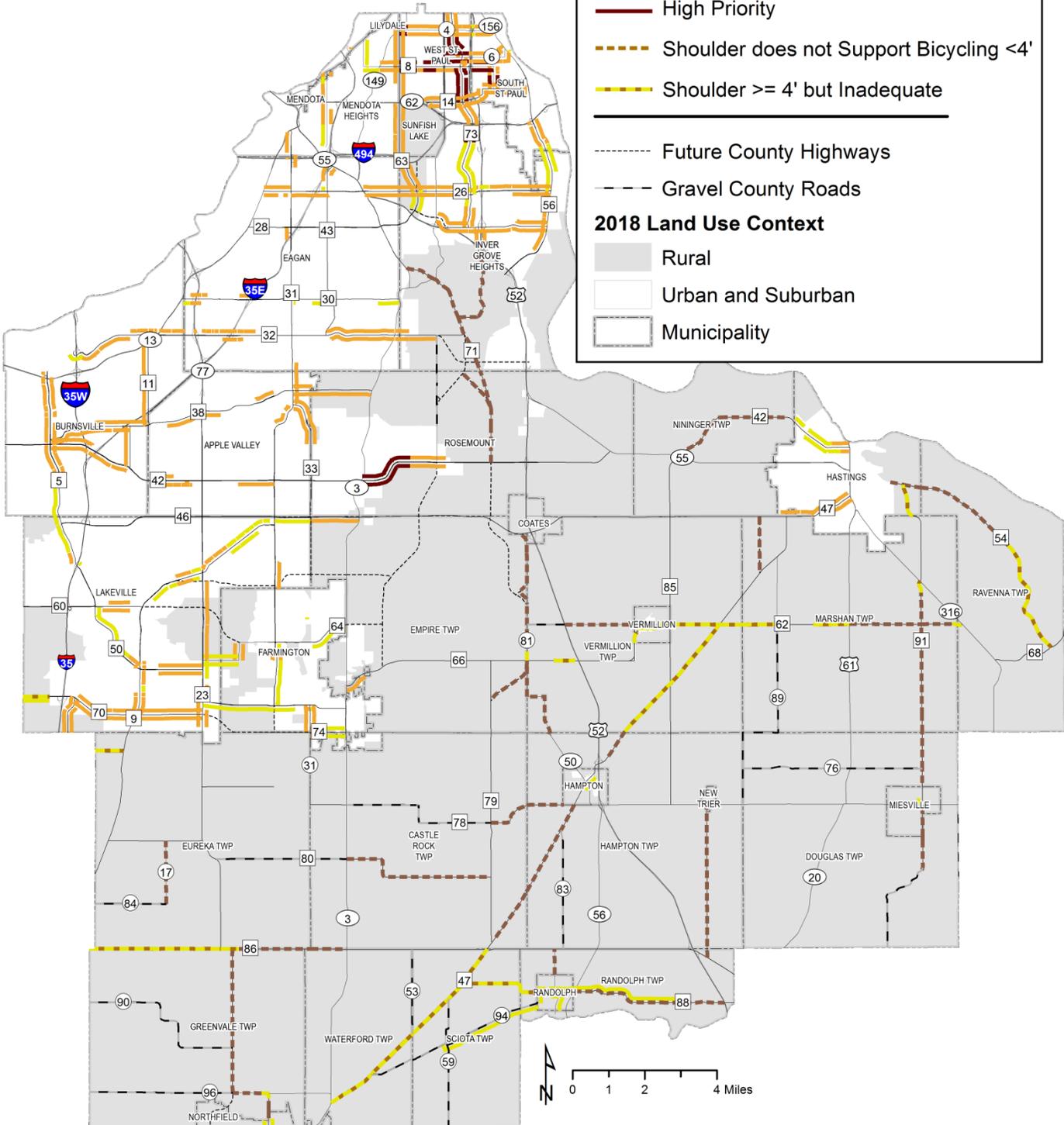


Figure 2-10: Planned County Pedestrian Network

See Appendix C for detailed maps

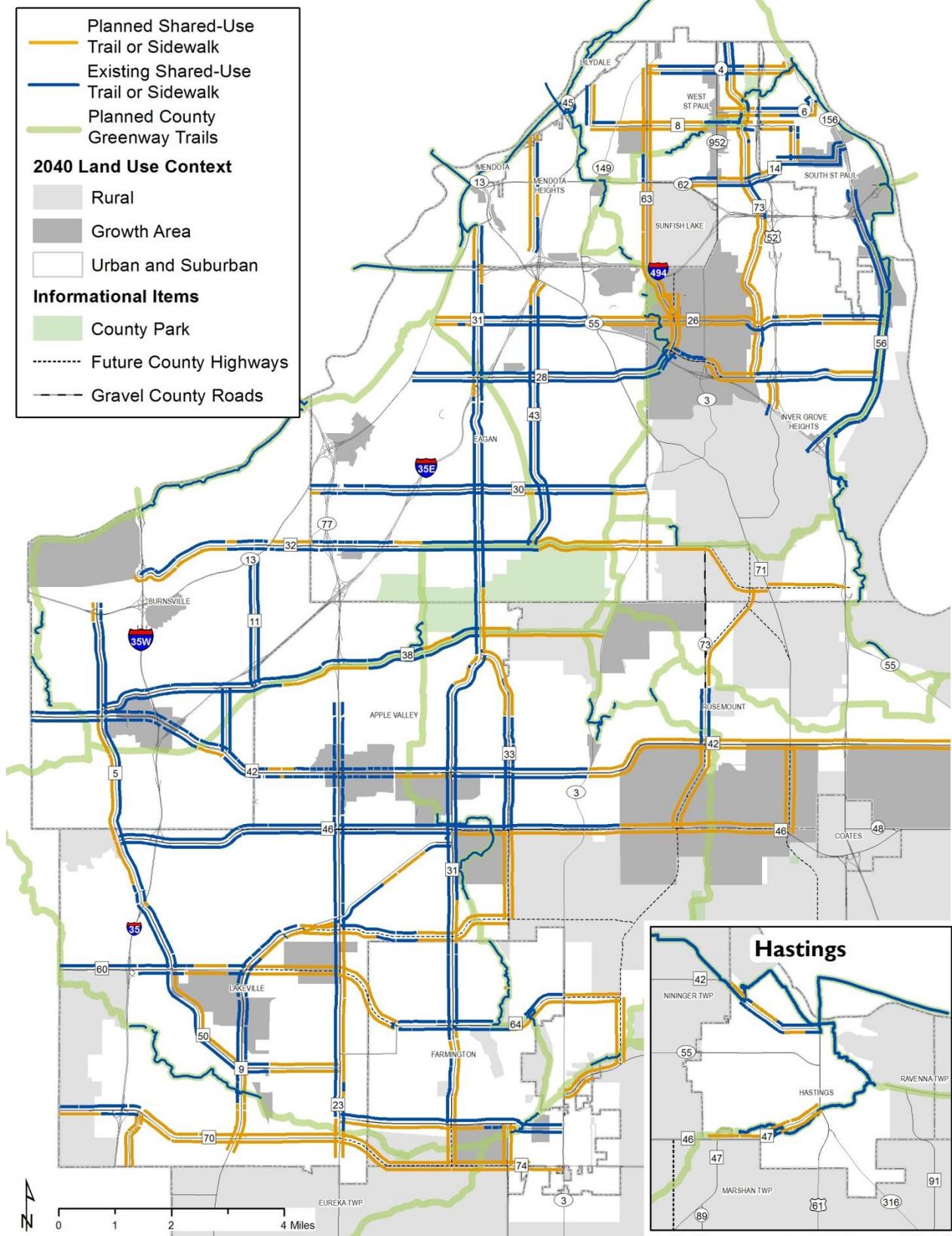
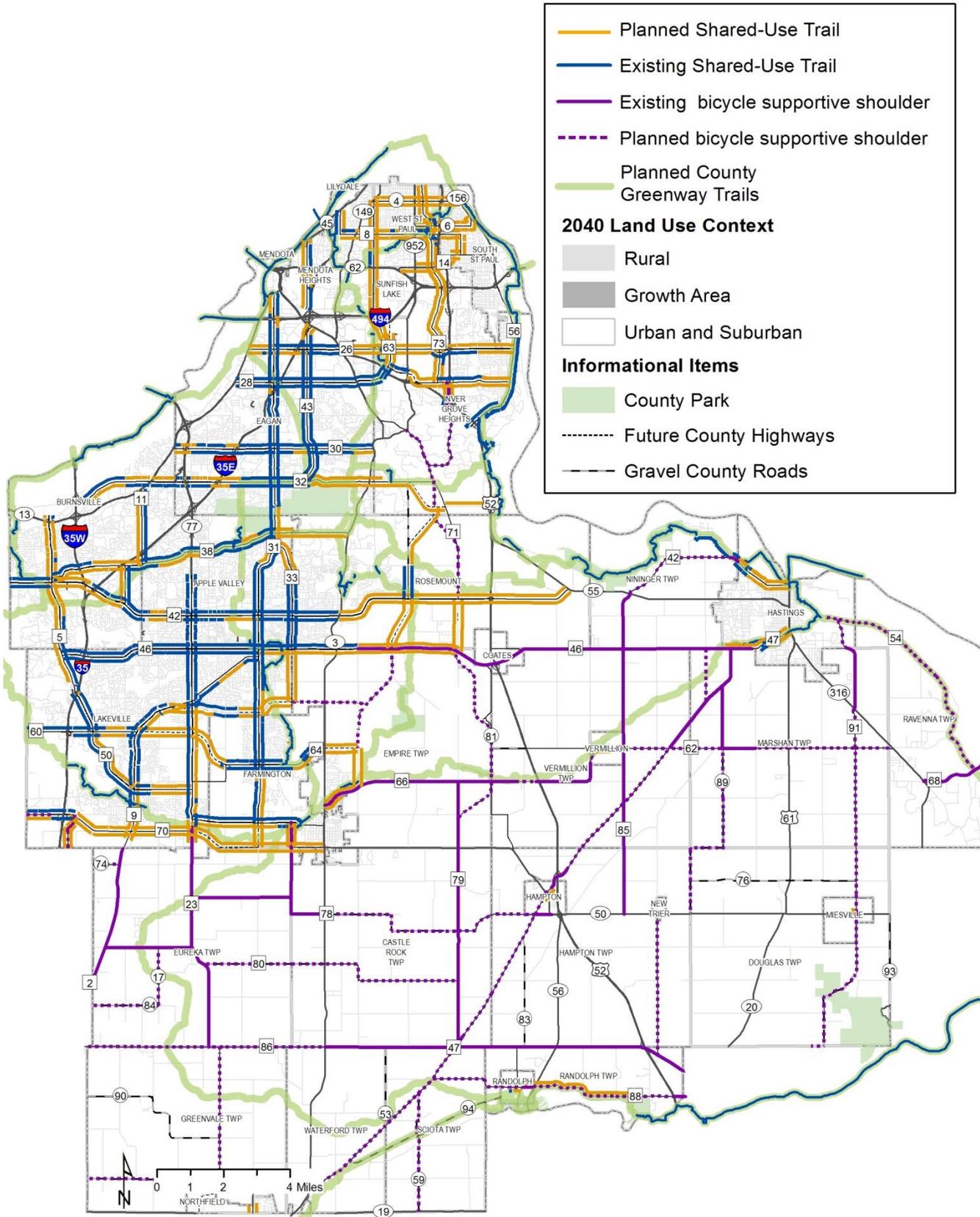


Figure 2-11: Planned County Bicycle Network

See Appendix C for detailed maps



Education, Encouragement, and Enforcement

Education, encouragement, and enforcement are essential components of creating a safe bicycle and pedestrian network and are needed to encourage and support use of infrastructure. Addressing this need will involve coordination and partnership with other agencies and across County departments. Considerations include:

- Partner with law enforcement to address behaviors that impact safety for walking and bicycling, such as speeding and distracted driving.
- Continue to support bicycle, pedestrian, and Safe Routes to School planning at the local and school-district level.
- Partner to provide education regarding rules of the road and safe travel behavior for pedestrians, bicyclists, and motorists.
- Continue to provide for continuing education for County and City staff about new bikeway types, planning, design and bicycle-related issues that may arise.
- Partner with cities and other organizations for active transportation demonstration projects.
- Coordinate across County departments to support bicycling and walking to work. Potential initiatives could include:
 - Install walk and bike-supportive facilities at County buildings.
 - Incentives to support active commuting, such as insurance discounts.
 - Access to secured, covered parking and shower and changing room facilities.
 - Bike-walk events along greenways.
 - Financial support for bicycle purchase, maintenance, and repair.

Evaluation

Regular evaluation of pedestrian and bicycle programs and infrastructure improvements allows for tracking progress towards the proposed system, identifying changes that may be needed for more effective progress and can also help set reasonable expectations for implementation. After staff resources for evaluation efforts are in place consider:

- Establishing pedestrian and bicycle performance measures such as trail miles built, ADA improvements made, pavement quality, etc.
- Developing a progress scorecard to track support accountability for integrating pedestrian and bike improvements into the system and to showcase achievements.
- Applying for recognition as a Walk Friendly Community by Walk Friendly Communities and a Bicycle Friendly Community by the League of American Bicyclists.
- Participating in regional discussions on establishing a pedestrian and bicycle count program to better understand value and effectiveness of infrastructure improvements.

GENERAL STRATEGIES AND POLICIES

The following section recommends strategies and policies to support integration of pedestrian and bicycle modes into the County transportation system, especially within transit or dense land use corridors, to provide safe, timely, convenient and efficient connections. Many of these are the same as in the 2030 Transportation Plan. Recommended revised and new policies are noted.

The following **strategies** support integrating pedestrian and bicycling modes:

Provide Pedestrian and Bicycle Facilities Along County Highways Based on Land Use Context. *(New)*

- Construct off-highway shared use trails in urban and suburban contexts on both sides of County highways, where practical.
- Construct road shoulders in the rural areas, based on MnDOT State-Aid guidance to provide widths that support bicycling, where practical.
- Consider, as part of the planning and design process, the options listed below where shared use trails are not practical in urban and suburban contexts, due to right of way constraints or other considerations:
 - Sidewalks.
 - Alternate routes with pedestrian and bicycle facilities on local or state roads when pedestrian and bicycle facilities are not practical on a County roadway.
 - On-road bicycle facilities.
 - Construct paved shoulders on construction and resurfacing projects in rural contexts whenever practical.
- Consider constructing off highway shared use trails in rural contexts where there is high pedestrian and bicycle demand, such as near major County facilities, employment centers, commercial activity centers, rural centers, parks and greenways, schools, facilities for older adults, and continuity between urban/suburban areas.

Provide for Continuity, Barrier Removal and Safety for All Users *(Revised)*

- Provide for continuous facilities, address physical barriers such as busy roads and water crossings and provide safe facilities for users of all modes.
- Perform a pedestrian safety analysis with transportation improvement projects.
- Continue reviewing 4-to-3 lane conversion opportunities to add dedicated bike and walk facilities and shoulders.
- Create bicycle and regional trails that form a network to serve countywide needs (e.g. access to major County facilities, activity centers, employment centers and schools), and provide connections between municipalities and to adjacent counties.

Continue to Support the Countywide Greenway System *(Revised)*

- When greenway trails or natural resource corridors cross County highways, locate crossings to take advantage of existing grade separations where possible. Consider new separations where natural resource, wildlife, pedestrian, and bicycle benefits justify them.

-
- Use publicly owned land for greenways whenever possible.
 - Where greenway trails would meet regional intent with respect to connectivity, continuity, and existing or potential bicycle trip demand, work with the Metropolitan Council and local jurisdictions to integrate greenway trails into the RBTN.

Improve the Bicycle and Pedestrian Network In and Near County Right-of-way to Enhance System Function and Safety *(Revised)*

- Prioritize barriers and gaps to overcome with preference for areas of high pedestrian activity that are bisected by multi-lane roads with speeds of 40MPH or greater, railroads, missing trail segments or water features. The pedestrian and bicycle demand analysis should inform this prioritization. Tools to address barriers may include bridges, tunnels and route realignment.
- Evaluate, in coordination with cities, which County roads in urban and suburban areas lack pedestrian infrastructure and are not scheduled for expansion or reconstruction in a satisfactory timeframe to accommodate pedestrians and bicyclists and consider projects independently of road projects.
- Evaluate conditions at County roadways and areas with high potential pedestrian and bicycle demand, such as County facilities, employment centers, commercial activity centers, rural centers, parks and greenways, schools, and facilities for older adults.
- Where there is excess vehicle capacity, evaluate geometric and striping changes to make space for pedestrian facilities, bicycle facilities, and shoulders.
- Encourage local governments to install pedestrian and bicycle facilities on both sides of roadways or include other improvements as appropriate to provide supportive trail networks where pedestrian and bicycle activity is expected or present.
- Integrate the County greenway system in future County highway projects (e.g., when constructing a highway, grade the area of a potential greenway crossing to accommodate a grade separation) where applicable.
- For County buildings, link the facility into existing and future pedestrian and bicycle networks on all sides. Construct trails or sidewalks that follow expected pedestrian patterns.
- Work with local partners to develop alternate routes in locations where a County roadway cannot adequately accommodate bicycling and walking needs.

Ensure Adequate Resources are Planned for and Allocated to Trail Maintenance.

- Resurface trails as needed consistent with trail maintenance agreements, and consider trail maintenance needs through the County's 5-Year Capital Improvement Program (CIP) process.
- Explore use of the County's roadway pavement management system for trails.
- Encourage cities to uphold maintenance agreements on roadside trails and keep them usable year-round.

Ensure Safety of Bicycle and Pedestrian Facilities Based on Context. *(Revised)*

- Follow Americans with Disabilities Act requirements and guidelines to make facilities accessible to all users.
- Create or designate a pedestrian and bicycle transportation staff position in the County to participate in multidisciplinary transportation work teams and advance non-motorized transportation.

-
- Assess pedestrian and bicycle needs as part of all transportation system studies and CIP project development processes.

Bicycle and Trail Facilities in CIP

- Consider inclusion of bicycle and trail facilities as part of Transportation and Sales and Use Tax CIP projects.

The following *policies* support integrating pedestrian and bicycling modes:

T.15 Bicycle and Trail Facilities within County Right of Way

Require approval for design and location of bicycle and trail facilities within County highway right-of-way.

T.16 Bicycle and Trail Facilities Signs

Traffic controls and signage on bicycle and trail facilities will be in accordance with the Minnesota Manual on Uniform Traffic Control Devices.

T.17 Bicycle and Trail Facilities Maintenance

Local governments are required to provide maintenance through terms of the County Bikeway Trails Maintenance Agreement. If not addressed through the trail maintenance agreements, snow removal is at the discretion of the local government.

T.18 Bicycle and Pedestrian Facilities Construction *(Revised)*

Consider construction of bicycle and pedestrian facilities in conjunction with all highway projects based on needs and context, whenever practical.

T.19 On-Road Bicycle Facilities *(New)*

Consider the use of on-road bicycle facilities where appropriate to help provide for bike and pedestrian needs where all of the following conditions exist:

- There is local support.
- An off-road multiuse trail is not practical or feasible.
- An alternate route for an on-road facility, such as a parallel local street, is not available.
- On-street parking is prohibited or does not need to be removed to accommodate the on-road bicycle facility.
- The on-road facility is part of an identified system that provides for regional connectivity and transportation system connections.
- State aid design guidelines can be met
- Speed limit is 35 miles per hour or lower.

T.20 Complete Streets

-
- Evaluate pedestrian and bicycle facilities (lighting, ramps, crosswalks, countdown timers etc.) by context and identify deficiencies to be addressed by the County or cities.

BICYCLE AND PEDESTRIAN FUNDING

Investments for bicycle trails and facilities are identified within the Preservation Goal of the Transportation Plan, the Transportation CIP and Parks CIP.

Preservation Goal

In the future, estimated annual CIP needs are expected to rise as recent installation of system elements begin to age. The estimated annual CIP investments for preservation of bicycle trails and facilities projects, including estimated investments for County Roads, are included in the Transportation Plan.

Transportation CIP

There are four primary ways pedestrian and bicycle facilities are funded within the Capital Improvement Program (CIP).

1. Pedestrian and bicycle facilities are considered and implemented along County highways. If a shared use trail or other pedestrian/bicycle facility is included with a highway project, the pedestrian/bicycle facility investment is added within the total highway project investment.
2. Large, stand-alone pedestrian and bicycle facility projects are designated specific project funding within the Safety and Management Category of the Transportation CIP.
3. The Safety and Management Category of the Transportation CIP contains an annual set-aside of \$883,000 for smaller transportation projects, including pedestrian and bicycle improvements.
4. The Maintenance and Preservation Category of the Transportation CIP contains a set-aside for existing trail improvement and rehabilitation projects at various locations throughout the County. These projects include repairing deterioration to prolong the life of a trail by overlaying deteriorated surfaces with an asphalt surface, and to provide connectivity on new sections of trail. This set-a-side is \$700,000 annually.

Parks CIP

The Parks Capital Improvement Program also identifies investments for the regional trail and greenway trail systems. The current Parks CIP investment for regional trails is comprised of Federal, State, Metro and County Investments. Specific activities include trail and greenway land acquisition, design and construction; sign and wayfinding implementation; interpretive media design and installation; and trailhead development. The 2019 Parks CIP investment for regional and greenway trails totals \$6 million. Over the next five years (through 2023), the total investment planned for

regional greenways and trails is \$37 million. Approximately 30% of this total is expected come from Federal, State, and Regional Sources.

NEXT STEPS

The findings and recommendations of the Bicycle and Pedestrian Study will be considered for incorporation into the Dakota County 2040 Transportation Plan when it is updated in 2019.

There are some topics brought up by the Project Management Team and the public during this study process that cannot be evaluated and addressed fully without considering transit and vehicle modes. Evaluation of the topics listed below will be considered within the context of the full transportation plan update.

Topics for further consideration within the Dakota County 2040 Transportation Plan update planning process include, but are not limited to:

- Coordination of walk/bike improvements with mill and overlay projects.
- Coordination with cities to fill trail gaps.
- Revise the contiguous plat ordinance to explicitly include pedestrian and bicycle infrastructure as part of the county road network.
- Lighting for year round use and safety.
- Support facilities such as bike racks, landscaping, surface treatments, benches, and fencing.
- Funding for pedestrian and bicycle facilities.
- Policies including maintenance and cost sharing.