Duluth-Superior Metropolitan Bikeways Plan

February 2019

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Duluth-Superior area communities cooperating in planning and development through a joint venture of the Arrowhead Regional Development Commission and the Northwest Regional Planning Commission

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Maps

MAP DISCLAIMER

The maps in this plan present information that is a compilation of data from various federal, state, county, regional, and municipal sources. Geographic information has limitations due to the scale, resolution, date and interpretation of the original source materials. Users should consult available data documentation (metadata) to determine limitations and the precision to which the data depicts distance, direction, location or other geographic characteristics. These maps and/or data are not legal survey documents to be used for describing land for the purpose of ownership or title.

Chapter 1: INTRODUCTION

Purpose – Role of the Metropolitan Bicycle Plan

The Duluth-Superior Metropolitan Interstate Council (MIC) has undertaken a complete update to the Metropolitan Bikeways Plan first developed and approved in 1994. This plan is a blueprint for the development of the bikeways system in the Duluth-Superior Urban Area for the next 25 years and sets forth a vision of where the region would like to be and guidance on how to get there.

This Bikeways Plan is a complementary document to the existing Duluth-Superior Long Range Transportation Plan (LRTP). The LRTP establishes a 20-year vision for transportation in the urban area. A major component of this vision is an urban transportation system which is fully integrated and multimodal, where citizens of all ages and abilities have convenient and desirable options. This Bikeways Plan provides a guide to advance the bicycling component of this vision.

This Bikeways Plan depicts an inter-connected network of bicycle routes for people of all ages and abilities as a component of the urban ransportation system. As with any system, each segment of the system is reliant on the other congruent parts in order to fully function properly as designed. The Plan provides guidance to roadway decision-makers on the design of bicycle facilities, development of programs, and prioritization of improvement projects.

In addition, this Plan is a working document and is meant to be adaptable. As projects take place incrementally, including roadway and land use changes, bike routes may

Fundamental Principles

- 25-year vision for the urban bikeway transportation system.
- Accommodates people of all ages and abilities.
- Guiding document – for planning purposes, not for route finding, wayfinding or construction.
- Plan is adaptable, not static.
- Improvements to the bike routes are a shared responsibility among jurisdictions, made deliberately and incrementally with an eye towards developing the system as a whole.

deliberately need to be adjusted, expanded, removed and/or changed in some way to meet the new condition.

The Plan contains goals and recommendations that are regional in scope and provides a planning framework to guide decision-making. The bikeways system will continue to be developed incrementally and not all at once. While the MIC, a regional transportation planning agency, is responsible for planning the system, the implementation of the recommendations in this plan largely lies upon the roadway authorities. Therefore, it will take the cooperation and coordination from state, regional, local agencies, organizations and groups to realize this bikeway system vision.

Finally, this plan is not for route finding or wayfinding of the existing bike routes. The intent of this document is to guide roadway jurisdictions and the general public on the future dirction of the bikeway network as a whole. This document is to be used for planning purposes and the actual routes and improvements will be ultimately determined by the appropriate roadway authority.

Federal Rules & Guidance

The Metropolitan Interstate Council is the officially designated Metropolitan Planning Organization (MPO) for the Twin Ports and receives federal funding to undertake transportation planning efforts on behalf of the Duluth-Superior urban area. Of the planning responsibilities that the MPO must undertake, one is to plan for the bicycle as a mode of transportation. The following is a review of the federal rules purtaining to MPO's and bicycle planning:

23 CFR 450 – Metropolitan Transportation Planning & Programming

(a) Set forth the national policy that the MPO designated for each urbanized area is to carry out a continuing, cooperative, and comprehensive performance-based multimodal transportation planning process, including the development of a metropolitan transportation plan (20+ year long range plan) and a transportation improvement program (3-5 years short range program of projects) that encourages and promotes the safe and efficient development management, and operation of surface transportation systems to serve the mobility needs of people and freight (including accessible pedestrian walkways, ***bicycle transportation facilities***, and intermodal facilities that support intercity transportation, including intercity buses and intercity bus facilities and commuter vanpool providers), fosters economic growth and development, and takes into consideration resiliency needs, while minimizing transportation-related fuel consumption and air pollution;

Latest direction from USDOT - Federal Highway (FHWA)

Incorporating On-Road Bicycle Networks into Resurfacing Projects **– March 2016**

- US DOT policy is to incorporate safe and convenient walking and bicycle facilities into transportation projects.
- It is the responsibility of every transportation agency in the United States to improve conditions for bicycling and to integrate into their transportation systems.
- Transportation agencies are encouraged not just to meet the minimum requirements of providing bicycle facilities, but to go beyond minimum standards to provide the safest and most convenient bicycle facilities practicable.

450.306

(b)(2) Increase the safety of the transportation system for motorized and non-motorized users;

450.316

(vii) Seeking out and considering the needs of those traditionally underserved by existing transportation systems, such as low-income and minority households, who may face challenges accessing employment and other services;

450.324

Development and content of the metropolitan transportation plan

(b) The transportation plan shall include both long range and short range strategies/actions that provide for the development of an integrated multimodal transportation system (including accessible pedestrian walkways and ***bicycle transportation facilities***) to facilitate the safe and efficient movement of people and goods that address current and future transportation demand.

(f) The metropolitan transportation plan shall, at a minimum, include:

> (12) Pedestrian walkway and ***bicycle transportation facilities*** in accordance with 23 USC 217 (g)

Why Bicycling?

The bicycle is particularly suited for and an integral component of an urban transportation system. Urban mobility is complex, because of all the modes involved, the multitude of origins and destinations, and the dynamic nature of people's travel choices. Add to this the mobility demands due to the nature of higher densities and shorter distances placed upon the urban transportation system, where mode shift is dynamic and intricately linked with urban form and spatial structure.

Furthermore, modes of transportation are not the ends, but means to an end. Finding the right balance is akin to utilizing the right tool for the job. Other tools may work, but what is the most efficient and effective? Various transportation modes can be the right tools to most efficiently and effectively serve the Duluth-Superior Urban Area.

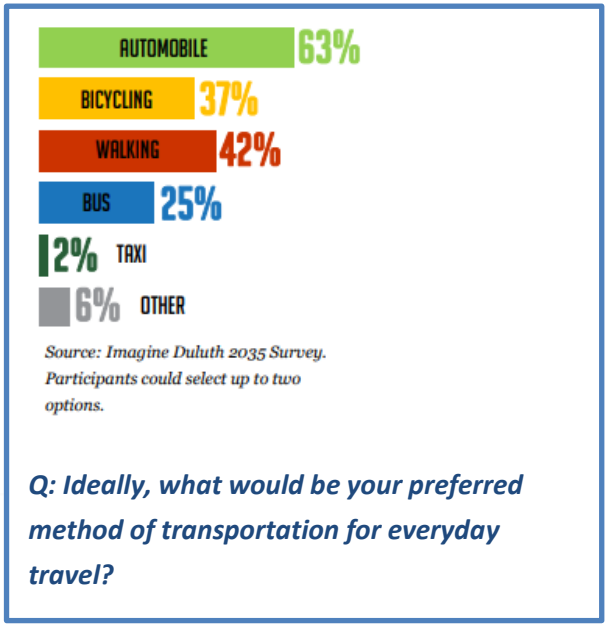
Within a dense urban area, an efficient way to provide physical connections is through the use of a bicycle as a mode of transportation. A majority of trips in urban areas (which includes all trips a person makes) encompass shorter distances, fewer than three miles. These shorter distances coupled with the real limits on space and public infrastructure resources, creates an environment where bringing more people into smaller spaces calls for us to devise the best ways to provide more access with less space. When bicycling is added to the mix for people of all ages and abilities to get around, the benefits are numerous.

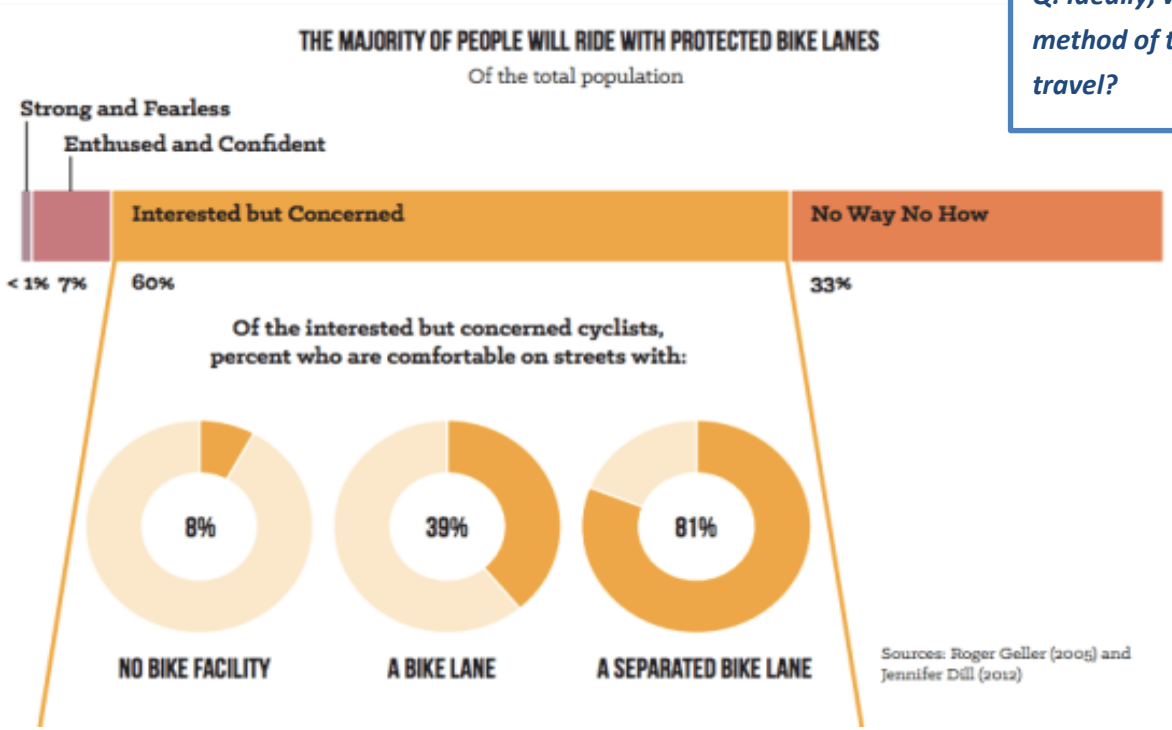
Bicycling Benefits

- One of the highest returning public infrastructure investments in an urban area with a fully connected network of all ages & abilities bikeways.
- Equitable access to transportation.
- Reduces health risks associated with physical inactivity.
- Strengthens the local economy.
- More affordable for the whole community.
- In areas of and times of congestion, it provides an increase capacity in traffic and parking, particularly in areas where space is limited, but more and more people are going.

A highly bikeable community also means residents, workers and visitors have opportunities for physical activity that can be incorporated as part of their regular day-to-day activities.

Lastly, the general public is increasingly asking for better bicycle transportation facilities. Nationally, it has been found that the majority of the general public, nearly 70%, will bicycle for transportation with the proper infrastructure in place. Locally, results from recent surveys in the Duluth-Superior area, respondents have stated they would bicycle for transportation more often if the infrastructure was improved.





What has changed? The reason for the Plan update

Bicycling in the United States has taken on many iterations, boom and bust cycles since the invention of the bicycle. Cyclists made the initial push for paving roads in the early 1900s. As motor vehicles gained in immense popularity a push began to find separate spaces for cyclists. The 1970's energy crisis and increasing environmental awareness led to a wave of renewed popularity towards bicycling. In the 2000s, as cities continue to urbanize rapidly and congestion continues to increase another wave of interest in bicycling has taking place. This wave has lead to expotential growth of bicycle infrastructure in cities across the U.S. There is increasingly growing push for communities to build bicycle-friendly infrastructure including, trails and bike lanes.

In the past, and for some still today, a major view of bicycling is that this is a childhood activity and not necessarily a mainstream adult activity (except for a small percent of the population). For adults, the bicycle has also grown to be viewed primarily as a vehicle for recreational purposes. While some still hold that viewpoint today, planning for bicycles as a vehicle for transportation has been underway for over 40 years. In the 1970s, both locally and nationally, plans were released to direct transportation investments to enusre bicycling was a viable component of the overall transportation system. In 1974, Federal Highway released their "Bikeways – State of the Art" report to provide national guidance on designing bikeways. The following year, the City of Duluth released their Bikeways Plan calling for a network of bicycle friendly improvements to the city street network.

Summary of Trends

- Travel behavior shift – general public desire for bikeway facilities.
- Growing public health concerns due to physical inactivity.
- Local government fiscal realities have created a need to gain better return on infrastructure investments.
- Decline of gas tax funding (largest source of funding for roads).
- Massive technological innovation, particularly the rapid adoption by the general public with use of the smart phone.
- Delay in driving by young people.

However, by the end of the 1970s, bicycle enthusiasm waned and a key theory emerged, one championed by John Forester, a prominent bicycle transportation engineer of the time. He asserted that sharing the road without separated bikeway facilities was far more safe for cyclists. This idea was largely accepted across the United States and in turn efforts to build separated bikeway facilities stalled.

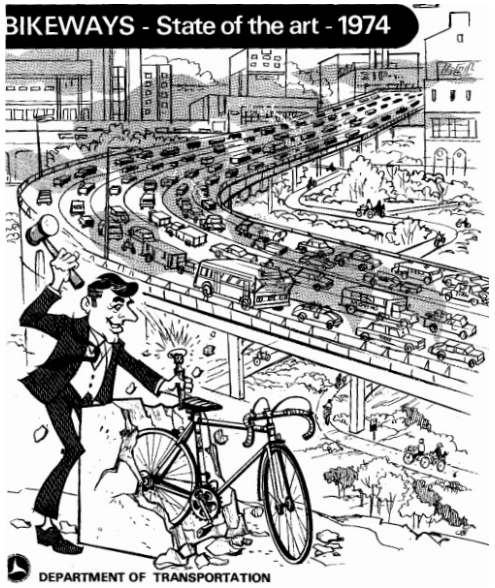
In 1991, federal funding was directed towards planning for the transportation system and specifically called on MPOs to put together bicycle and pedestrian transportation plans. The MIC decided to create separate bicycle and pedestrian plans and completed the regional bicycle plan in 1994. This plan focused largely on bicycle commuters to work and recreational bicyclists and largely comprised of sharing-the-road bikeway facility recommendations.

However, accomodations in the 2000's, there has been a significant change in thought on how to best accommodate bicyclists. A move away from a primarily sharing the road system to one that provides separate facilities has emerged. This idea is linked to the research which shows that a majority of people would be willing to bike, but not where they would have to share the lane with motor vehicles.

On top of this is the trend that people are becoming less physically active and the evidence is mounting that this is creating significant health effects. The research further shows that to change this lack of physical activitiy behavior, exercise has to be incorporated as part of everyday routine. With cities and regions being more spread out, transportation has a role in promoting physical activity. People note that time and distance are the two biggest factors preventing them from being more physically

Transportation vs. Recreation – design for whom?

- **Transportation** – getting from point A to point B. Direct, without unnecessary stopping or detours.
- **Recreation** – leisurely or a work out, does not need to be direct, should include loops.

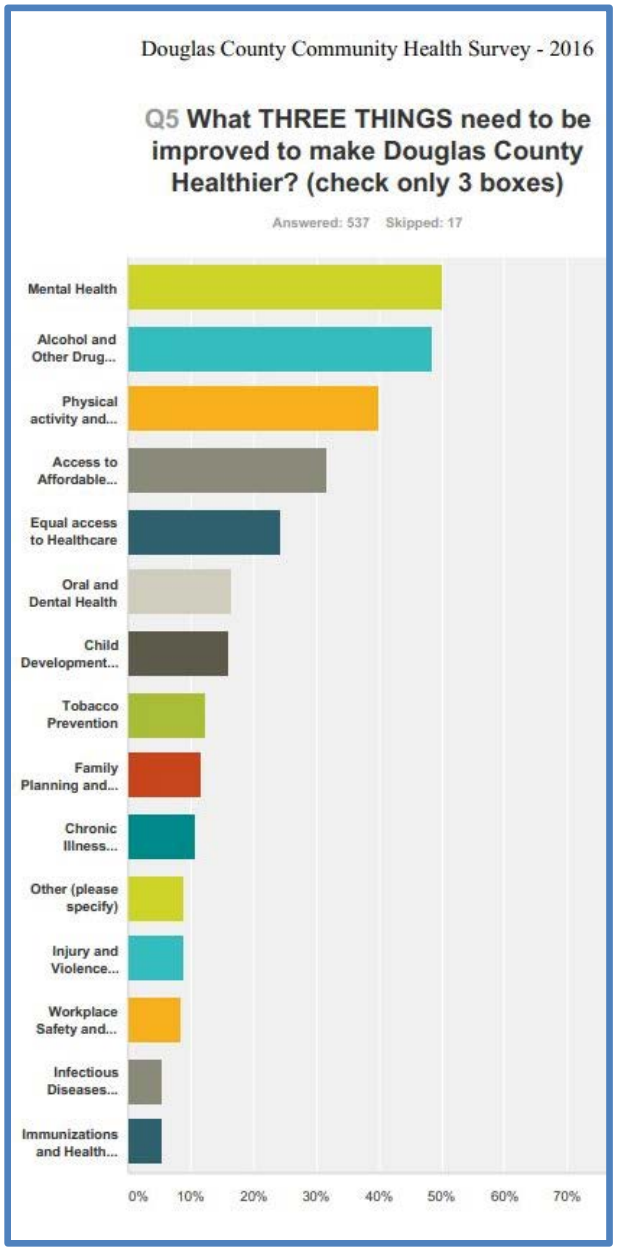


active. A bicycle is one of the most efficient and effective tools to overcome the barrier of time and distance, since the majority of trips people make are within three miles.

Regular physical activity reduces the risk for certain chronic diseases including high blood pressure, stroke, coronary artery disease, type 2 diabetes, obesity, colon cancer and osteoporosis. Furthermore, the built environment and overall environment can either be detrimental or helpful people being active.

Local public health organizations, including county public health departments and hospitals, routinely undertake a community health needs assessment to determine the health priorities for the area and devise strategies to address these health needs. The two counties that cover the MIC area, St. Louis County in Minnesota and Douglas County in Wisconsin, are leaders in these efforts and helped put together a community health improvement and implementation plan. In St. Louis County, the Community Health Needs Assessment and Implementation Plan identified four priority areas, one of which being "Obesity, including lack of access to healthy foods and physical activity." The plan has a goal of reducting the rate of obesity. Douglas County's plan has a goal to increase healthy eating and physical activity to reduce overweight/obesity of Douglas County residents. Both plans call for increasing opportunities for people to be physically active as one of the key measures to improve healthy outcomes.

Over the last 10 years, significant progress has been made, including in the Twin Ports to make it better for people to bicycle. Bicycle transportation facilities have been expanded, communities are redesigning streets with people who bicycle in mind,



bicycle support facilites are being installed, including bike route wayfinding signage, bike fix-it repair station, bike racks and bike share system. Local governments are pioneering to innovate new bikeway designs. In addition, there are now national guidance documents for designing bikeways, through Federal Highway (FHWA) and National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide.

With all that is happening, it is time to consider this renewed focus on the unique situation of urban streets that require innovative treatments. This bikeways plan is focused on this urban viewpoint with solutions.

Planning Process

The Bikeways Plan builds on previous planning efforts completed by the MIC, surrounding jurisdictions, and partner agencies and organizations. There are numerous planning efforts that have informed the development of this plan. The level of detail into which each of these plans gives regarding the bicycle network varies greatly. In addition, a number of bikeway planning efforts have influenced this plan, including the Downtown Duluth Bikeways Audit & Survey, Michigan Street Protected Bikeway Demonstration Project and the various Safe Routes to School plans.

Therefore in 2010, work began to re-think the bikeway system. The MIC worked closely with local partners on this update, in some cases serving in a supporting role and in others as the lead, but all with the intention of incorporating the recommendations and ideas into the updated Bikeways Plan.

Previous Twin Ports Bikeway Planning Initiatives

1975 – Duluth Bikeways Plan (MIC)

1994 – Duluth-Superior Metropolitan Bikeways Plan (MIC)

1998 – Duluth-Superior Metro Area Bikeways Status Report & Implementation Plan (MIC)

2007 – Proctor Master Trails Plan

2010 – Connecting Duluth Report

2011 – Duluth Trail & Bikeway Plan

2014 – Plan for Duluth's Bikeways

2015 – Downtown Duluth Bikeways Audit & Survey

2015 – Hermantown-Proctor Munger Trail Spur

2016 – Duluth Township Trails Plan

2017 – Cross City Trail Mini-Master Plan

2017 – Protected Bike Lane Demonstration Project

2018 – Canosia Township Trails Plan

Upcoming Bikeway Planning Initiatives

2019 – Superior Active Transportation Plan

2019 – Campus Connector Mini-Master Trails Plan

From the very start, a number of big issues arose that really needed a series of separate planning efforts before the bikeways plan update could move forward. These issues were:

- Determination of which streets within the City of Duluth should have space dedicated to bike facilities, particularly bike lanes.
- Final alignment of the Cross City Trail, the backbone trail running the length of Duluth and "closing the gap" connecting between the Munger and Gitchi Gami State Trails.
- Major connecting trails to Proctor, Hermantown and surrounding townships.
- Clarification on the Downtown Duluth bikeway network.
- Update of the bikeway system in Superior (this will be undertaken as part of the Superior Active Transportation Plan).

2010 Connecting Duluth Report – Citizen-driven effort led by Fit City Duluth, conducted a complete bicycle system assessment. The local advocacy organization engaged bicyclists directly in the City of Duluth about where they ride currently and where they would prefer to ride. A series of public meetings were held throughout Duluth to gather this input. A final report detailing preferred routes as well as recommendations was completed.

2011 Duluth Trail & Bikeway Plan – The plan created a vision for trails and bikeways in Duluth for both recreation and transportation purposes. The plan identified a system of transportation routes for bicycling, both on-street and off-street, and provided recommendations on what bikeway type should be installed. The plan also called for additional follow up, including feasibility evaluation, public outreach and a

Duluth Trail & Bikeway Plan - Bikeway System Evaluation

- A largely bike unfriendly on-road environment
- Good base of existing bike routes
- Strong tourism market
- Tremendous resources - terrain, lake, river, views, natural areas, four season climate, etc.
- Positive Complete Streets policy
- Few paved trails and no bike lanes
- Few and hidden trailheads
- Challenging terrain and climate
- Need for off-street paved trails and on-street bike lanes
- Need for a bikeway advocacy group to promote road biking
- Need for bikeway connections to downtown, schools and commercial areas
- Safe, dedicated bike facilities (lanes, sharrows and bike parking) as needed downtown

site specific design process, for each of these improvement projects. Some improvements involve simple addition of signage and pavement markings, others may be part of a larger road reconstruction, and some may require removal of on-street parking.

2013-14 – Plan for Duluth's Bikeways Duluth undertook an extensive evaluation of the recommended bikeways from past planning efforts. Another round of public meetings were held to gather input and revise a plan for bikeways. A final public meeting was held, then the plan was brought through the formal city processes, including approval from Planning Commission and Duluth City Council.

2015-19 – Duluth-Superior Metropolitan Bikeways Plan Update – The planning efforts for this project began in 2015. The process moved slowly as a number of big issues arose and needed to be worked through before proceeding. These issues included determining the final alignment of the Cross City Trail, the backbone trail running the east-west length of Duluth at the bottom of the hill as well as providing the key connection between existing and planned trails from the Twin Cities to Grand Marais. In addition, planning efforts took place to determine where bikeways would be placed in Downtown Duluth and the UMD campus. As these locations are the two of the largest generators of traffic in the region, it was key to gain a more clear direction on bikeways through these areas.

Duluth-Superior Metro Bikeways Plan – a Multi-Year Planning Process

2015: Early engagement with MIC committees and Policy Board and targeted general public and issue analysis.
- Perspective on Bicycling Survey
- Visioning exercise
- Identification of gap areas worksheet
- Superior Bikeways Public Meeting
- Downtown Duluth Bikeways Audit & Survey

2016: Review of feedback and prior plans and outreach to local groups and organizations.
- Trouble Spots Survey
- Cross City Trail Master Plan

2017 - Technical Review, analysis and mapping
- Protected Bike Lane Demonstration Project

2018 - Drafting of Plan
- Public Open House
- Roadway Jurisdiction Vetting
- Draft Review & Comment Period
- Draft Plan Public Meeting

2019 – Final Revisions & Approval

Chapter 2: PLAN GOALS AND STRATEGIES

Vision

The Duluth-Superior Metropolitan Area is a great place for people to bicycle all year, whether for a trip to the grocery store or a ride along the trail to get to school or work. This can be seen in the numbers of people who are out and about on a bike, regardless of the season. Many days see multitudes of people using bike facilities going to work or school on a weekday morning, or enjoying a family trip on a weekend, taking in a major event or just heading over to a friend's house.

Goals

1. Bicycle transportation facilities are fully integrated into a seamless multimodal transportation system and are treated as an equal.
2. Safe, convenient and efficient bikeway system for people of all ages and experience levels to go about their daily activities all year by bicycle if they choose.
3. Location, type and design of bicycle transportation facilities are determined utilizing evidence based solutions and appropriate land use.
4. Work in a common effort to investigate and address bicycle transportation needs through the development and promotion of the Metropolitan Bikeways Plan.
5. Increase opportunities to be physically active as part of everyday routine to reduce physical inactivity and subsequant associated negative health outcomes.
6. Design should consider and strive to be for all ages and abilities.

State Bikeway Plan Goals

Minnesota Statewide System Bicycle Plan

Plan goals are to increase:

- Safety and comfort - Build and maintain safe and comfortable bicycling facilities for people of all ages and abilities
- Local bicycle network connections - Support regional and local bicycling needs
- State bicycle routes - develop a connected network of state bicycle routes with partners
- Ridership - increase ridership of people who already bicycle and people who don't

Wisconsin Bicycle Transportation Plan

Plan goals are to increase mobility, choice, safety & connectivity and specifically:

- Increase level of bicycling
- Reduce crashes

Strategies – 5 e's

Engineering

- As part of a bikeway project, consider streetscaping opportunities that create a sense of place and mitigate environmental issues.
- Consider improving the bikeway network even as part of smaller scale projects such annual re-striping, signal timing adjustments, and/or utility repair projects.
- Offer more frequent and ongoing training opportunities in design, planning, and public engagement accommodating bicyclists for engineering and planning staff.
- Work with jurisdictions to develop a standard practice for bicycle parking for general public use across the region.
- Ensure that standards for bicycle parking conform to Association of Pedestrian and Bicycle Professionals (APBP) guidelines.
- Consider methods to mitigate key risk areas for cyclists, including but not limited to adding traffic calming where speeding is an issue, minimizing where possible door zones, right-hooks, etc., and adding clarity to all roadway users to reduce confusion with who has the right-of-way.
- Implement more transportation policies and programs that encourage multi-modal transportation choices, such as no minimum car parking standards or shared parking allowances to complement your community's infrastructure investments and programs.
- Adequately maintain the on-and-off-road bicycle infrastructure to ensure usability and safety.

The Healthiest Wisconsin 2020 Objectives for Physical Activity Include:

- By 2020, increase physical activity for all through changes in facilities, community design and policies.
- By 2020, every Wisconsin community will provide safe, affordable and culturally appropriate environments to promote increased physical activity.
- By 2020, every Wisconsin community will provide safe, affordable and culturally appropriate environments to promote increased physical activity for individuals among populations of differing races, ethnicities, sexual identities and orientations, gender identities, and educational or economic status.

- Proactively identify and develop solutions to physical barriers and bikeway gaps in order to provide convenient bicycle access to all parts of the community.
- Develop a system of bicycle boulevards, utilizing quiet neighborhood streets, that creates an attractive, convenient and comfortable cycling environment welcoming to cyclists of all ages and skill levels.
  Learn how to do it at http://www.ibpi.usp.pdx.edu/guidebook.php.
  Use the Bicycle Boulevards section of the NACTO Urban Bikeway Design Guide for design guidelines.
- Since arterial and collector roads are the backbone of every transportation network, it is essential to provide designated bicycle facilities along these corridors along roadway or parallel route to allow bicyclists of all skill levels to reach their destinations quickly and safely.
- Ensure intersections are safe and comfortable for cyclists. Include elements such as color, signage, medians, signal detection and pavement markings. The level of treatment required for bicyclists at an intersection will depend on the bicycle facility type used, whether bicycle facilities are intersecting, the adjacent street function and land use. See the NACTO design guidelines and the 2012 AASHTO Guide for the Development of Bicycle Facilities for recommended intersection treatments.
- Improve the bicycling and transit connection:
  - Improve bicycle parking at major transit stops where it makes sense to provide bike-supportive infrastructure including bike racks, secure lockers at transfer points between modes at transit centers and bottom of the hill along key corridors.

What to do About the Vertical Challenge —A Long Term Strategy

In Duluth, the hill, which runs the length of the city has a 600+ foot vertical climb from the waterfront and it goes without saying that it's a big barrier to bicycling.

Furthermore, major destinations including colleges (UMD, CSS and LSC), the regional commercial center (the Miller Hill Mall area), and a growing residential and services corridor are all located on top of the hill means this barrier cannot be ignored.

A variety of solutions have been put into place, including utilizing transit service to bring cyclists and their bicycles back to the top of the hill and identification and wayfinding of the least steep routes to climb the hill by bicycle but more work is needed.

- Consider increasing bike capacity on buses, particularly on longer distance (greater than 3 miles) routes, hill climbing routes, where major gaps exist in the bikeways network or where there are limited alternatives.
- Examine ways for transit to carry non-traditional bicycles (i.e. fat tire bikes, etc).

Education

- Implement the Bicycle and Pedestrian Safe Routes to School curriculum in all schools. Encourage all schools to utilize Walk! Bike! Fun! Curriculum.
- Educated both motorists and cyclists their rights and responsibilities on the road.
- Consider creating volunteer-based Bicycle Ambassador program. Have Ambassadors attend community and private events year-round to talk to residents and visitors of all ages about bicycling and to give bicycle safety. They can also offer bike commuting presentations for area businesses.
- Offer more adult education opportunities at the community centers targeting the 'interested but concerned' bicyclist. Ensure that the curriculum addresses the 'vertical challenge'.
- Host a Traffic Skills 101 or bike commuter course for engineers and planners to help them better understand cyclists' needs. For more information visit: www.bikeleague.org/programs/education/
- Host a League Cycling Instructor (LCI) seminar to increase the number of certified LCIs in the community. Having local instructors will expand cycling education, recruit knowledgeable cycling ambassadors, deliver education to motorists, provide cycling education to motorists, provide cycling education to

- adults and kids, and have experts available to assist in encouragement programs. Visit http://www.bikeleague.org/programs/education/ for more information.
- Start a bicyclist ticket diversion program. Road users given a citation are offered an opportunity to waive fees for violations by attending a bicycling education course. This should include a classroom and on-road components.
- Educate elected officials to ensure adequate funding.
- Educate police departments on bike safety and encourage them to pull over poor cyclists and motorists behavior.

Encouragement

- Support local agencies and organizations with encouragement type events, such as “Open Streets”, “Bike to Work Day”, “Bike to School Day” etc.
- Set up and promote a bicycle-themed community celebration or social ride each time a new bicycle related project is completed. This is a great way to show off the community’s good efforts and introduces new users to the improvement.
- Encourage the UMD, UWS, the hospitals and other local institutions to promote cycling and to seek recognition through the Bicycle Friendly program, incorporating bike share programs, bike co-ops, and cycling education classes.

Enforcement

- Ask police officers to use targeted information and enforcement to encourage motorists and cyclists to share the road safely. This could be in the form of a brochure or tip card explaining each user's rights and responsibilities, such as "A Pocket Guide to Minnesota Bicycle Laws" produced by the Minnesota State Non-Motorized Transportation Advisory Committee.
- Enforcement practices could also include positive enforcement ticketing. Police officers could team up with local stores to reward safe cycling practices.
- Consider, including the cost/benefit, safety amenities such as adequate path lighting and emergency call boxes and offer services such as bike registration and missing bike recovery assistance.
- Support local government efforts to improve cyclist safety.
- Look into effective measures to reduce dangerous driving behaviors, distracted driving, including eliminating cell phone use while operating a motor vehicle, and tackling common harassment including threatening, swerving, and unnecessary honking.

Evaluation

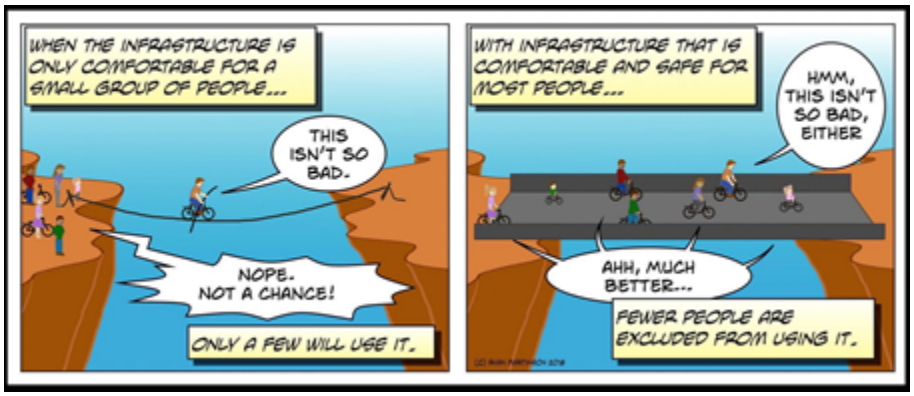
- Consider studying funding spent towards bike infrastructure and the return on investment in order to help guide future bikeway infrastructure investments.
- Conduct official pre/post evaluations of bicycle-related projects in order to study the change in use, car speed and crash numbers. This data will be valuable to build public and political support for future bicycle-related projects.
- Research best practices on creating a target level of bicycle use (e.g. percent of trips) to be achieved within a specific timeframe and ensure data collection necessary to monitor progress.

Chapter 3: PLAN FRAMEWORK

Bikeways Accessible to Everyone

The fundamental premise of this plan and the recommended bicycle network, is to create an environment where people can safely and comfortably bicycle as part of their everyday routine regardless of their age or their skill level at riding a bicycle. The majority of people will not bicycle if they view a route as unsafe, uncomfortable or having to go out of their way.

The Bikeways Plan builds on previous planning efforts both completed by the MIC as well as surrounding jurisdictions and partner agencies and organizations. The level of detail into which each of these plans gives recommendations regarding the bicycle network varies greatly. In addition, a number of bikeway planning efforts that while not officially adopted but none-the-less have informed this plan, including the Connecting Duluth Report, the Downtown Duluth Bikeways Audit & Survey and the Michigan Street Protected Bikeway Demonstration Project.



Design matters when building a bicycle network for people of all ages & abilities.

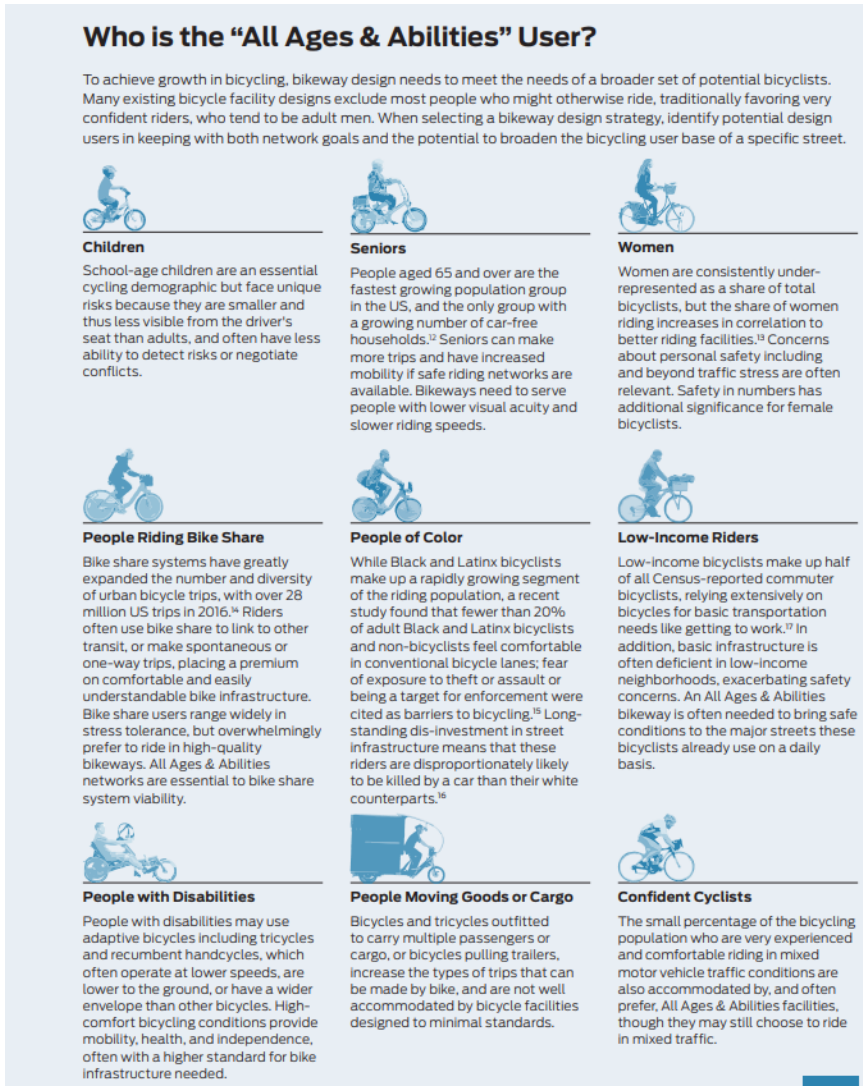
Innovation of urban bicycle infrastructure is transforming urban streets and rapidly expanding bikeway infrastucture in cities across the United States. As new designs are being tried, new resources for urban bikeway design are also becoming widely available, particularly the NACTO guides.

All Ages & Abilities

A central component of this Plan is the focus on "all ages and abilities". What does this mean? This Plan has focused on designing a bikeway system that is available for the vast majority of people to use, regardless of their age, skill level or comfort with riding a bicycle.

In the past, bike planning and in turn infrastructure has focused on the existing cyclists out there on the roads, riding with traffic, usually an adult who is in great physical shape and in good health and is riding for commute to work purposes and/or long distance recreational trips. This Plan has focused on people of all ages and all abilities and their numerous transportation trips made as part of their everyday routine.

NACTO has provided a clear and concise definition for "All Ages & Abilities" that this Plan is using as its definition.



Source: NACTO Designing for All Ages & Abilities – December 2017

Bicycle Network Framework

All ages & abilities. – for people who have the physical ability to ride a bicycle, regardless of this level of skill.

Everyday Routine - For people traveling for their everyday routine activities—daily trips including commute to work, school, grocery store, shopping, visiting family or friends etc.

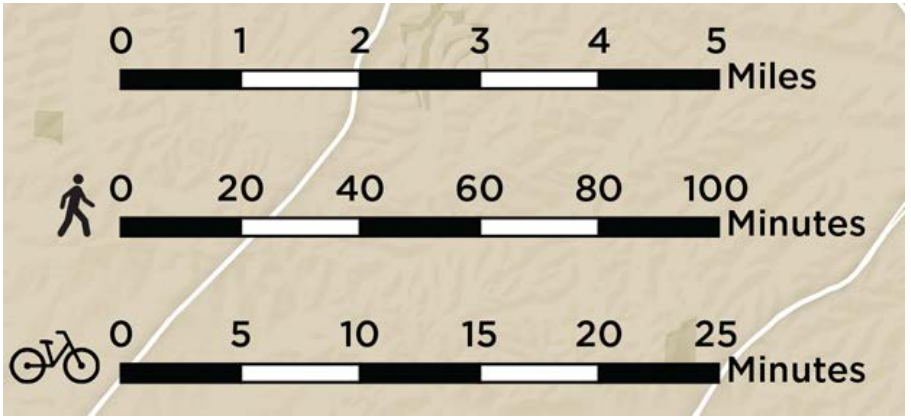
Shorter Distances - for people traveling shorter distances—focus on trips less than 3 miles. The distance that most people will shift modes from a bicycle to a motor vehicle are for distances greater than 3 miles. In addition, the majority of all trips people make regardless of mode is less than 3 miles in distance each way.

Plan Framework – focus on 3 principles:

1. **All Ages & Abilities**
2. **Everyday Routine**
3. **Short Trips**

Trip Generation – Design for everyday routine

The most frequent criticism heard about bicycle infrastructure is that "no one uses it". This concern over bicycle infrastructure, including installing bike lanes on the street as well as bike racks for parking, limits the amount of infrastructure that is put into place. Even if the infrastructure is put into place, the question arises about whether or not this infrastructure really only serves a small



number of people and is that benefit worth the costs. Of course, there are other value judgments being made here as well, maintaining the status quo of a car orientated society. Largely that the built environement should continue to focus on making it easier and more convenient to drive a car, at the expense of the other modes.

Bikeways Route Planning - Decision-making Criteria

Route selection is critical. Bikeways will under-perform or not work at all when routing is illogical, require frequent or unnecessary stopping,or require shared lane usage on roadways with high traffic speeds and volumes.

As part of designating a system of preferred routes, candidate routes were selected based on following criteria:

1. Low-stress bikeway network – continuous and direct route.
2. Designed with the end user in mind, people who are riding bicycles for transportation (not recreation).
3. Trips – design for people making a variety of trips (majority) and not only the commute to work trip.
4. Slope – avoid steep grades
    a. Any roadway or path with a grade greater than 8% must be avoided (not reasonable).
    b. Any roadway or path with a grade between 5-8% can be a bikeway for only 1 consecutive block if no other option is available.

5. Public Health - designed to for people to conduct their activities via bicycle as part of their everyday routine (Focus on 2-5 miles or the length of a typical urban bicycle trip.)
6. All ages and all abilities network – building a system that the largest number of people can utilize not just the confident road cyclists.
7. Direct access to destinations:
    a. Public School – where attendance is required by law.
    b. Public transit centers and stations
    c. Civic & Community Institution (town hall, city hall, county courthouse)– places where public decisions are made i.e. places where public meetings are held.
    d. Food Distribution– places where people purchase or pick up food
    e. Commercial destination centers
    f. Medical Facilities – hospitals, doctor's office, pharmacy
    g. Recreational places – parks and trails
    h. Strategic connections
    i. Desire line for bicyclists – closely follow a desire line for bicycle travel

Bikeway Facility Types

In general – here are the bikeway facility options available:

Bike Lanes

Conventional Bike Lanes- The bike lane is located adjacent to motor vehicle travel lanes and flows in the same direction as motor vehicle traffic. Bike lanes are typically

on the right side of the street, between the adjacent travel lane and curb, road edge, or parking lane. This facility type may be located on the left side when installed on one-way streets, or may be buffered if space permits.

Buffered Bike Lanes- Buffered bike lanes are conventional bicycle lanes paired with a designated buffer space separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane.

Contra-Flow Bike Lanes- Contra-flow bicycle lanes are bicycle lanes designed to allow bicyclists to ride in the opposite direction of motor vehicle traffic. They convert a one-way traffic street into a two-way street: one direction for motor vehicles and bikes, and the other for bikes only. Contra-flow lanes are separated with yellow center lane striping. Combining both direction bicycle travel on one side of the street to accommodate contra-flow movement results in a two-way cycle track.

Left-Side Bike Lanes- Left-side bike lanes are conventional bike lanes placed on the left side of one-way streets or two-way median divided streets.

Protected Bike Lanes (also called Separated Bike Lanes or Cycle Tracks)

One-Way Protected Bike Lane - one-way protected cycle tracks are bikeways that are at street level and use a variety of methods for physical protection from passing traffic. A one-way protected cycle track may be combined with a parking lane or other barrier between the cycle track and the motor vehicle travel lane.

Raised Protected Bike Lane - raised cycle tracks are bicycle facilities that are vertically separated from motor vehicle traffic. Many are paired with a furnishing zone between

the cycle track and motor vehicle travel lane and/or pedestrian area. A raised cycle track may allow for one-way or two-way travel by bicyclists.

Two-Way Protected Bike Lane - two-way cycle tracks (also known as protected bike lanes, separated bikeways, and on-street bike paths) are physically separated cycle tracks that allow bicycle movement in both directions on one side of the road. Two-way cycle tracks share some of the same design characteristics as one-way tracks, but may require additional considerations at driveway and side-street crossings.

Bicycle Boulevards

Route Planning- Direct access to destinations

Route selection for bicycle boulevards is critical. Bicycle boulevards will not work if they are routed in illogical ways, if they require frequent or unnecessary stopping, or if they follow higher traffic speed and volume roadways. Bicycle boulevards have the potential to play a key role in a low-stress bikeway network, as they can complement, and provide strategic connections between, off-street paths, cycle tracks and bike lanes.

Support Facilities

Signs and Pavement Markings- Easy to find and to follow

Signs and pavement markings create the basic elements of a bicycle boulevard. They indicate that a roadway is intended as a shared, slow street, and reinforce the intention of priority for bicyclists along a given route. Signs and pavement markings

alone do not create a safe and effective bicycle boulevard, but act as reinforcements to other traffic calming and operational changes made to the roadway.

Speed Management- Slow motor vehicle speeds

Speed Management measures for bicycle boulevards bring motor vehicle speeds closer to those of bicyclists. Reducing speeds along the bicycle boulevard improves the bicycling environment by reducing overtaking events, enhancing drivers' ability to see and react, and diminishing the severity of crashes if they occur. Speed management is critical to creating a comfortable and effective bicycle boulevard.

Volume Management- Low or reduced motor vehicle volumes

Volume Management measures reduce or discourage thru traffic on designated bicycle boulevard corridors by physically or operationally reconfiguring select corridors and intersections along the route. On roadways with shared travel lanes such as bicycle boulevards, motor vehicle traffic volumes significantly impact bicyclist comfort. Higher vehicle volumes decrease comfort and may lead to a greater potential for conflicts, as well as a loss of perceived safety.

Minor Street Crossings- Minimal bicyclist delay

Minor Street Crossings for bicycle boulevards typically involve the intersection of two residential or local streets with low motor vehicle volumes and speeds. At intersections with local streets and minor collectors, bicycle boulevards should have right-of-way priority and reduce or minimize delay by limiting the number of stop signs along the route. Stretches of at least a half mile or more of continuous travel without stop sign control are desirable.

Major Street Crossings- Safe and convenient crossings

Major street crossings may pose a significant barrier the effectiveness and quality of a bicycle boulevard. Treatments of high quality should be selected to mitigate these barriers.

Offset Intersections- Clear and safe navigation

Offset Intersections are junctions at which two streets in a designated bicycle boulevard corridor align asymmetrically with an intersecting roadway. Since bicycle boulevards typically utilize local streets, bicyclists are likely to encounter discontinuities in the street grid that require them to turn briefly onto another street before resuming their original direction. Offset intersection treatments are categorized into treatments for major street crossing and treatments for minor street crossings.

Green Infrastructure- Enhancing environments

Incorporating green infrastructure into transit street design can improve water quality, detain stormwater flows, reduce the volume of stormwater runoff, and relieve burden on municipal water treatment systems.

Intersections

Bike Boxes- A bike box is a designated area at the head of a traffic lane at a signalized intersection that provides bicyclists with a safe and visible way to get ahead of queuing traffic during the red signal phase.

Intersection Crossing Markings- Intersection crossing markings indicate the intended path of bicyclists. They guide bicyclists on a safe and direct path through intersections, including driveways and ramps. They provide a clear boundary between the paths of through bicyclists and either through or crossing motor vehicles in the adjacent lane.

Two-Stage Turn Queue Boxes- Two-stage turn queue boxes offer bicyclists a safe way make left turns at multi-lane signalized intersections from a right side cycle track or bike lane, or right turns from a left side cycle track or bike lane. Two-stage turn queue boxes may also be used at unsignalized intersections to simplify turns from a bicycle lane or cycle track, as for example, onto a bicycle boulevard. At midblock crossing locations, a two-stage turn queue box may be used to orient bicyclists properly for safe crossings. Multiple positions are available for queuing boxes, depending on intersection configuration.

Median Refuge Island- Median refuge islands are protected spaces placed in the center of the street to facilitate bicycle and pedestrian crossings. Crossings of two-way streets are facilitated by allowing bicyclists and pedestrians to navigate only one direction of traffic at a time. Medians configured to protect cycle tracks can both facilitate crossings and also function as two-stage turn queue boxes.

Through Bike Lanes- For bicyclists traveling in a conventional bike lane or from a truncated cycle track, the approach to an intersection with vehicular turn lanes can present a significant challenge. For this reason it is vital that bicyclists are provided with an opportunity to correctly position themselves to avoid conflicts with turning vehicles.

Combined Bike lanes/ Turn Lane- A combined bike lane/turn lane places a suggested bike lane within the inside portion of a dedicated motor vehicle turn lane. Shared lane markings or conventional bicycle stencils with a dashed line can delineate the space for bicyclists and motorists within the shared lane or indicate the intended path for through bicyclists.

Cycle Track Intersection Approach- The approach to an intersection from a cycle track should be designed to reduce turn conflicts for bicyclists and/or to provide connections to intersecting bicycle facility types. This is typically achieved by removing the protected cycle track barrier or parking lane (or lowering a raised cycle track to street level), and shifting the bicycle lane to be closer to or shared with the adjacent motor vehicle lane.

Signals

Bicycle Signal Heads- A bicycle signal is an electrically powered traffic control device that should only be used in combination with an existing conventional traffic signal or hybrid beacon.

Signal Detection and Actuation- Bicycle detection is used at actuated signals to alert the signal controller of bicycle crossing demand on a particular approach. Bicycle detection occurs either through the use of push-buttons or by automated means (e.g., in-pavement loops, video, microwave, etc).

Active Warning Beacon for Bike Route at Unsignalized intersection- Active warning beacons are user-actuated amber flashing lights that supplement warning signs at unsignalized intersections or mid-block crosswalks. Beacons can be actuated either manually by a push-button or passively through detection.

Hybrid Beacon for Bike Route Crossing of Major Street- A hybrid beacon, also known as a High-intensity Activated Crosswalk (HAWK), consists of a signal-head with two red lenses over a single yellow lens on the major street, and pedestrian and/or bicycle signal heads for the minor street.

Signing and Marking

Colored Bike Facilities- Colored pavement within a bicycle lane increases the visibility of the facility, identifies potential areas of conflict, and reinforces priority to bicyclists in conflict areas and in areas with pressure for illegal parking.

Shared Lane Markings- Shared Lane Markings (SLMs), or "sharrows," are road markings used to indicate a shared lane environment for bicycles and automobiles.

Bike Route Wayfinding- A bicycle wayfinding system consists of comprehensive signing and/or pavement markings to guide bicyclists to their destinations along preferred bicycle routes. Signs are typically placed at decision points along bicycle routes – typically at the intersection of two or more bikeways and at other key locations leading to and along bicycle routes.

Chapter 4: BICYCLE NETWORK

The bicycle network was based on the following route selection criteria. The directness of the routes as well as the severity of slope have all been considered in route selection. In addition, population density and common destinations and activity hubs, whether they be schools, community centers, areas with large clusters of jobs and business districts have all been identified as key areas for bikeways. Distance plays a key role in this plan as well. Most bicyclists will not travel further than three miles per trip as part of their everyday routine. Therefore, the plan focuses on shorter distance trips. However, the plan does include the longer distance routes that connect between the major hubs. In the end, these bikeways have been devised not just for the small percentage of people who are comfortable riding with motor vehicles with no separation or protection, but for people of all ages and abilities who would bicycle if there were safe and comfortable routes available to them.

All streets were mapped out based on their percent grade.

- 9% grades—bike routes on streets with slopes greater than 9% were only considered if there was no reasonable alternative, but would continue for no more than one block in length.
- 12% grades—bike routes on streets with slopes greater than 12% were not considered as it is too extreme of grades to climb for regular transportation.

Bike Lane on Tower Avenue in Superior, WI. Commercial districts are regular destinations for people, and ideally set up to move around via a bicycle due to the close distances among destinations.

Existing Bikeways System—All Ages & Abilities

The existing bikeways system depicts the routes that serve people of all ages and abilities currently. These routes take into account the type of bikeway, volume of traffic, speed of traffic and width of bikeway. Routes with existing wayfinding signage or bikeway pavement markings were not automatically included in this existing bikeway system map. For example, Kenwood Avenue in Duluth and 28th Street in Superior have sharrows marked on the pavement, yet both are excluded from this as neither bikeway is an all ages & abilities. Both streets have a high enough traffic volume that precludes it from being included. For reference, see the NACTO guide on "Designing for all ages and abilities".

There are over 50 gaps in the existing bikeways network. The majority of these gaps have alternate routes available on streets with low traffic volumes and low speeds. However, some routes have no reasonable alternative for a person bicycling as part of their everyday routine.

Existing Bikeways System Characteristics:

- Signed Shared Lanes = 73 miles
- Conventional Bike Lanes = 5 miles
- Bikeable Shoulders = 218 miles
- Multi-use Paths = 25 miles
- Seasonal Multi-use = 65 miles

Total Mileage of Existing Bikeways = 386 miles

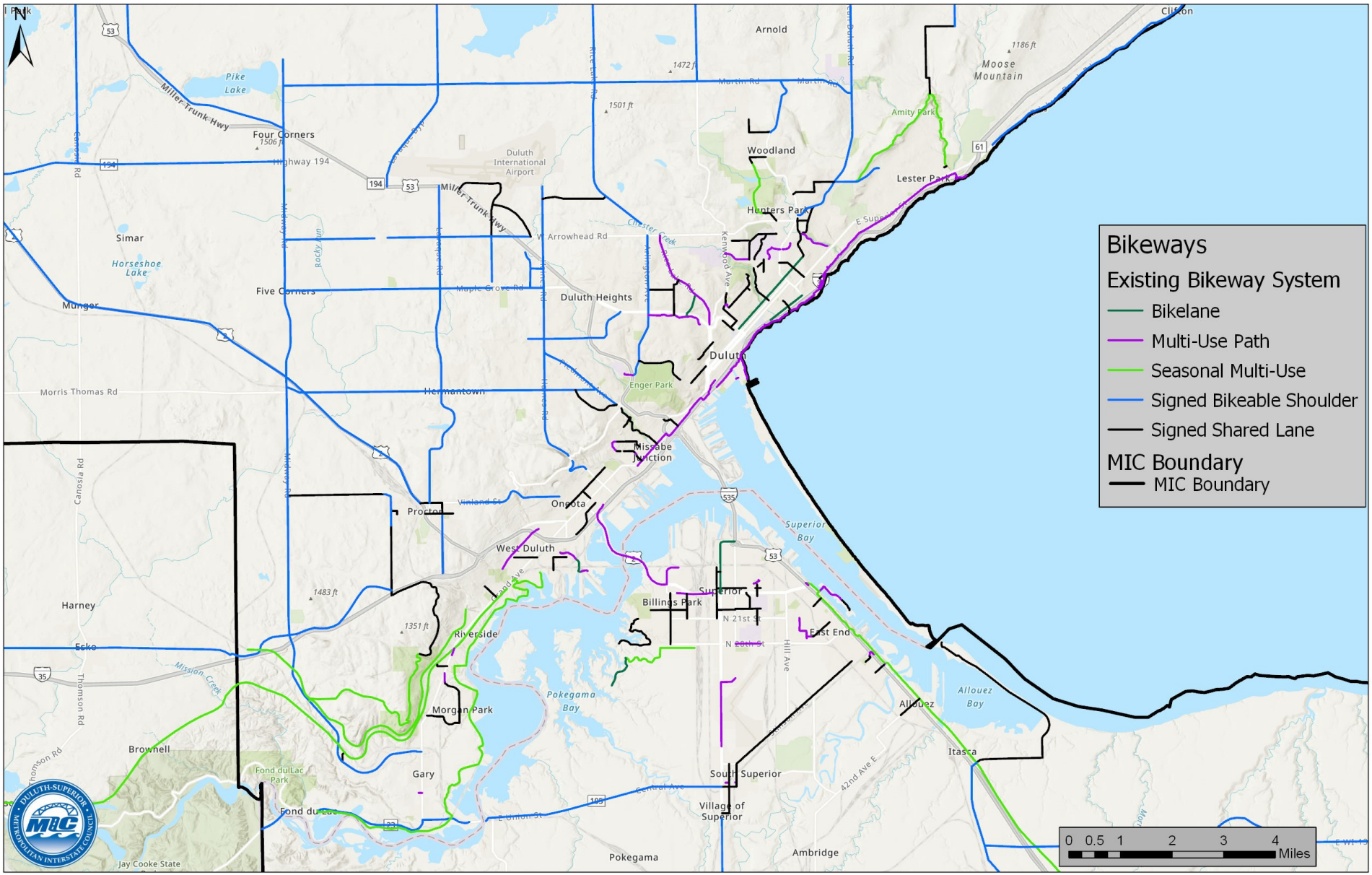
Close the gaps, sooner than later

A list of the major gaps has been created. These are the top places to focus resources on closing these gaps as soon as possible. With time being of essence, solutions to closes these gaps may include trying out pilot projects or interim projects until a roadway is scheduled for major work or funding becomes available.

Existing Major Gaps in the Bikeway System

- London Rd/Superior St—between 6th Ave West to 14th Ave E and 21st Ave E to 26th Ave E
- Lake Ave —Superior Street to Lift Bridge
- St. Marie St—from Vermillion Rd to Carver Ave
- Downtown Superior to UWS—Tower Ave to Catlin Ave
- Grand Ave—63rd Ave W to Central Ave
- Central Entrance—Basswood Ave to Decker Rd
- Proctor—along 2nd Street from Hwy 2 to 9th Ave
- Arrowhead Rd—from Kenwood Ave to Haines Rd
- Woodland Ave—from 21st Ave E to Anoka St
- Ugstad—Falcon Dr to Roosevelt Dr

Existing Bikeway System - All Ages & Abilities



Future Bikeways System—25-year vision

The Future Bikeways System map is a vision of what the system will ideally look like 25 years from today. Is it possible to complete this ambitious vision by then? Over the next 25 years, all major roadways in the area should have some level of improvement, from resurfacing to full reconstruction. This is the optimal time for incorporating bikeway facilities. Therefore, yes it is possible to accomplish this vision.

This plan identifies the existing various bikeway types as well as calls for new bikeways on streets that do not currently have one.

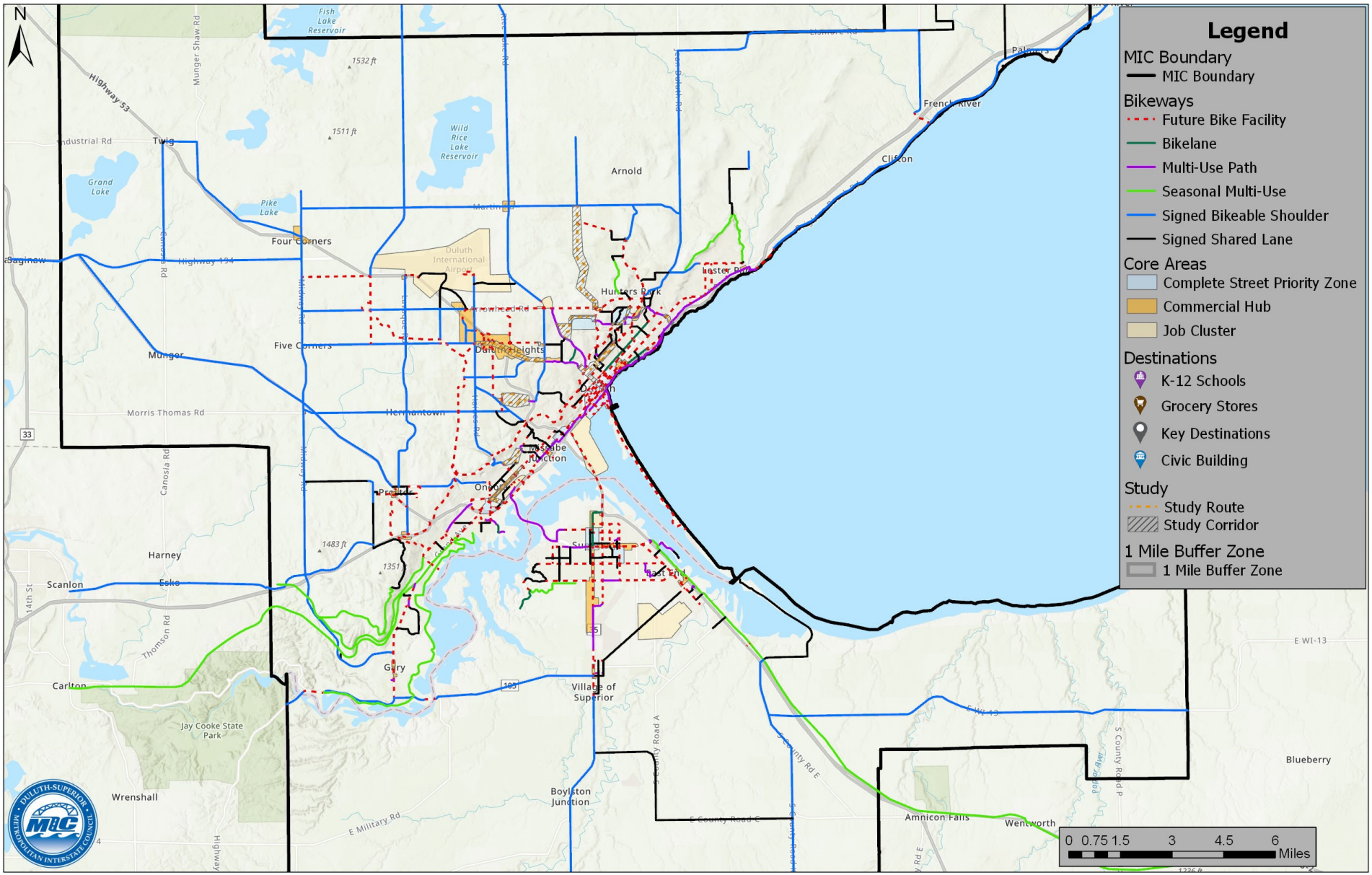
Trip Generation—Activity Hubs

With a focus of this plan on shorter distance trips, all the major commercial and neighborhood hubs and job clusters have been identified in this plan. The following series of maps depicts each hub and the recommended routes in that hub. Most bicycle trips people will take are shorter distances and therefore focusing on and improving the routes with each hub area is priority.

Future Network Considerations

- London Rd
- Lester River road
- Pitt St
- 3rd Street
- 6th Street
- Piedmont Ave
- Main St / N 5th St Superior
- Downtown, Observations, Vertical Transportation Needs

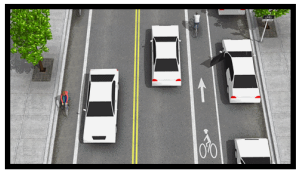
Future 2045 Bikeways Map—25 year vision



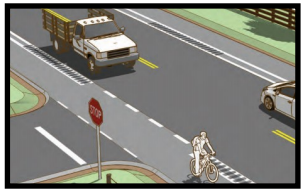
Bikeway Types

Future Bikeway Facility—this is any bicycle route, on or off-street, that will require some level of reconfiguration of the existing roadway. Determination of the particularly facility type will be made at the time of the project, and could possibly include pilot or interim design concepts.

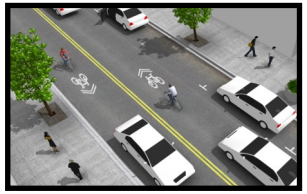
Multi-Use Path—a bike route physically separated from motor vehicle traffic that is a minimum of 8-feet in width (may be narrower in constrained areas and/or expected low level of use) which accommodates multiple self-propelled devices, including but not limited to, pedestrians walking, bicycles, scooters, strollers, skateboards, inline skates, etc.



Bike Lane— a space designated on the street through pavement markings, which restricts motor vehicle usage and parking.



Signed Bikeable Shoulder—a minimum of 3-foot wide shoulder space on the side of a roadway with a low number of existing and/or potential bicyclists. Shoulder width should depend on a number of factors including traffic volumes, speed of traffic and natural topographical challenges.



Signed Shared Lane—a bike route denoted with wayfinding signage and traffic calming features, and may or may not include pavement markings.

Seasonal Multi-Use—an off-street paved or gravel path that is open to cyclists but is not plowed of snow.

Core Areas—areas where there is a density of destinations where people are regularly traveling to and from and where destinations are in close proximity to each other.

Commercial Hub—area where there is a variety of retail and services in close proximity.

Complete Streets Priority Area—area where the active transportation modes (walking, bicycling, transit, etc) are present in high numbers, relative to the region as a whole.

Job Cluster—area with high numbers of employment in close proximity.

1-mile Buffer Zone—area where people would consider active transportation modes to travel as part of every day routine.

Destination—a place where the general public gathers regularly for basic supplies and/or civic functions.

Civic Building—gov't building, library, museum, etc

Grocery Stores—supermarket, convenience stores, markets, etc

K-12 Schools—public schools

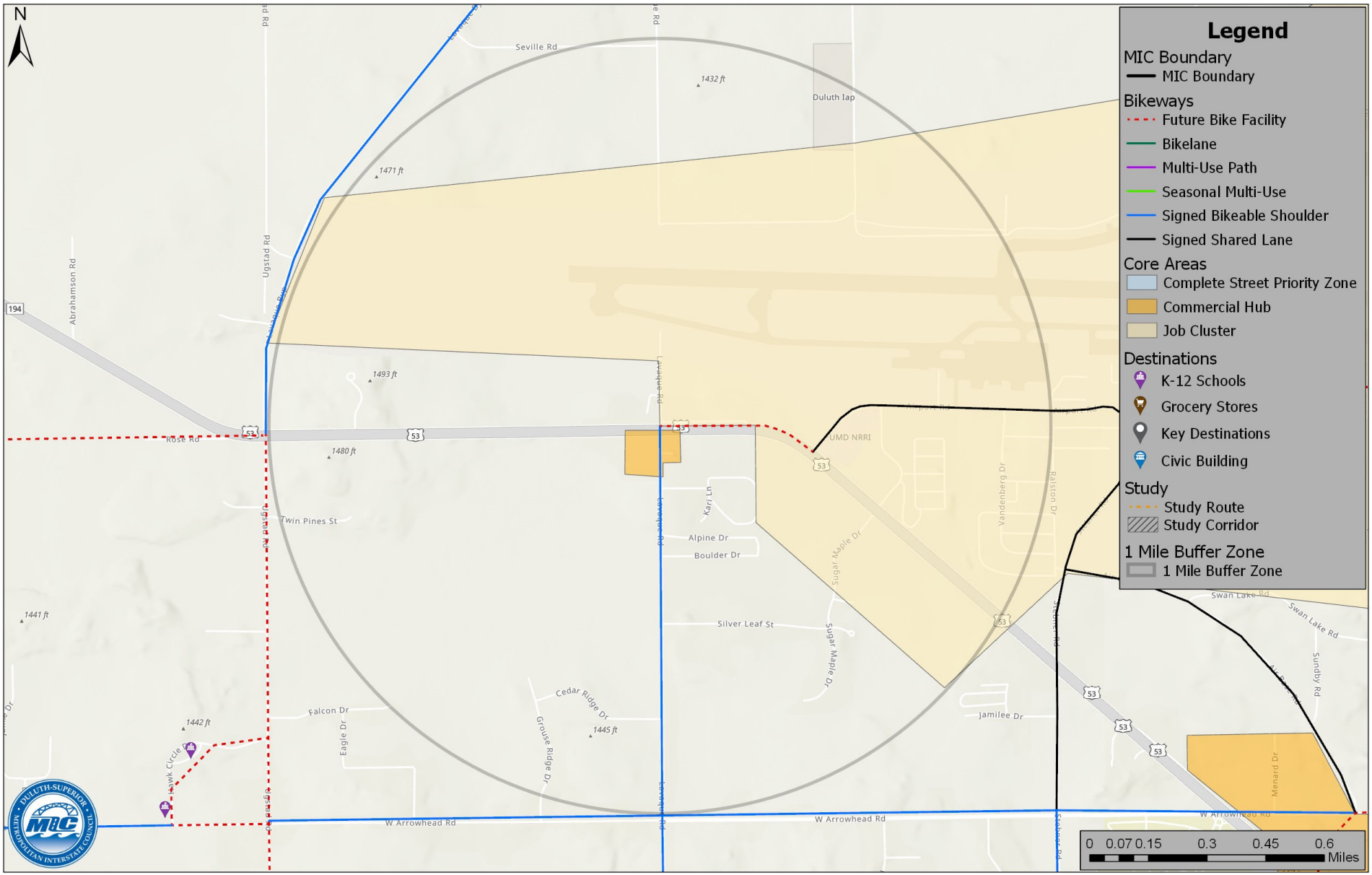
Key Destinations—colleges, medical centers, etc.

Study—an area where further analysis, including engagement with the general public and examination of alignment alternatives is needed to determine the preferred bike route and type.

Study Route—a route alignment to depict the bike route connection being made, but not necessarily the exact route.

Study Corridor—an area where a bike route should be developed, but the exact alignment, including a vetting of the routing alternatives should be further studied.

MAP 4.1: Airport Zone



Airport Zone

Top Priorities

1. Connection to commercial hub at Lavaque Rd & Hwy 53.
2. Airport jobs to hub (closest) Hermantown market plan
3. Airport job cluster to residential areas in Hermantown to the south and Duluth Heights to the east.

One Mile Buffer Population: 1,724

Notes:

The population within this airport zone encompasses a Federal Prison. Of the total population, 629 of the 1,724 are inmates and not potential bicyclists.

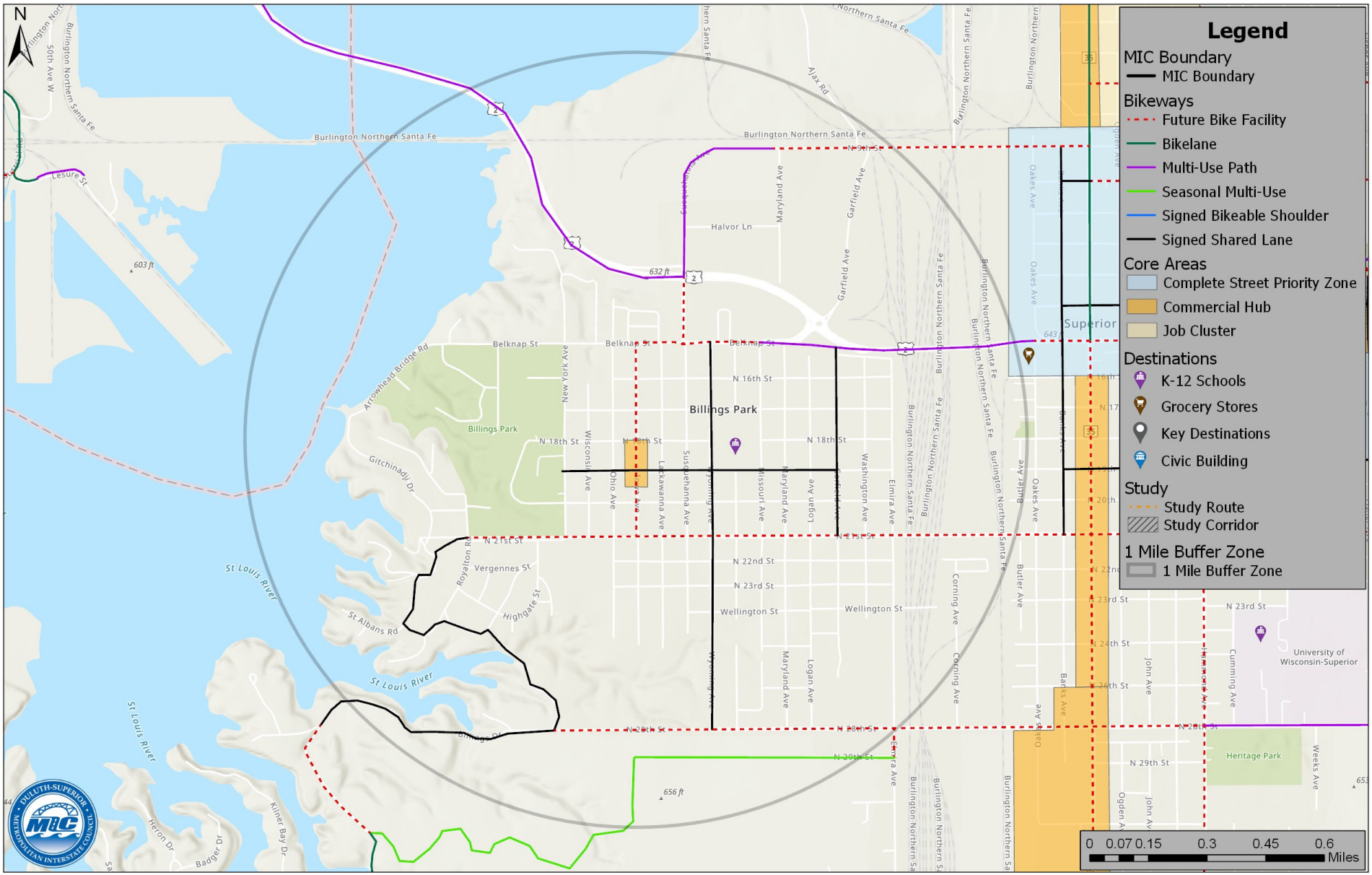
This hub primarily serves the airport area job cluster.

This commercial hub has a cluster of restaurants, banks, retail and medical offices.

Existing Key Gaps

- Hwy 53—Lavaque Rd to Airport Rd
- Arrowhead Rd to Air Base Rd (job cluster)
- Stebner and Haines Rd wayfinding signage directing to job cluster.

MAP 4.2: Billings Park—Superior, Wisconsin



Billings Park—Superior, Wisconsin

Top Priorities

1. Wyoming Ave & 19th St wayfinding and traffic calming on the connections to Cooper Elementary.
2. Belknap St from viaduct to Banks Ave and from Maryland Ave to Susquehanna Ave —widen the multi-use path on the south side.
3. Susquehanna Ave from Belknap to Bong Bridge bike/ped path to end of existing multi-use path at Amsoil driveway.—extend multi-use path.

One Mile Buffer Population: 4,195

Notes:

This hub primarily serves Cooper Elementary School and the surrounding residential area of Billings Park

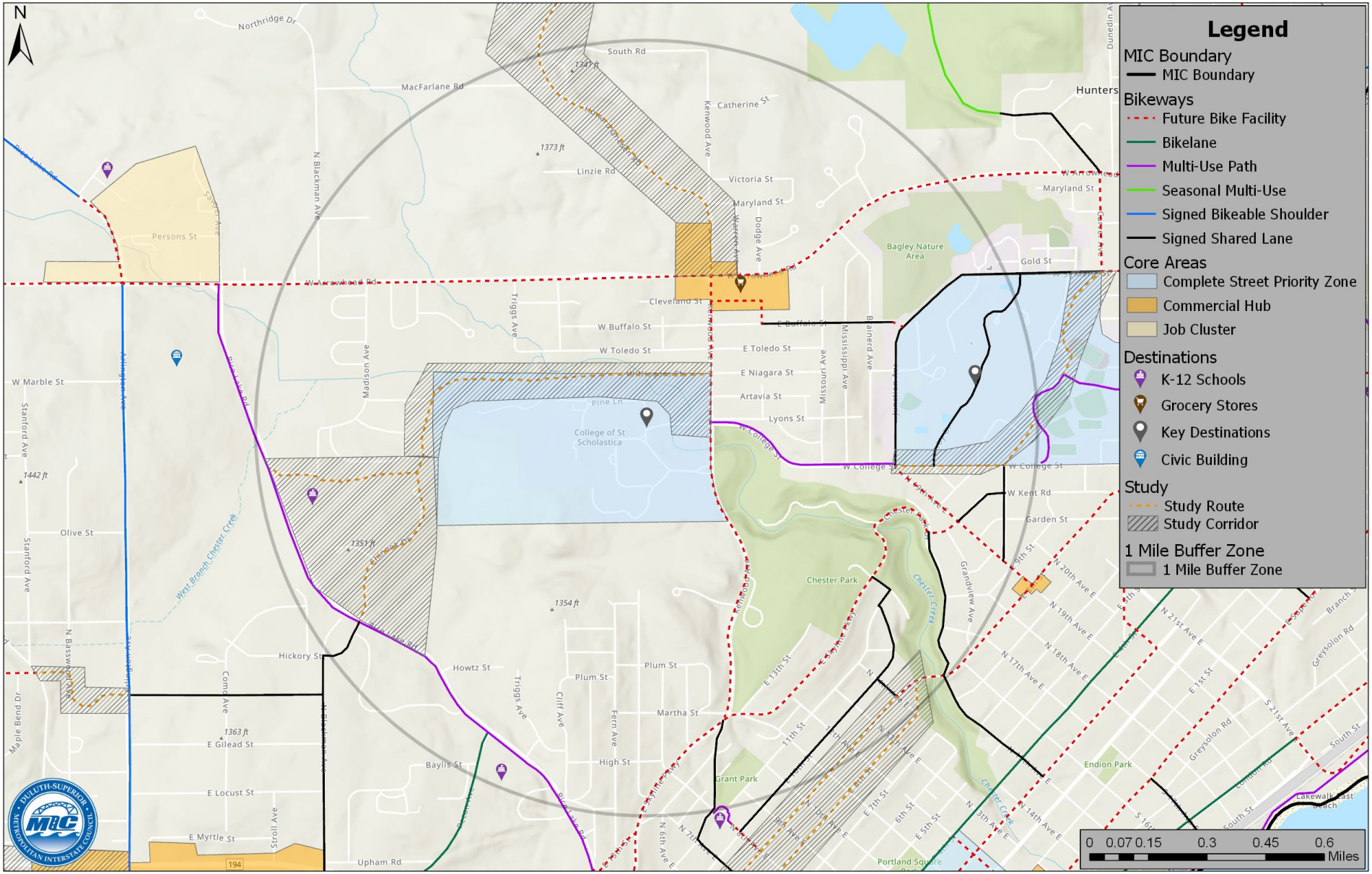
This commercial has a cluster of restaurants and retail.

Allowing Billings Park residents to get around within their neighborhood.

Existing Key Gaps

- N 21st St Bikeway from Tower Ave to Billings Park
- Belknap St from Susquehanna Ave to viaduct
- Iowa Ave from Belknap St to 21st Street.
- Winter St from Maryland Ave to Tower Ave.

MAP 4.3: College of St. Scholastica —Duluth, Minnesota



College of St. Scholastica —Duluth, Minnesota

Top Priorities

1. Extension of trail to CSS campus.
2. Connection to Duluth Heights/ Boulder Ridge/ Rice Lake Rd
3. Lowell school connection with Kenwood Ave.

One Mile Buffer Population: 10,524

Notes:

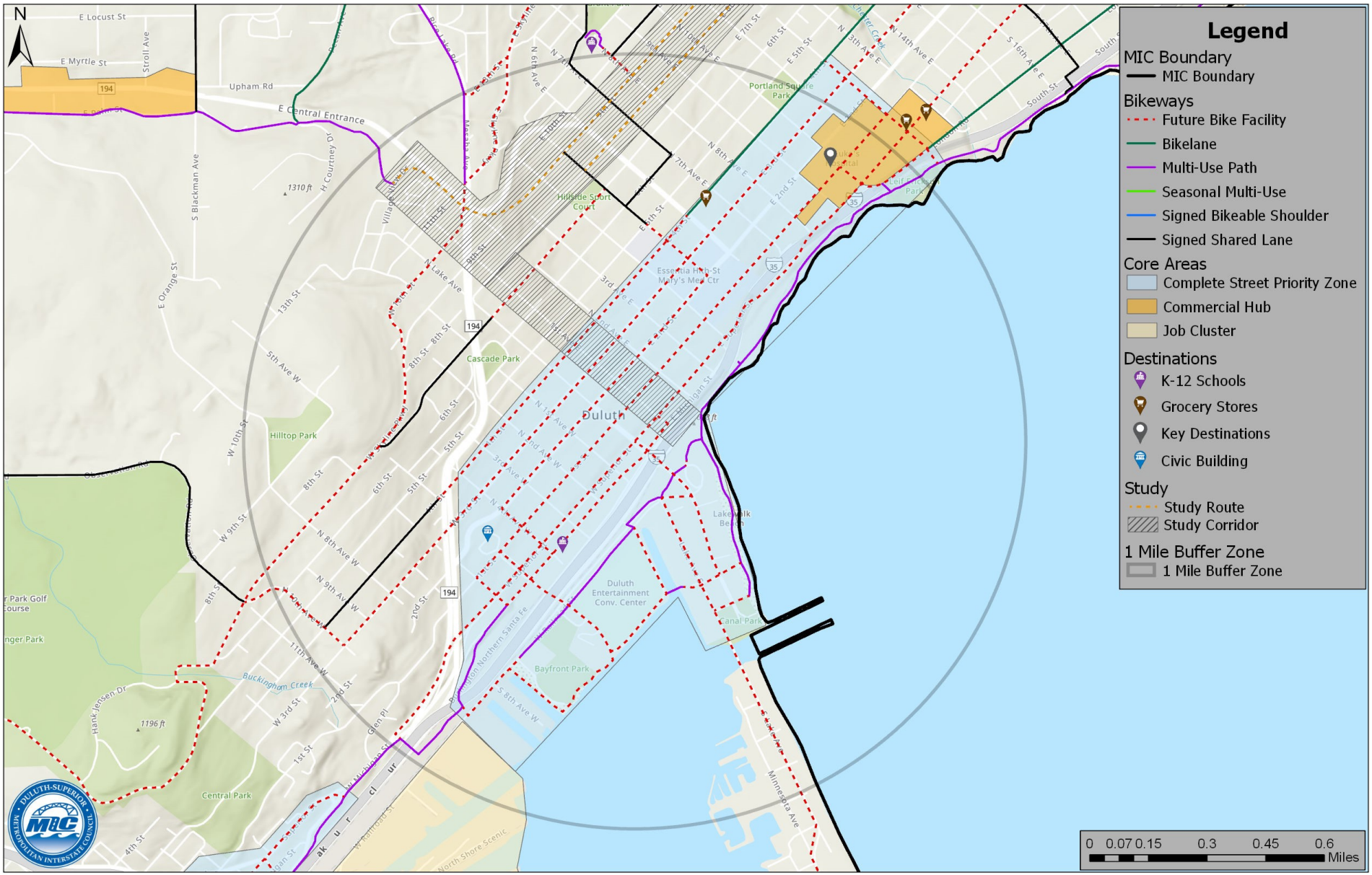
This hub primarily serves the College of St. Scholastica/UMD and residents of the Kenwood area.

This commercial has a cluster of retail, banks, restaurants, grocery stores, and pharmacy.

Existing Key Gaps

- Kenwood Ave between College St and Arrowhead Rd.
- Rice Lake Rd to CSS.
- Bikeway through CSS campus

MAP 4.4: Downtown Duluth



Downtown Duluth

Top Priorities

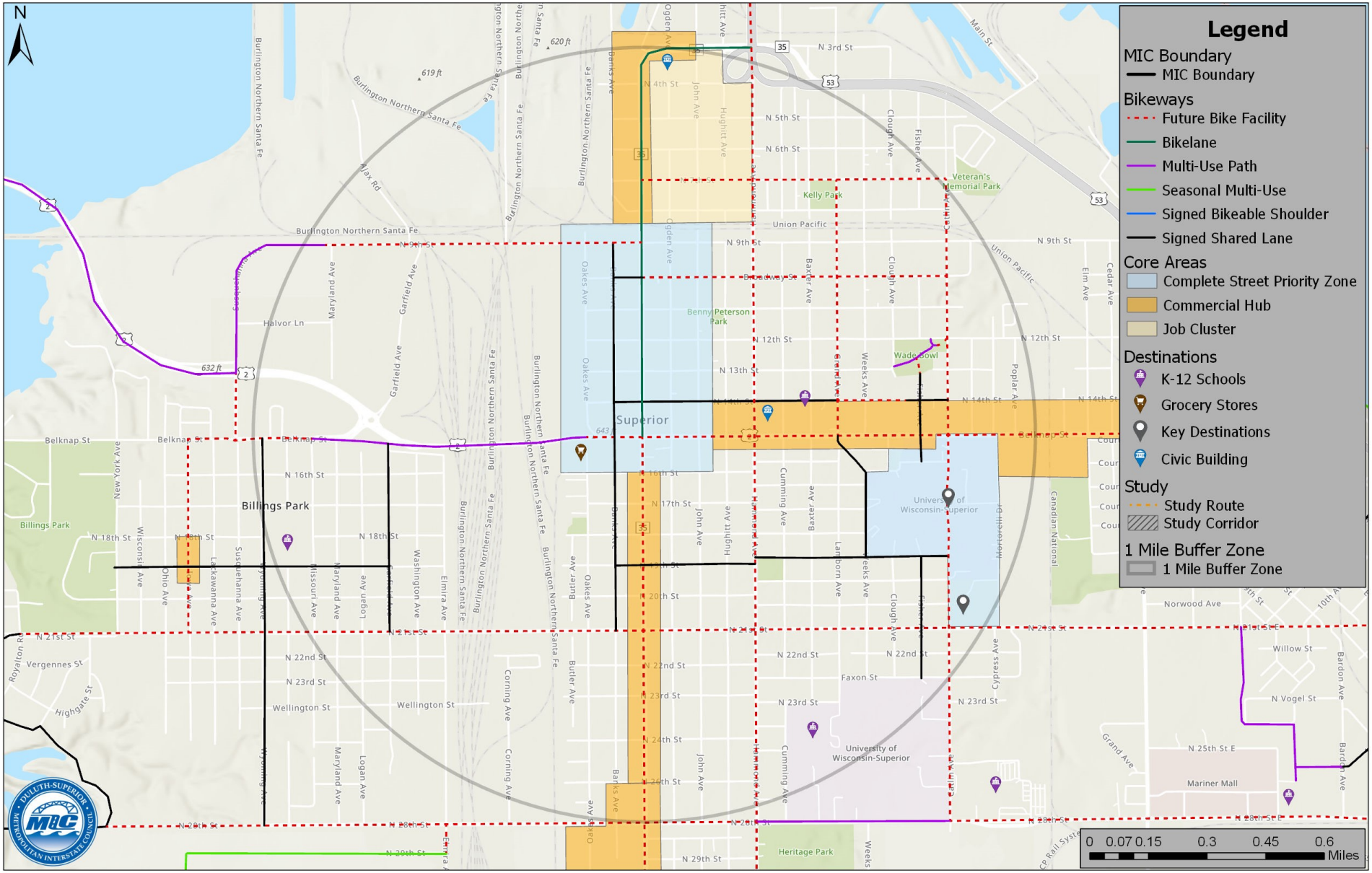
1. Superior St/Michigan St—both east and west directions from downtown Duluth to Lincoln Park and to hospitals, Hillside and Endion neighborhoods.
2. Lake Ave/5th Ave W—Downtown to Waterfront.
3. Hill Climbing Route – 3rd Ave W (DTC) to 2nd St to 5th Ave East to 4th Street.

One Mile Buffer Population: 9,817

Existing Key Gaps

- Superior St/Michigan St from 6th Ave West (CCT Downtown Spur) to 12th Ave E and London Rd
- Lake Ave—Superior Street to Railroad St.
- Vertical Challenge—Superior St to 4th Street (Downtown to Hillside, Observation Hill and Harbor Highlands.
- Superior St/Michigan St from 6th Ave West through Mesaba Ave and to the Superior Street/ Michigan Street split near the M7H gas station.

MAP 4.5: Downtown Superior



Downtown Superior

Top Priorities

1. Belknap – East Downtown to UWS
2. Tower Ave – Library to South
3. Hammond Ave—Belknap St to 28th St.

One Mile Buffer Population: 12,260

Notes:

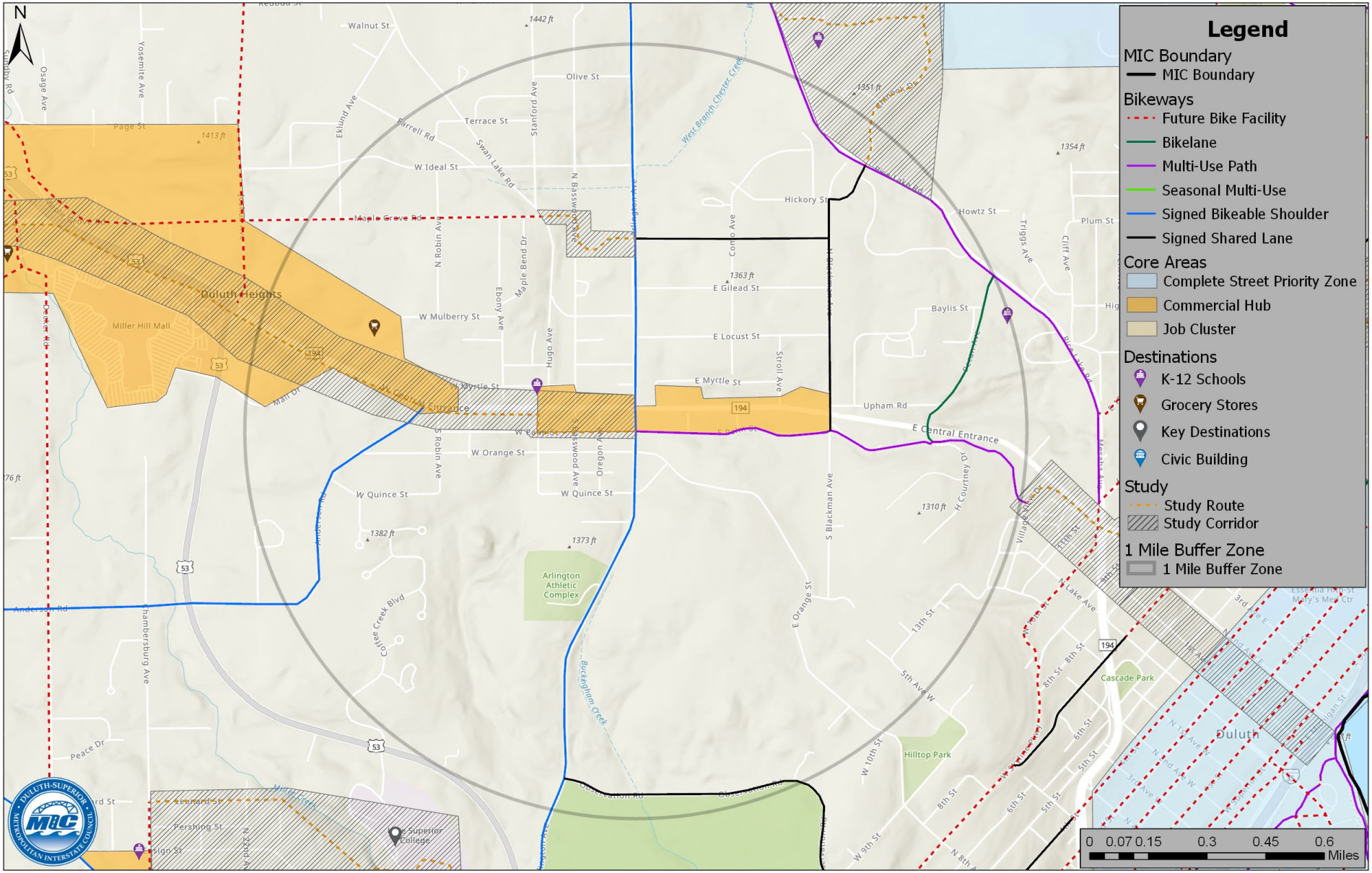
This hub primarily serves North End, Downtown, and Billings Park residents.

This commercial has a cluster of the downtown area, which includes the Belknap corridor and the Tower Ave corridor.

Existing Key Gaps

- Connors Point—between Catlin Ave and N 5th Street/Main Street.
- Belknap St and Tower Ave Intersection
- Between downtown Superior and UWS campus.
- Belknap St—from Banks Ave to Billings Park.
- Tower Ave - from Belknap St to South End Superior.
- Winter St from Maryland Ave to Tower Ave

MAP 4.6: Duluth Heights



Duluth Heights

Top Priorities

1. Central Entrance path extension to the Hillside and to the Miller Hill Mall.
2. Duluth Heights neighborhood - Joshua Ave Trail
3. Future trail from Arlington Ave to Swan Lake Rd and Maple Grove Rd.

One Mile Buffer Population: 3,852

Notes:

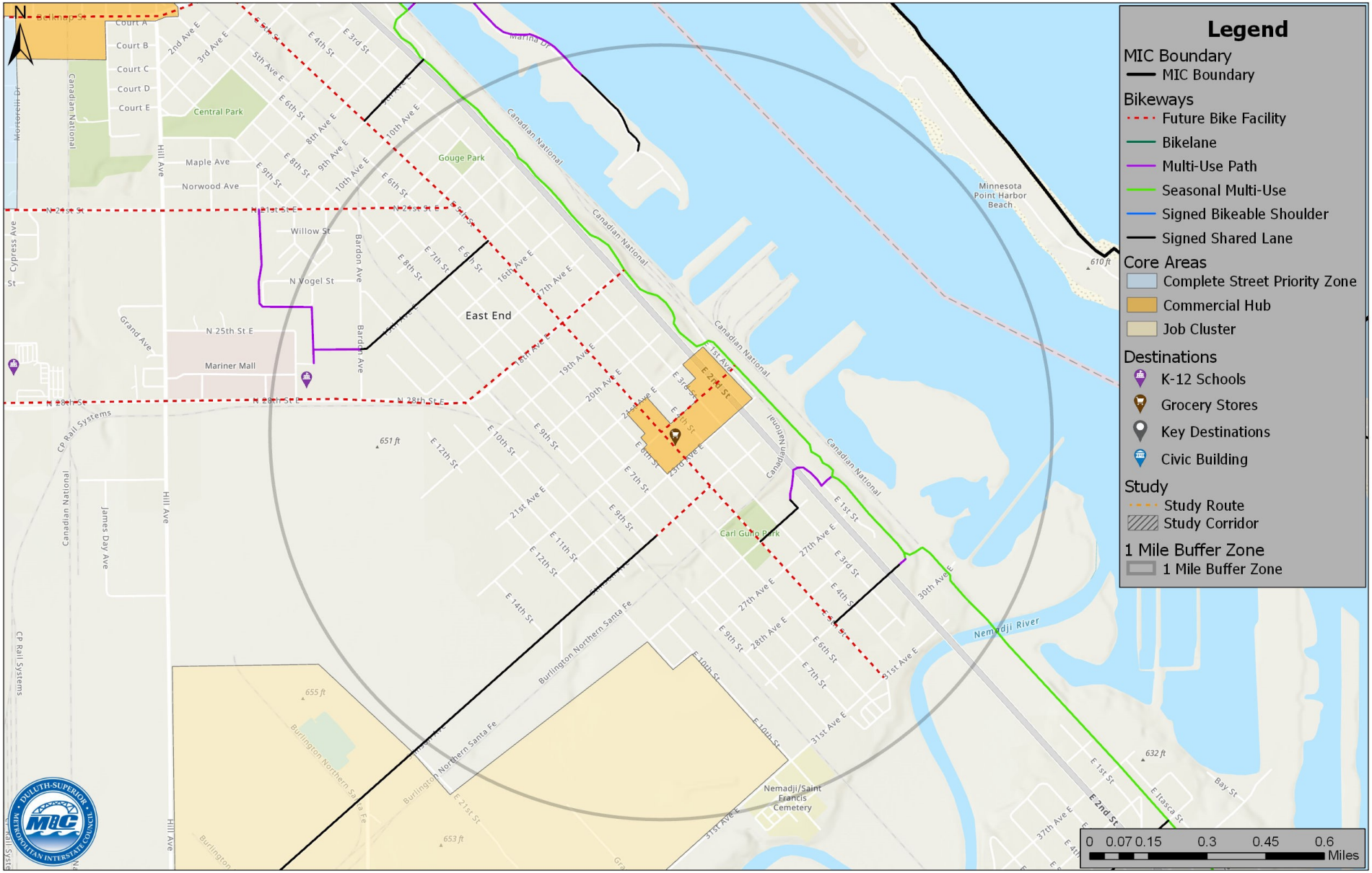
This hub primarily serves the Duluth Heights residents.

This commercial hub has the Miller Hill Mall and other restaurants, retail stores and grocery stores.

Existing Key Gaps

- Central Entrance Bike Path – Current terminus at Arlington Ave to Miller Hill Mall.
- Central Entrance Bike Path from Harbor Highlands to Hillside Neighborhood.
- Willow St to Maple Grove Rd connection between Arlington Rd and Swan Lake Rd.

MAP 4.7: East End—Superior, Wisconsin



East End—Superior, Wisconsin

Top Priorities

1. 5th St Bikeway
2. 28th St Bikeway – school friendly
3. Grocery store connection across Hwy 2/53

One Mile Buffer Population: 3,782

Notes:

This hub primarily serves the East End residents.

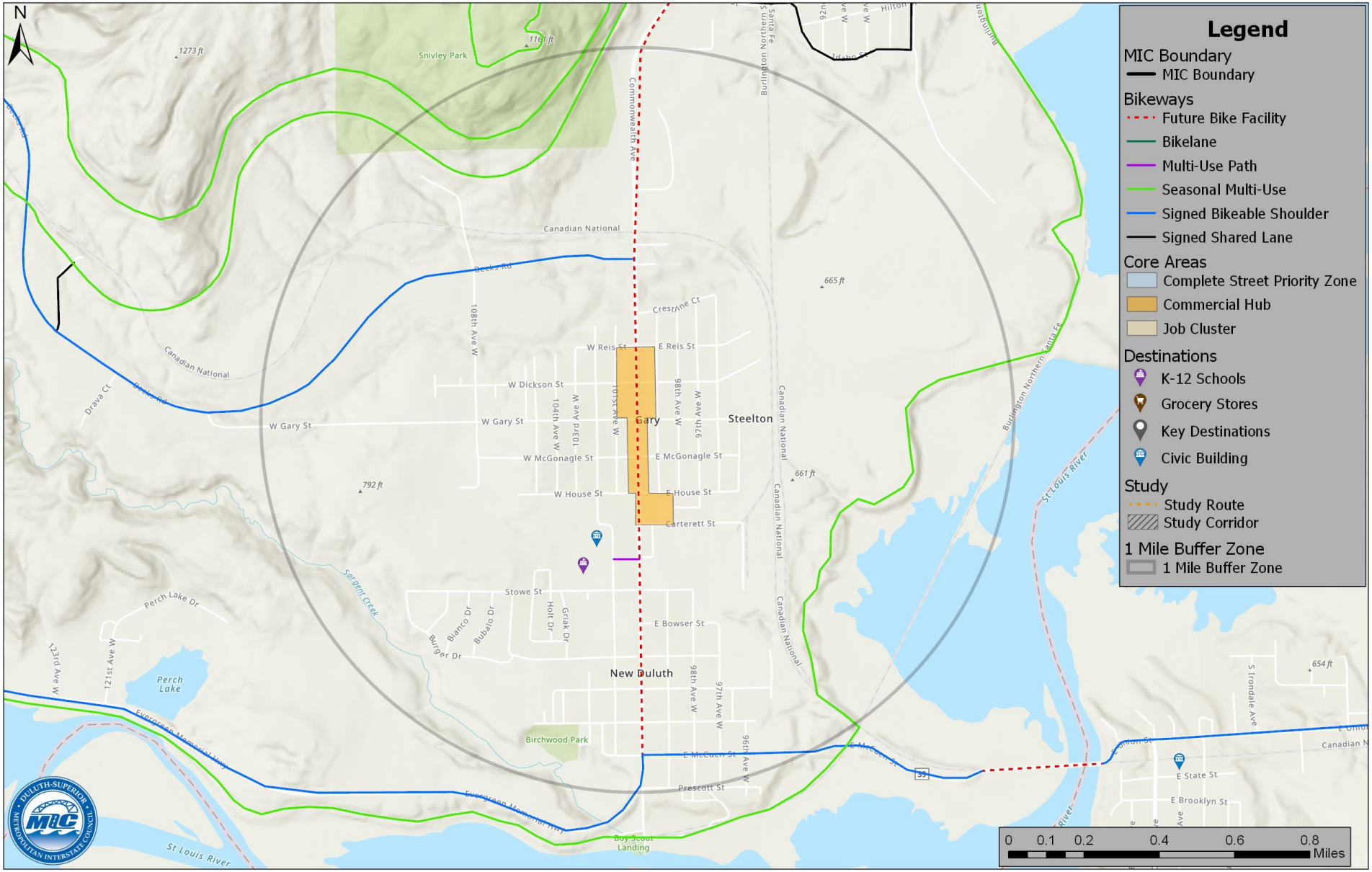
This commercial has a cluster of restaurants, hardware store, grocery stores, and banks.

Allowing East End residents to get around within their neighborhood.

Existing Key Gaps

- E 5th St– between Belknap St to 26th Ave E.
- 22nd Ave E—East 2nd St to Osaugie Trail
- 18th St & 28th St Corridor to schools.

MAP 4.8: Gary-New Duluth—Duluth, Minnesota



Gary-New Duluth—Duluth, Minnesota

Top Priorities

1. Hwy 23 Bikeway
2. Stowe School—bike friendly crossings at Hwy 23
3. Connection to Morgan Park

One Mile Buffer Population: 2,661

Notes:

This hub primarily serves the Gary – New Duluth residents.

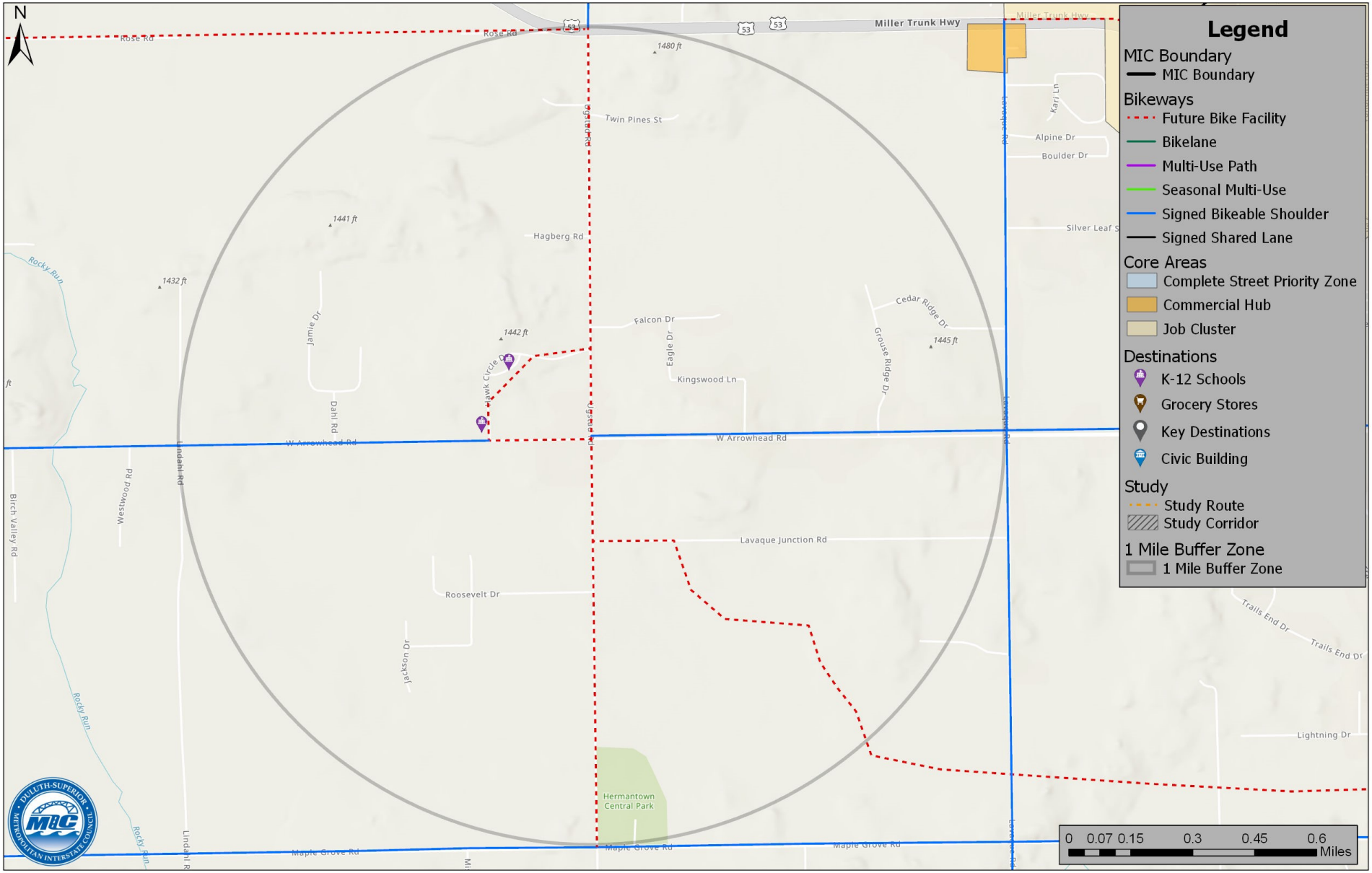
This commercial has a cluster of restaurants, retail, and grocery stores.

Allows the Gary-Duluth residents to get around within their neighborhood.

Existing Key Gaps

- Connection Between Gary-New Duluth and Morgan Park
- Filmore St, Stowe St, and Commonwealth Ave Intersection
- Hwy 23 to Oliver, Wisconsin , particularly the Oliver Bridge.

MAP 4.9: Hermantown Community Center Area



Hermantown Community Center Area

Top Priorities

1. Bike path on Hermantown Community School
2. Connections to immediately surrounding neighborhoods
3. Arrowhead and Ugstad intersection
4. Hermantown Trail

Allows : 1,080

Notes:

This hub primarily serves the Hermantown Community

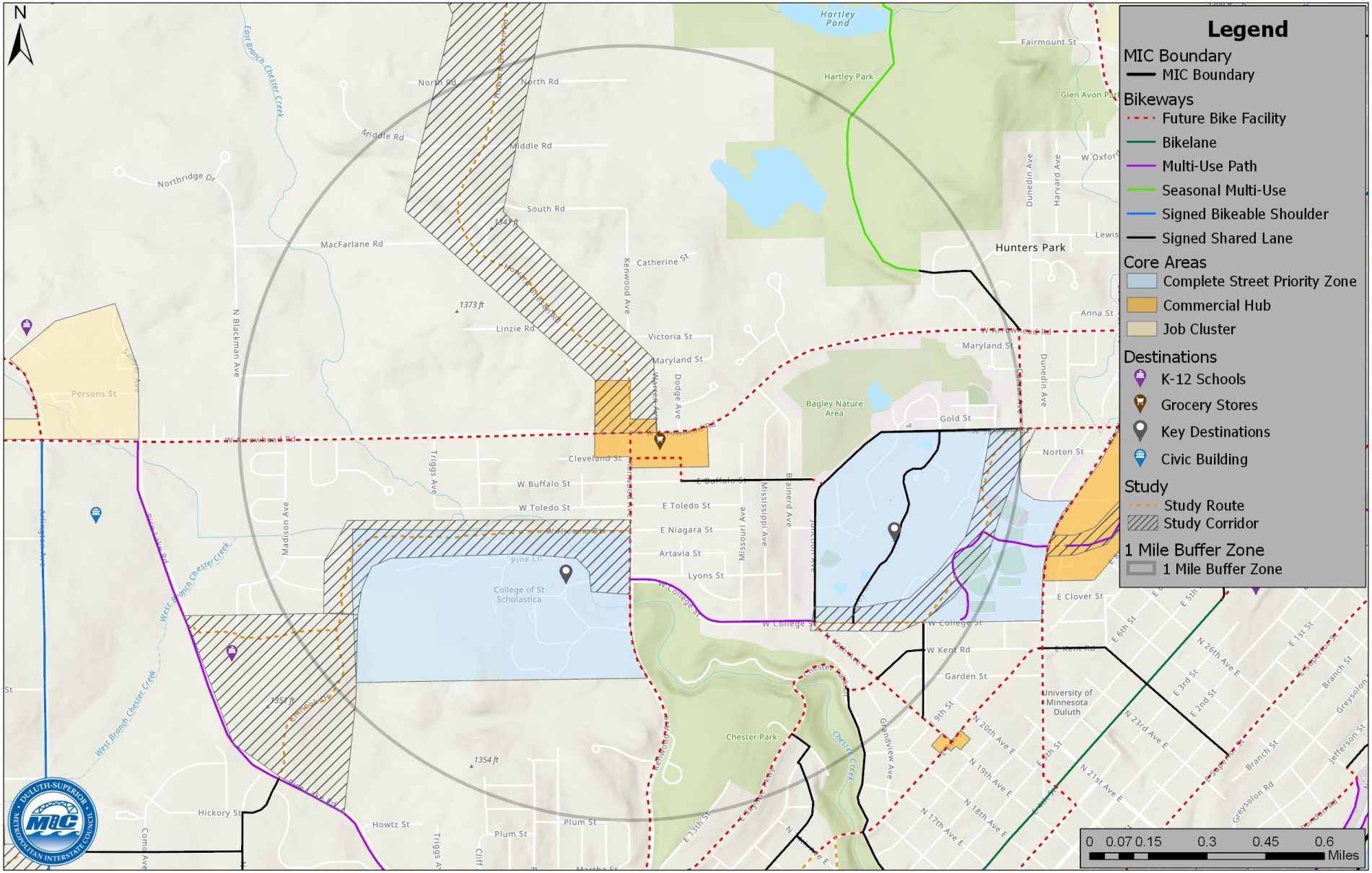
This hub is the central location of the Hermantown School District.

Allows the Hermantown district to have connectivity within the city.

Existing Key Gaps

- Eastern residential areas to the schools.
- Direct connections between new Wellness Center at Arrowhead Rd and Ugstad Rd to the Hermantown Middle/High School.
- Direct Connection from Jackson Estates to the schools.

MAP 4.10: Kenwood



Kenwood

Top Priorities

1. Kenwood Ave from College St to Arrowhead Rd.
2. Kenwood and Arrowhead Rd Intersection
3. Kenwood shopping center to UMD

One Mile Buffer Population: 8,980

Notes:

This hub primarily serves the residents of the Kenwood area and students of UMD and St. Scholastica.

This commercial has a cluster of retail, banks, restaurants, grocery stores and pharmacy.

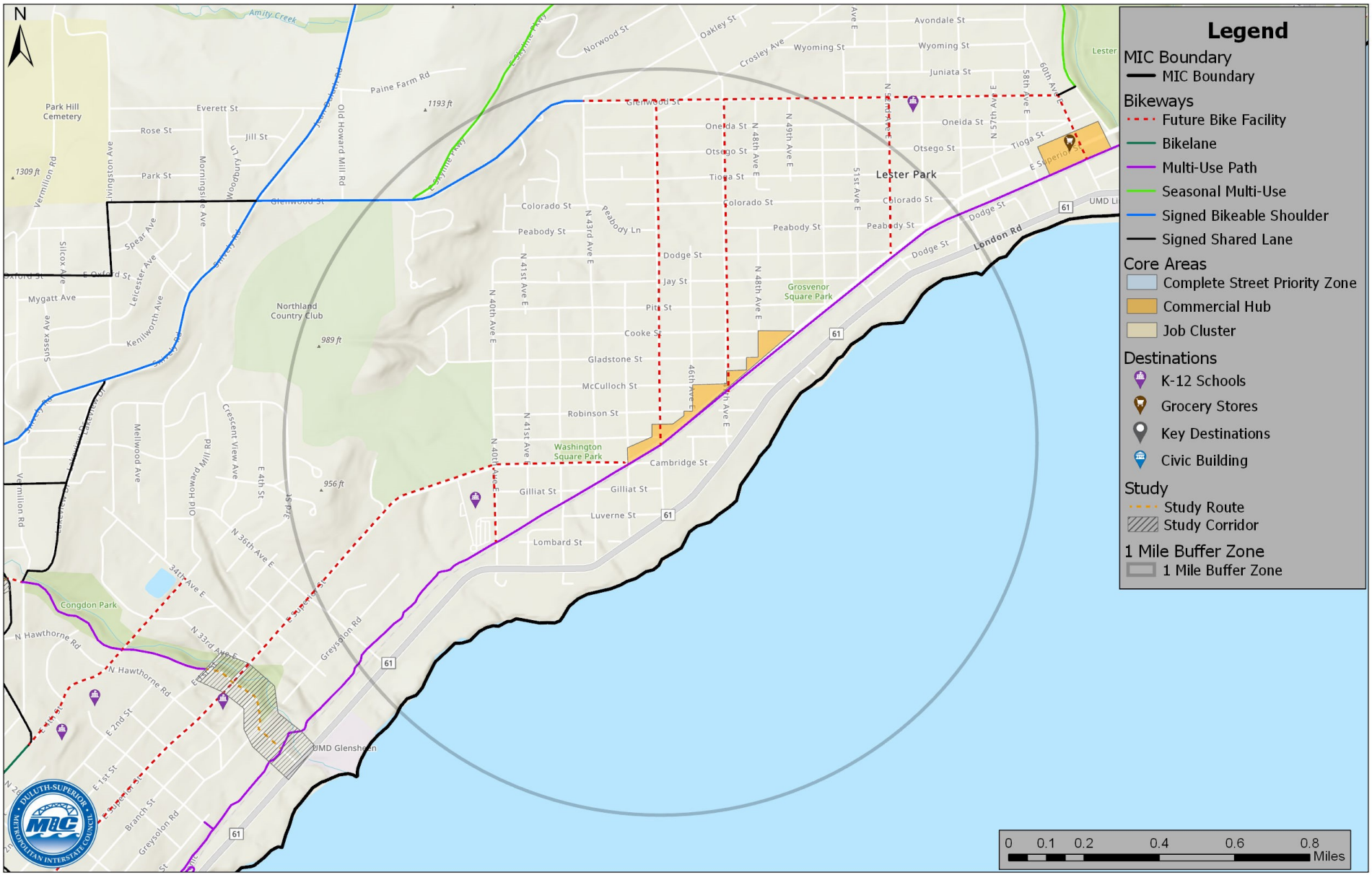
Study Corridor

Allows Kenwood residents to get around within their neighborhood.

Existing Key Gaps

- Arrowhead Rd—from College St to Arrowhead Rd.
- Cleveland St- Kenwood Ave to Kenwood Shopping Center
- Kenwood Shopping Center to UMD along Buffalo St.
- Kenwood Ave and Arrowhead Rd intersection.

MAP 4.11: Lakeside—Duluth, Minnesota



Lakeside—Duluth, Minnesota

Existing Conditions/ Top Issues

1. 40th Ave E and Superior St Intersection
2. Glenwood – upper to Jean Duluth Rd / Snively Rd
3. Lakewalk

- Stop signs are confusing at trail and railroad crossings
- Trail pavement markings for crossings are lacking/ minimal
- Missing curb ramps to cross streets
- Traffic signals along Lakewalk are confusing and not designed for trail user

One Mile Buffer Population: 6,210

Notes:

This hub primarily serves the Lakeside residents.

This commercial has a cluster of restaurants, retail, grocery stores, banks, hardware stores and gyms.

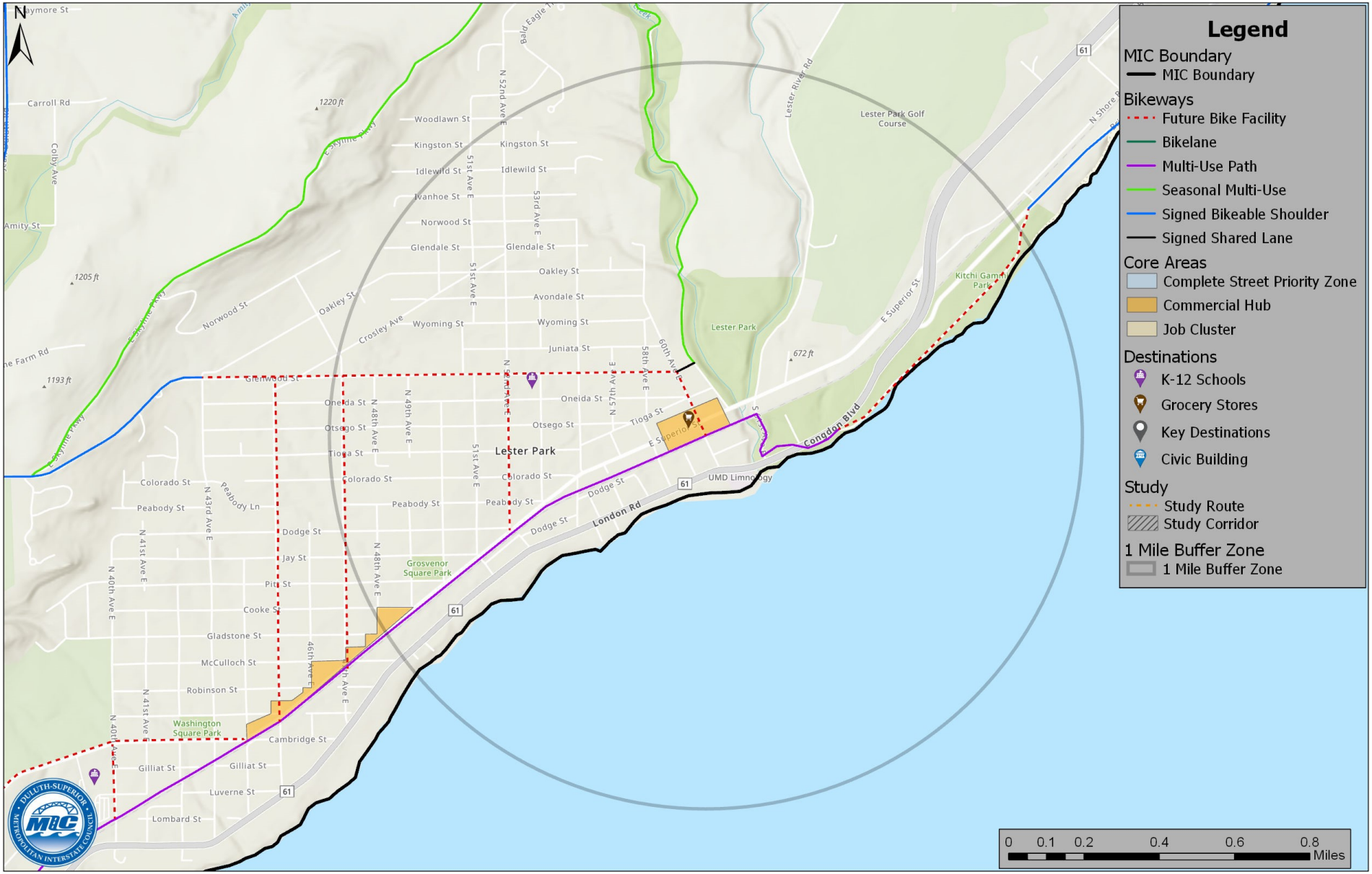
Lakewalk has competing traffic control.

Clarify where traffic should stop

Existing Key Gaps

- East High School - Greyhound Dr to Lakewalk Connection
- 47th and Superior St Intersection
- 44th Ave – Bike path crossing the tracks to Superior St, Lakewalk and Cambridge St

MAP 4.12: Lester Park—Duluth, Minnesota



Lester Park—Duluth, Minnesota

Top Priorities

1. Lakewalk connection – Super One – curb ramp to avenue
2. Lower Glenwood to Lester Park elementary
3. 52nd Ave to Lester Park elementary
4. 61st Ave E is an issue

One Mile Buffer Population: 4,209

Notes:

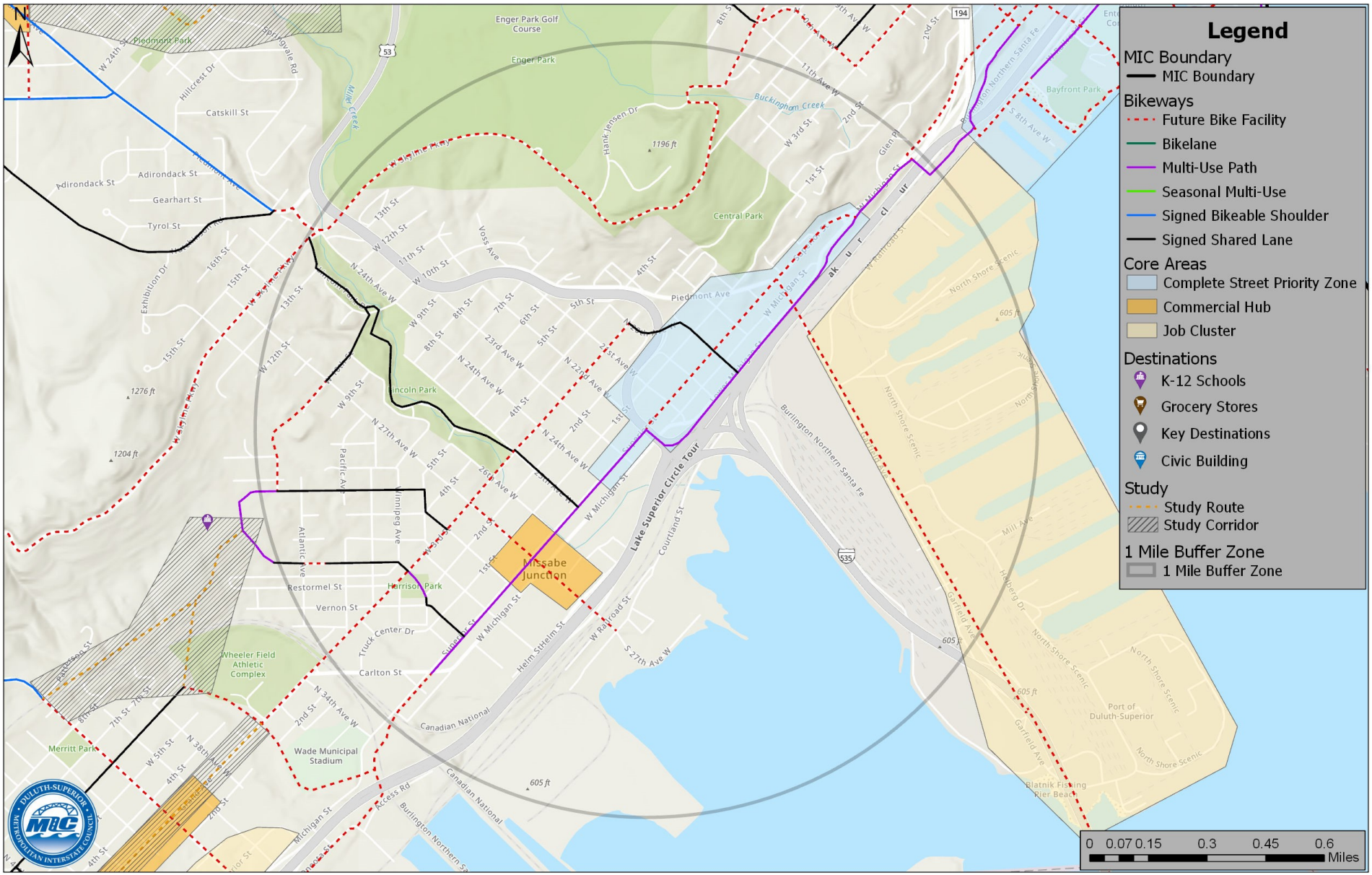
This hub primarily serves the Lester Park residents.

This commercial has a cluster of restaurants, retail, grocery stores, banks, hardware stores and gyms.

Existing Key Gaps

- Missing Lakewalk curb ramps—48th Ave E, 49th Ave E, 50th Ave E, 52nd Ave E
- Direct connection to Super One main entrance
- Lack of bike parking
- Trail crossing at 59th Ave E

MAP 4.13: Lincoln Park—Duluth, Minnesota



Lincoln Park—Duluth, Minnesota

Top Priorities

1. 3rd St Bikeway
2. Lincoln Park Craft District
3. Downtown/ Mesaba Ave connection
4. Tight narrow corner on the Superior St side of the bike/ ped bridge
5. Bridge needs more description
6. Lacking crosswalk markings across driveways
7. 27th Ave W at Cross City Trail Crossing

One Mile Buffer Population: 6,237

Notes:

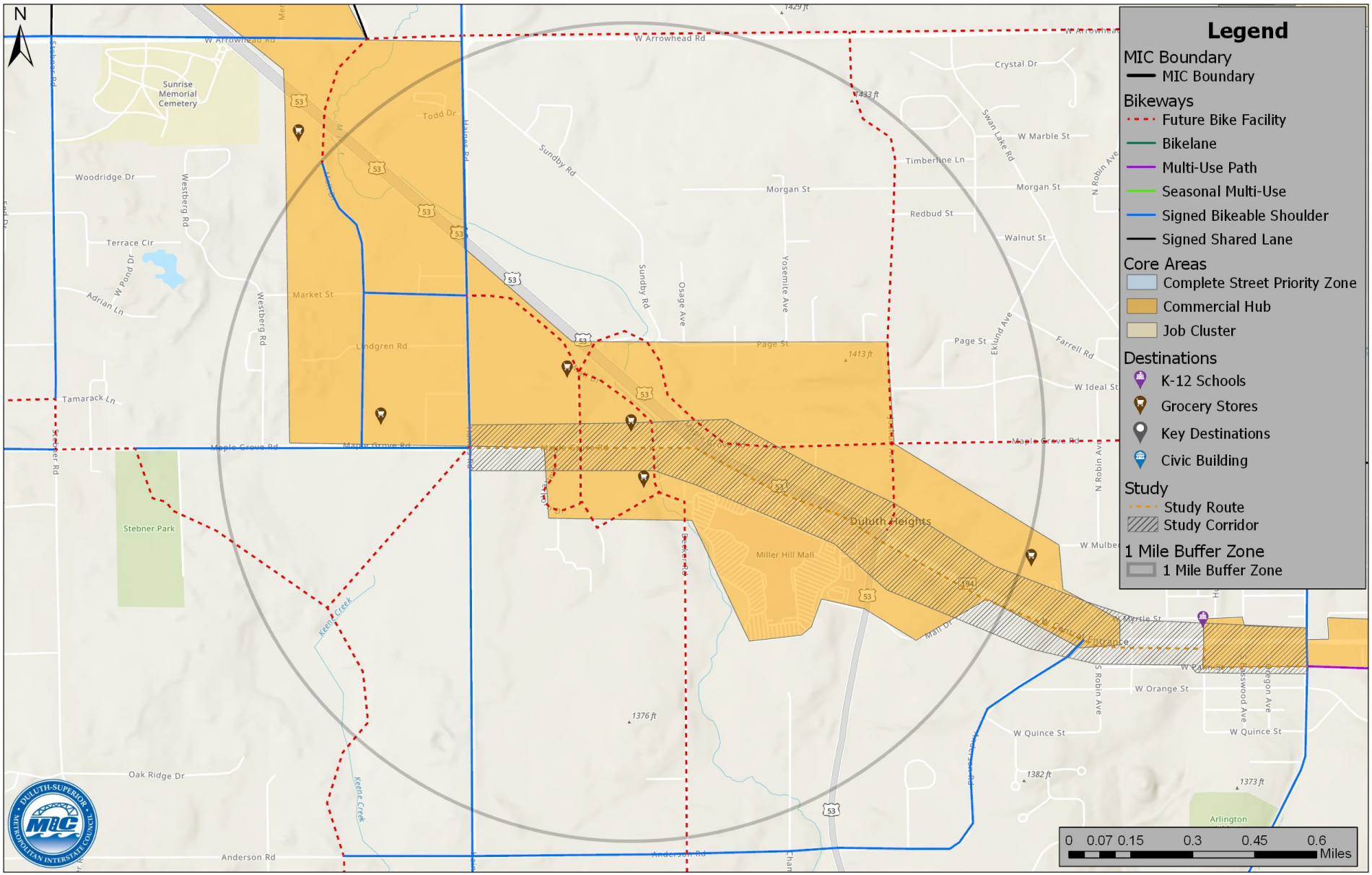
This hub primarily serves the Lincoln Park residents and connection to a growing hub.

This commercial has a cluster of restaurants, retail, grocery stores and banks.

Existing Key Gaps

- Missing curb ramps – W Michigan St, 17th 1/2 Ave, 20th Ave W, 21st Ave W,
- No Connection N 30th Ave W

MAP 4.14: Miller Hill Commercial Area—Duluth, Minnesota



Miller Hill Commercial Area—Duluth, Minnesota

Top Priorities

1. Central Entrance
2. Hwy 53/ Miller Trunk Hwy crossing
3. Maple Grove

One Mile Buffer Population: 2,011

Notes:

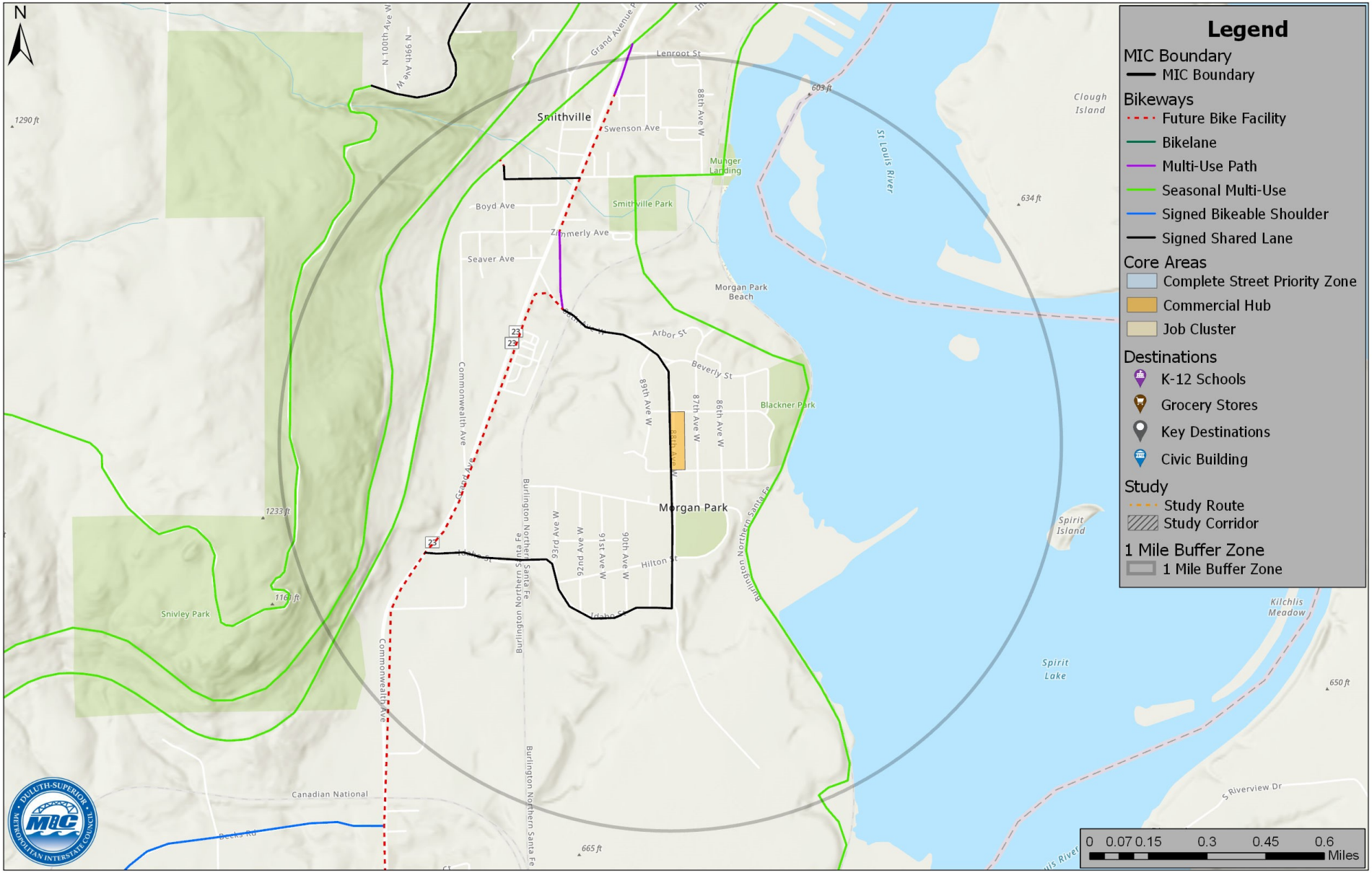
This hub primarily serves the Duluth Heights residents, urban dense, and workers of the Miller Hill Mall.

This commercial hub has the Miller Hill Mall and other restaurants, retail stores and grocery stores.

Existing Key Gaps

- Central Entrance from Basswood to Trinity Rd
- Maple Grove Rd/ 53 Intersection
- Joshua Ave

MAP 4.15: Morgan Park—Duluth, Minnesota



Morgan Park—Duluth, Minnesota

Top Priorities

1. Hwy 23 to the North
2. Hwy 23 to the south – business district and school
3. Main route through Morgan Park

One Mile Buffer Population: 2,281

Notes:

This hub primarily serves the Morgan Park residents.

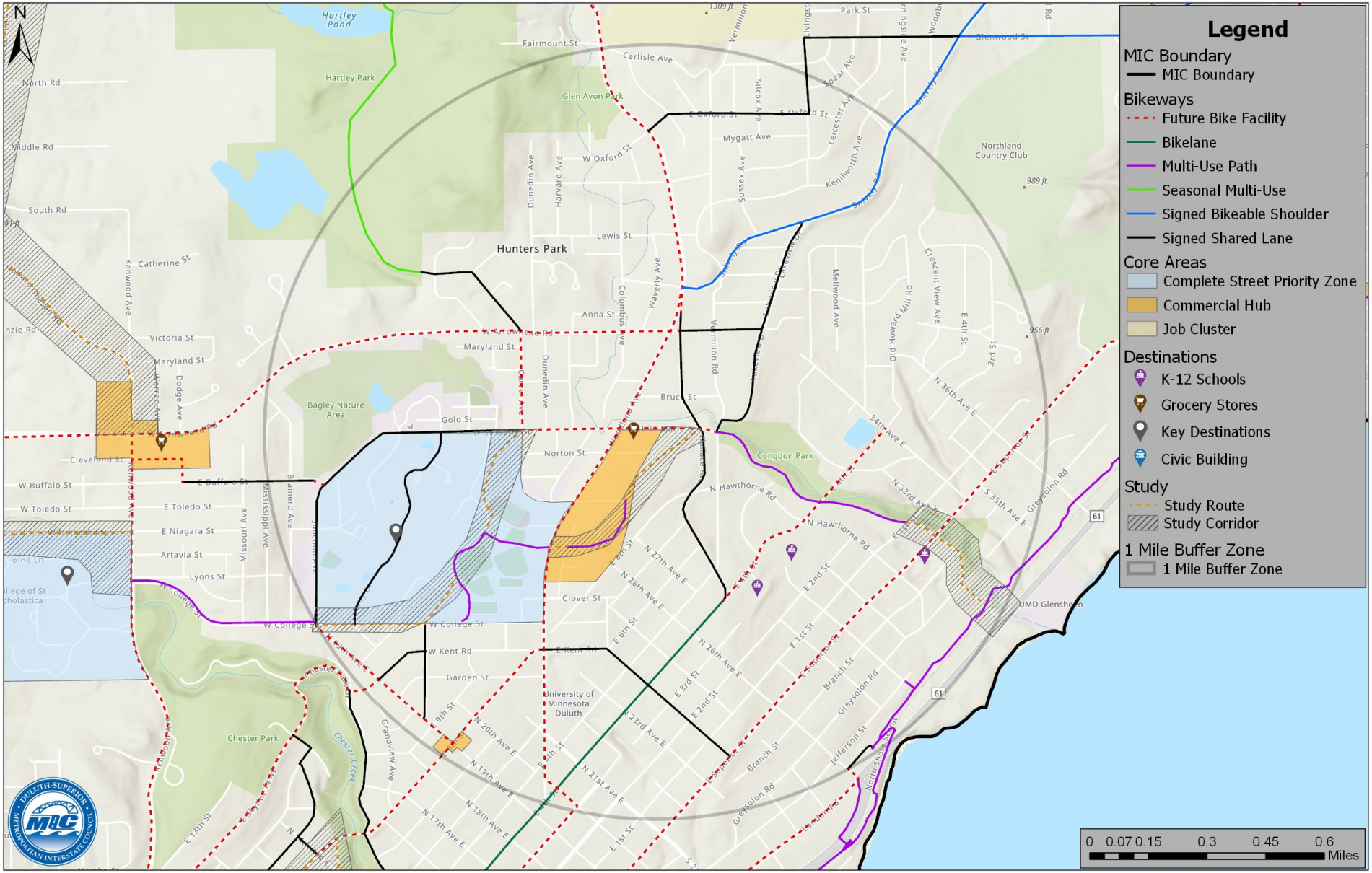
Provides the commercial cluster of Morgan Park.

Allowing Morgan Park residents to get around within their neighborhood.

Existing Key Gaps

- Morgan Park to Gary-New Duluth
- Munger Trail Bridge over 93rd has no connection
- Pleasant view to 88th Ave W

MAP 4.16: Mount Royal—Duluth, Minnesota



Mount Royal—Duluth, Minnesota

Top Priorities

1. St Marie St
2. Woodland Ave
3. Bluestone connection to Mount Royal
4. 4th St bike lane extension

One Mile Buffer Population: 12,091

Notes:

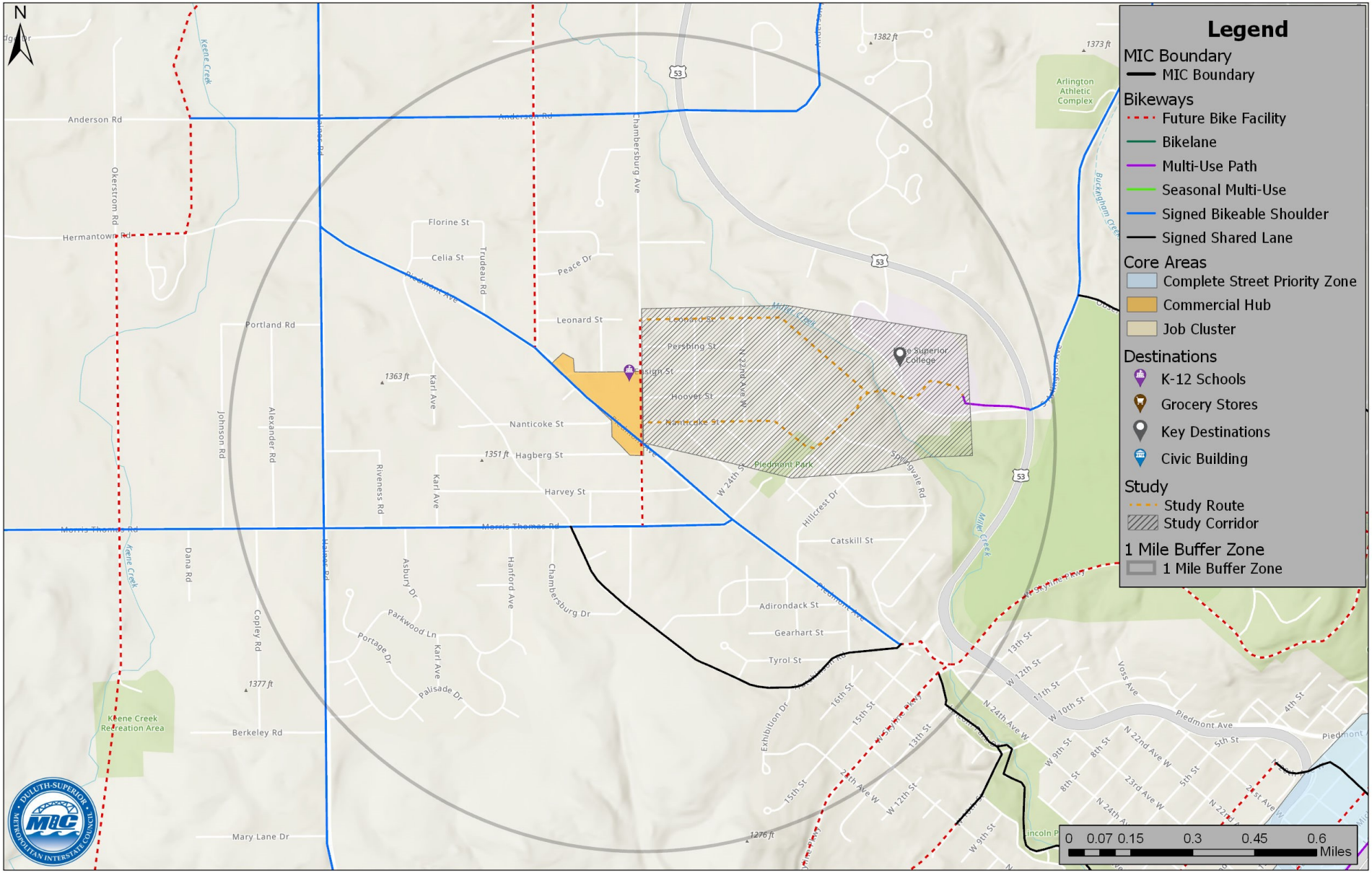
This hub primarily serves UMD students, Chester Park residents and three elementary schools.

This commercial hub has the cluster of good and services that the Woodland corridor offers.

Existing Key Gaps

- Elizabeth St to Mount Royal Cr
- Arrowhead Rd to Snively Rd
- Ridgewood Ct to Arrowhead Rd

MAP 4.17: Piedmont



Piedmont

Top Priorities

1. Chambersburg Ave
2. Lake Superior College (LSC) connection
3. Piedmont Ave

One Mile Buffer Population: 4,644

Notes:

This hub primarily serves the Piedmont residents and Lake Superior College (LSC). There is currently only informal walking paths through a ravine and across Miller Creek which provide direct connection between the Piedmont Neighborhood and LSC.

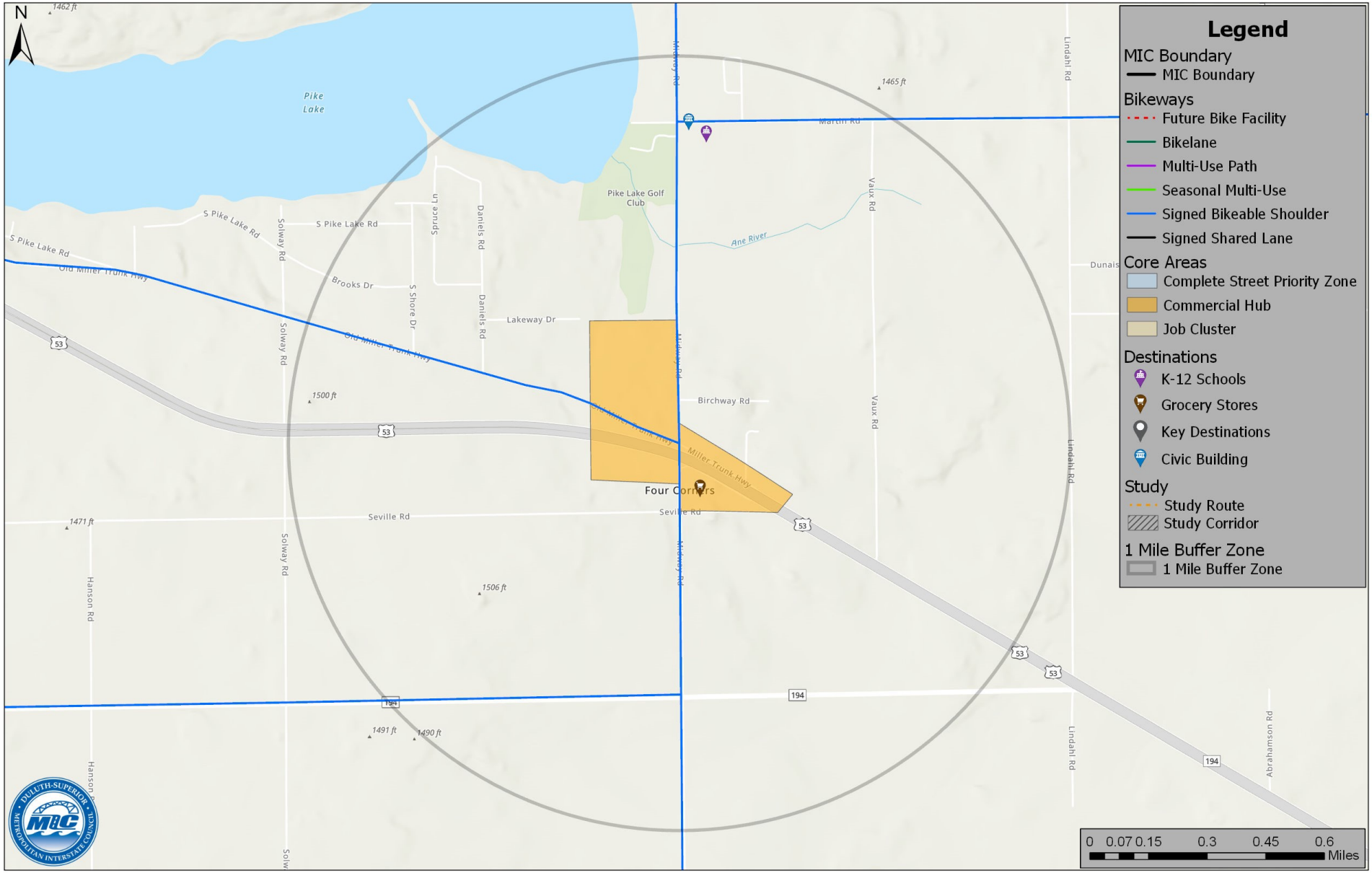
This commercial hub has a cluster of restaurants, retail and medical offices.

Allowing Piedmont residents to get around within their neighborhood and provide a connection the a major destination (LSC) located adjacent to the neighborhood.

Existing Key Gaps

- Lake Superior College (LSC) to Leonard St
- Lake Superior College (LSC) to Piedmont Park
- Pineview Ave – 22nd to 24th

MAP 4.18: Pike Lake



Pike Lake

Top Priorities

1. Hwy 53 intersection at Midway Rd
2. Midway Rd to Pike Lake Schools
3. Old Miller Trunk Hwy
4. Midway and Martin Rd intersection

One Mile Buffer Population: 891

Notes:

This hub primarily serves the Pike Lake residents.

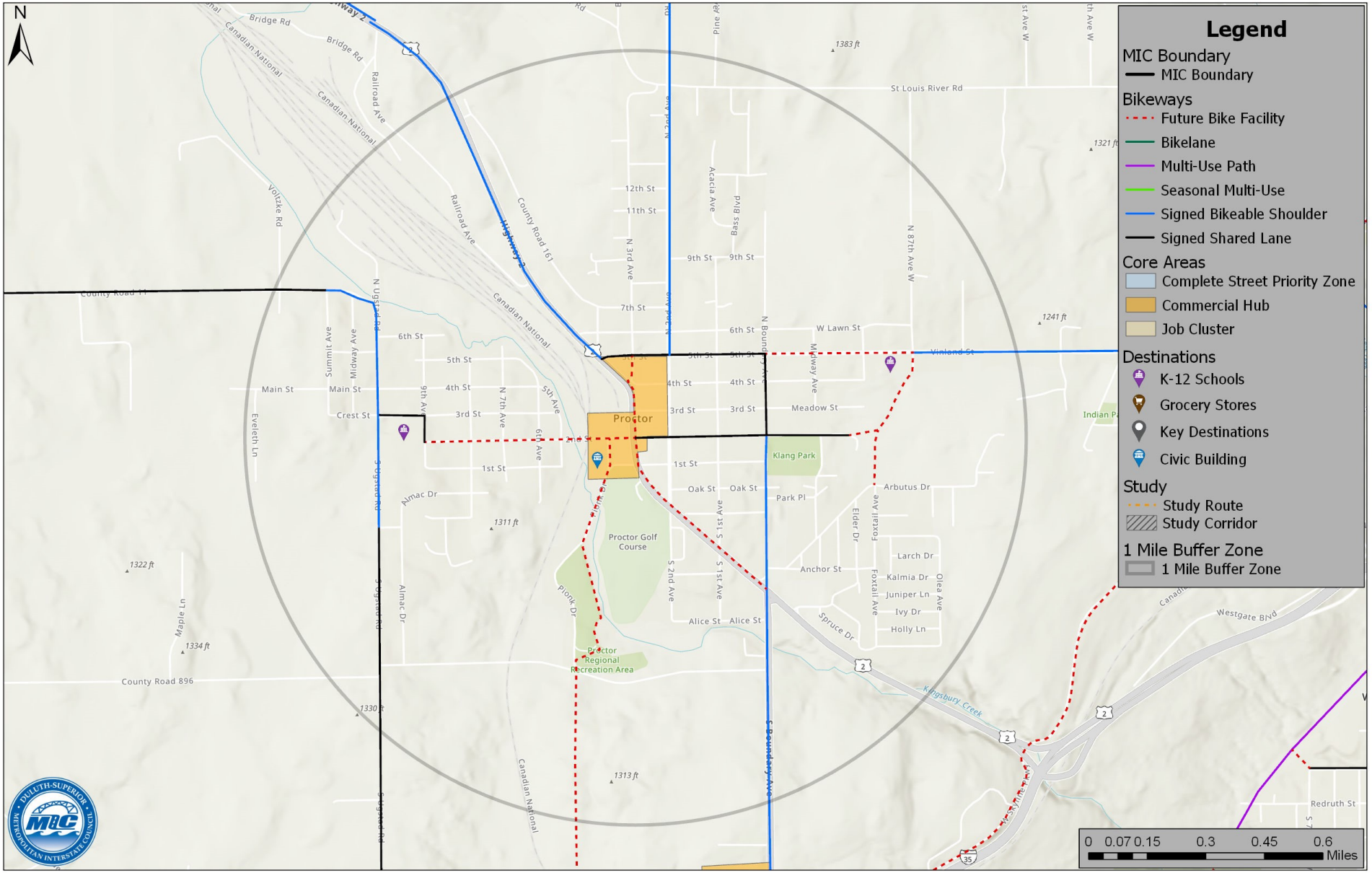
This commercial hub has cluster of restaurants, banks, retail grocery stores, and medical offices.

Allows Pike Lake residents to get around within their neighborhood.

Existing Key Gaps

- Getting across Hwy 53 at Midway Rd
- Midway Rd to Pike Lake Elementary Main Entrance
- Midway Rd – Seville Rd to Birchway Rd

MAP 4.19: Proctor



Proctor

Top Priorities

1. 2nd St to high school and middle school
2. Connection to Bay View elementary
3. Hwy 2 – downtown Proctor

One Mile Buffer Population: 4,079

Notes:

This hub primarily serves the city of Proctor residents.

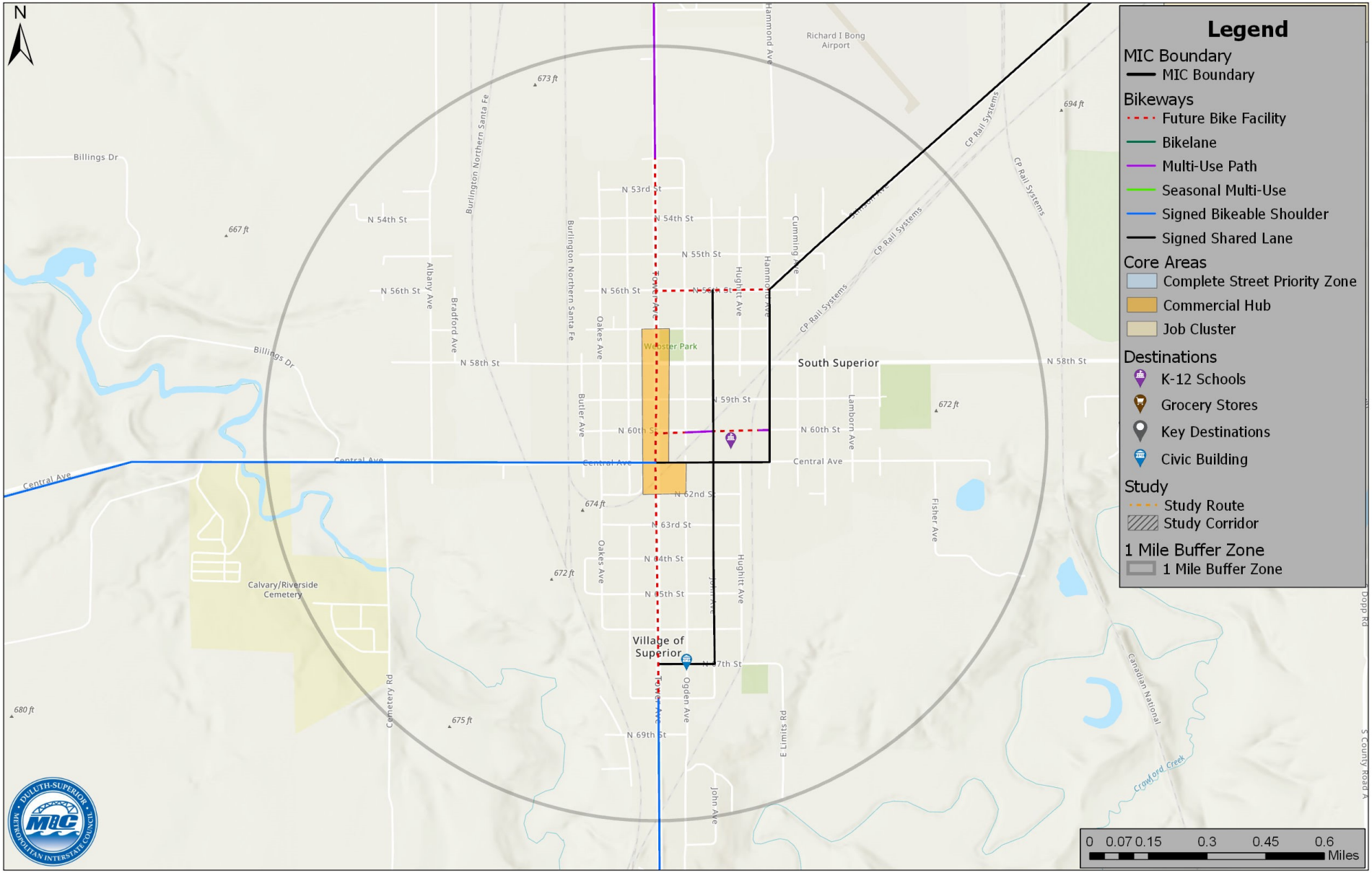
This commercial hub has cluster of restaurants, banks, retail and hardware stores.

Allows Proctor residents to get around within their neighborhood.

Existing Key Gaps

- Foxtail Ave and Arbutus Dr to Bay View Elem
- Orchard to Bay View Elem
- U.S. Hwy 2/Boundary Ave to 2nd St
- Proctor Connection to Munger Trail
  - Pionk Dr at Kirkus St to Skyline Pkwy
  - Along Knowlton Creek Blvd – Skyline Pkwy to 80th Ave W

MAP 4.20: South End Superior



South End Superior

Top Priorities

1. Tower Ave crossing, particularly at 60th St
2. Tower Ave – South end commercial district
3. Connection to the north on Tower Ave

One Mile Buffer Population: 2,447

Notes:

This hub primarily serves the South End Superior residents and as a connection to Downtown Superior.

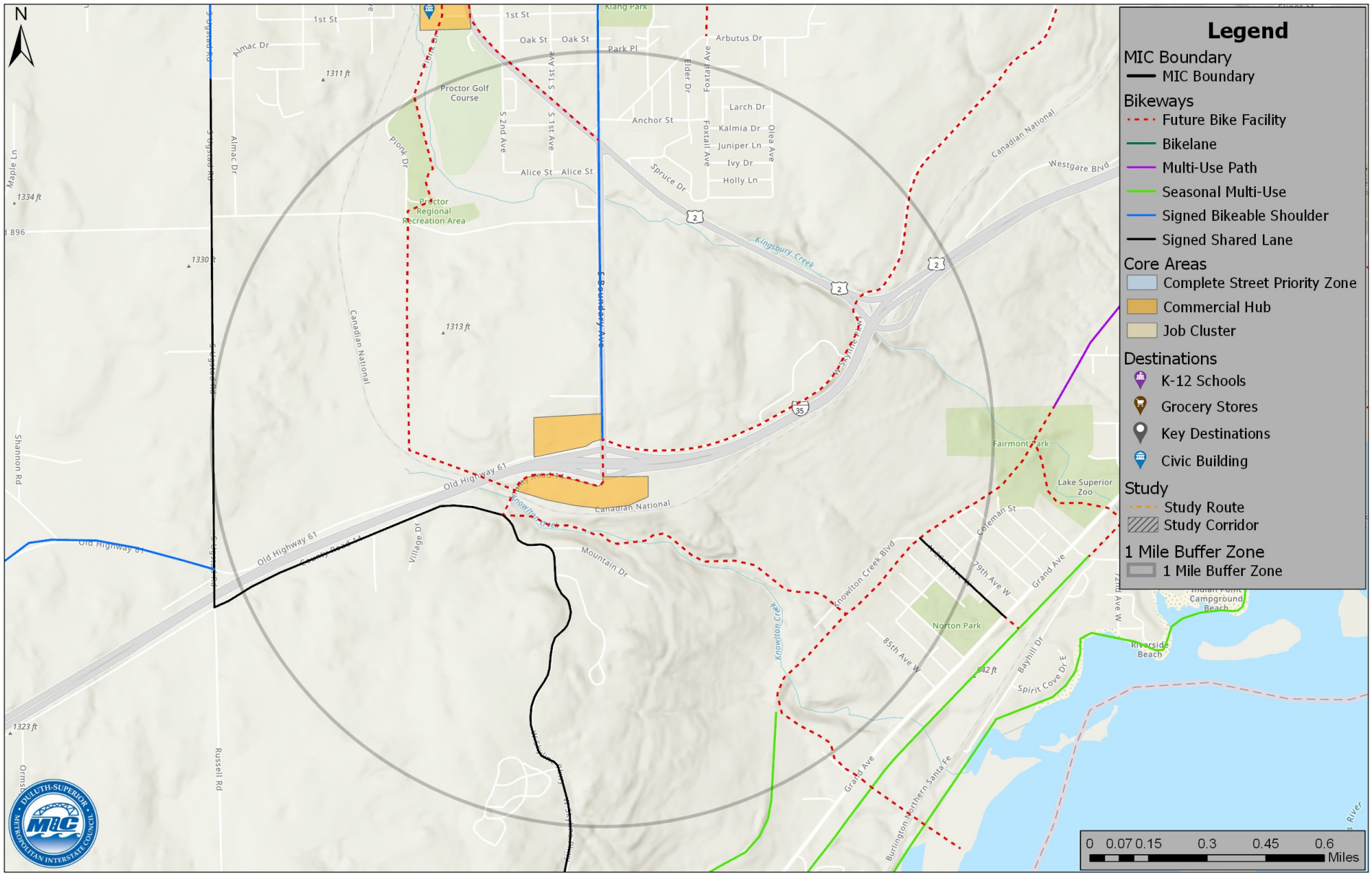
This commercial hub has cluster of restaurants, retail and hair salons.

Allows South End residents to get around within their neighborhood.

Existing Key Gaps

- Tower Ave from South End to downtown Superior.
- Tower Ave within the South End business district.
- South End Superior to East End Superior along Stinson Ave.

MAP 4.21: Spirit Mountain Commercial Area



Spirit Mountain Commercial Area

Top Priorities

1. Boundary Ave/ I-35 intersection
2. Boundary Ave
3. Proctor Trail connection to Munger Trail

One Mile Buffer Population: 1,755

Notes:

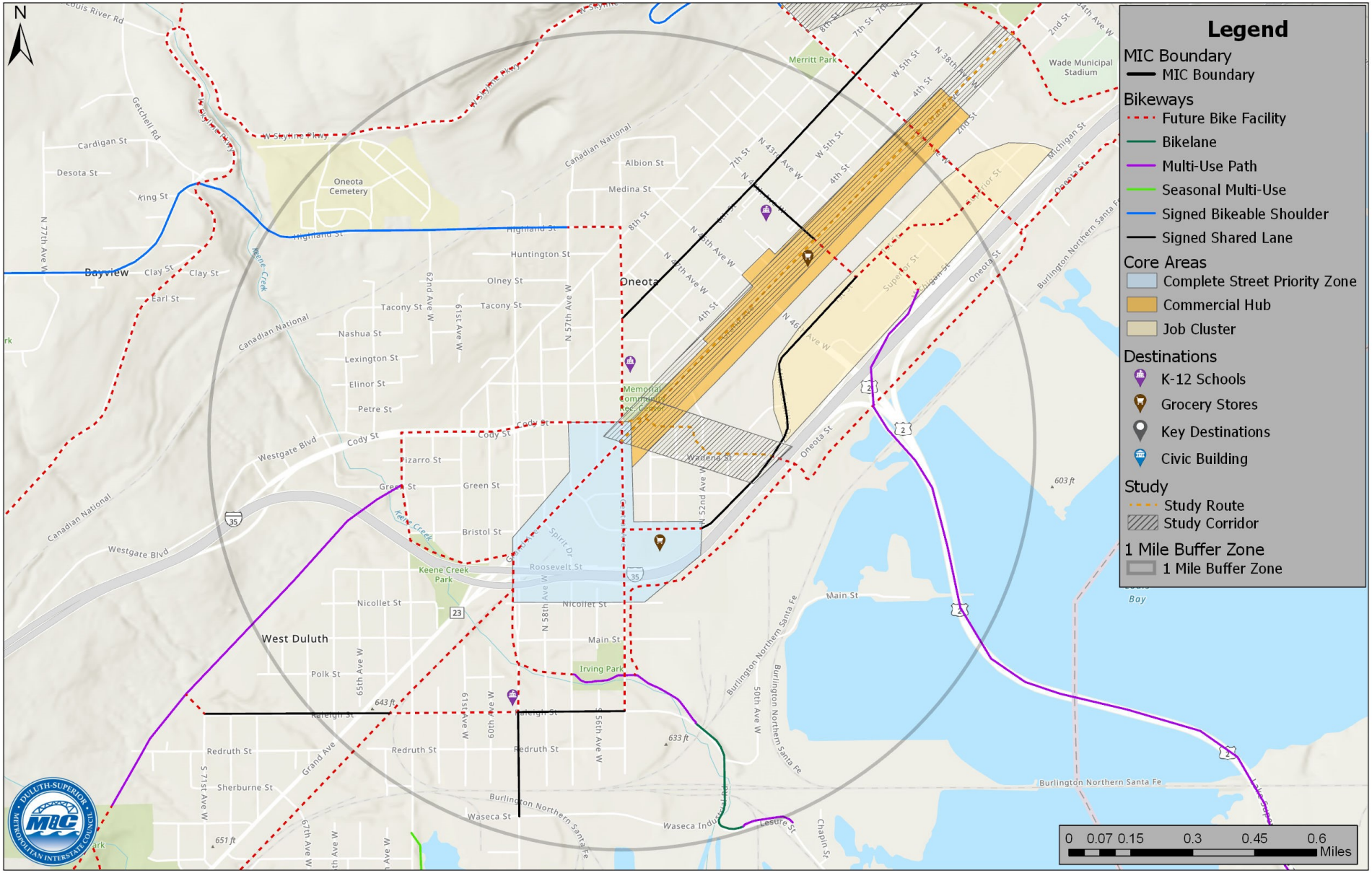
This hub primarily serves the Proctor and Bayview residents.

This commercial has a cluster of restaurants, lodging and recreational activities.

Existing Key Gaps

- Boundary Ave I-35 overpass
- Proctor Connector Trail between downtown Proctor through the Spirit Mountain commercial area.
- Proctor to West Duluth and the Cross City Trail and Munger Trail.

MAP 4.22: Spirit Valley/West Duluth



Spirit Valley/West Duluth

Top Priorities

1. Cross Trail Connection to the Munger Trail.
2. Grand Ave
3. Bong Bridge to Grand Ave to Cross City Trail

One Mile Buffer Population: 7,276

Notes:

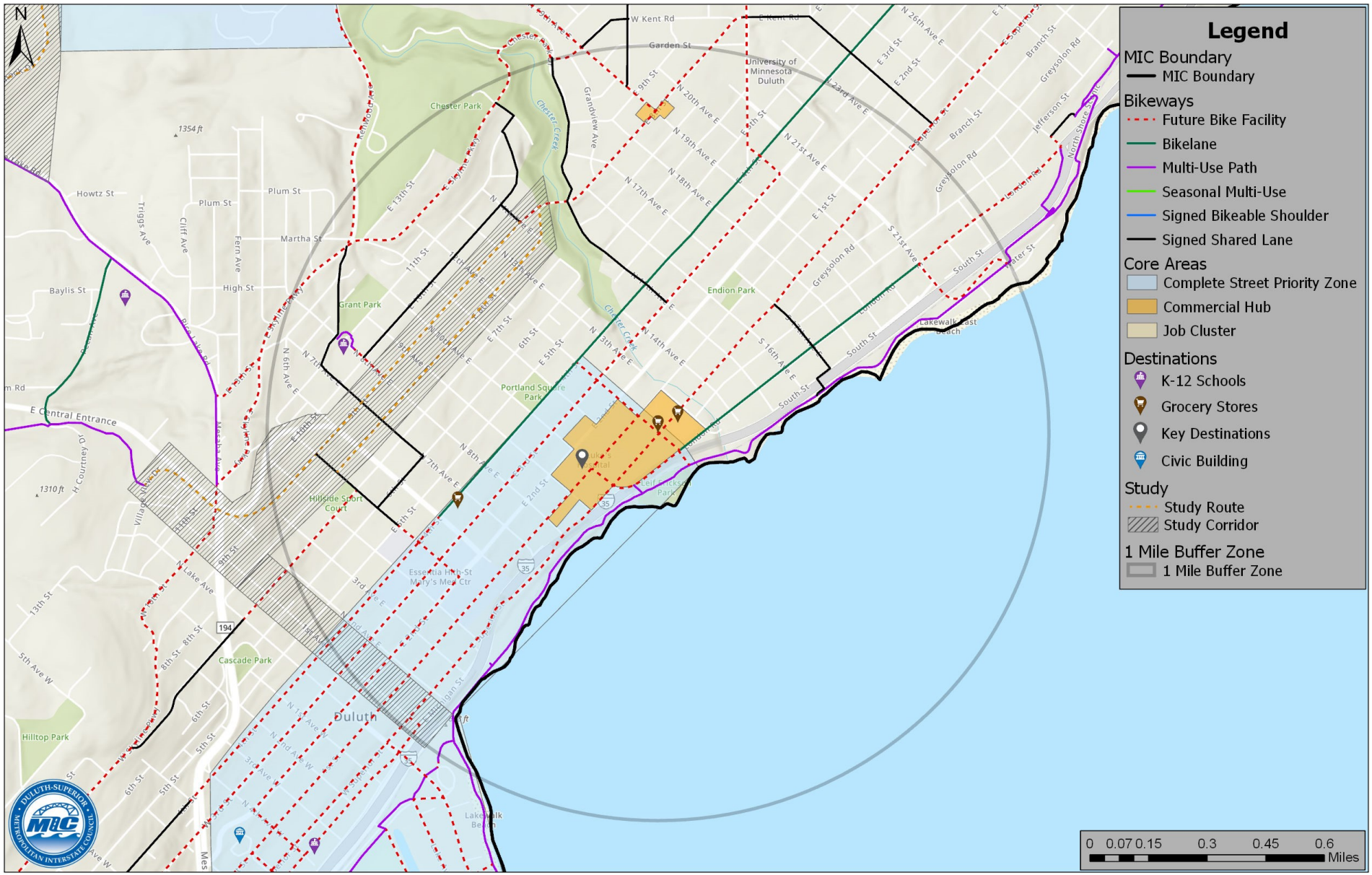
This hub primarily serves the West Duluth residents, multiple elementary schools and a growing commercial hub.

This commercial has a cluster of restaurants, retail, grocery stores, gyms and banks.

Existing Key Gaps

- Cross City Trail—from Carlton Ave to Munger Trail.
- Grand Ave (Hwy 23) from Raleigh Street to 59th Ave W (City Center West).
- Fairmount Neighborhood to Central Ave..
- Denfeld area to Lincoln Park Middle School.
- Bong Bridge to Grand Avenue.

MAP 4.23: East Hillside—Duluth, Minnesota



East Hillside—Duluth, Minnesota

Top Priorities

1. Superior Street
2. 12th Ave East
3. London Road

One Mile Buffer Population: 15,541

Notes:

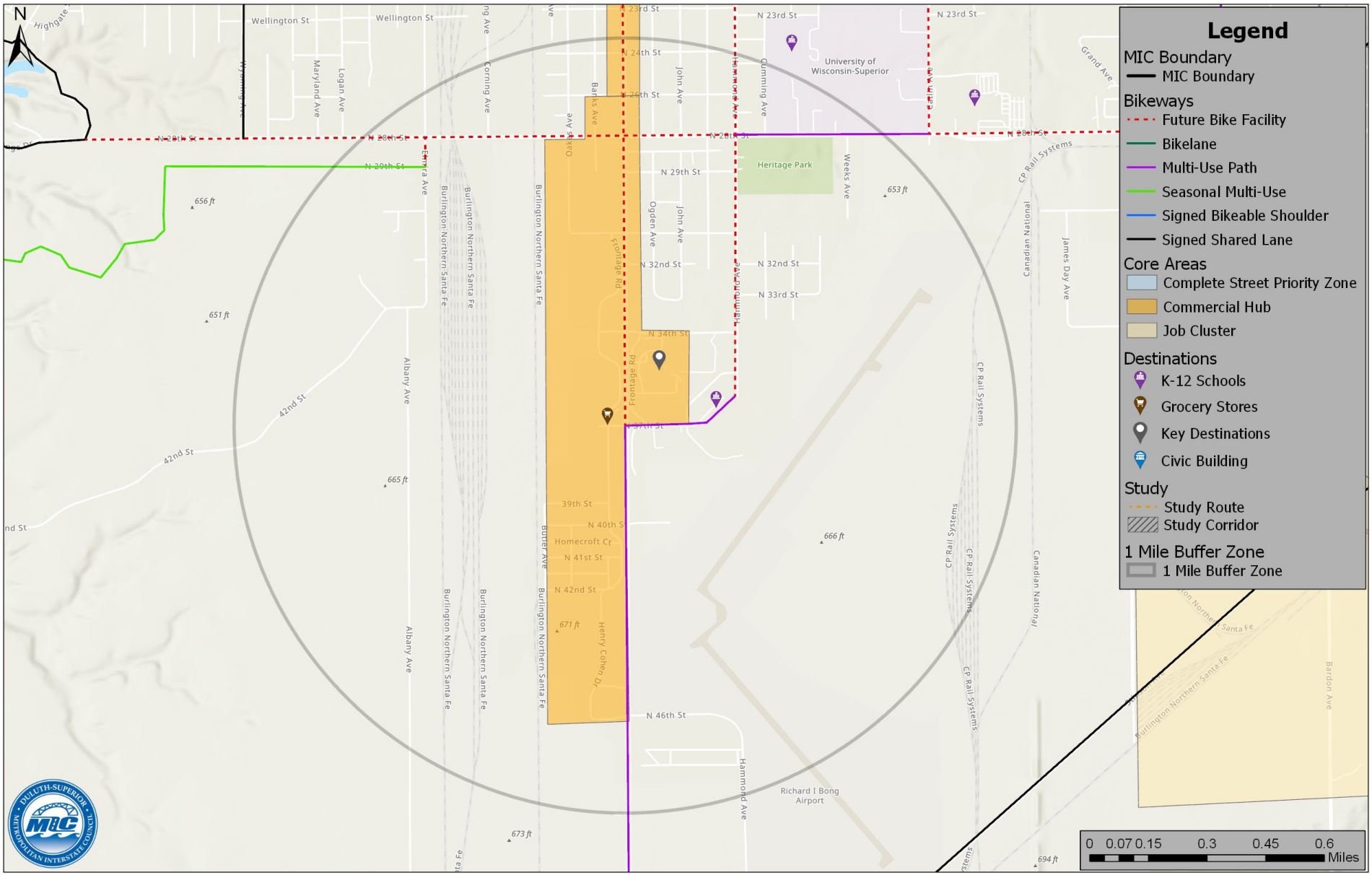
This hub primarily serves the East Hillside residents and as a connection to Downtown Duluth.

This commercial has a cluster of restaurants, retail, grocery stores, medical offices and banks.

Existing Key Gaps

- 8th/9th Street Corridor from 6th Ave E to 19th Ave East.
- Central Entrance corridor from 6th Ave E and 9th Street to the Harbor Highlands.
- Superior Street from downtown to the Hillside
- Downtown to Hillside connection.

MAP 4.24: Tower Avenue Commercial Area—Superior, Wisconsin



Tower Avenue Commercial Area—Superior, Wisconsin

Top Priorities

1. Tower Ave
2. 28th Street
3. Hammond Ave

One Mile Buffer Population: 2,591

Notes:

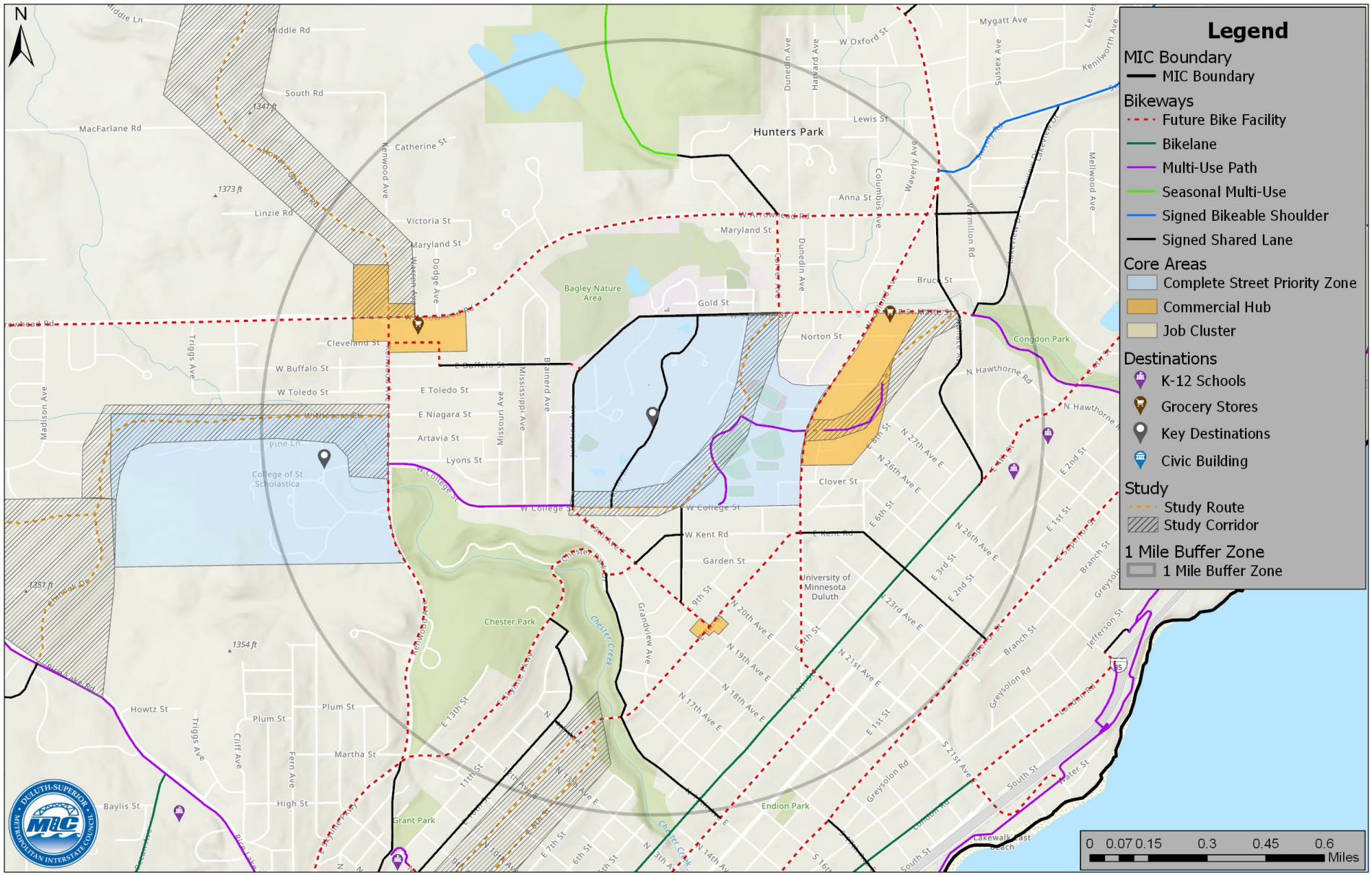
This hub primarily serves the Downtown and South End residents and serves as the main commercial hub of Superior.

This commercial has a cluster of restaurants, retail, and grocery stores, medical offices and banks.

Existing Key Gaps

- Tower Ave
- 28th Street
- Hammond Ave

MAP 4.25: University of Minnesota - Duluth



University of Minnesota - Duluth (UMD)

Top Priorities

1. St. Marie Street—from Vermillion Rd (Congdon Park) to Carver Ave (UMD campus).
2. Carver Ave from Arrowhead Rd to St. Marie St (UMD campus).
3. Snelling Ave, 19th Ave E, 8th Street Connection

One Mile Buffer Population: 7,276

Notes:

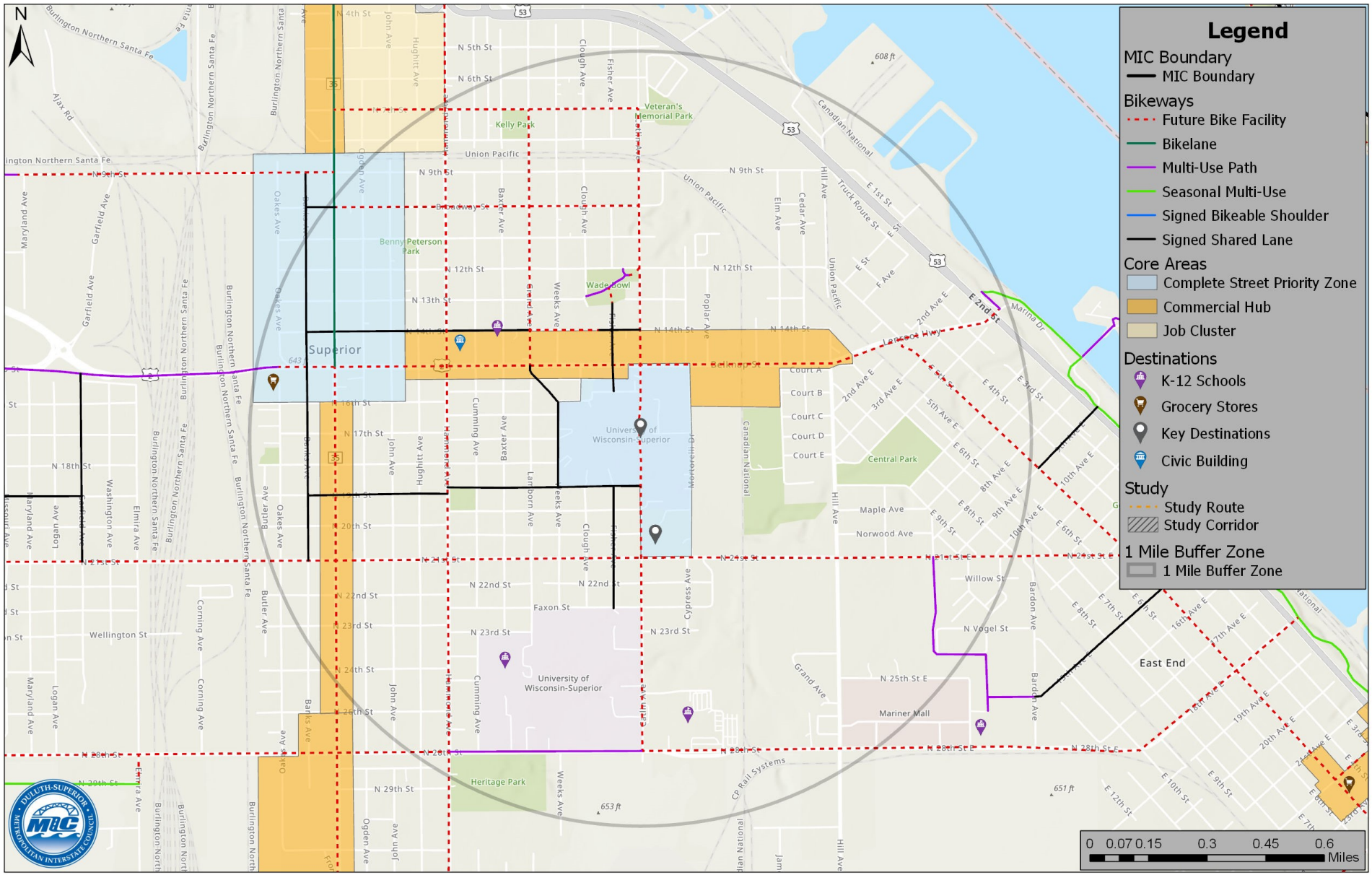
This hub primarily serves UMD students and Chester Park residents.

This commercial has a cluster of goods and services on the Woodland Ave and Kenwood Ave.

Existing Key Gaps

- St. Marie Street from Carver Ave to Vermillion Rd (Congdon Park)
- Carver Ave from Arrowhead Rd to St. Marie St
- Buffalo St from UMD to Kenwood Neighborhood.
- 8th Street from Chester Creek to UMD
- 19th Ave E from 8th Street to Snelling Ave

MAP 4.26: University of Wisconsin - Superior



University of Wisconsin - Superior (UWS)

Top Priorities

1. Catlin Ave
2. 21st Street
3. Belknap Ave

One Mile Buffer Population: 12,716

Notes:

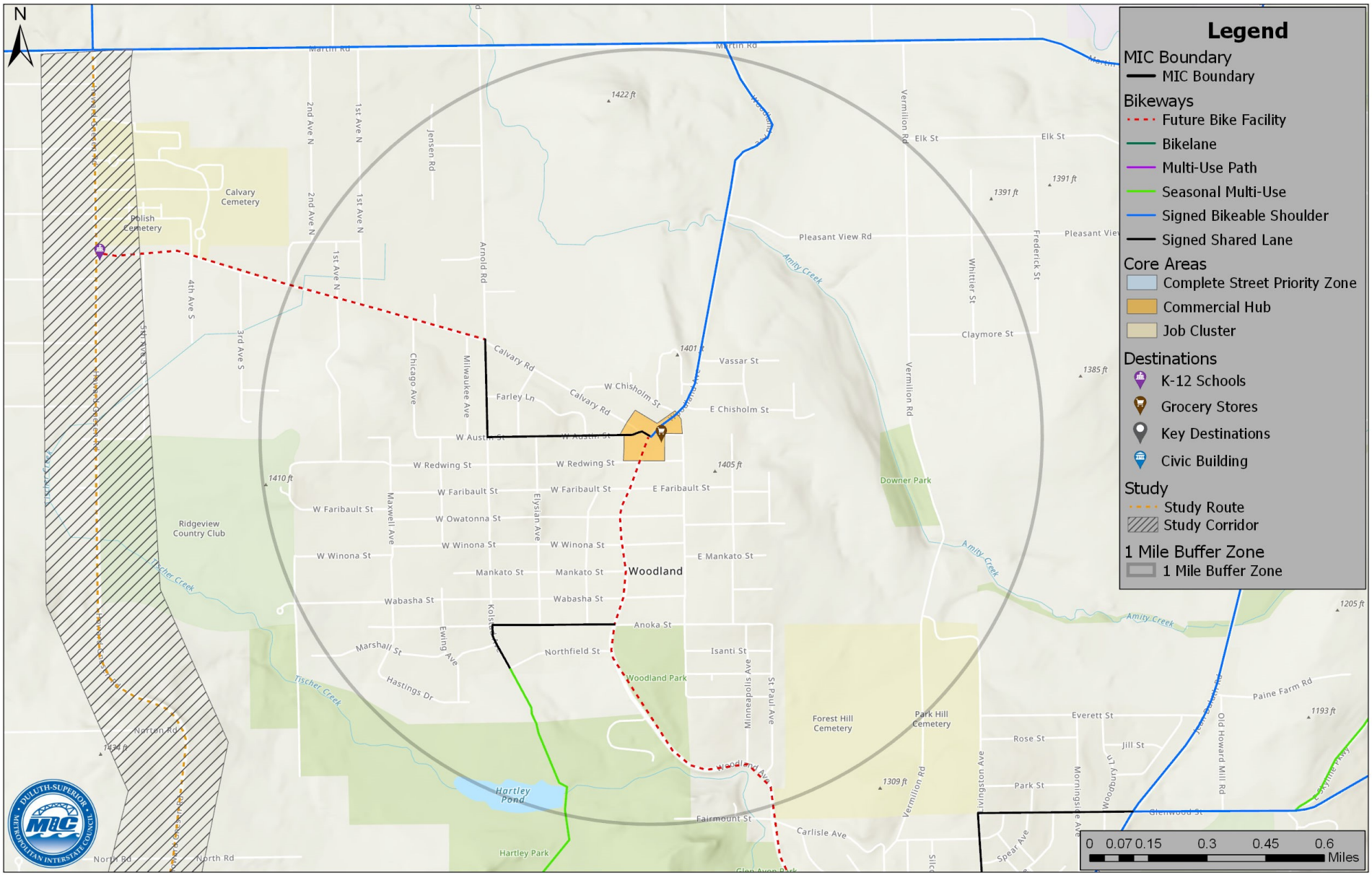
This hub primarily serves the students of UWS and residents to the major commercial hubs of the area.

This commercial area has the Belknap Corridor and the Tower Ave corridor.

Existing Key Gaps

- Catlin Ave from North End Superior 5th Street to 28th Street
- Belknap St from East End Superior 5th Street to Downtown Superior.
- 21st Street from Billings Park to East End
- Missing traffic calming and wayfinding on Fisher Ave and 19th Street.

MAP 4.27: Woodland—Duluth, Minnesota



Woodland—Duluth, Minnesota

Top Priorities

1. Woodland Ave—connecting the neighborhood to the hub.
2. Calvary Rd—providing an all ages, all ability bikeway facility between the Woodland Neighborhood to Homecroft Elementary School.
3. Connecting Woodland Ave south to Hartley Park and the UMD area.

One Mile Buffer Population: 4,141

Notes:

This hub primarily serves the Woodland residents.

This commercial has a cluster of restaurants, retail, and grocery stores and banks.

Allowing Woodland residents to get around within their neighborhood.

Key Gaps

- Woodland Ave between Calvary Rd to St. Marie St.
- Calvary Rd from Howard Gnesen Rd to Woodland Ave.
- Hartley Trail from Anoka St through Hartley Park , along Hartley Rd to Carver Ave and Arrowhead Rd.

Chapter 5: IMPLEMENTATION

This plan, with community input, is a long-term vision for bikeways within the Duluth-Superior Metropolitan Area. The ideas in this plan can be implemented in a number of ways. Funding is often a large barrier to building and maintaining bikeways, meaning implementation depends on volunteers to champion projects. The implementation also involves working closely with the community, property owners, and others. Some projects can be accomplished with volunteers, some with the help of local jurisdictions or agencies, and some with donations or grants. Some bikeways will need to involve many partners in the implementation.

Additional considerations for bikeway implementation involve determining alignments, the surface type needed, construction and engineering needs, environmental impacts, liabilities, legal constraints, potential conflicts with other user groups, property ownership, maintenance, security, marketing, wayfinding, and more. Some additional guides and resources are listed in the appendix that may be able to assist in some of these areas.

Implementation will only be possible with citizen buy-in and will take a coordinated effort between roadway jurisdictions, private property owners, community groups, citizens and impacted stakeholders.

Key Bikeway Implementation Guidance

NACTO – *Urban Bikeway Design Guide*

NACTO – *Design for All Ages & Abilities – Contextual Guidance for High-Comfort Bicycle Facilities*

FHWA – *Incorporating On-Road Bicycle Networks into Resurfacing Projects*

FHWA – *Small Town and Rural Multimodal Networks*

Addressing Issues

Common Barriers and Solutions

1. **Safety - do not feel safe bicycling .**
    a. Separate bike lanes from motor vehicle traffic
    b. Reduce motorist-bicyclist confusion & frustration – provide clear direction, for all users including where to properly store garbage cans.
    c. Evaluate the needs for lighting, emergency call boxes and other crime prevention through environment design techniques.

2. **Comfort - due to weather and street condition**
    a. Regular pavement maintenance of the streets with bikeways
    b. Reliable snow removal and street sweeping

3. **Hills – terrain too steep, too many hills**
    a. Point cyclists (through mapping, pavement markings and signage) towards uphill routes that are not too steep, provide bike climbing lanes and have off-street paths zig-zag up the hill.
    b. Improve bike to transit connections
    c. Allow for on-board transit bicycle options
    d. Install staircase bicycle ramps

4. **Inconvenient – distance and can't carry other items**
    a. Create direct routes on longer distance bikeways, less meandering
    b. Continue to install bicycling commuting repair stations a
    c. Provide education regarding existing on-demand roadside assistance programs (AAA Bicycle Service – Roadside Assistance Program.

Common Barriers to Bicycling

Safety

Comfort

Hills

Inconvenient

No bike available

d. Show what is possible – educate public about commuter gear at events, demonstrate the latest gear for helping people carry items by bike.

5. **Do not have a bike**
   a. Expand bike share, particularly in areas of low income, low car ownership.
   b. Continue bike maintenance workshops and support such as free pop-up bike shops.
   c. Bring awareness to the people who do not have a bike by creating a program to utilize the numerous bicycles that are picked up by transit and the police.

General Recommendations

1. **Provide direct connections** to major trip generators (schools, shopping, jobs, etc.).

2. **Include improvements to bikeway infrastructure in local development standards.** Increase local access to schools, businesses and services by including creating direct, separated connections between bikeway facilities and major entrance points into the destinations, and by including bikeways through parking lots.

3. **Incorporate bikeway design best practices** (separated bike lanes, creative place-making, public art opportunities, and green infrastructure) into street, transit and trail projects.

4. **Identify corridors that are potential connections or bike network routes** – any unused corridors that are potential connections or bike network routes. Assure that the jurisdictions have a process in place to consider and prioritize these when planning and constructing so we do not lose opportunities in the future.

5. **Design for up and down the hill bicycling**
    - Provide wayfinding through mapping, signage and pavement markings on routes that have easier hill climbs.
    - Add bike rails to public stairways, where streets or ramps do not exist and provide key connections between bikeways.
    - Consider gondola or funicular infrastructure.

6. **Install all bicycle facilities perpendicular to drainage grates and railroad crossings** – Identify all locations where this is not the case and propose a timeline for addressing these areas.

7. **Install high quality bicycle parking.** Consider the users when deciding on parking by:

    - Locating bike racks near front doors, with natural surveillance and visibility. Do not place bike racks behind buildings in hidden corners- encourages theft.
    - Providing bike parking at all government buildings used by the general public.
    - Installing bike parking shelters – at schools, and other places where large numbers of people bike frequently and leave bikes for longer periods of time.

- Identifying hot spot areas where bicycles are frequently stolen or vandalized and devise solutions to address this issue (including but not limited to installing bike racks that are more vandal resistent and relocating bike racks to a more visible area with better natural surveillance.
- Providing options for secure bike parking options, including lockers, secure entry area.
- Using signage to help find bike rack locations.
- Utilizing movable/temporary bike racks for major events.

8. **Provide bikeway transportation facility alternatives** to trail corridors that are primarily used for recreation.
9. **Provide detours for bike routes** and infrastructure when construction disrupts safe passage. Provide good and clear sinage. Detour shall provide the same level of safety as the route being disrupted.
10. **Try demonstration and pilot projects**. Give people a taste of what the changes might be like. One-day road diets and pop-up protected bike lanes let people test the concept before any large expenditures are made. Pilots projects need to be well thought-out, but they can be adjusted. Make adjustments based on actual data, not forecasts and fears of change.
11. **Continue to research, develop and expand bike share options** in the Duluth-Superior area.
12. **Develop a functional classification system** for bikeways**.**

13. **Consider undertaking a study on traffic signal systems** along the existing and proposed bikeway network to understand each signal's level of bicycle detection.
14. **Develop a regional or City mobile phone app** for users to find common routes to common places.

Performance Measurement

This plan, while long range in vision, is meant to provide a method in which to track progress today as well as provide flexibility to learn through trial and error. A number of key indicators should be annually tracked including:

- **Level of Traffic Stress** – perform analysis on the bikeway system. This grading system will provide jurisdictions an objective score on bikeway improvements.
- **Total bicycle network mileage**, including high speed road bike facilities and the mileage of all ages and abilities routes in the network.
- **Level of Use** – conduct an annual bike count in September (following the National Bike and Ped Documentation Project protocols) focusing on trends (changes over time) and before and after changes with new and/or improved bikeway infrastructure.
- **Level of Use** – count number of bicycles parked at all schools each month.
- **Total percent of students** who have a high quality, all ages and abilities bikeway to school.
- **Crash Rates** – serious and fatalities – track cyclists crashes.
- **Sidewalk Riding** – track percent of people who bicycle on sidewalks

- **Gender and Children Gap** – track the number, gender, and age of people who are cycling.
- **Partner with larger employment centers** to see what level their employees are using bikes to commute and gather data from them.

Future Plan Updates

As is the case with all planning documents, this Plan will require future updates to remain useful and relevant. The current state of bikeway planning nationwide is rapidly evolving and U.S. cities are embarking on an age of experimentation with new bicycle facilities being deployed increasingly every year.

Cities are beginning to design and build new types of bikeways that were relatively unknown as little as five years ago. It is anticipated that bikeway design innovations will continue to be developed.

Therefore, it is recommened that minor revisions and bikeway routing updates take place annually, and a major review takes place every 5 years. It is likely that over the coming years, new priorities or strategies will emerge, and new initiatives and programs will be desired.