Existing Conditions Report

2022 Grand Forks – East Grand Forks Bicycle & Pedestrian Element Update

Grand Forks-East Grand Forks Metropolitan Planning Organization

DRAFT - July 2022

Submitted by:

Bolton & Menk, Inc.
111 Washington Avenue South
Suite 650
Minneapolis, MN 55401
P: 612-416-0220

Table of Contents

Figures

Tables

Exhibits

No table of contents entries found.

Executive Summary

[Section Forthcoming]

I. Introduction

A. Project Background & Purpose

The Grand Forks-East Grand Forks Metropolitan Planning Organization (MPO) provides regional transportation planning services for the Grand Forks-East Grand Forks metropolitan area. The MPO implements the Transportation Improvement Plan (TIP), which provides substantial federal funding for transportation projects every year. The MPO's planning efforts represent a consideration and prioritization of projects. Bicycle and pedestrian type projects – both those represented in the four-year TIP and longer-term aspirations – are identified in the MPO's Bicycle and Pedestrian Element, which is a component of the larger Metropolitan Transportation Plan (also considering future land use, streets/highways, and public transportation).

The last Bicycle and Pedestrian Element was adopted in 2019. It set near- and long-term objectives to increase the number of walking and bicycle trips throughout the metropolitan area. This goal was to be met through several strategies, including improving multimodal access to key local destinations, improvements to bicycle and pedestrian safety in the region, and infrastructure investments to remove gaps and barriers to biking and walking. This Existing Conditions Report is intended to detail conditions for bicycling and walking as they currently exist in Grand Forks and East Grand Forks, as well as related sociodemographic information related to bicycling and walking, and transportation choices more generally.

Both Grand Forks and East Grand Forks consistently build pedestrian and bicycle facilities alongside regular development. This has resulted in an extensive sidewalk network along most streets (366 sidewalk miles total) and a substantial and growing shared use path/trail network (72 miles total). The trail network mainly consists of facilities along the Greenway, adjacent to the Red and Red Lake Rivers, the English Coulee, and shared-use paths along some roads. As a factor of its larger size and more stringent statutory requirements for sidewalk construction, Grand Forks has a more extensive bicycle and pedestrian network relative to East Grand Forks.

Figure 1. Grand Forks Metropolitan Area and MSA

B. Study Area

Greater Grand Forks is in the Red River Valley, a flat glacial plain that serves as a geographic barrier between Minnesota and North Dakota (**Figure 1**). Routine river flooding and cold winters result in a unique set of challenges when planning for active transportation in the area. Greater Grand Forks has developed strategies to mitigate the impacts of regular flooding, including the Greenway, which was developed after the flood of 1997. The Greenway that resulted from enhanced flood protection following 1997, preserves large amounts of the floodplain, bordered by significant levees and flood structures, in addition to functioning as a linear park with over 20 miles of bicycle and pedestrian trails.

The Grand Forks Metropolitan area is one of the coldest communities in the nation, with an average of 42 inches of snowfall per year. The cold season generally runs between November and early March, with temperatures seldom topping 30°F. The prolonged winter conditions greatly impact demand for bicycle and pedestrian infrastructure, as cold depresses demand for bicycling and walking facilities, and effectively supporting these types of infrastructure in the winter requires significant maintenance costs for snow and ice removal. The area is a rail freight hub for Burlington Northern Santa Fe (BNSF) Railway, with a large rail yard along Demers Avenue. BNSF's Great Northern Corridor mainline traverses the area, running between Chicago and ports of the Pacific Northwest. This mainline also serves the Bakken oil fields of western North Dakota, which has resulted in a surge in the number of rail cars hauling crude oil on BNSF mainline tracks that pass through Greater Grand Forks. Frequent and long trains, along with numerous at-grade crossings require special considerations when supporting bicyclists and pedestrians. In August of 2011, Grand Forks established five individual train Quiet Zones. Through this process significant safety features were incorporated for at-grade rail crossings like signing, striping, flashing lights and gates (at pedestrian and vehicle crossings), and power out indicators. The Quiet Zones in Grand Forks require 3-year renewals making the maintenance of these improvements essential to compliance with the program. With the success of this program in Grand Forks, East Grand Forks is presently making improvements to prepare for their own Quiet Zone in downtown near Sacred Heart School.

C. Socioeconomic and Demographic Characteristics

The Grand Forks – East Grand Forks area is the third largest metropolitan area in the state of North Dakota, with a total population of 68,342 people per the 2020 U.S. Census. The metropolitan area is comprised of the principal cities of Grand Forks (population 56,588) and East Grand Forks (population 8,555). There are over twenty smaller incorporated and unincorporated communities throughout Grand Forks County, North Dakota and Polk County, Minnesota that also rely on Greater Grand Forks for services, employment, and other resources. The region is home to both a United States Airforce Base as well as the University of North Dakota, both of which help Grand Forks with attracting new residents and investment while also contributing to the growing diversity of the area. While these contribute to the overall growth of the area, the Greater Grand Forks area did not grow faster than statewide average growth for North Dakota between the 2010 and 2020 decennial censuses, gaining approximately 6,900 people for a growth rate of 11.2 percent, compared to the North Dakota growth rate of 15.8 percent.

The following demographic analysis suggested that there is significant need for accessible, ADA compliant bicycle and pedestrian infrastructure. Roughly 10 percent of households in the area have at least one person with a disability, which is slightly over the statewide averages of Minnesota (7.4 percent) and North Dakota (7.2 percent). The higher percentage of households with at least one person with a disability means accessible ADA compliant pedestrian and bicycle facilities should be prioritized. There were concerns raised by the community about aging infrastructure (like heaving sidewalks) and existing infrastructure not being wide enough to accommodate people with limited mobility. Both issues can be potentially hazardous for people who struggle with movement.

1. Population Demographics

Grand Forks closely matches the demographic distribution of North Dakota as a whole and is slightly less diverse when compared to Minnesota. People of color (defined as any person who identifies as Black, Indigenous, Asian, Native Hawaiian or Pacific Islander, some other race, or two or more races) make up just over 19 percent of the population in the Grand Forks & East Grand Forks area, a slightly larger share when compared to North Dakota, but significantly smaller than Minnesota (**Table 1**). People of color are not equally distributed throughout the Grand Forks metropolitan area, a subject that will be discussed later in this Existing Conditions Report.

Table 1. Grand Forks MSA Demographic Comparison						
	Minnesota		**North Dakota**		**Grand Forks & East Grand Forks MPO**	
	Population	Percent*	Population	Percent	Population	Percent
Total	**5,706,494**	**-**	**779,094**	**-**	**68,342**	**-**
White	4,423,146	77.5%	645,938	82.9%	55,256	80.9%
Black or African American	398,434	7.0%	26,783	3.4%	3,503	5.1%
American Indian or Alaska Native	68,641	1.2%	38,914	5.0%	1,821	2.7%
Asian	299,190	5.2%	13,213	1.7%	2,423	3.5%
Native Hawaiian / Pacific Islander	2,918	0.1%	924	0.1%	33	0.0%
Some other Race	168,444	3.0%	11,382	1.5%	1,019	1.5%
Two or more races	345,721	6.1%	41,940	5.4%	4,287	6.3%
Hispanic or Latino**	345,640	6.1%	33,412	4.3%	3,521	5.2%
Not Hispanic or Latino	5,360,854	93.9%	745,682	95.7%	64,8921	94.8%

Source: U.S. Census Bureau (2020) Table P1 & P2, retrieved from IPUMS NHGIS, University of Minnesota, www.nhgis.org.
* Due to rounding totals may not add up to 100 percent
** People who identify as Hispanic, Latino, or Spanish may be any race

2. Dependent Ages

Children and older adults are also more likely to be reliant on nonmotorized modes of travel. Children cannot drive, and older adults might be unable or unwilling to drive as they age. Safe pedestrian access to transit stops and stations, as well as a robust network of pedestrian paths and sidewalks are a key aspect to both accessibility and socialization for older adults and children. The median age of Greater Grand Forks is 32.5 years old, younger than both North Dakota (35.2 years old) and Minnesota (38.1 years old). Approximately 22 percent of people in the Greater Grand Forks are under the age of 18, and approximately 46 percent are under the age of thirty (**Figure 3**). This combination of school- and university-aged persons should be considered when prioritizing investments in the bicycle and pedestrian network. The City of Grand Forks has already made significant investments for bicycle and pedestrian circulation at the university, in addition to their efforts for Safe Routes to School (SRTS) planning.

3. Low-Income Populations

Low-income populations are more likely to rely on biking, walking, transit, and other non-single occupancy vehicle modes to make trips. The poverty threshold is a national statistic by the United States Department of Health and Human Services. The Census Bureau's 2020 poverty threshold for a single person under 65 was an annual income of $12,760. For the same year, the poverty threshold for a family group of four comprised of two adults and two children was $26,200.

In 2020, the Grand Forks MSA had an estimated 14.3 percent of individuals have incomes below the poverty threshold, and 31 percent of individuals make less that 200 percent of the poverty threshold (**Figure 3**). These statistics are somewhat skewed by the large percentage share of college students that make up the Greater Grand Forks population. Students typically have a limited personal income which may not fully reflect their actual wealth or financial conditions.

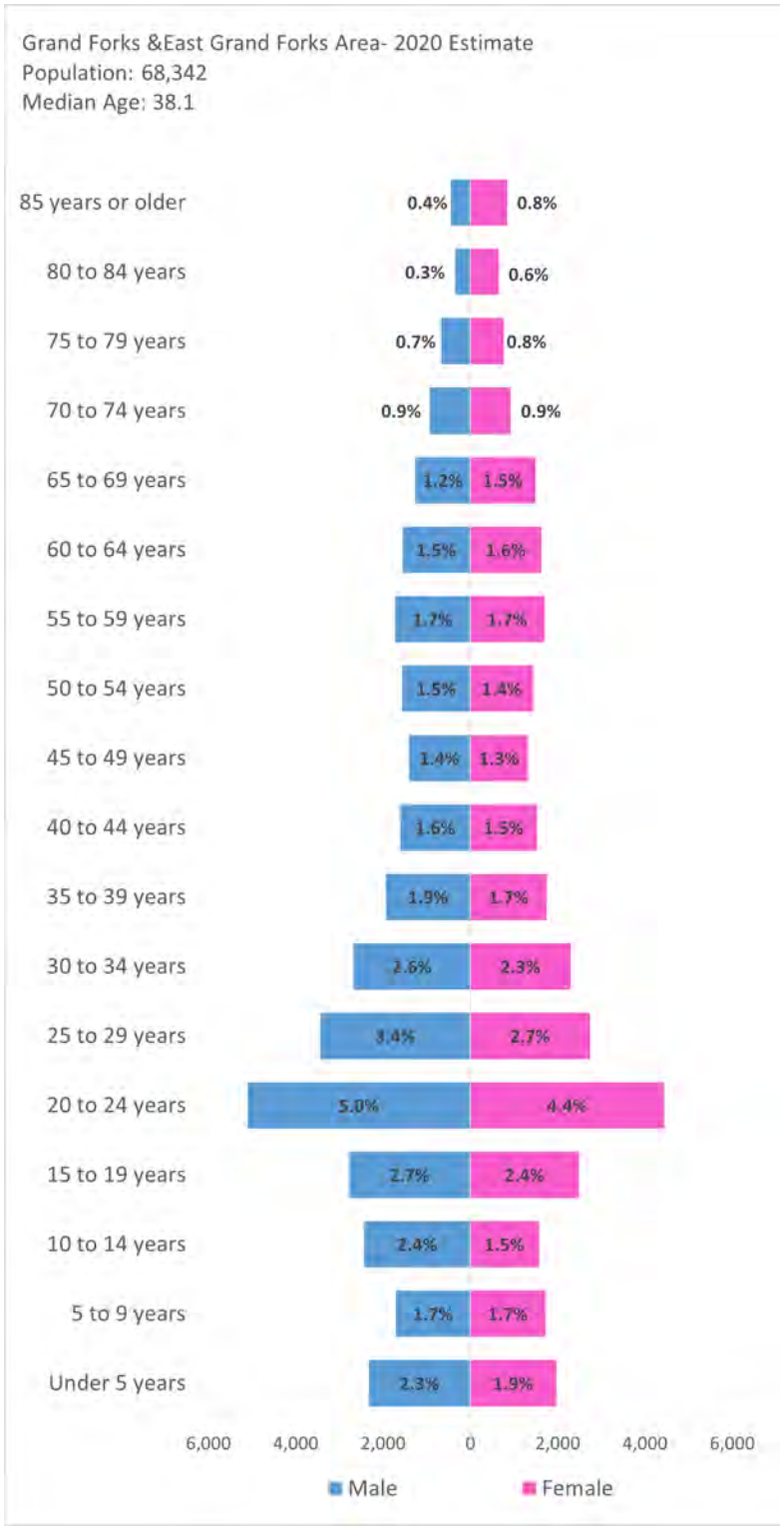
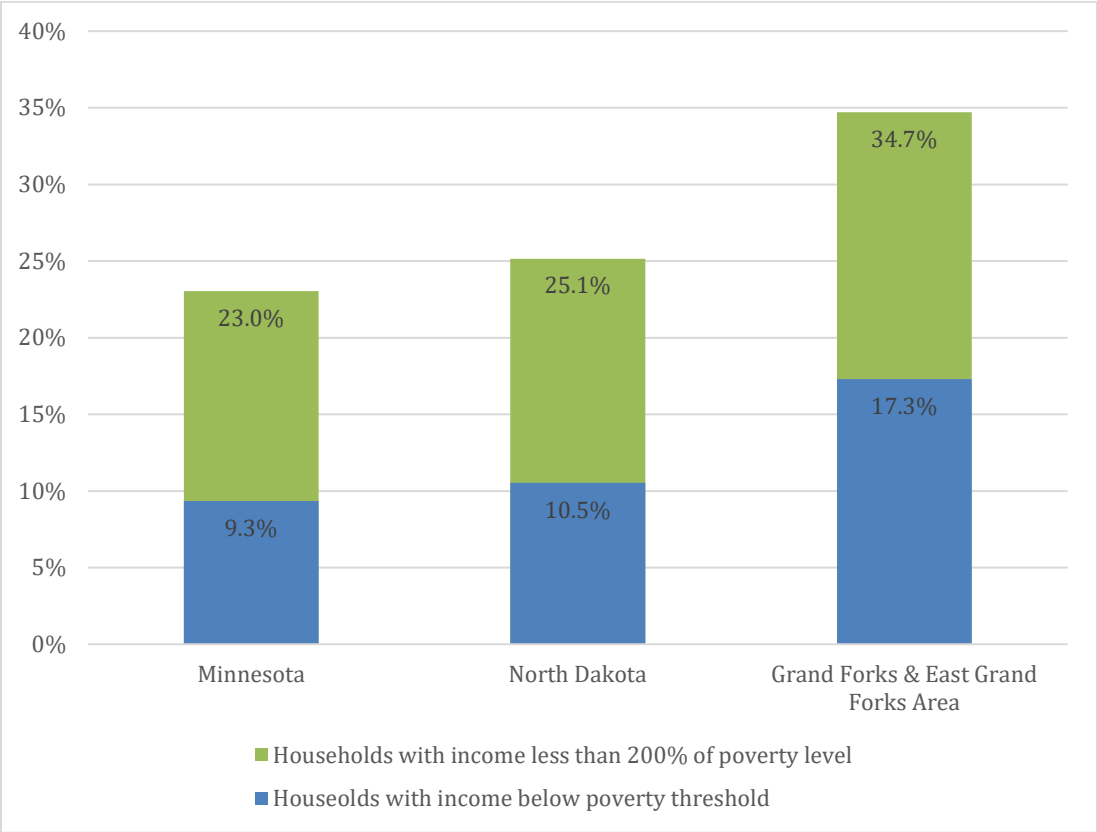


Figure 2. Population Pyramid for Greater Grand Forks
Source: *U.S. Census Bureau, ACS 5-Year Estimates (2016-2020) Tables B01001. Retrieved from IPUMS NHGIS, University of Minnesota, www.nhgis.org.*

Figure 3. Individual Incomes as Percent of the Poverty Threshold



Source: *U.S. Census Bureau, ACS 5-Year Estimates (2016-2020) Tables C17002. Retrieved from IPUMS NHGIS, University of Minnesota, www.nhgis.org.*

Poverty is not equally distributed throughout the area, and places with significantly higher rates of people living below the poverty threshold should be considered for additional engagement or analysis to ensure that the priorities of the Bicycle & Pedestrian Element Update align with their needs. Poverty and BIPOC populations are further analyzed in this report's Environmental Justice Analysis.

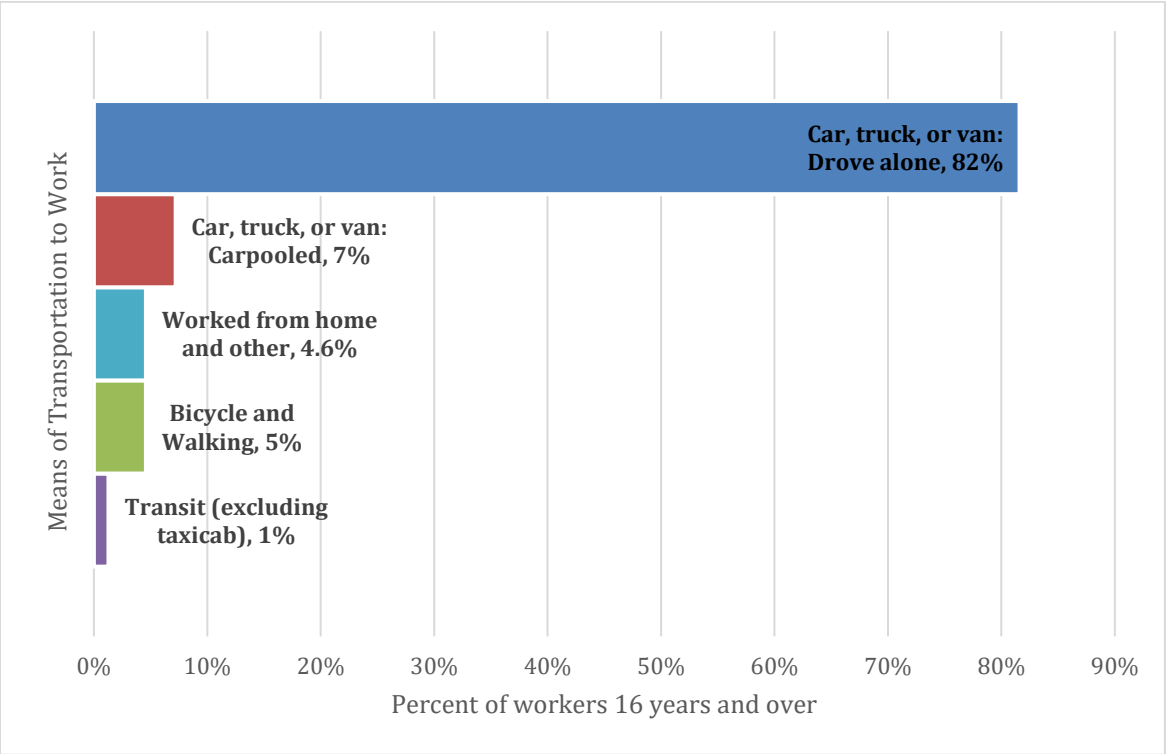
4. Disability

People with disabilities may be more likely to rely on biking, walking, and public transportation for travel, and might suffer disproportionate impacts from poor quality or lack of active transportation infrastructure. About 10 percent of households have at least one person with a disability in Grand Forks, about comparable to the statewide rates for both Minnesota and North Dakota, though the household statistics may not match the rates of individuals with disabilities. The distribution of these populations seems to have a weak positive correlation with areas with high populations under 16 years old and over 65 years old.

5. Means of Travel to Work

Approximately 5 percent of workers in the Grand Forks metropolitan area walk or bike to work, slightly higher than the average statewide rates for biking and walking in North Dakota and Minnesota (**Figure 4**). Work commute trips only capture a portion of all bicycle and pedestrian trips, but high mode share for commute trips is a common bellwether of overall system quality.

Figure 4. Grand Forks MSA Means of Travel to Work



Source: U.S. Census Bureau, ACS 5-Year Estimates (2016-2020) Table B08301, retrieved from IPUMS NHGIS, University of Minnesota, www.nhgis.org.
* Due to rounding totals may not add up to 100 percent

6. Households without a Vehicle

Households without a vehicle are more likely to rely on biking, walking, or public transportation for trips, for the simple reason that a car is not an available option. About 5.7 percent of households in the Grand Forks-East Grand Forks metropolitan area do not have a vehicle, slightly higher than the North Dakota statewide rate of about 5.1 percent of households, but lower than the Minnesota rate of 6.6 percent. While there is a great deal of overlap between households with incomes below the poverty threshold and not having access to an automobile, the essential nature of personal automobiles as a means of accessing employment, goods, and services forces automobile ownership as a matter of course.

II. Existing Studies Review

A review of existing documents, policies and studies was conducted as part of the Bicycle & Pedestrian Element Update. This section of the Existing Conditions Report provides a short synopsis, however readers are encouraged to read the Plans & Policies Report for more information.

[After the existing studies/policy is reviewed by MPO staff and comments are incorporated, the analysis and findings will be included here]

III. Community Surveys and Engagement

A. Surveys

An online survey was conducted regarding existing conditions, needs and opportunities. This survey was available online from July 1st to July 23rd of 2022. During this time, the survey received 319 complete responses, in addition to 75 partial responses.

Community feedback was also gathered from INPUTiD, an online mapping software made available on the project website. INPUTiD allowed users to leave feedback "geotagged" to specific locations in the Grand Forks and East Grand Forks under four general headers: "Ideas & Opportunities", "Dislikes", "Concerns", and "Other." This same process and utility was made available to the project steering committee, maintained as a separate dataset to allow the project team to draw distinctions between priorities of the two groups. During the three weeks the public INPUTiD resource was open, it garnered a total of 81 responses. The steering committee was able to leave comments on the project INPUTiD page from June 14th to July 1st. During this time, the steering committee left 96 comments. A brief summary of comments by type is included in Table 2 below.

Table 2. INPUTiD Summary of Feedback by Type

Source	Ideas & Opportunities		Dislikes		Concerns		Other	
	Total Comments	Percent	Total Comments	Percent	Total Comments	Percent	Total Comments	Percent
Project Website	28	34%	8	10%	36	44%	9	11%
Steering Committee	42	44%	9	9%	36	38%	9	9%
Total	**70**		**17**		**72**		**18**	

Additional analysis from public engagement, such as a detailed write up on Public Survey #1, takeaways from open houses, and takeaways from INPUTiD are covered in detail in the *Grand Forks – East Grand Forks Bicycle and Pedestrian Element Update Community Engagement Summary.*

B. Open Houses

The first open house was held on June 15th, 2022 at the East Grand Forks City Hall Rotunda. A summary of open houses and other community engagement events is included in the *Grand Forks – East Grand Forks Bicycle and Pedestrian Element Update Community Engagement Summary.*

IV. Community Bicycle Audit

On June 30th, the project team organized and conducted a community bike audit to collect first-hand data on the regional bicycle system. The audit was open to all members of the public and included fifteen attendees representing a variety skill levels from experienced to recreational to novice riders. The audit route (**Figure 5**) was nine miles in length, and it was designed to broadly sample many of the roadway types a typical cyclist may experience in the Grand Forks area: shared use paths along arterials, low volume minor arterial and collector roads, the Greenway, and others.

The audit was broken into five segments, with stop coordinated to allow participates to give feedback to project staff on key areas of need, desired amenities, confusion regarding rules of the road, and other potential barriers to cycling in Grand Forks. Key takeaways from the audit and subsequent discussions with the group are as follows:

Pavement Conditions –Audit participants expressed that poor pavement conditions frequently influenced route selection. Low pavement quality was given as a reason that more appealing routes (i.e., direct routes with little automobile traffic) were considered untenable (**Figure 6**). During the audit ride itself, ride leaders and participants noted that the road surface condition was noticeably worse in the bike travel lanes versus the vehicles travel lanes on University Avenue east of the University of North Dakota campus.

Bridge Amenities – Most major bridges throughout the metropolitan area are challenging for cyclists, either due to a lack of facilities or narrow facilities that do not provide adequate buffering between cyclists and automobile traffic.

Rules of the Road – Members of the audit group expressed that there was a lack of understanding regarding the rules of the road regarding interactions between cyclists and motorists. Members of the audit said that they think that this could be addressed with reoccurring education opportunities (i.e., education campaigns, public service announcements, bike rodeos).

East-West Connector – During the course of the audit ride and discussion, participants expressed that there was no clear east-west bike connector route between the densely populated parts of Grand Forks around 17th Avenue, the Greenway, and other bike routes. 17th Avenue was part of the audit. The group felt it the road was comfortable for cycling east of Washington Street and less comfortable west of Washington Street.

Railroad Crossings –Several members on the audit tour expressed discomfort crossing the railroad tracks at any location other than Downtown Grand Forks or 42nd Street. Additionally, there are limited options for crossing the Demers Avenue switching yard, creating a very large gap in the system. The most direct crossings, Columbia Road and Washington Street, have features that render them undesirable to all but the most confident of cyclists: The Columbia Road railroad crossing is a covered pedestrian walkway with steep grades. Washington Street is a generally

unattractive underpass with high traffic volumes, narrow shared facilities for cyclists and pedestrians, and is difficult to ride along due to dense public and private access along Washington.

Areas of Discomfort – The audit group felt uncomfortable crossing major arterials and generally avoided biking along arterial routes, such as Washington Street, Gateway Drive and US Highway 2 in East Grand Forks. Signalized intersections with queued vehicles do not provide space for bicyclists, notably the intersections at 17th Avenue South and South Washington Street and 17th Avenue South and South Columbia Road were both discussed as uncomfortable with audit participants.

Signage and Control – the group felt there were multiple areas where better signage would be beneficial to direct riders to safer crossings and better amenities. There were also a number of locations where improved control was desired, such as the DeMers Avenue and Columbia Road ramps.

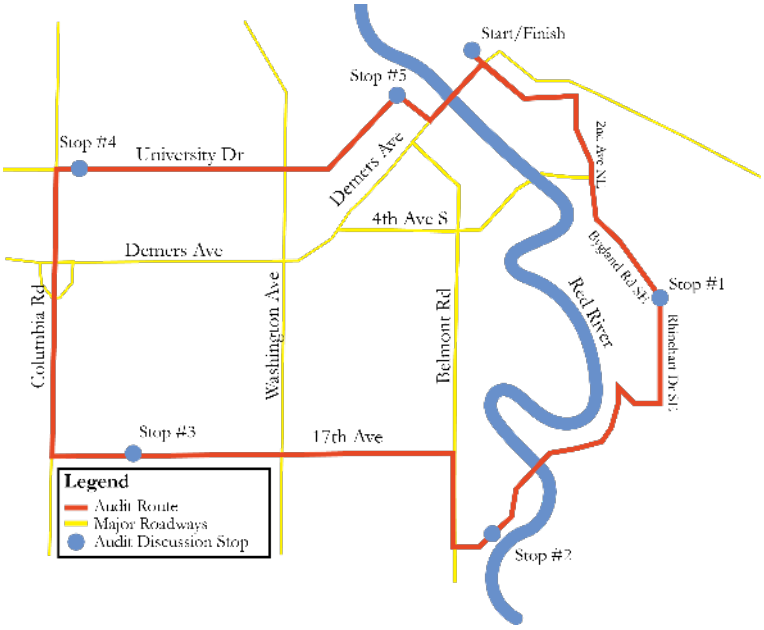


Figure 6. Bike Audit Ride Route

Figure 5. Poor pavement quality has a significant impact on rider comfort

V. Greater Grand Forks Today

This section considers underlying factors that help shape the structure and character of bicycling and walking use in Greater Grand Forks. Generally, these can be categorized in one of two ways: demand – the things that drive the need to make trips; and land use – which determine the structure of the overall transportation network.

A. Demand

The bicycle and pedestrian demand analysis reviews where deficiencies exist in the bicycle and pedestrian network and where potential linkages may address latent demand for bicycling and walking. Ultimately, these types of linkages can become potential future projects and can be prioritized for public investment. Latent demand is determined through a mixture of demographic analysis and existing land use. The demographic analysis is meant to determine where there are concentrations of people most likely to walk, bike, or use transit. The existing land use analysis will determine potential origins and destinations for trips within Greater Grand Forks.

Transportation is largely understood to be a derived demand, meaning that demand for transportation is driven by the need to access work, goods, and services. Even recreational trips are often made with a

destination in mind, such as to arrive at a park, local coffee shop, or quiet spot along the greenway. Understanding transportation demand as being derived from these needs makes it possible to construct an analysis based on building linkages between points of origin, like places of residence, and destinations, such as employment hubs, schools, and community centers.

B. Existing Land Use

The Grand Forks – East Grand Forks metropolitan area, like other communities in the United States that experienced rapid growth in the 20th century, has a dispersed development pattern that generally facilitates automobile trips and is less supportive of public transportation and short trips walking or bicycling. As a result of these land use policies, most trips are made with automobiles. However, owing to the age of the community, some areas like downtown were developed in a more compact way, and are more conducive to biking, walking, and transit. Land use patterns help shape the structure of a bicycle and pedestrian transportation network. High density residential areas, major employment nodes, civic and cultural uses, medical campuses, and commercial nodes all contribute to trip patterns within the transportation network.

The existing land use map (**Map 1**) shows the existing land use in Greater Grand Forks, which represents how most properties are currently being used. Not all streets that serve key areas such as employment nodes and medical facilities are currently easily accessed by bicycle and might not provide for direct routes when walking.

Key land use factors in Great Grand Forks include:

1. Downtown Grand Forks and Downtown East Grand Forks

These historic downtowns naturally developed pedestrian friendly networks as their initial platting largely predated automobiles as the dominant means of transportation. Like many other communities in the United States, the two downtowns atrophied in the middle of the century as business and residents moved outside of city centers, drawn away by cheaper development opportunities available outside of the city center the made possible by the highway system and low transportation costs.

Recent revitalization efforts have been successful in reestablishing the downtowns as a primary destination, with the Grand Forks Downtown Action Plan guiding development west of the Red River. This plan recommends large infill development projects at the Water Treatment Plant, Centennial Park, Pillsbury Park, Lyons' Place, and the Greenfield on 1st Area, amongst others. The Downtown Action Plan also includes guidance on future development to support walking and cycling between downtown destinations, such as shortening crossing distances, installing countdown timers, improving lighting, and filling gaps between existing trails. Some of these investments have already begun, including improvements to the downtown streetscape to improve walkability. However, the direction of investment in downtown prioritizes parking and mobility for automobiles on all major downtown roads, placing it at odds with multimodal investment. Crash analysis shows that downtown does have a significant number of bicycle and pedestrian crashes, which is likely related to density of multimodal transportation activity in downtown.

East Grand Forks has similar downtown urban form along DeMers Avenue, and also has a series of popular restaurants facing the river. However, East Grand Forks is also home to a large number of publicly owned surface parking lots where vehicles park for free. These facilities are a clear invitation that driving and parking in downtown East Grand Forks is highly encouraged.

The two downtowns are connected by the Sorlie Memorial Bridge (DeMers Avenue), one of three regular roadway crossings of the Red River. The bridge itself presents a barrier for cycling between the two downtowns, as it lacks dedicated facilities for cyclists on the bridge (**Figure 7**). These conditions are stressful for all but the most experienced cyclists and discourage non-automobile travel between any destinations divided by the Red River.

2. Parks and Recreation

The Greenway represents a large investment by both communities in the regional parks system and serves a means of mitigating the impacts of regular flooding events. The Greenway and Red River separates the cities of Grand Forks and East Grand Forks, in addition to containing a substantial portion of the region's network of shared use paths and numerous destinations such Riverside Park and Swimming Pool, Lincoln Drive Park, and a new skate park. The shared use paths of the Greenway can be understood both as a transportation resource to reach destinations along and adjacent to the Greenway, and as a destination in themselves for recreational purposes.

Smaller municipal parks are generally well distributed throughout both communities, allowing most of the population easy access to parks within a reasonable distance on foot or by bike. However, this is only true if there are adequate sidewalks or bike facilities and safe crossing opportunities to reach these destinations.

3. Highways and Interstates

Urban development to some extent is constrained in the Grand Forks metropolitan area by Interstate 29 to the west and US 2 (Gateway Drive) to the north. Grand Forks has a system of arterial roadways that serve as commercial nodes and major thoroughfares to access other parts of the city – Columbia Road,

Figure 7. Cyclists on Sorlie Bridge

Washington Street, Gateway Drive, University Avenue, DeMers Avenue, 17th Avenue, and 32nd Avenue. These major roadways can be significant barriers to safe crossing and cross-city connectivity. fInvestments that address these barriers can serve as low-cost high-yield investments to improve biking and walking in the community.

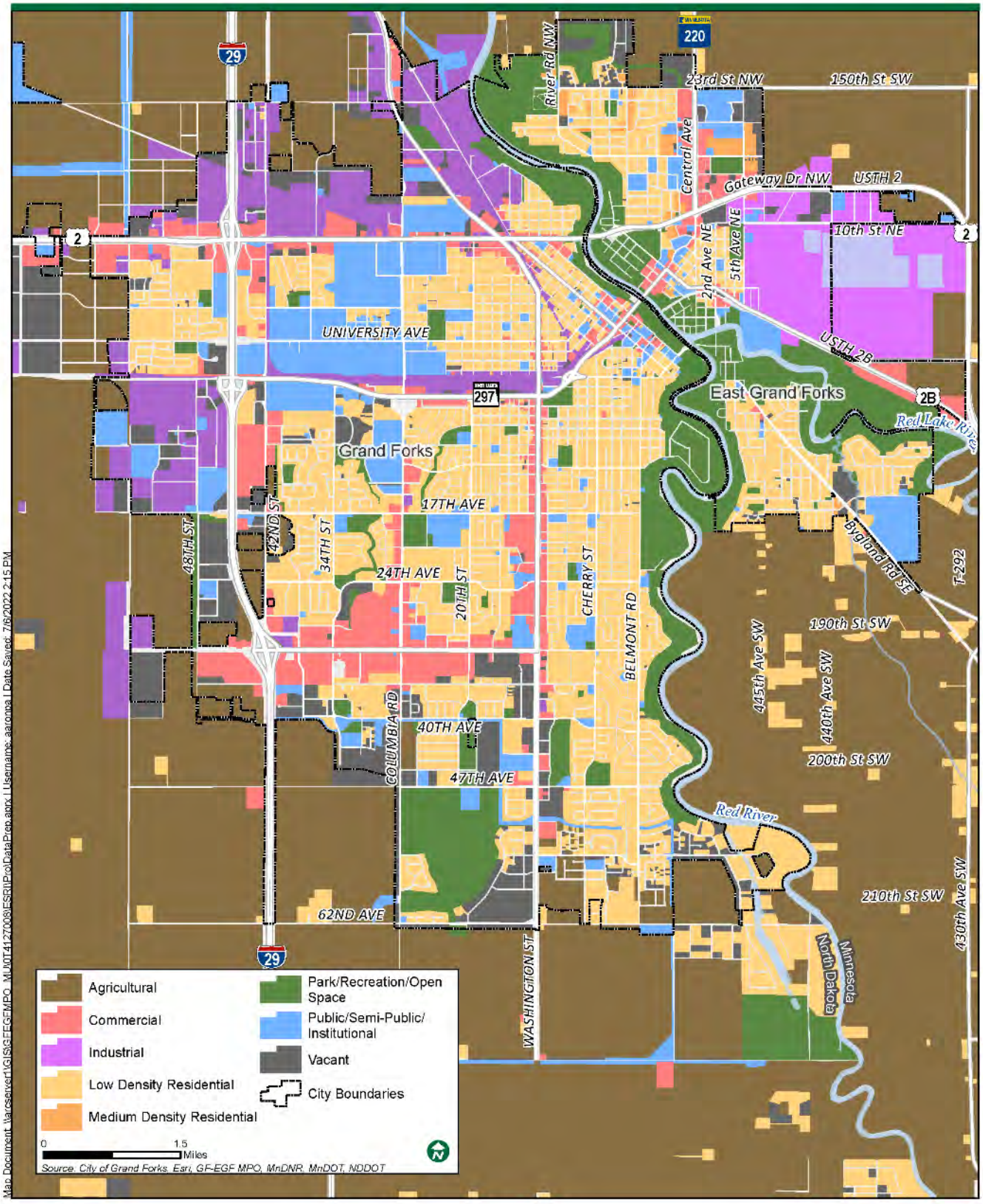
In East Grand Forks, US 2 is a major east-west roadway, as are DeMers Avenue, Central Avenue Northwest NW (Minnesota Highway 220), 4th Street, and 2nd Avenue Northeast/Bygland Road Southeast. DeMers is the primary downtown commercial corridor, and also provides access to US Highway 2 and Central Avenue. Central serves as a main north-south spine, connecting downtown East Grand Forks to residential and industrial areas to the north, as well as key educational institutions such as East Grand Forks High School and Northland Community and Technical College. 2nd/Bygland Road is the main connector between downtown East Grand Forks and growing residential areas of southern East Grand Forks.

4. Linear Commercial Corridors

Several of the highways also serve as important regional commercial corridors, such as Columbia Road, Washington Street, DeMers Avenue, Gateway Drive, Central Avenue Northwest, and 32nd Avenue. These corridors generate many trips for commerce, services, and employment. Today, most people access these corridors by automobile. While most of these corridors have dedicated pedestrian facilities, none have dedicated complete bicycle facilities. A related consideration for these corridors is how people may be able to access them from adjacent neighborhoods via side streets.

5. Schools, Civic Uses, and Cultural Destinations

Schools in both cities are frequently located within neighborhoods, which can create a significant amount of traffic during arrival and dismissal times. Each school district operates independently, with Grand Forks Public Schools having an enrollment of 7,567 students in the 2020-2021 school year, and East Grand Forks Public School district having an enrollment of 1,982 students during the same time period. There are 22 public schools in the region, divided between three high schools, four middle schools, and twelve elementary schools. There are also pre-kindergarten and private schools in the region. The Career Impact Academy is also set to open in the coming years. The Career Impact Academy is a school that will be built as a collaborative effort between the City of Grand Forks and private industry partners. 11th and 12th graders within the Grand Forks Area School District will be able to take classes while obtaining college credit and professional experience in a variety of different career fields. While this project is still in development, it will be a major education trip generator and employment location when finished. Grand Forks is home to the University of North Dakota, with an enrollment of more than 13,000 in 2021. East Grand Forks is home to Northland Community and Technical College, which has a student population of almost 4,000 shared between East Grand Forks and a campus in Thief River Falls. Safe Routes to Schools plans have been developed for 16 schools in Grand Forks, and three schools in East Grand Forks.



Map Document: \\arcserver\1\GIS\GFEGFMPO_MJ\0T4127008\ESRI\ProData\Prep.aprx | Username: aajonca | Date Saved: 7/6/2022 2:15 PM

C. Future Land Use

Ideally, the active transportation network should be planned in coordination with projected growth of a region to ensure that biking and walking are viable transportation options in more recently developed areas, as they typically are in the older and more compact parts of urban zones. The City of Grand Forks completed its 2050 Land Use Plan in spring 2022. The City of East Grand Forks last updated its land use plan in November 2021. These plans (**Map 2**) were consulted to determine how future developments might impact the future investments into the bicycle and pedestrian networks. Key features of the future land use plans include:

- Planned future land use for East Grand Forks will maintain the same heading as previous plans, with the majority of new housing construction being single-family housing south of the current city boundary at 182nd Street Southwest, and north and northeast of downtown. Multi-family residential and mixed use residential/commercial uses are present in limited quantities throughout the community, mostly concentrated within downtown East Grand Forks and north of downtown.
- Grand Forks' 2050 Land Use Plan divides residential zoning into two categories: urban residential and rural residential, in addition to adding a mixed-use category. Urban residential areas are intended to accommodate a complementary mix of housing units, granting greater flexibility with zoning for higher density housing in what was formerly single-family residential zoning. Urban residential zoning comprises nearly 7,000 acres of the raw developable land.
- Large increase in industrial and mixed-use land uses along major interstate corridors such as Interstate 29 and US-2. Trips between new mixed-use corridors and industrial clusters could generate a significant number of short biking and walking trips.
- The Downtown Action Plan and Renaissance Zone Plan support development goals throughout planned infill projects through Greater Grand Forks. The Downtown Action Plan has several small area plans for infill projects, and the Renaissance Zone Plan sets infill development goals for the Gateway District. The success of mixed-use neighborhoods and dense infill developments is in no small part contingent on supporting biking, walking, and transit to reach destinations, reducing need for parking, and supporting alternatives to private automobile trips.

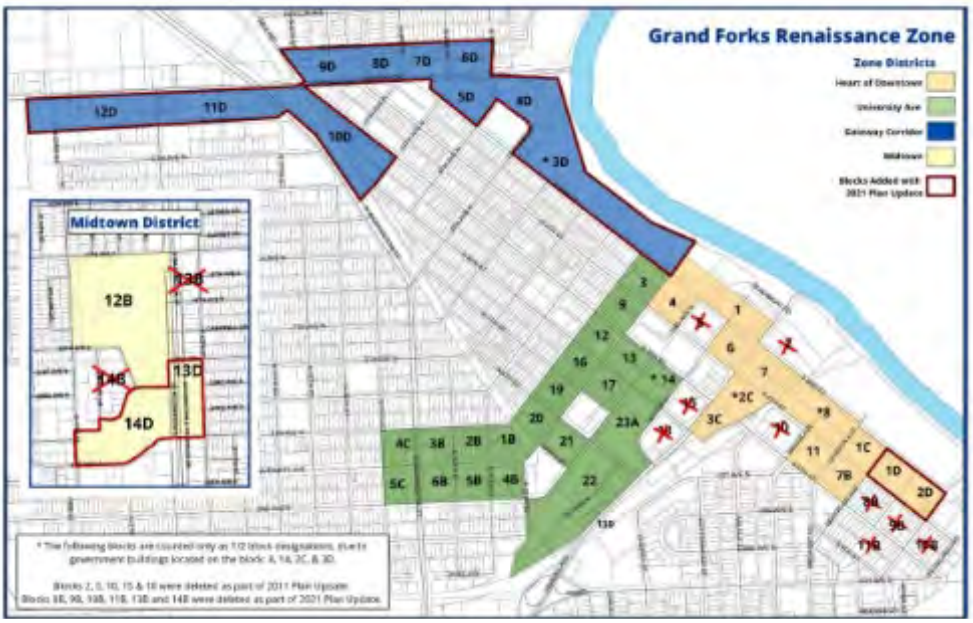
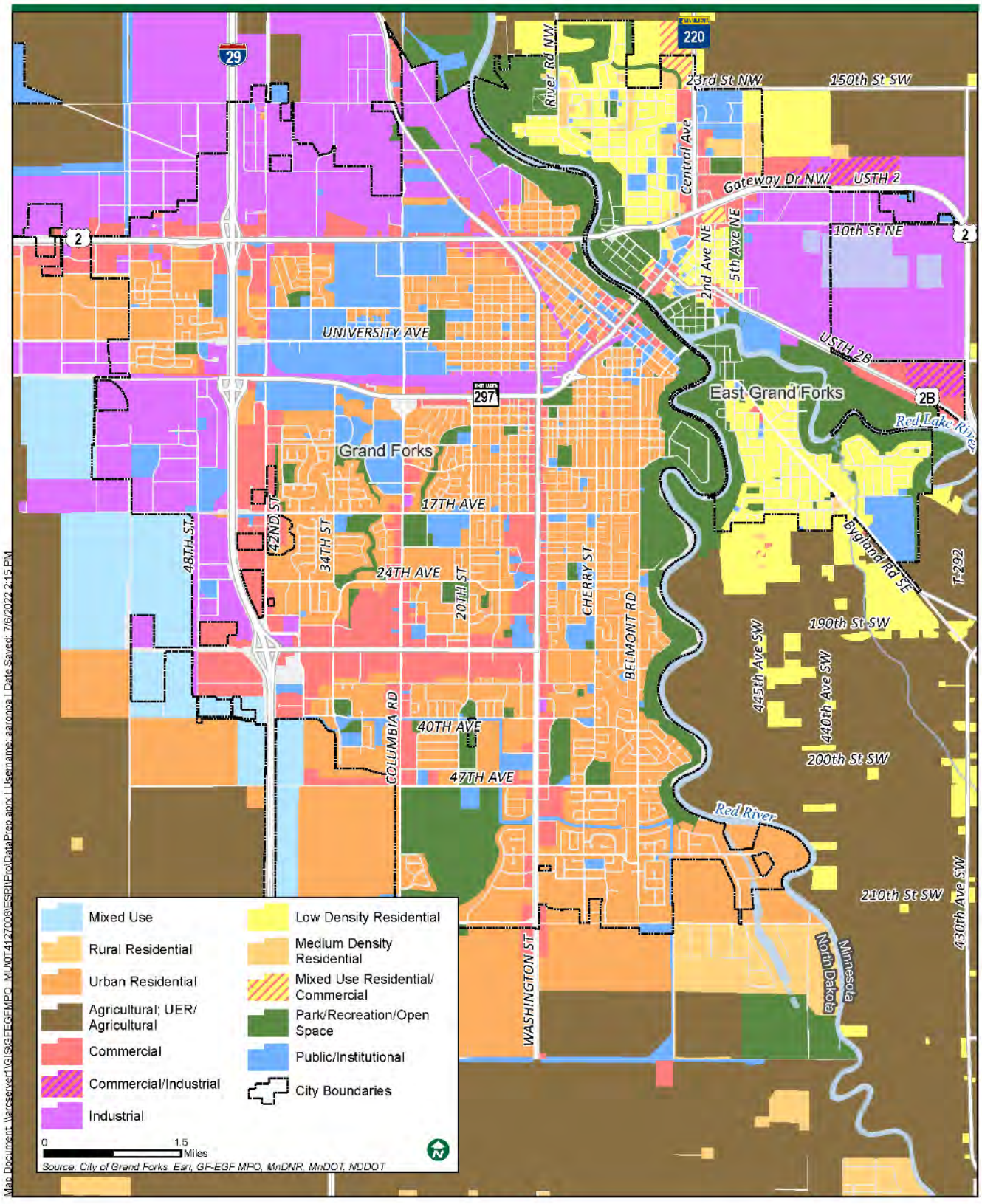


Figure 8. Renaissance Zone Plan Development Areas. The Renaissance identified several underdeveloped or underutilized areas that have significant potential for infill development.



Map Document: \\arcserver1\GIS\GFEGFMPO_MU\0T4127008\ESRI\ProjDataPrep.aprx | Username: aaronpa | Date Saved: 7/6/2022 2:15 PM

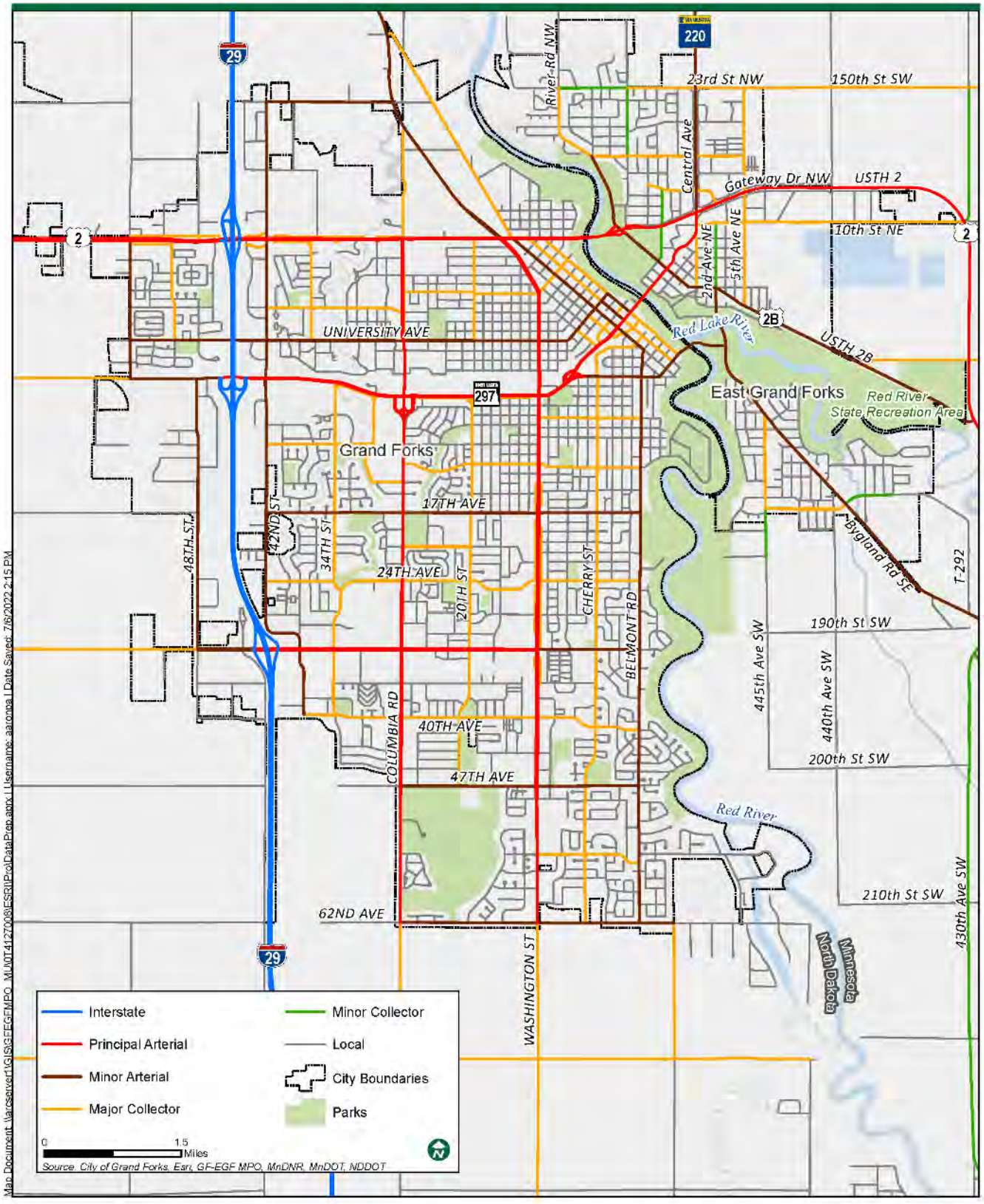
A. Functional Classification

The pedestrian and bicycle trail network are shaped by the street network. The functional classification of streets is a good barometer for determining the suitability of a roadway for use by bicyclists and pedestrians. Lower speed and volume roadways are better suited for on-street investments such as bike lanes and bicycle boulevards. Higher speed and volume roadways are better suited for off-street trails and paths.

The road classification network in Grand Forks is typical for cities in the United States of this size and vintage (**Map 3**). Interstate 29 and US HIGHWAY 2 generally define the borders of the community. Major arterials like Columbia, Washington, 32nd Avenue, and DeMers demarcate neighborhood borders and provide connections to downtown, commercial destinations, and the Greenway. Primary north/south arterials include Columbia Road, Washington Street, Belmont Road, and Bygland Road. The main east/west arterials are US HIGHWAY 2/Gateway Drive, University Avenue, DeMers Avenue, 17th Avenue, and 32nd Avenue. Most of the community is accessible by the local street system.

- Greater Grand Forks development is still largely contained within the borders of I-29 and US Highway-2/Gateway
- The network of principal and minor arterials forms a roughly orthogonal grid that generally define neighborhood boundaries. Likewise, older portions of the local street network are consistently laid out in orthogonal grids. These short blocks with frequent intersections can provide excellent bicycle and pedestrian connectivity. New development street networks are less direct.
- Principal arterials like Demers (Figure 9) connect the local street network to downtown Grand Forks and East Grand Forks. Many of the principal arterials already have shared use paths or alternative routes for biking and walking, but connections between these paths are lacking.

Figure 9. Demers Avenue in Grand Forks links the two core communities but is a barrier for biking and walking.



Map Document: \\arcserver1\GIS\GFEGFMPO_MU\0T4127008\ESRI\ProjDataPrep.aprx | Username: aaronpa | Date Saved: 7/8/2022 2:15 PM

B. Existing Bicycle Network

Greater Grand Forks has a growing network of shared use paths and on-street bicycle facilities (**Map 4**). The largest regional investment in the shared use path network is the Greenway, which has over 20 miles of paths along the Red River and Red Lake River and serves as north-south connector in both cities (**Figure 10**).

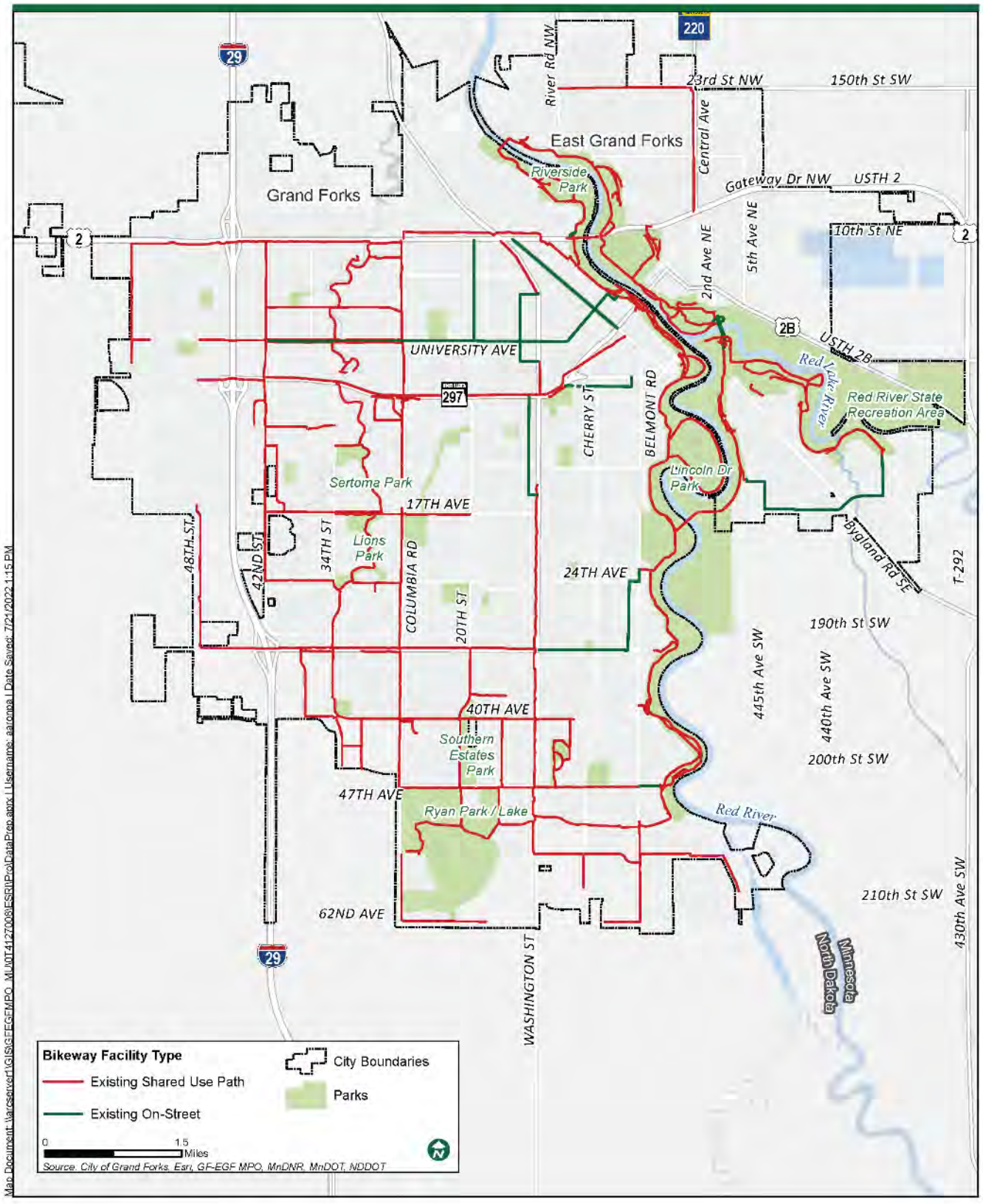
Grand Forks has consistently developed shared use paths and trails along roadways as part of the new development process, but these paths do not always provide adequate connections to valued destinations. Share use paths along roadways are typically realized as wider sidewalks (typically a minimum of 8 feet wide). Older neighborhoods generally do not have shared use paths, nor do they have the right of way to implement them. Nevertheless, these neighborhoods represent areas that could potentially generate bicycle trips due to their close proximity of destinations. Many streets in older neighborhoods are characterized by low speeds and low numbers of cars, and so may be comfortable places to bicycle given adequate infrastructure.

Figure 10. A cyclist on the Grand Forks Greenway

East Grand Forks has limited bicycle facilities outside of the Greenway and the downtown area. Greenway trails links to newer residential development in southern parts of the city, but there are limited connections from neighborhoods to the Greenway in places.

- Previous investment in bicycle facilities has mostly been in the Greenway and shared use paths, presenting issues with first/last mile connections between these resources and neighborhoods. A well-developed bicycle network is comprised of many types of infrastructure to meet the needs of various skill levels and trip types (**Figure 11**), in addition to supporting trips through providing secure storage and other amenities at origins and destinations.
- University of North Dakota has a shared bus/bike lane along University Avenue, which in turn links to a network of shared use paths and bicycle friendly streets. System cohesion could be improved through additional on-street facilities like bike lanes, street markings

Figure 11. Examples of Bicycle Facilities



Map Document: \\arcserver\GIS\GFEGFMPO_MJ\0T4127008\ESRI\ProData\Prep.aprx | Username: aaronna | Date Saved: 7/21/2022 1:15 PM

C. Existing Pedestrian Network

A well-developed pedestrian network (**Map 5**) supports all trip types. Walking plays a role in all trips, be it as minor as the distance between parking and the final destination, home and a transit stop, or as the primary transportation mode. In addition to pedestrian facilities such as sidewalks and shared use paths, the pedestrian network includes support for crossing roadways, railways, and other natural or constructed barriers.

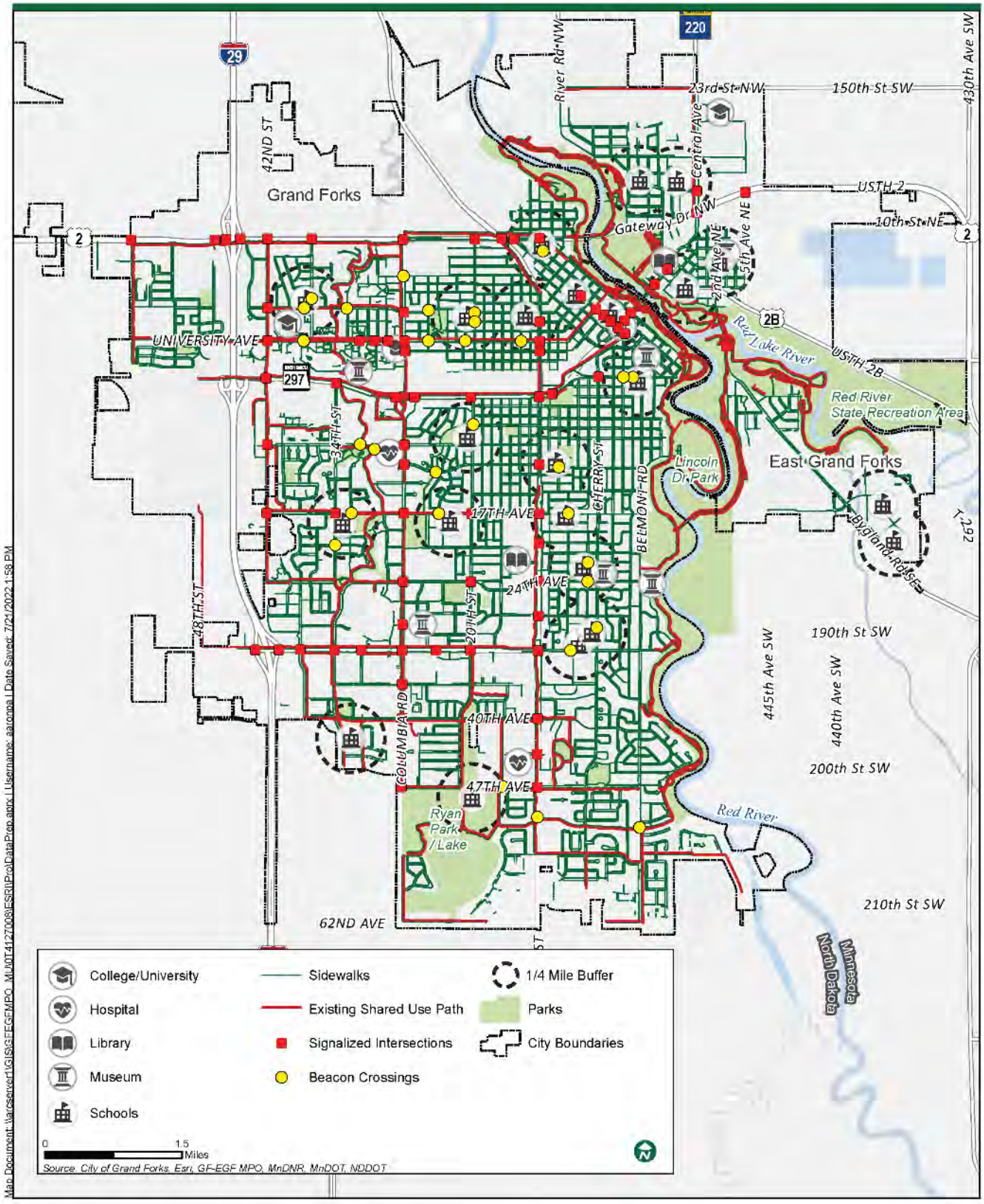
Grand Forks has consistently built sidewalks alongside new development, resulting in a relatively complete network of sidewalks within the community. All new residential developments are required to include sidewalks on both sides of the street during construction, though there are exceptions for older parts of the city, and areas zoned for industrial use are exempt from the sidewalk requirement.

East Grand Forks has a relatively complete pedestrian network in its downtown and older residential neighborhoods but has limited pedestrian facilities in more recent residential developments south of the Red Lake River along Bygland Road. Newer developments are not required to construct sidewalks during construction of newly planned streets, which present immediate challenges for pedestrian access for new residents and retrofitting streets with sidewalks after the face can be difficult.

- Grand Forks has made significant investments in signaling technology to improve pedestrian safety at intersections, such as countdown timers, leading pedestrian intervals, blank-out no right turn on red signs, and reducing crossing distances (**Figure 12**).
- Grand Forks has installed rectangular rapid-flashing beacons (RRFB) crossings near many local schools (**Figure 13**). Investments into RRFBs at other community destinations like libraries and public parks can greatly improve network cohesion.
- As previously mentioned, SRTS investments can be highly effective in the community, due to schools being embedded in neighborhoods. Older neighborhoods generally have one or more schools within a quarter-mile walk.
- Gaps in the pedestrian network are sporadic in Grand Forks, attributable to the grandfather clause that exempts specific areas from having to build sidewalks as part of the permitting process. East Grand Forks generally does not require sidewalk as part of the development process, resulting much more sporadic sidewalk network.
- Both communities address Americans with Disabilities Act (ADA) compliance in pedestrian facilities, both during roadway reconstruction and standalone projects

Figure 12. An accessible pedestrian signal located in downtown East Grand Forks

Figure 13. An example of RRFB being used to cross a four-lane road



Map Document: \\ar\cserver1\GIS\GFEGFMPO_MJ\0T4127008\ESRI\ProjDataPrep.aprx | Username: aaronna | Date Saved: 7/21/2022 1:58 PM

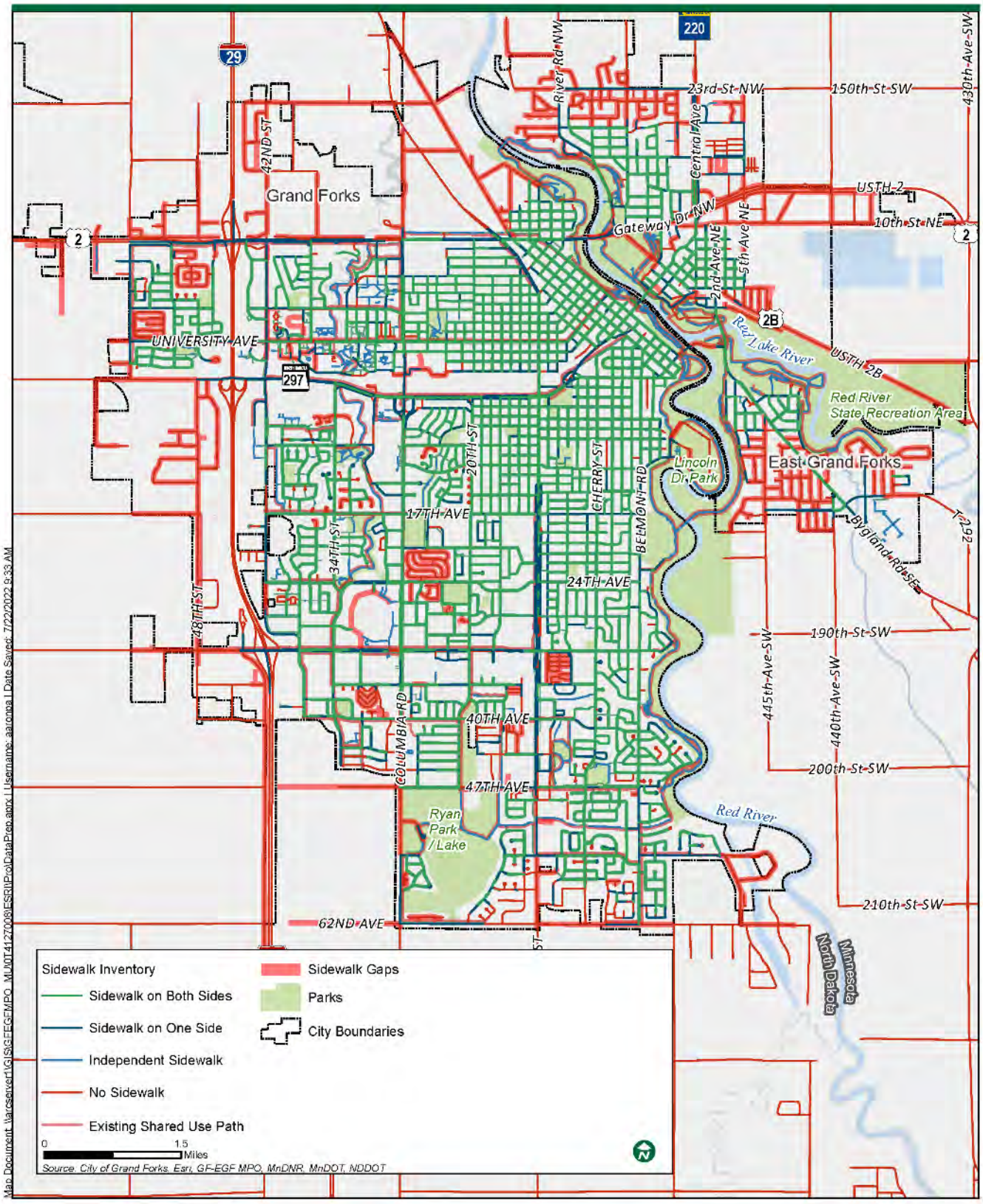
D. Sidewalk Gap Analysis

A cohesive public sidewalk system is essential for supporting walking as a mode of travel in Greater Grand Forks. While there might be debate over what constitutes a cohesive network, a simple answer would be that pedestrians should be able to travel on a dedicated facility to all the same locations as an automobile. To that end, this study built a new sidewalk analysis based on the previous analysis on sidewalk gaps in Greater Grand Forks. This new analysis examines the completeness of the sidewalk network along public the public right-of-way based on adjacent land use type, presence of the sidewalk on one or both sides of the right of way, and accommodates for independent pedestrian facilities (such as shared use paths, greenways, or other pedestrian facilities not associated with a public right-of-way. This analysis solely relied on the presence of a sidewalk to show completeness and made no considerations for other elements of a cohesive pedestrian network, such as general quality of surface, compliance with ADA standards, and other barriers that might render an existent sidewalk unusable, and other conditions like severely degraded surfaces can be insurmountable barriers to people with disabilities or other conditions that limit mobility.

There are approximately 455 linear miles of public right-of-way in Grand Forks, and an additional 145 miles in East Grand Forks, for a grand total of 600 miles of streets in the Greater Grand Forks transportation network. Between the two communities, there is an additional 30 miles of independent sidewalks, such as the Greenway Trail system or other off-street facilities. This report mapped the findings of a previous sidewalk gap analysis conducted by the MPO to determine if there are observable patterns with the location of gaps in the sidewalk network, and how these gaps align with other components of this report.

Findings from the GIS sidewalk gap analysis are as follows:

- Approximately 13 percent of the streets in Grand Forks have sidewalks on at least one side of the right of way, and about 36 percent of Grand Forks streets have sidewalks on both sides of the right of way. The remaining 51 percent of streets in Grand Forks have no pedestrian facilities.
- Grand Forks municipal code does not mandate the construction of sidewalks in industrial areas, and as a result only 30 percent of streets in areas zoned for industrial use have sidewalks on either side of the right of way. Sidewalks can be vital in making last mile connections between transit and employment and will be especially important given the 2050 Grand Forks Land Use Plan's emphasis on mixed use development near industrial zones.
- Most residential areas in Grand Forks have near complete pedestrian networks, with 73 percent of places zoned for residential use having sidewalks on at least one side of the right-of-way. The most prominent and consistent exception to this trend is the internal circulation networks associated with manufactured home developments. This presents a potential barrier for residents of manufactured housing developments from accessing the public sidewalk network.
- Sidewalks are much less common in East Grand Forks, where only 21 percent of streets have any pedestrian facilities. Areas zoned for residential use fare slightly better, where 41 percent of the roads in residential areas have sidewalks on at least one side of the right-of-way.



Map Document: \\arcserver\GIS\GF-EGF\MPO_MUP\0T4127008\ESRI\ProDataPrep.aprx | Username: aaronna | Date Saved: 7/22/2022 9:33 AM

E. Population Density

There is a positive correlation between the demand for active transportation and population density. As population density increases, so too does the density of destinations in close proximity to people, making short walking and biking trips feasible. The population density throughout the Grand Forks Metropolitan Area was mapped and compared the existing investment in bicycle facilities and shared use paths to explore this relationship (**Map 7**). This should be considered in conjunction with future land use planning, which will increase the density of both population and employment through infill development in addition to a greater emphasis on mixed use development.

The most densely populated areas in the region are associated with the University of North Dakota and central Grand Forks between 17th and 32nd Avenue. Both locations represent multi-family housing developments and high rates of student housing.

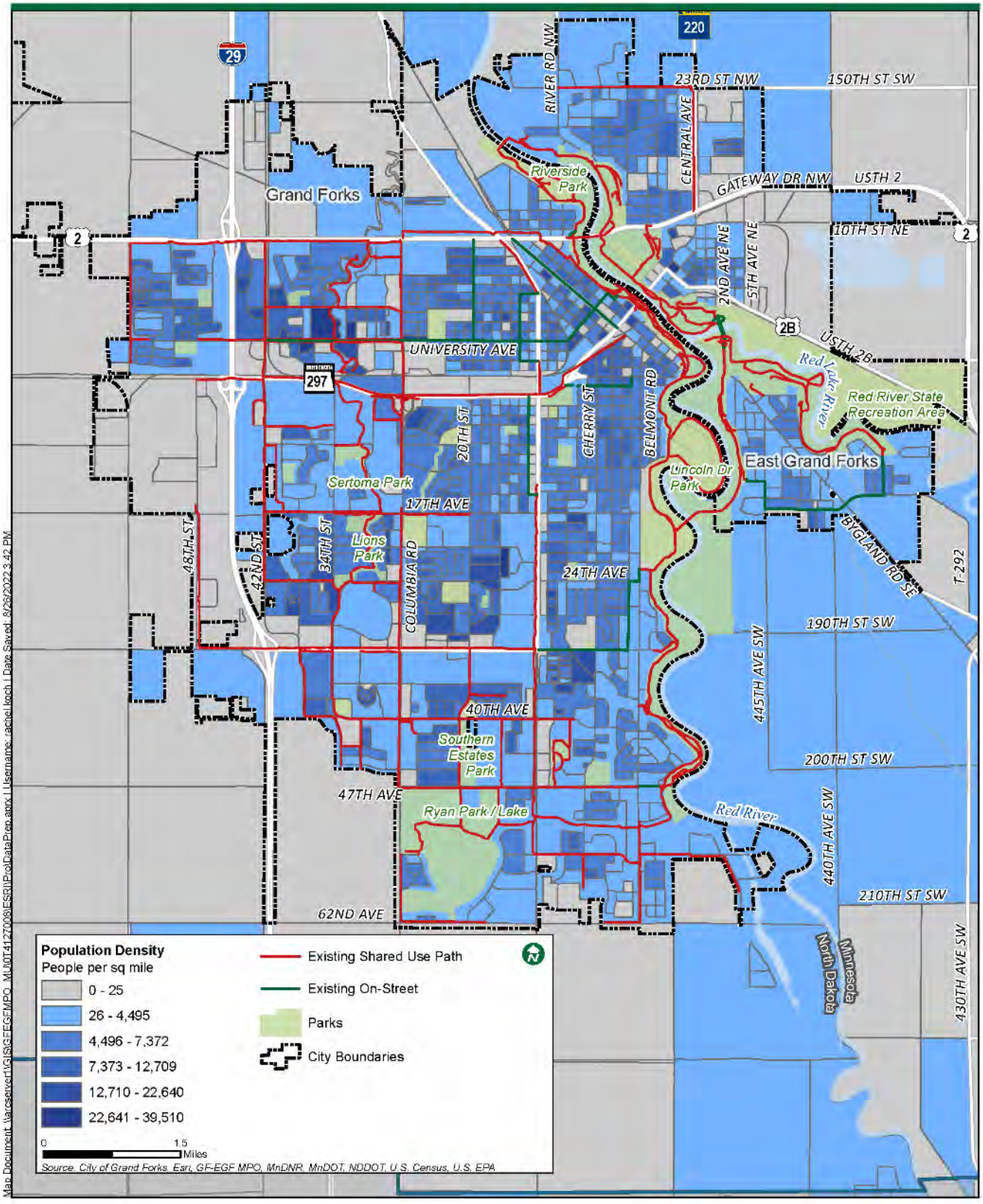
- Densely populated areas benefit from both greater internal connectivity, such as parks, schools, and other community destinations, as well as external connectivity to reach employment and other services.
- Some densely populated areas like the University of North Dakota and older neighborhoods near downtown have excellent internal connectivity for pedestrians and cyclists but need additional investment to connect to other areas.

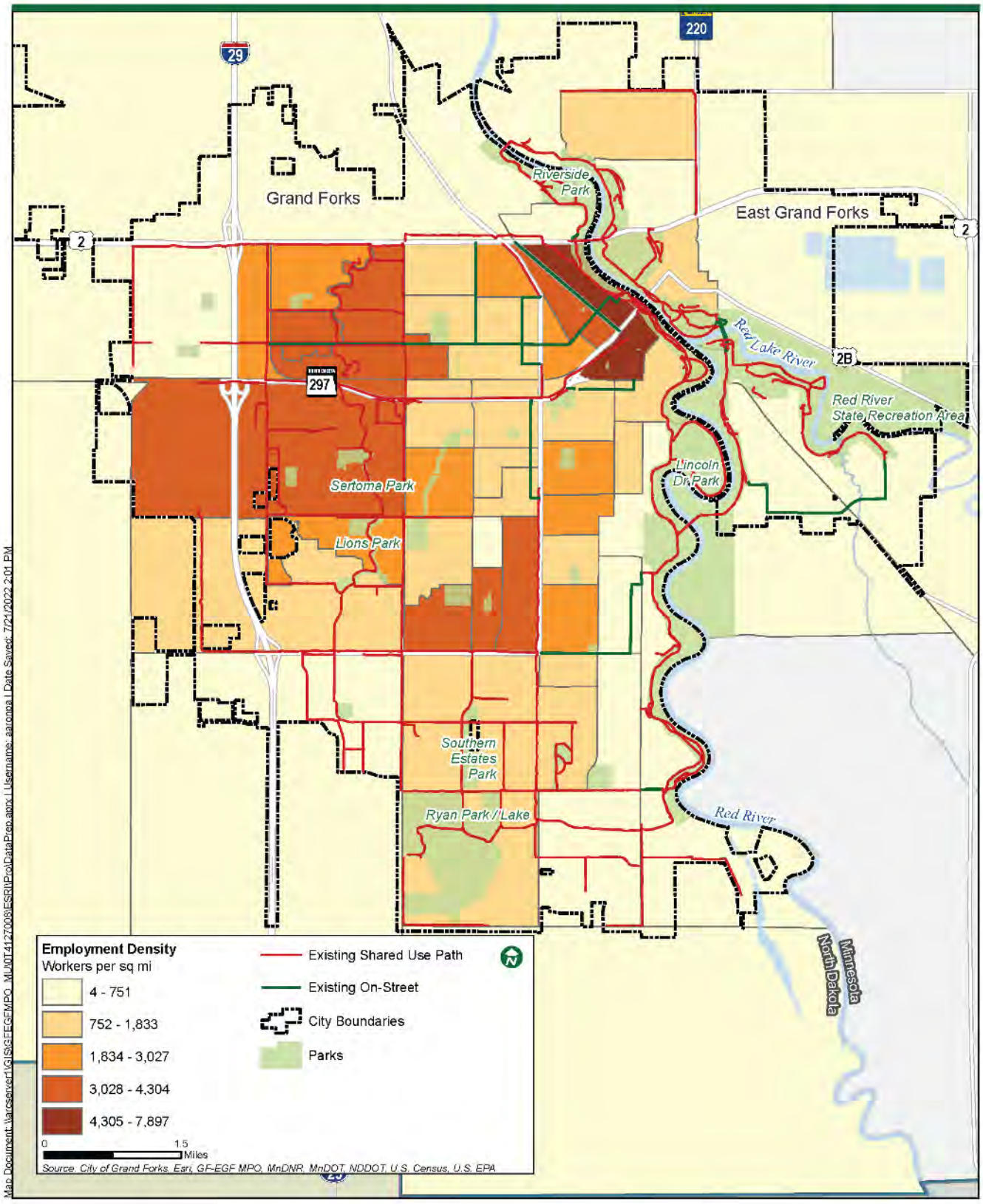
F. Employment Density

Like population density, there is a correlation between employment density and the demand for active transportation. The Employment Density map (**Map 8**) identifies the census block groups with the greatest job concentrations in the Grand Forks metropolitan area. Some of the larger employment nodes present in the area are diluted by the large size of the census block groups used for the analysis. Like the population density map, this should be considered in the context of both current needs and future growth projections. While areas like downtown Grand Forks are well served by the multimodal transportation network, additional investment will be needed to connect employees with the growing industrial centers east of I-29, as well as other large regional employers (**Figure 14**). The region's most concentrated employment areas include:

- Downtown Grand Forks
- Columbia Mall and Grand Cities Mall
- The University of North Dakota
- Altru Health Systems (south of DeMers Avenue on Columbia Road)
- LM Wind Power (1580 S. 48th Street, Grand Forks)

Figure 14. Large employment nodes like the Industrial Park west of I-29 represent opportunities to provide multimodal connections


Grand Forks
East Grand Forks
29
220
2
2B
297
RIVER RD NW
23RD ST NW
150TH ST SW
CENTRAL AVE
GATEWAY DR NW
USTH 2
10TH ST NE
2ND AVE NE
5TH AVE NE
USTH 28
UNIVERSITY AVE
Riverside Park
Red Lake River
Red River State Recreation Area
CHERRY ST
BELMONT RD
20TH ST
Lincoln Dr Park
Sertoma Park
17TH AVE
Lions Park
48TH ST
42ND ST
34TH ST
COLUMBIA RD
24TH AVE
BYGLAND RD SE
T-292
190TH ST SW
445TH AVE SW
40TH AVE
Southern Estates Park
200TH ST SW
47TH AVE
Ryan Park / Lake
Red River
440TH AVE SW
210TH ST SW
62ND AVE
North Dakota
Minnesota
430TH AVE SW
Population Density
People per sq mile
0 - 25
26 - 4,495
4,496 - 7,372
7,373 - 12,709
12,710 - 22,640
22,641 - 39,510
Existing Shared Use Path
Existing On-Street
Parks
City Boundaries
0
1.5
Miles
Source: City of Grand Forks, Esri, GF-EGF MPO, MnDNR, MnDOT, NDDOT, U.S. Census, U.S. EPA
Map Document: \\arcserver\GIS\GFEGFMPO_MU\0T4127008\ESRI\ProjDataPrep.aprx | Username: rachel.koch | Date Saved: 8/26/2022 3:42 PM


Grand Forks
East Grand Forks
Riverside Park
Red Lake River
Red River State Recreation Area
Lincoln Dr. Park
Sertoma Park
Lions Park
Southern Estates Park
Ryan Park / Lake
Red River
Minnesota
North Dakota
29
220
2
2B
297
Employment Density
Workers per sq mi
4 - 751
752 - 1,833
1,834 - 3,027
3,028 - 4,304
4,305 - 7,897
Existing Shared Use Path
Existing On-Street
City Boundaries
Parks
0
1.5
Miles
Source: City of Grand Forks, Esri, GF-EGF MPO, MnDNR, MnDOT, NDDOT, U.S. Census, U.S. EPA
Map Document: \\arcserver\GIS\GF-EGF\MPO_MUP\0T4127008\ESRI\ProjDataPrep.aprx | Username: aaronna | Date Saved: 7/21/2022 2:01 PM

G. Community Destinations

The transportation network facilitates people getting to necessary destinations for employment, services, goods, housing, and for recreation and enjoyment. Understanding where key destinations are situated throughout the metropolitan area is one way of understanding transportation demand. The distribution of such destinations throughout Greater Grand Forks (**Map 9**) has a substantial impact on determining the future of bicycle and pedestrian infrastructure. Notable clusters of destinations are located in the two downtowns, and along major commercial corridors such as Columbia and Washington.

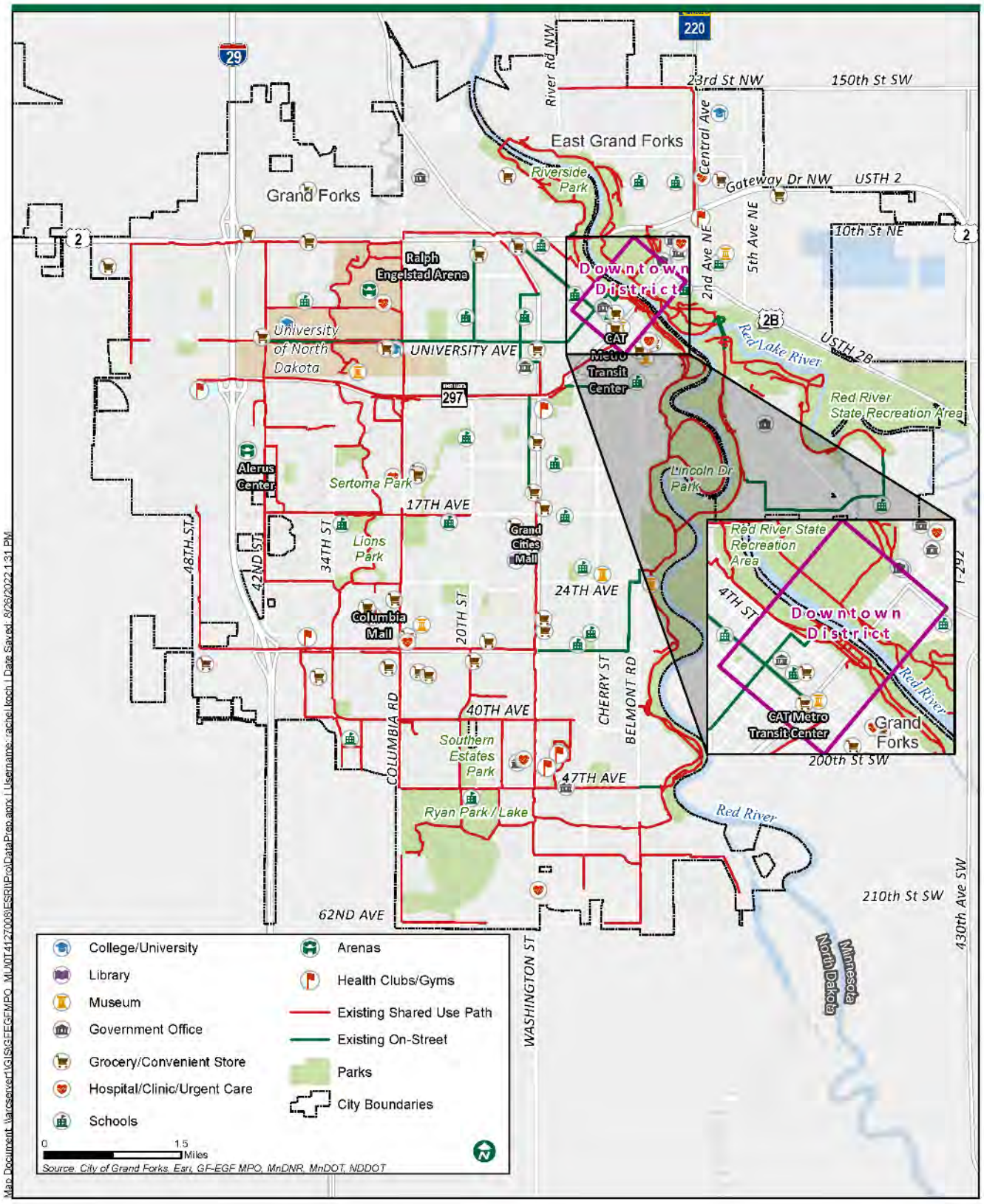
Some destinations, such as schools and parks, are well distributed throughout Greater Grand Forks. Destinations like schools, parks, and grocery stores help create a sense of community and are notable for the frequency of trips to these locations.

- Connections between residential uses around commercial destinations such as Columbia Mall and Grand Cities Mall, and downtown East Grand Forks. Given the prevalence of bicycle and pedestrian involved crashes in parking lots, special care should be taken to improve connectivity between the private and public realms
- Grand Forks has regional event destinations in the Ralph Englestad Arena and Alerus Center that are hubs for pedestrian activities during events. These venues attract 13,000 or more visitors at a time and connectivity and crossings can improve event management and safety.
- Cross connections between East Grand Forks and Grand Forks across the Red River would support connections between newer residential developments, employment, and commercial land uses
- New residential development in Grand Forks and East Grand Forks have very homogenous land uses, with little connectivity to destinations.

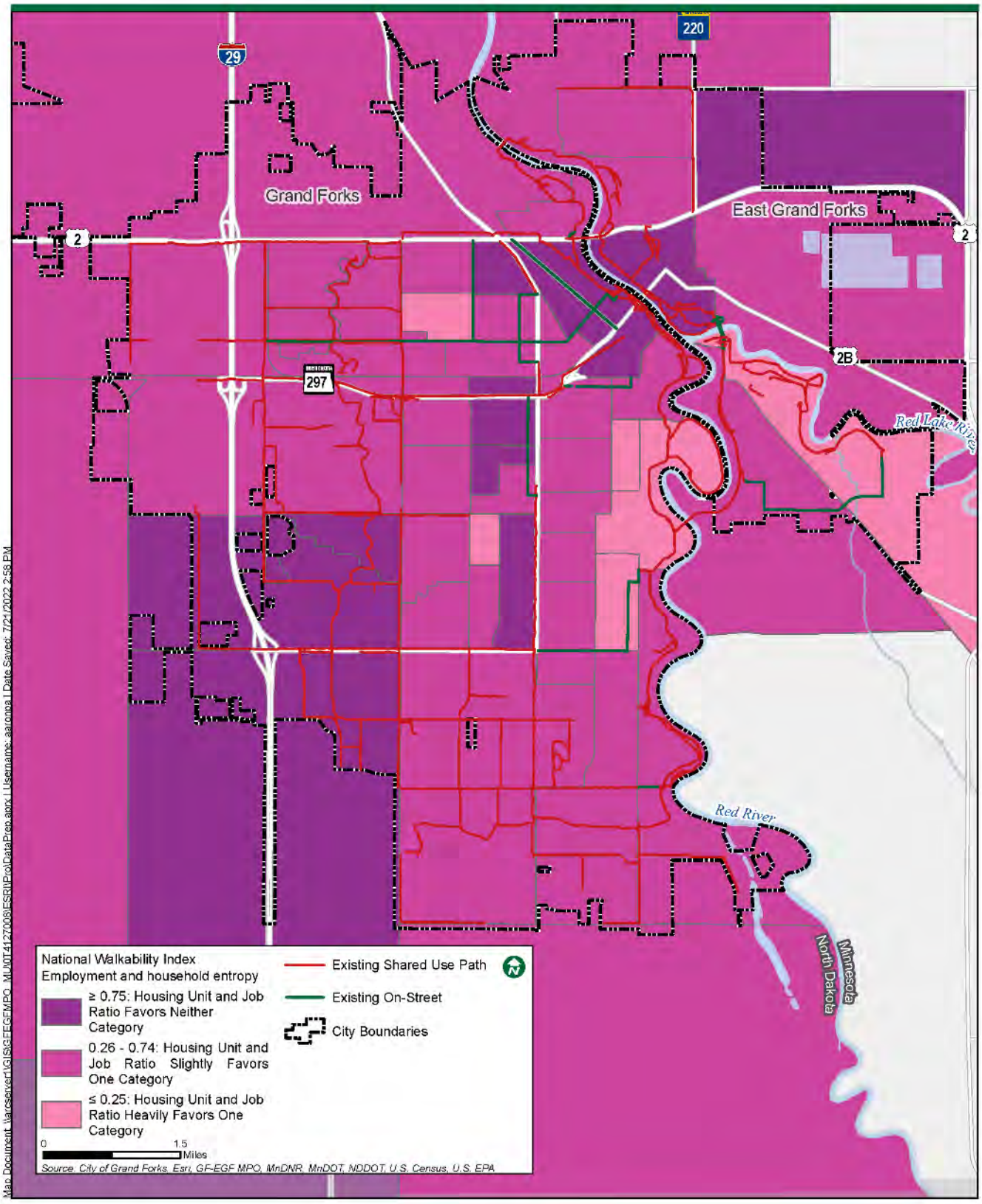
H. National Walkability Index – Employment and Household Ratio

Areas with a diverse set of employment types (such as jobs in the office, retail, and service sectors) plus many occupied housing units are more conducive to walking trips as people can take short trips to meet their daily needs. The National Walkability Index's Employment and Household Entropy score is calculated as being the ratio of occupied housing units in a census block group and number of jobs in the same geographic area (**Map 10**). An entropy score of one represents a maximally mixed land use (i.e., an equal number of occupied housing units and jobs in an area). An entropy score of zero represents an area that is entirely housing or entirely employment, with no variety in land use. This entropy score does not account for factors such as street design, safety (traffic), security (crime), pedestrian-friendly design, topography, or weather. Generally, Grand Forks does not tend to mix land uses, resulting in most trips only being feasible via automobile. Future infill development can help address these conditions by creating destination islands in homogenous land use zones. Other takeaways from this analysis include:

- The twin downtowns of Grand Forks and East Grand Forks, the areas surrounding Grand Cities Mall and Columbia Mall all have entropy scores above 0.75, indicating a very heterogenous land use mix, in addition to having high employment densities.
- There are many residential neighborhoods near high entropy score areas. These should be prioritized for investments that increase connectivity to adjacent high entropy score areas, such as downtown, Grand Cities Mall, and the Columbia Mall areas.
- The industrial area along I-29 north and south of 32nd Avenue have low entropy scores but attract many trips as people travel to work. Investments in these locations should prioritize linking major employers to the bicycle and pedestrian network.



Map Document: \\arcserver\GIS\GF-EGF\MPO_MJ\0T4127008\ESRI\ProjData\Prep.aprx | Username: rachel.koch | Date Saved: 8/26/2022 1:31 PM


29
220
Grand Forks
East Grand Forks
2
2
2B
297
Red Lake River
Red River
Minnesota
North Dakota
National Walkability Index
Employment and household entropy
≥ 0.75: Housing Unit and Job Ratio Favors Neither Category
0.26 - 0.74: Housing Unit and Job Ratio Slightly Favors One Category
≤ 0.25: Housing Unit and Job Ratio Heavily Favors One Category
Existing Shared Use Path
Existing On-Street
City Boundaries
0
1.5
Miles
Source: City of Grand Forks, Esri, GF-EGF MPO, MnDNR, MnDOT, NDDOT, U.S. Census, U.S. EPA
Map Document: \\ar-server1\GIS\GF-EGF\MPO_MUT\0T4127008\ESRI\ProjectDataPrep.aprx | Username: aaronna | Date Saved: 7/21/2022 2:58 PM

VI. Environmental Justice Analysis

Certain demographics, be it due to economic circumstances, ability, age, or previous/ongoing systemic disinvestment, are more likely to rely on biking, walking, and transit compared to the population overall. At the same time, these analyses address equity concerns, either highlighting areas with high concentrations of minority populations that may have been subject to systemic disinvestment, or showing where investment could be targeted to benefit a group that has a greater need for active transportation investment. These groups can generally be summarized under the title of environmental justice communities.

The following section uses the U.S. Census Bureau data for Black, Indigenous, People of Color (BIPOC) populations within the community as well as data regarding the number of families living below the poverty threshold. This analysis also uses the Environmental Protection Agencies' Environmental Justice (EJ) Demographic Index (**Map 11**) to visualize the relationship between current investments in bicyclists and pedestrian facilities and where equity populations live. The EJ Demographic Index is based on the based on the average of two other EPA demographic indicators; low-income and people of color. The EJ Demographic Index provides a percentile comparison to all other census block groups' home state to contextualize if the census block group would potentially require targeted outreach to address the needs of equity populations. This is not meant to cover the entirety of equity populations within Greater Grand Forks. These analyses are meant to help identify possible locations for future focused investment or community engagement.

A. BIPOC

Approximately 83.6 percent of the population in Greater Grand Forks identifies as White, with the largest minority population groups corresponding with Black, Asian, and American Indians and Alaska Natives. The racial and ethnic demographics of Greater Grand Forks is detailed previously in this report's demographic analysis section. These populations are not evenly distributed throughout the region, with the following areas showing much higher than average rates of BIPOC populations:

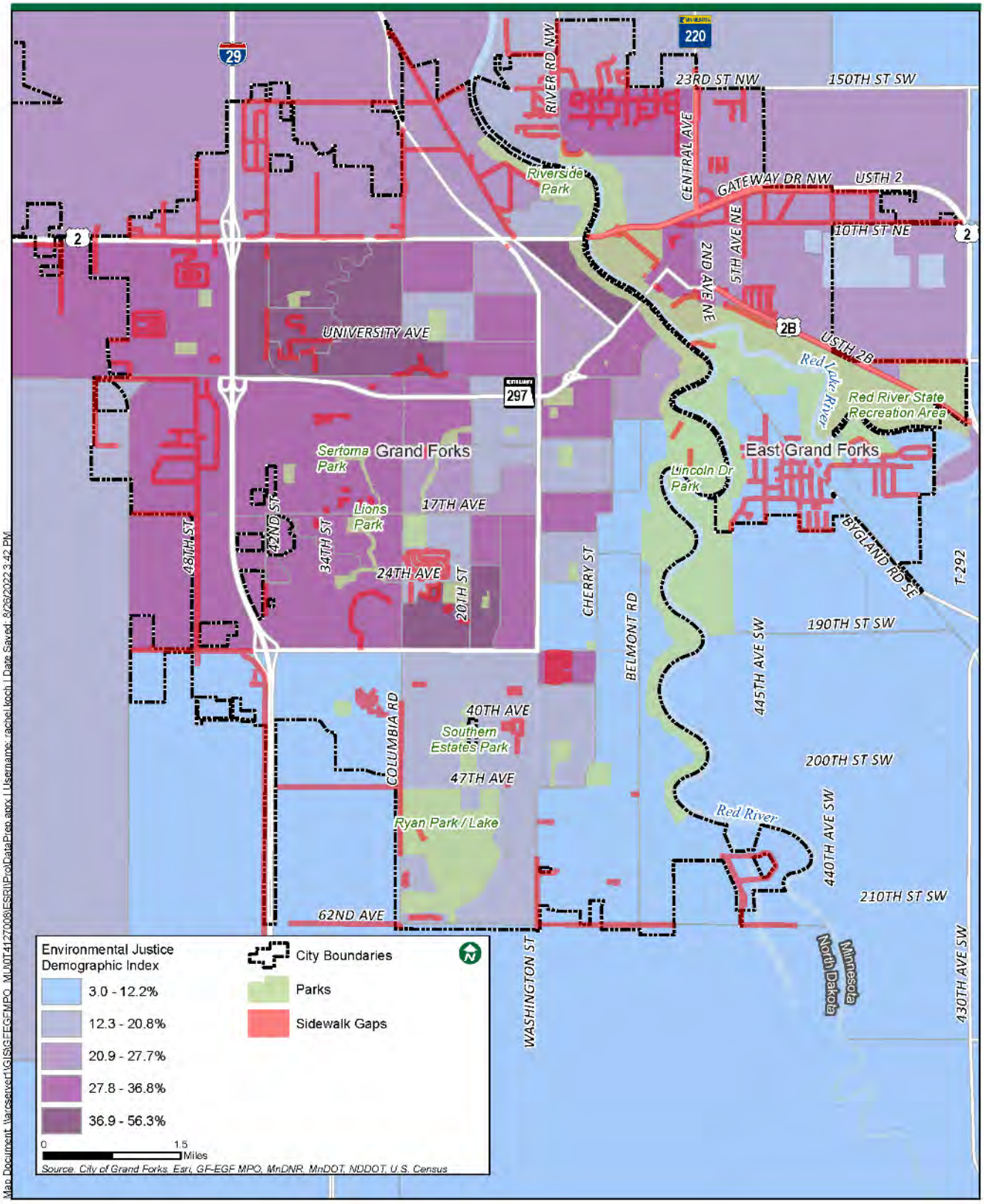
- Neighborhoods surrounding the University of North Dakota
- Neighborhoods surrounding the Columbia Mall, north of 32nd Avenue bordered by 42nd Street and South Columbia Road.

B. Poverty

An estimated 14.3 percent of the population in the Grand Forks metropolitan area has an income below the poverty threshold. Lower income people are more likely to bike or walk, as low income is correlated with lower automobile ownership rates. However, certain areas within Greater Grand Forks have substantially higher rates of people living below the poverty threshold, indicating potential areas of concentrated poverty. These locations could be the focus of future community engagement efforts to shape investment priorities. Areas that show above average concentrations of poverty include:

- University of North Dakota and surrounding areas
- Symington Park area and surrounding areas
- Downtown Grand Forks and Downtown East Grand Forks
- The northwestern quadrant of East Grand Forks, between Central Avenue and River Road to the east and west, and 23rd Street and 17th Street to the north and south.

Note that income status of university student populations can be somewhat misleading, as these individuals' low-income status might not reflect their actual access to wealth via means not captured in the U.S Census methodology, such as family resources. The University of North Dakota area has one of the most comprehensive bicycle and pedestrian networks in the metropolitan area.

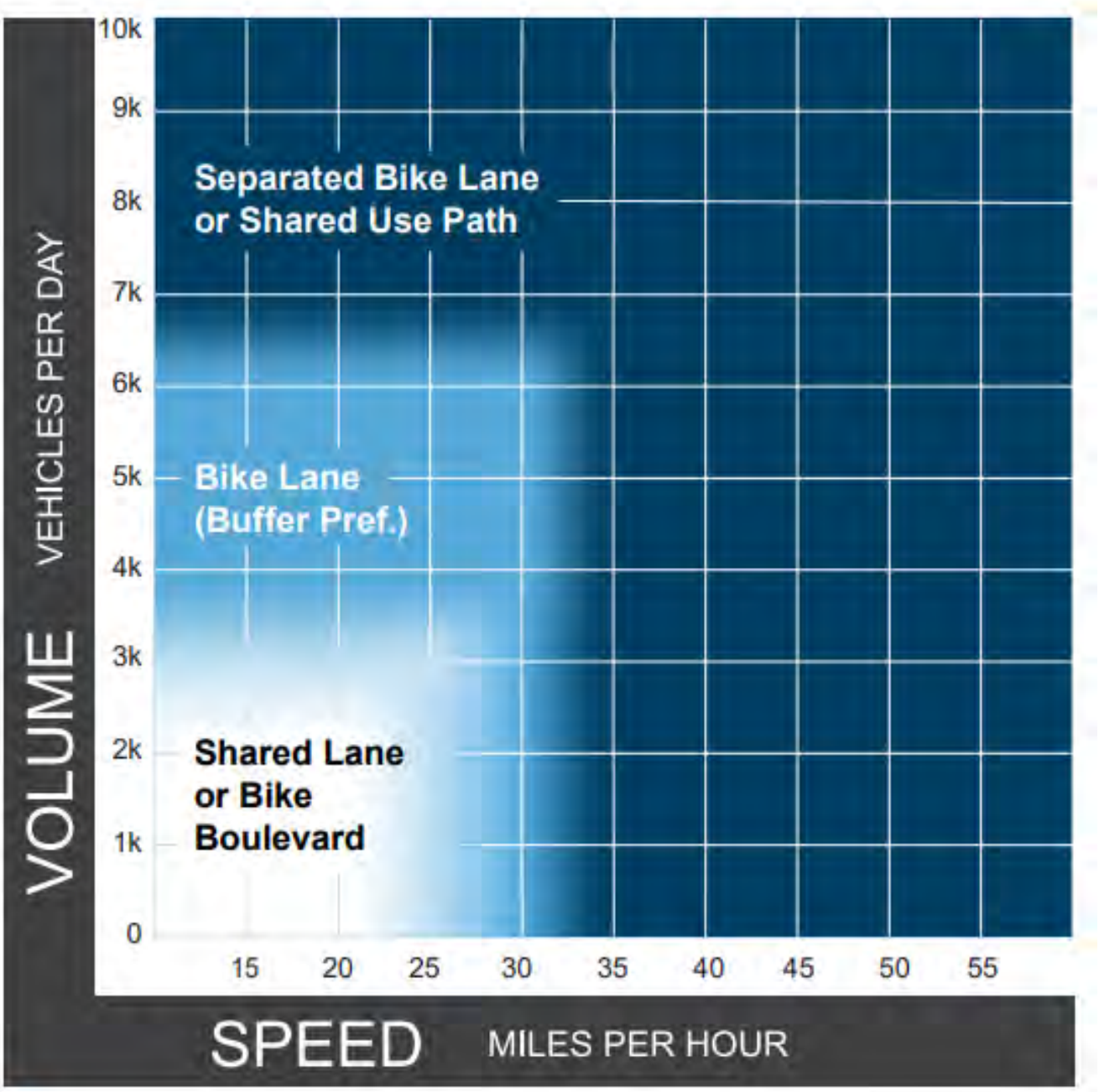

29
220
2
2B
297
RIVER RD NW
23RD ST NW
150TH ST SW
CENTRAL AVE
Riverside Park
GATEWAY DR NW
USTH 2
10TH ST NE
2ND AVE NE
5TH AVE NE
UNIVERSITY AVE
USTH 2B
Red Lake River
Red River State Recreation Area
Sertoma Park
Grand Forks
East Grand Forks
Lincoln Dr Park
Lions Park
17TH AVE
42ND ST
34TH ST
48TH ST
24TH AVE
20TH ST
CHERRY ST
BELMONT RD
BYGLAND RD SE
T-292
190TH ST SW
445TH AVE SW
40TH AVE
Southern Estates Park
COLUMBIA RD
47TH AVE
200TH ST SW
Red River
Ryan Park / Lake
440TH AVE SW
210TH ST SW
62ND AVE
WASHINGTON ST
North Dakota
Minnesota
430TH AVE SW
Environmental Justice Demographic Index
3.0 - 12.2%
12.3 - 20.8%
20.9 - 27.7%
27.8 - 36.8%
36.9 - 56.3%
City Boundaries
Parks
Sidewalk Gaps
0
1.5
Miles
Source: City of Grand Forks, Esri, GF-EGF MPO, MnDNR, MnDOT, NDDOT, U.S. Census
Map Document: \\grcserver1\GIS\GFEGFMPO_MJW\0T4127008\ESRI\ProjDataPrep.aprx | Username: racnel.koch | Date Saved: 8/26/2022 3:42 PM

VII. Street Environment

A. Traffic Volume

Previous sections of this report identified existing bicycle and pedestrian routes and highlighted the primary routes for both active transportation modes and automobiles. This report considered the guidance from the Federal Highway Administration's Bikeway Selection Guide (**Figure 15** & **Figure 16**) to determine the general ranges daily traffic throughout the Grand Forks and East Grand Forks street network and how that should shape analysis (**Map 12**). Higher traffic volume roads generally require investments that provide physical separation between vehicles and active transportation modes and depending on their specific context might also require specialized facilities to aid other movements, such as crossings:

- **0 to 2,000 Vehicles per Day**: Interior neighborhood roads generally have lower volumes of traffic. These roads are comfortable for cyclists of all skill levels. Minor treatments, such as road signs alerting drivers to bicyclists on the roadway or to yield to pedestrians can be very effective in increasing comfort. Crossing is comfortable for most pedestrians. These roads are usually controlled with stop conditions when they intersect busier roads, so crossing busier roads is a key factor.
  Examples: Oak Street, 18th Avenue Southeast
- **2,000 to 3,000 Vehicles per Day**: Minor neighborhood collector roads generally have volumes of traffic in this range. These roads might present some challenges to less experienced or younger bicyclists. At higher traffic volumes, bike lanes or shared lane markings are helpful for increasing user comfort. Marked pedestrian crossings near community destinations like schools, parks, community centers, and convenience stores should be installed when possible, and might be necessary at other locations.
  Examples: 8th Avenue South, James Avenue Southeast
- **3,000 to 5,000 Vehicles per Day**: Popular minor neighborhood collectors; these are the conventional threshold for installing marked bike lanes. Roads with this volume of traffic typically require greater investment for safe crossings, such as well marked crosswalks, signage, and potentially traffic control at key intersections.
  Examples: Cherry Street, Rhineheart Drive
- **5,000 to 10,000 Vehicles per Day**: Only experienced and confident of cyclists will feel confident sharing the road with higher volumes of traffic such as this. Conventional bike lanes may be adequate, but will not feel comfortable due to the frequency of vehicles passing. Most users will prefer separated facilities. Sidewalks should be separated from curbs or have some buffer between pedestrians and automobile traffic. Well-designed crosswalks with traffic controls and pedestrian refuge medians should be installed at key crossings.
  Examples: University Avenue, Minnesota Ave/1st Avenue Southeast, Bygland Road
- **Over 10,000 Vehicles per Day**: Roads with these volumes of automobile traffic are not suitable to all but the most dedicated of bicyclists. Investment should be in separated bicycle facilities, or direct bicycle traffic to alternative parallel routes with lower volumes of traffic. Sidewalks should be set back from the curb. Crosswalks along these corridors should include traffic controls and pedestrian medians refuge islands where possibel.
  Examples: Columbia Road, Washington Street, Gateway Drive/US Highway 2

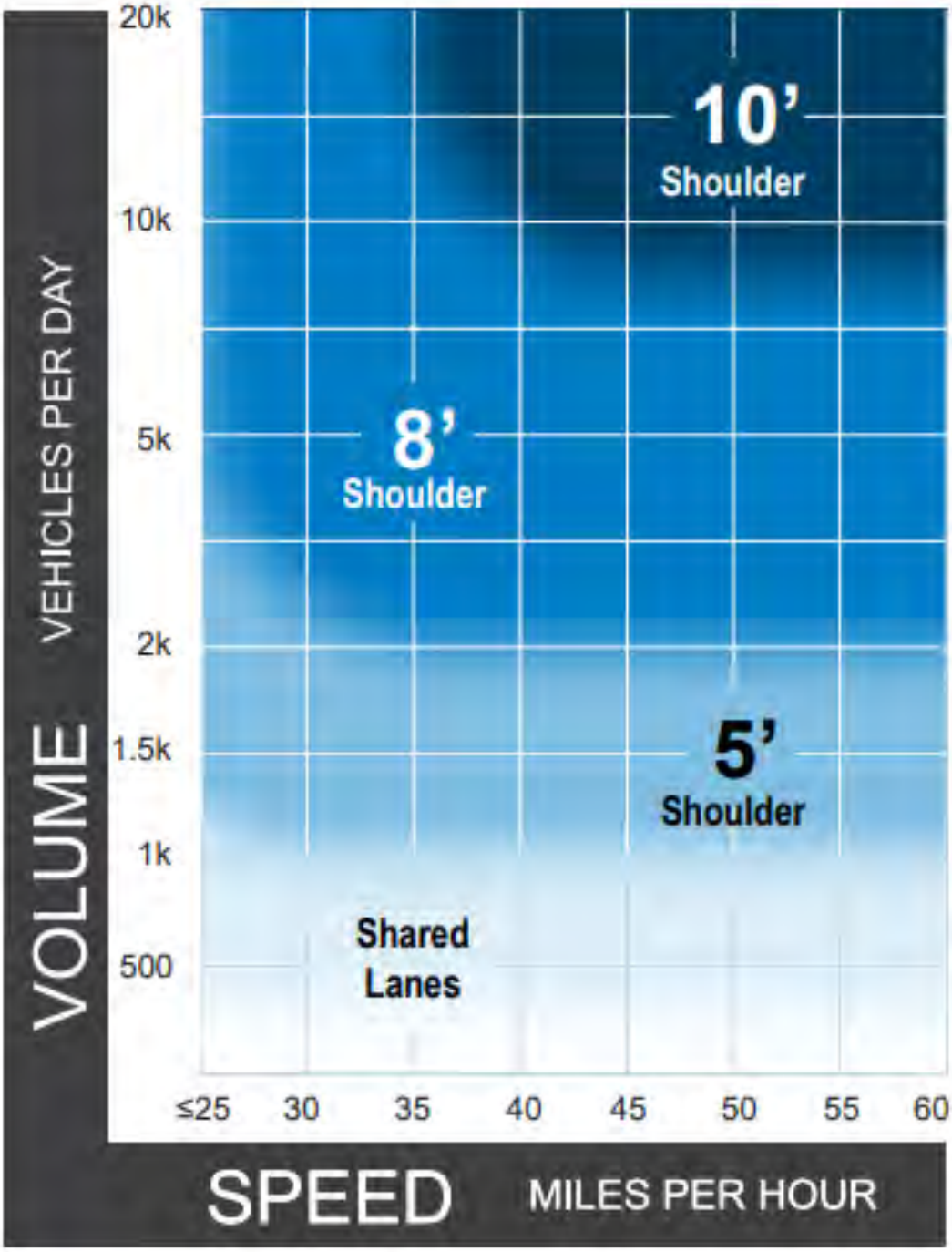


Notes

1 Chart assumes operating speeds are similar to posted speeds. If they differ, use operating speed rather than posted speed.

2 Advisory bike lanes may be an option where traffic volume is <3K ADT.

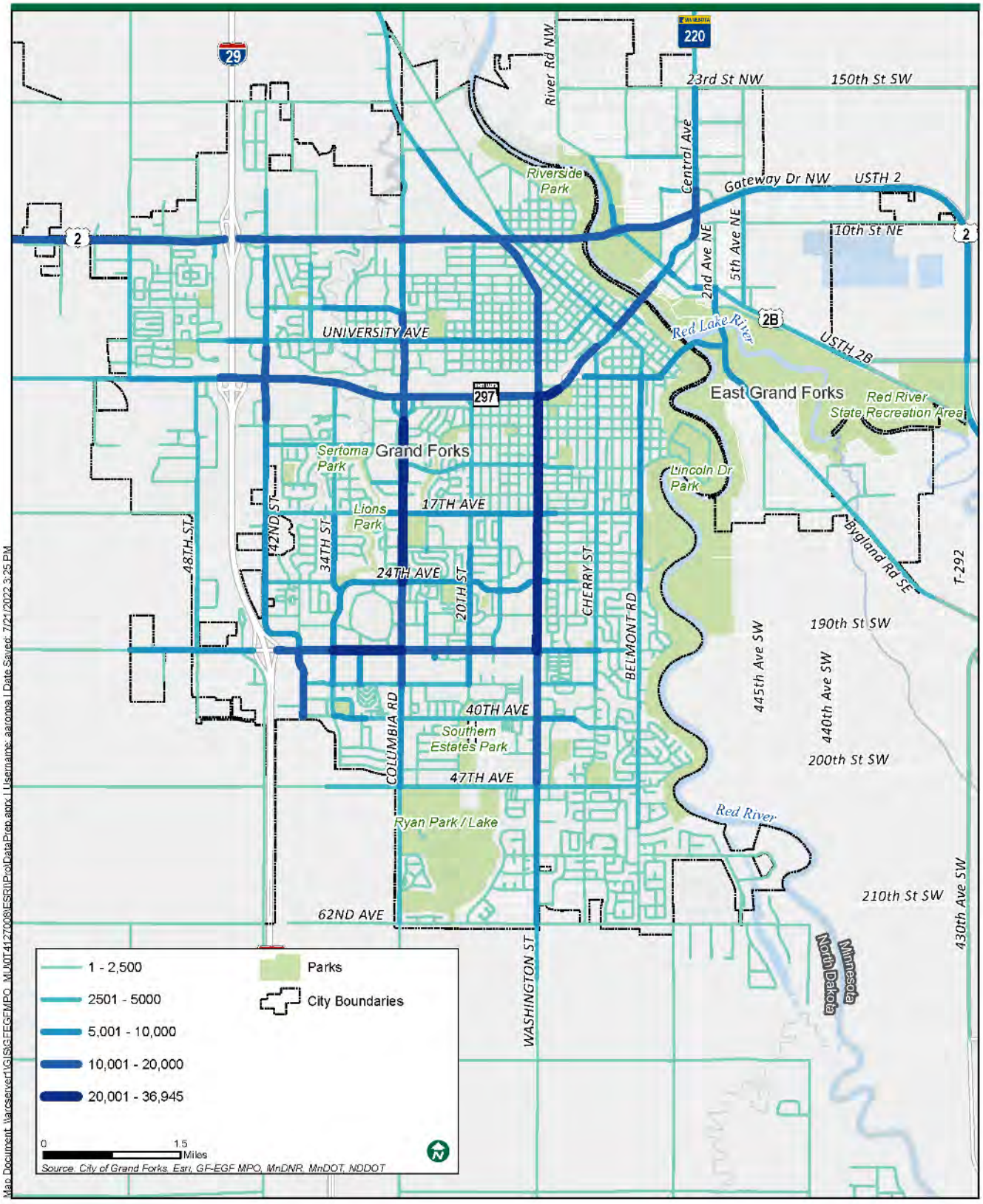
Figure 15. Preferred Bikeway Type or Urban, Urban Core, Suburban and Rural Town Centers
Source: FHWA Bikeway Selection Guide, 2019



Notes

1. This chart assumes the project involves reconstruction or retrofit in constrained conditions. For new construction, follow recommended shoulder widths in the AASHTO Green Book.
2. A separated shared use pathway is a suitable alternative to providing paved shoulders.
3. Chart assumes operating speeds are similar to posted speeds. If they differ, use operating speed rather than posted speed.
4. If the percentage of heavy vehicles is greater than 5%, consider providing a wider shoulder or a separated pathway.

Figure 16. Preferred Shoulder Widths for Rural Roadways
Source: FHWA Bikeway Selection Guide, 2019

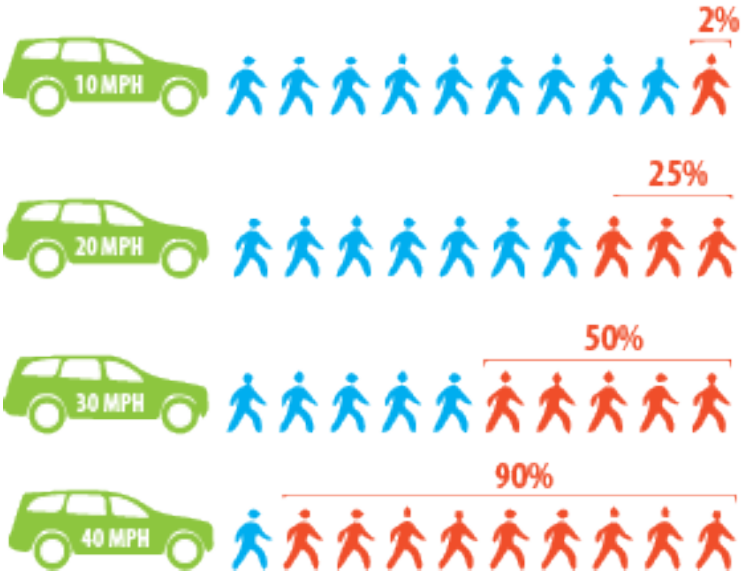


Map Document: \\arcserver1\GIS\GFEGFMPO_MJ\0T4127008\ESRI\ProjDataPrep.aprx | Username: aaronna | Date Saved: 7/21/2022 3:25 PM

B. Traffic Speeds

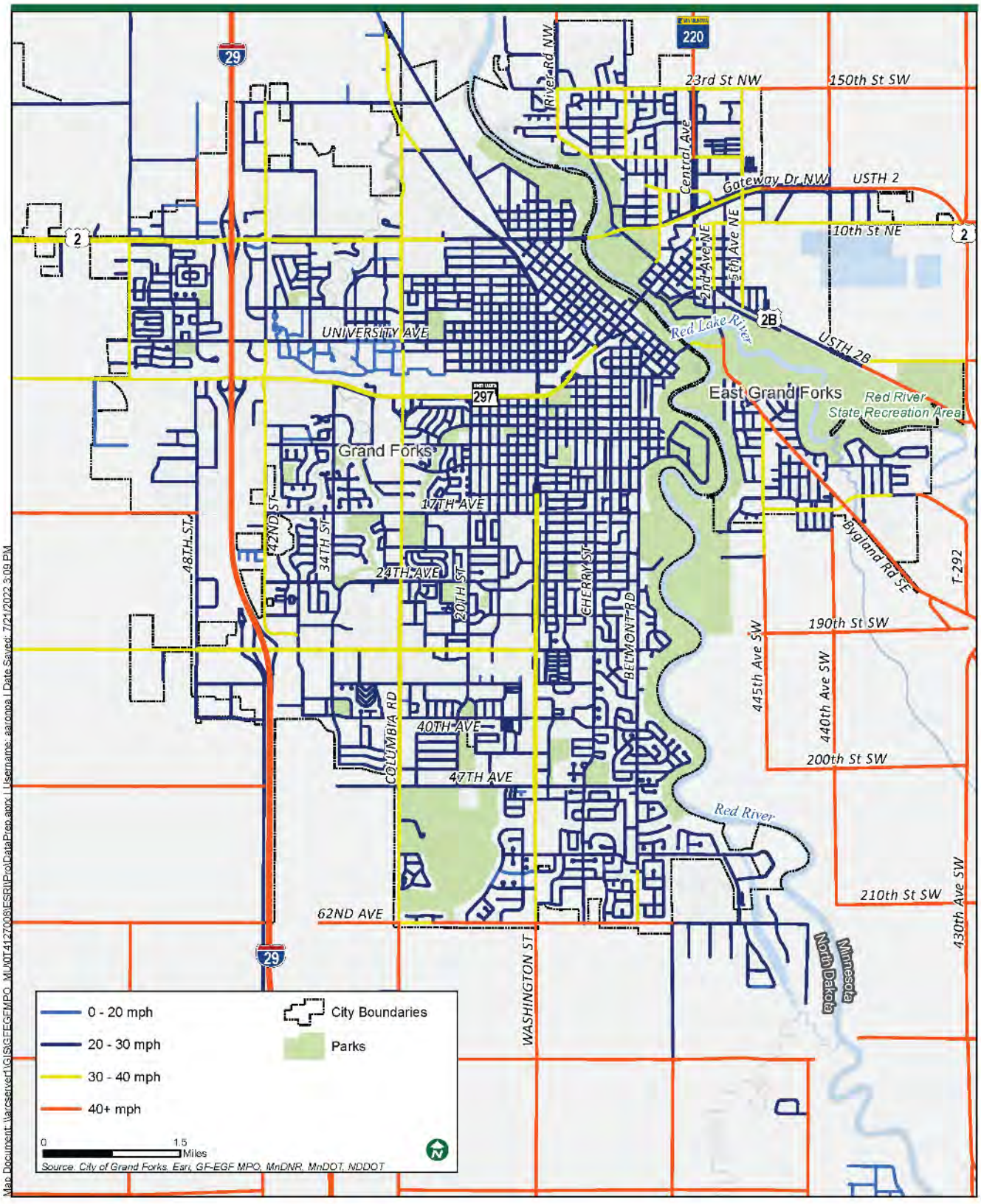
The following map (**Map 13**) shows the posted speed limit for Grand Forks and East Grand Forks streets. Speed in conjunction with functional classification and traffic volume, is a major factor when determining the suitability of a roadway for bicycle and pedestrian usage. Streets with both low speeds and low traffic counts are ideal candidates for investments into active mobility. However, these corridors are only as useful as they can link people to destinations or connect to the greater network of bicycle and pedestrian facilities.

Traffic speeds also provide helpful data when determining where there is need for greater separation between automobile traffic bicycle/pedestrian road users. Higher speed roadways generally require greater physical separation between automobiles and active modes of transportation and require additional treatment for safe crossings. As automotive speeds increase, the survivability of pedestrian and bicyclist crashes rapidly decrease (**Figure 17**).



This relationship between speed and potential for injury or death informs network design both in terms of minimizing crash exposure for active transportation users, in addition to engineering improvements to manage prevailing vehicle speed along active transportation corridors. Minimizing crash exposure can be done through directing active mobility traffic onto lower traffic roads, reducing crossing distances, and providing enhanced crossing facilities. Actual vehicle travel speeds often differ from these posted speeds, especially in areas with low enforcement. Prevailing speed can be managed passively through engineering and design features such as travel lane width, lane striping, frequency of intersections, streetscape design, and other factors.

- Higher speed corridors that separate residential areas from schools, such as Bygland Road, should be priorities for SRTS investments.
- Road speeds between commercial corridors are generally low, and traffic volumes are manageable. A simple network of east-west connections to major investments in shared use
- The areas along high-speed corridors tend to have Housing and Employment Entropy scores closer to 1.0, indicating a more diverse land use and thus greater suitability for biking and walking trips. Investments around areas like Washington Street near Grand Cities Mall, Columbia Road near the Columbia Mall, and Demers Avenue headed into Downtown Grand Forks should focus on enabling short trips between residential and commercial destinations, addressing crossing barriers, and reducing conflict points for bicyclists and pedestrians.



Map Document: \\arcserver1\GIS\GF-EGF\MPO_MAP\0T4127008\ESRI\ProjectaPrep.aprx | Username: aaronpa | Date Saved: 7/21/2022 3:09 PM

C. Bicycle and Pedestrian Crashes

One of the primary goals of active transportation system planning is to plan for and create accessible and safe places for people to bicycle and walk. A key part of this is to reduced the number of bicycle and pedestrian crashes in Greater Grand Forks (**Map 14**). Both North Dakota and Minnesota have a Vision Zero plan, a traffic safety program that deploys an interdisciplinary approach to reducing all traffic crashes, injuries, and deaths on public roads. Figure 15 displays crashes reported by local law enforcement between 2017 and 2021. While these crash data provide useful insights to guide investments and identify areas in need of treatment, they have often been referred to as the “tip of the iceberg" because they are limited almost entirely to motor vehicle-related events that occur on public roadways, and thus might not include crashes that occur on private property such as parking lots and driveways, or crashes that do not involved motor vehicles. Finally, these generally do not include near-misses, which can greatly impact modal choices. Although under-reporting and omissions do present limitations on the dataset, analysis of crashes in Greater Grand Forks can still provide valuable insights into community safety issues and should be paired with engagement and community communication to identify other crash hot spots.

Analysis of the crashes from 2017-2021 indicate the following

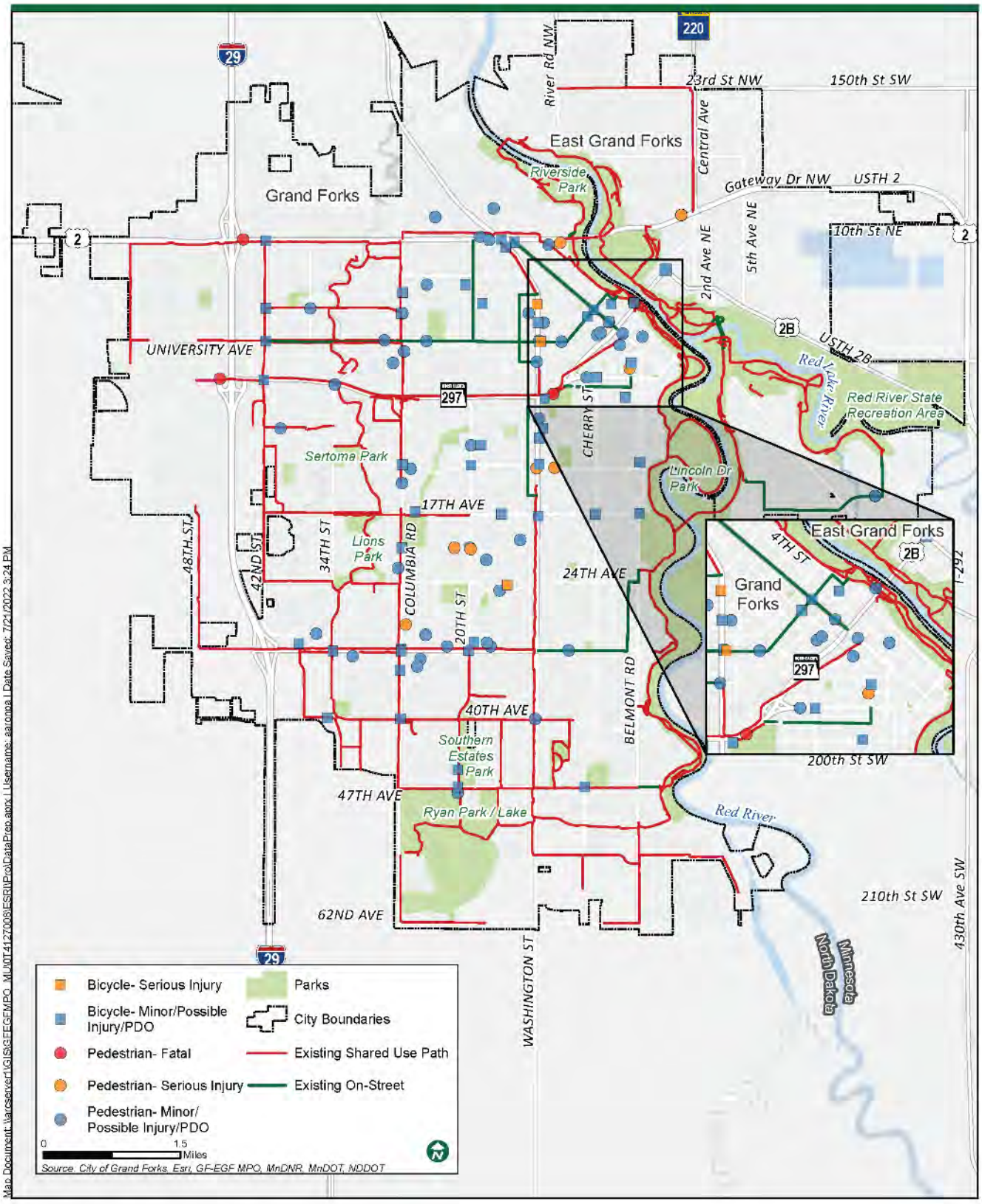
- There were 118 bicycle and pedestrian crashes in the five-year study period. The split between bicyclists and pedestrians was about equal, with 61 pedestrian crashes, and 57 bicycle crashes (**Table 2**).

Table 3. Grand Forks Area Bicycle and Pedestrian Crashes 2017-2021

Municipality	East Grand Forks	Grand Forks	Combined Grand Forks MPO
Pedestrian	2	59	61
Bicyclists	1	56	57
Total	**3**	**115**	**118**

- Bicycle crashes were much more likely to occur at intersections (43 out of 57 bicycle crashes). Pedestrian crashes trended slightly towards occurring at non-intersection locations (39 out of 61 pedestrian crashes). Crashes at controlled intersections (i.e., with traffic signals or signs) accounted for 32 bicycle crashes and 16 pedestrian crashes.
- There were a combined 42 crashes which reported that the vehicle was making a turn during the crash, accounting for a little over one third of all crashes. Most of these crashes (n=35) were reported at intersections. The prevalence of non-intersection turning crashes might be indicative of conflicts with private access such as driveways and alleyways. Right turn crashes were only slightly more common than left turn crashes.
- Crashes tend to cluster around busy arterials and downtown Grand Forks. Crashes along arterials are most common where the road separates residential areas from retail and commercial land uses, such as 32nd Avenue South, Washington Street, and Gateway Drive.
- There was a combined 23 bicycle and pedestrian crashes in parking lots during the study period, representing nearly 20 percent of all crashes. Parking lots are not formally part of the street system and are frequently not under the planning and engineering control of a city, but zoning policy can affect their design to better accommodate safety goals.
- There were three fatal crashes and twelve serious injury crashes during the study period. The three fatal crashes involved pedestrians. The fatal crashes occurred at DeMers between South 12th Street and 5th Avenue South, across from the fire station, at the Demers Interstate 29 southbound on-ramp, and at the Interstate 29 northbound on-ramp at US-2.

Pedestrian and Bike Crashes (2017-2021)



D. Bicycle and Walking Crossing Barriers

A lack of crossing opportunities can severely hinder the efficacy of a regional bicycle and pedestrian network, especially if a barrier prevents people from walking or biking to access school, work, or services. This analysis (**Map 15**) examines three of the most common crossing barriers for active transportation networks: Freeways and expressways, rail corridors, and natural features such as bodies of water like rivers and streams. These barriers are present in the Greater Grand Forks and they affect biking and walking network continuity.

Freeway and expressways were defined as any roadway that met the following criteria: a full access-controlled highway, or any non-freeway principal arterials consisting of at least four lanes and divided by a median. This analysis identified Interstate 29, US HIGHWAY 2, and parts of principal arterials such as Columbia Road, Washington Street, and 32nd Avenue in this category.

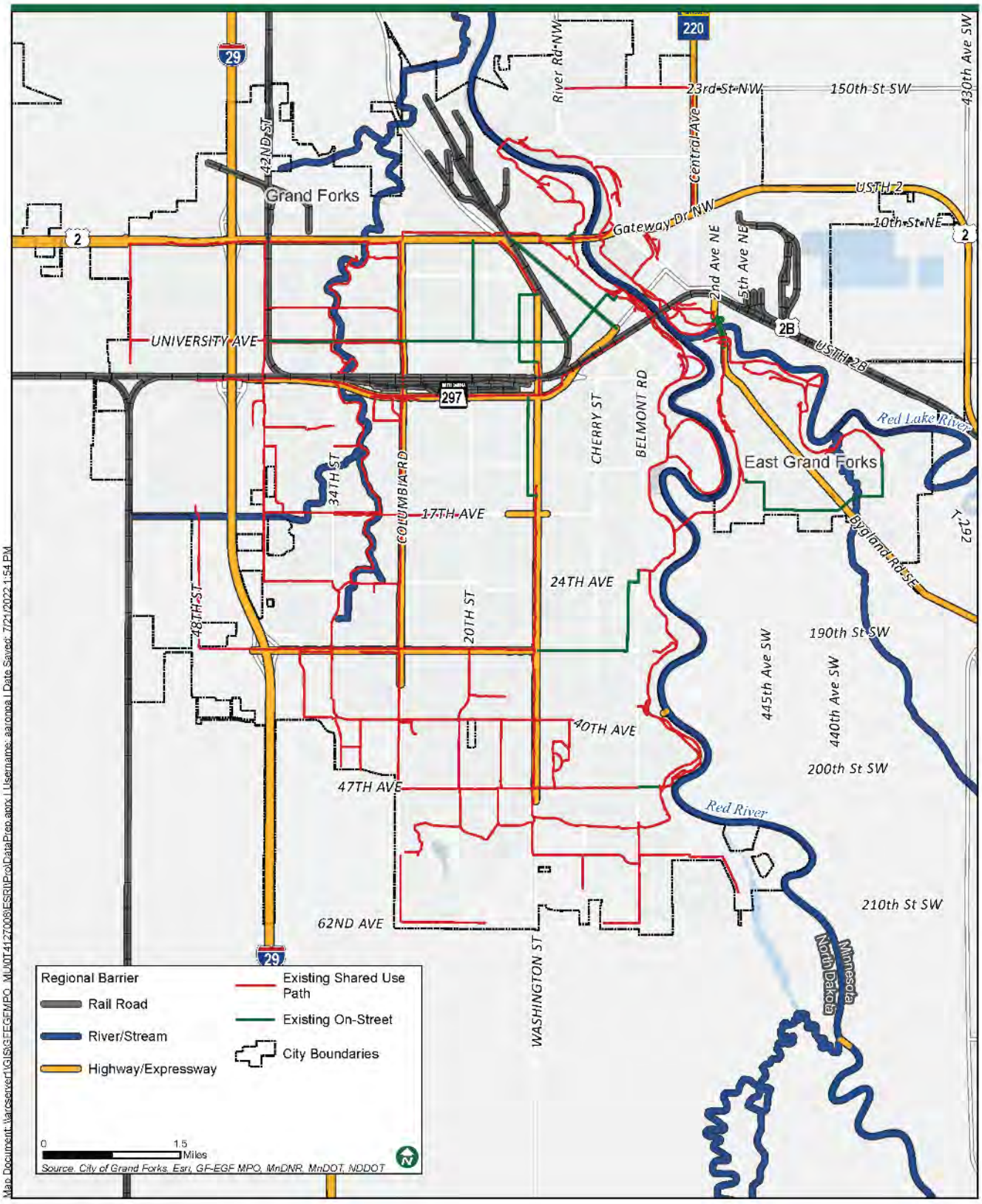
Grand Forks is situated on a major BNSF rail corridor. Rail tracks bisect some of the oldest and densest parts of the community, with many gated and uncontrolled at-grade crossings, some of which service multiple trains a day, and can be the cause of delay for all road users. Activity relating to the Bakken oil field development in recent years has greatly increased the number of trains with over 100 cars, increasing delays. The rail switching yard north of DeMers Avenue between Washington and 42nd Street is another barrier that limits north/south connectivity for all road users. Switching operations can cause substantial delays for traffic traversing at-grade crossings near the rail yard (42nd Street, Washington Street). The 2017 Freight Rail Access Study found that there were five crossings in the city with daily delay that exceeded 75 minutes per day. At grade crossings are also present in downtown Grand Forks – directly south of downtown and along the Mill Road spur accessing the North Dakota Mill and Elevator. Many crossings are uncontrolled along the Mill Spur.

The Red River and Red Lake River are the dominant natural features in the region. They are a regular natural barrier, and much more so during flooding when bridges may be closed. For bicyclists and pedestrians, this can result in detours. There are three main roadway crossings of the Red River – US Highway 2, DeMers Avenue, and Minnesota Avenue. Of these only DeMers Avenue and US Highway 2 are available for people walking and bicycling. There are also two bicycle/pedestrian bridges over the Red River – one located 0.6 miles north of US HIGHWAY 2 and another near 17th Avenue. The Red Lake River connects with the Red River in the southern part of East Grand Forks, with the main crossing being the Louis Murray Bridge at the intersection of 2nd Avenue Northeast and 3rd Avenue Southeast.

Lesser waterways, such as the English Coulee that winds through the University of North Dakota campus, also presents a less substantial barrier for biking and walking. This creek already has several bike and pedestrian crossings.

Key aspect of these crossing barriers include:

- Interstate 29 is a major barrier to the west, with crossings limited to Demers Avenue, Gateway Drive/US Highway 2, and 32nd Avenue.
- Railroad crossings are a significant north-south barrier, especially along and west of Columbia Road. Cyclists might struggle with the steep grades and narrow path for the Columbia overpass, requiring detouring to 42nd Street or Washington Street.
- Crossing the Red River is limited to three existing bridges, none of which have dedicated cyclists facilities, and mixed quality of pedestrian facilities. Other planning efforts, such as the Downtown Action Plan and Downtown Transportation Study have made recommendations on how to address these deficiencies during bridge reconstruction.


Grand Forks
East Grand Forks
UNIVERSITY AVE
17TH AVE
24TH AVE
40TH AVE
47TH AVE
62ND AVE
42ND ST
34TH ST
48TH ST
COLUMBIA RD
20TH ST
CHERRY ST
BELMONT RD
WASHINGTON ST
River Rd NW
23rd St NW
Central Ave
150th St SW
430th Ave SW
Gateway Dr NW
2nd Ave NE
5th Ave NE
10th St NE
USTH 2
USTH 2B
Red Lake River
Bygland Rd SE
190th St SW
200th St SW
210th St SW
445th Ave SW
440th Ave SW
Red River
Minnesota
North Dakota
29
220
297
2
2B
Regional Barrier
Rail Road
River/Stream
Highway/Expressway
Existing Shared Use Path
Existing On-Street
City Boundaries
0
1.5
Miles
Source: City of Grand Forks, Esri, GF-EGF MPO, MnDNR, MnDOT, NDDOT
Map Document: \\arcserver\GIS\GF-EGF\MPO_MUP\0T4127008\ESRI\ProjData\Prep.aprx | Username: aaronna | Date Saved: 7/21/2022 1:54 PM

E. Bicycle Level of Traffic Stress

Data from the previous sections were used to calculate the bicycle level of traffic stress (BLTS) for bicyclists in Greater Grand Forks. BLTS methodology quantifies the perceived safety issues of being near vehicles as a relation to the speed and spacing of vehicles per road segments. These are grouped into four ranks of impact of traffic-based stress on cyclists. This analysis is based on methodology developed by the Mineta Transportation Institute and the Oregon Department of Transportation. BLTS for Greater Grand Forks was calculated using GIS data of road segments from data provided for prevailing speed, functional classification, average vehicles per day, number of lanes, and presence of bike facilities such as lanes, shared lane markings, or separated paths. The analysis included the network of shared use paths. The levels of traffic stress are grouped into the four following categories:

- **BLTS 1 – Negligible stress roadways**. Local residential streets, bike paths/cycle tracks. Intersections are rare and easily traversed. Suitable for all riders, though children might require supervision from more experienced cyclists.
- **BLTS 2 – Low stress roadways**. Collector level streets with bike lanes or streets within the central business district. Traffic speed differential is low, and intersections are not difficult to cross for most users. Requires more attention than BLTS 1, thus not suitable to young children.
- **BLTS 3 – Moderate stress roadways**. Low-speed arterials with bike lanes or moderate speed non-multilane roadways. Suitable for most observant adult cyclists.
- **BLTS 4 – High stress roadways**. Moderate to high traffic speeds and volumes with complex intersections, wide crossing distances, or high volumes/speed. Suitable only for the most confident and skilled cyclists.

The BLTS methodology pairs these levels of traffic stress with four groupings of cyclists based on tendency to use bicycles as a mode of transportation and their route making choices (**Figure 18**). The smallest group, “Strong and Fearless” represents people who feel comfortable travelling by bike under any condition and on any roadway. The second group, “Enthused and Confident”, are more advanced cyclists who will travel on most roadways but tend to avoid high volume and speed conditions. More than half of the population falls into the largest of the group, “Interested but Concerned”. These are people who would ride if roadway conditions were perceived to be safe enough. The final group in not depicted in the graphic. This “No Way No How” group represents the approximately one-third of the population who will not ride under any circumstances. with a range of acceptable levels of traffic stress given the purpose of the trip.

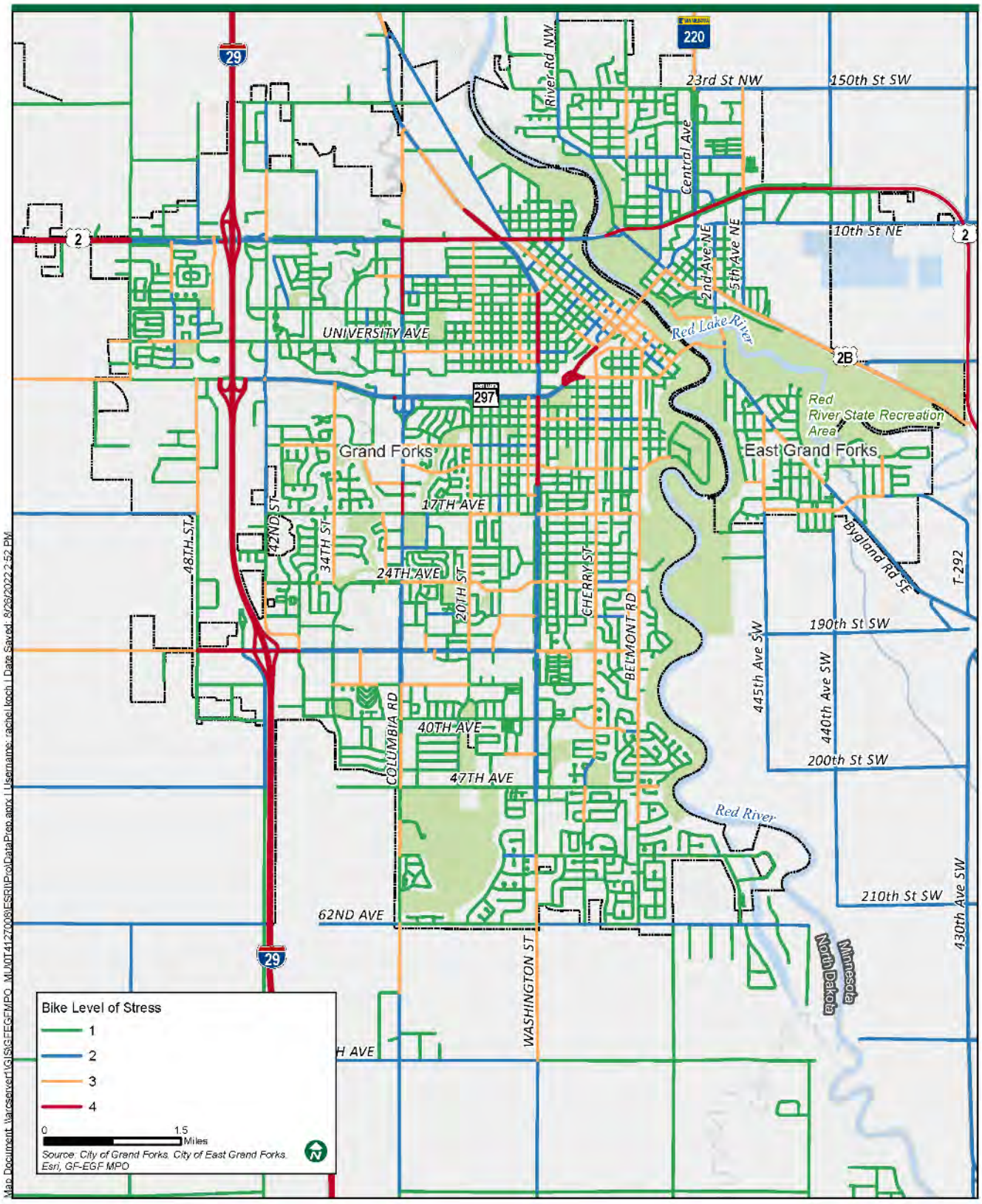
Figure 17. Bicyclist preferences profiles
Source: FHWA Bikeway Selection Guide, 2019

Growing the number of people bicycling means making gains in the enthused and confident category (with supportive infrastructure that takes them where they want to go) and interested and concerned category (who are averse to high stress traffic environments but may be compelled to bike more if high comfort facilities can be created).

The data collected throughout this study was used to determine the bicycle level of traffic stress for the Greater Grand Forks road network (**Map 16**). Unsurprisingly, the analysis indicates what is generally understood about various street types in Grand Forks. Neighborhood streets tend to be quite comfortable (BLTS 1 or 2), minor arterials are more difficult (BLTS 3), and major arterials are quite uncomfortable (BLTS 4). Shared Use Paths along major arterials provide a more appealing alternative to many cyclists, but these paths still might be intimidating to low-stress cyclists due to the proximity to high-speed traffic, and potential conflicts with vehicular traffic at intersections and street crossings.

This analysis supports the findings of the regional barriers analysis, including:

- The north-south gap in Grand Forks could be addressed by reducing level of traffic stress along Washington Street, and improving continuity along Columbia Road
- Many east-west gaps could be readily addressed with low-cost interventions, such as bike boulevards and on-street facilities.



Map Document: \\arcserver\GIS\GFEGFMPO_MU\0T4127008\ESRI\ProDataPrep.aprx | Username: rachel.koch | Date Saved: 8/26/2022 2:52 PM