

Barnesville Comprehensive Plan



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Introduction

Introduction

The purpose of this comprehensive plan is to aid in the decision making of Barnesville's elected officials. Data was gathered in order to depict a community profile of the City of Barnesville. This is a picture in time of Barnesville as it was as of the development of this plan. An overview was conducted concerning information about Barnesville's public facilities, transportation resources, demographics, housing, land use patterns, and economic development activities in order to paint a profile of life in Barnesville as well as to strategize on the needs/issues this plan will address.

Public Participation

Study Review Committee

The development of this plan was guided by a Study Review Committee (SRC) comprised community leaders, professional staff, and regional partners. The job of the SRC was to guide and direct all aspects of the plan. This group was the driving force behind the vision of the plan and heavily relied upon other public participation efforts to inform them of citizen desires. The SRC was comprised of the following individuals:

- Mike Rietz – City Administrator
- Karen Lauer – EDA Director
- Bill Christian – Metro COG
- Michael Maddox – Metro COG
- Brent Berg
- Darrel Thomas
- Dion Bredman
- Guy Swenson
- Heather Weber
- Jason Rick
- Margaret Follingstad
- Ryan Tonsfeldt
- Steve Mortensen
- Betty Strom

Stakeholder Groups

Stakeholder groups were utilized at the outset of the plan to glimpse into what the thoughts and feelings were of Barnesville residents on a variety of issues. Four stakeholder group meetings were held at the outset of the planning process. Individuals from economic development and business, Housing/neighborhoods and cultural, community infrastructure, and public official sectors were asked to participate.

A SWOT analysis was performed to establish a baseline as to what residents felt the strengths, weaknesses, opportunities, and threats were to the community. The table below encapsulates the responses from all of the stakeholder groups.

Table 1: SWOT Analysis Responses

<u>Strengths</u>	<u>Weaknesses</u>
<ul style="list-style-type: none"> • Smaller environment • Mix between urban and rural • Proximity to Fargo and lakes region • Main Street Program <ul style="list-style-type: none"> ○ EDA • Park System • Public Works <ul style="list-style-type: none"> ○ Street maintenance • City owned enterprises <ul style="list-style-type: none"> ○ One stop shop ○ City is responsive ○ Lower taxes ○ Diversity of service • Proximity to Transportation Corridors <ul style="list-style-type: none"> ○ State Routes • Small town feel <ul style="list-style-type: none"> ○ With amenities • Proximity <ul style="list-style-type: none"> ○ 25 minutes from everywhere • People <ul style="list-style-type: none"> ○ Passion ○ Support for city • Industrial amenities • Park system • Quality of life • Events • Young Families • Fiber infrastructure • Natural Gas • Population increasing 	<ul style="list-style-type: none"> • Proximity to Fargo • Affordability of infrastructure improvements • Rental living <ul style="list-style-type: none"> ○ Lack of ○ Low vacancy rate ○ High demand/low supply • Lack of new housing • Lack of new development <ul style="list-style-type: none"> ○ Market rates of Fargo negatively impact Barnesville market • Lack of affordable housing • City as developer <ul style="list-style-type: none"> ○ Risk • Lack of retail <ul style="list-style-type: none"> ○ Demand is low ○ Most business goes to the Fargo market • Proximity to Fargo • Lack of local jobs • Ability to afford utility expansion <ul style="list-style-type: none"> ○ Especially towards interstate • Capacity of water system to serve commercial uses • Manpower

Table 2: SWOT Analysis Responses

<u>Opportunities</u>	<u>Threats</u>
<ul style="list-style-type: none"> • Areas designated for new development • School system • Commercial/industrial development <ul style="list-style-type: none"> ○ Current park is almost full ○ Opportunity to expand • Trails <ul style="list-style-type: none"> ○ Success in receiving grants • City is funding stream savvy • Interstate exits • Commuters <ul style="list-style-type: none"> ○ High wage earners • Fiber infrastructure <ul style="list-style-type: none"> ○ telecommuting • Home based businesses • Education <ul style="list-style-type: none"> ○ Tech Savvy • Main Street <ul style="list-style-type: none"> ○ New infrastructure ○ Designed to preserve small town feel • Availability of commercial land 	<ul style="list-style-type: none"> • Market conditions • Minnesota Border City status <ul style="list-style-type: none"> ○ Barnesville is not included ○ Proximity issue • Perception as a bedroom community • Expense of infrastructure expansion • Visibility from Interstate • Willingness to incur debt <ul style="list-style-type: none"> ○ Spend money ○ Raise taxes • Aging facilities • Competing with other small towns <ul style="list-style-type: none"> ○ Facilities • Link between economic health and the price of gas • Dependent on Farm economy • Aging water mains • Worries about lead in the water system

Online Survey

A short online survey was made available to Barnesville residents in the summer of 2016, ending in August. The survey was open for approximately two months and garnered 124 responses. The survey provided valuable insight into how citizens view Barnesville, and their ideas on what they think Barnesville needs to do in the future. The survey results can be found in **Appendix 1**.

The answers to some questions were placed in a word cloud. The function of a word cloud is to show what is the predominate answer to a question. The more responses, the bigger the word. Lengthy responses were reduced to one word representing the theme of the response.

The word cloud represented in **Figure 1** details responses to questions asked about how Barnesville is viewed and would like to be viewed (survey questions 5-6). **Figure 2** details responses to survey question 8: What amenities/qualities do you think would serve to attract/retain residents?

Public Meetings

Two public meetings were held during the planning process to update Barnesville's comprehensive plan. The first public meeting was held on October 11, 2016 from 6-8 p.m. at the Barnesville Senior Center. Even though this meeting was lightly attended. Those who participated gave thoughtful comments on how Barnesville should progress as a community as well as detailing challenges to overcome in order to achieve its goals.

The second public meeting was held at the end of the planning process. It was held at the City of Barnesville Council meeting on October 9, 2017. The meeting presented the final elements of the plan to residents at this meeting.

Figure 1: Questions 5-6 Word Cloud



Figure 2: Question 8 Word Cloud



Existing Conditions

Demographic and Growth Trends

The Comprehensive Plan helps to establish broad policies and goals that reflect the aspirations and visions of residents of the City of Barnesville. In order to best understand future development needs and growth patterns, the Plan first outlines the historical and existing socioeconomic conditions that have both shaped and continue to shape the City. An examination of these patterns sheds light onto the manner in which the City may grow and evolve over the coming years.

Historical Population Trends

Over the past several decades, Barnesville has experienced both periods of population growth and decline. Between 1950 and 1980, the City of Barnesville steadily gained population, growing by 38% over this 30 year period.

This was followed by a decade of population loss, as the population of Barnesville declined by approximately 6% between 1980 and 1990. Since 1990, Barnesville has experienced a sustained period of growth, with a 2010 U.S. Census population of 2,563 and a 2015 U.S. Census Bureau population estimate of 2,577¹.

For a rural community with roots in agricultural, Barnesville has managed to add population over the last 50 years even as the agricultural economy has slowly declined. As is shown in **Figure 3 and Figure 4**, the population of Barnesville along with the total rural non-farm population of Clay County has tended generally upwards for the last half century. The trend lines of both Barnesville and Clay County closely mirror each other.

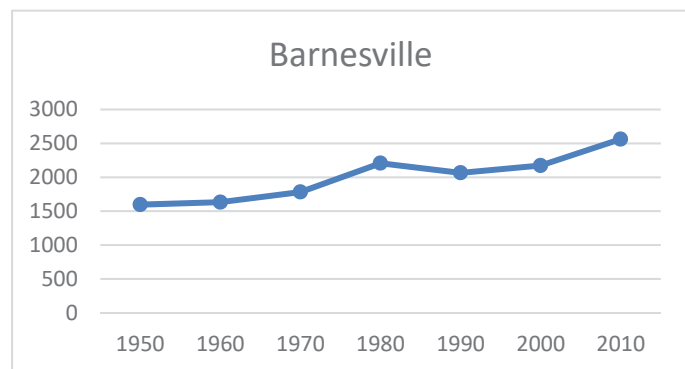


Figure 3: Historical Growth of Barnesville, 1950-2010

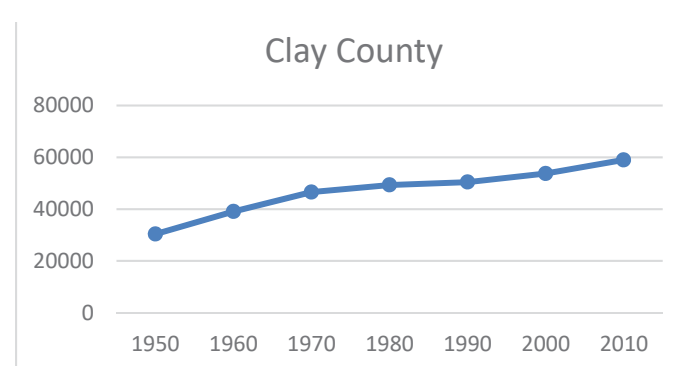


Figure 4: Historical Growth of Clay County, 1950-2010

Population Projection

Barnesville has been growing at a consistent pace over the past couple of decades. The city has sufficient land and utility capacity to continue to grow at historic rates. As the Fargo Moorhead Region continues to rapidly expand, so too will the Barnesville area as people look for affordable housing options in a more relaxed environment. **Table 3** is taken out of the Metro COG 2016 FM Demographics Report. Metro COG updates demographic projections and socioeconomic data every five-years for inclusion in the regional Travel Demand Model (TDM). **Table 3** shows the population projection for Barnesville as well as each of the jurisdictions that comprise the Metropolitan Statistical Area (MSA).

¹ U.S. Census Bureau Annual Population Estimates, 2015.

With that population growth, Barnesville will need to develop additional housing units to accommodate the influx of new residents. **Table 4** represents the projected household growth.

Table 3: Best Case Scenario Population Forecasts

	2015	2020	2025	2030	2035	2040	2045
MSA	232,900	259,260	281,030	300,460	317,400	331,730	342,360
MPA	222,366	246,523	267,331	286,013	302,419	316,413	326,782
Cass County	168,930	189,900	206,620	221,350	233,940	244,460	251,940
Clay County	63,970	69,360	74,410	79,110	83,460	87,270	90,420
Fargo	117,230	129,690	140,030	151,810	162,450	172,140	179,800
West Fargo	32,300	37,370	40,140	42,000	43,240	43,660	43,270
Horace	2,620	5,070	8,190	8,940	9,500	9,820	10,040
Casselton	2,420	2,530	2,680	2,800	2,920	2,990	3,110
Balance of Cass	14,360	15,240	15,580	15,800	15,830	15,850	15,720
Moorhead	43,840	47,120	50,290	53,340	56,390	59,100	61,420
Dilworth	4,300	4,760	5,210	5,620	5,960	6,270	6,510
Barnesville	2,780	3,020	3,300	3,530	3,730	3,920	4,110
Hawley	2,190	2,290	2,390	2,460	2,570	2,630	2,700
Balance of Clay	11,450	12,710	13,760	14,680	15,470	16,130	16,610

Table 4: Household Forecasts by Jurisdiction

	2015	2020	2025	2030	2035	2040	2045
MSA	86,178	94,750	104,970	112,450	119,850	124,830	130,440
MPA	81,875	90,210	99,550	106,820	113,940	118,700	124,460
Cass County	63,899	70,460	78,160	83,820	89,290	92,520	96,750
Clay County	22,279	24,290	26,810	28,630	30,560	32,310	33,690
Fargo	46,671	50,870	56,280	60,260	64,650	66,630	70,550
West Fargo	10,348	12,410	13,460	13,950	14,630	15,540	15,690
Horace	810	840	1,730	2,710	2,980	3,190	3,360
Casselton	874	890	920	950	1,000	1,040	1,090
Balance of Cass	5,196	5,450	5,770	5,950	6,030	6,120	6,060
Moorhead	14,205	16,420	17,830	19,190	20,610	21,880	23,010
Dilworth	1,595	1,660	2,030	2,150	2,290	2,470	2,530
Barnesville	1,013	1,050	1,130	1,190	1,270	1,320	1,430
Hawley	854	910	940	970	1,020	1,050	1,080
Balance of Clay	4,612	4,250	4,880	5,130	5,370	5,590	5,640

Race and Ethnicity in Barnesville

The City of Barnesville is predominately white, with approximately 99% of individuals of one race reporting to be white according to the 2011-2015 U.S. Census Bureau American Community Survey (ACS). 4.5% of the residents of Barnesville were estimated to be two or more races, a number which has increased over the past several years. Table 1 summarizes the racial and ethnic composition of Barnesville as of 2015.

Table 5: Race and Ethnicity in the City of Barnesville, 2015

	Total	Percent
One Race	2,455	95.50%
White	2429	94.50%
Black or African American	16	0.60%
American Indian or Alaska Native	0	0.00%
Asian	10	0.40%
Native Hawaiian and Other Pacific Islander	0	0.00%
Some other Race	0	0.00%
Two or More Races	116	4.50%

Source: U.S. Census Bureau, 2011-2015 American Community Survey.

Education

Over the past few decades, the educational attainment of residents of the City of Barnesville has increased significantly. In 1990, approximately 29% of residents had less than a high school education, a figure which has declined to under 10% in 2015. Further, individuals with a bachelor's degree or higher have increased from approximately 12% in 1990 to nearly 22% in 2015. Table 2 depicts the educational attainment of Barnesville residents per the 2011-2015 ACS. Overall, the educational attainment of Barnesville residents has improved dramatically, and closely aligns with similarly sized cities within the region.

Table 6: Educational Attainment of City Residents, 2015

	Total	Percent
Population 25 years and over	1,698	100%
Less than 9th grade	75	4.4%
9th to 12th grade, no diploma	88	5.2%
High school graduate (includes equivalency)	587	34.6%
Some college, no degree	328	19.3%
Associate's degree	248	14.6%
Bachelor's degree	273	16.1%
Graduate or professional degree	99	5.8%
Percent high school graduate or higher		90.40%
Percent bachelor's degree or higher		21.90%

Source: U.S. Census Bureau, 2011-2015 American Community Survey.

Income

Table 7 (below) outlines the income distribution of family households and all households within the City of Barnesville as of 2015. Overall, the median household income for all households closely aligns with that of Clay County as a whole, while both the median and mean family income is higher than that of Clay County. The largest individual income bracket within the city was households earning between \$75,000 and \$99,999 annually. This bracket accounted for approximately 29 percent of family households and 20 percent of all households within the city.

According to the 2011-2015 American Community Survey, 4.2% of the population of Barnesville was below the poverty level in 2015. The poverty level is published annually by the US Census Bureau and is determined by income, household size, and children under the age of 18. The poverty threshold for a single-person under the age of 65 is \$12,486; whereas, the poverty threshold for a two-adult household with two children is \$24,339. This continues the trend of marked decline in poverty levels over the past 2 decades, which was at approximately 5.6% in 2010; 6.7% in 2000, and 12.7% in 1990. This trend, along with moderately high-income levels, indicate that the City of Barnesville has improved its overall economic conditions considerably over the past number of decades.

Table 7: Household and Family Income, 2015

Income & Benefits (In 2015 Inflation-Adjusted Values)					
	Estimate	Percent		Estimate	Percent
All Households	1,001		Family Households	637	
Less than \$10,000	27	2.7%	Less than \$10,000	5	0.8%
\$10,000 to \$14,999	37	3.7%	\$10,000 to \$14,999	10	1.6%
\$15,000 to \$24,999	147	14.7%	\$15,000 to \$24,999	43	6.8%
\$25,000 to \$34,999	96	9.6%	\$25,000 to \$34,999	38	6.0%
\$35,000 to \$49,999	138	13.8%	\$35,000 to \$49,999	87	13.7%
\$50,000 to \$74,999	184	18.4%	\$50,000 to \$74,999	112	17.6%
\$75,000 to \$99,999	202	20.2%	\$75,000 to \$99,999	182	28.6%
\$100,000 to \$149,999	122	12.2%	\$100,000 to \$149,999	112	17.6%
\$150,000 to \$199,999	22	2.2%	\$150,000 to \$199,999	22	3.5%
\$200,000 or more	26	2.6%	\$200,000 or more	26	4.1%
Median household income (dollars)	57,163		Median family income (dollars)	76,958	
Mean household income (dollars)	67,322		Mean family income (dollars)	84,503	

Source: U.S. Census Bureau, 2011-2015 American Community Survey.

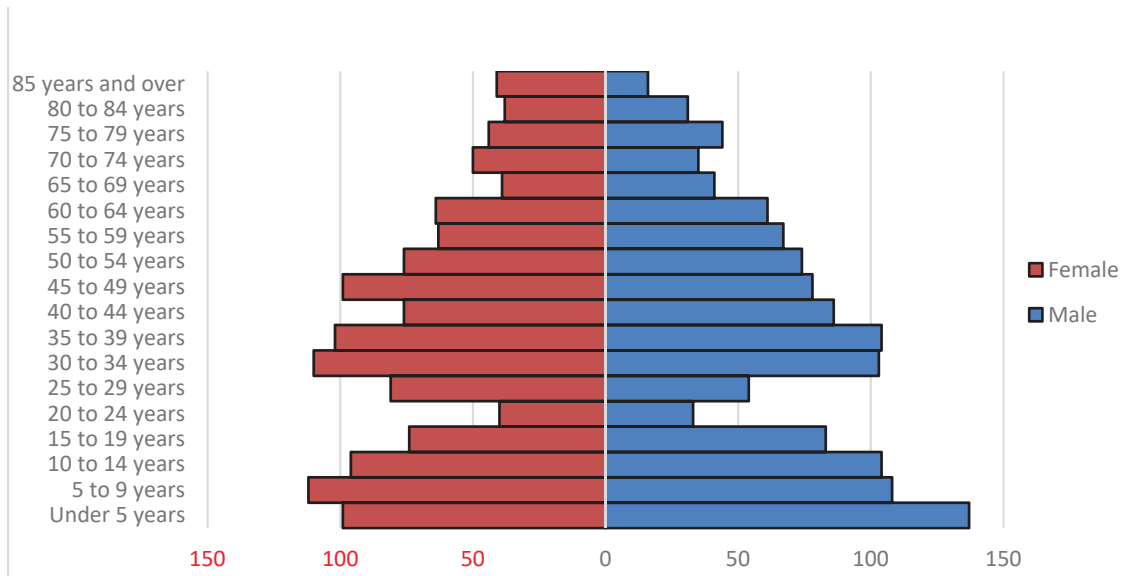
Age Structure

Barnesville is uniquely situated as a community with direct access to Interstate 94 and within close proximity to both the Fargo-Moorhead urban core and the Minnesota lakes country. This unique geographical situation is reflected, in part, in the city's age structure. The population pyramid depicted in **Figure 5** shows a high concentration of individuals between 30 and 40 years of age. This "young family" cohort may be attracted to the city due to its high quality school system, lower cost of living,

small-town atmosphere, and proximity to recreational and city activities. As can be seen on the population pyramid, individuals in this age cohort tend to have young children. This is reflected in the high overall totals of children between the ages of 0 and 10 living in the City of Barnesville.

The lack of presence of the 15-24 year old age cohorts can be explained by the lack of both secondary educational opportunities and entry level jobs; whereas, there are multiple secondary educational

Figure 5: Barnesville Population Pyramid



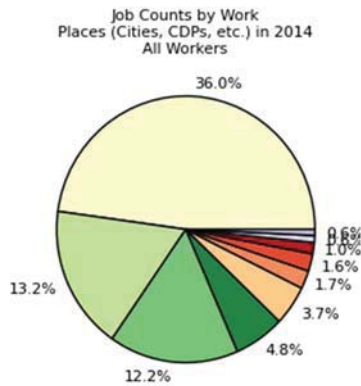
opportunities just a short distance from Barnesville. The pyramid does reflect the potential that these individuals return to Barnesville upon completion of their higher education, as the 25-29 year old cohort as well as the 30-34 year old cohort are substantially larger. Overall, the population pyramid shows that Barnesville, by and large, has a large number of young adults and children, giving some credence to its “family-friendly” image.

Employment & Workforce

Figure 6 provides an overview of where residents of the City of Barnesville are employed. The majority, approximately 54%, commute to the Fargo-Moorhead-West Fargo urban area to work. Roughly 12% of Barnesville residents are employed within the City, with the remaining residents working within other regional communities or travelling long distances for employment.

As the figures illustrate, the City of Barnesville has a very high share of residents who commute to the Fargo-Moorhead metro area for work.
(continue this paragraph)

Figure 6: US Census Employment Destinations for Barnesville Residents



Jobs Counts by Places (Cities, CDPs, etc.) Where Workers are Employed - Primary Jobs		
	2014	
	Count	Share
All Places (Cities, CDPs, etc.)	1,260	100.0%
Fargo city, ND	454	36.0%
Moorhead city, MN	166	13.2%
Barnesville city, MN	154	12.2%
West Fargo city, ND	60	4.8%
Hawley city, MN	46	3.7%
Grand Forks city, ND	21	1.7%
Detroit Lakes city, MN	20	1.6%
Pelican Rapids city, MN	13	1.0%
St. Paul city, MN	8	0.6%
Graceville city, MN	7	0.6%
All Other Locations	311	24.7%

Households

Table 4 outlines the current housing characteristics of the City of Barnesville.

The use of the term “housing unit” refers to a single residence in which one or more people live. It could be a single-family home, a twin home, or a unit within a multi-unit apartment complex. In 2015, Barnesville had a total of 1,130 housing units, with an occupancy rate of approximately 89 percent. Notably, only 1.4 percent of single-family homes were unoccupied, compared to approximately 14 percent for rental units. Overall, the vast majority (approximately 84 percent) of all housing units within the City of Barnesville were single-family homes. While apartments are limited, demand for apartments is also low, and vacancy rates are significantly greater than rates in the Fargo-Moorhead urban area.

Between 1998 and 2006 there were 164 housing units constructed in Barnesville, with a yearly peak of 25 housing units (2002 & 1999). However, since 2007 housing starts in Barnesville have slowed. In 2010, only one housing unit was constructed, which is indicative of the housing bubble collapse. There has been a bit of a resurgence in 2016 with 12 houses and 5 townhomes being constructed.

Approximately 78 percent of all housing units within Barnesville were built prior to 1980, and 24 percent of all home were built prior to 1939. Even as a rural community with an older housing stock, Barnesville has numerous examples of modern housing stock as houses are continuing to be constructed due to population increases creating a mixture of new and old housing units providing affordability in the housing market.

Table 8: Barnesville Housing Characteristics, 2015

Barnesville Housing Characteristics, 2015		
	Number	Percent
Total housing units	1,130	100%
Occupied housing units	1,001	88.6%
Vacant housing units	129	11.4%
Homeowner vacancy rate	1.4	N/A
Rental vacancy rate	13.7	N/A
Owner-Occupied	839	83.8%
Renter-Occupied	162	16.2%
Average Household Size, Owner-Occupied	2.66	N/A
Average Household Size, Renter-Occupied	1.93	N/A
Housing Type		
1-unit, detached	899	79.6%
1-unit, attached	35	3.1%
2 or more units	186	16.5%
Mobile home	10	0.9%
Year Structure Built		
Built 2014 or later	7	0.6%
Built 2010 to 2013	0	0.0%
Built 2000 to 2009	154	13.6%
Built 1990 to 1999	89	7.9%
Built 1980 to 1989	60	5.3%
Built 1970 to 1979	276	24.4%
Built 1960 to 1969	128	11.3%
Built 1950 to 1959	97	8.6%
Built 1940 to 1949	52	4.6%
Built 1939 or earlier	267	23.6%
Value of Owner-Occupied Housing Units		
Less than \$50,000	43	5.1%
\$50,000 to \$99,999	210	25.0%
\$100,000 to \$149,999	298	35.5%
\$150,000 to \$199,999	157	18.7%
\$200,000 to \$299,999	117	13.9%
\$300,000 to \$499,999	14	1.7%
Median (dollars)	128,400	N/A

*US Census Bureau

According to the latest information from the U.S. Census Bureau, the 2015 median price of homes within the City of Barnesville was \$128,400. This is one of the lowest median home prices within the region, comparing favorably to the City of Fargo (\$168,600), Moorhead (\$159,100), and even smaller regional cities such as Hawley (\$145,200). Each of the aforementioned cities, however, have housing stock that is, on average, significantly newer, and a higher percentage of rental housing units available.

The City of Barnesville should look to capitalize on its affordable housing prices as it looks to attract new residents in the future.

Barnesville Existing Land Use

The Comprehensive Plan provides the opportunity for city leaders to look beyond the day-to-day zoning issues and guide the future use of land and development in the community. In order to fully understand how development should move forward, an inventory of existing land use conditions was completed. This section details existing land uses with the City of Barnesville and those areas immediately surrounding the city boundary.

The relationship between a comprehensive plan and the zoning ordinance is often misunderstood. There is often confusion between land use and zoning. Land use as defined for use in this Comprehensive Plan is a broad explanation of the primary use of a certain piece of the property; whereas, zoning is the specific regulations applied to land.

The sections below describe the land use categories that were inventoried as well as examples of various land use types in Barnesville. **Figure 7** shows the existing land uses inventoried as part of this Plan.

Agricultural

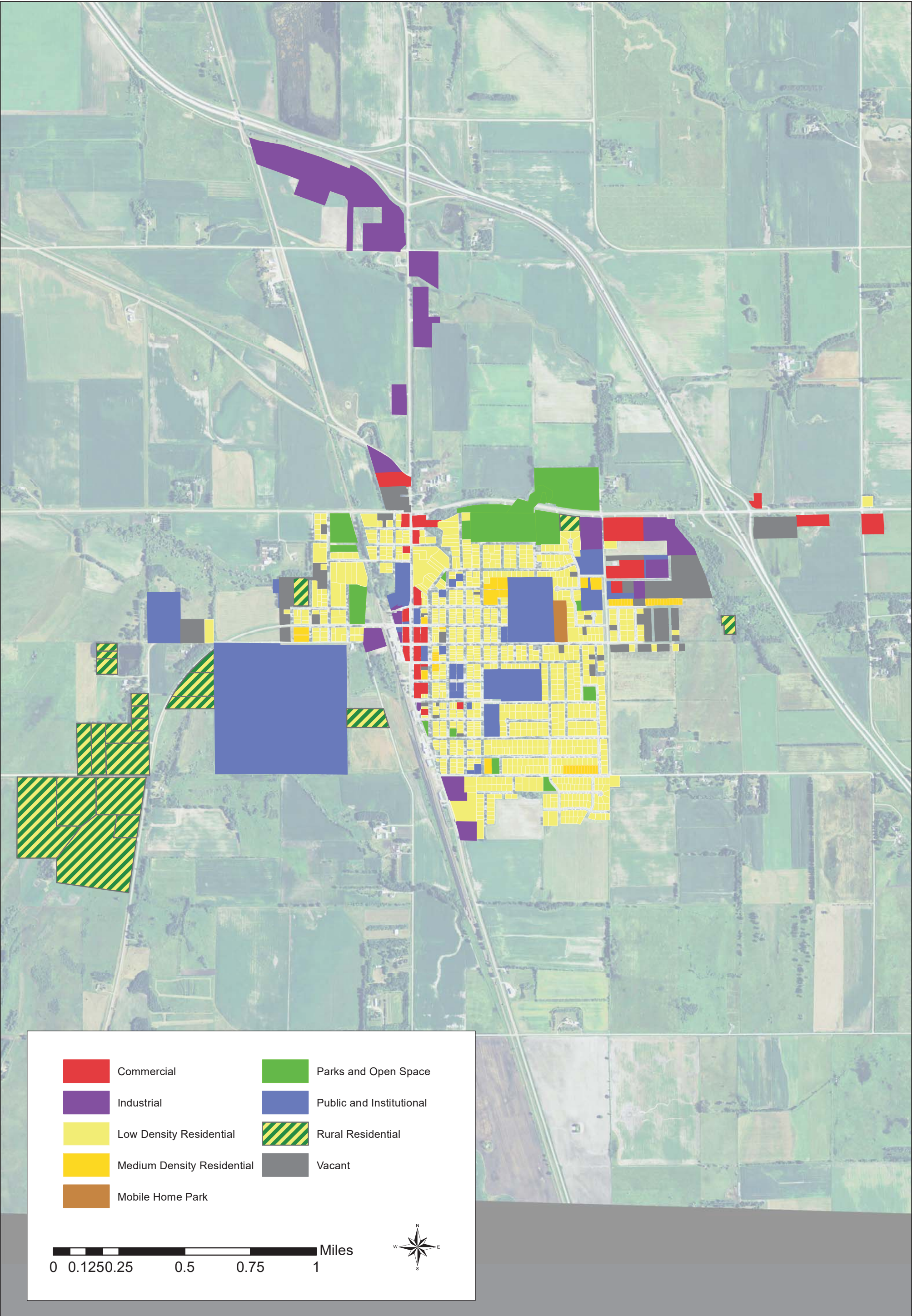
Agricultural uses can be described as those areas, including a homestead, which is used for the production of agricultural products such as small grains, livestock, vegetables, etc. Agriculture, from a land use perspective, is thought of as a “base” condition that existed before more formalized development took place. Often, agriculturally designated areas are not legally described in the same way developments within a city are described.

Even though agricultural areas are considered a “base” land use, they can be one of the most intensive uses due to the noise, dust, and odors associated with agricultural production. Typically, agricultural uses within and adjacent to a city are thought of as “holding zones,” where the possibility exists that a city may one day expand into these areas. However, this in no way is meant to discourage such uses or to force landowners to sell or redevelop their properties. Rather, when developers or cities are looking for places to expand, these areas are often investigated to determine the owner’s willingness to sell land for development purposes.

As is typical for a rural community, agricultural land use is the predominate use surrounding Barnesville. Some businesses, such as the Agassiz Valley Grain elevator, specifically cater to the farm community. When addressing future land uses within city limits, empty parcels (often times agricultural uses) will be examined for their suitability for development. Those areas within city limits will first be analyzed, followed by those areas contiguous to city limits to ensure orderly and efficient development patterns.

The map depicted in **Figure 7** provides an overview of the current land use within and surrounding City of Barnesville. Agricultural land uses outside of Barnesville are not depicted on the map with a specific color. Agricultural land uses within the corporate boundaries are shown in green in **Figure 7**.

Barnesville Existing Land Use



Residential

The vast majority of land uses within Barnesville are what are often referred to as low-density residential. This type of residential development is characterized by mainly single-family dwellings with one structure per lot. Lot sizes can vary, but the typical density is approximately five dwelling units per acre which equate to a lot area of 7,500 square feet.

Medium-density is generally classified as apartment complexes with less than twelve units or any type of townhome or row house. A typical medium-density development has around 12 dwelling units per acre. There are a small number of medium-density developments within Barnesville. One example of a medium-density land use would be the old creamery building which was repurposed into housing units. In other places within the City, large older housing units were split into apartment units. These converted housing units would also be an example of medium-density residential development.

A high-density development is any housing complex with greater than twelve dwelling units per acre. On average, high-density development would have a density around nineteen dwelling units per acre. There are no high-density developments located within Barnesville.

Apartment units typically provide more affordable and transitional housing options for people that may not be in a circumstance where owning a home is an option. The need for rental units will have an influence in the programming of medium-density housing in the future land use section of this plan. It is unlikely that high-density housing would be viable within the Barnesville housing market. In **Figure 7**, low-density land uses are shown in yellow, and medium-density uses are shown in light orange.

Commercial

Commercial uses are widely varied and can range from restaurants, bars, and retail shops to gas stations and automotive repair shops. Commercial uses typically can be described as anything that has sales to the end-user. Commercial uses can range in intensity. . For the purposes of this Plan, home based businesses are not considered commercial land uses. The primary use of the land, as a residence, is the main indicator of a parcel's land use.

Most of the commercial land uses are clustered along Front Street in Downtown Barnesville. These businesses provide goods and services to Barnesville residents and represent the majority of job locations within the City. In addition to downtown, there are other commercial uses located in other area of the city. The commercial park has a mix of land use types, some being commercial and others being industrial in nature.

Auto-oriented commercial uses are those businesses that cater to travelers along regional highways. Barnesville does have some instances of auto-oriented commercial uses, namely the Dairy Queen, gas stations, and the Dollar General (small box retail). These uses are located at the junction of MN 34 and MN 9 on the north side of town. This plan will address the placement different types of commercial uses and how Barnesville can leverage its location along I-94 to expand its commercial base in order to better serve travelers along I-94.

Commercial land uses are shown in red on **Figure 7**.

Industrial

Industrial uses are generally one of the most intensive uses, having the potential to generate noise, truck traffic, and odors. These uses are required to be on large lots and are located away from other non-compatible land uses in order to mitigate their impact. They also tend to be among the largest employers within cities, use a majority of city services, and bring in extensive tax revenue.

Industrial land uses are usually located next to high-volume transportation facilities, as in the case of the Barnesville commercial park. However, in Barnesville's case, the residential and industrial growth areas have collided, limiting the expansion of both. Barnesville's industrial land uses are located in a few distinct areas. These areas are along the rail line, along MN 34, and in the commercial park on the east side of town.

Industrial land uses are shown in purple on **Figure 7**. This plan will address the need for development of industrial land uses as well as the placement of those land uses.

Public and Institutional

Hospitals, municipal buildings and services, public parking lots, fair grounds, and schools all comprise public and institutional uses. They can be described as those facilities and infrastructure owned by public entities necessary for municipal operations. Public and Institutional uses are one of the most prominent on the land use map because of their large size.

Examples of Public and Institutional uses in Barnesville are schools, city hall, sewer lagoons, county fairgrounds, churches, and Valley Care Rehab. Public and Institutional uses are shown in blue on **Figure 7**.

Park and Open Space

Parks and Open Spaces in Barnesville are places like Wagner Park, Blue Eagle Lake Park, and the baseball diamonds. These public places are community owned and are used for community wide recreation. Private lands that are not developed and are not open to the public are not shown as this type of land use.

Park and Open Space land uses are shown in light green on **Figure 7**.

Vacant

The purpose of delineating these is to show areas that are open to immediate development. Examples of such areas are vacant lots within residential growth areas. In some instances, neighboring land owners have acquired these vacant properties as additions to their yard. These areas are still shown as vacant because the right of the property owner to develop these properties still exists. They will be shown as vacant until such time as the owner consolidates the two properties into one via the platting process, thereby nullifying their right to build a separate use on that property.

Commercial properties that are vacant in downtown are also shown. These properties are prime spots for redevelopment and will be addressed in later sections of this plan. Vacant land uses are shown in gray in **Figure 7**.

Extraterritorial Jurisdiction

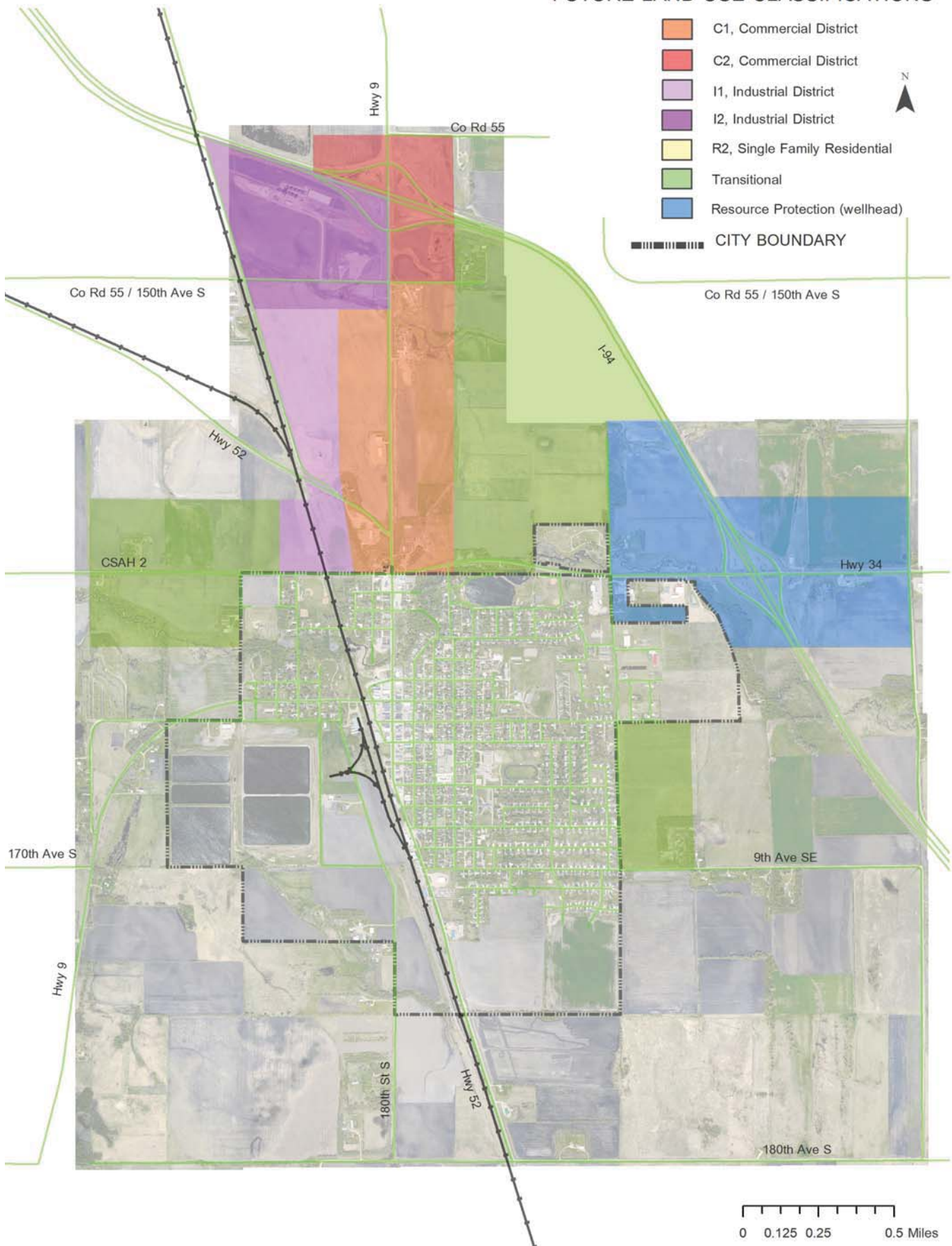
In order to provide for the orderly annexation of unincorporated lands, and to ensure that municipal infrastructure is extended in an efficient manner, State of Minnesota statute gives any municipality within the state sole planning jurisdiction within a two-mile area surrounding a municipality's boundary. This area is often referred to as the Extraterritorial Jurisdiction (ETJ).

The City of Barnesville has chosen not to exercise its two-mile ETJ, rather opting to enter into a Joint Powers Agreement (JPA) with Humboldt and Barnesville Townships. A JPA is essentially an additional level of land use control where, instead of one agency, a board consisting of representatives from each jurisdiction make land use and zoning decisions. This is done by creating a separate land use plan and zoning ordinance that only applies to the agreed upon area. This effort was undertaken in 2012, with a final plan adopted in 2013.

The Joint Powers Area (per 1996 boundary) is comprised of approximately 1,380 acres which includes 49 parcels and only 33 property owners. A majority of the acreage within the boundaries of the JPA is currently used for agricultural purposes. **Figure 8** shows the Joint Powers Authority (JPA) Area.

With most of the areas north and east of Barnesville located within the JPA, city leaders must decide how they would like address growth and development in this plan. Strategies like infill development or creating denser development models could substitute for outward residential growth. There is still land open for development opportunities within areas under sole jurisdiction of the City of Barnesville.

FUTURE LAND USE CLASSIFICATIONS



Transportation Network

Street Network

The street network of Barnesville is laid out in a basic grid pattern; however, the grid pattern is interrupted by large land uses such as the fair grounds and the high school. These land uses have obstructed the normal connectivity of a grid network. There are few opportunities for direct east/west travel across the city. In newer development areas, there has been a departure from the normal grid network, creating varying block sizes as well as a more organic street network.

There are also multiple highways that converge within Barnesville; namely US 52, MN 32, and MN 9. These facilities are owned and maintained by MnDOT. This can sometimes complicate decisions to repair, replace, or add roadway amenities to the facilities. In 2011, MN 9/Front Street was reconstructed through Downtown Barnesville, giving the City an opportunity to work with the State on a preferred cross-section. Working with the State, Barnesville was able to add new sidewalks in front of downtown businesses, install pedestrian friendly bulb-outs at corners, add crosswalk markings, and generally beautify the corridor with additional design features.

Within the life of this plan, other portions of MnDOT controlled facilities will be reconstructed. Recommendations and opportunities within the reconstruction of those roadways will be discussed later in this plan. The City of Barnesville should take the opportunity to coordinate with State of Minnesota efforts to implement change within the community.

Barnesville is located adjacent to I-94, MN 34, US 52 and MN 9 provides two access points to I-94.

Figure 10 is a map of Barnesville's street network and the functional classification of roadways as delineated by MnDOT.

Parking

Horizontal, on-street parking is allowed on the majority of streets within Barnesville, whether it be downtown or within residential areas. Existing street widths are more than enough to accommodate the large vehicles often found around agricultural communities. The City of Barnesville does provide three off-street lots in the Downtown area as well as providing other parking throughout the community.

Functional Classification of Roadways

Roadways are classified according to their intended use, cross-section, and traffic pattern. There are four different classifications: local, collector, arterial, and interstate. Both the collector and arterial classifications can be broken down into subcategories such as major, minor, primary, interstate, and other. These classifications are different in rural versus urban areas, but the intention of the classifications are the same.

Functional System	Services Provided
Arterial	Provides the highest level of service at the greatest speed for the longest uninterrupted distance, with some degree of access control.
Collector	Provides a less highly developed level of service at a lower speed for shorter distances by collecting traffic from local roads and connecting them with arterials.
Local	Consists of all roads not defined as arterials or collectors; primarily provides access to land with little or no through movement.

Land use is an important determinant of the function of an area's roads. As land use changes because of development, especially at the urban fringe, road functions also change. It is not uncommon for roads that once served as rural local access routes to farmland, and now serve suburban residential subdivisions and commercial land uses, to be reclassified as urban collectors or arterials depending on the intensity of development and the type of traffic generated by the development. Design standards or guidelines must change to meet actual or impending change in traffic character and road function.

There is a basic relationship between functionally classified highway systems in serving traffic mobility and land access. Arterials provide a high level of mobility and a greater degree of access control, while local facilities provide a high level of access to adjacent properties but a low level of mobility. Collector roadways provide a balance between mobility and land access.

Figure 9: Functional Classification

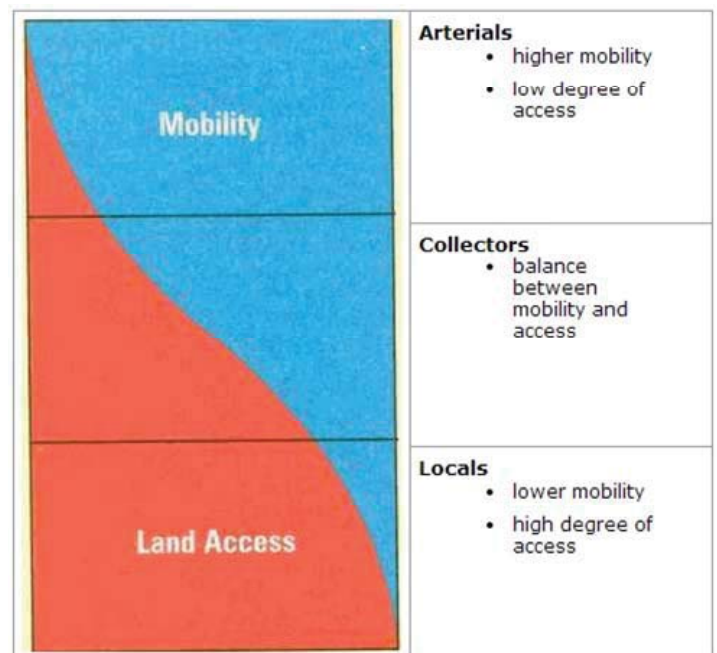
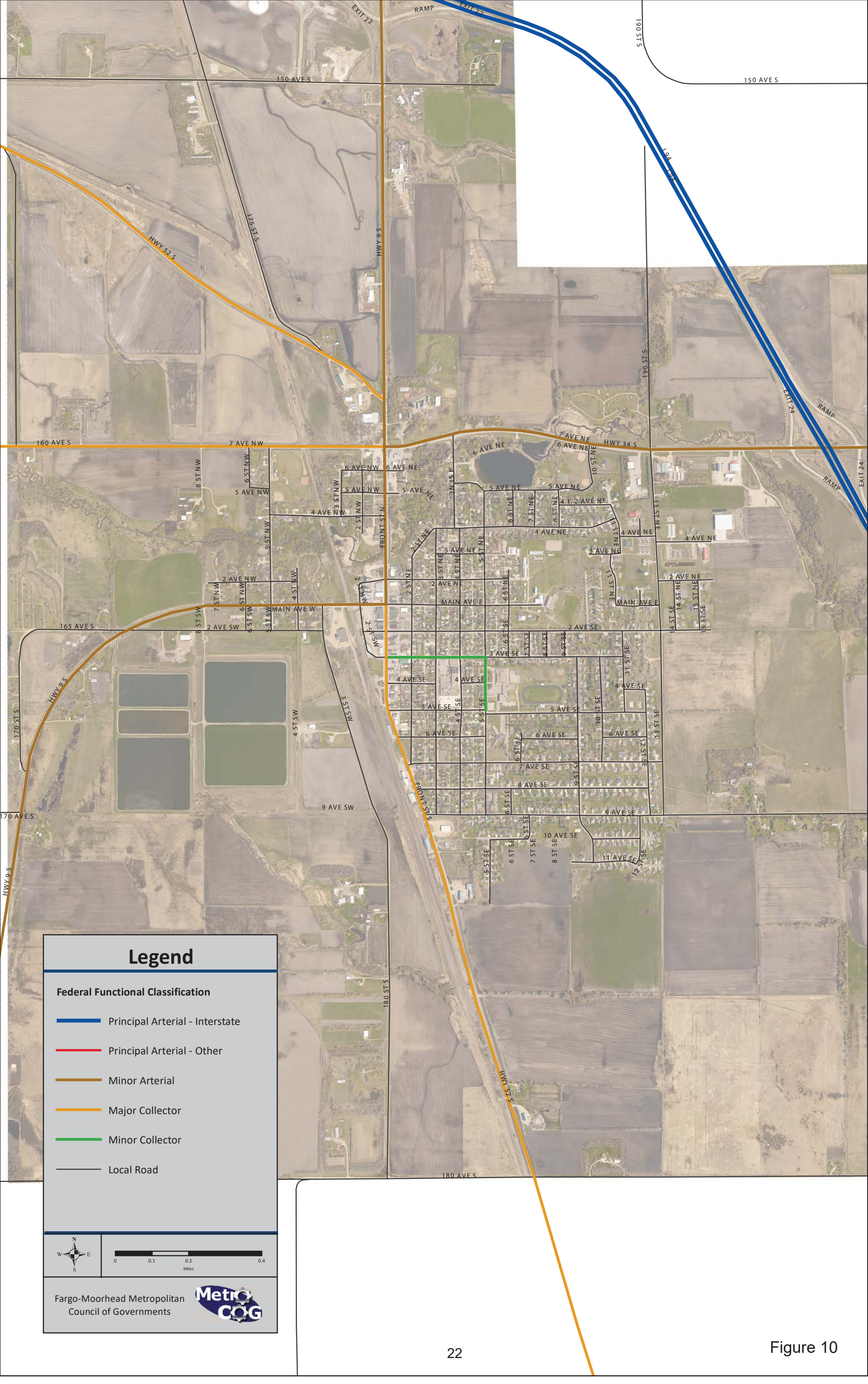


Figure 10 shows the official classification of roadways as per MnDOT. The functional classification of roadways is set by the State of Minnesota Department of Transportation (MnDOT). Jurisdictions do have the option of setting their own local functional classification for internal decision-making purposes. The City of Barnesville has identified what it believes to be an error in this classification that may have stemmed from the last FFC change in 2016. It will work with Metro COG to sort out this issue. Barnesville should identify an east/west and north/south corridor that can serve as a collector network. This collector system can be used to focus traffic control and give drivers a clear east/west and north/south route through town.



Legend

Federal Functional Classification

- Principal Arterial - Interstate
- Principal Arterial - Other
- Minor Arterial
- Major Collector
- Minor Collector
- Local Road

Fargo-Moorhead Metropolitan Council of Governments

Figure 10

Sidewalks

The beginning of this section provides some definitions that serve to better clarify various types of bicycle and pedestrian infrastructure.

Sidewalk - A sidewalk is a paved facility either four or five feet in width. Sidewalks are designed for the pedestrians in mind, providing off-street movement within a localized residential neighborhood or commercial district. In downtown areas, sidewalks may be significantly wider to accommodate direct storefront access and higher volumes of pedestrian traffic.

Shared-Use Path - A share-use path (commonly referred to as bike path or simply a path) is a paved facility between eight and ten feet in width. The facilities intended purpose is for both bicycle and pedestrian travel. These facilities are constructed in a larger regional type of system, which may connect localized residential areas with downtown, parks, or other commercial areas.

There is a marked difference between the development styles of older and newer parts of Barnesville. The grid network style of the central part of town was developed with sidewalks; on the contrary, the newer fringe areas of Barnesville were not developed with sidewalks.

There has been much controversy over the sidewalk issue in Barnesville. The key issues are centered around the need for sidewalks within the City, the requirement to install within new developments, and potential retrofitting of these types of facilities. Some within the community believe that sidewalk infrastructure is unnecessary in such a small community where traffic is calm. Others believe that these amenities are necessary in making bicycle and pedestrian travel both safe and reliable.

Figure 11 shows depicts an inventory of sidewalks and shared-use paths within Barnesville.

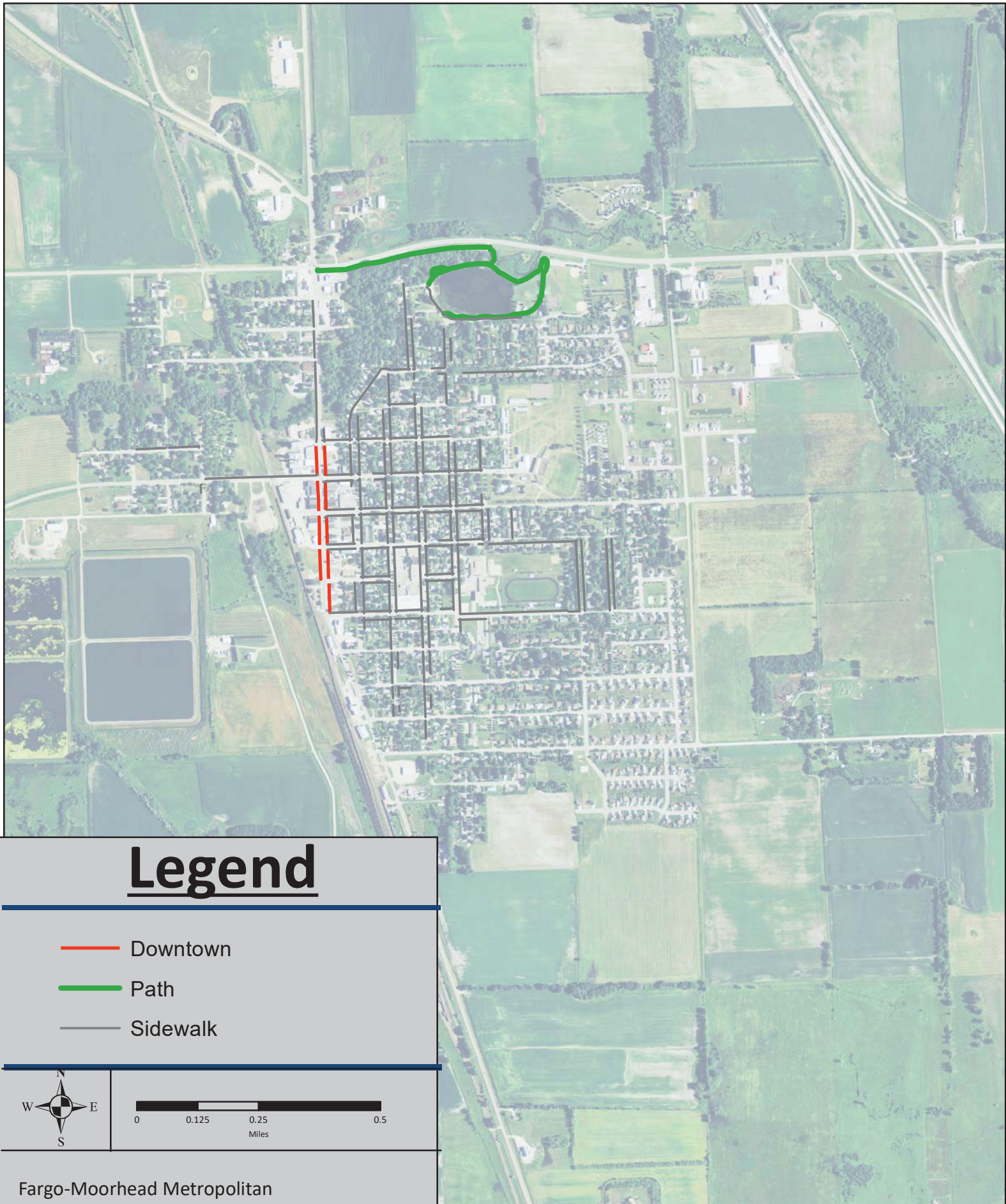
In 2016, the City of Barnesville completed a sidewalk retrofit on the south side of the high school using Safe Routes to School funding it was awarded. This sidewalk retrofit extended pedestrian facilities to a part of town that was previously without sidewalks.

This Plan will address the areas of town where retrofitting could make sense, development patterns, regulations on new development, and the larger bicycle and pedestrian system.

Bicycle and Pedestrian Infrastructure

The City of Barnesville is located along the 50-mile wide areas along the Adventure Cycling Association's Bicycle Route System, which names numerous proposed routes across the entire United States. It is also located in close proximity to the future planned route for the North Country Trail, which will traverse westward through Rothsay, MN, crossing the Red River of the North into North Dakota at Kent, ND.

Barnesville Sidewalk and Path Inventory



Ongoing projects

It is important to note that the City of Barnesville and the MnDOT have cooperated on addressing a pedestrian connection along MN 34 on the north side of town. This would connect Wagner Park with the baseball diamonds on the west side of Barnesville.

The City of Barnesville is in the process of providing a continuous 10 foot wide paved shared use path from Reed Field on the northwest end of town to the City's campground on the northeast side of town. The path will be located on the south side of Trunk Highway 34 and would connect Reed Field, amenities along Front Street, Blue Eagle Park, and the City's campground. The project has been broken into three phases:

Phase 1

Phase 1 connects Blue Eagle Lake to the amenities on Front Street. This half-mile long phase was constructed in 2016.

Phase 2

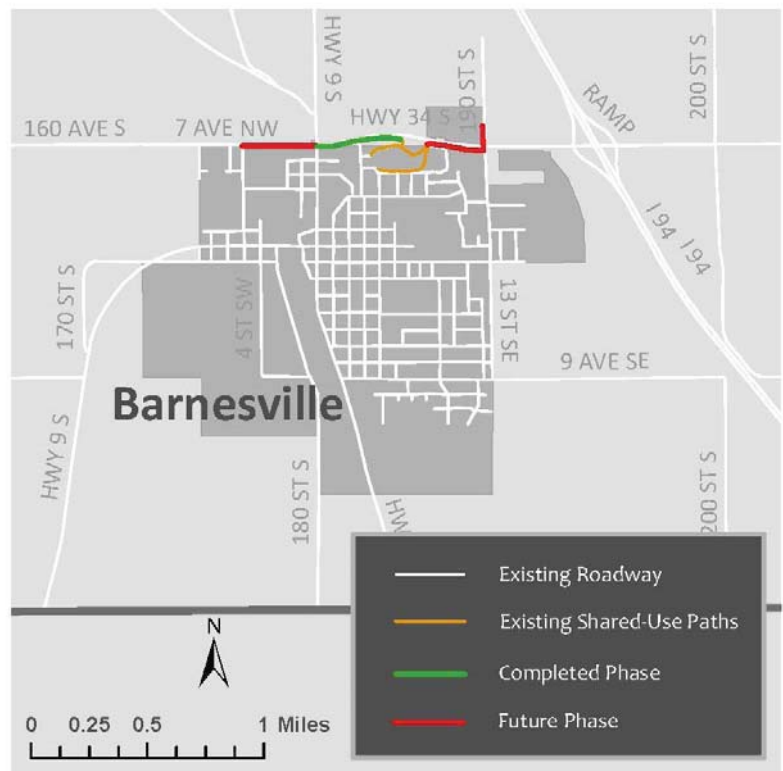
Phase 2 will connect Front Street to Reed Field *Figure 12: MN 34 Shared Use Path*

while providing a safe connection over the Otter Tail Valley Railroad line. The City of Barnesville is actively seeking funding for this Phase with Transportation Alternatives (TA) applications submitted in both 2016 and 2017. Phase 2 was not awarded funding with the 2016 TA submittal as well as the 2017 TA submittal. Barnesville will reapply for this project in 2018. If successful, the project will receive the funding in order to construct the project in 2023.

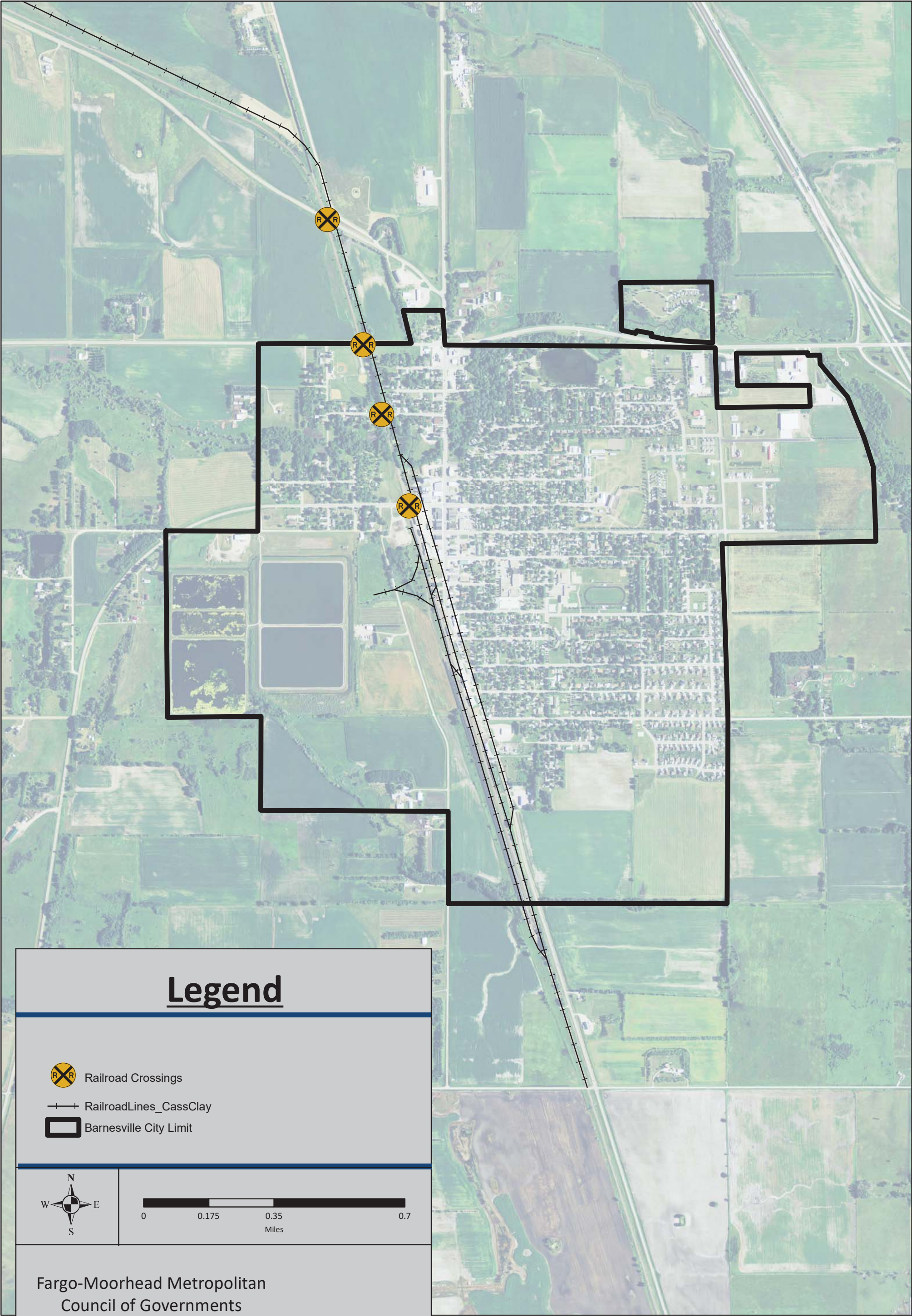
Phase 3

Phase 3 of the path will connect Blue Eagle Park to the City's campground on the north side of Trunk Highway 34. This would require a crossing of Highway 34. Once Phase 2 receives funding, the City of Barnesville will pursue Phase 3.

Figure 12 details the phases of this project.



Barnesville Railroad Lines and Crossings



Rail

The Otter Tail Valley Railroad (OTVR) runs along the western edge of Barnesville, separating only a small fraction of the city. The OTVR provides bulk shipping services to many of this region's grain elevators. Agassiz Valley Grain has a large elevator at the intersection of I-94 and MN 9. There is a small switching yard on the south side of Barnesville containing a number of tracks, of which the longest has the capacity to store approximately 87 cars. There are also a number of spur track providing service to local businesses. It is thought that the OTVR provides great opportunity for those companies that may need rail service to locate to Barnesville especially as freight rail has reemerged as a viable and affordable way to move goods.

Figure 13 shows the rail facilities in and around the City of Barnesville.

Barnesville Utility Infrastructure

The City of Barnesville provides a bevy of municipal services to its residents and businesses including cable TV, high-speed internet, electricity, telephone, water, and sewer. The most important utility services mentioned in a comprehensive plan are potable water supply and sanitary sewer system. The location of this municipal infrastructure makes expansion of the city possible. However, significant costs are involved in extending these utilities, including possible expansion of the wastewater processing or expansion of water treatment capabilities. Greater infrastructure capacity allows growth to occur.

Development should be planned in a manner to minimize infrastructure costs. An orderly progression of development rather than leaping to areas not contiguous to city boundaries results in infrastructure efficiency, minimizing the cost to utility users.

Sanitary Sewer

The majority of the sanitary sewer network in Barnesville predates 1973, which are primarily constructed from Vitrified Clay Pipe (VCP). This pipe material is made from a blend of clay and shale that has been subjected to high temperature creating a ceramic material. The life span of VCP is typically 50 to 60 years; whereas, the Polyvinyl Chloride (PVC) pipes typically used after 1980 can have a lifespan of 100 years. Even though VCP piping is one of the best materials for sanitary sewer systems, it is vulnerable to cracking, roots, and settlement.

Figure 14 shows the Barnesville's sanitary sewer network and the material the pipe is made from and each pipe is labeled based with its corresponding size. In 2017, KLJ Engineering went through an effort to map and create a database of attributes for the sanitary sewer network. **Figure 15** shows the sanitary sewer network from the 2004 Comprehensive Plan. It is important to maintain these types of maps and record when pipes are replaced in order to keep an accurate account of the age and material of infrastructure. Doing so can indicate when pipe segments may have outlived their useful life and may be in need of regular inspection.

Potable Water

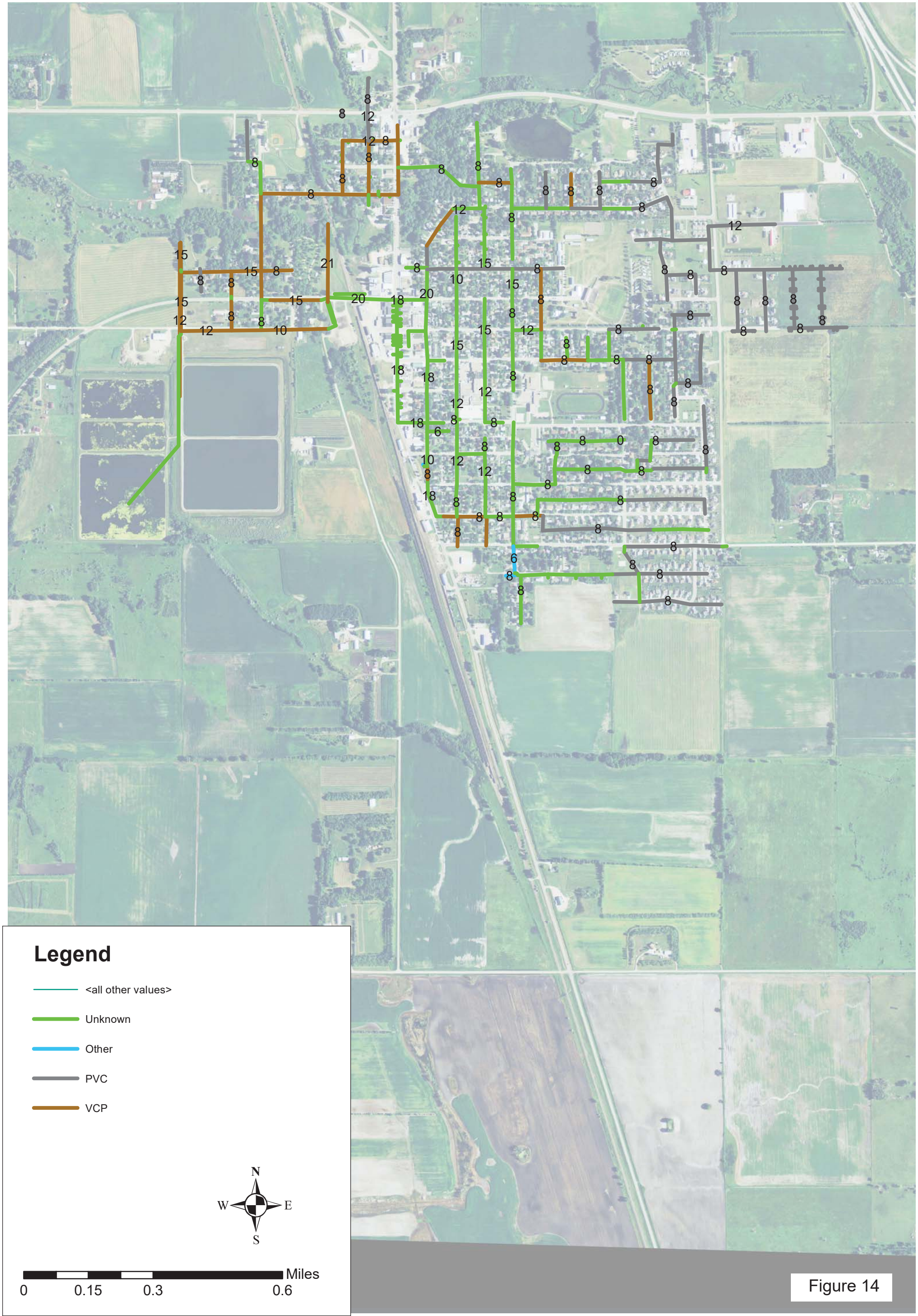
The City of Barnesville supplies potable water to its residents from three wells, which tap into groundwater from the Quat and Buried Artes aquifers. For planning purposes, it is estimated that a household uses approximately 250 gallons of water per day, but can range to more than 350 GPH depending upon the size of the household. **Figure 16** shows the Barnesville's potable water lines. **Figure 17** shows an inventory of water mains from the 2004 Comprehensive Plan. As mentioned above, this information is useful to retain as the comprehensive plan is updated. As Barnesville continues to grow, this information will be useful in determining if pipes will need to be resized as housing units are added.

Barnesville Municipal Electric Utility

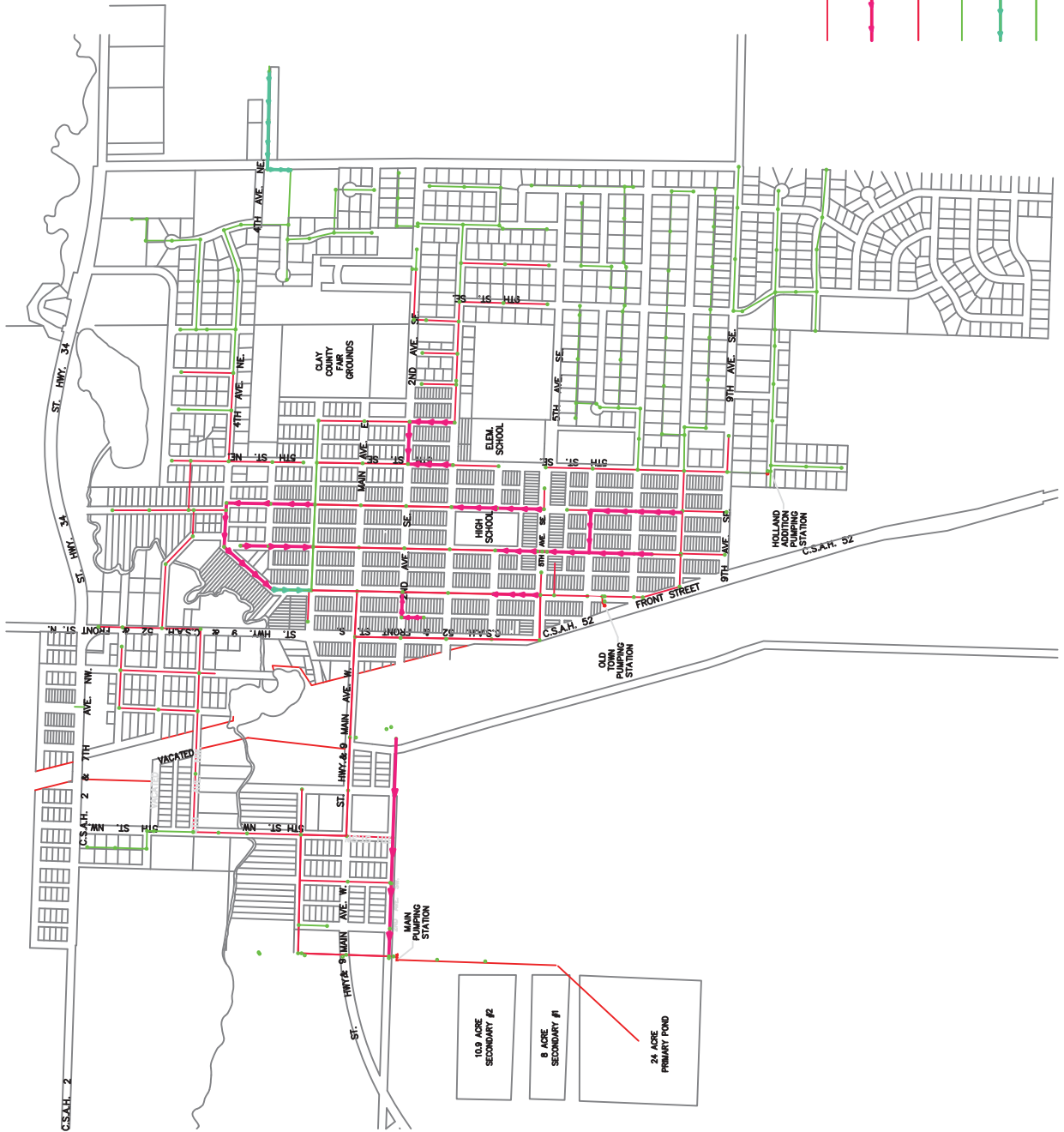
Barnesville Municipal Utilities was established in 1899. Today it provides electricity to approximately 1,050 residential customers and 125 commercial and industrial customers. Because the electric utility is locally owned, Barnesville residents and businesses enjoy lower wholesale power supply and transmission costs as compared to surrounding communities. Barnesville Municipal Utilities receives a

fixed monthly power allocation from the Western Area Power Administration (WAPA), which operates several hydroelectric plants along the Missouri River. In 2017, Barnesville is projected to receive about 48 percent of its power requirements from WAPA.

Barnesville Sanitary Sewer Network

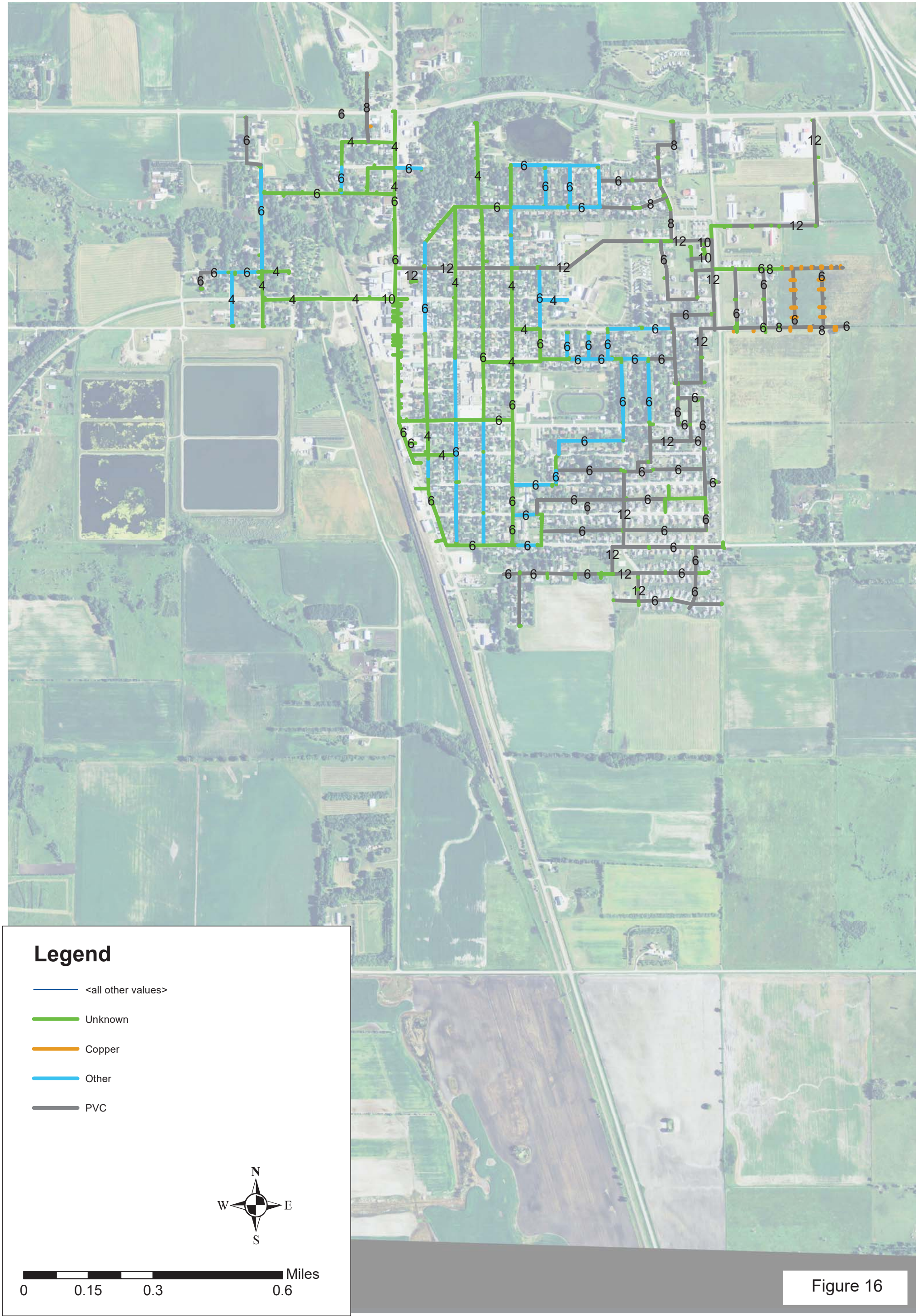


MAP 1 CITY OF BARNESVILLE SANITARY SEWER INVENTORY

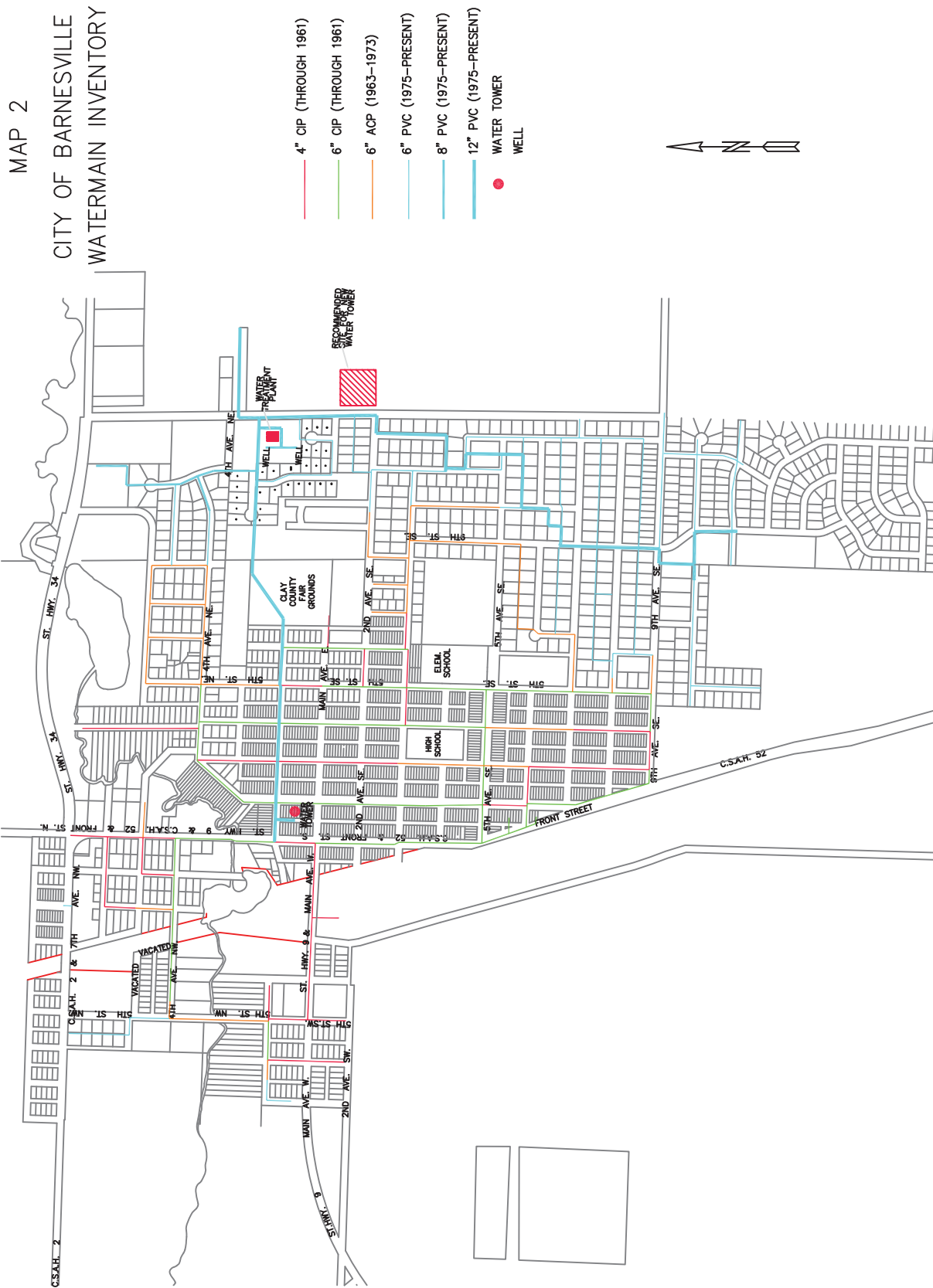


- 8" VCP
(Through 1973 +/-)
- 10" TO 12" VCP
(Through 1973 +/-)
- 15" TO 20" VCP
(Through 1973 +/-)
- 8" PVC (1973-PRESENT)
- 12" PVC (1973-PRESENT)
- 15" PVC (1973-PRESENT)

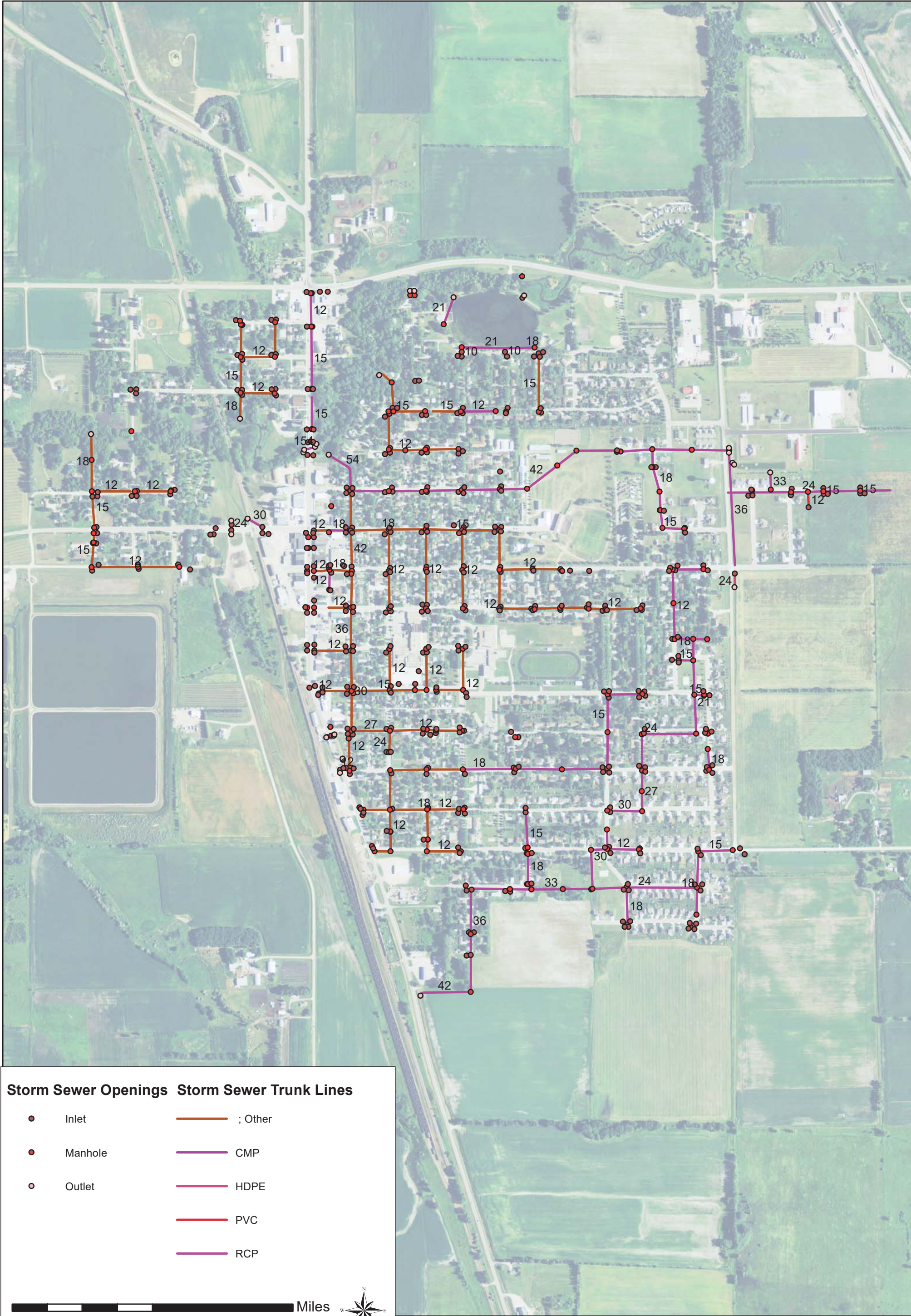
Barnesville Potable Water Lines



MAP 2



Storm Sewer Infrastructure



Storm Sewer

Storm sewer systems are designed to carry runoff during rainfall events. It is not designed to carry sewage or hazardous wastes. The runoff is carried in underground pipes or open ditches and discharged into local streams, rivers, and/or surface water bodies. The discharge from storm sewers is not treated, meaning what does into the storm drain is what is drained into local water bodies.

The storm sewer system is shown in **Figure 18**. There are alternative neighborhood designs that do not utilize storm sewer systems to carry runoff. Some communities are experimenting with Low Impact Development (LID) styles that uses ponds, ditches, and natural waterways to carry storm water. This development style is cheaper to develop than neighborhood with traditional storm sewer infrastructure. Future sections of this plan will address new development and associated infrastructure.

Natural Features

Barnesville is located on the shoreline of the former lake Agassiz and the soils are considerably less productive than those found closer to the Red River. The soils information presented in **Figure 19** comes from the Soil Survey of Clay County, which was conducted in the mid-1970s. This map was included in the 2004 Comprehensive Plan and is maintained in this version, as the regional soils remain constant. The map key can be found in **Appendix 2**. As is shown, most of the soils found in and around Barnesville are loamy in nature. This soil type is typical of a rolling topography, which provides differing soil characteristics due to moisture retention in depression areas. Given current building technologies, most of the soils in and around Barnesville will lend themselves to development. However, there are certain areas around Barnesville that have extremely high water tables. This makes development of the property for residential purposes unlikely due to the necessity to pour foundations below the frost line. Some slab on grade building styles may be able to be built in these areas with some engineering investigation. Slab on grade buildings are indicative of commercial or medium/high density residential land uses.

As is shown on **Figure 18**, areas along Whiskey Creek as well areas east of Front Street and south of Main Ave have the potential for flooding. It is important for the City to be cognizant of the State of Minnesota Wetlands Law, which has the following purposes:

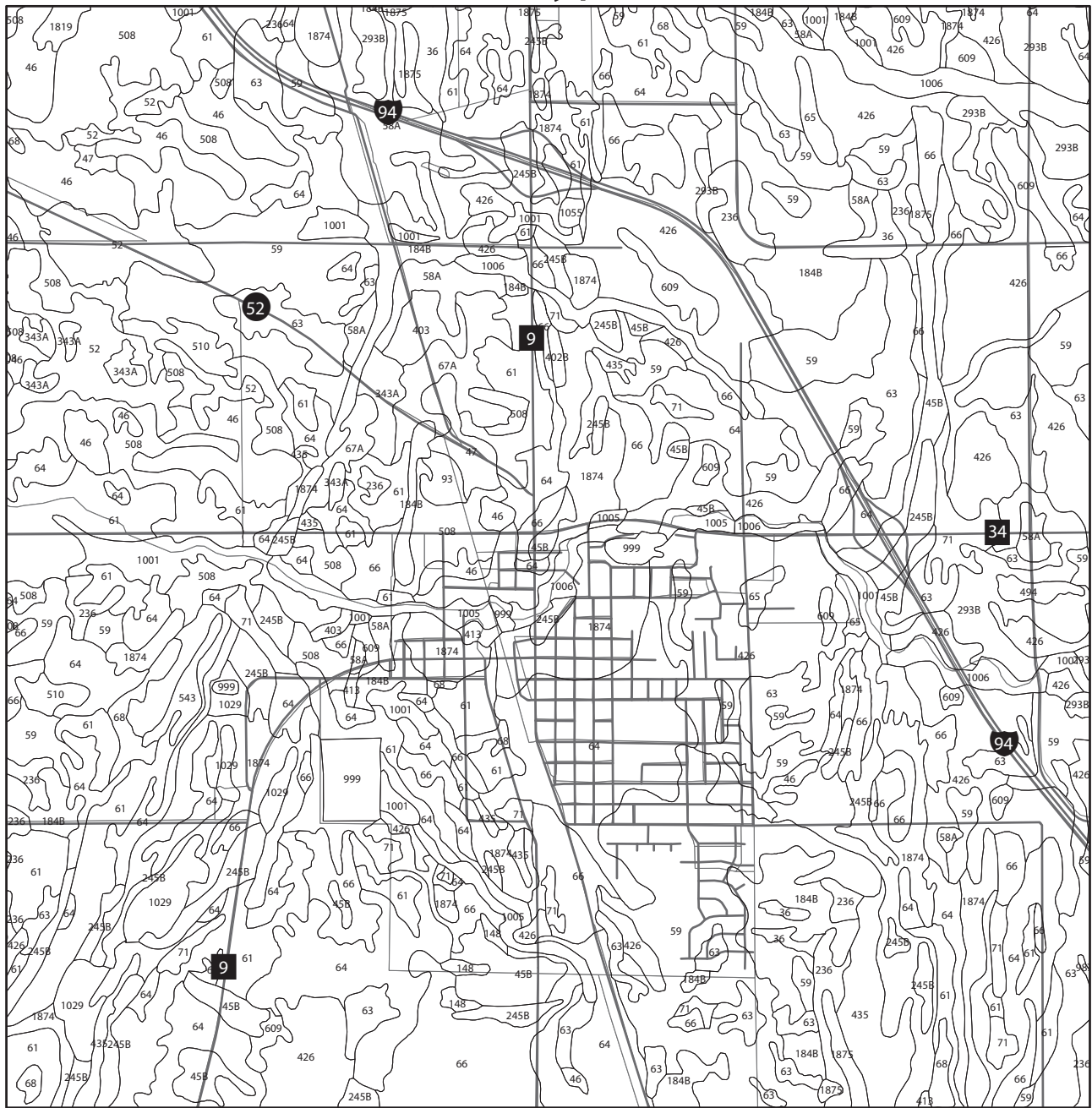
- *Achieving no net loss in the quantity, quality and biological diversity of Minnesota's existing wetlands;*
- *Increasing the quantity, quality and biological diversity of Minnesota's wetlands by restoring or enhancing diminished or drained wetlands;*
- *Avoiding direct or indirect impacts from activities that destroy or diminish the quantity, quality or biological diversity of wetlands, and;*
- *Replacing wetlands values where avoidance of activities is not feasible and prudent.*

Figure 20 illustrates the east to west moving wet areas that run from I-94 to west of the Ottertail Valley Railroad tracks. The general topography of Barnesville is a product of Lake Agassiz and there is generally a rise from west to east in the areas around Barnesville. A mile half west of Barnesville elevations are near 960 feet. A similar distance to the east contours near 1,100. The average slope in and around Barnesville

is about 35 feet per mile. This east to west slope is played out on natural drainage patterns, as well. Most of the perennial and intermittent waterways have an east-west alignment.

Drinking Water Supply Management Area (DWSMA) indicates those areas where contaminants have the potential to be carried by precipitation into to the underground water source of the municipal wells. The total area of the DWSMA runs approximately two miles to the north and east of the city, covering Sections 21, 28, and 29 of Humboldt Township. Certain land uses that could carry the potential for contaminant release should not be located in these areas.

Figure 19 Soil Types



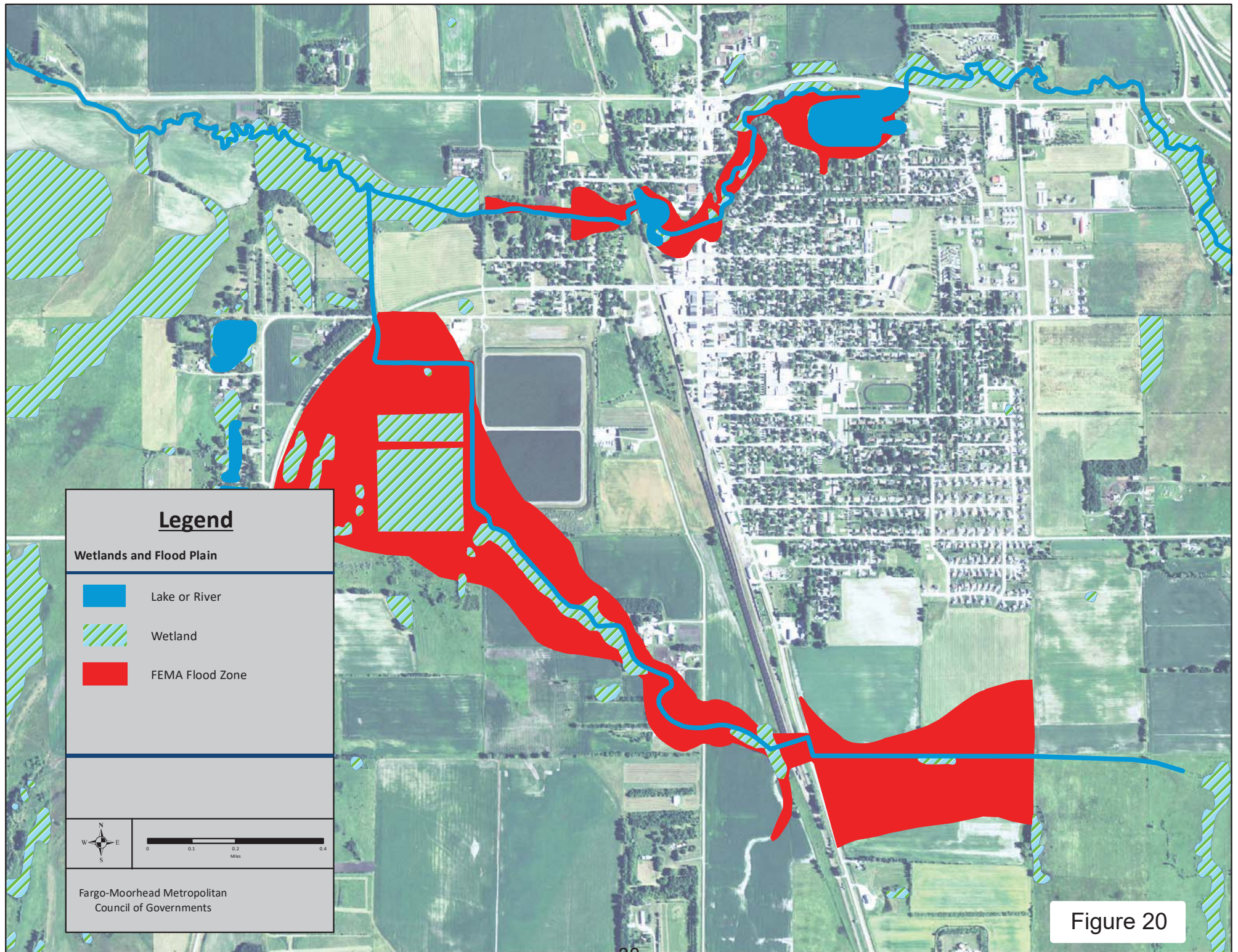


Figure 20

Goals & Objectives

The Study Review Committee (SRC) was instrumental in the development of the goals and objectives listed in this section. The SRC underwent an exercise to develop a strategic vision for the City of Barnesville. This vision will guide the decision making process of the City and give a clear path to follow. Each goal, objective, and policy was crafted by local leaders and citizens from what they thought was important for the health and wellbeing of the City to address where Barnesville is going, what the needs of the community are, and key priorities that would help to launch towards a certain outcome.

For some, the differences between goals, objectives and policies are not clear. Each is defined below:

- Goals – are general statements of desired outcomes, of which planned effort is directed.
- Objective – are more specific and are a subset of goals, providing measurable strategies toward specific measures that would accomplish the goal.
- Policies – are operational actions that a community will undertake to meet the goals and objectives. These are detailed actions that need to be taken and often address specific obstacles to implementing a project.

As a result, these “big ideas” were developed. Objectives and policies were placed into three categories: short term, medium term, and long term. Short term is defined as addressed within 1-5 years, medium term being 5-10 years, and long term being 10-20 years. In this way, the SRC has essentially prioritized when each item should be addressed.

Goal 1: A connected trail network, promoting healthy living and comradery within the community.

Short Term Objectives & Policies

- To provide bicycle and pedestrian facilities along MN 34
 - Continue to work with MnDOT on extending the bike path adjacent to MN 34
 - Annually apply for Transportation Alternatives funding through MnDOT on an annual basis
- To provide bicycle and pedestrian facilities along MN 9
 - Continue to work with MnDOT on the reconstruction of MN 9 through Barnesville
 - Determine facilities that the City of Barnesville would like added through the reconstruction project
 - Investigate on-street bicycle options for MN 9 through the core of Barnesville

Medium Term Objectives & Policies

- To create a bicycle and pedestrian network
 - Identify corridors where off-street bicycle paths are feasible
 - Identify corridors where on-street bicycle facilities would allow Barnesville to connect to other facilities
 - Connect Barnesville parks with on-street or off-street bicycle facilities

- Investigate where path lighting can be installed
- Investigate and apply for funding opportunities to extend bike paths
- Examine the need for bicycle friendly facilities such as bike racks, especially on Front Street
- Ensure all new developments are platted with off-street bicycle paths running through them separate from sidewalks
- Develop a comprehensive bicycle and pedestrian project list of all projects needed to make a trail network including cost
- Continue to conduct Safe Routes to School audits and apply for SRTS funding opportunities through MnDOT
- To create a healthy living atmosphere in Barnesville
 - Host City events for the bicycle and pedestrian community
 - Create City sponsored events for sporting activities utilizing Barnesville's parks
 - Encourage businesses within Barnesville to conduct outdoor events, as well as allowing festivities to occur on City streets
 - Invite urban agriculture groups to provide gardening workshops
 - Continue to support for the community garden concept that was started in 2017

Long Range Objectives & Policies

- To extend a connected bicycle and pedestrian trail network to all parts of Barnesville
 - Construct off-street path facility retrofits where determined necessary
 - Place path lighting on bicycle facilities that warrant such an amenity
 - Investigate working with Clay and Ottertail counties on the possibility of extending a marked route to the North Country Trail
 - Mark on-street bicycle network with system of pavement markings and signs

Goal 2: A framework of development oriented to create positive first impressions for citizens and visitors to Barnesville.

Short Term Objectives & Policies

- To identify "gateway" areas that provide a first impression when entering Barnesville
 - Determine the extent to which gateway areas should be extended
 - Determine the design criteria for these gateway areas
 - Consider the annexation of areas that Barnesville may want to control
 - Work with the Joint Powers Authority on the designation and approval of land uses in gateway areas
- To research methods available to designate "gateway" areas
 - Research Minnesota specific regulations on Overlay Zones and other zoning techniques

Medium Term Objectives & Policies

- To minimize unsightly/blighted land uses in “gateway” areas
 - Research ways to negate land uses in gateway areas that do not portray a favorable image of the City of Barnesville
 - Adjust City ordinances to provide penalties for the continuation of land uses that violate City ordinances
- To update Barnesville’s zoning ordinance and JPA ordinance
 - Include zoning techniques that enhance gateway areas
 - Detail design criteria within the zoning ordinance

Long Range Objectives & Policies

- To Develop land uses and buildings that accentuate the character of the community

Goal 3: Lands within Barnesville developed to create a bustling community with a high quality of life that places an emphasis on technology.

Short Term Objectives & Policies

- To explore the need for additional programmed and non-programmed park space
 - Conduct a study documenting the use of park facilities in Barnesville
 - Examine current park trends such as pocket, pop-up, or parklet parks, and their application within Barnesville
- To integrate technology into community features
 - Investigate the feasibility of providing community wifi hotspots
 - Integrate community polling and engagement functionality to the City of Barnesville website
 - Investigate methods to push community messages directly to electronic devices
 - Consider developing community electronic kiosks with community information, advertisements, and wayfinding functionality

Medium Term Objectives & Policies

- To construct a multi-purpose building (recreation center) to be available for public use
 - Determine the size and scope of the building that will meet the community’s demand
 - Determine the amenities that the community desires
 - Explore funding mechanisms to pay for the facility
 - Examine where best to locate a future community center

Long Range Objectives & Policies

- To attract national retailers
 - Engage representatives from medium box retailers to identify ways Barnesville can attract retail opportunities
- To incorporate park space into new developments
 - Make sure park set-asides in the subdivision ordinance are adequate for Barnesville's needs
 - Ensure all neighborhoods have access to parks and/or open space that able to be accessed by walking or biking

Goal 4: Housing options within Barnesville that are inclusive and diverse in order to spur population growth within the City.

Short Term Objectives & Policies

- To develop a diverse mix of housing types
 - Review city zoning ordinances to ensure ability to construct diverse housing unit types
 - Conduct a market analysis of the demand for townhome and apartment living options
 - Integrate a mixed-use philosophy into new developments
 - Work with the Joint Powers Authority to develop specific small area plans delineating specific uses and road networks within growth areas

Medium Term Objectives & Policies

- To fill vacant residential lots within current Barnesville city limits
 - Identify those parcels where infill development could occur, detailing the desired use of the parcel

Long Range Objectives & Policies

- To expand the population of Barnesville to 5,000 people
 - Work with the building community to construct new houses
 - Actively market the Barnesville community in nearby areas such as Fargo/Moorhead, Wahpeton, and Fergus Falls through outreach and advertisement into those cities
 - Construct different housing types to cater to more diverse living options

Goal 5: Infrastructure within Barnesville that is well maintained, providing reliable, sustainable, and low service costs creating value for residents.

Short Term Objectives & Policies

- To address 13th Street SE dust control in the interim to the roadway being paved
 - Investigate the costs of dust suppression methods
 - Analyze cost vs benefit of dust suppression methods
 - Investigate a cost-sharing method for providing dust control to adjacent residents
- To pave 13th Street SE from 2nd Avenue SE to 9th Avenue SE
 - Study the issues involved with the paving of 13th Street SE
 - Evaluate the future alignment of the roadway in regards to future extension of 13th Street SE to the south
- To prepare a long-term infrastructure replacement plan
 - Track the age and condition of Barnesville's infrastructure
 - Analyze available infrastructure funding versus infrastructure maintenance needs
 - Create a long-term replacement schedule for infrastructure

Medium Term Objectives & Policies

- To update aged infrastructure in the older parts of Barnesville
 - Annually repair city infrastructure according to the infrastructure replacement plan
 - Take in account the future sizing needs when repairing/replacing infrastructure
- To extend infrastructure (sanitary sewer and potable water) to the MN 34/I-94 interchange
 - Conduct a study detailing issues and costs associated with extending infrastructure
 - Determine the most feasible location for infrastructure to be extended taking into account community goals, infrastructure cost, and opportunities for future development to connect

Long Range Objectives & Policies

- To connect 10th Avenue SE or 11th Avenue SE to Highway 52
 - Ensure ROW is preserved to make roadway connection through the platting process
 - Evaluate desired roadway network pattern and access locations
 - Formally study the feasibility of extension of a roadway connection in this area

Goals 6: Encouragement of local spending, both private and public, for the purpose of place-making, creating job opportunities, business growth, and population retention and attraction.

Short Term Objectives & Policies

- To attract job creators

- Assess the commercial market segments that they would like to attract to locate in Barnesville
 - Analyze the requirements for such companies to locate to Barnesville
 - Work with City leadership on incentivization techniques to attract businesses
 - The City of Barnesville should continue business development efforts in particular, working with existing businesses to stay profitable
- To build a local workforce capable of filling the needs of the business sector
 - Partner with the School District to build career prospects of high school students
 - Create a job/intern placement program for students to work at local businesses to gain career skills
- To develop existing vacant buildings within their downtown core
 - Market underutilized buildings along Front Street
 - Reach out to non-traditional entities or business types to fill vacant buildings (brewer and distiller guilds, artist collectives, architectural reclamation, or other groups not able to find space in the Fargo Moorhead Region)
 - Explore the feasibility of apartment renovations for multiple floor buildings

Medium Term Objectives & Policies

- To develop a hotel at the MN 34 and I 94 Interchange
 - Continue to reach out to the hotel development community
 - Research the feasibility of providing public funding to create a community water park attached to a hotel (including identifying funding)

Analysis & Recommendations

Future Land Use

The City of Barnesville, Humboldt Township, and Barnesville Township have entered into a Joint Powers Agreement (JPA), which establishes a framework for cooperative land use planning in areas adjacent to or within close proximity to Barnesville city limits. The overarching intent of the JPA is to:

1. Establish a guide for future development of this area;
2. Implement zoning policies and applicable regulations pertaining to this area;
3. Identify appropriate/permissible uses and densities for transitional areas; and
4. Establish an entity with overlapping interests to oversee permitting, development, and subdivision proposals.

In 2012, these entities updated the comprehensive plan that governs future land uses within the JPA area. The document specifically delineates future land uses. Since much of the area surrounding Barnesville is governed by the JPA, future land uses will not be delineated as part of the City of Barnesville's Comprehensive Plan. Rather, this section will specify how these areas should develop as well as some philosophies to abide by as these areas develop.

Housing Types

There are many different types of residential housing units. Dwelling units are typically described with a municipality's zoning ordinance according to their density, which range from rural residential to high density. The following descriptions of residential housing types will provide examples of the different types of housing. These can be employed to diversify the housing base of a community while attracting a more diverse demographic.

Single-Family Home

For clarification sake, a single-family home is what is commonly seen throughout Barnesville. This type of housing is meant for one family and comes in a variety of styles. **Figure 21** shows a single-family home in Barnesville. Lot sizes generally range between 6,000-7,500 square feet. Occasionally, older homes are converted into multiple-family rental units. However, this is not desirable as it tends lead towards the degradation of the property.

Figure 21: Single-Family Home Example



Twin-Home

A twin-home is defined as a structure where two dwelling units are built that share a common wall. These types of housing units can typically be considered either low or medium density, depending on an individual municipality's zoning ordinance. These are extremely common in the Fargo-Moorhead Area. There are a few examples of twin-homes in Barnesville, such as on 2nd Avenue NE east of 13th Street SE. **Figure 22** is a typical example of a twin-home.

Figure 22: Twin-Home Example



Townhome

Townhomes, as exemplified in **Figure 23**, are extremely similar to twin-homes. The main difference is that townhomes typically come in clusters of four, six, or even eight units. Townhomes come in a wide variety of shapes and sizes. Twin homes and Townhomes can be platted in different ways, either splitting out individual lots or holding property in common. It is important to distinguish the responsibilities of the property owners, developers, and any association as part of a development agreement prior to approving the subdivision of the property. Both twin-homes and townhomes can be either owner or renter occupied. Townhomes are usually considered medium-density residential units.

Figure 23: Townhome Example



Row House

A row house is not dissimilar from a townhome, rather is it a difference in application. Row houses were common during the industrial revolution, being located adjacent to industry. They provided a low-cost housing option for factory workers. Today, row houses have made a resurgence in popularity, both in the remodeling of existing row house stock and in new construction.

Figure 24: Fargo Row House Example



Row houses are a popular option for young adults and are generally located near downtown areas. Row houses can be renter or owner-occupied.

Medium-Density Apartments

Apartment density is defined by the number of dwelling units contained within the individual complexes. Medium-density apartment complexes are generally defined as having less than 12 dwelling units. The Creamery Association building in Barnesville is a prime example of medium density apartments. **Figure 25** provides an example of a typical medium-density apartment.

In providing a diverse mix of housing options, medium-density apartment complexes are a good option for Barnesville to implement on a limited basis. There may not be the need for many housing units of this type. The 2010 Housing Study indicated that there was adequate demand for an eight-unit complex. As Barnesville grows, city leadership should evaluate such diverse housing options as the demographic profile of new residents dictates.

Figure 25: Medium-Density Apartment Complex Example



High-Density Apartments

Apartment complexes with more than 12 dwelling units are considered high-density. Some complexes can have densities up to 30 dwelling units an acre, with more than a hundred apartment units in one building. In Fargo, many large apartment complexes have been constructed in the past five years. However, these type of apartment complexes are not suitable for a rural setting such as Barnesville. Even the development of one such complex could provide for many years of growth at current growth rates. **Figure 26** provides an example of a high-density apartment complex typically found in urban areas.

Figure 26: High-Density Apartment Complex Example



Figure 27: Williston, ND Mixed-Use Housing Example



Housing Options/Mix

Higher density housing options such as condominiums, townhomes, or apartments are a significantly small percentage of dwelling units in Barnesville. The largest medium density uses are senior housing complexes; however, there are a number of other renter and owner-occupied medium density dwelling units in Barnesville. Most rural communities have a similar housing composition. In Barnesville's case, it is likely due to the relatively affordable price of single-family houses compared to nearby markets.

There is a shortage of types of dwelling units that cater to segments of the population that either cannot afford, cannot maintain, or do not want to purchase a single-family house. One prime demographic segment that Barnesville wishes to attract/retain are people between the ages of 18-30. This age cohort may prefer to rent or purchase a smaller dwelling unit with less maintenance. In developing various housing types, Barnesville can better accommodate those looking for other housing options and be inclusive to various needs.

Barnesville should consider diversifying its housing mixture as it expands. This could attract a new population segment to the community, minimize new lands the City would have to develop, and provide increased revenues for municipal infrastructure. These higher density housing options should be strategically placed, such as around schools, downtown, or transitioning from more intense land uses. Every new development that occurs in Barnesville should contain a mixture of densities.

Figure 28: Fargo Mixed-Use Housing Density Example

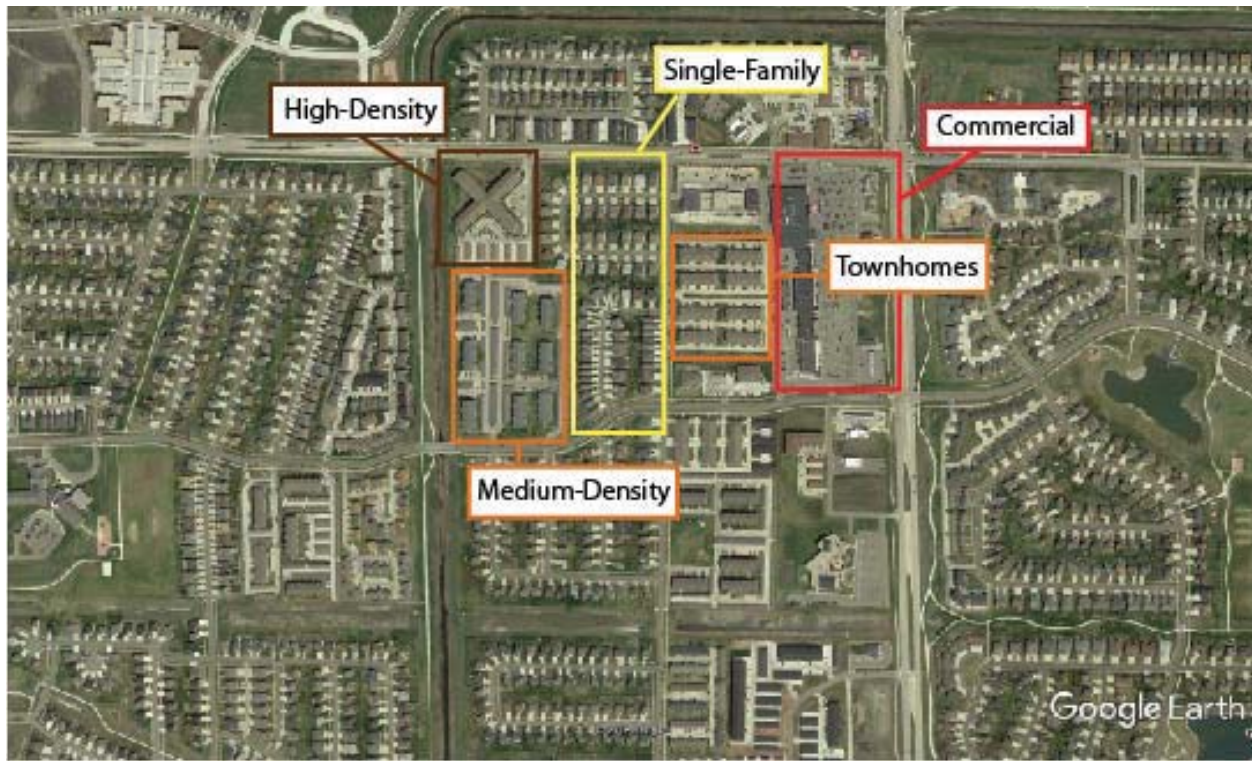


Figure 27 represents a housing development in Williston, ND. The large development was platted with various housing densities, such as single-family, twin-homes, row houses, medium-density apartments, and high-density apartments. Developments do not need to be at this scale in order to incorporate a mix of densities, however. **Figure 28** represents the Osgood neighborhood in Fargo, ND. This area slowly developed with various types of housing densities. As you can see, higher density housing uses are generally located along the arterial roadways (40th Avenue S – top of figure).

Land Use Separation

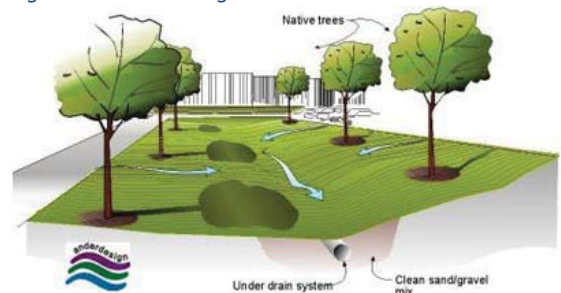
Barnesville's primary growth area is also adjacent to its commercial park. Locating such incompatible uses adjacent to one another can sometimes lead to conflicts such as invasive odors, noises, or sounds. When locating future

Figure 29: Berm Design



residential, commercial, and industrial land uses, city leadership should consider the compatibility of the adjacent uses and ways in which impacts can be mitigated.

Figure 30: Swale Design



Buffering

Buffering is a technique often utilized when incompatible uses abut one another. Buffering can take many forms, including fences, walls, swales, berms, vegetation, and even land uses. The application of these techniques help to minimize the impacts of higher intensity land uses on lesser intensive uses. They can also serve to provide community character.

Land Use Transitions

Land use transitions can also act as a buffer.

Transitions are accomplished by locating higher density residential around commercial uses. Industrial land uses tend to be extremely intense and required to be on large parcels, separating them from adjacent uses. Commercial uses, instead of residential land uses, can be used to buffer industrial uses.

This methodology will be applicable when areas north of MN 34 and along MN 9 are developed. These areas will likely have a commercial land use element that could include a gas station, hotel, and or strip commercial buildings. **Figure 31** provides an example how land uses can be transitioned from this strip commercial to residential. These transitions should also include some sort of buffering.

Figure 31: Land Use Transition Example



Utilities

One of Barnesville's goals is to develop commercial areas around either of the I-94 interchanges. To accomplish this goal, the City of Barnesville will need to extend its sanitary sewer system to these areas as well as potable water line. Unlike potable water, extending sanitary sewer trunk lines is an extremely complicated and expensive task to undertake.

The extension of water and sewer utilities to each of the interstate exits was studied in 2015. The *Barnesville Infrastructure Expansion for Hotel on Interstate 94* specifically details four proposed design options for water and sewer expansion, the necessary permitting needed, and the costs associated with each extension option. Water and sewer service to the MN 9 interchange with Interstate 94 would cost approximately 1.6 million dollars whereas the same service to the MN 34 interchange with Interstate 94 would cost approximately 1 million dollars.

City leadership must decide on the right time to develop such an extension and the mechanism to pay for the improvement. City leaders must weigh the cost and benefits of extending the trunk sewer before development is platted, and whether their risk adversity in paying for this extension prior to a proposed development plat may hinder economic development goals.

Development

Currently the City of Barnesville is the sole developer operating in the community. This was not always the case, however. The City of Barnesville is projected to grow as the Fargo Moorhead Region grows. Barnesville has a much lower cost of living than that of the urban core of the Fargo-Moorhead metropolitan area. Housing prices are significantly less, especially when compared to Fargo's housing market. Barnesville also is strategically located between many destination areas such as the Lake Region and is conveniently located near Interstate 94.

City staff should explore the development community located in Fergus Falls, FM Region, and other surrounding areas to see what developers are looking for. They should also strategize as to what type of housing they would like to see developed and then contact developers with experience in that specific area. The City of Barnesville could also still act as the developer, but still needs to seek out builders to complete its housing diversity vision. City leaders and City staff must be proactive in seeking out individuals within the development/building industry and gain knowledge from those individuals.

Gateway Enhancement

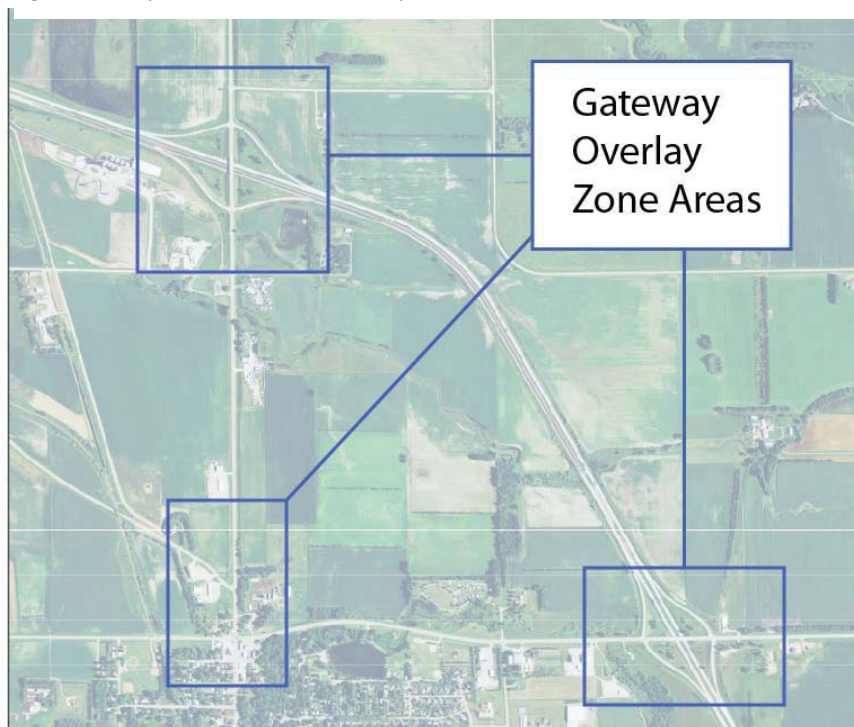
The majority of traffic that enters Barnesville comes from MN 9 or MN 34 as they intersect with I-94. These areas represent the community by being the first thing people, both residents and visitors, see upon entering the community. The Study Review Committee expressed concern that these areas do not represent the vision of Barnesville as a community.

Figure 32: Proposed Barnesville Gateway Areas

Figure 32 details those areas thought as gateways into Barnesville. These areas are identified as key points where attention should be focused on for enhancement.

Enhancement can take many forms, from the type of land uses desired in the location, juxtaposition of buildings, types of structures, and aesthetics of the buildings themselves. The City of Barnesville would like to scrutinize the types of land uses that occur in these

areas as well as the look of the buildings, including materials that are used. They would like these areas to portray as positive image of the community and draw people to the core of the city.



One way to successfully achieve this goal is to utilize an overlay zoning tool. This zoning district would in essence float over a particular area that could be delineated by city staff. The overlay zone would contain additional restrictions and design criteria requirements placed on the underlying zones. This tool is highly utilized in the City of Fargo. However, it is important that the City of Barnesville establish these criteria in concert with local businesses, residents, developers, and local leaders in order to not be overly restrictive, which could hinder business attraction efforts.

This tool would also need to be added to the zoning ordinance and added to the development review process. The overlay zones could differ from one another or could have the same requirements. The City will have to determine what kind of design guidelines, land uses, and the like should occur within these overlay zone areas. They will also have to determine the enforcement techniques they would like to employ. After adding this zoning tool, city staff will have to perform a zoning change in order to apply the overlay district.

Transportation

As primarily a rural community, Barnesville does not have major traffic volumes necessitating capacity expansion projects like Moorhead or Fargo. However, maintenance of the roadways within its jurisdiction are of high importance. Barnesville is a bedroom community, and as such, well-maintained roadways are vital to its citizens' quality of life. With many of the roadways running through Barnesville falling under the jurisdiction of the Minnesota Department of Transportation (MnDOT), it is important to work with this agency in coordinating maintenance efforts within the Barnesville area.

Upcoming Construction Projects

As the MPO for the greater Fargo-Moorhead metropolitan area, Metro COG tracks and reports upon significant transportation improvement projects occurring within the region in the Transportation Improvement Program. This Program, which is updated annually, identifies one project which will have a significant effect on the City of Barnesville. In 2023, MnDOT has programmed the reconstruction of MN 9, which runs through Barnesville. The City of Barnesville has a distinct opportunity to be a part of the project scoping discussion. City leadership has determined that the downtown streetscape improvements on Front Street do not need to be extended any further north than they are currently (stopping at Main Ave). However, MnDOT will improve all of the facilities within the right-of-way up to ADA standards. This could include the sidewalk and path facilities that are currently in place on the west side of the road.

This reconstruction also provides the City of Barnesville the opportunity to participate with MnDOT in a discussion of any bicycle and pedestrian improvements made within the cross-section. This could include the addition of bike lanes, a wide shoulder, or the addition of sharrows. City leaders should continue to work with MnDOT in order to cooperatively arrive at a project that benefits both parties.

Roadway Connectivity

In Barnesville, the grid network is commonly interrupted and, in newer parts of the community, roadways often do not line up with one another on either side of a main artery. As Barnesville continues to grow, it is important that newly built subdivisions connect to the established roadway network in a meaningful way. That is, roadways should line up with one another, and the internal roadway networks should be done in a logical fashion.

Developments should be laid out in order to maximize connectivity and provide a consistent design of blocks that are of similar size. Where developments are located adjacent to agricultural land that may one day develop, roadways should be stubbed-in to ensure the logical extension of the roadway network. This practice has been applied in some of the newer development; however, in others it has not, to the detriment of connectivity between developments. Cul-de-sacs should be discouraged as they detract from the connectivity of the roadway network.

The City of Barnesville should emphasize the continuation of certain routes that provide cross-city connection. Future Development should not impede the logical extension of these roadways. Such roadways would be 2nd Avenue SE and 13th Street SE. These two roadways represent the only routes that connect go entirely through Barnesville uninterrupted.

Figure 33 shows a few examples of roadway connectivity in Barnesville. The red arrows represent areas where roadway connectivity has not been maintained in adjacent developments. The green arrows represent where connectivity has been maintained. Not all roadways need to connect; however, maintaining connectivity assists in managing access points, making safer intersection movements, and creating efficiency in moving about the city.

Figure 33: Roadway Connectivity

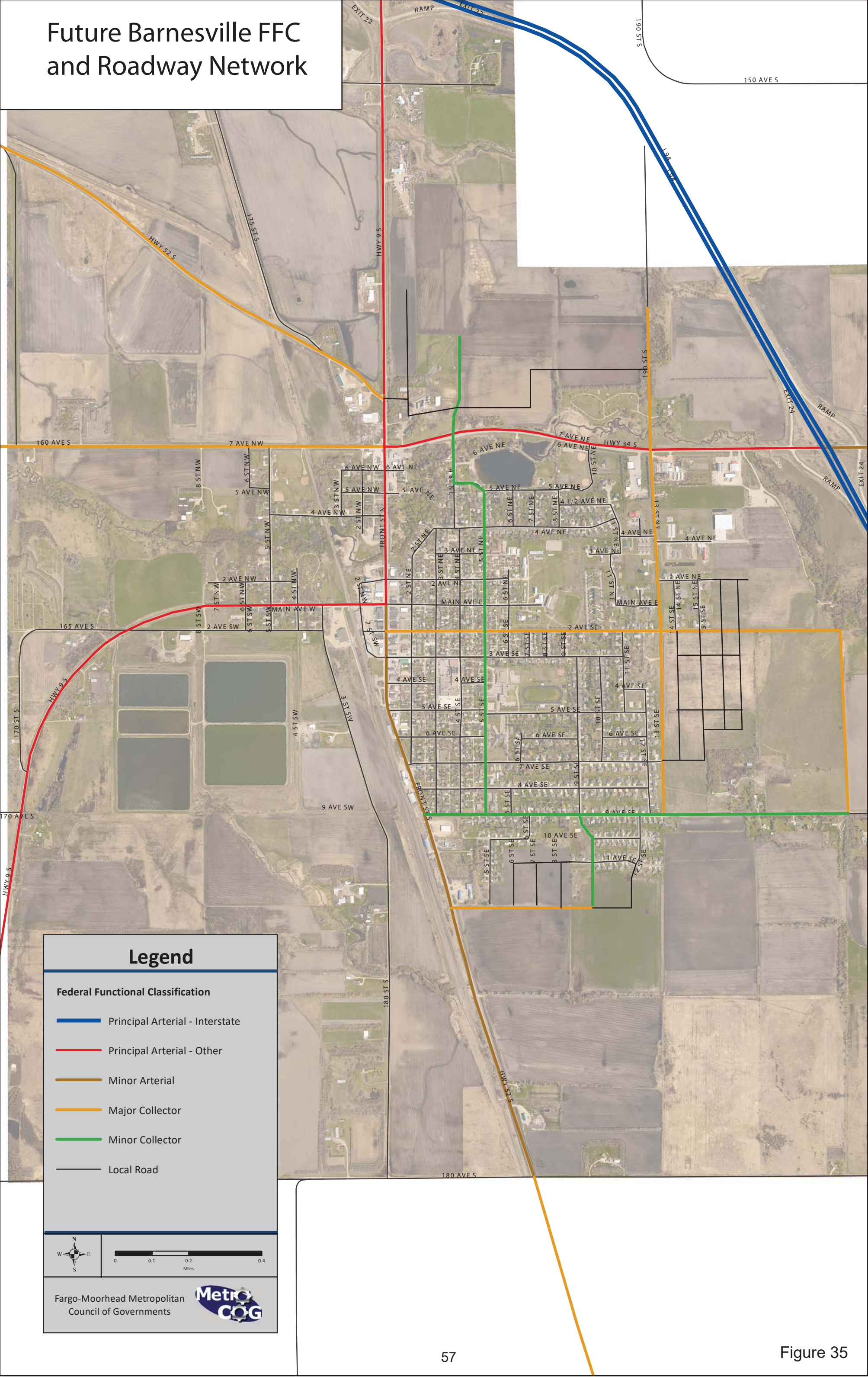


Future Functional Classification (FFC)

The City of Barnesville has the ability to functionally classify its roadways separate from MnDOT's official Federal Functional Classification. Doing so would help Barnesville to classify roadways it feels are important and serve a larger purpose than a local residential street. **Figure 34** delineates a possible functional classification system for Barnesville's roadway network.

Figure 34 also extends those functionally classified roadways into areas that could be developed. Of particular mention would be the extension of 13th Street SE south of 9th Avenue SE. This would take a major realignment of the roadway due to houses that have been built. However, the roadway has yet to be paved and such an alignment shift should be considered to create a major collector corridor allowing residents uninterrupted north/south connectivity.

Future Barnesville FFC and Roadway Network



2nd Avenue SE is also a logical major collector corridor that has been extended eastward into a new subdivision. This extension should continue until the next section line, where a logical north/south roadway can be built. This may not occur immediately, but will should be considered as development occurs in the future.

4th Street should be extended northward as areas along MN 34 and MN 9 are developed. This minor collector corridor would link to an existing access point on MN 34. This corridor also leads past Blue Eagle Lake Park and the Barnesville High School, both important destinations within Barnesville's core.

The 10th/11th Avenue corridor would be a logical place for a major collector. This would connect to Front Street, making travel to Barnesville's downtown core easier than traversing neighborhood streets. Such a facility should extend from Front Street to the extension of 13th Street SE, leaving space for the continuation of the nearby subdivisions.

Other local roadways, shown in black in **Figure 34**, should be extended in a manner to continue the grid network that has already been established. Notice that access points across higher functionally classified corridors are made at existing access locations.

It is noteworthy to mention that the lines drawn in **Figure 34** represent roadway extension concepts and do not reflect actual planned roadway alignments. In order for these areas to develop, the development rights must be purchased though a transaction by a willing buyer and willing seller. All roadways alignments must first be studied and engineering completed before such concepts could be implemented.

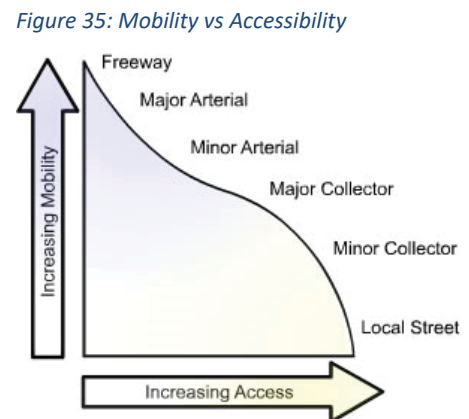
Additional Access Points and Access Management

Since Barnesville is located at the crossroads of many state highways, access onto those high speed facilities should be managed in order to protect the functionality of the roadway and minimize high speed traffic conflicts. Access points on higher functionally classed roadways should be limited to two or three per mile. This would apply to MN 9 between the I-94 and MN 34, and MN 34 between Front Street and the interstate.

As development occurs in these areas, it is critical that the internal roadway networks be designed to filter internal traffic to collector streets that access the highway system in limited locations that also link to neighborhood street networks.

13th Street SE

Public engagement efforts held throughout the update of this Comprehensive Plan resulted in the identification of one roadway in particular need of improvement: 13th Street SE between 2nd Avenue SE and 9th Avenue SE. This roadway is currently gravel, but is critical due to its location on the edge of the political boundary of Barnesville. Many members of the public felt as if paving this street is an essential



improvement for a variety of reasons. In many ways it serves as a separation of the urban part of the City from the rural surrounding area.

13th Street SE connects to MN 34 and provides residents and easy way to access the State Highway System. However, the unpaved portion of the roadway presents two major problems. First, high urban traffic volumes have left the road in disrepair. The roadway is nearly impassable during spring thaw and when there is moisture. Secondly, the gravel roadway and the increased traffic volumes makes dust control tenuous. Neighborhood residents have often complained of the amount of dust coming off of the road. Treatments such as magnesium chloride can control the dust, but are expensive to apply and only last a short time.

13th Street SE certainly has the potential of receiving a higher functional classification in the future as development surrounds it. As such, it is recommended that this segment of the roadway be paved. An extensive study will need to be conducted in order learn all of the issues with the roadway base, the amount of right-of-way that will need to be acquired, and the cost to construct the facility. Generally, roadways are estimated to cost approximately one million dollars per lane mile to construct. Being on a section line, the City has access 33 feet of ROW from the centerline of the roadway by statute.

The future alignment of this roadway should take into consideration the future extension of 13th Avenue SE. A complication to extending this roadway is that it is not on a section-line and therefore does not have guaranteed right of way. Currently, development has blocked the progression of a roadway that acts as a collector. The land to the south also is in an irrevocable land trust. It is unknown what the procedure would be to extend 13th Street to the south and if the land trust has any bearing on that decision.

Since the majority of Barnesville residents commute to other regions for employment, it is important to provide access to the State Highway System. 13th Avenue SE serves as this connection for the eastern portion of the community. The extension of the roadway south, the northern roadway extension, and the paving of the roadway segment would allow 13th Avenue SE to function as it is intended.

10th/11th Avenue SE Connection

As Barnesville continues to grow to the south, an additional connection from those developments to Front Street will be necessary to provide a fully-connected street network. This connection would occur south of 9th Avenue SE, somewhere between Dean's Bulk Service and the quarter-section line in order to have adequate access spacing. This could occur by extending 11th Avenue SE south around Dean's Bulk Service, extending 10th Avenue SE by the bus barn, or as development occurs extending what would be 12th or 13th Avenue SE.

This roadway connection should be mandated as part of the development of any lands within this southern growth area. A blighted property in this area is targeted for redevelopment within the next couple of years. A southern collector facility of this type should be clearly delineated as part of any plat that is submitted for development in this area. Connections to 5th Street SE, 9th Street SE, and 11th Avenue SE should also be included when development in this area occurs.

Bicycle and Pedestrian Analysis

There has long been a gap in providing bicycle and pedestrian accommodations to Barnesville residents. This is evident in the connections that must traverse MN 9 and MN 34, where facilities do not extend. Within much of the core of Barnesville, city streets can be utilized as bicycle and pedestrian facilities because of the low traffic volumes and slow speeds.

However, there is a demand for a citywide trail network. Such a network should connect popular destination points as shown in **Figure 36**, consisting of both on-street facilities, signed routes, and off-street trails. This section will explain different ways of accomplishing the City's goal in creating such a bicycle and pedestrian network.

Bicycle and Pedestrian Streets

There are a number of streets in Barnesville that should be considered when creating a bicycle and pedestrian network. Bicycle amenities could include route designation (and applicable signage as a bike route), application of bike lanes or shared lane markings (sharrows), or future installation of a path facility alongside the roadway. Pedestrian amenities would include paths or sidewalks. The following paragraphs detail streets that bicycle and pedestrian amenities should be considered.

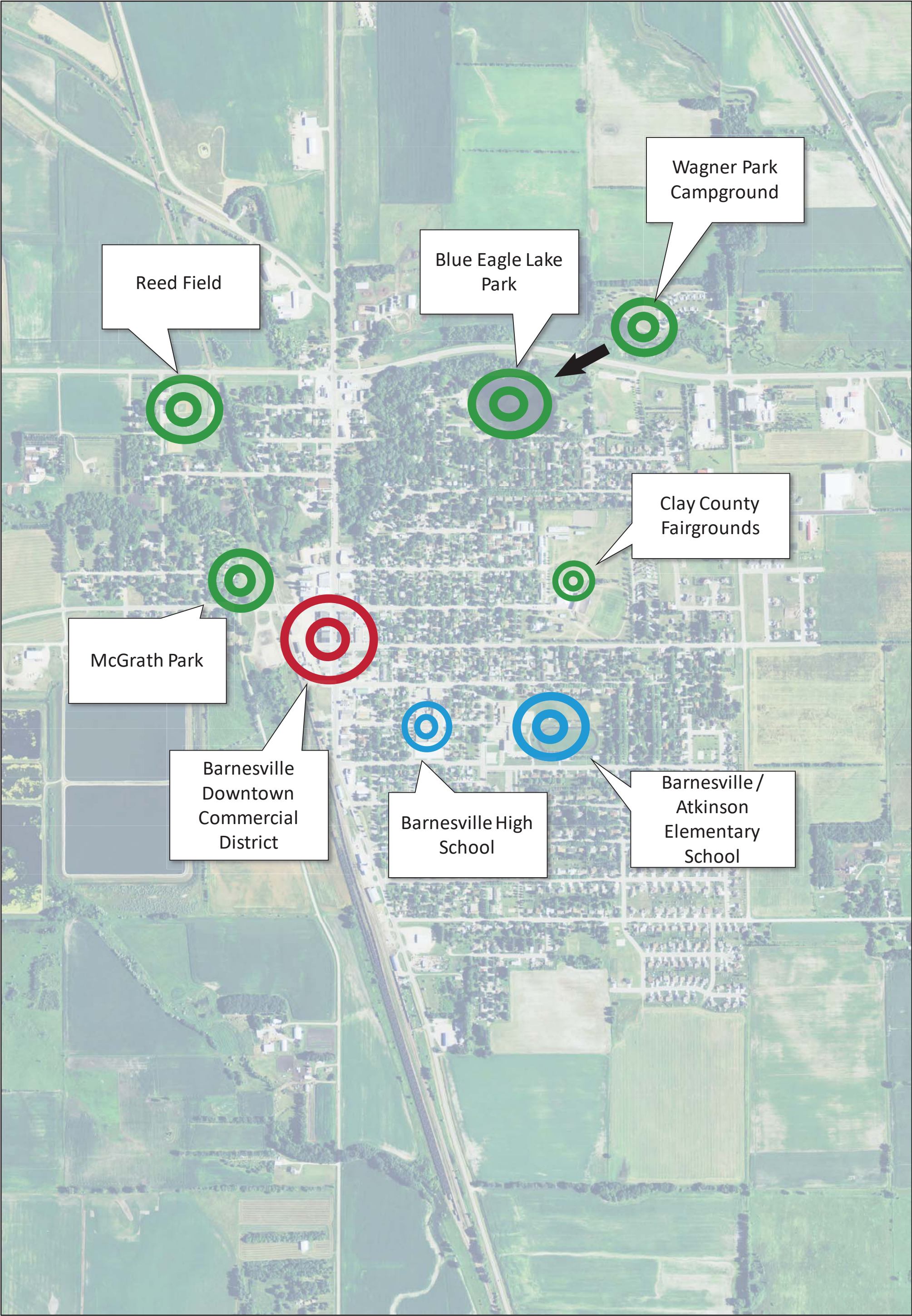
2nd Avenue SE – Other than State Highways, 2nd Avenue SE provides east/west connectivity across Barnesville. Pedestrian amenities on this roadway could connect residential growth areas on Barnesville's east side with the downtown core. Being one of the only east/west options for car travel, adding bicycle amenities could give riders a safe and direct way to get across town.

5th Street NE/SE – Like 2nd Avenue SE, this roadway provides north/south connectivity across Barnesville. 5th Street also provides access to Barnesville and Atkinson Elementary Schools. Both bicycle and pedestrian amenities on this roadway could provide a safe route to get to school for children. It also terminates at Blue Eagle Lake Park, which is Barnesville's largest park providing both programmed and un-programmed park space.

MN Highway 34 – The City of Barnesville has worked cooperatively with the Minnesota Department of Transportation (MnDOT) to conceptualize a shared-use path along MN Highway 34 connecting Wagner Park Campground with the baseball diamonds on the west side of Barnesville. To date, the section from Front Street to Blue Eagle Lake Park has been awarded funding through the Transportation Alternatives Program (TAP). However, Barnesville has been unsuccessful in being awarded funding for the additional segments of this path. The City of Barnesville should continue to work with MnDOT and Metro COG in order to fund the construction of the two remaining sections, with the priority being the section from Front Street to the baseball diamonds.

13th Street SE – It is the City's desire (as stated in this Plan) to pave the gravel portion of 13th Street SE. In anticipation of this project, the City of Barnesville has acquired adequate right of way to construct a bike path facility adjacent to the roadway. This should be a primary consideration during the reconstruction process. The City is also considering extending that path to the north because there is adequate right of way to install a facility. This would connect to the MN 34 path facility listed above.

Barnesville Bicycle & Pedestrian Destinations



Growth Areas – As Barnesville expands, bicycle and pedestrian facilities should be incorporated into the design of subdivisions by requiring them in the platting process. However, this does not necessarily mean the installation of sidewalks on every block. Rather, the City of Barnesville should conceptualize how a bicycle and pedestrian network should be configured and require those facilities to be implemented as required set-asides when the land is developed. This will have to be integrated into the City of Barnesville’s subdivision ordinance. These new facilities should connect with existing or planned facilities and should facilitate the creation of a network of such bicycle and pedestrian amenities.

Bicycle and Pedestrian Lighting

One of the City of Barnesville’s stated goals is to create a safe and inclusive bicycle and pedestrian network. Lighting along bicycle and pedestrian corridors could be used to create the perception of safety and make the system appealing to use during all hours of the day. The installation of lighting can be expensive, and as such, only those corridors that play an integral role in creating a connected network should be considered to have lighting installed along them.

The placement of lighted corridors must be thought through carefully because lighting may have unintended consequences. One such consequence is that people will actually use the facilities that are lit. This may be troublesome due to the fact that parks close at dusk. Light spillage onto neighboring properties can be a problem. The lights employed along paths should minimize light spillage so that the lights do not disturb people living along the paths.

Figure 37 shows the scale to which pedestrian lighting should be built. Notice the lampshade directing the light downward in comparison to a typical street light. Instead of purchasing two sets of light standards, many communities integrate pedestrian lighting into existing poles. **Figure 38** is an example of such a type of light standard.

Barnesville Downtown Commercial District

Much of the pedestrian traffic of the City likely occurs in the downtown core of Barnesville. This is especially true for events such as Potato Days. Front Street traverses the traditional downtown core of Barnesville. The roadway cross-section is extremely large for a two-lane facility, as it is approximately 70 feet from curb-to-curb. The

Figure 37: Pedestrian Lighting Scale

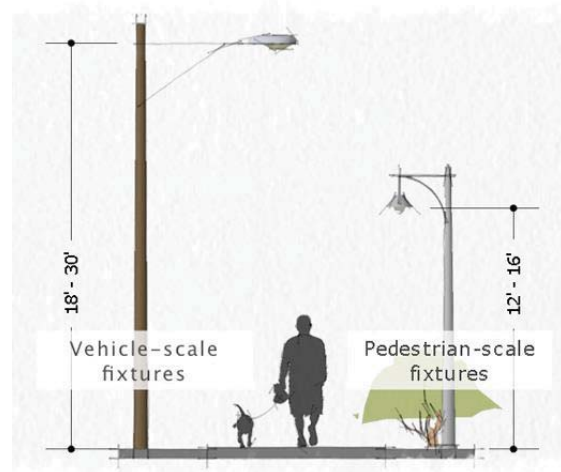


Figure 38: Pedestrian Integrated Light Standards



Figure 39: Bike Lane Configuration example Shared Lane Marking (Sharrow) Application Example

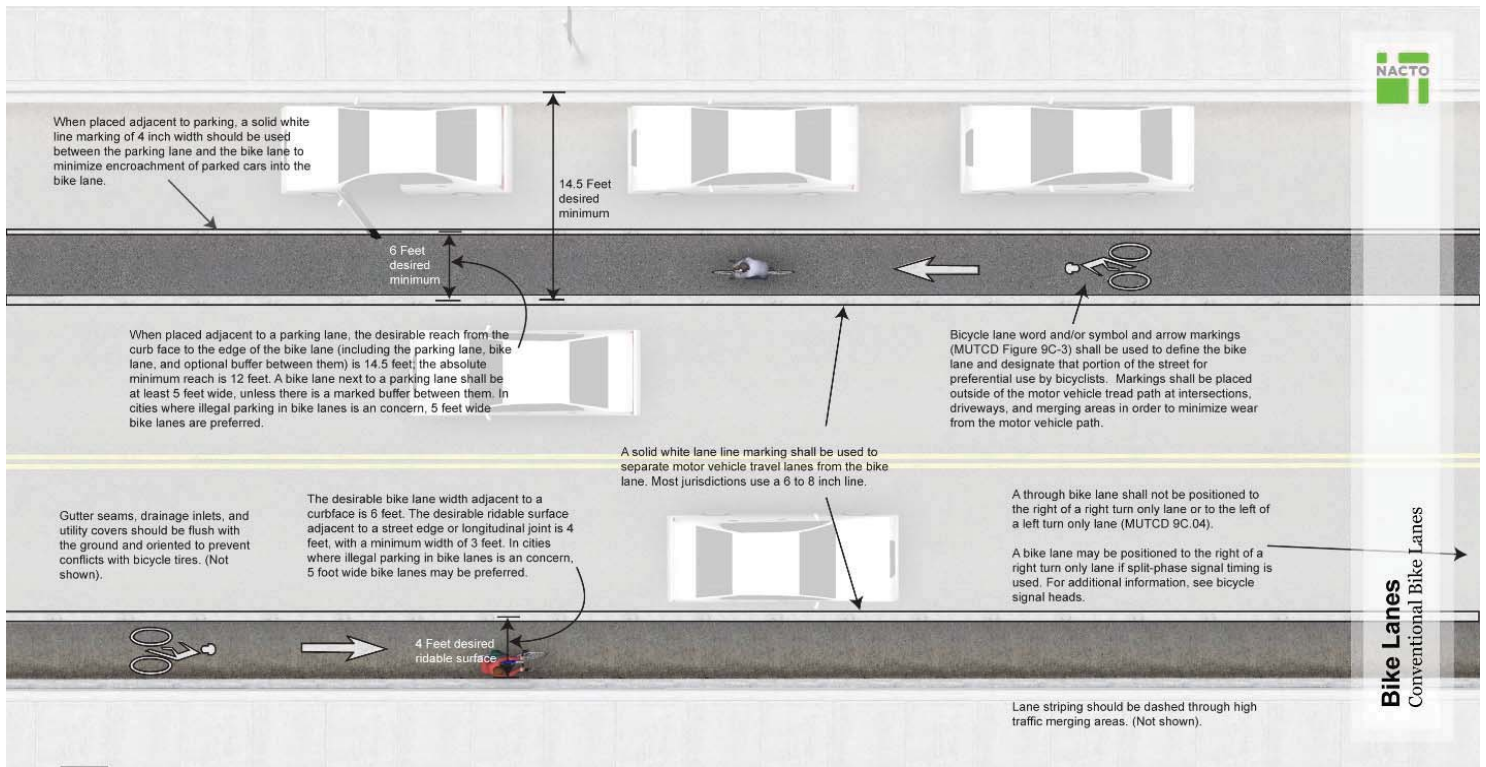
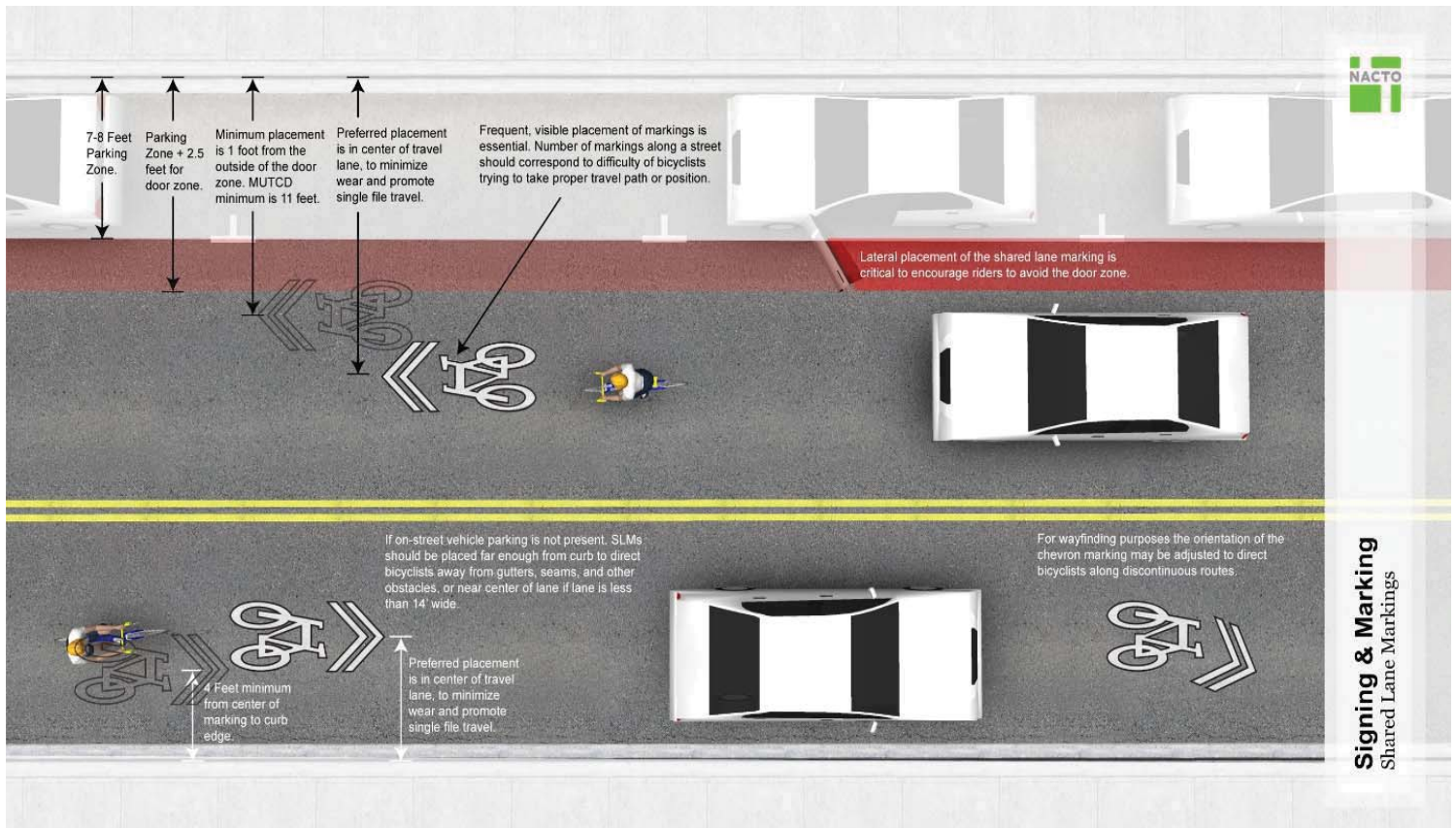


Figure 40: Shared Lane Marking (Sharrow) Application Example



cross-section includes unmarked parallel parking which is located on both sides of the street. In the south 100 block of Front Street, where pedestrian bulb outs occur, the width of the roadway cross-section between these bulb outs is approximately 50 feet.

Even with the expanded sidewalks and pedestrian bulb outs, the roadway cross-section is ample to accommodate bicycle amenities such as bike lanes. Bike lanes provide a formalized travel lane for bicycles only as shown in **Figure 39**.

Other bicycle treatments, such as shared lane markings (sharrows), would reassure bicycle riders that they have the right to use the roadway and would bring driver awareness to the potential for bicycle users. Shared lane markings do not take away from the width of travel lanes; rather they are a marker placed on the travel lane as shown in **Figure 40**.

Front Street is a Minnesota designated highway, and as such, improvements would need to be coordinated with the Minnesota Department of Transportation (MnDOT). MnDOT is very progressive in accommodating multiple modes of transportation into their roadway facilities and have a formalized Context Sensitive Solutions policy addressing the need for bicycle and pedestrian amenities in cases where their highway facilities pass through a community.

Either treatment should be considered for application on Front Street given its prominence as the center of the Barnesville Community.

Bike Lane Examples

The conversion of excess lane-widths on roadways into bicycle features is extremely popular nationwide. This is indicative of the Livable Streets movement. It envisions streets that are safe, vibrant, and connects people where they live, work, and play by incorporating multiple modes of transportation into the streetscape.

It is a common misconception that bicycles are safer rider on a sidewalk than in the street. While this depends on the skill of the rider, there are less incidents of cars colliding with bicyclists when they ride in traffic. This is because the rider is more visible to the driver. Most roadways in Barnesville have low traffic volumes and have low speed limits. This type of environment is perfect to incorporate bicycle amenities into.

Below are some examples of cities that have successfully integrated such facilities into streetscapes.

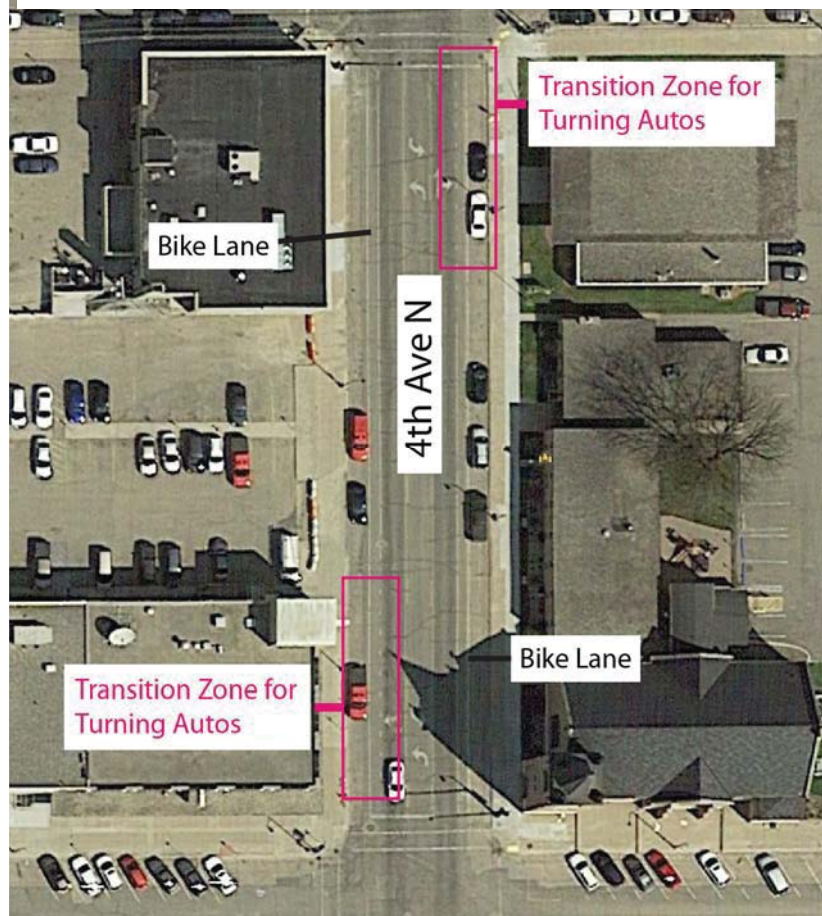
4th Street N – Fargo, ND

In 2012, the City of Fargo sought to both improve operations and incorporate bicycle amenities into its downtown roadways. One such

roadway was 4th Street North from 1st Avenue North to 5th Avenue North. This section was previously a narrow four-lane cross-section with parallel parking on either side. The City decided that the traffic utilizing this roadway would flow more efficiently if a three-lane cross-section were employed.

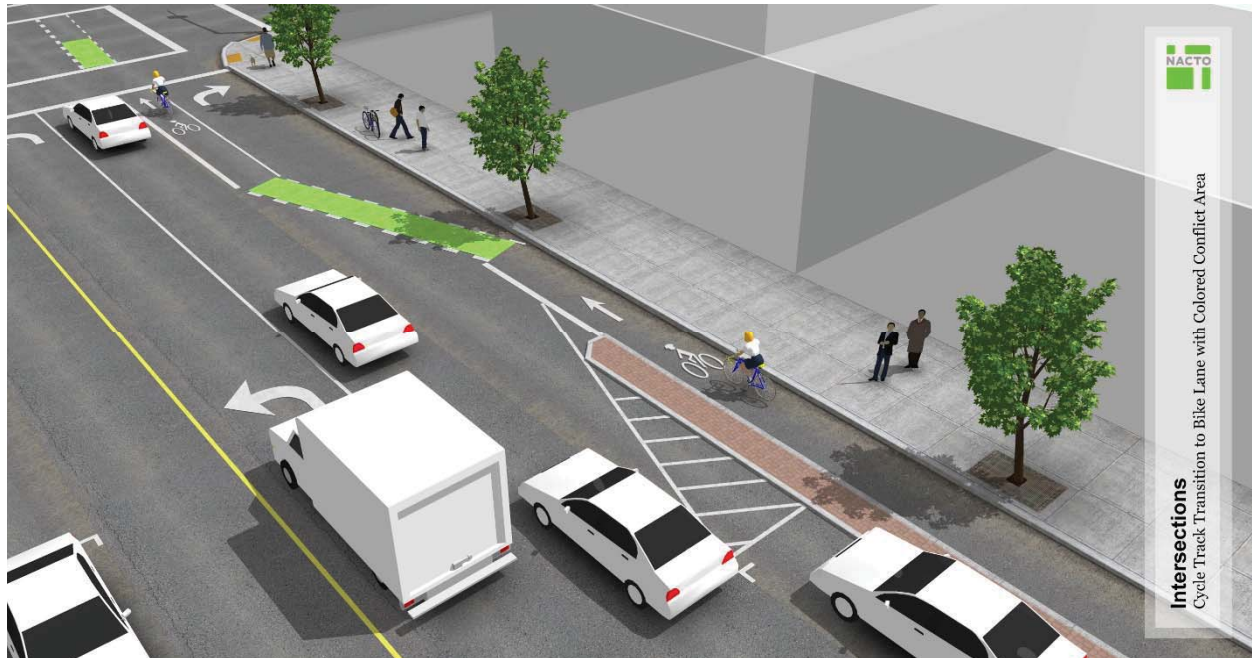
Reducing the amount of thru-lanes also presented an opportunity to add bicycle amenities to 4th Street North, which would allow riders a route to get to City Hall and the Fargo Downtown Library, two popular destinations. **Figure 41** shows the new roadway cross-section.

Figure 41: 4th Avenue N Bike Lanes



As you can see in **Figure 41**, the bike lane is bounded by parking on the curb-side and thru-lanes on the other. At the intersections, the bike lane is skip-dashed in order to make riders and drivers aware that vehicles may merge into the bike-lane to make a right turn, and bikes may merge into traffic lanes to make a left turn. This is often called a transition zone or conflict area.

Figure 42: Transition Zone/Conflict Area Delineation



Transition zones appear in instances where automobile traffic will come into conflict with bicycle traffic, such as driveways and at intersections. Often the pavement will be colored in those locations to sound an extra warning that this is a conflict area as in **Figure 42**.

Parks and Recreation

Parks, and their associated recreation components, are quality of life factors that people take into consideration when deliberating on whether to move to an area. In order to draw new residents, Barnesville must consider these quality of life factors in laying out future developments. Barnesville has a long record of accomplishment of doing such. Recently Barnesville finished its Parks and Recreation Plan, which analyzes current park facilities. As the community moves forward, it must consider some of the points in this section.

Barnesville has many park facilities for a city of its size with a wide array of equipment. The parks are spread out throughout the community, making access to parks easy for residents in all parts of Barnesville. This section will examine those park and recreation facilities in Barnesville, and explore park and recreation facility needs going forward.

Park & Amenity Dispersion

Figure 43 shows the main park facilities located throughout Barnesville and lists the amenities in each of the parks. Much of the existing city is within a quarter-mile walk of some sort of park as is shown in **Figure 44**. A quarter-mile is considered the average distance people are willing to walk. Barnesville has a good dispersion of parks within its neighborhoods. However, when you take into consideration that parks have varying amenities, it may be a greater distance to access a park with certain amenities.

Basketball is a good example of amenity dispersion. Only one park in Barnesville has a basketball court, Del Acres Park in the newer part of the community; whereas, almost all of the parks in Barnesville have a volleyball court. City staff have noticed that there is extensive use of the basketball court at the elementary school. If the school expands, this court would likely disappear, creating additional demand for basketball courts within city parks.

When developing new parks or reprogramming existing parks, under represented amenities should be considered. However, not all amenities need to be dispersed throughout Barnesville. Amenities such as Blue Eagle Lake and the Skating Rink are ample in their singular location for a community of Barnesville's size.

Park Set-Asides

It is important to set aside lands for parks as Barnesville grows. This is typically included in the City's Subdivision Ordinance. Emphasis for new parks should be placed on areas that are developed across a barrier from the main part of Barnesville. This thought is represented by green stars in **Figure 43**. The stars represent areas where significant parkland should be set aside when it is developed. Below is a brief explanation of why parkland would be critical in each area represented by a Star.

- North Star – This area may one day developed into a mix of residential and commercial uses. The residential areas will likely be located between commercial areas that will be concentrated along MN 9 and I 94. MN 34 represents a barrier for people to access sizeable park facilities on the other side of the highway. A sizeable park space should be set aside in this area because of the lack of connection to other Barnesville parks. The park should include a bevy of amenities.
- East Star – This is the prime growth area of Barnesville. As such, the neighborhood park theme should be continued. In the future, 13th Street may present a barrier, as traffic will likely use this route to access the state highway system. This park should be of a neighborhood scale, reminiscent of other parks in the area.
- Southern Star – This area will likely develop secondary to the primary growth area on the east side of Barnesville. Some development has been occurring in this area over the course of the last 10 years. A park should be located in this area to maintain park spacing and provide neighborhood oriented park facilities.

Barnesville Park Analysis

1. **Blue Eagle Lake Park** - This is the largest park in Barnesville. It is mixed function in nature as it provides facilities for walking/biking, fishing, playgrounds, tennis courts, picnic shelters, volleyball pit, swimming area, a sledding hill, and bathrooms. A newly completed shared-use path connects the park with the nearby Dairy Queen. There are few lights in the park as facilities close at dusk; however, the sledding hill is lit in the winter months. **George J. Dahm Park** is located on the east side of the Blue Eagle Lake Park, consisting of two softball diamonds.

2. **Wagner Park Campground** - Located across MN 34 from Blue Eagle Lake Park, this park provides 28 camping sites complete with electricity, water, picnic tables, and fire rings and an additional 50 primitive sites for tent camping. The park also has showers, playground equipment, and a volleyball pit. Wagner Park is a popular RV destination. However, MN 34 creates a barrier for campers to access the city by bike or foot.

3. **Del Acres Park** - This neighborhood park has a playground, unlit basketball court, and a picnic shelter. It also has a large unprogrammed field providing enough room for activities. The park does not have lights. The basketball court is extremely popular as it is the only outdoor court in Barnesville.

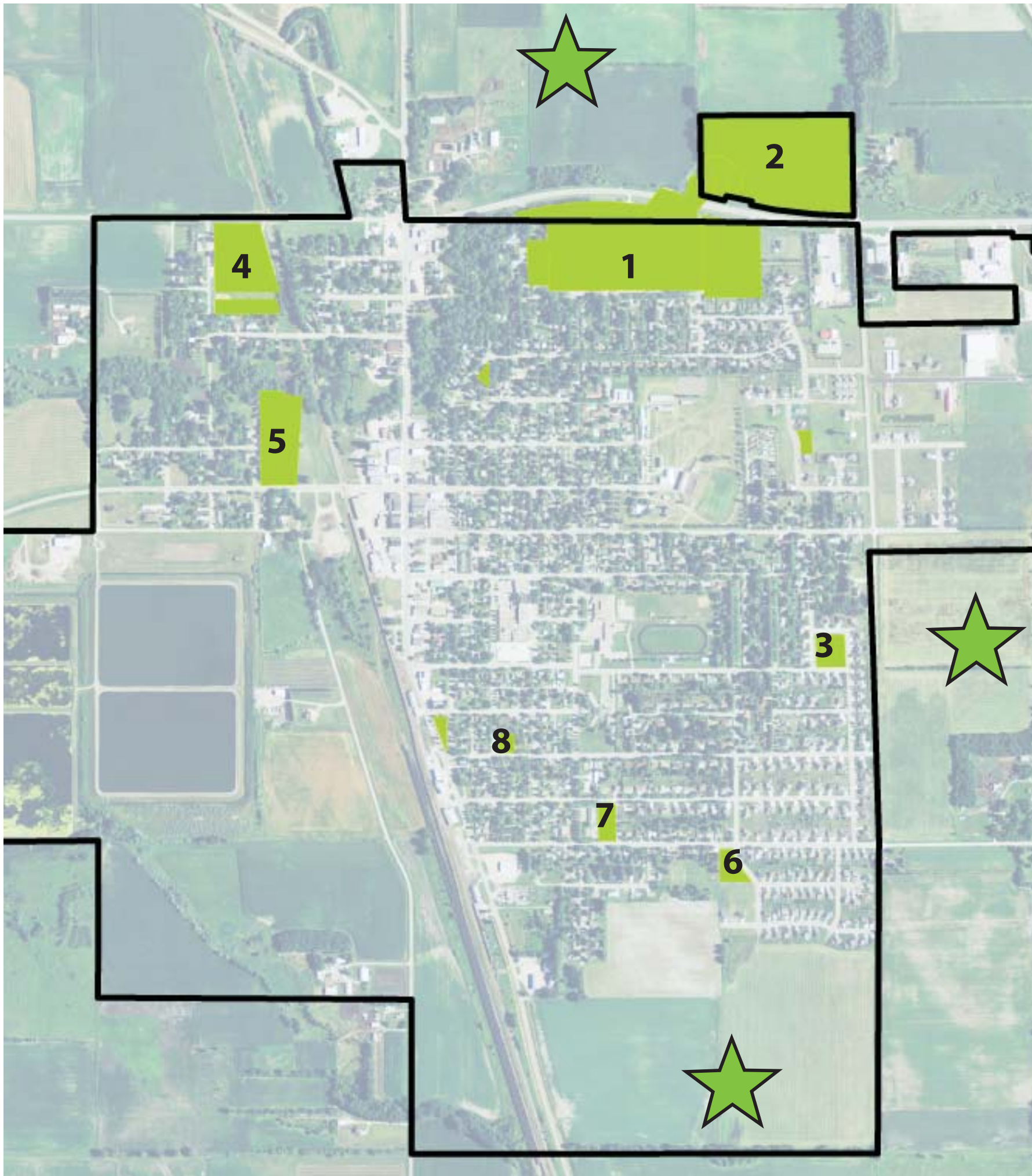
4. **Reed Field** - Located west of the railroad tracks on 160th Avenue S, the Barnesville Baseball Diamonds consist of three baseball diamonds complete with bleachers and outfield fences. This park is home to organized middle school and high school baseball. Reed Field is owned and operated by the American Legion.

5. **McGrath Park** - This park services the western portion of Barnesville, west of the railroad tracks. It is also home to the only disc golf course within the community. It also has bathrooms, a picnic shelter, playground, softball backstop, horseshoe pits, and a volleyball pit. Approximately half of the open space is owned by the Burlington Northern and Santa Fe Railroad. A splash pad opened in May of 2017.

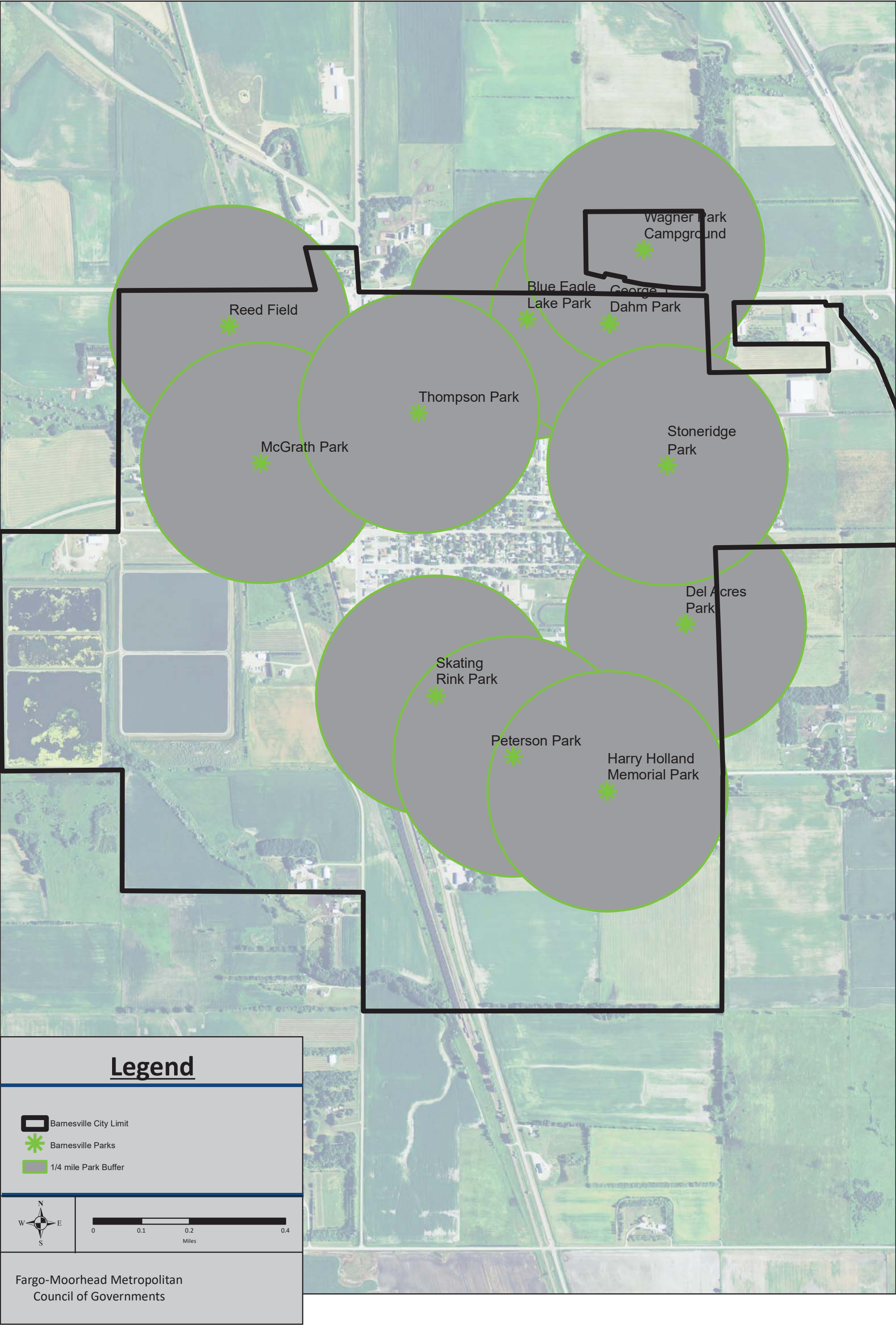
6. **Harry Holland Memorial Park** - This pocket park on the south side of Barnesville services the Heartland Addition neighborhood. It consists of a playground, small shelter, and a lighted concrete slab for skating.

7. **Peterson Park** - Approximately the size of half a block, Peterson Park has a gazebo, volleyball pit, and an open field for unprogrammed activities and games.

8. **City Skating Rink Park** - As its name suggests, this park is oriented towards ice skating in the winter months. It has a walled and lighted hockey rink, warming house, and an open skating rink. In the summer, the open skating rink can be utilized as an unprogrammed field for activities and games and the rink as a dog park.



Barnesville Parkland Walkability



Connection

As mentioned in the Bicycle and Pedestrian Section, parks in Barnesville should be connected in some regard. That may manifest in various types of bicycle and pedestrian infrastructure. Having this sort of connected system of parks would make it easier for people to access particular amenities that may not be located in the park nearest to their residence.

Programmed vs Un-programmed Park Uses

Parks within Barnesville should have a mix of active both programmed and un-programmed uses. Programmed uses are those facilities that are installed for a specific use. Examples of programmed uses include playground equipment, basketball courts, swings, and the like. These facilities are meant to be used for a particular function. These type of facilities be expensive to install, but typically have a long life span.

Figure 45: Del Acres Park Programmed Use



Un-programmed spaces are those areas that do not have specific facilities used for a particular function. Un-programmed park areas usually consist of a lawn for passive recreational uses. This could range from throwing a Frisbee to laying in the sun. These spaces consist of open lawn areas. Aside from the park property, there are not any costs in creating an un-programmed park area.

Figure 46: Del Acres Park Un-programmed Use



However, there is typically an ongoing maintenance cost in keeping the grass mowed, which is relatively low cost. Both programmed and un-programmed spaces are important in providing opportunities for citizens to recreate.

Community Center & Community Facilities

During the survey at the beginning of the comprehensive plan, respondents overwhelmingly said that a community center would serve to both attract and retain Barnesville residents. The type of amenities were not specifically identified within the survey. There is strong community support for the concept of a community center, but not a clear consensus of what the community center would contain. A community center could be as simple as a meeting space to hold events, or could be more of an athletic center consisting of a basketball court and exercise equipment.

Further community outreach is necessary to determine the type facility that both citizens desire and is financially feasible for the city to build and operate. If such a facility is purposed to be constructed, the funding mechanism would likely be paid directly by city residents. The City of Barnesville and

community leaders must work together with citizens in order to realize a consistent vision for such future community facilities.

Community Pool

Those respondents from the initial comprehensive plan survey also expressed a desire to have a community pool. A grass roots effort was started to embark on visioning such a community facility. However, due to the constrained municipal financing options, this effort has led to study a community pool facility being attached to a hotel. The Barnesville's economic development professionals have long been trying to attract a hotel developer to locate in Barnesville. This hotel would likely be at one of the I-94 interchanges. In many other rural communities, many hotels have water park type attractions including a pool and waterslides. This is a financially feasible way to develop community infrastructure.

Moving forward, the City of Barnesville should continue to work towards such an end as well as study the cost of both a hotel-attached and stand-alone facility. Without the ability to add new financing mechanisms to fund such improvements, Barnesville must attract private entities to build and operate amenities such as a community pool. Barnesville should work with communities such as the City of Dilworth to see how they were able to implement their community pool. There are many precedents around the region that have either developed a community pool or combined efforts with a private developer. The City of Barnesville should seek out these examples and gain the institutional knowledge of their staff in order to garner insight into the process and decide on a way to implement such community facilities.

North Country Trail

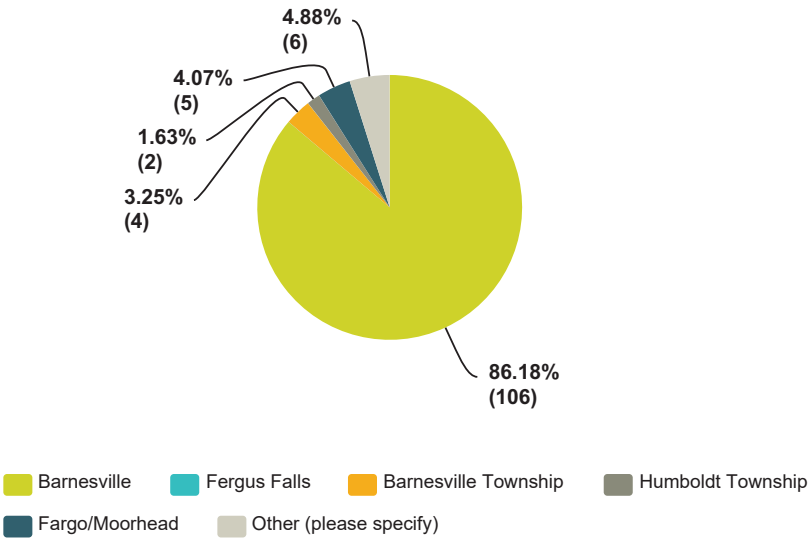
On March 5, 1980, Congress passed legislation authorizing the North Country National Scenic Trail, culminating efforts that began even before the National Trails System Act of 1968, which established the Appalachian and Pacific Crest National Scenic Trails (NST's) as the nation's first. The NCT runs through Michigan, Minnesota, North Dakota, New York, Ohio, Pennsylvania, and Wisconsin. When complete, the North Country National Scenic Trail will be approximately 4,600 miles long. Currently, over 2,000 miles of trail are complete and waiting to be used.

Much of the NCT follows rural roadways. The closest trail segment is approximately 12 miles south of Barnesville on Township Rd 40.

Appendix 1

Q1 In which city/area do you live?

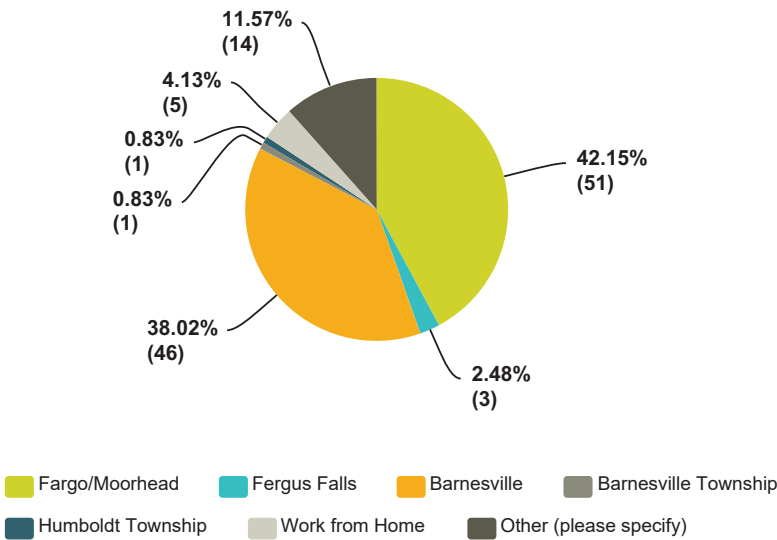
Answered: 123 Skipped: 1



Answer Choices	Responses	
Barnesville	86.18%	106
Fergus Falls	0.00%	0
Barnesville Township	3.25%	4
Humboldt Township	1.63%	2
Fargo/Moorhead	4.07%	5
Other (please specify)	4.88%	6
Total		123

Q2 In which city/area do you work?

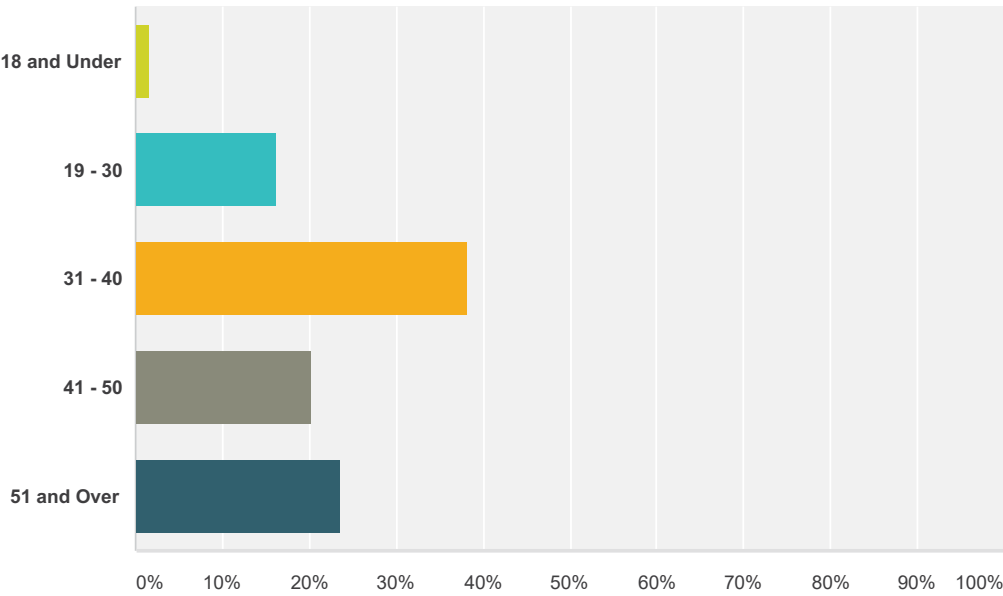
Answered: 121 Skipped: 3



Answer Choices	Responses	
Fargo/Moorhead	42.15%	51
Fergus Falls	2.48%	3
Barnesville	38.02%	46
Barnesville Township	0.83%	1
Humboldt Township	0.83%	1
Work from Home	4.13%	5
Other (please specify)	11.57%	14
Total		121

Q3 Please indicate which age category you fall in.

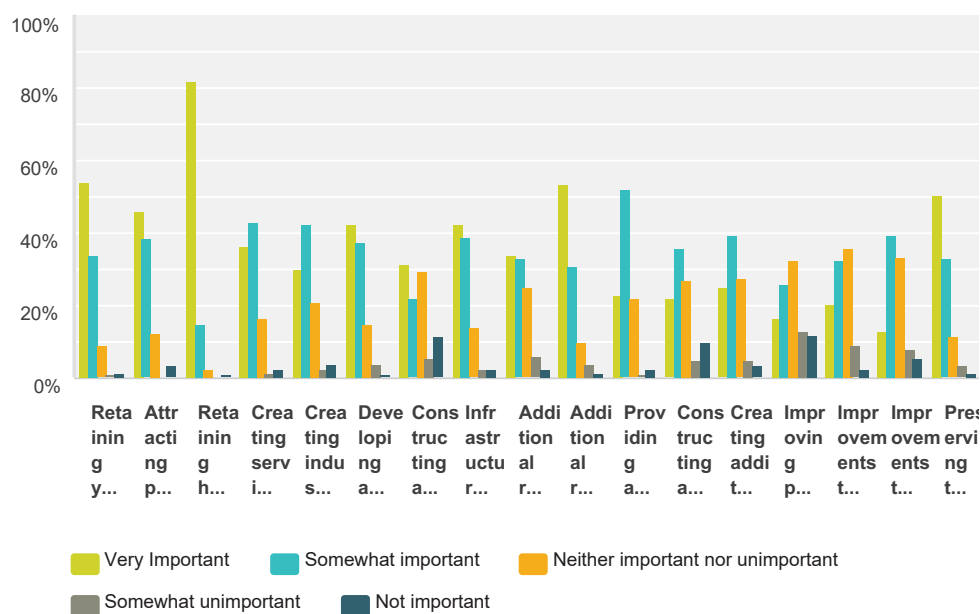
Answered: 123 Skipped: 1



Answer Choices	Responses	
18 and Under	1.63%	2
19 - 30	16.26%	20
31 - 40	38.21%	47
41 - 50	20.33%	25
51 and Over	23.58%	29
Total		123

Q4 Please rate the following issues from very important and not important.

Answered: 123 Skipped: 1

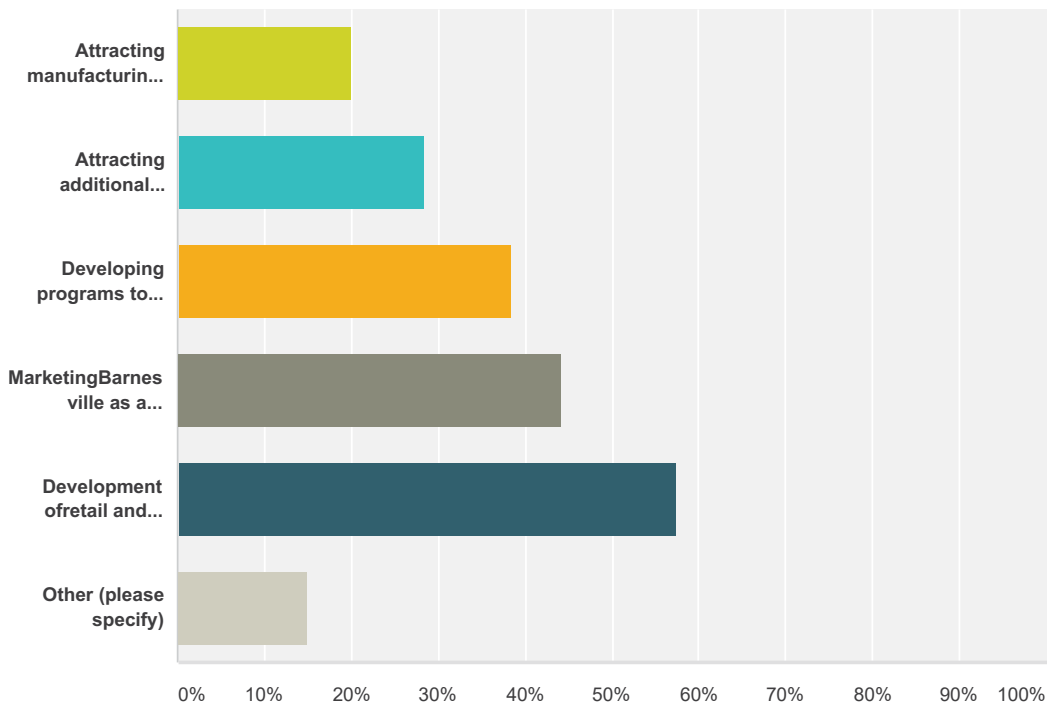


	Very Important	Somewhat important	Neither important nor unimportant	Somewhat unimportant	Not important	Total	Weighted Average
Retaining youth in Barnesville	54.17% 65	34.17% 41	9.17% 11	0.83% 1	1.67% 2	120	1.62
Attracting professionals to the city	45.90% 56	38.52% 47	12.30% 15	0.00% 0	3.28% 4	122	1.76
Retaining high-quality schools	81.97% 100	14.75% 18	2.46% 3	0.00% 0	0.82% 1	122	1.23
Creating service-sector jobs	36.36% 44	42.98% 52	16.53% 20	1.65% 2	2.48% 3	121	1.91
Creating industrial jobs	30.08% 37	42.28% 52	21.14% 26	2.44% 3	4.07% 5	123	2.08
Developing a plan for downtown investment and revitalization	42.62% 52	37.70% 46	14.75% 18	4.10% 5	0.82% 1	122	1.83
Constructing additional sidewalks in Barnesville	31.71% 39	21.95% 27	29.27% 36	5.69% 7	11.38% 14	123	2.43
Infrastructure improvements, such as water/sewer replacements	42.28% 52	39.02% 48	13.82% 17	2.44% 3	2.44% 3	123	1.84
Additional recreational opportunities for residents (parks/outdoor)	33.88% 41	33.06% 40	24.79% 30	5.79% 7	2.48% 3	121	2.10
Additional recreational opportunities for residents (indoor recreation center)	53.66% 66	30.89% 38	9.76% 12	4.07% 5	1.63% 2	123	1.69
Providing additional services to senior citizens	22.76% 28	52.03% 64	21.95% 27	0.81% 1	2.44% 3	123	2.08
Constructing additional apartment and alternative housing options	22.13% 27	36.07% 44	27.05% 33	4.92% 6	9.84% 12	122	2.44

Creating additional single family homes in the city	24.79% 30	39.67% 48	27.27% 33	4.96% 6	3.31% 4	121	2.22
Improving public transportation options for residents	16.26% 20	26.02% 32	32.52% 40	13.01% 16	12.20% 15	123	2.79
Improvements to the existingroadway system (local roads)	20.33% 25	32.52% 40	35.77% 44	8.94% 11	2.44% 3	123	2.41
Improvements to the existing roadway system (State roads)	13.11% 16	39.34% 48	33.61% 41	8.20% 10	5.74% 7	122	2.54
Preserving the character of Barnesville	50.41% 61	33.06% 40	11.57% 14	3.31% 4	1.65% 2	121	1.73

Q7 What do you believe will be the two (2) most important priorities to improve the economy of Barnesville over the next 30 years?

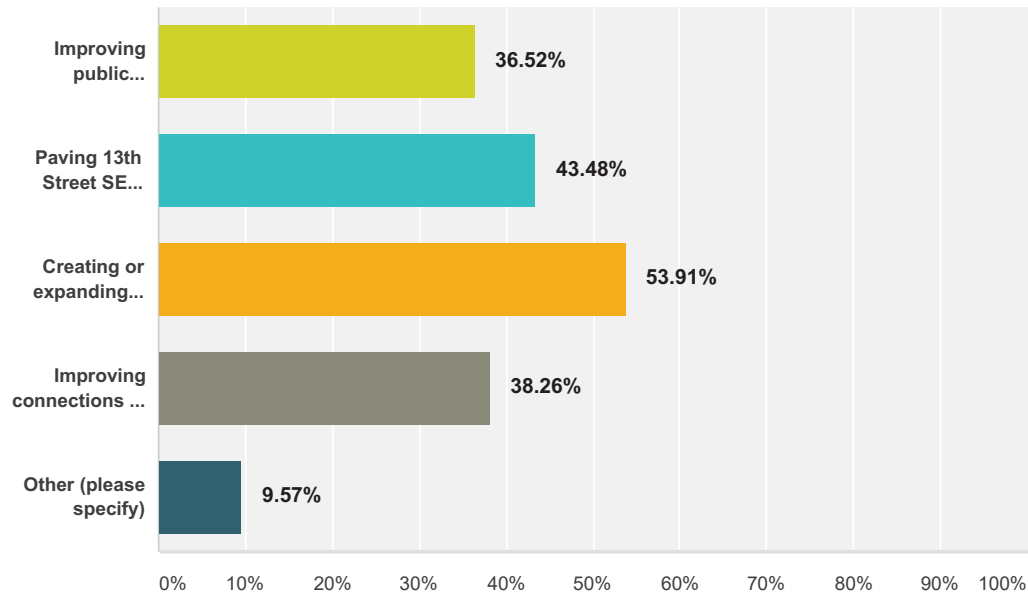
Answered: 120 Skipped: 4



Answer Choices	Responses	
Attracting manufacturing firms to the region	20.00%	24
Attracting additional professional services (office)	28.33%	34
Developing programs to retain and attract young professionals	38.33%	46
MarketingBarnesville as a bedroom community with a high quality of living	44.17%	53
Development ofretail and other commercial facilities within the city	57.50%	69
Other (please specify)	15.00%	18
Total Respondents: 120		

Q9 What should be the top two (2) priorities to improve transportation in Barnesville over the next 30 years?

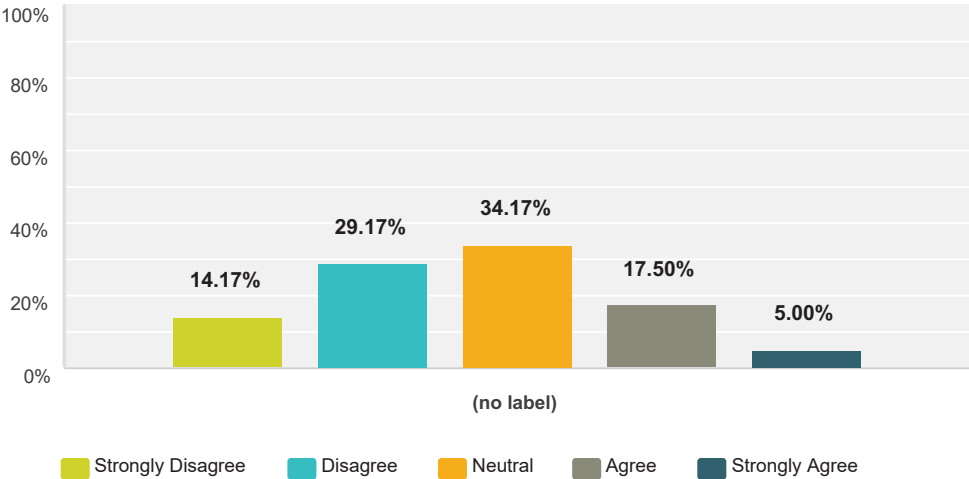
Answered: 115 Skipped: 9



Answer Choices	Responses	
Improving public transportation options for residents with daily commutes to Fargo-Moorhead and Fergus Falls	36.52%	42
Paving 13th Street SE between 2nd Avenue and 9th Avenue	43.48%	50
Creating or expanding bicycle and pedestrian facilities within Barnesville	53.91%	62
Improving connections to schools	38.26%	44
Other (please specify)	9.57%	11
Total Respondents: 115		

Q10 Using the scale below, does Barnesville have adequate bicycle and pedestrian facilities?

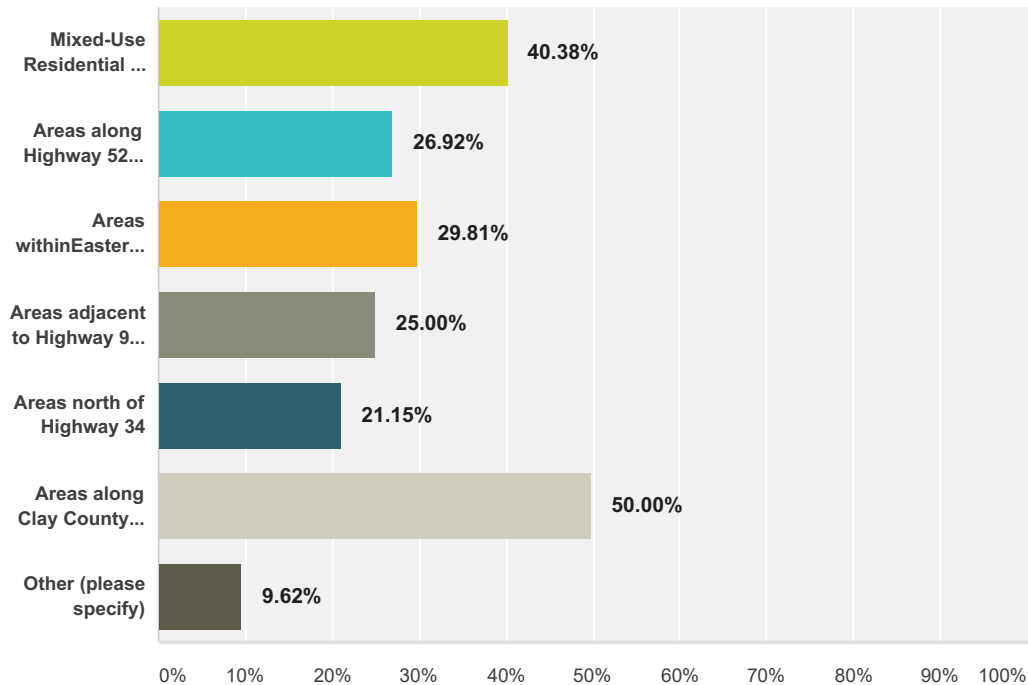
Answered: 120 Skipped: 4



	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total	Weighted Average
(no label)	14.17% 17	29.17% 35	34.17% 41	17.50% 21	5.00% 6	120	2.70

Q14 Over the next 30 years, what areas of the city would you like to see developed as Residential? (check all that apply)

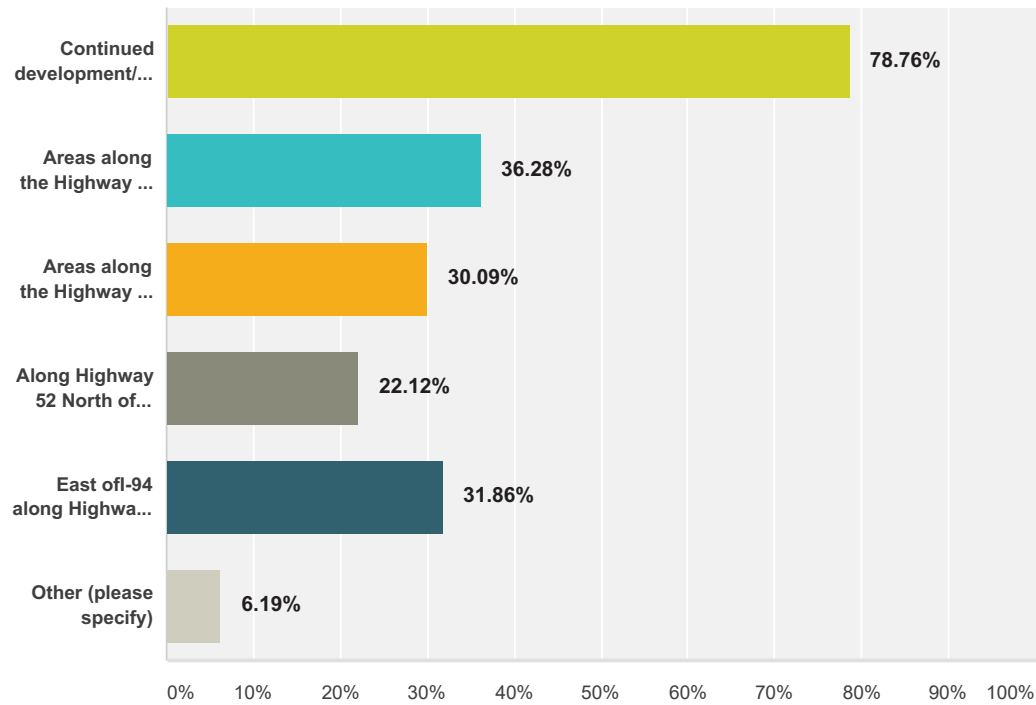
Answered: 104 Skipped: 20



Answer Choices	Responses	
Mixed-Use Residential in Downtown	40.38%	42
Areas along Highway 52 North	26.92%	28
Areas within Eastern city limits South of Highway 34	29.81%	31
Areas adjacent to Highway 9 corridor between Highway 34 and I-94	25.00%	26
Areas north of Highway 34	21.15%	22
Areas along Clay County Highway 2 (Comstock Road)	50.00%	52
Other (please specify)	9.62%	10
Total Respondents: 104		

Q15 Over the next 30 years, what areas of the city would you like to see developed as Commercial/Retail? (Check all that apply)

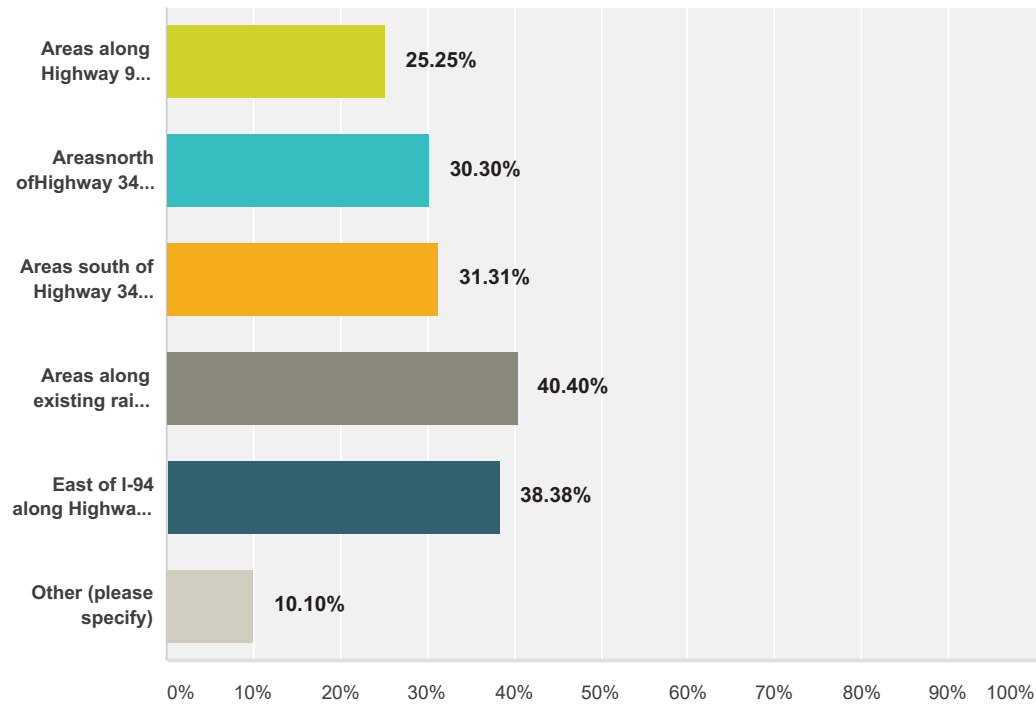
Answered: 113 Skipped: 11



Answer Choices	Responses	
Continued development/investment in downtown	78.76%	89
Areas along the Highway 9 corridor	36.28%	41
Areas along the Highway 34 corridor	30.09%	34
Along Highway 52 North of Barnesville	22.12%	25
East of I-94 along Highway 34	31.86%	36
Other (please specify)	6.19%	7
Total Respondents: 113		

Q16 Over the next 30 years, what areas of the city would you like to see developed as Industrial? (Check all that apply)

Answered: 99 Skipped: 25



Answer Choices	Responses	
Areas along Highway 9 corridor	25.25%	25
Areas north of Highway 34 corridor between Highway 9 and I-94	30.30%	30
Areas south of Highway 34 between city limits and the interstate	31.31%	31
Areas along existing rail facilities	40.40%	40
East of I-94 along Highway 34	38.38%	38
Other (please specify)	10.10%	10
Total Respondents: 99		

Appendix 2

Soil Survey of Clay County

Appendix 2

Soil Descriptions

Symbol	Soil Name	Description	Symbol	Soil Name	Description
36	Flom clay loam	This soil is poorly suited for building site because of wetness. If buildings are constructed on this soil, they should be built with out a basement. This soil is poorly suited to use a septic tank absorption fields because high water table. Mound systems may be suitable.	59	Grimstad fine sandy loam	Buildings constructed on this soil should have the lower level constructed above the seasonal high water table. Landscaping should be designed to drain surface water away from structures. This soil is poorly suited for on-site septic due to a high water table. Mound systems may suitable.
45B	Maddock fine sand, 0 to 4 percent slopes	This soil is well suited as a building site for buildings and local roads. This soil readily absorbs but does not adequately filter septic tank effluent, and may lead to ground water pollution.	61	Arveson clay loam	This soil is poorly suited for building because of flooding and a high water table. If buildings are constructed on this soil, the lower level should be constructed above the high water table. Landscaping should be designed to drain surface water away from structures. This soil is poorly suited for septic fields because the upper part of the soil does not filter effluents. The poor filtering capacity of the soil may result in the pollution of the ground water.
46	Borup loam	This soil is not generally suited for buildings, roads, or septic absorption fields. The main limitation is flooding hazard. Buildable soils are usually nearby.	63	Rockwell clay loam	This soil is poorly suited for building because of flooding and a high water table. If buildings are constructed on this soil, the lower level should be constructed above the high water table. Landscaping should be designed to drain surface water away from structures. This soil is poorly suited for septic systems because of its seasonal high water table and because of its moderate or moderately slow permeability, which it from readily absorbing effluent.
47	Colvin silty clay loam	Constructing tile drains around foundations helps to remove excess subsurface water. Buildings constructed on this soil should have the lower level constructed above the seasonal high water table. Landscaping should be designed to drain surface water away from structures. This soil is poorly suited to use a septic tank absorption fields because high water table. Mound systems may be suitable.	64	Ulen fine sandy loam	This soil is poorly suited for building because of flooding and a high water table. If buildings are constructed on this soil, the lower level should be constructed above the high water table. Landscaping should be designed to drain surface water away from structures. This soil is poorly suited to use for septic systems because of the high water table. The poor filtering capacity may result in the pollution of ground water supplies. In some places a mount system may be suitable.
52	Augsburg silt loam	This soil is generally not suited for building sites and septic systems due to flood hazard.	65	Foxhome fine sandy loam	Buildings constructed on this soil should have the lower level constructed above the seasonal high water table. Landscaping should be designed to drain surface water away from structures. This soil is poorly suited to use for septic systems because of the high water table. In some places a mount system may be suitable.
58A	Kittson fine sandy loam, 0 to 2 percent slopes	Buildings constructed on this soil should have the lower level constructed above the seasonal high water table. Foundations and footings should be designed to withstand shrinking and swelling. Landscaping should be designed to drain surface water away from structures. This soil is poorly suited for septic systems because of its seasonal high water table and because of its moderate or moderately slow permeability, which it from readily absorbing effluent.	66	Flaming fine sand	Buildings constructed on this soil should have the lower level constructed above the seasonal high water table. Landscaping should be designed to drain surface water away from structures. This soil is poorly suited to use for septic systems because of the high water table. The poor filtering capacity may result in the pollution of ground water supplies. In some places a mount system may be suitable.

Soil Survey of Clay County

Appendix 2

Soil Descriptions

Symbol	Soil Name	Description	Symbol	Soil Name	Description
67A	Bearden silt loam, 0 to 2 percent slopes	Buildings constructed on this soil should have the lower level constructed above the seasonal high water table. Foundations and footings should be designed to withstand shrinking and swelling. Landscaping should be designed to drain surface water away from structures. This soil is poorly suited to use a septic absorption fields because of the seasonal high water table and because the soil does not adequately filter the effluent. The poor filtering may lead to pollution of ground water supplies. A mound type system may be suitable.	184B	Hamerly loam, 1 to 4 percent slopes	Constructing tile drains around foundations helps to remove excess subsurface water. Buildings constructed on this soil should have the lower level constructed above the seasonal high water table. Landscaping should be designed to drain surface water away from structures. This soil is poorly suited to use a septic tank absorption fields because high water table. Mound systems may be suitable.
68	Arveson clay loam, depressional	This soil is generally not to use as building sites or septic tank absorption fields because of the flood hazard.	236	Vallers loam	Constructing tile drains around foundations helps to remove excess subsurface water. Buildings constructed on this soil should have the lower level constructed above the seasonal high water table. Landscaping should be designed to drain surface water away from structures. This soil is poorly suited to use a septic tank absorption fields because high water table. Mound systems may be suitable.
71	Fossum loamy sand	This soil is poorly suited for building because of flooding and a high water table. If buildings are constructed on this soil, the lower level should be constructed above the high water table. Landscaping should be designed to drain surface water away from structures. This soil is poorly suited to use a septic absorption fields because of the seasonal high water table and because the soil does not adequately filter the effluent. The poor filtering may lead to pollution of ground water supplies. A mound type system may be suitable.	245B	Lohnes coarse sandy loam, 1 to 6 percent slopes	This soil is well suited as a building site for buildings and local roads. This soil readily absorbs but does not adequately filter septic tank effluent, and may lead to ground water pollution.
93	Bearden silty clay loam	Buildings constructed on this soil should have the lower level constructed above the seasonal high water table. Foundations and footings should be designed to withstand shrinking and swelling. Landscaping should be designed to drain surface water away from structures. This soil is poorly suited to use a septic tank absorption fields because of the seasonal high water table. A mound type system may be suitable.	293B	Swenoda sandy loam, 1 to 4 percent slopes	Foundations and footings should be designed withstand swelling and shrinking. Constructing tile drains around foundations helps to remove excess subsurface water. Buildings constructed on this soil should have the lower level constructed above the seasonal high water table. Landscaping should be designed to drain surface water away from structures. This soil is poorly suited to use a septic tank absorption fields because high water table. Mound systems may be suitable.
148	Poppleton fine sand	This soil is poorly suited to use as septic tank absorption fields due to high water table and poor filtration. Poor filtration may lead to ground water pollution; mound systems may be acceptable in certain situations.	343A	Wheatville silt loam, 0 to 2 percent slopes	This soil is poorly suited to use a septic tank absorption fields because high water table. Mound systems may be suitable. If buildings are constructed on this soil foundations and footings should be constructed to withstand shrinking and swelling.

Soil Survey of Clay County

Appendix 2

Soil Descriptions

Symbol	Soil Name	Description	Symbol	Soil Name	Description
402B	Sioux sandy loam, 1 to 6 percent slopes	This soil is well suited as a building site for buildings and local roads. This soil readily absorbs but does not adequately filter septic tank effluent, and may lead to ground water pollution.	494	Darnen loam	Buildings constructed on this soil should have the lower level constructed above the seasonal high water table. Foundations and footings should be designed to withstand shrinking and swelling. Landscaping should be designed to drain surface water away from structures. The soil is poorly suited for on-site septic systems; in some cases a mound system may be suitable.
403	Viking sandy clay loam	Constructing tile drains around foundations helps to remove excess subsurface water. Buildings constructed on this soil should have the lower level constructed above the seasonal high water table. Landscaping should be designed to drain surface water away from structures. This soil is poorly suited to use a septic tank absorption fields because high water table. Mound systems may be suitable.	508	Wyndmere fine sandy loam	This soil is poorly suited for on-site septic due to a high water table. Mound systems may suitable. Buildings constructed on this soil should have the lower above the seasonal high water mark. Landscaping should be designed to drain surface water away from structures.
413	Osakis loam	Buildings constructed on this soil should have the lower level constructed above the seasonal high water table. Landscaping should be designed to drain surface water away from structures. This soil readily absorbs but does not adequately filter the effluent from septic absorption fields. Ground water pollution may result. Mount systems may be suitable.	510	Elmville fine sandy loam	Buildings constructed on this soil should have the ground floor constructed above the seasonal high water table. Landscaping should be designed to drain surface water away from structures. Foundations and footings should be designed to prevent structural damage from shrinking and swelling. This soil is poorly suited for on-site septic due to a high water table. Mound systems may suitable.
426	Foldahl loamy fine sand	Buildings constructed on this soil should have the lower level constructed above the seasonal high water table. Foundations and footings should be designed to withstand shrinking and swelling. Landscaping should be designed to drain surface water away from structures. This soil is poorly suited for septic fields because the upper part of the soil does not filter effluents. The seasonal high water table is an additional limitation to on-site septic.	543	Markey muck	This soil is generally not suited for building sites and septic systems because of the ponding hazard.
435	Syrene sandy clay loam	This soil is poorly suited for building site because of wetness. If buildings are constructed on this soil, they should be built with out a basement. This soil is poorly suited to use a septic tank absorption fields because high water table. Mound systems may be suitable.	609	Dickey loamy fine sand	Buildings constructed on this soil should have the foundations and footings should be designed to withstand shrinking and swelling. This soil is poorly suited for septic fields because the upper part of the soil does not filter effluents. The poor filtering capacity of the soil may result in the pollution of the ground water. Installing a larger than average drain field helps to lessen the severity of these limitations.

Soil Survey of Clay County

Appendix 2

Soil Descriptions

Symbol	Soil Name	Description	Symbol	Soil Name	Description
1001	Haplaquolls and Udifluvents, level	These soils are generally not suited to use as sites for dwellings, small commercial buildings, local roads or streets, or septic tank absorption fields. The flood hazard is the main limiting factor.	1055	Haplaquolls and Histosols, ponded	These soils are generally not suited to use as sites for dwellings, small commercial buildings, local roads or streets, or septic tank absorption fields. Wetness and ponding are the main limitations.
1005	Fluvaquents, loamy	These soils are generally not suited to use as sites for dwellings, small commercial buildings, local roads or streets, or septic tank absorption fields. The flood hazard is the main limiting factor.	1819	Glyndon silty clay loam	Buildings constructed on this soil should have the lower level constructed above the seasonal high water table. Landscaping should be designed to drain surface water away from structures. This soil is poorly suited to use a septic tank absorption fields because high water table. Mound systems may be suitable.
1006	Fluvaquents-Haploborolls complex	These soils are generally not suited to use as sites for dwellings, small commercial buildings, local roads or streets, or septic tank absorption fields. The flood hazard on bottom lands and the steepness of adjoining slopes are the principal limitations to urban uses of these soils.	1874	Lohnes sandy loam	This soil is well suited as a building site for buildings and local roads. This soil readily absorbs but does not adequately filter septic tank effluent, and may lead to ground water pollution.
1029	Pits, gravel	Areas of these pits can be leveled and reclaimed, but their suitability for uses will vary considerably; onsite investigation is necessary to determine suitability.	1875	Flom clay loam, depressional	This soil is not generally suited for buildings, roads, or septic absorption fields. The main limitation is flooding hazard and ponding. Buildable soils are usually nearby.