ENVIRONMENTAL ASSESSMENT WORKSHEET (EAW)

Mesenbrink Mixed-Use Development, Mankato, MN

January 2023

ENVIRONMENTAL ASSESSMENT WORKSHEET

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1 Project Title

Mesenbrink Mixed-Use Development, Mankato, MN

2 Proposer

Organization:	Mesenbrink Construction & Engineering, Inc.
Contact person:	John Mesenbrink
Title:	Owner
Address:	7765 East 175th Street
City, State, ZIP:	Prior Lake, MN 55372
Phone:	952 447 5058
Email:	jemmbc@mesenbrinkconstruction.com

3 RGU

Organization:	City of Mankato
Contact person:	Mark Konz
Title:	Associate Director - Planning and Development Services
Address:	10 Civic Center Plaza PO Box 3368
City, State, ZIP:	Mankato, MN 56002-3368
Phone:	507-387-8611
Fax:	507-388-7530
Email:	mkonz@mankatomn.gov

4 Reason for EAW Preparation

Required:

☐ EIS Scoping

☒ Mandatory EAW MS 4410-4300, Subpart 19.D.

Discretionary:

☐ Citizen petition

☐ RGU discretion

☐ Proposer initiated

Mandatory EAW, as identified in *Minnesota Rules, Part 4410.4300, Subpart 19.D.*

5 Project Location

County:	Blue Earth County		
City/Township:	Mankato		
PLS Location (¼, ¼, Section, Township, Range):	**Section**	**Township**	**Range**
SE Quarter	15	108N	26W
Watershed (82 major watershed scale):	Le Sueur River		
GPS Coordinates:	44.1549, -93.9339		
Tax Parcel Number:	R430915400009 and R430915400003		

6 Project Description

a. EQB Monitor Description

Provide the brief project summary to be published in the EQB Monitor, (approximately 50 words).

Mesenbrink Construction proposes the construction of a new mixed-use development consisting of retail space, apartment units and single family residential, located on approximately 105 acres in Blue Earth County (to be annexed into the City of Mankato).

b. Complete Description

Give a complete description of the proposed project and related new construction, including infrastructure needs. If the project is an expansion include a description of the existing facility. Emphasize: 1) construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes, 2) modifications to existing equipment or industrial processes, 3) significant demolition, removal or remodeling of existing structures, and 4) timing and duration of construction activities.

Project Description (Including Context/Need)

Mesenbrink Construction proposes the construction of a mixed-use development located on approximately 105 acres in Blue Earth County (to be annexed into the City of Mankato). The location of the Proposed Project is depicted on **Figure 1, "Regional Location,"** and **Figure 2, "USGS Location."** The existing property is primarily of agricultural use. In the northeast corner of the property contains part of an unnamed lake (07007100 as per the DNR). Mesenbrink Construction would develop the property from west to east starting with retail/residential units on the west side of the property. Then transition into apartment units in the middle of the development. Finishing with single family homes on the east side of the property. The development plans for the Proposed Project are depicted on **Figure 3, "Proposed Improvements."** The construction of the development would utilize traditional construction methods such as earth-moving equipment. Utilities within the Study Area would be installed as per the

City of Mankato guidelines. The construction of the development is planned to begin 2024 with finishing of the project to be determined. Construction is anticipated to commence in 2024, with full build-out completed over the course of five to ten years, depending on economic conditions.

The proposed mixed-use development follows the City of Mankato's *Land Use Plan* for the development of retail/residential, multiple-family residential, and single-family residential. According to the *Mankato Area Housing Study Update*, dated August 2022, the City of Mankato will have an estimated growth of 335 to 350 households per year. Vacancy rates for multiple-family units within the City of Mankato are currently low, necessitating the construction of additional multiple-family units.

Construction Methods

Traditional construction methods will be used during the construction of this development.

Modification to Existing Equipment

No modifications to existing equipment are anticipated to be required for the implementation of the Proposed Project.

c. Project Magnitude

Table 1: Project Magnitude

Total Project Acreage	105 acres
Linear project length	0.5 mile
Number and type of residential units	112 Single Family Homes 713 Apartment Units
Residential building area (in square feet)	3,436,764 square feet (land area)
Commercial building area (in square feet)	247,892 square feet (land area)
Industrial building area (in square feet)	N/A
Institutional building area (in square feet)	N/A
Other uses – specify (in square feet)	N/A
Structure height(s)	Max. 45 feet

d. Project Purpose

Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

The purpose of the Proposed Project is to provide additional housing and commercial property in the City of Mankato. The Proposed Project would also provide an extension of sanitary sewer and watermain to services to the future development of the property to the east (in the proposed extension of Hoffman Road to the east).

e. Future Development

Are future stages of this development including development on any other property planned or likely to happen?

☐ *Yes* ☒ *No*

If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

f. Previous Development

Is this project a subsequent stage of an earlier project? ☐ *Yes* ☒ *No*

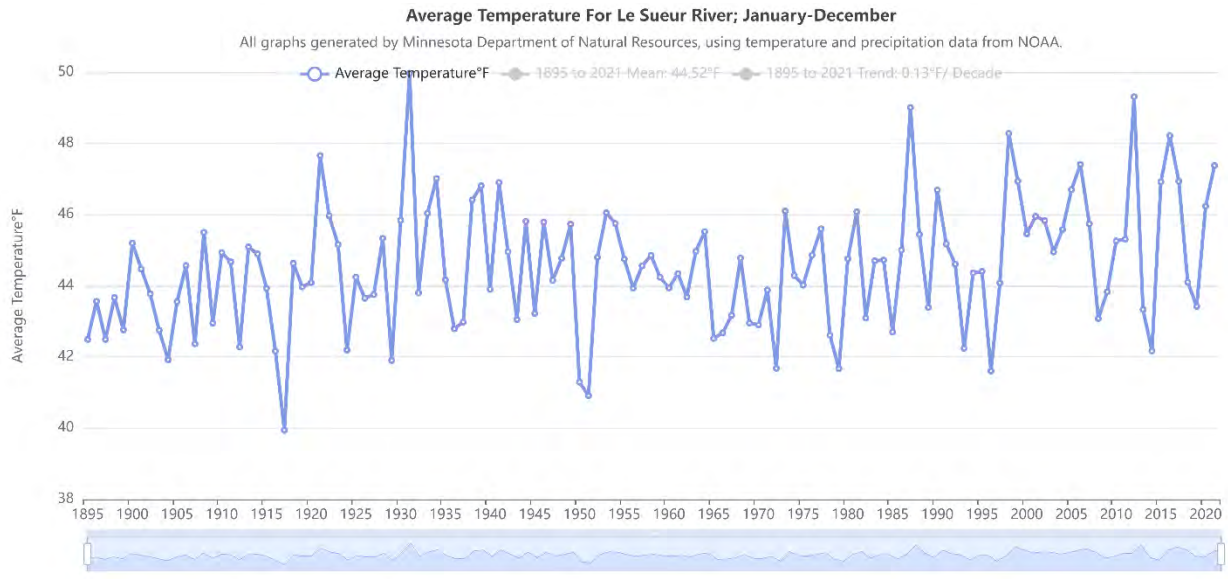
If yes, briefly describe the past development, timeline and any past environmental review.

7 Climate Adaptation and Resilience

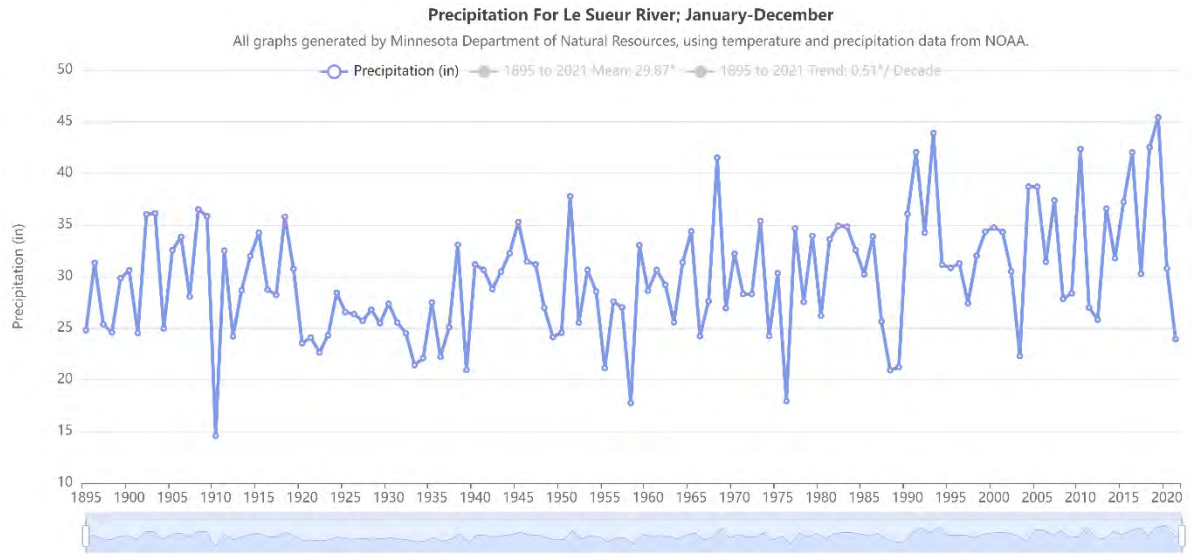
a. Climate Trends

Describe the climate trends in the general location of the project (see guidance: Climate Adaptation and Resilience) and how climate change is anticipated to affect that location during the life of the project.

The Proposed Project is located within the Le Sueur River Watershed. Data from the Minnesota Department of Natural Resources (DNR) *Minnesota Climate Explorer* shows climate trends for this watershed.[1] Historical data from 1895 to 2021 shows variable average temperatures and precipitation totals from year to year, as shown in the graphs below:



[1] Minnesota Department of Natural Resources. 2022. Minnesota Climate Explorer. Electronic resource, https://arcgis.dnr.state.mn.us/ewr/climateexplorer/main/historical, accessed January 2023.



The trends for temperature and precipitation within the Le Sueur River Watershed are:

- Average daily mean temperature of 44.52 degrees Fahrenheit with an increase of 0.13 degrees F per decade
- Average daily maximum temperature of 54.89 degrees Fahrenheit with a decrease of 0.02 degrees F per decade
- Average daily minimum temperature of 34.15 degrees Fahrenheit with an increase of 0.25 degrees F per decade
- Average annual precipitation of 29.87 inches with an increase of 0.51 inch per decade

Projected future data for the Le Sueur River Watershed was also evaluated using the *Minnesota Climate Explorer*. The mid-century (2040-2059) projections fit with the life of the project and are summarized below. The data makes projections using RCP 4.5 (representative concentration pathway), which is an intermediate stabilization scenario. The information shown is the model mean of eight general circulation global climate models.

- Projected average daily mean temperature: 48.59 degrees Fahrenheit
- Projected daily maximum temperature: 55.36 degrees Fahrenheit
- Projected daily minimum temperature: 42.05 degrees Fahrenheit
- Projected average annual precipitation: 32.07 inches

Comparing the projected values with the historical values, the average daily mean, maximum, and minimum temperatures and the average annual precipitation are all expected to rise over the life of the project.

b. Resource Categories

Table 2: Resource Categories

Resource Category	Climate Considerations	Project Information	Adaptations
Project Design	The Proposed Project involves the construction of new residential and commercial spaces. This will add new impervious surface as well as increase energy consumption within the Study Area.	Climate change-related risks and vulnerabilities include: - During intense rainfall events, increases in the amount of impervious surfaces may result in more localized flooding in the area - Certain building construction materials such as dark roofing materials absorb heat during the day and radiate it at night, which increases the urban heat island effect and amplifies the warming temperatures of climate change	The Study Area is outside of the 500-year flood plain according to FEMA's *Flood Insurance Risk Map*.[2] Blue Earth County's *Land Use Plan* identifies green infrastructure as a priority action.[3]
Land Use	Conversion of crop land to residential and commercial space will require the maintenance of associated roadways, sidewalks, and parking lots.	Climate change risks and vulnerabilities identified include: Increased freeze/thaw results in increased icing of roadways, trails, sidewalks, and parking lots, resulting in the need for increased salting. Chlorides degrade lake water quality and impact aquatic life. Chlorides also degrade soil and can kill landscape plantings	Blue Earth County's *Land Use Plan* identifies the following implementation action: "The development of future commercial uses in the rural area shall be reviewed for their emergency services, stormwater and wastewater treatment, access to transportation systems, and water supply needs and the corresponding impacts to those systems."[4]
Water Resources	Addressed in **Section 12**	Addressed in **Section 12**	Addressed in **Section 12**
Contamination/ Hazardous Materials/ Wastes	No hazardous waste is expected to be generated, used, or stored throughout the life of the project. Any waste generated during construction will be stored in marked containers in accordance with applicable laws and subsequently disposed of at licensed facilities.	N/A	N/A
Fish, wildlife, plant communities, and sensitive ecological resources (rare features)	Addressed in **Section 14**	Addressed in **Section 14**	Addressed in **Section 14**

[2] FEMA. Flood Map Area 2752310045D. Flood Map Service Center. 1990. Electronic resource, https://msc.fema.gov/portal/search?AddressQuery=Mankato%2C%20MN#, accessed October 2022.

8 Cover Types

Estimate the acreage of the site with each of the following cover types before and after development:

Project construction and disturbance limits were used to define the Study Area footprint. Existing and future land cover conditions within the Study Area are detailed in **Table 3**, **"Cover Types," Figure 4, "Existing Land Cover,"** and **Figure 5, "Future Land Cover."**

Table 3: Cover Types

Cover Type	Before (acres)	After (acres)	Cover Type	Before (acres)	After (acres)
Wetlands and shallow lakes (<2 meters deep)	28.59	21.5	Livestock rangeland/pastureland	0	0
Deep lakes (>2 meters deep)	0	0	Lawn/landscaping	3.52	43.51
Wooded/forest	0	0	Green infrastructure TOTAL (from table below*)	0	0
Rivers/Streams	0	0	Impervious surface	1.36	30.94
Brush/Grassland	0	0	Stormwater Pond (wet sedimentation basin)	0	3.56
Cropland	70.61	4.57	Other (describe)	0	0
			TOTAL	104.08	104.08

Table 4: Green Infrastructure

Green Infrastructure Type	Before (acres)	After (acres)
Constructed infiltration systems (infiltration basins/infiltration trenches/rainwater gardens/bioretention areas without underdrains/swales with impermeable check dams)	0	0
Constructed tree trenches and tree boxes	0	0
Constructed wetlands	0	0
Constructed green roofs	0	0
Constructed permeable pavements	0	0
Other (describe)	0	0
TOTAL*	**0**	**0**

[3] Blue Earth County. Blue Earth County Land Use Plan. 2018. Electronic document, https://www.blueearthcountymn.gov/DocumentCenter/View/4148/Approved-Land-Use-Plan---2018-, accessed October 2022.
[4] Blue Earth County 2018: 99.

Table 5: Trees

	Percent	Number
Percentage of tree canopy removed, or number of mature trees removed during development	0%	0
Number of new trees planted	TBD	TBD

9 Permits & Approvals Required

List all known local, state and federal permits, approvals, certifications and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure. All of these final decisions are prohibited until all appropriate environmental review has been completed. See Minnesota Rules, Chapter 4410.3100.

All known permits at state, federal, and local levels required for the Proposed Project are listed in **Table 6, "Required Permits & Approvals."**

Table 6: Required Permits & Approvals

Government Agency	Type of Application/Permit	Status
State Agencies		
Minnesota Pollution Control Agency	National Pollutant Discharge Elimination System (NPDES) Construction Storm Water Permit	To be applied for
	Sanitary Sewer Extension Permit	To be applied for
Minnesota Department of Health	Watermain Extension Permit	To be applied for
Minnesota Department of Natural Resources	Water Appropriations Permit	To be applied for, if necessary
Local Agencies (if applicable)		
City of Mankato / Mankato Township	Conditional Use Permit (as needed)	To be applied for
City of Mankato / Mankato Township	Residential Building Permit	To be applied for
City of Mankato	Grading/Excavating Permit	To be applied for

10 Land Use

a. Existing Land Use

Description

Existing land use of the site as well as areas adjacent to and near the site, including parks and open spaces, cemeteries, trails, prime or unique farmlands.

Existing land uses within and adjacent to the Study Area are detailed in **Figure 6, "Existing Land Use."** The approximately 105-acre Study Area is comprised of mostly out-of-production agricultural fields with some forested areas in the north, as well as 28.59 acres of wetlands located in the northeast section of the Study Area. A review of available historic aerial imagery reveals the land has been largely in agricultural production since at least the late 1930s, with portions of the current forested area present in the north part of the Study Area. There are no anticipated significant potential environmental hazards due to these past land uses within the Study Area.

The land uses directly adjacent to the site include residential homes, agricultural land, a wetland, a senior living facility, and forested areas. The Minnesota Department of Transportation District Headquarters and the Blue Earth County Justice Center/County Jail are located farther to the north. To the east, past a small piece of agricultural land, is a solar farm. The southern extent of the property is bordered by a forested area, followed by agricultural land for approximately a mile. To the west, past a senior living facility, there are multiple apartment complexes, a middle school, and the site of a future low-density residential development.

There are no existing roadways within the Study Area, but the project is connected to US Highway 14 and MN Highway 83 via County Highway 12. Downtown Mankato is located approximately three miles west of the Study Area.

As shown on **Figure 15, "Outdoor Recreation,"** no parks, open space, or outdoor recreational facilities are located within the Study Area.

Local Plans

Describe planned land use as identified in comprehensive plan (if available) and any other applicable plan for land use, water, or resources management by a local, regional, state, or federal agency.

The City of Mankato's *Land Use Plan* provides the city with a guide for the future development of public and private property within city limits while sustaining Mankato's natural and economic environments. The *Land Use Plan* aligns with State of Minnesota Statute 462.353 and acts as the city's Comprehensive Plan. As shown in **Figure 7, "Proposed Land Use,"** Mankato's *Land Use Plan* designates the area as Parks/Open Space, Mixed Residential/Retail, High-Density Residential, and Public-Semi Public. Pending approval of the environmental review process, the subject property would be guided as Parks/Open Space, Mixed Residential/Retail, High-Density Residential, and Medium-Density Residential—where it was previously guided at Public-Semi Public.

The goal of the Mixed Residential/Retail land use designation is to encourage and support alternative development patterns which allow for a mixture of uses for retail, residential, and office to co-exist in the same areas, within nodes or urban villages. The goal of the High-Density Residential designation is to promote low, medium, and high-density residential development which provides affordable and lifecycle housing. The goal of the Medium-Density Residential Designation is to promote low and medium-density residential development which provides affordable and lifecycle housing opportunities. The *Land Use Plan* does not include goals for the Public/Open Space designations or the Public-Semi Public designations.

Zoning

Zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic rivers, critical area, agricultural preserves, etc.

The subject property is not currently classified under *Chapter 10, "Land Use (Zoning),"* of the *Mankato City Code*. The surrounding properties to the north, east, and south also lack zoning classifications. However, the parcels to the west of the subject property, across 586th Avenue, are classified as R-4: Multiple Dwelling. The purpose of this district is to provide for high-density residential development.

Pending approval of the environmental review process, the subject property will be given zoning classifications aligned with the proposed land uses. The western extent of the subject property is anticipated to be zoned B-1, "Community Business District"; the middle section of the Study Area is anticipated to be zoned R-4, "Multiple-Family Dwelling District"; and the eastern extent is anticipated to be zoned R-1, "One-Family Dwelling District." The B-1, "Community Business District," is designed to provide for a broad range of retail developments which are adjacent to residential areas. The R-4, "Multiple-Family Dwelling District," is intended to provide for high-density residential development. The R-1, "One-Family Dwelling District," is intended to provide for low-density residential development.

In November 2022, the Mankato City Council adopted *Ordinance No. O-2022-1114-16*, creating *Mankato City Code Chapter 10, Section 10.65, "Shoreland Overlay District."* Effective as of January 1, 2023, the purpose of this Ordinance is to guide the subdivision, use, and development of shorelands of public waters in Minnesota. As shown on **Figure 3, "Proposed Improvements,"** a portion of the Study Area is located within a Shoreland Overlay District, as defined in *Minnesota Rules, Parts 6120.2500 – 6120.3900*, as land located within 1,000 feet from the ordinary high water (OHW) level of a lake, pond, or flowage.

All local and State regulations—including a 150-foot setback from the OHW level of public waters, depicted on **Figure 3, "Proposed Improvements"**—related to Shoreland Overlay Districts would be followed throughout the implementation of the Proposed Project. The residential portions of the Proposed Project would be designated as a Planned Unit Development (PUD) overlay district.

The subject property is not identified as a Special Flood Hazard Area on the effective FEMA FIRM panel 2752310045D, dated March 5, 1990. Thus, the subject property is not located in a Floodway District, Flood Fridge District, or General Floodplain District, as defined by *Chapter 10, "Land Use (Zoning),"* of the *Mankato City Code*.

Critical Facilities

Describe any critical facilities (i.e. facilities necessary for public health and safety, those storing hazardous materials, or those with housing occupants who may be insufficiently mobile) that exist within or near the project area.

The subject property is surrounded by agricultural land or open space to the north, east, and south for approximately 1.5 miles. To the west, the subject property abuts a senior living facility. Past the facility, the area includes newly developed multiple-family dwellings, a middle school, and a planned low-density residential neighborhood. The Minnesota Department of Transportation District Headquarters and the Blue Earth County Justice Center/County Jail are located approximately half a mile northwest of the Study Area. The nearest hospital, the Mayo Clinic/Immanuel St. Joseph Hospital, is located approximately two miles northwest of the Study Area. The Study Area is located approximately one mile from Kennedy Elementary School, one-half mile from Prairie Winds Middle School, and one mile from Mankato East Senior High School. The Study Area connects to US Highway 14 and MN Highway 83 from County Highway 12. An existing 18-inch sanitary sewer line and 12-inch water main line connect to the Project Site at the intersection of County Highway 12 and Hoffman Road.

b. Project Compatibility

Discuss the project's compatibility with nearby land uses, zoning, and plans listed in Item 10a above, concentrating on implications for environmental effects.

The Proposed Project is generally consistent with the City of Mankato's approved land use and zoning plans. The goal of the Mesenbrink Mixed-Use Development Project is to provide area residents with a variety of housing options near a variety of retail and daily service destinations. This goal aligns well with the goals of the applicable land use and zoning classifications within the Study Area. The project will also include the construction of a park and five small stormwater ponds.

c. Project Incompatibility

Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 10b above.

The eastern half of the Study Area is designated as Parks/Open Space in the north and Public/Semi-Public in the south in the Mankato Land Use Plan. According to the City's *Land Use Plan*, the Public/Semi-Public designation encompasses a wide spectrum of uses including government entities, churches, schools, hospitals, non-profit organizations, institutions, and universities. This is currently incompatible with the Proposed Project's intention to use this space as a site for single-family residential development. To mitigate this incompatibility, the project team will amend the City's *Land Use Plan* to change the designation of the subject property from Public/Semi-Public to Medium-Density Residential, pending approval of the Proposed Project's environmental review process. The goal of the Medium-Density Residential Designation is to promote low and medium-density residential development which provides affordable and lifecycle housing opportunities. The goal of this land use designation aligns with the Proposed Project and future zoning classifications.

11 Geology, Soils, & Topography/Land Forms

a. Geology

Describe the geology underlying the project area and identify and map any susceptible geologic features such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. Discuss any limitations of these features for the project and any effects the project could have on these features. Identify any project designs or mitigation measures to address effects to geologic features.

The Study Area is located within the Des Moines lobe glacial drift. According to the *Blue Earth County Geological Atlas* (1991), glacial drift deposits range in thickness from slightly less than 150 feet to over 300 feet. No geological site hazards to groundwater are known to occur within the Study Area. Sinkholes, unconfined/shallow aquifers, and shallow limestone bedrock are not known to exist within the Study Area. The nearest areas prone to surface karst feature development are located approximately three miles northwest of the Study Area, near the Minnesota River valley, and south of the Study Area, near the Le Sueur River. There are no wells identified within the Study Area. Local wells near the Study Area were drilled to a maximum depth of 262 feet, with none reaching bedrock.

b. Soils & Topography

Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability or other soils limitations, such as steep slopes, highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 12.b.ii.

According to the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) *Web Soil Survey*, there are nine soil classification types located within the Study Area, detailed in **Table 7, "NRCS Soil Classifications within Study Area,"** and **Figure 8, "Soils."** The area surrounding the Study Area contains largely similar soil types, though not all are redundant.

Table 7: NRCS Soil Classifications within Study Area

Percent of Study Area	Map Unit Symbol	Map Unit Name	Drainage Class	Hydrologic Soil Group	Wind Erodibility Group	K Factor, Whole Soil
31.7%	109	Cordova clay loam, 0 to 2 percent slopes	Poorly Drained	C / D	6	0.28
25.0%	110	Marna silty clay loam, 0 to 2 percent slopes	Poorly Drained	C / D	4	0.32

Percent of Study Area	Map Unit Symbol	Map Unit Name	Drainage Class	Hydrologic Soil Group	Wind Erodibility Group	K Factor, Whole Soil
10.2%	287	Minnetonka silty clay loam	Poorly Drained	C / D	6	0.32
8.6%	539	Klossner muck, lake plain depressional, 0 to 1 percent slopes	Very Poorly Drained	C / D	2	-
8.4%	525	Muskego soils, 0 to 1 percent slopes	Very Poorly Drained	C / D	2	-
5.7%	239	Le Sueur loam, 1 to 3 percent slopes	Somewhat Poorly Drained	C / D	6	0.28
4.4%	286	Shorewood silty clay loam, 1 to 6 percent slopes	Moderately Well Drained	C / D	6	0.28
4.1%	211	Lura silty clay, 0 to 1 percent slopes	Very Poorly Drained	C / D	4	0.28
2.0%	114	Glencoe silty clay loam, 0 to 1 percent slopes	Very Poorly Drained	C / D	6	0.28

NRCS classifies soils into hydrologic soil groups, A through D. Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms. NRCS definitions by hydrologic soil group are below.

- Group A – Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands.
- Group B – Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately course texture.
- Group C – Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture.
- Group D – Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays with high swelling potential, soils with a permanent high-water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material.
- If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Table 7 shows that the Study Area is primarily comprised of hydrologic soil groups. Soils in the C or C/D category may require additional artificial drainage measures.

Erodibility of soils within the Study Area is also noted in **Table 7**. For Wind Erodibility Group, those soils that are most susceptible to wind erosion have a rating of 1 while those that are least susceptible have a rating of 8. Within the Study Area, the majority of soils are rating 4 or above, indicating moderate wind erodibility. The K Factor, Whole Soil, rating is based upon the percentages of silt, sand, and organic matter within a given soil structure, modified by the presence of rock fragments. Values range from 0.02 to 0.69, with higher values indicating greater susceptibility of soils to sheet and rill erosion by water. The majority of soils within the Study Area are rated 0.28, indicating minimal water erosion susceptibility of these soils.

The Study Area is largely flat, with the northern end of the Study Area at a slightly higher elevation than the southern end. There are no steep slopes located within the Study Area.

As required by the NPDES permit, mitigation measures related to the preservation of existing soil conditions within the Study Area will be followed as part of the Proposed Project, including but not limited to:

- Construction phasing where possible to limit the amount of exposed soils.
- Soil stabilization in areas where construction activities are halted for 14 days or more.
- Stabilize exposed soils within 24 hours where the portion of the side drains to a public water.

For additional discussion of NPDES permitting requirements and erosion/sedimentation control related to stormwater runoff, please refer to **Section 12, "Water Resources."**

12 Water Resources

a. Surface Water & Groundwater Features

Describe surface water and groundwater features on or near the site in a.i and a.ii below.

i. Surface Water

Describe lakes, streams, wetlands, intermittent channels, and county/judicial ditches. Include any special designations such as public waters, shoreland classification and floodway/floodplain, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include the presence of aquatic invasive species and the water quality impairments or special designations listed on the current MPCA 303d Impaired Waters List that are within 1 mile of the project. Include DNR Public Waters Inventory number(s), if any.

Public Waters – One Mile Search Area

Surface waters located within and adjacent to the Study Area are depicted on **Figure 10, "Surface Waters."** The Study Area is located within the Le Sueur River major watershed (HUC8: 07020011).

Portions of the site include:

- Unnamed Public Water Stream flowing to the Le Sueur River – PWI Number 7-23a
- Unnamed Public Water Wetland – DNR Basin ID: 7-71

- Unnamed Public Water Wetland – DNR Basin ID: 7-73

As shown on **Figure 3, "Proposed Improvements,"** a portion of the Study Area is located within a Shoreland Overlay District, as defined in *Minnesota Rules, Parts 6120.2500 – 6120.3900*, as land located within 1,000 feet from the ordinary high water (OHW) level of a lake, pond, or flowage.

Wetlands

A wetland delineation, approved by the Local Government Unit on February 22, 2022, identified 11 wetlands within the Study Area, totaling 28.59 acres. The approved wetland delineation report is included in **Appendix B, "Additional Assessments."** The following delineated wetlands were identified within the Study Area:

- Basin 1 (21.50 Acres) is a shallow open water community with fringing wetlands located in the northern part of the property which is listed as an Unnamed Public Water Wetland – DNR Basin ID: 7-71
- Basin 2 (0.07 Acres) is a seasonally flooded basin located along the western edge of the property
- Basin 3 (1.63 Acres) is a seasonally flooded basin located along the western edge of the property
- Basin 4 (0.33 Acres) is a seasonally flooded basin located along the western edge of the property
- Basin 5 (0.27 Acres) is a seasonally flooded basin located along the western edge of the property
- Basin 6 (0.62 Acres) is a seasonally flooded basin located along the western edge of the property
- Basin 7 (0.33 Acres) is a seasonally flooded basin located along the western edge of the property
- Basin 8 (0.15 Acres) is a seasonally flooded basin located along the western edge of the property
- Basin 9 (1.71 Acres) is a seasonally flooded basin located along the western edge of the property
- Basin 10 (1.30 Acres) is a seasonally flooded basin located along the western edge of the property
- Basin 12 (0.12 Acres) is a seasonally flooded basin located along the western edge of the property
- Basin 15 (0.58 Acres) is a seasonally flooded basin located along the western edge of the property

ii. Ground Water

Describe aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within a MDH wellhead protection area; 3) identification of any onsite and/or nearby wells, including unique numbers and well logs if available. If there are no wells known on site or nearby, explain the methodology used to determine this.

Groundwater data for the Study Area was obtained from MnDNR and Blue Earth County. The Proposed Project is located within the Shakopee (Prairie du Chien Group) aquifer formation and the Oneota Dolomite (Prairie du Chien) aquitard formation.

According to the MnDNR *Spring Inventory*, no springs are identified within the Study Area. Depth to groundwater within the Study Area is generally 0-10 feet. The Proposed Project is not within an existing DWSMA or wellhead protection area.

There are no existing domestic wells onsite, however, as detailed on **Figure 9, "Geologic Conditions & Groundwater,"** there are several wells located on properties adjacent to the Study Area. Any unexpected wells encountered during the construction of the Proposed Project will be sealed in accordance with the requirements of the Minnesota Department of Health.

b. Project Effects & Mitigations

Describe effects from project activities on water resources and measures to minimize or mitigate the effects in Item b.i. through Item b.iv. below.

i. Wastewater

For each of the following, describe the sources, quantities and composition of all sanitary, municipal/domestic and industrial wastewater produced or treated at the site.

1. *If the wastewater discharge is to a publicly owned treatment facility, identify any pretreatment measures and the ability of the facility to handle the added water and waste loadings, including any effects on, or required expansion of, municipal wastewater infrastructure.*

The Proposed Project would require the extension of City of Mankato sanitary sewer infrastructure from a planned connection point at the intersection of Hoffman Road and Blue Earth County CSAH 12. The sanitary sewer is sized to account for this development along with future development to the east. Wastewater would primarily be generated by single-family homes and apartment buildings, as well as a convenience store, car wash, and additional commercial facilities.

No wastewater treatment would be conducted on site. Wastewater would be collected in the extended sanitary sewer and routed to the Mankato Wastewater Reclamation Facility (WWRF). The Mankato WWRF currently has enough capacity to accommodate the Proposed Project, and also may be expanded during the life of the Proposed Project.

Wastewater generated by the Proposed Project was determined by the following:

- 112 single-family homes: 100 gal/capita/day, 3-person occupancy = **33,600 gallons/day**
- 713 apartments: 100 gal/capita/day, 2.7-person avg. occupancy = **192,510 gallons/day**
- Convenience Store: **assumed 1,000 gallons/day**
- Car Wash: **assumed 3,500 gallons/day**
- Retail Stores: assumed 8 stores with 200 gal/store/day = **1,600 gallons/day**
- Total estimated wastewater = **232,210 gallons/day**

A Minnesota Pollution Control Agency (MPCA) Sanitary Sewer Extension Permit would be obtained prior to the construction of the Proposed Project.

2. *If the wastewater discharge is to a subsurface sewage treatment systems (SSTS), describe the system used, the design flow, and suitability of site conditions for such a system. If septic systems are a part of the project, describe the availability of septage disposal options within*

the region to handle the ongoing amounts generated as a result of the project. Consider the effects of current Minnesota climate trends and anticipated changes in rainfall frequency, intensity and amount with this discussion.

Wastewater generated by the Proposed Project would be routed to the Mankato WWRF via sanitary sewer.

3. *If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigate impacts. Discuss any effects to surface or groundwater from wastewater discharges, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects.*

Wastewater generated by the Proposed Project would be routed to the Mankato WWRF via sanitary sewer. The WWRF will treat sewage prior to discharge.

ii. Stormwater

Describe the changes in surface hydrology resulting from change of land cover. Describe the routes and receiving water bodies for runoff from the project site (major downstream water bodies as well as the immediate receiving waters). Discuss environmental effects from stormwater discharges on receiving waters post construction including how the project will affect runoff volume, discharge rate and change in pollutants. Consider the effects of current Minnesota climate trends and anticipated changes in rainfall frequency, intensity and amount with this discussion. For projects requiring NPDES/SDS Construction Stormwater permit coverage, state the total number of acres that will be disturbed by the project and describe the stormwater pollution prevention plan (SWPPP), including specific best management practices to address soil erosion and sedimentation during and after project construction. Discuss permanent stormwater management plans, including methods of achieving volume reduction to restore or maintain the natural hydrology of the site using green infrastructure practices or other stormwater management practices. Identify any receiving waters that have constructed-related water impairments or are classified as special as defined in the Construction Stormwater permit. Describe additional requirements for special and/or impaired waters.

Stormwater Quantity and Quality

The developable portions of the Study Area are currently used for row-crop agriculture. The Proposed Project would alter the landscape and hydrologic conditions of the site through changing the land use with the construction of streets, buildings, sidewalks, and driveways. It is anticipated that approximately 30 acres of new impervious area would be generated within the Study Area. Runoff from the Proposed Project would be collected into storm sewer pipes and routed to onsite stormwater wet sedimentation basins to remove pollutants and regulated discharge rates leaving the property to at or below existing conditions.

Soil conditions and depth to groundwater make constructing volume control stormwater best management practices (BMPs) infeasible. To meet City and State stormwater management requirements, multiple wet sedimentation basins are proposed. Smaller wet sedimentation basins

would be constructed in available green spaces near the proposed apartment units and the single-family homes, with one large regional wet sedimentation basin designed to manage and treat any remainder runoff needed to meet regulations.

The project would meet or exceed the City of Mankato's *City Ordinances* which are based on State MS4 requirements and the MPCA's NPDES Construction Stormwater Permit.

Runoff Routes

The existing property is relatively flat with small pocket depressions that store runoff on the landscape. In general, runoff from the property travels north to a large unnamed public water wetland. The outlet for this wetland is County Ditch 12, which routes around the property to the south and ultimately discharges into the Le Sueur River.

The Proposed Project would maintain the existing conditions characteristics and patterns with the mall collected runoff in the property discharging to the same unnamed public water wetland to the north. For areas draining directly to the unnamed public water wetland, converting what is row-crop agriculture today to turf will reduce pollutant loads including total suspended solids (TSS). Existing drainage patterns are shown on **Figure 11, "Existing Drainage Patterns,"** and proposed drainage patterns are shown on **Figure 12, "Proposed Drainage Patterns."**

Stormwater Controls

The construction plan will include: an erosion and sediment control plan, a turf establishment plan and a Stormwater Pollution Prevention Plan (SWPPP). Stormwater control measures would include standard erosion control best management practices including but not limited to silt fences, rock construction entrances, temporary sedimentation basins, inlet protections and any requirements outlined in the City grading permit and the MPCA NPDES Construction Stormwater Permit.

Grading activities will be phased to minimize any erosion that may occur during an unexpected rainfall event. Maximum efforts will be incorporated during construction and post-construction to reduce erosion and protect water quality to the downstream receiving water bodies.

iii. Water Appropriation

Describe if the project proposes to appropriate surface or groundwater (including dewatering). Describe the source, quantity, duration, use and purpose of the water use and if a DNR water appropriation permit is required. Describe any well abandonment. If connecting to an existing municipal water supply, identify the wells to be used as a water source and any effects on, or required expansion of, municipal water infrastructure. Discuss environmental effects from water appropriation, including an assessment of the water resources available for appropriation. Discuss how the proposed water use is resilient in the event of changes in total precipitation, large precipitation events, drought, increased temperatures, variable surface water flows and elevations, and longer growing seasons. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation. Describe contingency plans should the appropriation volume increase beyond infrastructure capacity or water supply for the project

diminish in quantity or quality, such as reuse of water, connections with another water source, or emergency connections.

The Proposed Project would require the extension of City of Mankato watermain from a planned connection point at Hoffman Road and Blue Earth County CSAH 12. The watermain is sized to account for this development and future development to the east. A Minnesota Department of Health permit is required for the watermain installation and would be obtained prior to construction. Water flow and pressure will be adequate for the Proposed Project.

An estimate of daily water use was determined with the following criteria:

- Total estimated wastewater = **232,210 gallons/day** which is expected to be the same as water use
- Irrigation basis – as suggested by City of Mankato staff: If a person has an average of 8 zones in their yard and waters each zone 15 minutes per zone, they will use 2,880 gallons per week or 11,520 gallons per month. 11,520/30 days per month = 384 gallons per house per day of water. This can be reduced to approximately 6 months out of the year in Minnesota which yields 192 gal/day normalized.
    - 112 single-family homes = **21,504 gallons/day**
    - The multi-family and commercial area contains approximately 1/3 the green space as the single-family home area. Therefore, it can be approximated that this area would require **7,168 gallons/day**
- Total estimated water use is 260,882 gallons/day

It is not anticipated that the project will require dewatering activities. A MnDNR Water Appropriations permit would be obtained prior to construction if it is determined that dewatering activities are required.

iv. Surface Waters

1. *Wetlands- Describe any anticipated physical effects or alterations to wetland features such as draining, filling, permanent inundation, dredging and vegetative removal. Discuss direct and indirect environmental effects from physical modification of wetlands, including the anticipated effects that any proposed wetland alterations may have to the host watershed, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. Identify measures to avoid (e.g., available alternatives that were considered), minimize, or mitigate environmental effects to wetlands. Discuss whether any required compensatory wetland mitigation for unavoidable wetland impacts will occur in the same minor or major watershed, and identify those probable locations.*

Wetlands

Delineated Wetlands

Impacts to Basin 1, a Public Water Wetland, would be avoided, and a 150-foot setback would be maintained from the OHW of the wetland. All other wetlands are considered isolated and heavily

degraded as a result of agricultural activities. These wetlands would be completely filled to allow for development.

Permitting and Sequencing Information

All wetland impacts would be properly permitted through the MNDNR, Wetland Conservation Act of Minnesota (WCA) and Section 404 of the Clean Water Act (CWA). A sequencing analysis is required as part of this permitting process. The only wetland under the jurisdiction of the MNDNR and CWA is Basin 1. No impacts to this basin are anticipated. Therefore, no sequencing analysis is necessary.

The remaining eleven wetlands are only under the jurisdiction of the WCA. Historically, these wetlands have been in crop rotation and have been heavily degraded by the removal of wetland hydrology and hydrophytic plant communities. Due to the degradation that has occurred, these wetlands are eligible for sequencing flexibility. MN Rule 8420.0520, Subpart 7a.A.1, allows for flexibility in sequencing if the wetlands to be impacted have been degraded to the point where replacement of it would result in a certain gain in functional and public value. There are several highly functional wetland banks in the Le Sueur River watershed with available wetland credit. Impacts to wetlands as a result of this project would be mitigated for within the same major watershed, allowing a functional lift to the watershed.

2. *Other Surface Waters- Describe any anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent channels, county/judicial ditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal and riparian alteration. Discuss direct and indirect environmental effects from physical modification of water features, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. Identify measures to avoid, minimize, or mitigate environmental effects to surface water features, including in-water Best Management Practices that are proposed to avoid or minimize turbidity/sedimentation while physically altering the water features. Discuss how the project will change the number or type of watercraft on any water body, including current and projected watercraft usage.*

All local and State regulations—including a 150-foot setback from the OHW level of public waters, depicted on **Figure 3, "Proposed Improvements"**—related to Shoreland Overlay Districts would be followed throughout the implementation of the Proposed Project. Direct or indirect adverse impacts to other surface water features are not anticipated to occur as a result of the Proposed Project.

13 Contamination/Hazardous Materials/Wastes

a. Pre-project Site Conditions

Describe existing contamination or potential environmental hazardson or in close proximity to the project site such as soil or ground water contamination, abandoned dumps, closed landfills, existing or abandoned storage tanks, and hazardous liquid or gas pipelines. Discuss any potential environmental effects from pre-project site conditions that would be caused or exacerbated by

project construction and operation. Identify measures to avoid, minimize or mitigate adverse effects from existing contamination or potential environmental hazards. Include development of a Contingency Plan or Response Action Plan.

The MPCA's *What's in My Neighborhood* mapper identified 28 potentially contaminated sites located within a one-mile radius of the Study Area, detailed in **Table 8, "MPCA "What's in My Neighborhood" Sites within a One-Mile Radius".** As shown in **Figure 13, "MPCA WIMN,"** none of these sites are located within the Study Area. None of these sites pose a significant threat or impact to the Proposed Project.

Table 8: MPCA "What's in My Neighborhood" Sites within a One-Mile Radius

Site ID	Site Name	Program Name List	Distance from Site (Meters)
220708	Pillars of Mankato	Hazardous Waste; Stormwater	64
225332	Kwik Trip #1011	Stormwater; Tanks	579
89963	Mankato TACC	Hazardous Waste	619
123973	Blue Earth County Justice Center	Hazardous Waste; Stormwater	646
105806	MCHS Eastridge Clinic	Hazardous Waste	646
151637	Prairie Winds Middle School	Stormwater; Tanks	798
220913	Northern Natural Gas - M460B Hwy 83 Rplc	Hazardous Waste	799
46666	Nelson Cabinetry	Hazardous Waste	811
148864	Toppers Plus	Hazardous Waste	1,025
133941	58967 Madison Avenue	Hazardous Waste	1,030
128983	Mankato Ford LLC	Air Quality; Hazardous Waste; Investigation and Cleanup; Tanks	1,163
250733	ULTA Beauty #1660	Hazardous Waste	1,182
121122	59175 Madison Avenue	Hazardous Waste	1,315
76119	Walmart Supercenter 1473	Hazardous Waste; Stormwater	1,332
143225	PETCO Store 1655	Hazardous Waste	1,372
139017	Michael's Store 2729	Hazardous Waste	1,372

Site ID	Site Name	Program Name List	Distance from Site (Meters)
222562	Sally Beauty Supply #2996	Hazardous Waste	1,373
95221	Snell Collision Center	Air Quality; Hazardous Waste; Tanks	1,452
41670	Wellner Auto Clinic Inc	Hazardous Waste	1,454
47119	Alltel Retail Store	Hazardous Waste	1,529
105623	Oasis Market #5116	Investigation and Cleanup; Tanks	1,628
196526	Former Twin Cities Avanti Store 5116	Investigation and Cleanup	1,628
216556	Shopko 021 - Pharmacy	Hazardous Waste	1,646
49011	Shopko 021	Hazardous Waste	1,646
91172	Auto Tech N Tire Inc	Hazardous Waste	1,666
46519	Sam's Club 6510	Hazardous Waste; Tanks	1,687
42568	AutoZone 3159	Hazardous Waste	1,716
129251	Circle K Store 2746704	Tanks	1,732

b. Project Related Generation/Storage of Solid Wastes

Describe solid wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from solid waste handling, storage and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of solidwaste including source reduction and recycling.

Construction activities for this development would generate substantial waste. The amount of waste is anticipated to be representative of construction projects of this size and scope. The contractors would dispose of any wastes generated in an approved method and/or to an approved facility. The contractors will be encouraged to recycle as many construction materials as feasible. All brush and tree waste generated on site would be chipped or otherwise disposed of and will not be burned on site.

Typical municipal commercial and residential solid waste is anticipated to be generated throughout the life of the Proposed Project. All solid waste materials would be handled through licensed solid waste haulers. Numerous agencies and organizations offer best management practices to avoid or minimize waste generation through reuse and recycling activities or by encouraging sustainable purchasing

practices to reduce impacts. Local businesses will be encouraged to participate in these practices and take advantage of available resources.

c. Project Related Use/Storage of Hazardous Materials

Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location and size of any new above or below ground tanks to store petroleum or other materials. Indicate the number, location, size and age of existing tanks on the property that the project will use. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverseeffects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.

Fuels and oils typical for the operation of construction equipment would be delivered but not stored on site. Building products used for home and facility construction will be used, stored, and disposed of in accordance with all State and local regulations.

No previous environmental hazards have been identified on the proposed development site. Normal construction, household, and commercial hazardous wastes are anticipated. Toxic or hazardous materials, such as fuel for construction equipment and materials used in the construction of homes and facilities (paint, adhesives, stains, acids, bases, etc.) would likely be used during site preparation and construction. Spills of these materials are not anticipated but could require notification of the Minnesota Duty Officer if a significant spill occurs. Builders and contractors are responsible for proper management and disposal of any wastes brought or generated on site. During construction, any toxic or hazardous materials would be properly used, stored and disposed of when finished.

d. Project Related Generation/Storage of Hazardous Wastes

Describe hazardous wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from hazardous waste handling, storage, anddisposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of hazardous waste including source reduction and recycling.

Please refer to **Section 13b** and **Section 13c**.

14 Fish, Wildlife, Plant Communities, & Sensitive Ecological Resources (Rare Features)

a. Resources/Habitats/Vegetation

Describe fish and wildlife resources as well as habitats and vegetation on or near the site.

The approximately 105-acre Study Area is primarily comprised of agricultural fields with some forested areas in the north and 28.59 acres of wetland in the northeast portion of the subject property. A review

of available historic aerial imagery reveals the land has been largely in agricultural production since at least the late 1930s, with portions of the current forested area present in the north part of the Study Area.

Wildlife species typically associated with habitat of the type and quality present include white-tailed deer, raccoons, coyote, turkey, squirrel, other small rodents, and birds common to the area. Wildlife populations that temporarily use the agricultural and forested areas within the Study Area for cover may be temporarily displaced during the construction of the Proposed Project, however these wildlife species are anticipated to relocate to other nearby habitat in the area until construction is complete.

b. Rare Features

*Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, andother sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-____) and/or correspondence number (ERDB **20170450**) from which the data were obtained and attach the Natural Heritage letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.*

The Proposed Project was submitted to the Minnesota Department of Natural Resources (MnDNR) Division of Ecological & Water Resources for Natural Heritage Information System (NHIS) review on September 15, 2022. NHIS review determined that the Proposed Project would not negatively affect any known occurrences of State-listed rare features. For more information, please refer to the Natural Heritage Letter and Project Report (MCE #2022-00619; received on September 15, 2022), which are included in **Appendix C, "Agency Coordination."**

Additionally, the United States Fish and Wildlife Service's (USFWS) online Information for Planning and Consultation (IPaC) tool identified one Federally-listed endangered species (Northern Long-Eared Bat), one candidate species (Monarch Butterfly), and one migratory bird (Bald Eagle) that may be located within the Study Area. The USFWS IPaC Official Species List (generated on September 15, 2022) is included in **Appendix C, "Agency Coordination."**

The MnDNR maintains a list of townships within Minnesota that contain documented Northern Long-Eared Bat (NLEB) maternity roost trees and/or hibernacula.[5] As of June 7, 2021, there are no identified NLEB trees or hibernacula located within Blue Earth County. Although no NLEB trees or hibernacula have been documented within Blue Earth County, there is potential for the species to be found throughout Minnesota. NLEBs hibernate in caves or mines during the winter (November to March) and roost in forest and woodland habitats during the active season (April to October). Tree removal can negatively impact bats by destroying roosting habitat, especially during the pup rearing season when females are forming maternity roosting colonies and the pups cannot yet fly. To minimize these potential impacts, the DNR recommends that tree removal be avoided during the months of June and July.

[5] 2022. Townships Containing Documented Northern Long-Eared Bat (NLEB) Maternity Roost Trees and/or Hibernacula Entrances in Minnesota. MnDNR Website. Electronic resource: https://files.dnr.state.mn.us/eco/ereview/minnesota_nleb_township_list_and_map.pdf, accessed October 2022.

As shown on **Figure 14, "Biotic Resources,"** the Study Area is located within a Rusty Patched Bumble Bee Low Potential Zone. Low Potential Zones represent areas where Rusty Patched Bumble Bees are not likely to be present.

No other Federally-listed endangered species, critical habitats, refuge lands, or fish hatcheries were identified within the Study Area. For more information, please refer to the USFWS IPaC Official Species List (generated on September 15, 2022), which is included in **Appendix C, "Additional Assessments."**

c. Project Effects

Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project including how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separatelydiscuss effects to known threatened and endangered species.

As discussed in **Section 14b, "Rare Features,"** no State-listed threatened species, endangered species, species of special concern, or rare features were identified within the Study Area. Thus, no adverse impacts to these communities are anticipated as a result of the Proposed Project.

The primary impact that would occur as a result of the implementation of the Proposed Project is loss of habitat, primarily food and cover resources, and habitat fragmentation. The Study Area may currently serve as a corridor for wildlife species. This corridor would be temporarily impacted during construction activities. However, after the conclusion of construction activities, wildlife may continue to use the area to move from one location to another.

The project is not anticipated to have the potential to spread or introduce invasive species. The contractor will be required to control the State-listed noxious weeds.[6] The contractor will follow best management practices (BMPs) to control and appropriately manage any invasive species. Removed soil will remain on site and will not be transported to other areas. Construction vehicles that may come into contact with invasive species will be checked and washed on site prior to leaving the work area to minimize any spread of invasive species. Reseeding and landscaping material will be free of invasive plants or plant parts. The project will also minimize disturbance of the surrounding roadside and vegetation.

d. Control Measures

Identify measures that will be taken to avoid, minimize, or mitigate the adverse effects to fish, wildlife, plant communities, ecosystems, and sensitive ecological resources.

The City of Mankato will coordinate with the Developer to ensure that construction activities incorporate mitigation measures to minimize risk to plant and wildlife species.

[6] 2022. Minnesota Noxious Weed List. Minnesota Department of Agriculture (MDA) website. Electronic webpage: https://www.mda.state.mn.us/plants-insects/minnesota-noxious-weed-list, accessed October 2022.

Additionally, the following mitigation measures will be implemented to reduce impacts to the wetland habitat located in the northern portion of the Study Area:

- Do not park equipment or stockpile supplies in the area of the PWI
- Inspect and clean all equipment prior to bringing it to the site to prevent the introduction and spread of invasive species
- As soon as possible after construction, revegetate disturbed soil with native species suitable to the local habitat
- Use only weed-free mulches, topsoils, and seed mixes
- Ideally do not bring in topsoil
- Developer will follow all erosion and sediment control requirements throughout the construction process and will be in compliance with the NPDES Stormwater Permit, especially in proximity to the PWI

Mitigation measures related to the introduction and spread of invasive species are discussed in **Section 14c, "Project Effects."**

15 Historic Properties

Describe any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to the site. Include: 1) historic designations, 2) known artifact areas, and 3) architectural features. Attach letter received from the State Historic Preservation Office (SHPO). Discuss any anticipated effects to historic properties during project construction and operation. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to historic properties.

A file search of the State Historic Preservation Office (SHPO) and the Office of the State Archaeologist (OSA) databases was conducted to identify all known archaeological, historical, architectural, or traditional cultural properties that have the potential to be impacted by the Proposed Project. As part of early agency coordination efforts, a request for project review was submitted to SHPO on September 14, 2022. A response to this request was received on October 12, 2022. In its review of the Proposed Project, SHPO concluded that "there are no properties listed in the National or State Registers of Historic Places and no known or suspected archaeological properties in the area that will be affected by this project."[7]

[7] SHPO Letter 2022-2791. RE: Mesenbrink Residential Development. Electronic Correspondence, dated October 12, 2022.

No previously recorded or unconfirmed (alpha) archaeological sites are located within or directly adjacent to the Study Area.

There are no National Register of Historic Places (NRHP)-listed historic properties within one mile of the Study Area. However, according to SHPO files, there are 6 previously inventoried historic properties within the one-mile search radius. None of these properties are within or immediately adjacent to the Study Area. There is not anticipated to be any effect on any of these properties.

16 Visual

Describe any scenic views or vistas on or near the project site. Describe any project related visual effects such as vapor plumes or glare from intense lights. Discuss the potential visual effects from the project. Identify any measures to avoid, minimize, or mitigate visual effects.

The current visual expanse includes views of the surrounding agricultural, forested, and wetland areas. Visual impacts to the site will include removal of vegetation and construction of the residential facilities, interior roadway and surface parking lot areas, and the construction of infiltration pond features. This constitutes urban growth and will change the rural views of this location, but the surrounding wetlands to the north, agricultural land to the east, and forested and agricultural land to the south will not be affected by construction.

During construction activities, this land-use change will be pronounced with grading and excavation activities. Additional visual impacts are anticipated to include construction equipment and hauling vehicles to and from the site. Occasional dust plumes are anticipated as minimal due to exercised dust control measures.

17 Air

a. Stationary Source Emissions

Describe the type, sources, quantities and compositions of any emissions from stationary sources such as boilers or exhaust stacks. Include any hazardous air pollutants, criteria pollutants. Discuss effects to air quality including any sensitive receptors, human health or applicable regulatory criteria. Include a discussion of any methods used assess the project's effect on air quality and the results of that assessment. Identify pollution control equipment and other measures that will be taken to avoid, minimize, or mitigate adverse effectsfrom stationary source emissions.

Stationary sources of air emissions associated with the Proposed Project would stem from domestic heat sources in residential facilities once they are constructed. The residential buildings to be constructed as part of the Proposed Project are anticipated to use efficient heating and cooling systems. Stationary source emissions from the Proposed Project will be minimal and will comply with current residential and industry standards for heating and cooling equipment. Therefore, the Proposed Project would not result in significant adverse impacts to air quality from stationary-source emissions.

b. Vehicle Emissions

Describe the effect of the project's traffic generation on air emissions. Discuss the project's vehicle-related emissions effect on air quality. Identify measures (e.g. traffic operational improvements, diesel idling minimization plan) that will be taken to minimize or mitigate vehicle-related emissions.

Mobile sources of air emissions associated with the Proposed Project include the use of vehicles and equipment during construction activities, as well as vehicle emissions once residential developments and interior roadways are complete. Projected vehicle emissions are not anticipated to result in significant adverse effects during or following construction activities.

c. Dust & Odors

Describe sources, characteristics, duration, quantities, and intensity of dust andodors generated during project construction and operation. (Fugitive dust may be discussed under item 17a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize ormitigate the effects of dust and odors.

The Proposed Project is not anticipated to generate any odors.

Some dust generation is anticipated during construction activities. The primary source of dust generation will stem from vehicles entering and exiting the construction area prior to the implementation of paved roadways. A wet dust suppression plan, including watering dirt construction roads, will be followed during construction operations to minimize the effects of dust. Additionally, periodic cleanup of the construction site and limiting the amount of soil disturbance will help control dust generation.

Following development operations, dust should be limited to that typical of a residential area. No long-term or significant impacts are anticipated from dust and odors.

18 Greenhouse Gas (GHG) Emissions/Carbon Footprint

a. GHG Quantification

For all proposed projects, provide quantification and discussion of project GHG emissions. Include additional rows in the tables as necessary to provide project-specific emission sources. Describe the methods used to quantify emissions. If calculation methods are not readily available to quantify GHG emissions for a source, describe the process used to come to that conclusion and any GHG emission sources not included in the total calculation.

Global climate change results from the total accumulation of greenhouse gas (GHG) in the Earth's atmosphere, as well as other human-caused and natural factors. The GHG composition in the Earth's

atmosphere is changing and causing the planet's climate to change. The Proposed Project's incremental contribution to global GHGs cannot be translated into effects on climate change globally or regionally.

In general, regional impacts from climate change may include the following effects: increased mean annual air temperature (summer and winter warming); increased surface water temperatures; later onset of winter and earlier onset of spring; precipitation may fall in fewer, but more intense, storms; species adapted to cold climates may shift out of the Great Lakes basin into Canada; and aspen and birch forests may be replaced by hardwood forests of oak and hickory. Moderate climate change may increase agricultural yields and food production, with some regional and annual variability.

Mesenbrink Construction proposes to construct a multi-use development on approximately 105 acres of agricultural land in Blue Earth County. This development would include retail/residential units, apartment units, single family homes, and a park or green space. Construction would be performed utilizing traditional construction methods involving standard earth moving equipment per City of Mankato guidelines.

Currently, the area designated for the Proposed Project is primarily used as cropland. The MPCA tracks emissions of different sectors, including agriculture, and reports on this information. In 2008, the MPCA determined that cropland in Minnesota averages a greenhouse gas output of 1,776 CO2e lbs per acre per year. Using this figure, we can calculate that the annual output for 105 acres of cropland would be 186,480 lbs or 84.59 MTCO2e.

In addition, existing roadways within the Study Area contribute to GHG emissions and may be impacted by the Proposed Project. A traffic study was conducted in 2022 to assess current traffic conditions and forecast the impact of the Proposed Project on these conditions. The results of this study are summarized below in **Table 9, "Existing, Build, and No-Build AADT**." For more information, please refer to **Section 20, "Transportation,"** and **Appendix B, "Additional Assessments."**

Table 9: Existing, Build, and No-Build AADT

Roadway	Existing AADT	Build AADT (2045)	No Build AADT (2045)
TH 22	18859	27415	26328
Hoffman Rd	2000	5793	2366
CSAH 12	4000	19197	16661

Mobile source emissions generated from the existing roadways were computed using the EPA estimation of 80% of vehicles utilizing gasoline and 20% using diesel. As the roadway closest to the Study Area and the one projected to have the most significant change in average annual daily traffic (AADT) resulting from the Proposed Project, CSAH 12 data was utilized for calculating traffic emissions. These calculations were further compared to emissions data derived from averaging the AADT of all three roadways to ensure this is an accurate reflection of traffic emissions, however focusing on a single roadway rather than using the average of all three is preferred to avoid possible duplication in vehicle counts. The results of this calculation indicate that current traffic conditions on CSAH 12 produce 1,667.8 MTCO2e annually and the Proposed Project would increase this amount by 6,336.2 MTCO2e per year.

Construction activities for this project are anticipated to include a wide variety of construction equipment of various equipment classes, sizes, and engine types. Typical construction equipment for this type of project includes, but is not limited to, excavators, material handlers, skid steers, cranes, bulldozers, pavers, compactors, jackhammers, and haul trucks. These types of vehicles primarily rely on diesel as a fuel source, which results in the emission of CO2 and, to a lesser extent, CH4 and N2O. **Table 10, "GHG Emissions,"** provides an estimate for the emissions generated by this equipment for the two construction seasons anticipated to complete the Proposed Project (approx. working 120 days per season) and utilize approx. 25 diesel-powered pieces of heavy equipment and 25 gasoline-powered passenger vehicles. The total emissions from these activities (213.3 MTCO2e) are considered one-time emissions, however the industry standard for determining long-term impacts of construction-related GHG output is to annualize the total emissions over a project's lifetime, which is defined as a 30-year period.[8] Annualized, this would be 7.11 MTCO2e.

Once construction of the project has been completed, operational GHG emissions will be the combined result of the commercial and residential spaces. In general, the annual averages for energy consumption for residential households is higher than that of commercial buildings.[9] For the purposes of calculating GHG emissions, the Proposed Project specifications of 673 residential units (113 single-family units, 30 townhomes, and 530 apartment units) is considered the equivalent of 673 households. The total commercial space is 26,400 sq ft (21,000 sq ft retail center and 5,400 sq ft gas station). Both commercial and residential spaces are anticipated to utilize the typical municipal energy sources for the area (natural gas and electricity) as well as the municipal waste management system. Estimates for each of these emissions sources are presented below in **Table 10, "GHG Emissions."** All calculations were facilitated by use of the EPA's Simplified GHG Emissions Calculator (SGEC) Version 7, dated June 2021, and information on national averages where more detailed local data was not available.

[8] Meridian Consultants, LLC. 2016. *Environmental Impact Report (EIR 15-01): Lompoc Motorsports Project, City of Lompoc*. Prepared for the City of Lompoc. Section 4.6 Greenhouse Gas Emissions: 4.6-16.
[9] U.S. Energy Information Administration. 2022. Use of Energy Explained. Electronic resource, https://www.eia.gov/energyexplained/use-of-energy/, accessed October 2022.

Table 10: GHG Emissions

Scope	Emission Type	Project-related Conditions (MTCO2e)	Calculation method(s)
Scope 1	Construction Mobile Equipment (annualized)	7.11	SGEC Tool[10] (2 construction seasons of 120 working days each, 25 gas-powered and 25 diesel-powered vehicles traveling 20 miles per day)
Scope 1	Construction Waste (annualized)	1.56	Based on national average per square foot[11]
Scope 1	Motor Vehicle Emissions	6336.2	SGEC Tool (using AADT for CSAH 12 for 2 miles of travel, 80% gas-powered and 20% diesel-powered vehicles)
Scope 1	Stationary Equipment/Facility Natural Gas Usage	2605	Based on annual national average usage for residential and commercial users[12]
Scope 2	Off-site Electricity Usage	5538.4	Based on annual national average electricity usage for residential and commercial users[13]
Scope 2	Water Usage	86.81	Water Energy Climate Calculator[14] for Mankato area
Scope 3	Off-site Waste Management	2.33	Based on 2015 MPCA annual averages for municipal waste management[15]
TOTAL		**14,577.41**	

Based on these calculations, the Proposed Project would result in an increase of 14,492.82 MTCO2e per year than is currently produced by the existing conditions. There are no Minnesota or National Ambient Air Quality Standards for GHGs. The assessment of GHG emissions and climate change is extremely complex. Currently it is not possible to model the physical impacts of global or regional climate change, such as storm frequency/intensity or temperature increases, caused by incremental GHG emissions, such as those from the Proposed Project. In other words, while this project will contribute to climate change generally, existing scientific tools do not allow local or state regulatory authorities to quantify the specific effects of a particular project on global or regional climate change impacts, and therefore cannot be added cumulatively to other potential project impacts. There is currently an absence of regulatory guidance for analyzing GHG emission impacts. If, in the future, climate models improve in their predictive capacity or more regulatory guidance is provided, the city will incorporate those tools into its environmental review process at that time.

[10] Environmental Protection Agency. 2021. Simplified GHG Emissions Calculator (SGEC), Version 7. Electronic resource, https://www.epa.gov/climateleadership/simplified-ghg-emissions-calculator, accessed July 2022.
[11] Wastecare Corporation 2013. "Waste Generated by Industry/Building Type." Electronic resource, https://www.wastecare.com/usefulinfo/Waste_Generated_by_Industry.htm, accessed July 2022.
[12] U.S. Energy Information Administration. 2022. Natural Gas Summary. Electronic resource, https://www.eia.gov/dnav/ng/NG_SUM_LSUM_A_EPG0_VRS_MMCF_M.htm, accessed October 2022.
[13] U.S. Energy Information Administration. 2022. Use of Energy Explained. Electronic resource, https://www.eia.gov/energyexplained/use-of-energy/, accessed October 2022.
[14] Pacific Institute. 2010. Water Energy Climate Calculator. Electronic resource, http://www.wecalc.org, accessed July 2022.
[15] Minnesota Pollution Control Agency. 2017. *Metropolitan Solid Waste Management Police Plan 2016-2036*. Electronic resource, https://www.pca.state.mn.us/sites/default/files/w-sw7-21e.pdf

b. GHG Assessment

i. GHG Mitigation Considerations

Describe any mitigation considered to reduce the project's GHG emissions.

At least some of these emissions may be mitigated or offset by practices that can remove carbon from the atmosphere and sequester it. Additional practices can reduce additional indirect GHG emissions due to energy usage and other activities. These mitigation efforts may include planting native grasses to facilitate carbon uptake, establishing sustainability operations plans to reduce electric and natural gas usage, and increasing recycling and energy reuse efforts. The majority of these mitigation efforts will depend on municipal policy and end-user efforts and are therefore not a part of the current project proposal. However, during construction, BMPs such as engine anti-idling would be implemented in order to minimize additional GHG output.

ii. GHG Reduction Calculations

Describe and quantify reductions from selected mitigation, if proposed to reduce theproject's GHG emissions. Explain why the selected mitigation was preferred.

No current on-site mitigation is planned as part of the Proposed Project. However, it should be noted that the inclusion of a green space in project plans will offset some of the emissions resulting from the retail and residential development. Unfortunately, there are currently no reliable and widely accepted methods for calculating the emissions reduction of urban and suburban park spaces.

iii. Project Lifetime GHG Emissions

Quantify the proposed projects predicted net lifetime GHG emissions (total tons/#of years) and how those predicted emissions may affect achievement of the Minnesota Next Generation Energy Act goals and/or other more stringent state or local GHG reduction goals.

As current MN Statutes require greenhouse gas (GHG) emissions control plans for large energy facilities, the State has implemented a climate action plan to address GHG emissions.[16] Current goals are to reduce GHG emissions statewide to 30% below 2005 levels by 2025, and 80% below 2005 levels by 2050. The Proposed Project does not involve any large energy facilities but is a mixed-use development of commercial and residential spaces. However, BMPs will be utilized in the planning and construction phases of the project in order to remain in keeping with State and local GHG reduction goals.

[16] 2020 Minnesota Statutes. CHAPTER 216H: GREENHOUSE GAS EMISSIONS. Electronic document, https://www.revisor.mn.gov/statutes/cite/216H, accessed July 2022.

19 Noise

Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area, 2) nearby sensitive receptors, 3) conformance to state noise standards, and 4) quality of life. Identify measures that will be taken to minimize or mitigate the effects of noise.

Existing noise sources in the area include vehicle traffic along Blue Earth County Highway 12.

a. Construction Noise

Noise associated with the construction of the Proposed Project will be generated from grading and excavation activities to prepare the site for utility and roadway installation. See **Table 11, "Typical Construction Equipment Noise Levels at 50 Feet,"** for typical noise levels of construction equipment measured at 50 feet.

Table 11: Typical Construction Equipment Noise Levels at 50 Feet

Equipment	Manufacturers Sampled	Total Number of Models in Sample	Peak Noise Level (dBA*)	
			Range	Average
Backhoes	5	6	74-92	83
Front Loaders	5	30	75-96	85
Dozers	8	41	65-95	85
Graders	3	15	72-92	84
Scrapers	2	27	76-98	87
Pile Drivers	N/A	N/A	95-105	101

*Units of "A-weighted Decibels"
Source: United States Environmental Protection Agency and Federal Highway Administration

Minnesota Rules, Part 7030, define daytime hours as 7am to 10pm, and nighttime as 10pm to 7am. Construction operations will occur within State noise standards as cited in **Table 12, "Noise Standards (MN Statute 7030.0040),"** below.

Table 12: Noise Standards (MN Statute 7030.0040)

Noise Area Classification	Daytime		Nighttime	
	L_{50}	L_{10}	L_{50}	L_{10}
1 (Residential)	60	65	50	55
2 (Commercial)	65	70	65	70
3 (Industrial)	75	80	75	80

*L_{10} is the sound level, expressed in dBA, which is exceeded 10% of the time for one hour.
*L_{50} is the sound level, expressed in dBA, which is exceeded 50% of the time for one hour.

b. Traffic Noise

Traffic noise is anticipated to increase during construction activities and post-construction with the established residential developments and interior roadways. Operators will ensure all vehicles and equipment have mufflers and operate in accordance with State and local regulations. Therefore, the Proposed Project would not result in significant adverse impacts from traffic noise.

20 Transportation

a. Project-Related Traffic

Describe traffic-related aspects of project construction and operation. Include: 1) existing and proposed additional parking spaces, 2) estimated total average daily traffic generated, 3) estimated maximum peak hour traffic generated and time of occurrence, 4) indicate source of trip generation rates used in the estimates, and 5) availability of transit and/or other alternative transportation modes.

S2 Traffic Solutions, LLC (SSTS) completed a Traffic Study Memorandum to estimate the trips generated by the Proposed Project and evaluate the potential need for transportation or roadway improvements. The complete Traffic Study is included in **Appendix B, "Additional Assessments."**

Existing and Proposed Parking Spaces

The subject property is currently undeveloped and does not have a defined parking area. The Proposed Project would include 713 apartment units that would have off-street parking and garages, there would be 1,426 parking stalls; 112 single family homes, that would have off-street parking and garages, there would be 224 parking stalls; 6,250 square feet of commercial retail space that would include off-street parking, there would be 25 parking stalls; and a convenience store/gas station that would include parking spaces on the lot for customers of the Convenience Store, there will be 25 parking stalls. 1,700 total off-street parking spaces would be provided.

Estimated Traffic Generation

SSTS prepared a Traffic Study Memorandum for the Proposed Project. The Traffic Study Memorandum assumed full development of the site by 2025. The complete Traffic Study Memorandum is included in **Appendix B, "Additional Assessments."**

Trip generation was estimated using the methodology outlined in the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 11th Edition*. The Proposed Project is anticipated to generate approximately 7,876 vehicle trips per day. Within the PM peak hour, the Proposed Project is anticipated to generate 710 trips, consisting of 395 entering vehicles and 315 exiting vehicles. Project trip generation is detailed in **Table 13, "Project Trip Generation,"** and the Traffic Study Memorandum included in **Appendix B, "Additional Assessments,"** provides a full description and analysis of the peak-hour traffic and traffic recommendations.

Table 13: Project Trip Generation

Land Use	Type	Block No.	Land Use Code	Size		Trips Generated: AM peak Enter	AM peak Exit		PM Peak Enter	PM Peak Exit		Weekday ADT
Mid-Rise Apartment/Suburban	Residential	1	221	713	units	R 62	195	R	170	108	R	3,237
Single Family Housing	Residential	1	210	112	units	R 20	58	R	66	39	R	1,056
Shopping Center	Retail	2	822	6,250	s.f.	R 9	6	R	21	21	R	343
Convenience Store/Gas Station	Retail	2	945	16	fuel pos.	R 216	216	R	182	182	R	4,114
Totals - Gross						307	475		439	350		8,751
						782			789			
Shared Trips						31	48		44	35		875
						78			79			
Pass-By Trips						0	0		0	0		0
						0			0			
Totals - Net*						**276**	**428**		**395**	**315**		**7,876**
						704			**710**			

Availability of Transit and Alternative Transportation

Mankato Transit provides transit services in Mankato and North Mankato, however, transit routes currently do not serve the area within or adjacent to the Study Area. The nearest transit facility to the site is located in front of the Blue Earth County Justice Center, over half a mile from the site from the site.

Trails and sidewalks provide another alternative approach for local travel. The project would include internal sidewalks and trails, and sidewalks along some residential streets to link with existing and future local sidewalk and trail systems.

b. Potential Congestion

Discuss the effect on traffic congestion on affected roads and describe any traffic improvements necessary. The analysis must discuss the project's impact on the regional transportation system.If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW. Use the format and procedures described in the Minnesota Department of Transportation's Access Management Manual, Chapter 5 (available at: http://www.dot.state.mn.us/accessmanagement/resources.html) or a similar local guidance.

SSTS documented existing conditions of the nearby roadways during the weeks of August 22, 2022, and September 5, 2022. The study focused on the following intersections:

1. TH 22 & Hoffman Road
2. 586th Avenue (CSAH 12) & Hoffman Road
3. CSAH 12 & 211th Lane

Peak hour turning movement counts were conducted at the above intersections and indicate the AM peak hour occurs at 7:15 AM to 8:15 AM, and the PM peak hour occurs at 4:45 PM to 5:45 PM.

SSTS analyzed intersection operations using *Synchro/Simtraffic, 11th Edition*, for the 2025 build-out year and for the 2045 planning horizon year. There are no improvement projects planned for the Study Area roadways and none were assumed for the no-build or build conditions.

Effects on Traffic and Roadways

The results of the analysis show that all intersections are expected to operate at acceptable LOS C or better for overall operations with manageable vehicle queues for both the 2025 No-Build and Build conditions. During the 2045 AM Peak hour for both the No-Build and Build conditions, the analysis indicates the intersection of TH 22 and Hoffman Road would be approaching capacity with long delays for some movements and long vehicle queues in the westbound direction. It is recommended that this intersection be monitored for potential future capacity improvements. All other studied intersections would operate acceptably.

c. Mitigation Measures

Identify measures that will be taken to minimize or mitigate project related transportationeffects.

No mitigation measures are required to accommodate site generated traffic. That said, if conditions deteriorate at the intersection of TH 22 and Hoffman Road by 2045, potential minimal improvements including protected permissive traffic signal phasing on the north and southbound approaches should be considered, and extension of the existing westbound right turn lane back to Coneflower Lane and conversion of the lane to a share through and right turn lane will provide adequate additional capacity.

21 Cumulative Potential Effects

a. Geographic Scales & Timeframes

Describe the geographic scales and timeframes of the project related environmental effects that could combine with other environmental effects resulting in cumulative potential effects.

It is estimated that the Proposed Project may take upwards of five to ten years to completely build out, depending on the development market. During this timeline, the City will promote sustainable practices to reduce impacts from other local and regional development.

b. Future Projects

Describe any reasonably foreseeable future projects (for which a basis of expectation has been laid) that may interact with environmental effects of the proposed project within the geographic scales and timeframes identified above.

The City of Mankato will work closely with the County and area townships to determine any potential constraints or opportunities with regard to additional road or other improvements, or developments, in this area that may compound impacts identified within this EAW—especially during active construction. Zoning, as well as all permit and approval requirements, will be secured prior to construction of the Proposed Project.

c. Discussion/Summary of Cumulative Potential Effects

Discuss the nature of the cumulative potential effects and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to these cumulative effects.

Cumulative effects associated with the Proposed Project are essentially the effects of continued growth and development. This can have both positive and negative effects on the human and natural environment. The largest impact to this parcel is the loss of wildlife areas and an increase in impervious surfaces. Through responsible development and using best management practices, negative impacts can be minimized.

Future development within and near the Study Area is anticipated to generate more traffic, placing some additional pressure on the surrounding transportation systems. To account for this, continued transportation planning at the local and county levels is necessary to provide for the long-term development and anticipated growth in the City of Mankato.

Through the increase in traffic and impervious surfaces, and adding facilities with heating and cooling systems, there may be a minimal increase in greenhouse gas (GHG) emissions. It is unlikely this will grossly increase the regional impacts from climate change. Best management practices during the construction process, use of energy efficient building materials and appliances or other systems, and the addition of native landscape vegetation and tree species may help offset impacts from increased GHG emissions.

22 Other Potential Environmental Effects

If the project may cause any additional environmental effects not addressed by items 1 to 20, describe the effects here, discuss the how the environment will be affected, and identify measures that will be taken to minimize and mitigate these effects.

The Proposed Project is not anticipated to adversely affect any additional human or environmental elements not already addressed within this EAW document.

RGU CERTIFICATION

*The Environmental Quality Board will only accept **SIGNED** Environmental Assessment Worksheets for public notice in the EQB Monitor.*

I hereby certify that:

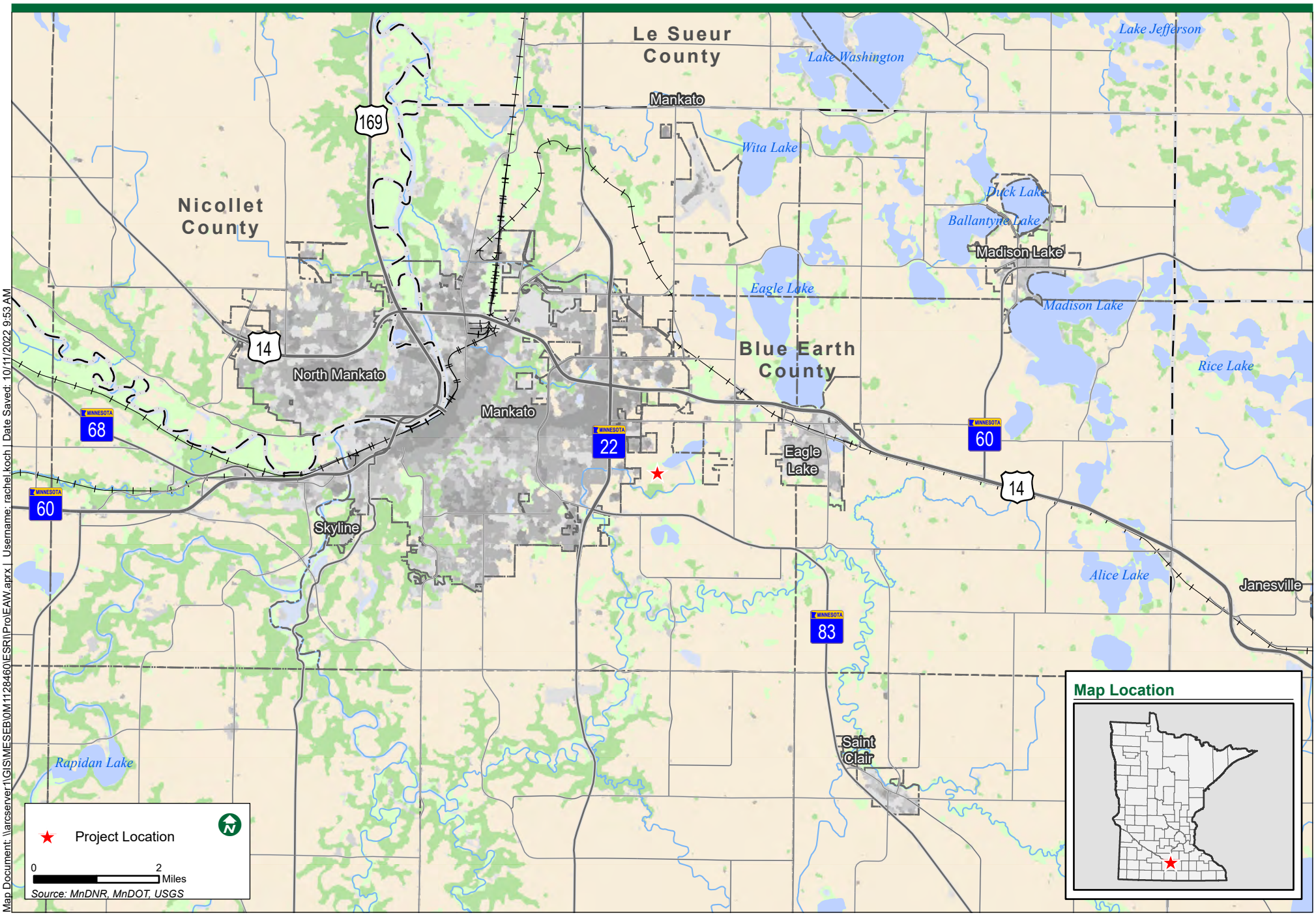
- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at *Minnesota Rules, parts 4410.0200, subparts 9c and 60*, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Signature Mark J. Kuzy Date 1/27/23

Title Associate Director of Planning and Development Services

Appendix A: Figures

Figure 1: Regional Location



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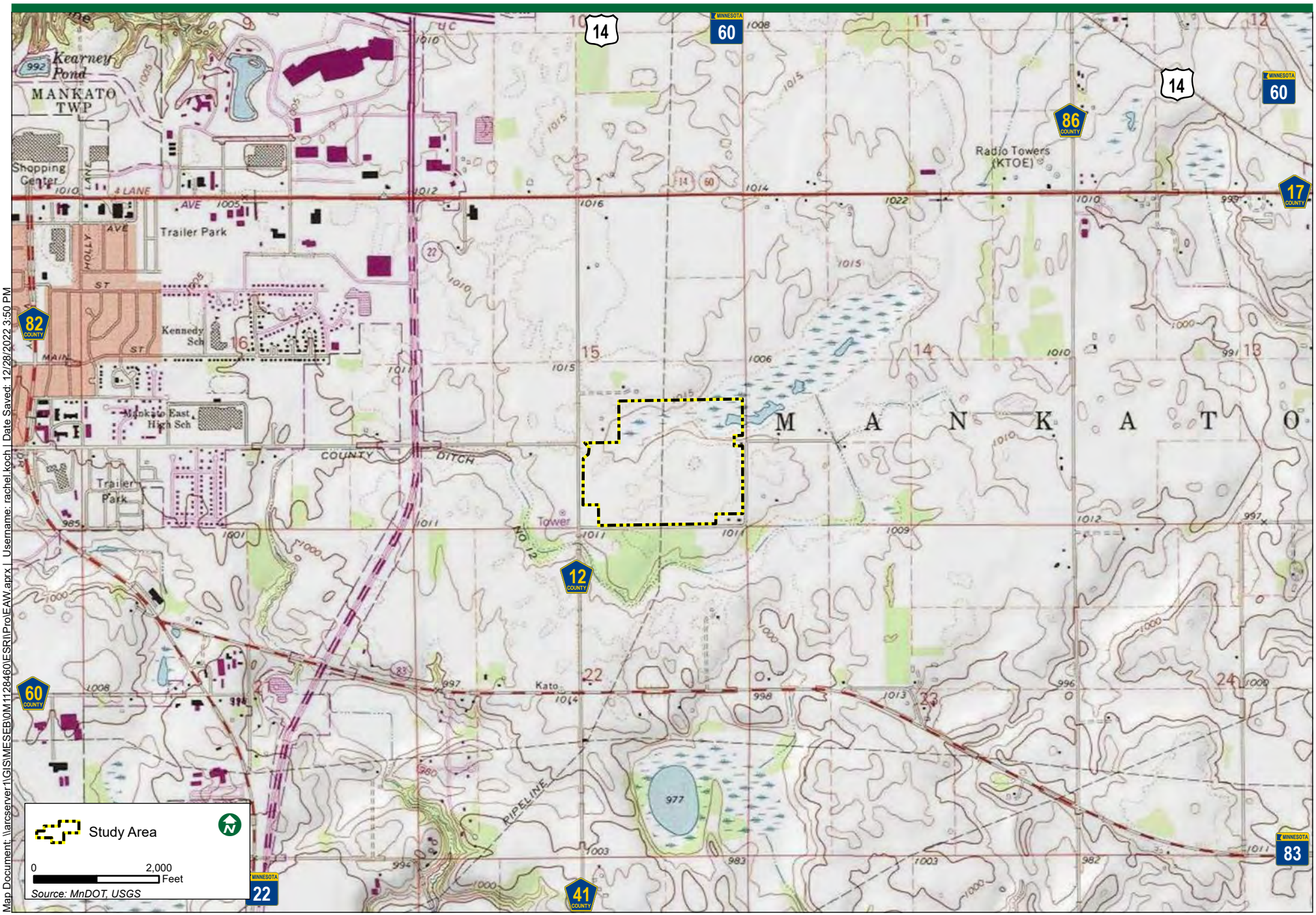

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Figure 3: Proposed Improvements

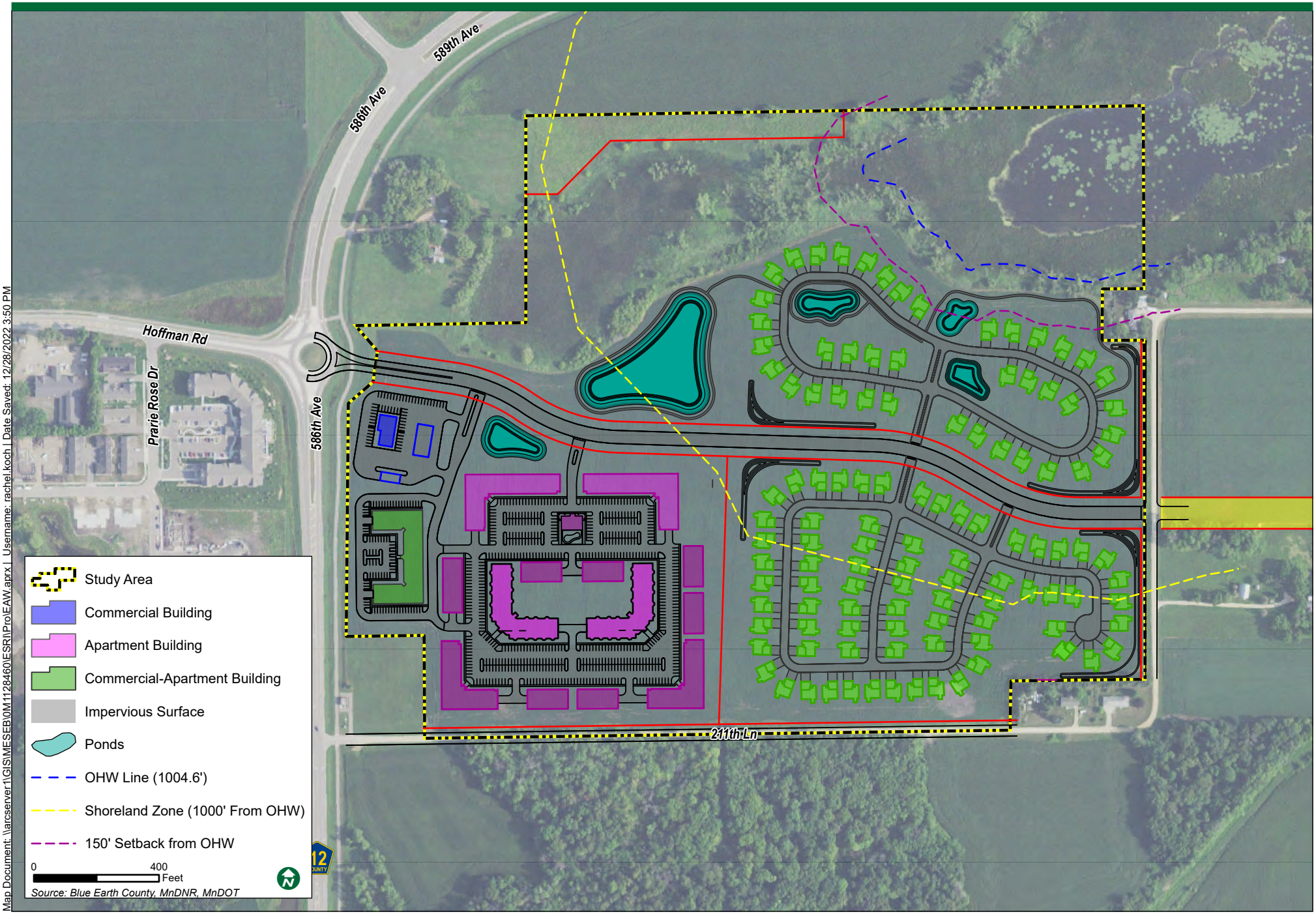

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Figure 4: Existing Land Cover

January 2023

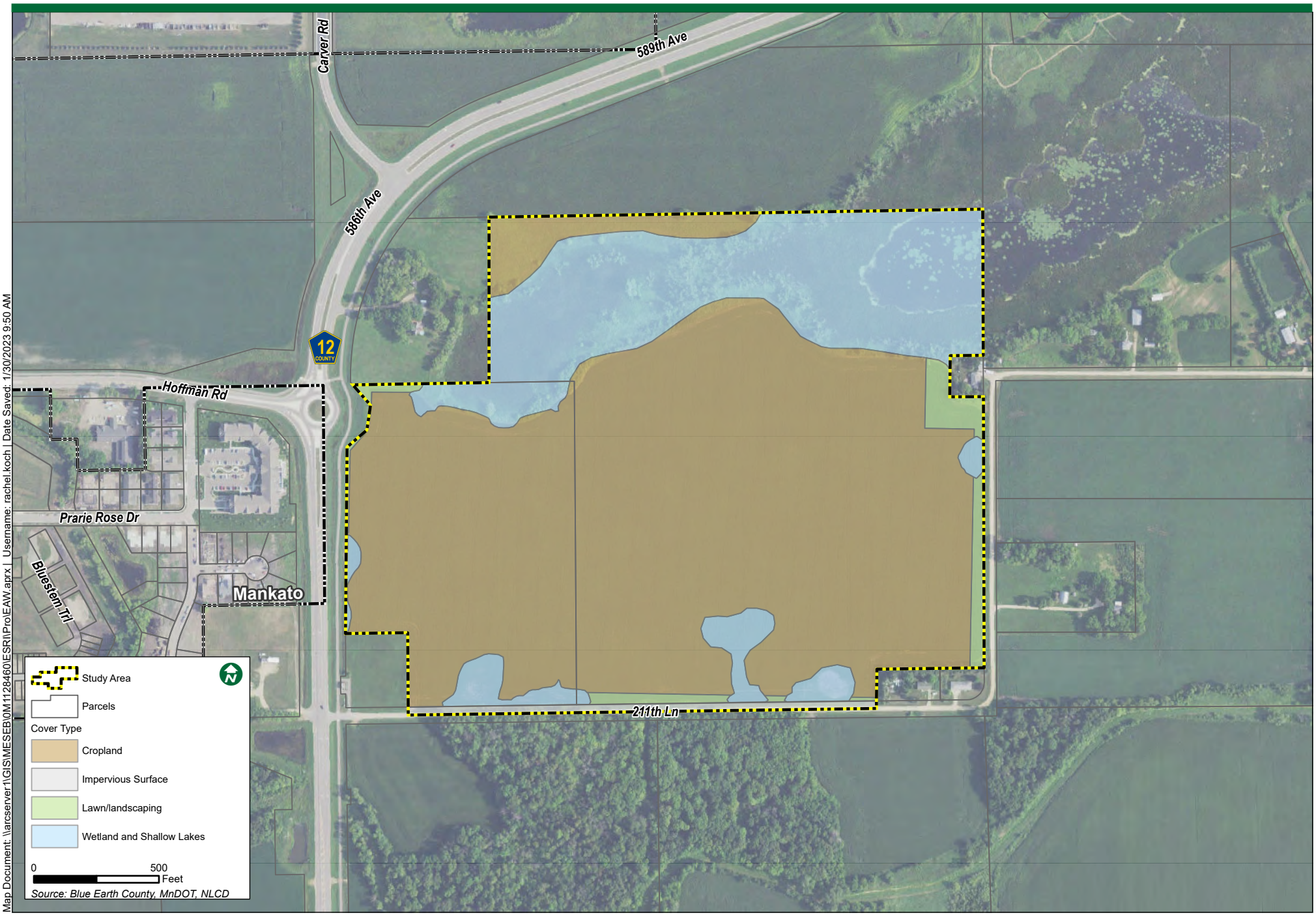

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Figure 5: Future Land Cover

January 2023

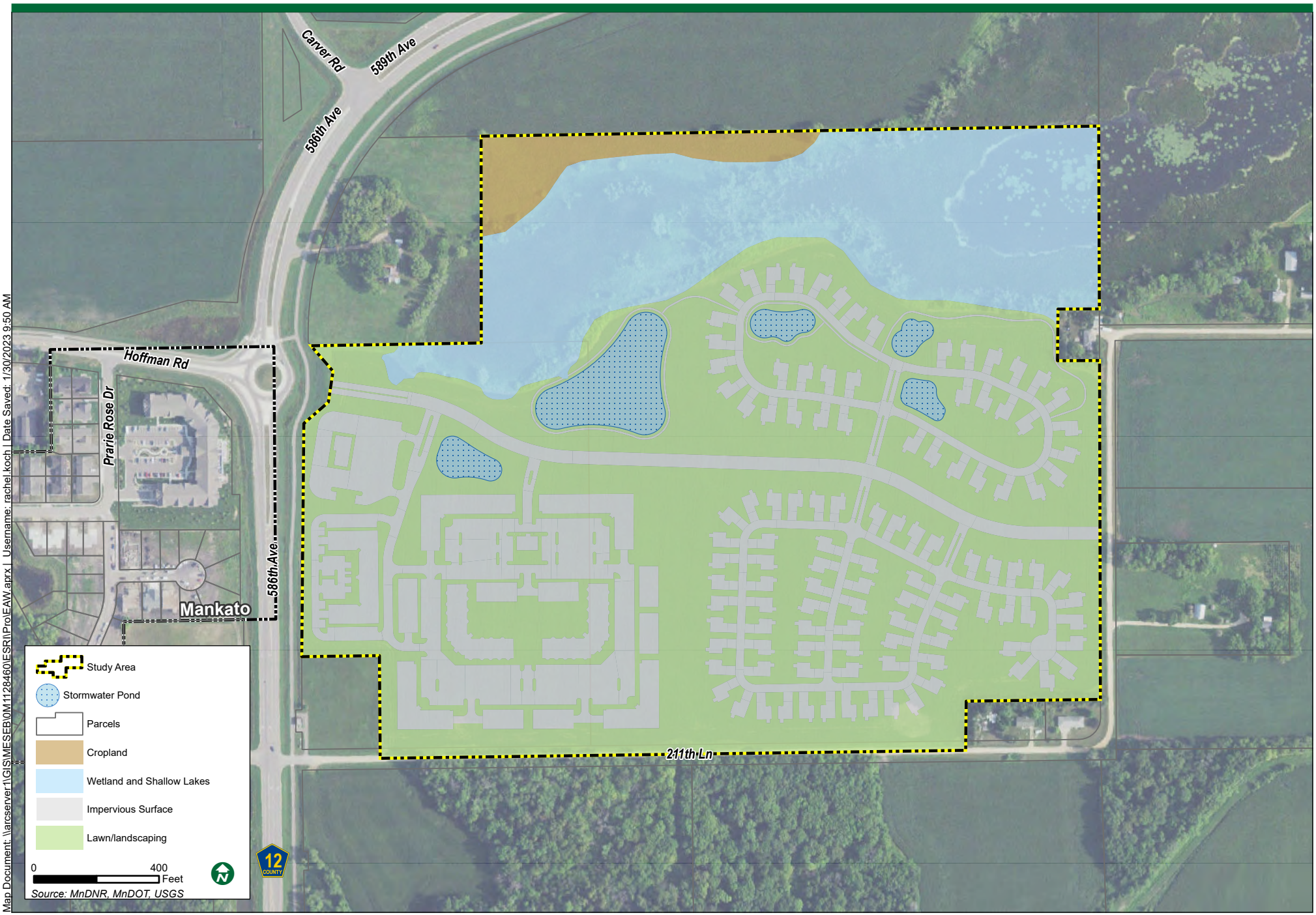

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Figure 6: Existing Land Use

December 2022

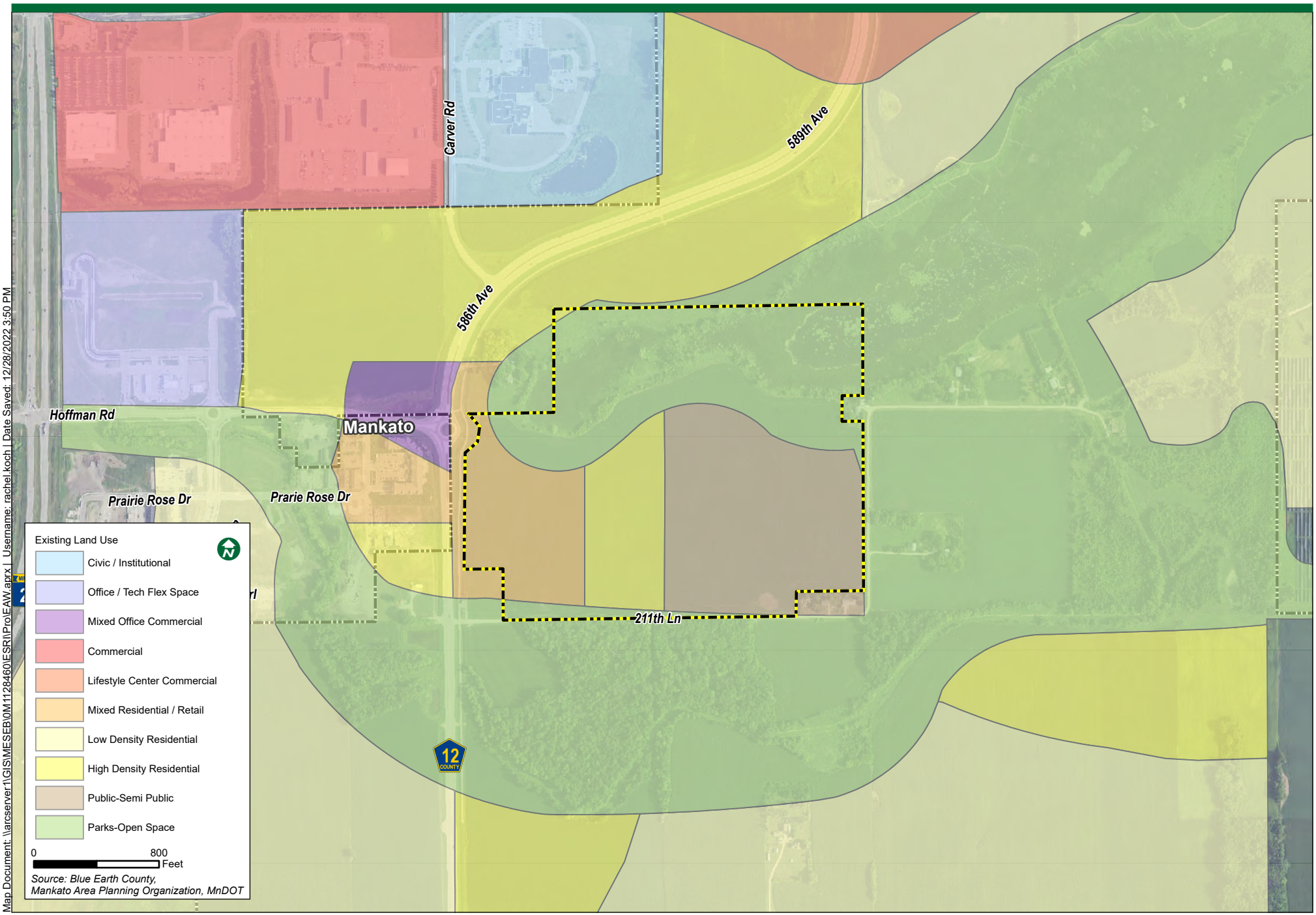

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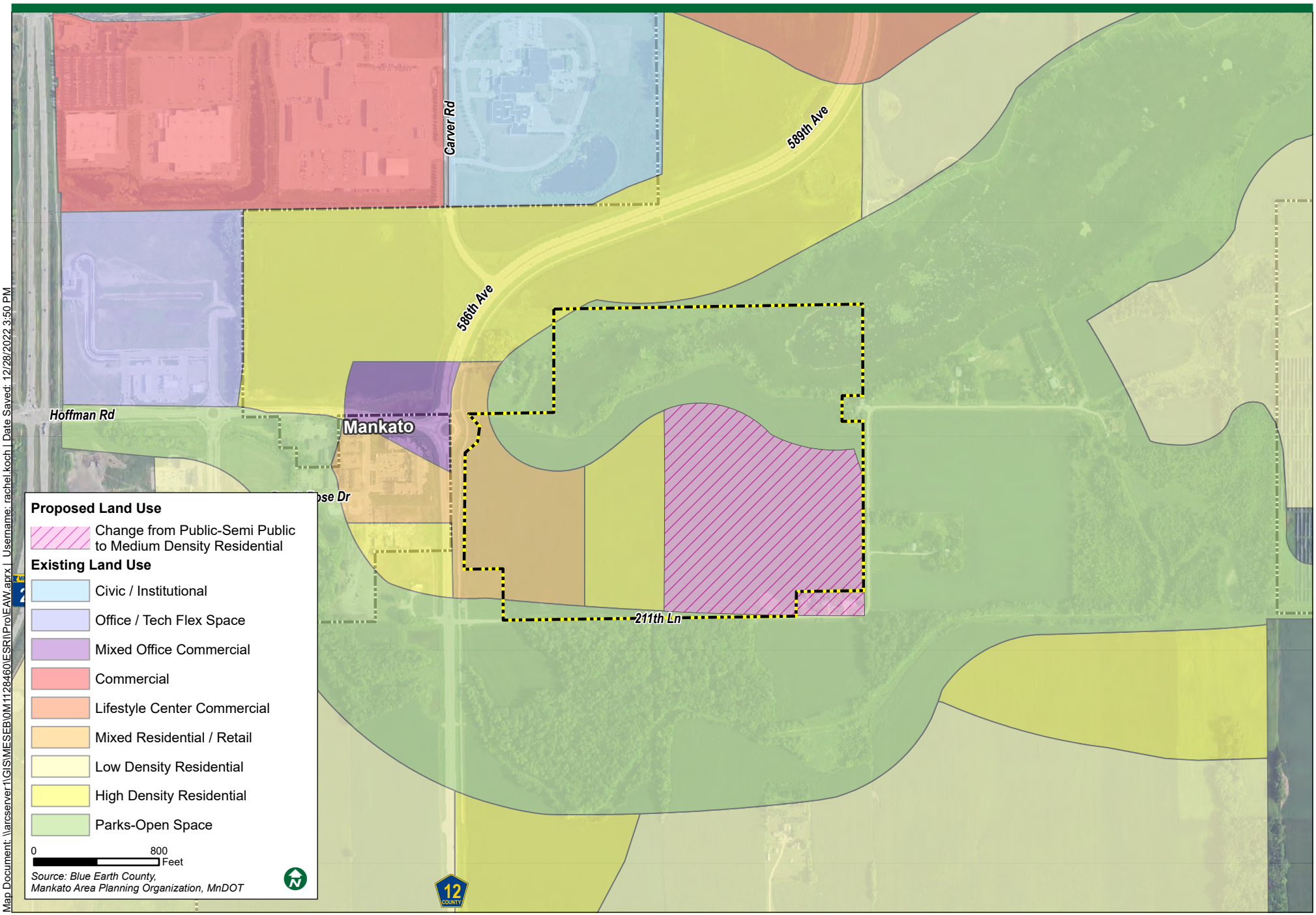
Figure 7: Proposed Land Use



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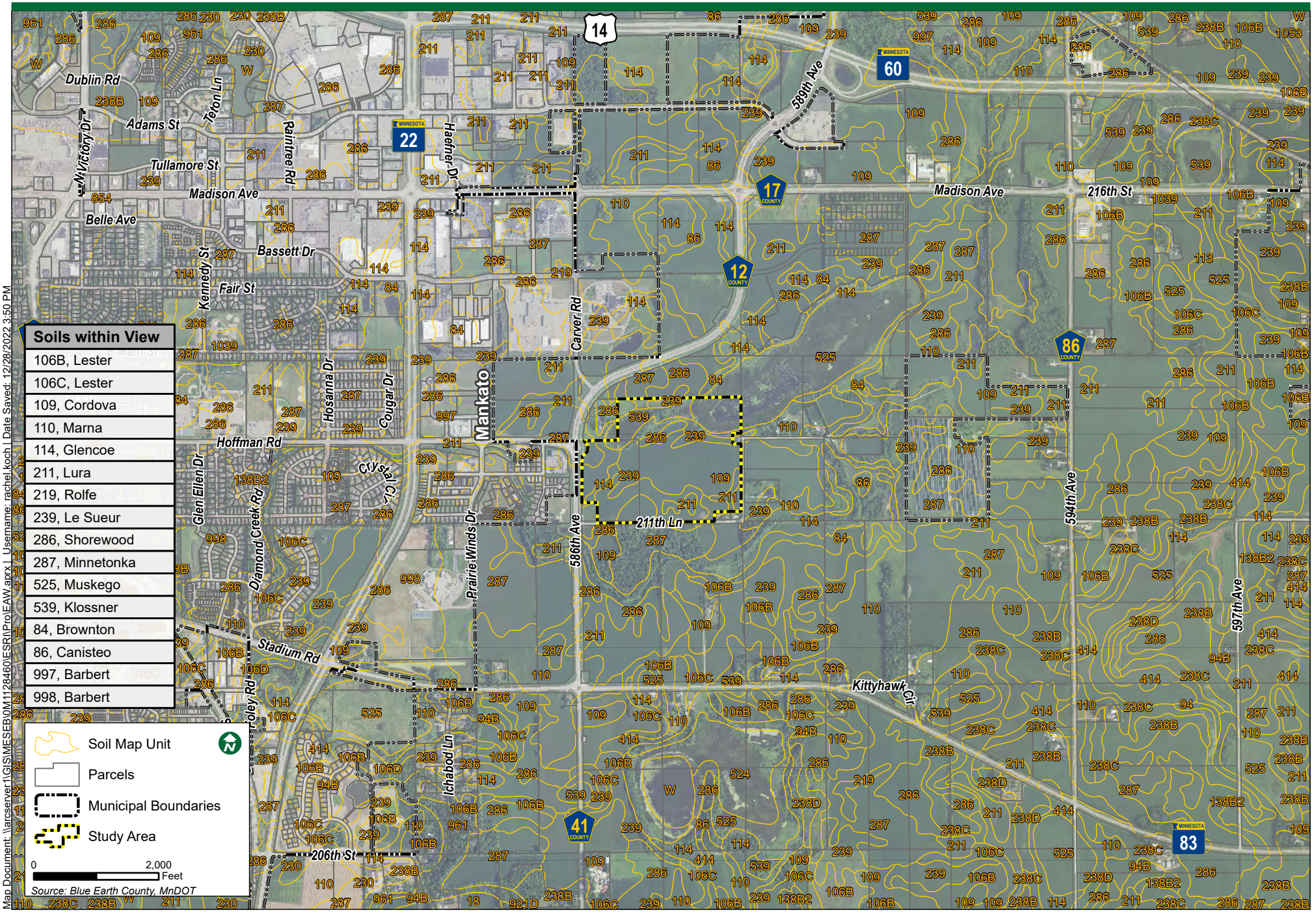

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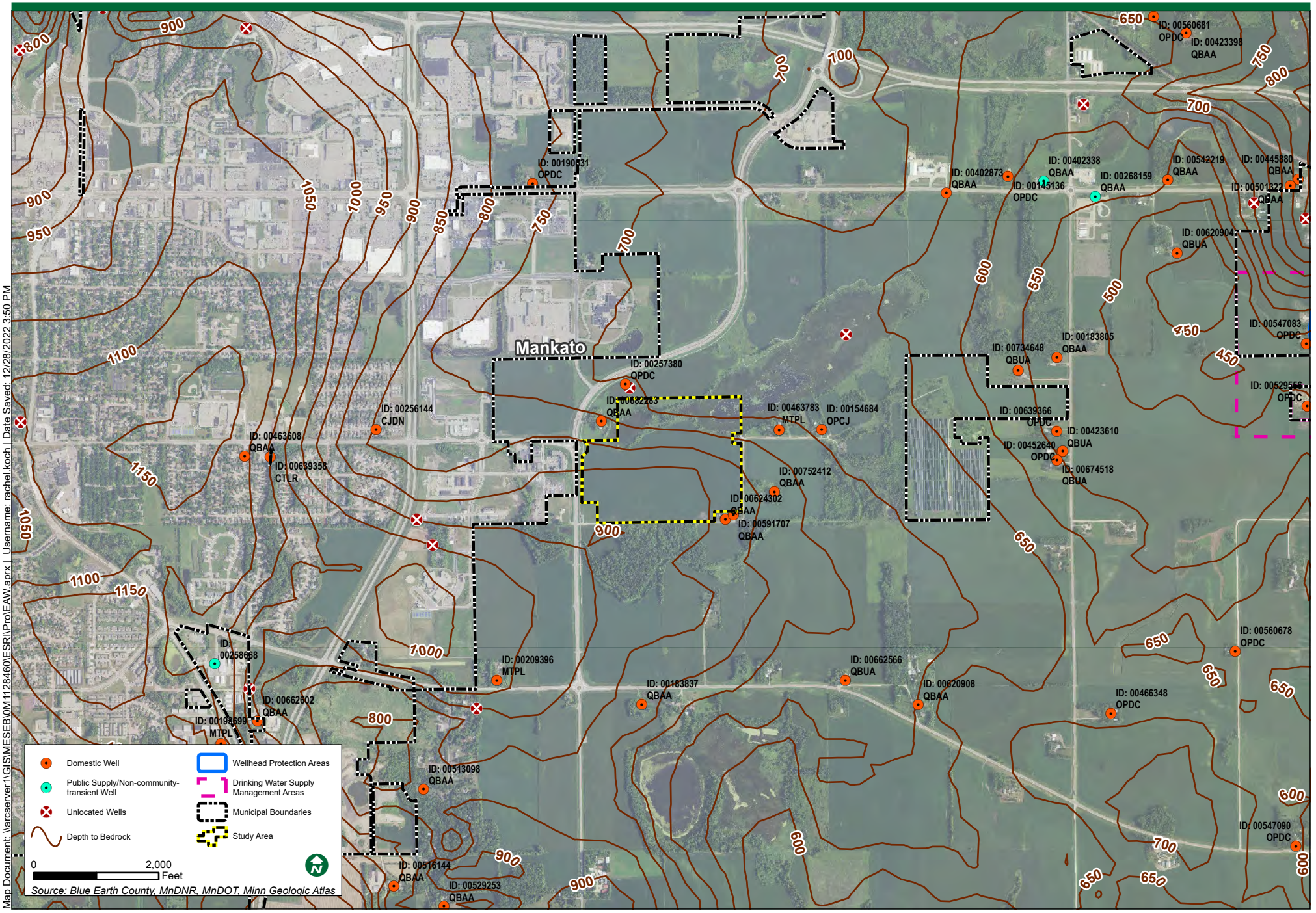

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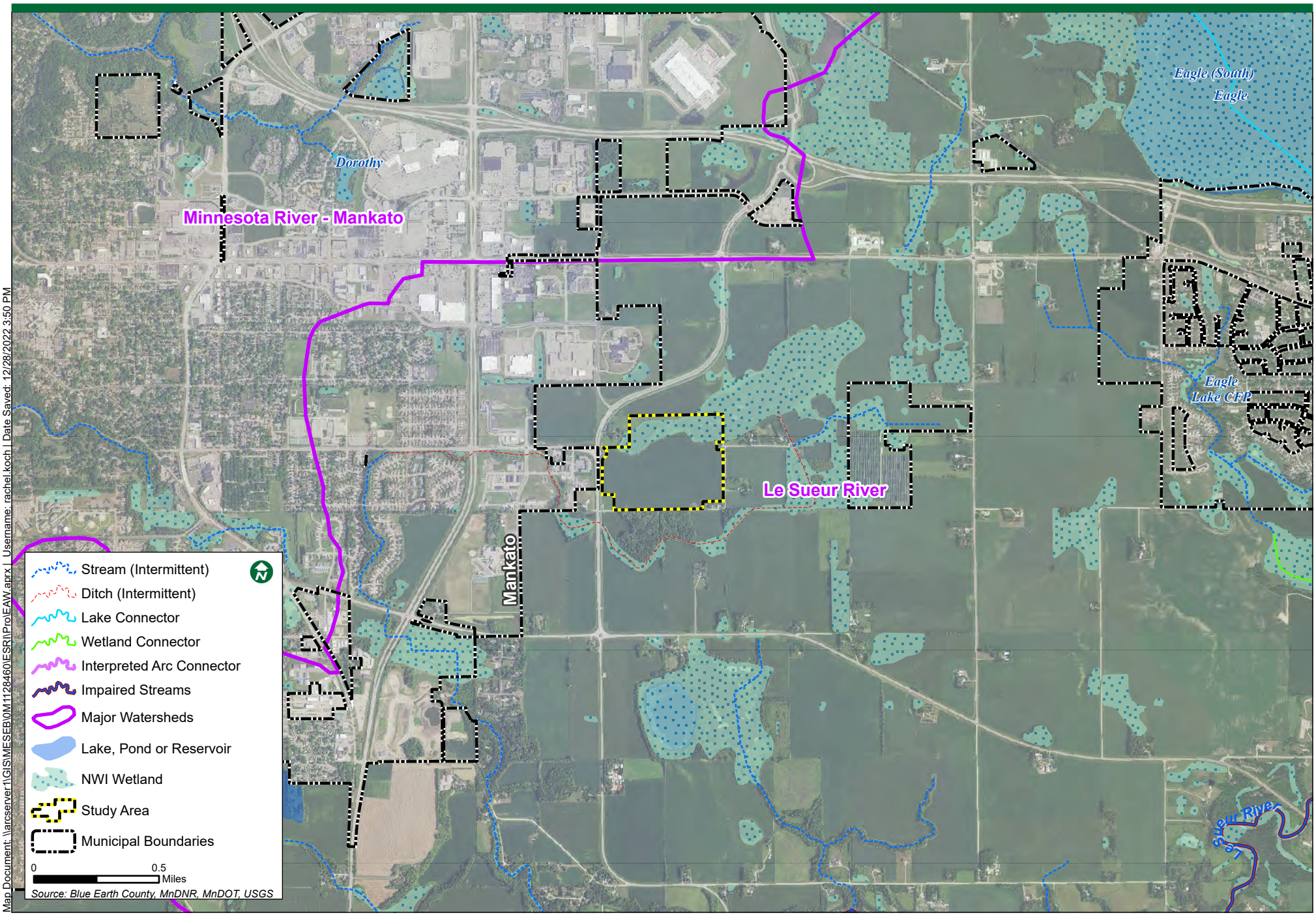

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Figure 11: Existing Drainage Patterns

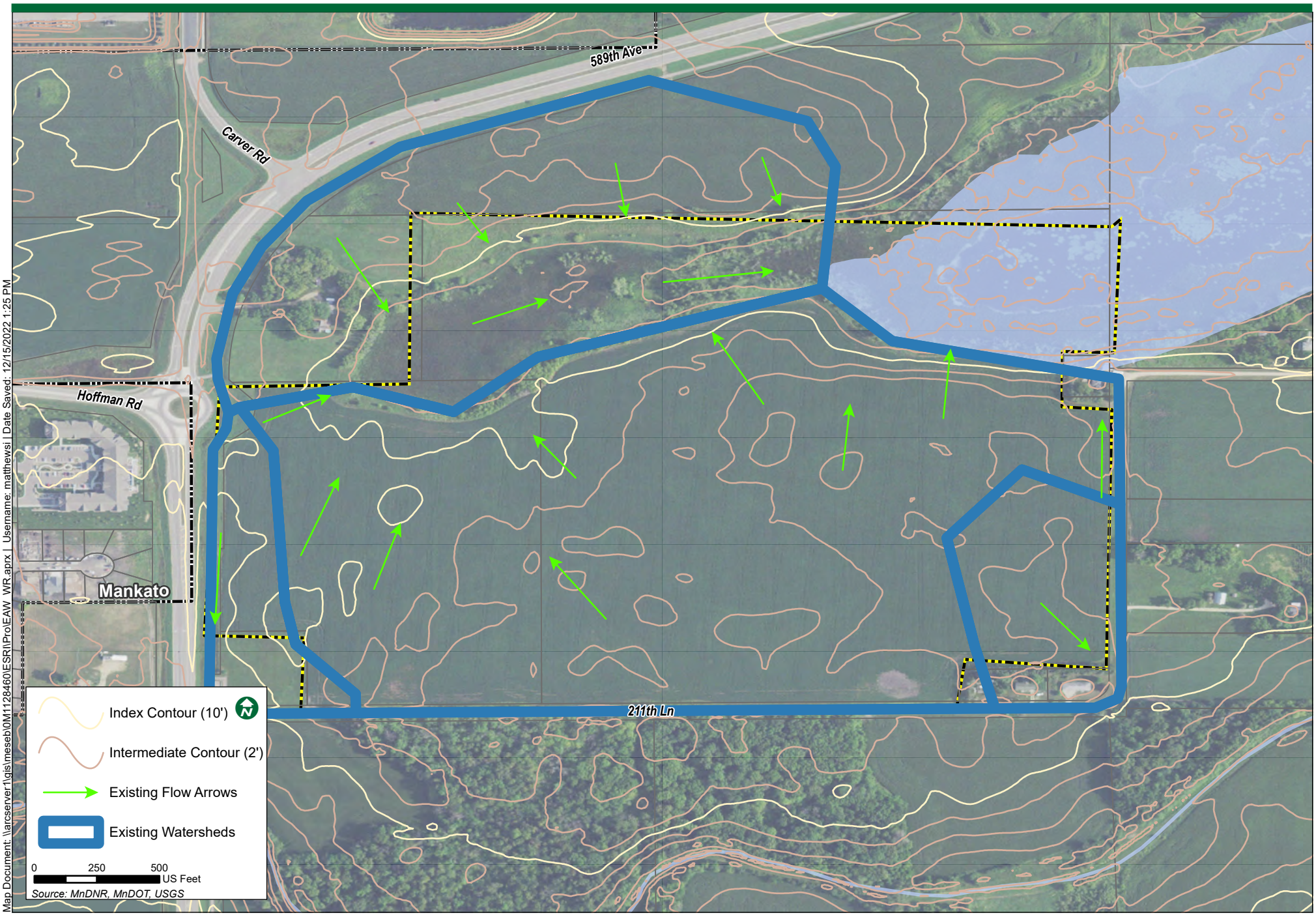
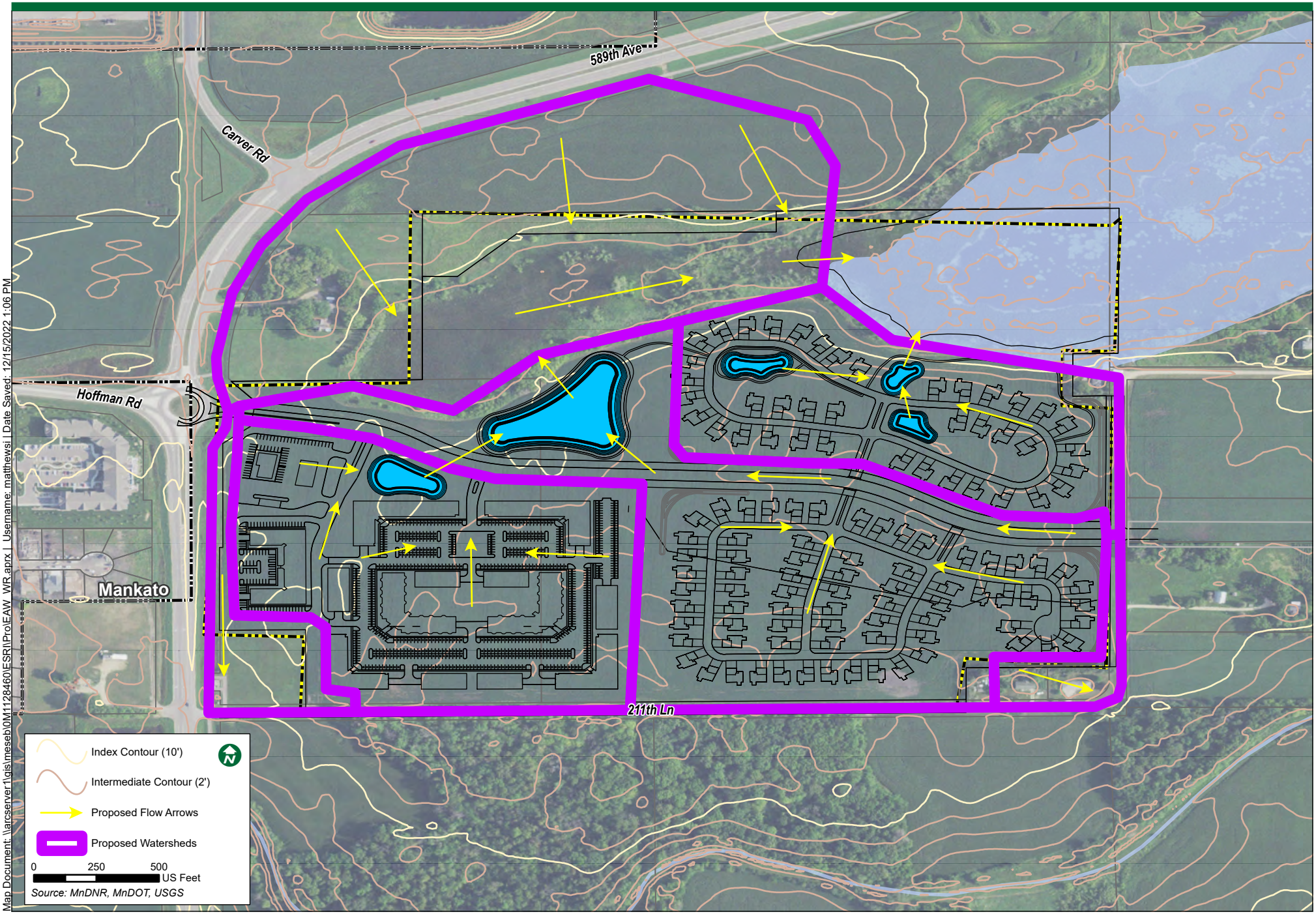


Figure 12: Proposed Drainage Patterns



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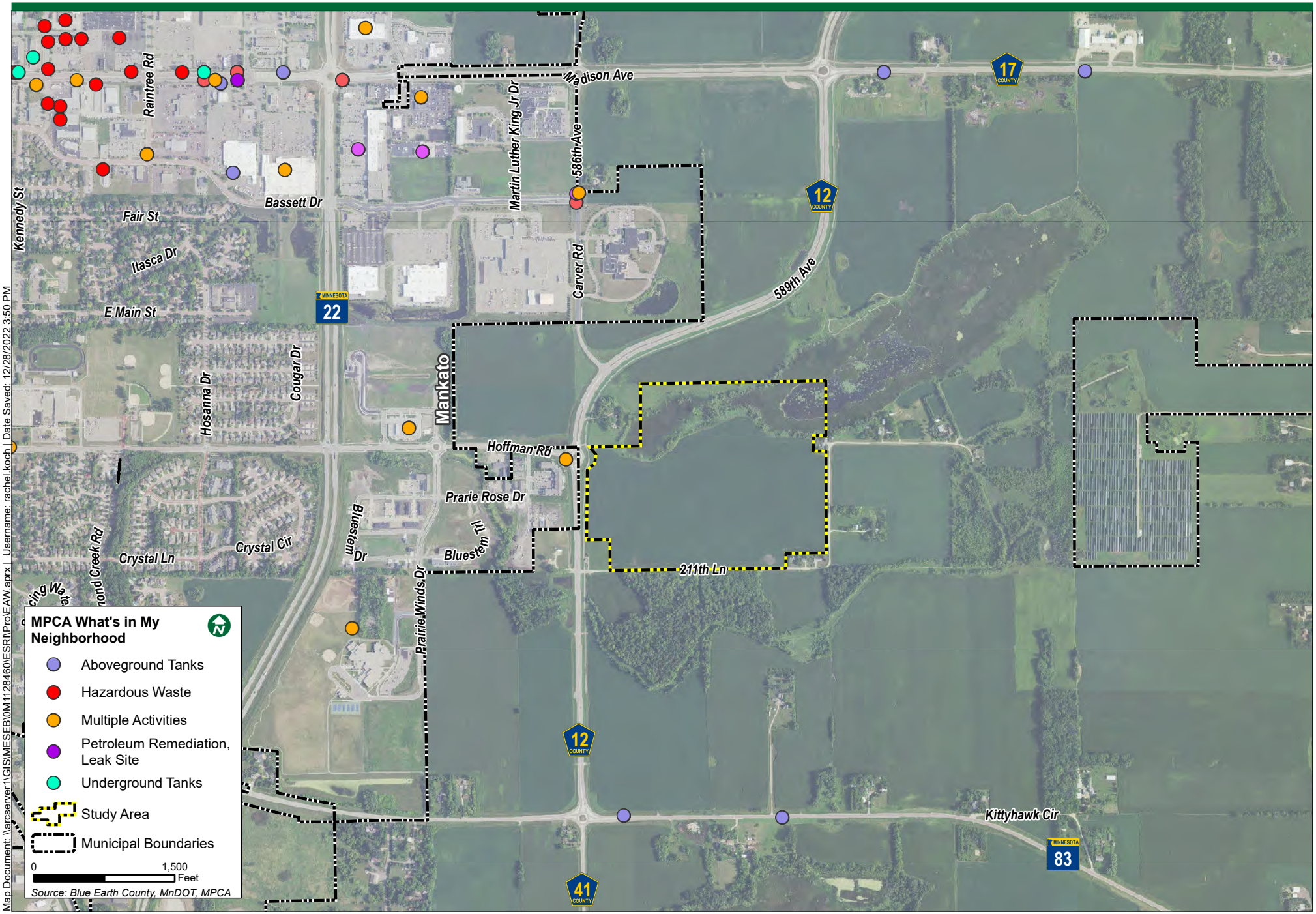

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Figure 14: Biotic Resources

December 2022

BOLTON & MENK

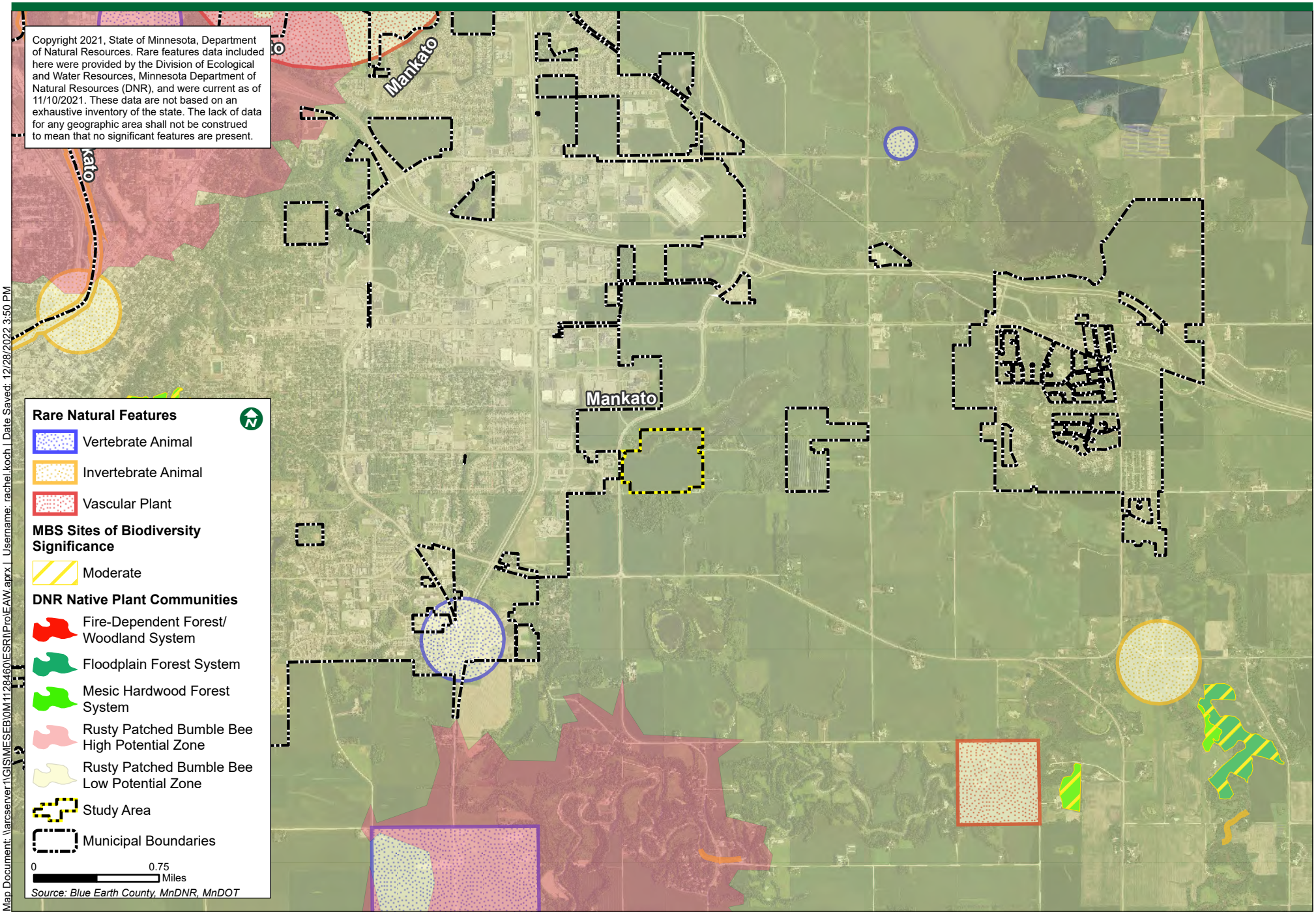

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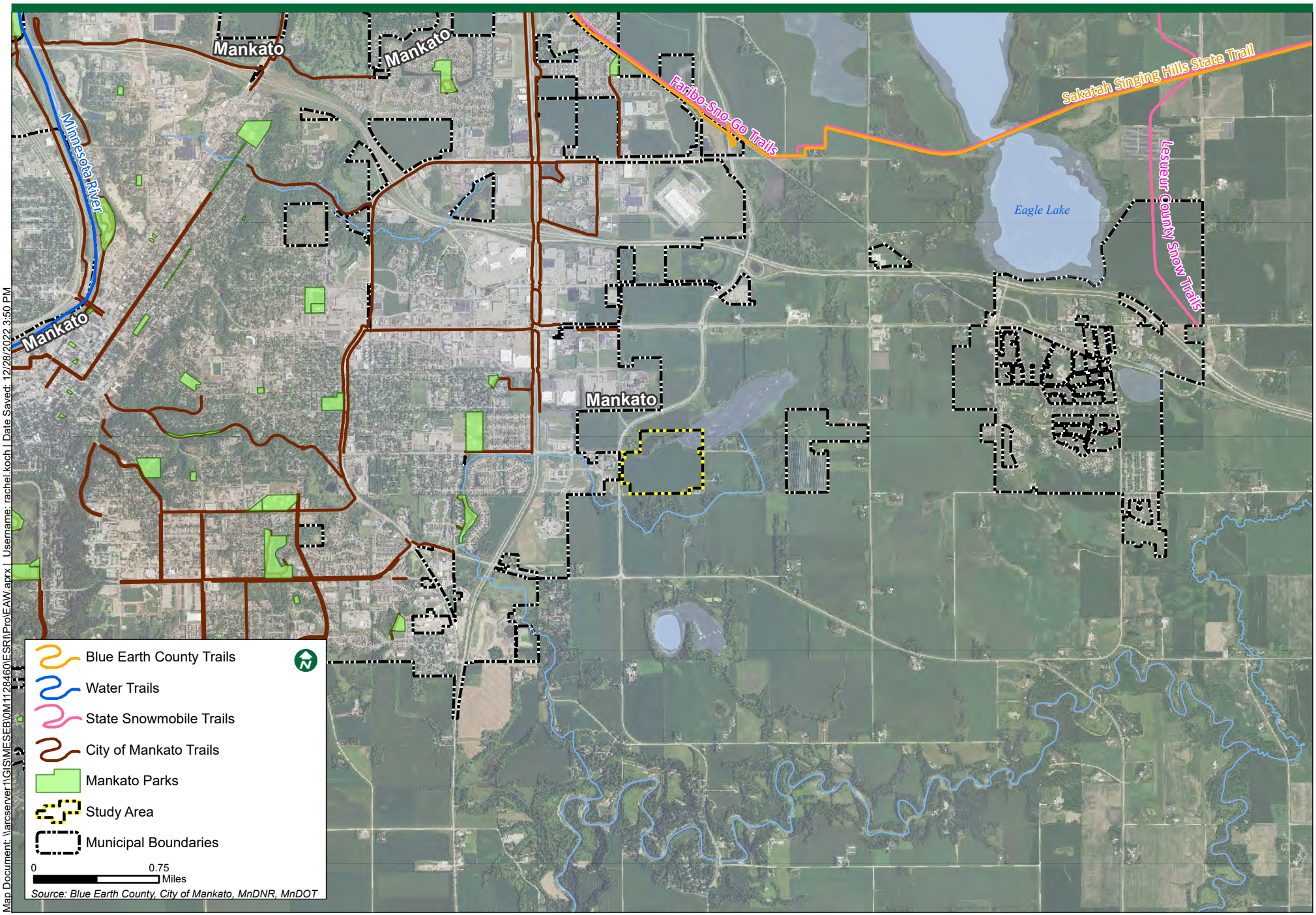
Figure 15: Outdoor Recreation



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Appendix B: Additional Assessments

Traffic Study Memorandum

SSTS
S² TRAFFIC SOLUTIONS

December 29, 2022

To: **John Mesenbrink, Mesenbrink Construction**

From: **Vernon Swing, PE**

Re: **Traffic Analysis – Mesenbrink Mixed Use, Mankato, MN**

Per your request, SSTS LLC has conducted a traffic study for the Mesenbrink Mixed Use Development (hereafter referred to as the Proposed Project) located on the east side of 586th Ave (CSAH 12) at Hoffman Rd in Mankato, MN. This traffic study reflects the anticipated development of 112 single family homes, 713 mid-rise multi-family units, 6,250 sq ft (6.25 K-sf) of retail/shopping center and a 4.7 K-sf convenience/gas station and assumes completion of the development by the 2025 design year. The Proposed Project will be accessed via an extension of Hoffman Dr from the roundabout at CSAH 12 to the east, and from 211th Ln. **Figure 1**, Vicinity Map, depicts the location. **Figure 2**, Site Plan, illustrates the site layout and access locations.

The study area for this memorandum includes the intersections listed below, and the study focuses on the traffic operations during the 2025 Design year and 2045 Planning Horizon Year with and without the Proposed Project.

- Hoffman Rd & TH 22
- Hoffman Rd & CSAH 12
- CSAH 12 & 211th Ln

The existing AM and PM peak hour traffic conditions were documented through new turning movement traffic counts at the listed intersections. Further, forecasts were developed for the 2025 traffic conditions and 2045 traffic conditions at these intersections without the development, and forecasts of the trip generation potential for the proposed land uses and distribution of these trips through the study area are documented.

Existing Conditions

The existing conditions of the roadways and intersection providing direct and indirect access to the Proposed Project were documented and are noted in **Table 1** (the descriptions reflect conditions adjacent to the site). Additionally, **Figure 3** shows the existing lane geometry and traffic control at the study intersections.

Table 1. Study Roadway Characteristics

Roadway	Functional Class	Typical Section	Posted Speed	AADT (Year)
TH 22	Principal Arterial	4-Lane Divided Rural	45 mph	18,859 (2021) (MnDOT)
Hoffman Rd	Major Collector	2-Lane Undivided Urban	30 mph	1,800 (2020) (MAPO)
CSAH 12	Major Collector	2-Lane Undivided Rural	45 mph	4,000 (2022) (Counts)
211th Ln	Local Street	2-Lane Undivided Rural	30 mph	N/A

Existing Traffic Volumes

AM and PM peak hour turning movement counts were conducted at the study area intersections on Thursday August 25, 2022, and on Thursday September 8, 2022. The following notes the peak hour timeframes:

- AM: 7:15 AM to 8:15 AM
- PM: 4:45 PM to 5:45 PM

Figure 4 illustrates the existing peak hour traffic volumes.

Future Conditions

To quantify the impacts of a development on the surrounding roadway system, it is necessary to first forecast and analyze traffic conditions that would be present on the roadway system without the inclusion of the proposed project. For this study, it is anticipated that the Proposed Project will be completed by 2025, thus year 2025 was selected for analysis, and again forecasts have been completed for the year 2045 to be consistent with the Planning Year Horizon. Review of the MAPO 2045 Transportation Plan indicates that traffic on TH 22 will grow at a rate of approximately 1.4 percent per year, traffic on Hoffman Rd will grow at approximately 1.1 percent per year, and traffic on CSAH 12 will grow at a rate of 6.4 percent per year. It is important to consider that these growth forecasts reflect the inclusion of development of this property, with approximately the same site usage. This analysis utilized the 1.4 percent growth in background traffic on both TH 22 and Hoffman Rd, and the 6.4 percent growth rate on CSAH 12. This will present a conservative analysis of the Build conditions as by 2045 the background numbers with the forecast growth will include development of the parcel, thus the results of the 2045 No-Build will essentially reflect the MAPO Build forecast for the subject property, and the Build results, as presented, are a worst case. **Figure 5** illustrates the No-Build traffic volumes for year 2025, and **Figure 6** illustrates the 2045 No-Build traffic volumes, with the growth applied to existing traffic volumes.

Trip Generation and Distribution

The trip generation estimates reflect the land uses discussed for the Proposed Project including 112 single family homes, 713 multi-family units, 6.25 K-sf of retail shopping, and a 4.7 K-sf Convenience/Gas Station. The volume of vehicle trips generated by the Proposed Project has been estimated for the weekday AM and PM peak hours and on a daily basis using the data methodology described in the Institute of Transportation Engineers' ***Trip Generation Manual*** [1]**,** 11th Edition. ITE's Land Use Codes corresponding to proposed uses are Single Family Homes 210, Mid-Rise Multi-Family 221, Retail Shopping Less than 40 K-sf 822, and Convenience Store/Gas Station 845. Table 2 summarizes the trip generation estimate for the Proposed Project.

[1] **Trip Generation Manual**, Institute of Transportation Engineers (ITE), 11th Edition

Table 2 - Trip Generation

Land Use	Type	Block No.	Land Use Code	Size	Trips Generated: AM peak Enter	AM peak Exit	PM Peak Enter	PM Peak Exit	Weekday ADT
Mid-Rise Apartment/Suburban	Residential	1	221	713 units	62	195	170	108	3,237
Single Family Housing	Residential	1	210	113 units	21	59	67	39	1,066
Shopping Center	Retail	2	822	6,250 s.f.	9	6	21	21	343
Convenience Store/Gas Station	Retail	2	945	16 fuel pos.	216	216	182	182	4,114
Totals - Gross					307	476	439	350	8,760
					783		790		
Shared Trips					31	48	44	35	876
					78		79		
Pass-By Trips					164	164	147	147	3,154
					328		293		
Totals - Net*					**112**	**264**	**249**	**169**	**4,730**
					376		**417**		

Further, the ITE Trip Generation Handbook, 3rd Edition, outlines a procedure to account for shared trips and pass-by trips within a proposed development which is reflected in Table 2. Shared trips are trips that visit more than one use within a multi-use development. For example, a resident of an apartment may also be a patron of a retail shop within a development and would not generate a new trip to visit the retail shop. ITE suggests between 10 and 40 percent of the traffic destined to retail from residential and visa versa can occur based on time of day. This analysis assumes 10 percent of the site traffic will be shared. Pass-by trips are those trips already using the adjacent roadway and enter the site as an intermediate stop on their way to another destination. The pass-by trips are not generated by the land use under study, and thus, are not new trips added to the network but are trips using the site accesses. The proposed retail uses within the Proposed Project are estimated to generate a larger amount of pass-by vehicle traffic than is realistic for this area as the roadways currently have lower volumes than the estimated pass-by trips. In order to be more accurate yet conservative in terms of traffic impacts, the traffic analysis does not assume any pass-by traffic at the intersections of CSAH 12 with Hoffman Rd and with 211th Ln. (This assumption is quite conservative when considering conditions in 2045 when the forecast traffic passing the site will be greater.) Table 3 reflects the trip generation for the Proposed Project without pass-by traffic that has been analyzed for this report.

Table 3 - Trip Generation w/o Pass-By

Land Use	Type	Block No.	Land Use Code	Size	Trips Generated: AM peak Enter	AM peak Exit	PM Peak Enter	PM Peak Exit	Weekday ADT
Mid-Rise Apartment/Suburban	Residential	1	221	713 units	62	195	170	108	3,237
Single Family Housing	Residential	1	210	112 units	20	58	66	39	1,056
Shopping Center	Retail	2	822	6,250 s.f.	9	6	21	21	343
Convenience Store/Gas Station	Retail	2	945	16 fuel pos.	216	216	182	182	4,114
Totals - Gross					307	475	439	350	8,751
					782		789		
Shared Trips					31	48	44	35	875
					78		79		
Pass-By Trips					0	0	0	0	0
					0		0		
Totals - Net*					**276**	**428**	**395**	**315**	**7,876**
					704		**710**		

As shown in Table 3, the Proposed Project will generate 704 trips (276 entering and 428 exiting) during the morning traffic peak hour, 710 trips (395 entering and 315 exiting) during the evening traffic peak hour and 7,876 daily trips.

The new trips have been assigned to the surrounding roadways according to the existing traffic patterns, and according to travel time forecasts from Apple Maps, and Google Maps. The distribution is consistent

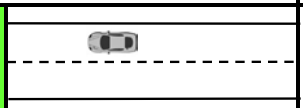
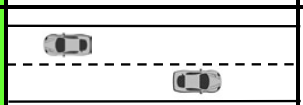
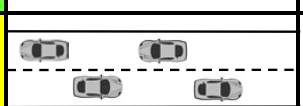
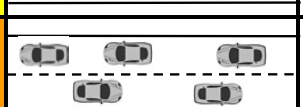
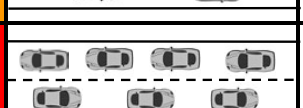
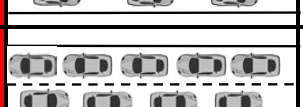
with the MAPO 2045 Plan and reflects the shortest travel time trips paths to destinations along Madison Avenue, Mankato State University, downtown Mankato, North Mankato, or outside the area. In general, the site traffic is distributed to the study area as follows:

- To/from the north 46 percent
- To/from the west 27 percent
- To/from the south 27 percent

Figure 7 illustrates the trip assignment. **Figures 8 & 9** illustrates the 2025 and 2045 Build conditions, respectively, by combining No-Build traffic with the trip assignment volumes.

Traffic Operations

The operating conditions of transportation facilities, such as roadways, traffic signals, roundabouts and stop-controlled intersections, are evaluated based on the relationship of the theoretical capacity of a facility to the actual traffic volume on that facility. Various factors affect capacity including travel speed, roadway geometry, grade, number of travel lanes, and intersection control. The current standards for evaluating capacity and operating conditions are contained in ***Highway Capacity Manual***[2]. The procedures describe operating conditions in terms of driver delay represented as a Level of Service (LOS). Operations are given letter designations with "A" representing the best operating conditions and "F" representing the worst. Generally, level of service "D" represents the threshold for acceptable overall intersection operating conditions during a peak hour. The Chart on the following page summarizes the level of service and delay criteria for signalized and unsignalized intersections.

Level of Service		Description	Delay (sec)	
			Signalized	Unsignalized/ Roundabout
A		Primarily free-flow operation.	0-10	0-10
B		Reasonably unimpeded operation.	>10-20	>10-15
C		Stable operation. The ability to maneuver is more restricted than LOS B.	>20-35	>15-25
D		Less stable operation. Small increases in flow may cause large increases in delay and reduced speeds.	>35-55	>25-35
E		Unstable operation. Low speeds and considerable delay.	>55-80	>35-50
F		Congested operation. High delay and extensive queuing.	>80	>50

For side street stop-controlled intersections special emphasis is given to providing an estimate for the level of service of the minor approaches. Traffic operations at an unsignalized intersection with side street stop-

[2] **Highway Capacity Manual (HCM),** Transportation Research Board, 6th Edition

control can be described two ways. First, consideration is given to the overall intersection level of service. This takes into account the total number of vehicles entering the intersection and the capability of the intersection to support these volumes. Second, it is important to consider the delay on the minor approaches, since the mainline does not have to stop. It is common for intersections with higher mainline traffic volumes to experience increased levels of delay and poor level of service on the side streets.

A final fundamental component of operational analyses is a study of vehicular queuing, or the line of vehicles waiting to pass through an intersection. An intersection can operate with an acceptable Level of Service, but if queues from the intersection extend back to block entrances to turn lanes or accesses to adjacent land uses, unsafe operating conditions could result. In this report, the Industry Design Standard 95th percentile queue length is used. The 95th Percentile Queue Length refers to that length of vehicle queue that has only a five-percent probability of occurring during an analysis hour.

This study has utilized the industry current Synchro/SimTraffic software package (11th Edition) to analyze the 2025 and 2045 No-Build and Build conditions for the AM and PM peak hours. It is noted, the reported results for the non-roundabout intersections are from the aggregate of 10 SimTraffic simulations which use a random number generator to seed the network with vehicles. These results reflect dynamic conditions and are more accurate for the non-roundabout intersections than the results of the static analysis reported by Synchro. Due to the random number generator results can sometimes show slightly better operations on minor movements under higher traffic conditions when the intersections are operating well. This can be seen when delays and queues noted in the Build Scenario are slightly less than the No-Build Scenarios. The results from the roundabout analysis are from the Synchro analysis which uses the methods developed for SIDRA (as adopted by the FHWA).

Analysis Results

Tables 4 summarizes the results of the operational analysis for the 2025 No-Build and Build Conditions. Note the 2025 No-Build and Build operations reflect the additional traffic associated with the annual growth rate applied to existing traffic volumes. Additionally, the Build operations include the net new traffic forecast for the Proposed Project.

Table 4
2025 No-Build and Build Traffic Operations

Intersection	Measure of Effectiveness (Delay in Sec and Queue in Ft)				
	Criteria	2025 No-Build		2025 Build	
		AM Pk Hr	PM Pk Hr	AM Pk Hr	PM Pk Hr
TH 22 & Hoffman Rd (Signal)	*Overall LOS & Delay*	C 22.0	C 20.1	C 24.6	C 21.6
	Worst Mvmt. LOS & Delay	D 44.1 (NBL)	D 54.7 (NBL)	D 42.5 (NBL)	D 41.3 (SBL)
	95th Percentile Queue	WBT - 378'	SBL - 198'	WBT - 374'	SBT - 238'
CSAH 12 & Hoffman Rd (RaB)	*Overall LOS & Delay*	A 2.8	A 2.7	A 4.2	A 4.3
	Worst Mvmt. LOS & Delay	A 4.2 (NB)	A 3.9 (NB)	A 4.4 (WB)	A 5.6 (EB)
	95th Percentile Queue	NB - 18'	NONE	EB - 20'	EB - 22'
TH 3 & TH 149 (Stop Control)	*Overall LOS & Delay*	A 0.4	A 0.2	A 1.2	A 1.0
	Worst Mvmt. LOS & Delay	A 2.4 (WB)	A 1.7 (WB)	A 7.1 (WB)	A 5.7 (WB)
	95th Percentile Queue	WB - 21'	SBL - 9'	WB - 46'	WB - 29'

The results shown in Table 4 indicate the 2025 No-Build operations of the study area intersections are acceptable with LOS C or better for overall operations, and acceptable operations for directional and individual travel lane operations, with manageable vehicle queuing. Further, the results in Table 4 indicate the 2025 Build overall operations and travel lane operations of the study area intersections and site access

are the same with acceptable LOS C or better for overall operations and acceptable operations for directional and individual travel lane operations, with manageable vehicle queuing. It is noted the westbound queue in the AM Peak for both scenarios does block the access to the turn lanes, however, the SimTraffic simulation shows these queues clear each cycle. These results suggest that no roadway improvements beyond the construction of Hoffman Rd to the east of CSAH 12 are required to accommodate the forecast traffic from the development, but the westbound approach to TH 22 should be monitored for future extension of the right turn lane.

Table 5
2045 No-Build and Build Traffic Operations

Intersection	Measure of Effectiveness (Delay in Sec and Queue in Ft)				
	Criteria	2045 No-Build		2045 Build	
		AM Pk Hr	PM Pk Hr	AM Pk Hr	PM Pk Hr
TH 22 & Hoffman Rd (Signal)	*Overall LOS & Delay*	C 31.1	C 22.6	D 40.9	C 29.5
	Worst Mvmt. LOS & Delay	E 63.6 (SBL)	D 44.6 (SBL)	E 78.4 (SBL)	D 43.2 (NBL)
	95th Percentile Queue	WB - 665'	SBT - 279'	WBT 786'	SBT 368'
CSAH 12 & Hoffman Rd (RaB)	*Overall LOS & Delay*	A 5.8	A 5.2	A 9.2	A 9.4
	Worst Mvmt. LOS & Delay	A 9.1 (NB)	A 7.5 (NB)	B 14.3 (NB)	B 11.3 (NB)
	95th Percentile Queue	NB - 62'	NB - 48'	NB - 130'	SB - 128'
TH 3 & TH 149 (Stop Control)	*Overall LOS & Delay*	A 1.1	A 0.9	A 2.4	A 2.4
	Worst Mvmt. LOS & Delay	A 3.4 (WB)	A 2.5 (WB)	C 24.6 (WB)	C 15.9 (WB)
	95th Percentile Queue	WB - 20'	SBL - 26'	WB - 49'	WB 29'

The results shown in Table 5 indicate the AM Peak 2045 No-Build and Build operations at the intersection of TH 22 and Hoffman Rd is approaching capacity, with poor operations for the southbound left turning movement and long vehicle queues on the westbound Hoffman Rd approach. The other study area intersections are operating at LOS A, with minor movements at level of service C or better for both the No-Build and Build conditions.

As stated earlier, this analysis includes background growth based on MAPO forecasts that include the development of the subject property and includes site traffic that has not been adjusted to reflect pass-by conditions. That said, if necessary, by 2045, review of mitigation strategies suggest that to improve the traffic operations at the intersection of TH 22 and Hoffman Rd, the traffic signal operations on TH 22 need to include protected/permissive phasing for the north and southbound left turning traffic, and the westbound approach should be modified to provide two through lanes, the right most lane serving as a share through and right. This extra through lane should extend to the intersection of Hoffman Rd and Coneflower Ln. This change will result in overall 2045 AM Peak Build operations at the TH 22 intersection of LOS D (37.2 sec of delay) and worst movement operations for the westbound left at LOS D (53.2 sec of delay), and will reduce the queue on the westbound approach to a manageable 418 feet.

Summary and Conclusions

The following provides a summary of the study, traffic operations and recommendations:

- AM and PM peak hour traffic operations were analyzed for the 2025 and 2045 conditions without and with the Proposed Project.
- The Proposed Project will generate 704 trips (276 entering and 428 exiting) during the morning traffic peak hour, 710 trips (395 entering and 315 exiting) during the evening traffic peak hour and 7,876 daily trips.

- Results of the traffic analysis for year 2025 for both the AM and PM peaks without the Proposed Project indicate acceptable operations with minimal vehicle delay and back-ups at adjacent intersections.
- Results of the traffic analysis for year 2025 for both the AM and PM peaks with the Proposed Project indicate acceptable operations with minimal vehicle delay and back-ups.
- Results of the traffic analysis for year 2045 AM Peak with and without the Proposed Project indicate the intersection of TH 22 and Hoffman Rd will be approaching capacity without improvements, long delays and long vehicle queues for some movements.
- Results of the traffic analysis for year 2045 PM Peak with and without the Proposed Project indicate acceptable operations with minimal vehicle delay and back-ups.
- The TH 22 and Hoffman Rd intersection may need to be modified by 2045 to include protected/permissive signal phasing on the north and southbound approaches, and the westbound approach may need an additional through lane from the intersection with TH 22 to Coneflower Ln. This new lane would be a shared through and right turn lane. It is suggested the traffic operations at this intersection be monitored to determine if improvements are needed.

Attachments: Figures 1-9
(The Appendices with Traffic Counts and Synchro/Simtraffic Worksheets are available upon request.)

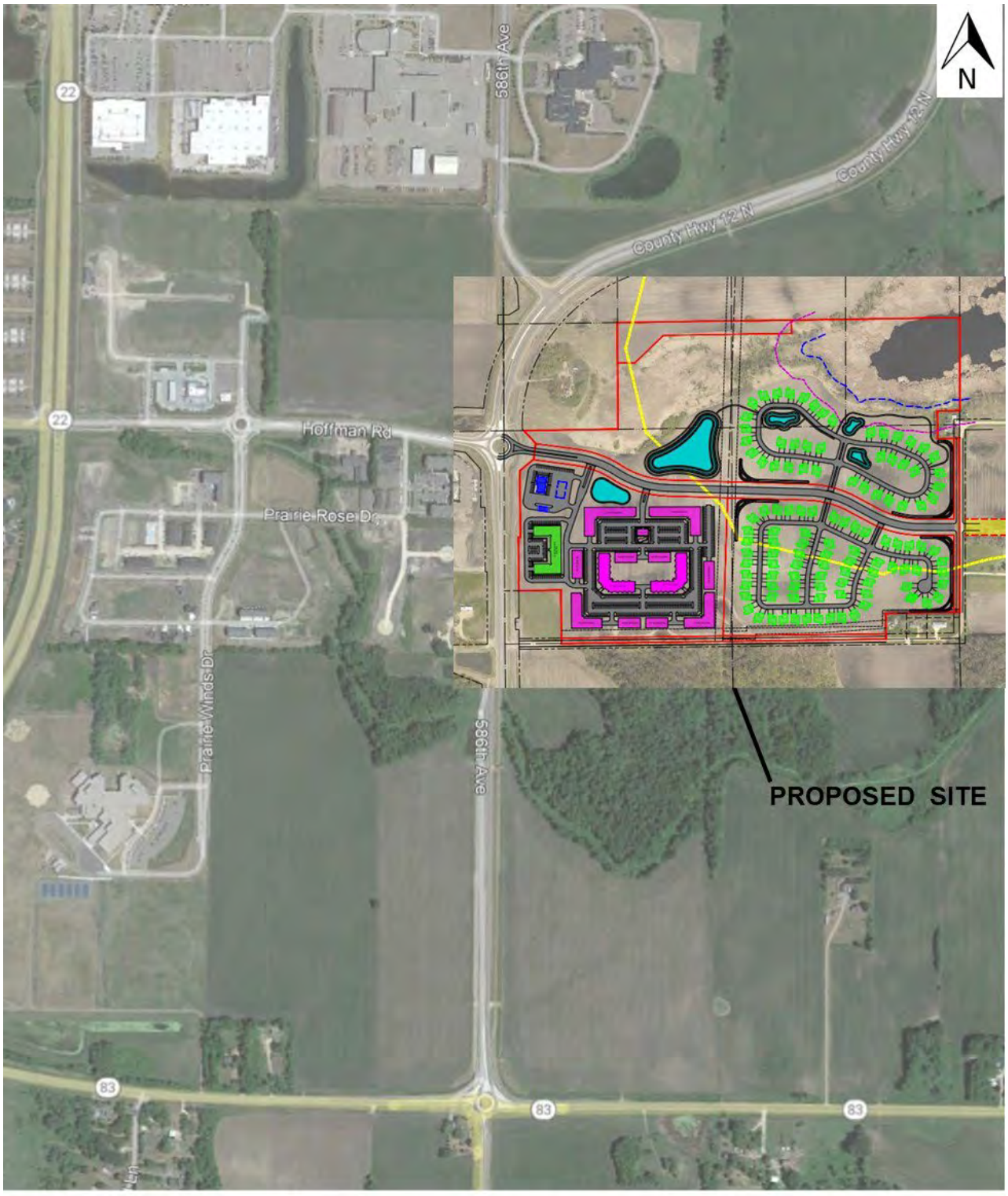


Figure 1 - Vicinity Map

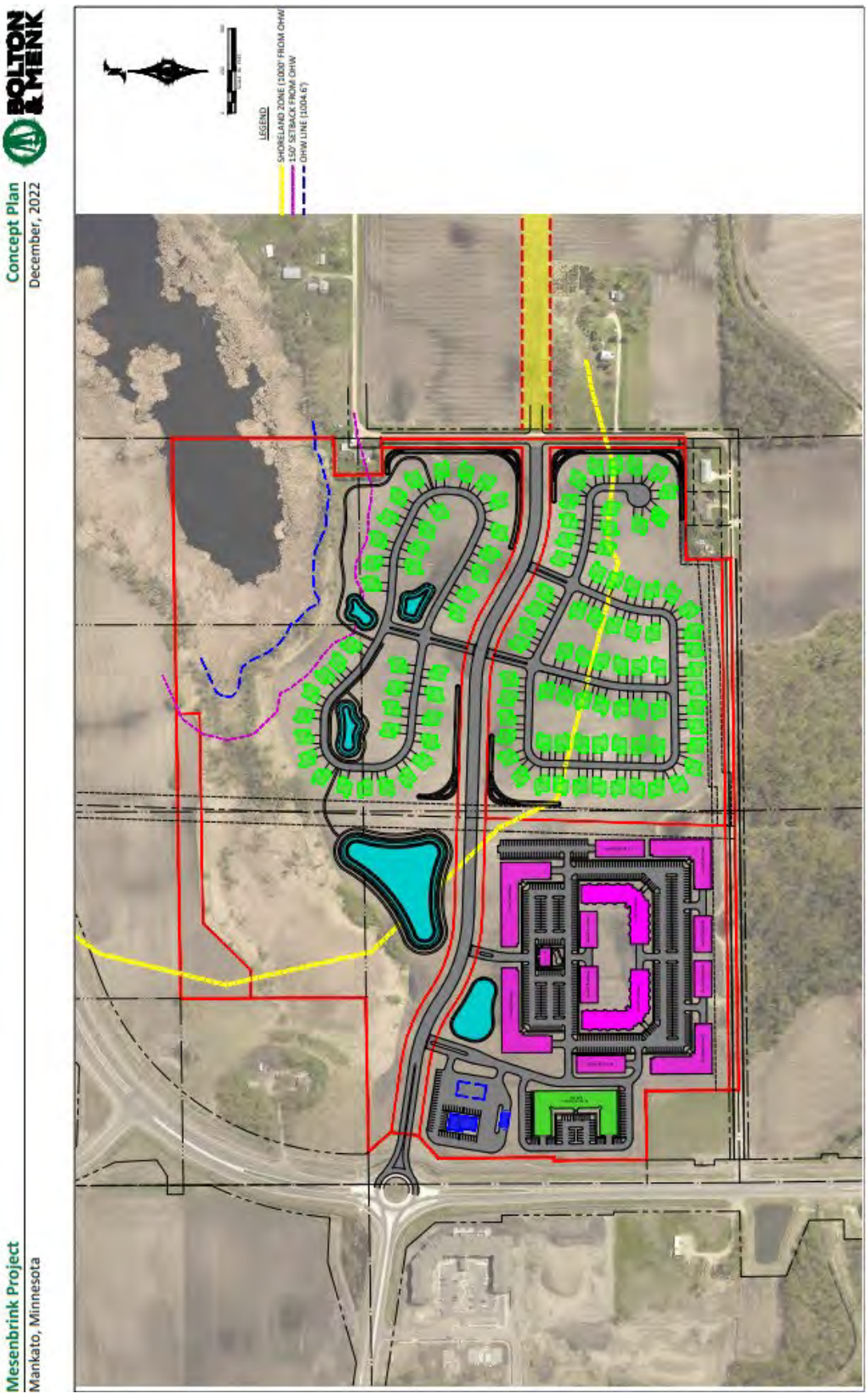


Figure 2 – Site Plan (By Others)

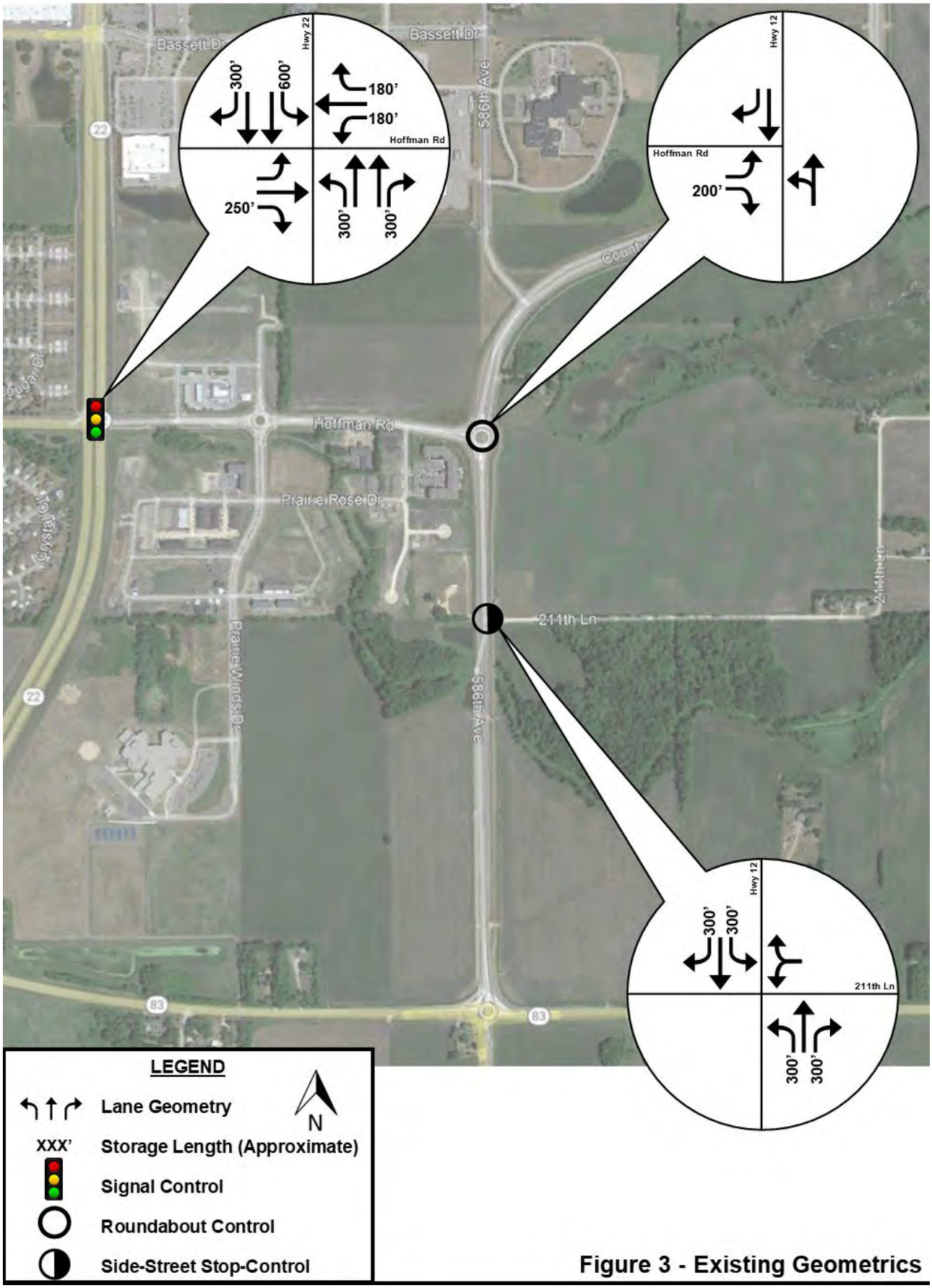


Figure 3 - Existing Geometrics

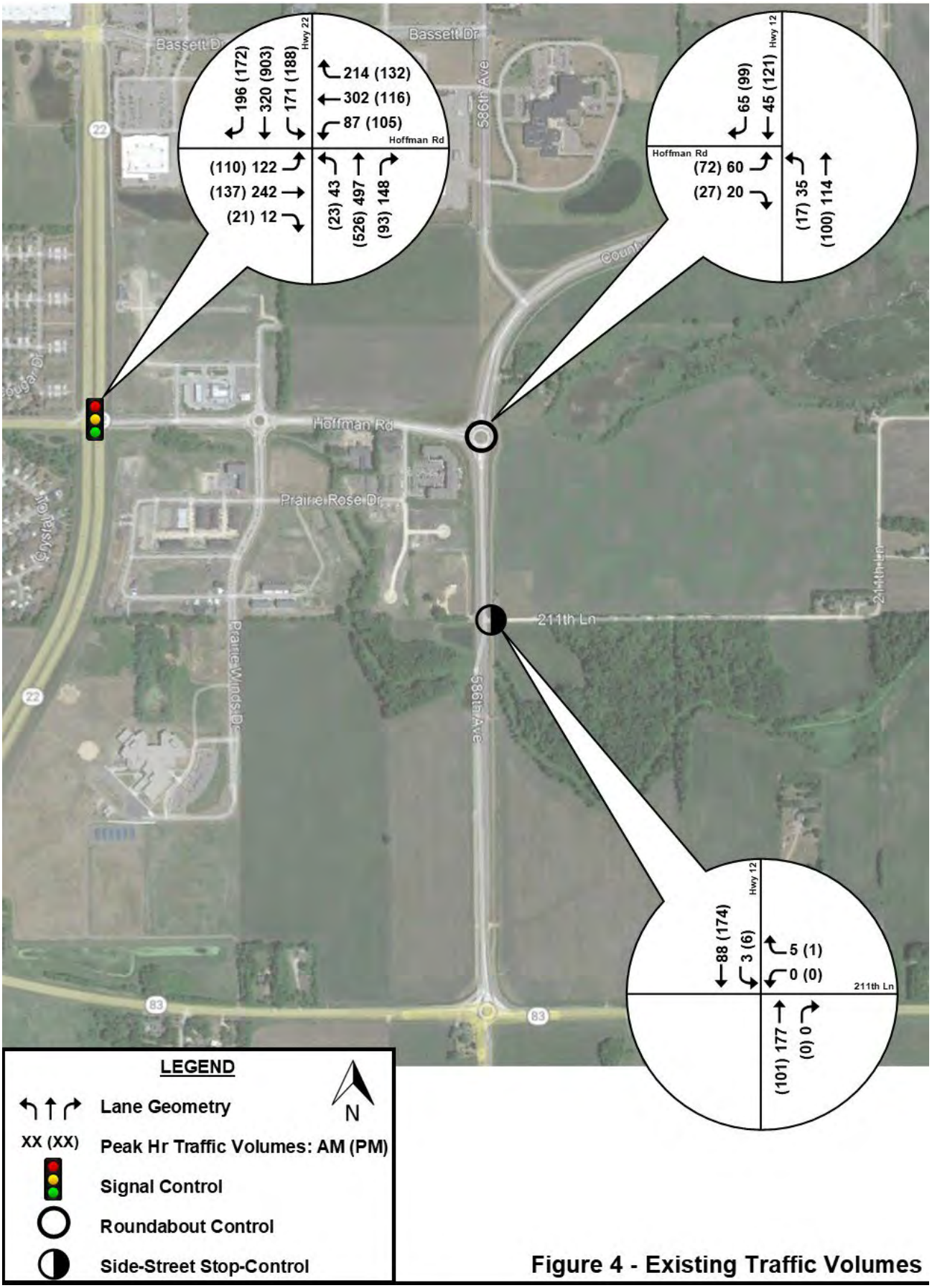


Figure 4 - Existing Traffic Volumes

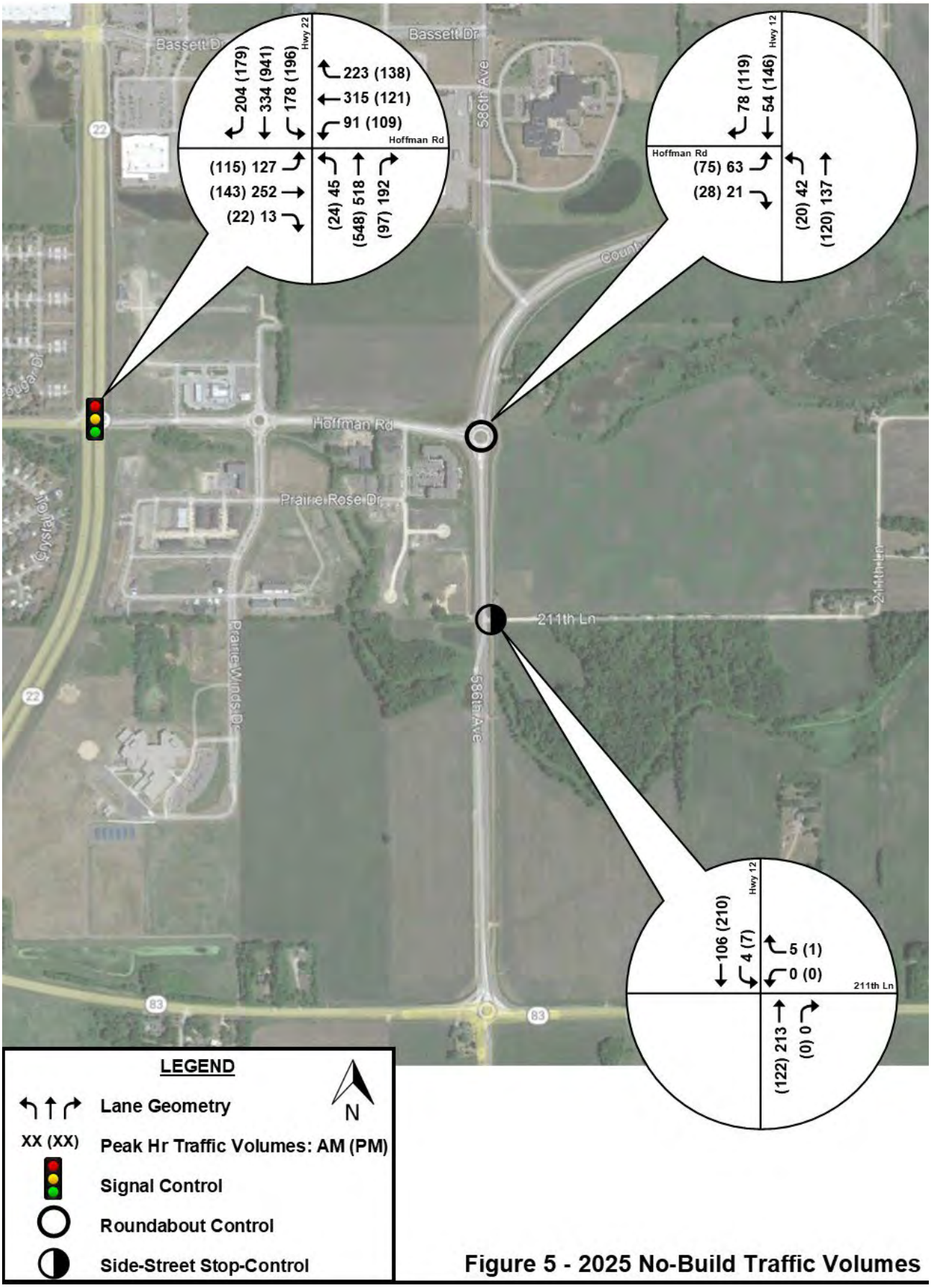


Figure 5 - 2025 No-Build Traffic Volumes

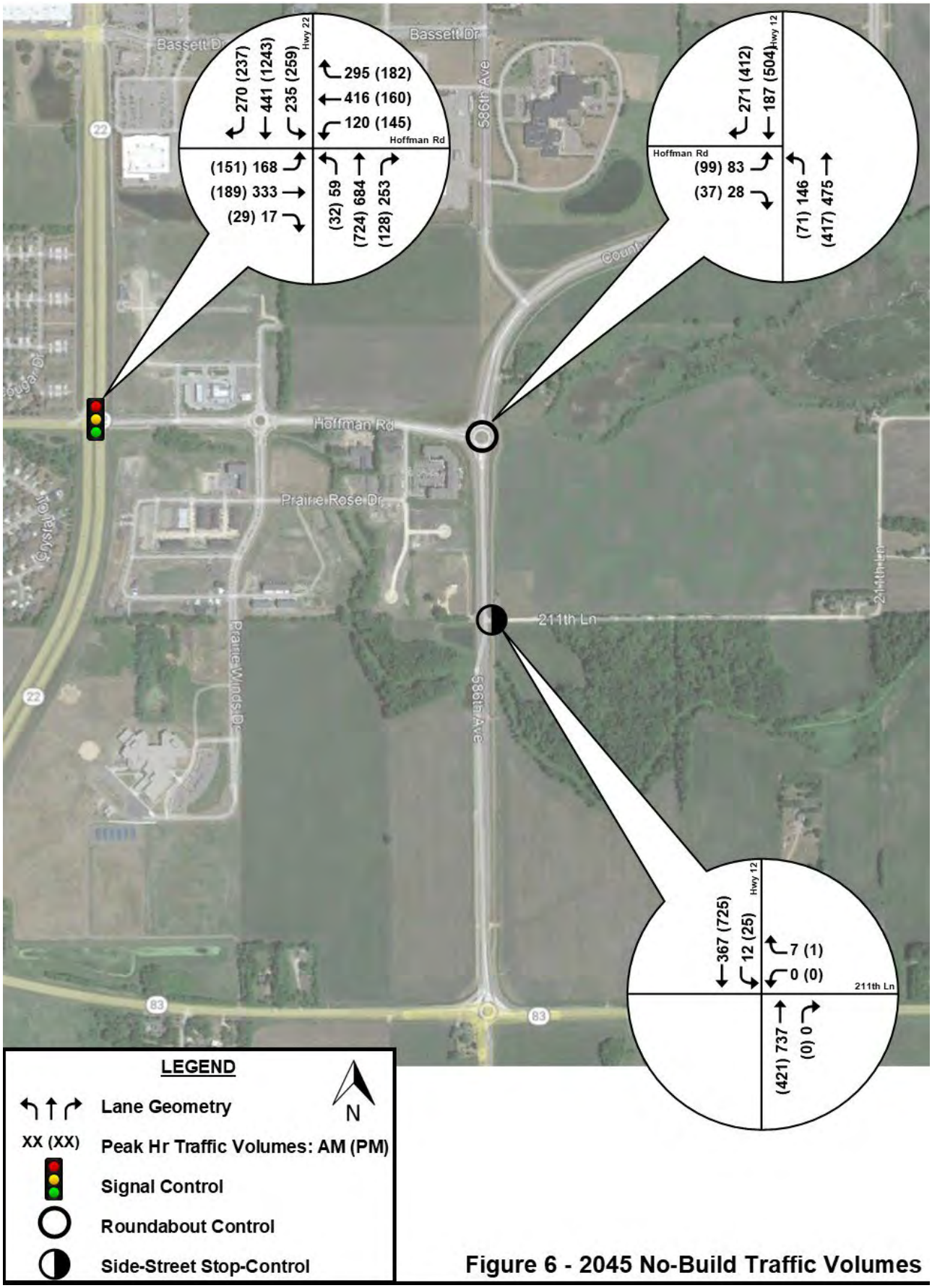


Figure 6 - 2045 No-Build Traffic Volumes

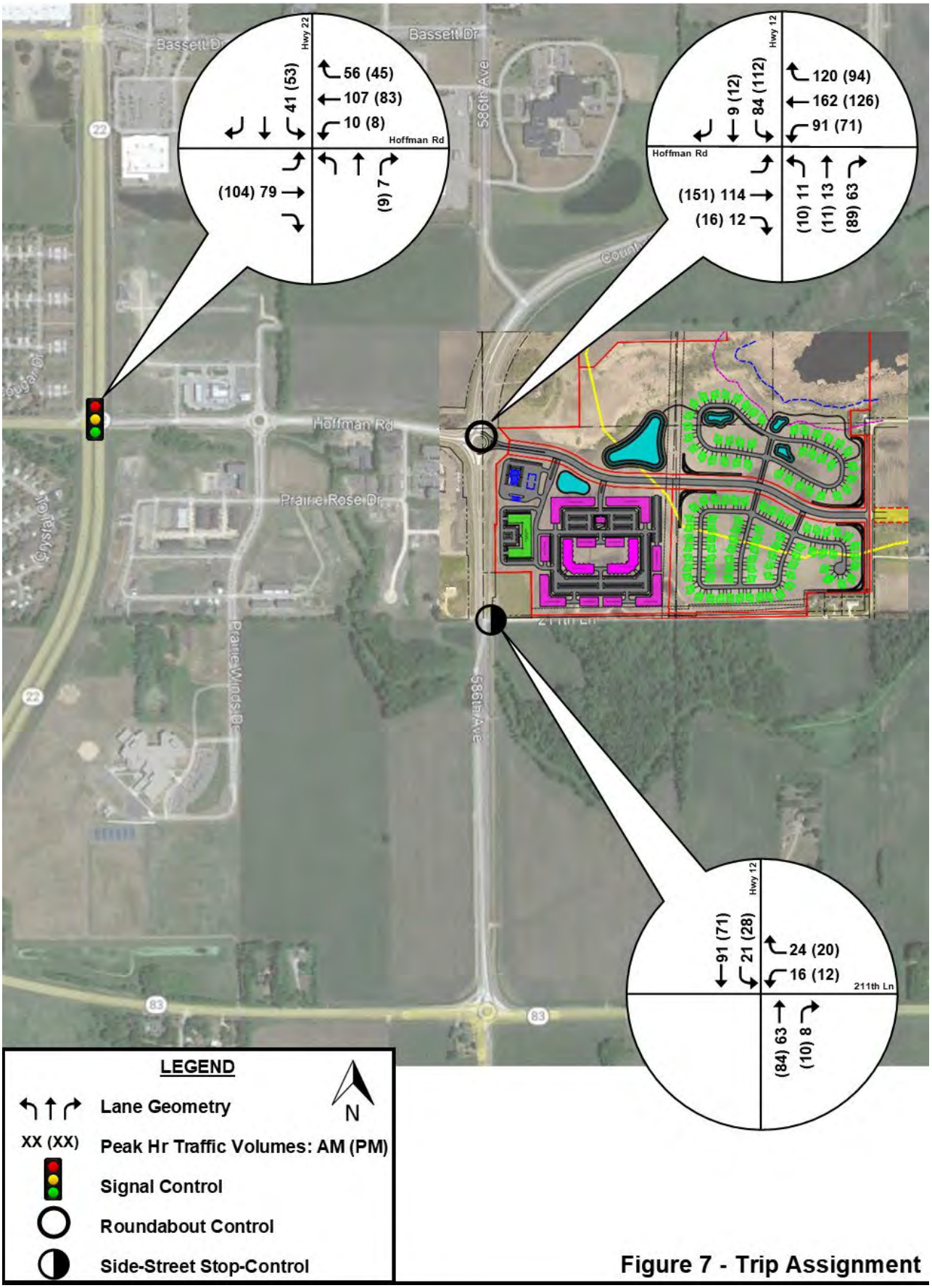


Figure 7 - Trip Assignment

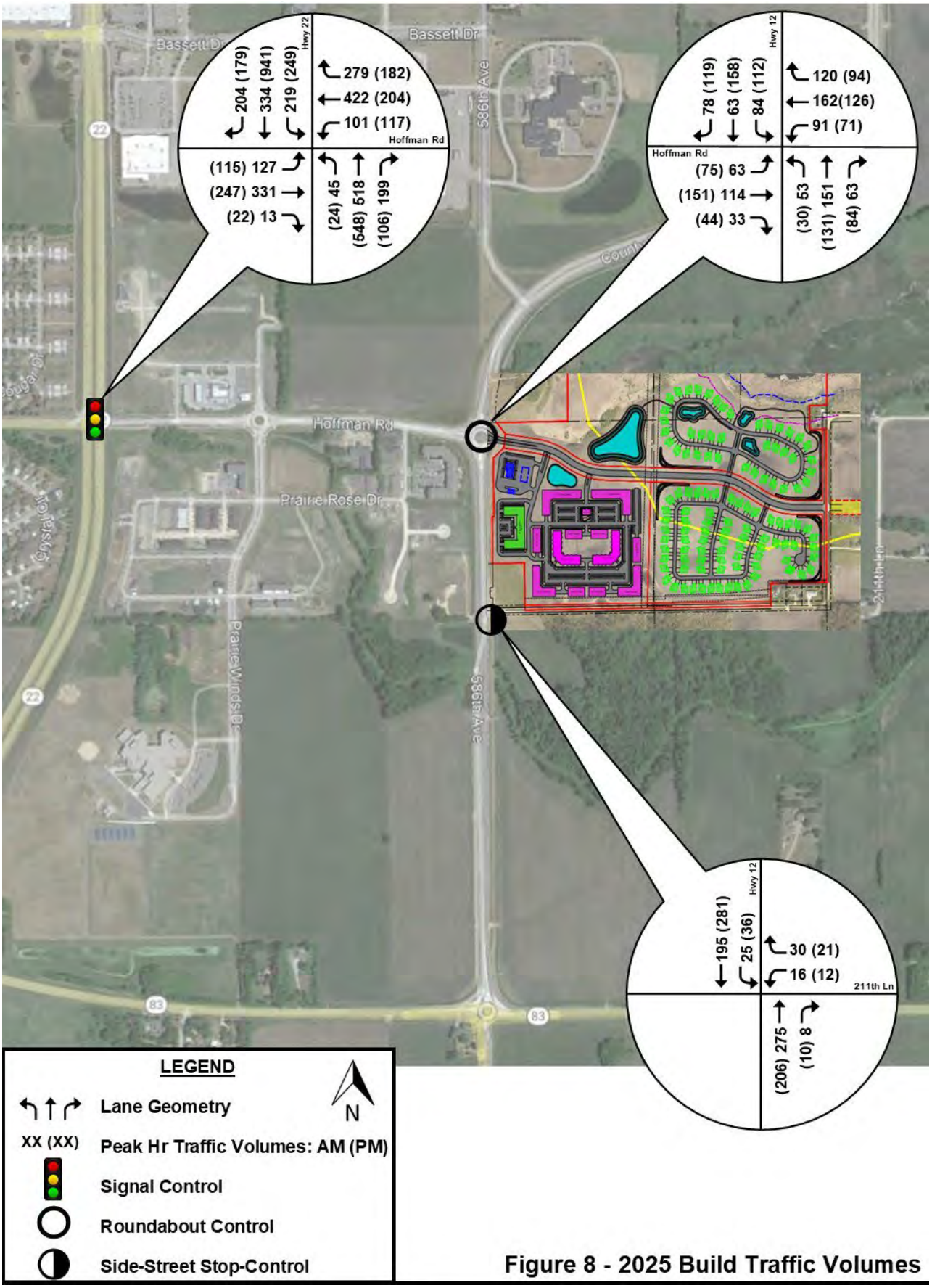


Figure 8 - 2025 Build Traffic Volumes

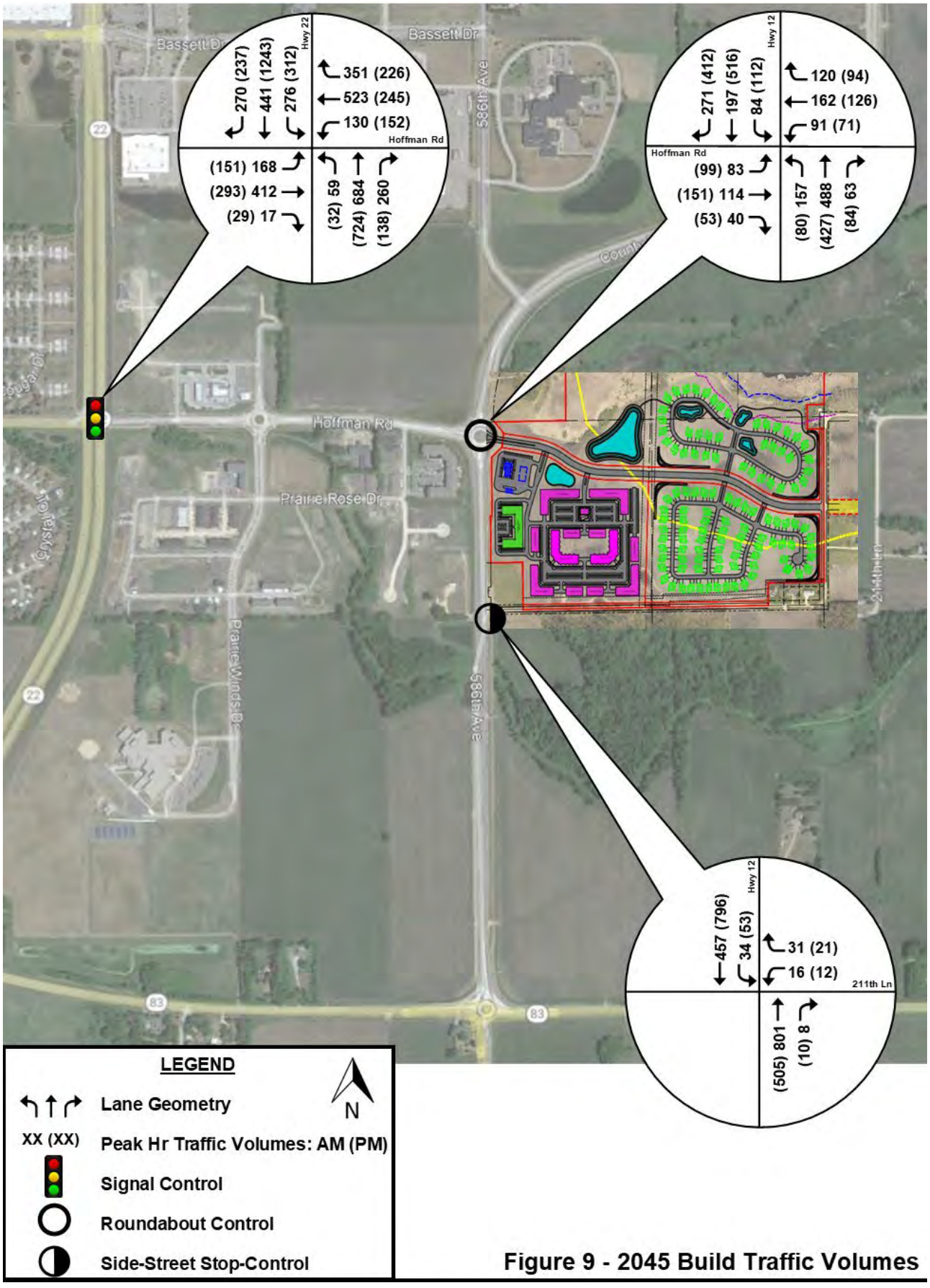


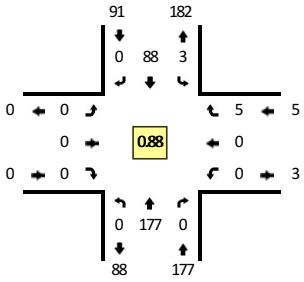
Figure 9 - 2045 Build Traffic Volumes

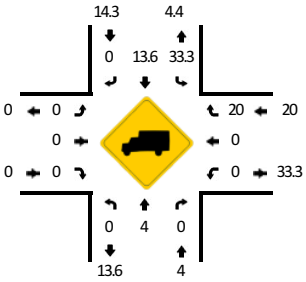
Appendix A: Traffic Counts

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

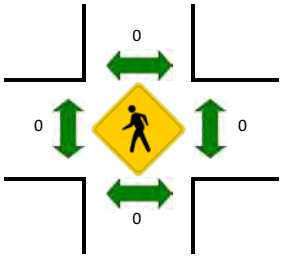
LOCATION: 586th Ave -- 211th Ln (Twp Rd 283) | **QC JOB #:** 15918803
CITY/STATE: Blue Earth, MN | **DATE:** Thu, Sep 8 2022

Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

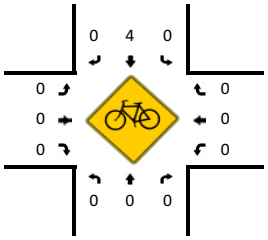


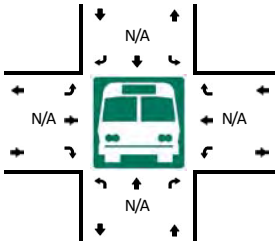


Quality Counts
DATA THAT DRIVES COMMUNITIES

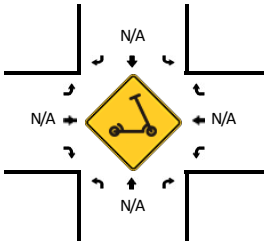












15-Min Count Period Beginning At	586th Ave (Northbound)				586th Ave (Southbound)				211th Ln (Twp Rd 283) (Eastbound)				211th Ln (Twp Rd 283) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	27	0	0	0	12	0	0	0	0	0	0	0	0	0	0	39	
7:15 AM	0	39	0	0	1	23	0	0	0	0	0	0	0	0	1	0	64	
7:30 AM	0	40	0	0	0	15	0	0	0	0	0	0	0	0	1	0	56	
7:45 AM	0	53	0	0	1	21	0	0	0	0	0	0	0	0	3	0	78	237
8:00 AM	0	45	0	0	1	29	0	0	0	0	0	0	0	0	0	0	75	273
8:15 AM	0	28	0	0	0	35	0	0	0	0	0	0	0	0	1	0	64	273
8:30 AM	0	25	0	0	0	26	0	0	0	0	0	0	0	0	0	0	51	268
8:45 AM	0	13	0	0	0	15	0	0	0	0	0	0	0	0	0	0	28	218

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	212	0	0	4	84	0	0	0	0	0	0	0	0	12	0	312
Heavy Trucks	0	12	0		0	8	0		0	0	0		0	0	0		20
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

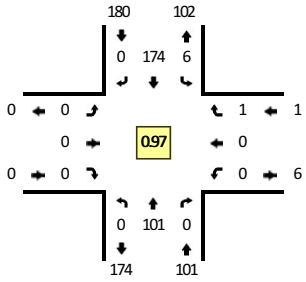
Comments:

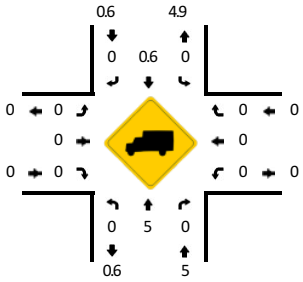
Report generated on 9/14/2022 9:47 AM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

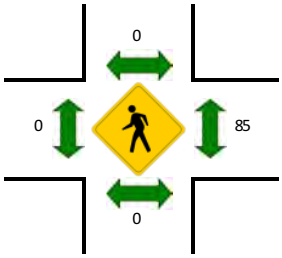
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

LOCATION: 586th Ave -- 211th Ln (Twp Rd 283) | **QC JOB #:** 15918804
CITY/STATE: Blue Earth, MN | **DATE:** Wed, Sep 7 2022

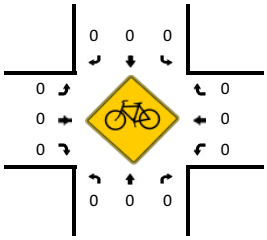
Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 4:45 PM -- 5:00 PM

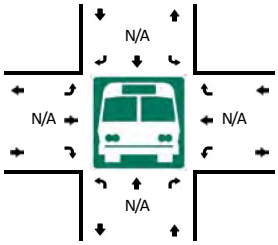




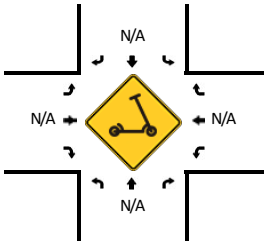












15-Min Count Period Beginning At	586th Ave (Northbound)				586th Ave (Southbound)				211th Ln (Twp Rd 283) (Eastbound)				211th Ln (Twp Rd 283) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	20	0	0	1	36	0	0	0	0	0	0	1	0	0	0	58	
4:15 PM	0	26	0	0	0	39	0	0	0	0	0	0	0	0	1	0	66	
4:30 PM	0	25	0	0	1	45	0	0	0	0	0	0	0	0	0	0	71	
4:45 PM	0	29	0	0	4	40	0	0	0	0	0	0	0	0	0	0	73	268
5:00 PM	0	21	0	0	1	50	0	0	0	0	0	0	0	0	0	0	72	282
5:15 PM	0	18	0	0	1	47	0	0	0	0	0	0	0	0	0	0	66	282
5:30 PM	0	20	0	0	2	42	0	0	0	0	0	0	0	0	3	0	67	278
5:45 PM	0	24	0	0	0	20	0	0	0	0	0	0	1	0	1	0	46	251

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	116	0	0	16	160	0	0	0	0	0	0	0	0	0	0	292
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Buses																	
Pedestrians		0				0				0				148			148
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 9/14/2022 9:47 AM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

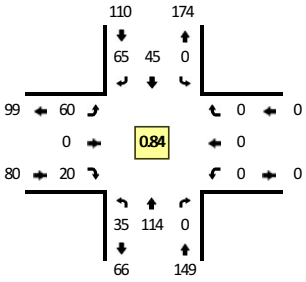
Type of peak hour being reported: Intersection Peak

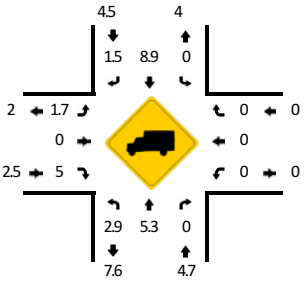
Method for determining peak hour: Total Entering Volume

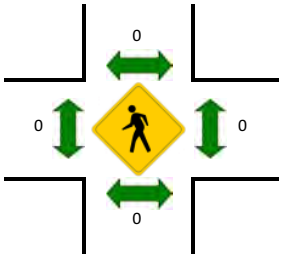
LOCATION: CSAH 12/586th Ave -- Hoffman Rd
CITY/STATE: Mankato, MN

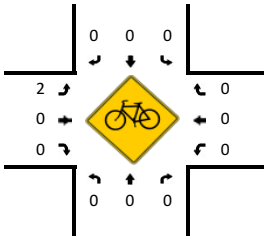
QC JOB #: 15918801
DATE: Thu, Aug 25 2022

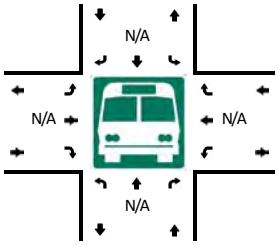
Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

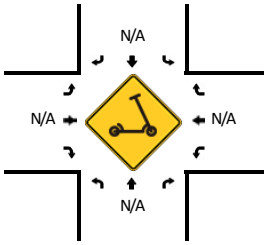












15-Min Count Period Beginning At	CSAH 12/586th Ave (Northbound)				CSAH 12/586th Ave (Southbound)				Hoffman Rd (Eastbound)				Hoffman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	5	6	0	0	0	12	14	0	8	0	5	0	0	0	0	0	50	
7:15 AM	6	30	0	0	0	12	17	0	17	0	2	0	0	0	0	0	84	
7:30 AM	7	23	0	0	0	11	22	0	19	0	3	0	0	0	0	0	85	
7:45 AM	13	34	0	1	0	18	13	0	13	0	9	0	0	0	0	0	101	320
8:00 AM	8	27	0	0	0	4	13	0	11	0	6	0	0	0	0	0	69	339
8:15 AM	9	18	0	0	0	8	25	0	6	0	5	0	0	0	0	0	71	326
8:30 AM	2	17	0	0	0	10	15	0	14	0	0	0	0	0	0	0	58	299
8:45 AM	3	12	0	0	0	11	20	0	6	0	4	2	0	0	0	0	58	256

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	52	136	0	4	0	72	52	0	52	0	36	0	0	0	0	0	404
Heavy Trucks	0	8	0		0	8	0		0	0	0		0	0	0		16
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 8/31/2022 9:04 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

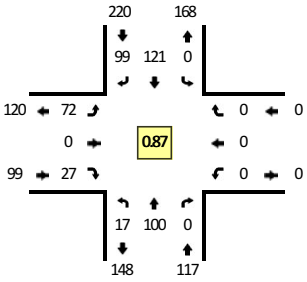
Type of peak hour being reported: Intersection Peak

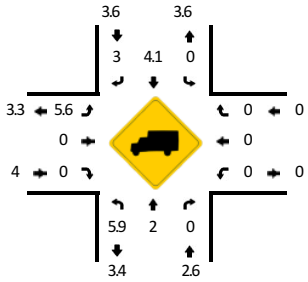
Method for determining peak hour: Total Entering Volume

LOCATION: CSAH 12/586th Ave -- Hoffman Rd
CITY/STATE: Mankato, MN

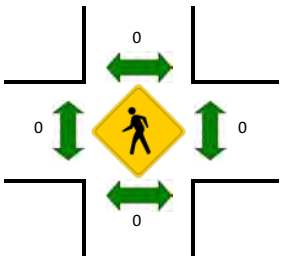
QC JOB #: 15918802
DATE: Thu, Aug 25 2022

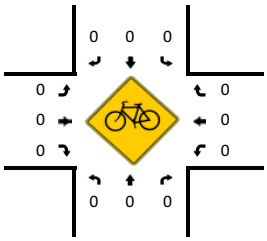
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

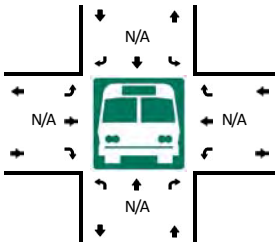


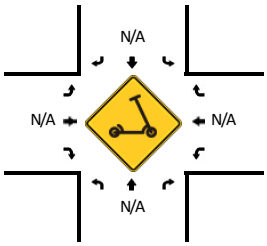


Quality Counts
DATA THAT DRIVES COMMUNITIES









15-Min Count Period Beginning At	CSAH 12/586th Ave (Northbound)				CSAH 12/586th Ave (Southbound)				Hoffman Rd (Eastbound)				Hoffman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	4	23	0	0	0	18	19	1	16	0	11	0	0	0	0	0	92	
4:15 PM	4	20	0	0	0	23	14	0	17	0	9	0	0	0	0	0	87	
4:30 PM	2	30	0	0	0	42	26	0	18	0	4	3	0	0	0	0	125	
4:45 PM	4	34	0	0	0	29	16	0	17	0	12	1	0	0	0	0	113	417
5:00 PM	5	16	0	0	0	26	28	0	24	0	7	0	0	0	0	0	106	431
5:15 PM	6	20	0	0	0	24	29	0	9	0	4	0	0	0	0	0	92	436
5:30 PM	3	13	0	0	0	18	20	0	16	0	9	1	0	0	0	0	80	391
5:45 PM	4	11	0	0	0	18	17	0	12	0	9	2	0	0	0	0	73	351

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	120	0	0	0	168	104	0	72	0	16	12	0	0	0	0	500
Heavy Trucks	0	4	0		0	8	4		4	0	0		0	0	0		20
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 8/31/2022 9:04 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

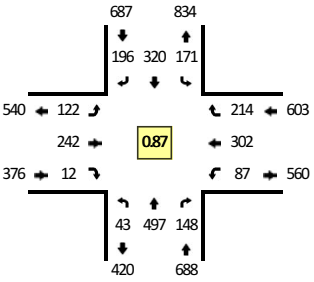
Type of peak hour being reported: Intersection Peak

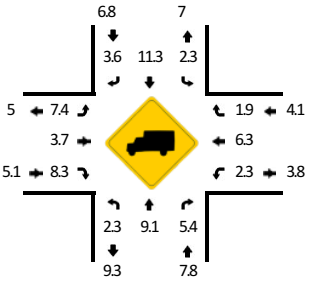
Method for determining peak hour: Total Entering Volume

LOCATION: MN-22 -- Hoffman Rd
CITY/STATE: Mankato, MN

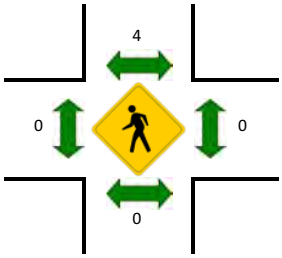
QC JOB #: 15918805
DATE: Thu, Sep 8 2022

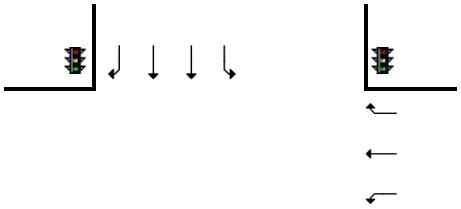
Peak-Hour: 7:45 AM -- 8:45 AM
Peak 15-Min: 8:15 AM -- 8:30 AM

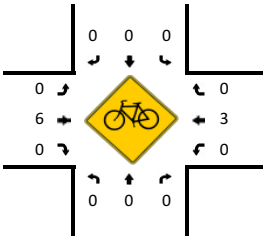


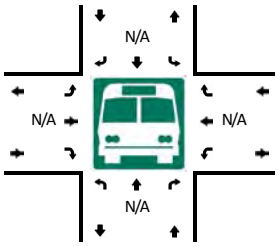


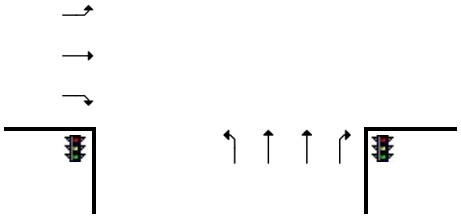
Quality Counts
DATA THAT DRIVES COMMUNITIES

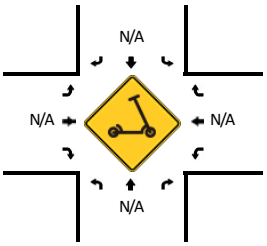












15-Min Count Period Beginning At	MN-22 (Northbound)				MN-22 (Southbound)				Hoffman Rd (Eastbound)				Hoffman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	5	129	25	0	12	57	5	0	14	18	6	0	10	17	24	0	322	
7:15 AM	4	119	21	0	25	66	8	0	34	19	3	0	7	11	23	0	340	
7:30 AM	6	138	30	0	24	67	21	0	19	25	5	0	13	25	32	0	405	
7:45 AM	4	169	37	0	39	82	20	0	29	67	1	0	9	48	36	0	541	1608
8:00 AM	8	121	59	1	68	68	35	1	26	78	5	0	20	71	70	0	631	1917
8:15 AM	15	124	38	0	48	80	70	0	33	65	2	0	34	95	75	0	679	2256
8:30 AM	15	83	14	0	15	90	71	0	34	32	4	0	24	88	33	0	503	2354
8:45 AM	1	113	15	0	11	85	14	0	26	16	1	0	14	25	18	0	339	2152

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	60	496	152	0	192	320	280	0	132	260	8	0	136	380	300	0	2716
Heavy Trucks	4	48	28		4	28	4		12	28	4		0	24	4		188
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 9/14/2022 9:47 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

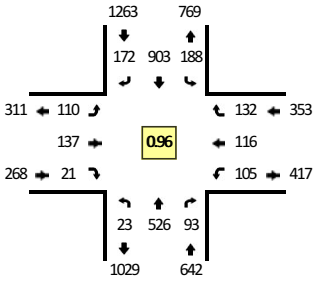
Type of peak hour being reported: Intersection Peak

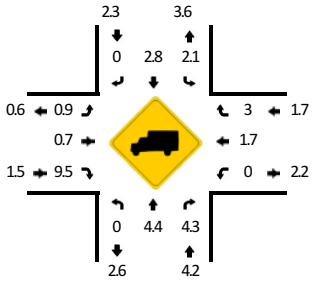
Method for determining peak hour: Total Entering Volume

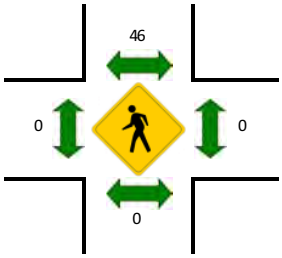
LOCATION: MN-22 -- Hoffman Rd
CITY/STATE: Mankato, MN

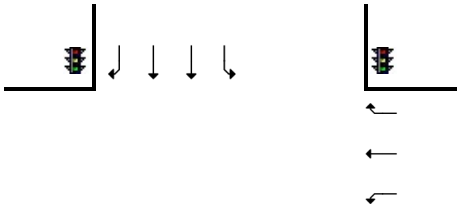
QC JOB #: 15918806
DATE: Wed, Sep 7 2022

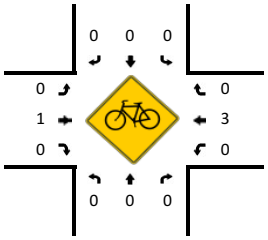
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

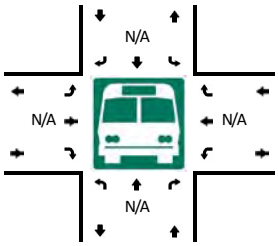


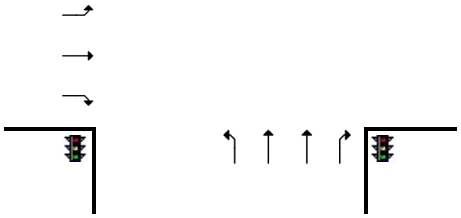


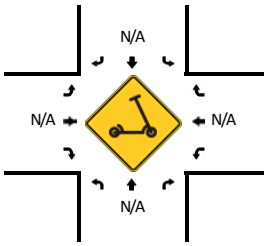












15-Min Count Period Beginning At	MN-22 (Northbound)				MN-22 (Southbound)				Hoffman Rd (Eastbound)				Hoffman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	5	156	26	0	29	176	36	1	30	24	4	0	20	22	23	0	552	
4:15 PM	3	145	18	0	27	217	49	1	27	25	7	0	12	14	25	0	570	
4:30 PM	5	147	18	0	37	196	44	0	36	24	5	0	27	15	20	0	574	
4:45 PM	3	141	20	0	49	232	30	0	34	40	5	0	25	20	29	0	628	2324
5:00 PM	6	144	25	0	48	244	48	0	16	27	0	0	30	34	37	0	659	2431
5:15 PM	5	140	20	0	39	227	40	0	24	27	9	0	22	25	27	0	605	2466
5:30 PM	9	101	28	0	51	200	54	1	36	43	7	0	28	37	39	0	634	2526
5:45 PM	8	125	17	0	29	163	47	0	40	28	5	0	29	46	34	0	571	2469

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	24	576	100	0	192	976	192	0	64	108	0	0	120	136	148	0	2636
Heavy Trucks	0	24	12		4	20	0		4	0	0		0	0	4		68
Buses																	
Pedestrians		0				40				0				0			40
Bicycles	0	0	0		0	0	0		0	0	0		0	4	0		4
Scooters																	

Comments:

Report generated on 9/14/2022 9:47 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Appendix B: Synchro/Simtraffic Worksheets

2025 AM Build SimTraffic Report

5: TH 22 & Hoffman Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.2	0.3	2.7	1.6	0.8	1.8	2.6	0.3	2.5	2.9	0.3	2.9
Total Del/Veh (s)	27.5	27.0	5.7	26.6	33.4	11.9	42.5	32.0	11.9	35.6	19.0	4.0

5: TH 22 & Hoffman Rd Performance by movement

Movement	All
Denied Del/Veh (s)	1.2
Total Del/Veh (s)	24.6

10: Highway 12 & Hoffman Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.6	0.4	2.5	0.0	0.0	0.0	0.2	0.2	0.1
Total Del/Veh (s)	7.1	3.8	6.0	9.3	9.2	6.3	4.1	5.7	2.9	3.3	6.6	1.7

10: Highway 12 & Hoffman Rd Performance by movement

Movement	All
Denied Del/Veh (s)	0.3
Total Del/Veh (s)	5.2

15: Highway 12 & 211th Lane Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.3	3.0	0.5	0.0	0.3
Total Del/Veh (s)	7.1	3.0	0.7	0.2	3.1	1.2	1.2

Total Network Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	24.2

Intersection: 5: TH 22 & Hoffman Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	142	291	52	254	494	255	89	278	243	130	176	152
Average Queue (ft)	65	164	10	67	230	104	37	135	112	57	116	71
95th Queue (ft)	112	258	36	183	374	246	73	200	193	100	168	123
Link Distance (ft)	1142	1142			2488			1490	1490			1311
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			230	230		230	300			300	300	
Storage Blk Time (%)		1			8	0						
Queuing Penalty (veh)		0			33	0						

Intersection: 5: TH 22 & Hoffman Rd

Movement	SB
Directions Served	T
Maximum Queue (ft)	137
Average Queue (ft)	53
95th Queue (ft)	100
Link Distance (ft)	1311
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: Highway 12 & Hoffman Rd

Movement	EB	WB	WB	NB	NB	SB
Directions Served	LT	LT	R	LT	R	LT
Maximum Queue (ft)	71	127	74	70	41	75
Average Queue (ft)	27	57	36	24	2	28
95th Queue (ft)	64	96	61	58	17	59
Link Distance (ft)	2488	1327		1128		891
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			200		200	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 15: Highway 12 & 211th Lane

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	57	28
Average Queue (ft)	16	8
95th Queue (ft)	36	28
Link Distance (ft)	1382	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 34

2025 AM Build Synchro Report

HCM 6th ROUNDABOUT	
Node #	10
Zone:	
X East (ft):	3088
Y North (ft):	-1385
Z Elevation (ft):	0
Description	
Max v/c Ratio:	0.27
Intersection Delay (s):	4.1
Intersection LOS:	A
ICU:	0.55
ICU LOS:	A
Inside Radius (ft):	28
Outside Radius (ft):	60
Roundabout Lanes (#):	1
Circle Speed (mph):	18
Inside Color:	
Transparent Circle:	☐

HCM 6th ROUNDABOUT	EB			WB			NB			SB		
Entry Lanes	1			1			1			1		
Conflicting Circle Lanes	1			1			1			1		
Exit Lanes	1			1			1			1		
Adjusted Approach Flow (vph)	226			398			288			242		
Demand Flow Rate (pc/h)	230			406			293			247		
Vehicles Circulating (pc/h)	259			294			284			334		
Vehicles Exiting (pc/h)	235			215			168			235		
Ped Vol. Crossing Leg (#/hr)	0			0			0			0		
Ped Capacity Adjustment	1.000			1.000			1.000			1.000		
Approach Delay (sec/veh)	4.3			4.2			4.3			3.4		
Approach LOS	A			A			A			A		
Lane	Left	—	Bypass	Left	—	Bypass	Left	—	Bypass	Left	—	Bypass
Follow-Up Headway (s)	2.609	—	—	2.609	—	—	2.609	—	—	2.609	—	—
Critical Headway (s)	4.976	—	—	4.976	—	—	4.976	—	—	4.976	—	—
Designated Moves	LT	—	R	LT	—	R	LT	—	R	LT	—	R
Assumed Moves	LT	—	—	LT	—	—	LT	—	—	LT	—	—
Right Turn Channelized	—	—	Free	—	—	Free	—	—	Free	—	—	Free
Lane Utilization	1.000	—	—	1.000	—	—	1.000	—	—	1.000	—	—
Entry Flow Rate (pc/h)	193	—	37	275	—	131	225	—	68	160	—	87
Capacity, Entry Lane (pc/h)	1060	—	1938	1022	—	1938	1033	—	1938	982	—	1938
Entry HV Adjustment Factor	0.982	—	0.980	0.980	—	0.980	0.981	—	0.980	0.979	—	0.980
Flow Rate, Entry (vph)	190	—	36	270	—	128	221	—	67	157	—	85
Capacity, Entry (vph)	1041	—	1900	1002	—	1900	1013	—	1900	961	—	1900
Volume to Capacity Ratio	0.182	—	0.019	0.269	—	0.067	0.218	—	0.035	0.163	—	0.045
Control Delay (sec/veh)	5.1	—	0.0	6.3	—	0.0	5.6	—	0.0	5.3	—	0.0
Level of Service	A	—	A	A	—	A	A	—	A	A	—	A
95th-Percentile Queue (veh)	1	—	0	1	—	0	1	—	0	1	—	0

2025 AM Build

2025 AM No Build SimTraffic Report

5: TH 22 & Hoffman Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.3	0.2	3.2	2.4	0.7	2.6	2.9	0.2	2.5	3.0	0.3	2.8
Total Del/Veh (s)	28.4	27.7	4.9	29.3	35.1	13.0	47.0	23.8	9.1	45.9	15.4	3.9

5: TH 22 & Hoffman Rd Performance by movement

Movement	All
Denied Del/Veh (s)	1.3
Total Del/Veh (s)	23.3

10: Highway 12 & Hoffman Rd Performance by movement

Movement	EBL	EBT	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0
Total Del/Veh (s)	4.9	2.6	5.2	2.0	3.9	4.3	2.0	3.1

15: Highway 12 & 211th Lane Performance by movement

Movement	WBR	NBT	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.2	1.4	0.0	0.1
Total Del/Veh (s)	2.1	0.3	0.9	0.2	0.3

Total Network Performance

Denied Del/Veh (s)	1.2
Total Del/Veh (s)	23.9

Intersection: 5: TH 22 & Hoffman Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	204	195	51	184	582	185	69	218	183	105	276	102
Average Queue (ft)	82	114	10	51	194	103	35	123	98	49	127	56
95th Queue (ft)	151	184	36	105	378	218	70	194	169	82	212	97
Link Distance (ft)	1142	1142			2490			1490	1490			1311
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			230	160		160	300			300	300	
Storage Blk Time (%)					12	1						
Queuing Penalty (veh)					36	4						

Intersection: 5: TH 22 & Hoffman Rd

Movement	SB
Directions Served	T
Maximum Queue (ft)	110
Average Queue (ft)	39
95th Queue (ft)	86
Link Distance (ft)	1311
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: Highway 12 & Hoffman Rd

Movement	EB	NB
Directions Served	L	LT
Maximum Queue (ft)	31	18
Average Queue (ft)	6	1
95th Queue (ft)	26	6
Link Distance (ft)	2490	1127
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 15: Highway 12 & 211th Lane

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	21	26
Average Queue (ft)	4	1
95th Queue (ft)	17	9
Link Distance (ft)	1382	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 40

2025 AM No Build Synchro Report

HCM 6th ROUNDABOUT	
Node #	10
Zone:	
X East (ft):	3088
Y North (ft):	-1385
Z Elevation (ft):	0
Description	
Max v/c Ratio:	0.15
Intersection Delay (s):	2.8
Intersection LOS:	A
ICU:	0.26
ICU LOS:	A
Inside Radius (ft):	28
Outside Radius (ft):	60
Roundabout Lanes (#):	1
Circle Speed (mph):	18
Inside Color:	
Transparent Circle:	☐

HCM 6th ROUNDABOUT	EB			NB			SB		
Entry Lanes	1			1			1		
Conflicting Circle Lanes	1			1			1		
Exit Lanes	1			1			1		
Adjusted Approach Flow (vph)	91			195			144		
Demand Flow Rate (pc/h)	92			199			147		
Vehicles Circulating (pc/h)	60			69			47		
Vehicles Exiting (pc/h)	47			60			221		
Ped Vol. Crossing Leg (#/hr)	0			0			0		
Ped Capacity Adjustment	1.000			1.000			1.000		
Approach Delay (sec/veh)	2.4			4.2			1.3		
Approach LOS	A			A			A		
Lane	Left	—	Bypass	Left	—	—	Left	—	Bypass
Follow-Up Headway (s)	2.609	—	—	2.609	—	—	2.609	—	—
Critical Headway (s)	4.976	—	—	4.976	—	—	4.976	—	—
Designated Moves	L	—	R	LT	—	—	T	—	R
Assumed Moves	L	—	—	LT	—	—	T	—	—
Right Turn Channelized	—	—	Free	—	—	Free	—	—	Free
Lane Utilization	1.000	—	—	1.000	—	—	1.000	—	—
Entry Flow Rate (pc/h)	69	—	23	199	—	—	60	—	87
Capacity, Entry Lane (pc/h)	1298	—	1938	1286	—	—	1315	—	1938
Entry HV Adjustment Factor	0.986	—	0.980	0.980	—	—	0.980	—	0.980
Flow Rate, Entry (vph)	68	—	23	195	—	—	59	—	85
Capacity, Entry (vph)	1279	—	1900	1260	—	—	1289	—	1900
Volume to Capacity Ratio	0.053	—	0.012	0.155	—	—	0.046	—	0.045
Control Delay (sec/veh)	3.2	—	0.0	4.2	—	—	3.2	—	0.0
Level of Service	A	—	A	A	—	—	A	—	A
95th-Percentile Queue (veh)	0	—	0	1	—	—	0	—	0

2025 AM No Build

2025 PM Build SimTraffic Report

5: TH 22 & Hoffman Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.2	0.2	3.1	1.4	0.3	1.5	2.9	0.2	2.7	2.4	0.4	2.3
Total Del/Veh (s)	27.5	30.4	8.7	27.1	30.3	9.3	41.6	24.8	7.2	41.3	16.1	4.6

5: TH 22 & Hoffman Rd Performance by movement

Movement	All
Denied Del/Veh (s)	0.9
Total Del/Veh (s)	21.6

10: Highway 12 & Hoffman Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.4	0.3	1.7	0.0	0.0	0.2	0.6	0.7	3.4
Total Del/Veh (s)	8.8	5.2	6.2	7.4	8.4	5.8	4.4	6.9	2.8	5.7	7.7	3.3

10: Highway 12 & Hoffman Rd Performance by movement

Movement	All
Denied Del/Veh (s)	0.5
Total Del/Veh (s)	6.0

15: Highway 12 & 211th Lane Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.3	3.9	0.6	0.0	0.2
Total Del/Veh (s)	5.7	2.4	0.6	0.3	1.8	1.1	1.0

Total Network Performance

Denied Del/Veh (s)	1.0
Total Del/Veh (s)	21.9

Intersection: 5: TH 22 & Hoffman Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	138	227	52	92	153	175	69	235	213	87	236	287
Average Queue (ft)	57	121	15	52	91	52	21	141	108	28	158	145
95th Queue (ft)	102	184	41	80	133	107	54	208	193	60	217	238
Link Distance (ft)	1142	1142			2488			1490	1490			1311
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			230	160		160	300			300	300	
Storage Blk Time (%)		0			0	0						0
Queuing Penalty (veh)		0			0	0						0

Intersection: 5: TH 22 & Hoffman Rd

Movement	SB
Directions Served	T
Maximum Queue (ft)	244
Average Queue (ft)	117
95th Queue (ft)	203
Link Distance (ft)	1311
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: Highway 12 & Hoffman Rd

Movement	EB	WB	WB	NB	NB	SB
Directions Served	LT	LT	R	LT	R	LT
Maximum Queue (ft)	144	76	53	52	41	116
Average Queue (ft)	45	49	34	20	1	32
95th Queue (ft)	98	71	50	51	13	73
Link Distance (ft)	2488	1820		1128		891
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			200		200	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 15: Highway 12 & 211th Lane

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	21	28
Average Queue (ft)	12	4
95th Queue (ft)	29	21
Link Distance (ft)	1382	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

2025 PM Build Synchro Report

HCM 6th ROUNDABOUT	
Node #	10
Zone:	
X East (ft):	3088
Y North (ft):	-1385
Z Elevation (ft):	0
Description	
Max v/c Ratio:	0.29
Intersection Delay (s):	4.5
Intersection LOS:	A
ICU:	0.60
ICU LOS:	B
Inside Radius (ft):	28
Outside Radius (ft):	60
Roundabout Lanes (#):	1
Circle Speed (mph):	18
Inside Color:	
Transparent Circle:	☐

HCM 6th ROUNDABOUT	EB			WB			NB			SB		
Entry Lanes	1			1			1			1		
Conflicting Circle Lanes	1			1			1			1		
Exit Lanes	1			1			1			1		
Adjusted Approach Flow (vph)	304			335			272			430		
Demand Flow Rate (pc/h)	310			342			278			439		
Vehicles Circulating (pc/h)	391			263			391			266		
Vehicles Exiting (pc/h)	182			307			260			229		
Ped Vol. Crossing Leg (#/hr)	0			0			0			0		
Ped Capacity Adjustment	1.000			1.000			1.000			1.000		
Approach Delay (sec/veh)	5.8			3.8			3.8			4.5		
Approach LOS	A			A			A			A		
Lane	Left	—	Bypass	Left	—	Bypass	Left	—	Bypass	Left	—	Bypass
Follow-Up Headway (s)	2.609	—	—	2.609	—	—	2.609	—	—	2.609	—	—
Critical Headway (s)	4.976	—	—	4.976	—	—	4.976	—	—	4.976	—	—
Designated Moves	LT	—	R	LT	—	R	LT	—	R	LT	—	R
Assumed Moves	LT	—	—	LT	—	—	LT	—	—	LT	—	—
Right Turn Channelized	—	—	Free	—	—	Free	—	—	Free	—	—	Free
Lane Utilization	1.000	—	—	1.000	—	—	1.000	—	—	1.000	—	—
Entry Flow Rate (pc/h)	260	—	50	232	—	110	179	—	99	307	—	132
Capacity, Entry Lane (pc/h)	926	—	1938	1055	—	1938	926	—	1938	1052	—	1938
Entry HV Adjustment Factor	0.979	—	0.980	0.979	—	0.980	0.979	—	0.980	0.979	—	0.980
Flow Rate, Entry (vph)	255	—	49	227	—	108	175	—	97	301	—	129
Capacity, Entry (vph)	907	—	1900	1033	—	1900	906	—	1900	1030	—	1900
Volume to Capacity Ratio	0.281	—	0.026	0.220	—	0.057	0.193	—	0.051	0.292	—	0.068
Control Delay (sec/veh)	6.9	—	0.0	5.6	—	0.0	5.9	—	0.0	6.4	—	0.0
Level of Service	A	—	A	A	—	A	A	—	A	A	—	A
95th-Percentile Queue (veh)	1	—	0	1	—	0	1	—	0	1	—	0

2025 PM Build

2025 PM No Build SimTraffic Report

5: TH 22 & Hoffman Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.2	0.2	3.2	2.0	0.3	2.1	3.3	0.2	2.8	2.4	0.4	2.5
Total Del/Veh (s)	29.2	35.5	9.8	30.6	36.0	7.8	41.3	19.1	6.9	41.9	11.4	4.1

5: TH 22 & Hoffman Rd Performance by movement

Movement	All
Denied Del/Veh (s)	0.9
Total Del/Veh (s)	18.6

10: Highway 12 & Hoffman Rd Performance by movement

Movement	EBL	EBT	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1
Total Del/Veh (s)	5.3	2.4	5.2	1.8	4.6	5.0	2.4	3.5

15: Highway 12 & 211th Lane Performance by movement

Movement	NBT	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.1
Total Del/Veh (s)	0.1	0.8	0.3	0.2

Total Network Performance

Denied Del/Veh (s)	0.9
Total Del/Veh (s)	19.6

Intersection: 5: TH 22 & Hoffman Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	160	159	52	152	147	86	48	171	153	64	263	197
Average Queue (ft)	67	90	15	57	69	39	13	107	79	22	125	111
95th Queue (ft)	115	152	42	115	113	77	42	164	149	49	218	180
Link Distance (ft)	1142	1142			2490			1490	1490			1311
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			230	160		160	300			300	300	
Storage Blk Time (%)				0	0							
Queuing Penalty (veh)				0	0							

Intersection: 5: TH 22 & Hoffman Rd

Movement	SB
Directions Served	T
Maximum Queue (ft)	173
Average Queue (ft)	85
95th Queue (ft)	153
Link Distance (ft)	1311
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: Highway 12 & Hoffman Rd

Movement	EB	NB	SB
Directions Served	L	LT	T
Maximum Queue (ft)	31	52	24
Average Queue (ft)	5	6	1
95th Queue (ft)	24	27	8
Link Distance (ft)	2490	1127	891
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 15: Highway 12 & 211th Lane

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 0

2025 PM No Build Synchro Report

HCM 6th ROUNDABOUT	
Node #	10
Zone:	
X East (ft):	3088
Y North (ft):	-1385
Z Elevation (ft):	0
Description	
Max v/c Ratio:	0.12
Intersection Delay (s):	2.7
Intersection LOS:	A
ICU:	0.29
ICU LOS:	A
Inside Radius (ft):	28
Outside Radius (ft):	60
Roundabout Lanes (#):	1
Circle Speed (mph):	18
Inside Color:	
Transparent Circle:	☐

HCM 6th ROUNDABOUT	EB			NB			SB		
Entry Lanes	1			1			1		
Conflicting Circle Lanes	1			1			1		
Exit Lanes	1			1			1		
Adjusted Approach Flow (vph)	112			152			288		
Demand Flow Rate (pc/h)	115			155			294		
Vehicles Circulating (pc/h)	162			84			22		
Vehicles Exiting (pc/h)	22			162			217		
Ped Vol. Crossing Leg (#/hr)	0			0			0		
Ped Capacity Adjustment	1.000			1.000			1.000		
Approach Delay (sec/veh)	2.7			3.9			2.0		
Approach LOS	A			A			A		
Lane	Left	—	Bypass	Left	—	—	Left	—	Bypass
Follow-Up Headway (s)	2.609	—	—	2.609	—	—	2.609	—	—
Critical Headway (s)	4.976	—	—	4.976	—	—	4.976	—	—
Designated Moves	L	—	R	LT	—	—	T	—	R
Assumed Moves	L	—	—	LT	—	—	T	—	—
Right Turn Channelized	—	—	Free	—	—	Free	—	—	Free
Lane Utilization	1.000	—	—	1.000	—	—	1.000	—	—
Entry Flow Rate (pc/h)	84	—	31	155	—	—	162	—	132
Capacity, Entry Lane (pc/h)	1170	—	1938	1267	—	—	1349	—	1938
Entry HV Adjustment Factor	0.976	—	0.980	0.983	—	—	0.980	—	0.980
Flow Rate, Entry (vph)	82	—	30	152	—	—	159	—	129
Capacity, Entry (vph)	1142	—	1900	1245	—	—	1323	—	1900
Volume to Capacity Ratio	0.072	—	0.016	0.122	—	—	0.120	—	0.068
Control Delay (sec/veh)	3.8	—	0.0	3.9	—	—	3.7	—	0.0
Level of Service	A	—	A	A	—	—	A	—	A
95th-Percentile Queue (veh)	0	—	0	0	—	—	0	—	0

2025 PM No Build

2045 AM Build SimTraffic Report

5: TH 22 & Hoffman Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.3	0.3	3.2	1.5	1.0	1.7	2.4	0.3	2.3	2.9	0.5	2.6
Total Del/Veh (s)	71.1	37.0	7.4	58.2	50.2	17.6	39.9	46.3	23.0	84.4	29.7	5.1

5: TH 22 & Hoffman Rd Performance by movement

Movement	All
Denied Del/Veh (s)	1.2
Total Del/Veh (s)	40.9

10: Highway 12 & Hoffman Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.3	0.5	2.0	0.0	0.0	0.0	0.3	0.2	0.3
Total Del/Veh (s)	10.2	4.3	6.5	12.1	12.4	6.7	136.7	123.1	104.4	9.6	11.4	3.5

10: Highway 12 & Hoffman Rd Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	41.6

15: Highway 12 & 211th Lane Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.9	2.5	1.8	0.1	0.6
Total Del/Veh (s)	55.7	50.7	63.0	27.1	8.4	1.7	39.5

Total Network Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	65.4

Intersection: 5: TH 22 & Hoffman Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	246	417	255	325	900	325	89	341	315	191	325	484
Average Queue (ft)	157	250	28	164	429	180	41	249	218	108	253	201
95th Queue (ft)	233	387	129	345	786	383	75	340	314	175	359	433
Link Distance (ft)	1142	1142			2488			1490	1490			1323
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			230	300		300	300			300	300	
Storage Blk Time (%)		13	0	0	13	0		2	0		14	
Queuing Penalty (veh)		2	0	0	65	2		1	0		32	

Intersection: 5: TH 22 & Hoffman Rd

Movement	SB
Directions Served	T
Maximum Queue (ft)	481
Average Queue (ft)	142
95th Queue (ft)	334
Link Distance (ft)	1323
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: Highway 12 & Hoffman Rd

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	LT	R	LT	R	LT	R
Maximum Queue (ft)	117	42	138	52	1132	225	152	41
Average Queue (ft)	39	5	64	35	812	172	59	8
95th Queue (ft)	77	27	108	52	1456	329	113	34
Link Distance (ft)	2488		1670		1128		891	891
Upstream Blk Time (%)					4			
Queuing Penalty (veh)					36			
Storage Bay Dist (ft)		200		200		200		
Storage Blk Time (%)					77	0		
Queuing Penalty (veh)					52	1		

Intersection: 15: Highway 12 & 211th Lane

Movement	WB	NB	NB	SB
Directions Served	LR	T	R	L
Maximum Queue (ft)	108	1165	325	53
Average Queue (ft)	29	431	32	14
95th Queue (ft)	73	1186	193	40
Link Distance (ft)	1382	1240		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			300	300
Storage Blk Time (%)		45		
Queuing Penalty (veh)		4		

Network Summary

Network wide Queuing Penalty: 197

2045 AM Build Synchro Report

HCM 6th ROUNDABOUT	
Node #	10
Zone:	
X East (ft):	3088
Y North (ft):	-1385
Z Elevation (ft):	0
Description	
Max v/c Ratio:	0.71
Intersection Delay (s):	9.1
Intersection LOS:	A
ICU:	0.86
ICU LOS:	E
Inside Radius (ft):	28
Outside Radius (ft):	60
Roundabout Lanes (#):	1
Circle Speed (mph):	18
Inside Color:	
Transparent Circle:	☐

HCM 6th ROUNDABOUT	EB			WB			NB			SB		
Entry Lanes	1			1			1			1		
Conflicting Circle Lanes	1			1			1			1		
Exit Lanes	1			1			1			1		
Adjusted Approach Flow (vph)	255			398			768			597		
Demand Flow Rate (pc/h)	260			406			783			609		
Vehicles Circulating (pc/h)	407			807			307			449		
Vehicles Exiting (pc/h)	350			215			316			633		
Ped Vol. Crossing Leg (#/hr)	0			0			0			0		
Ped Capacity Adjustment	1.000			1.000			1.000			1.000		
Approach Delay (sec/veh)	5.4			9.0			14.1			4.2		
Approach LOS	A			A			B			A		
Lane	Left	—	Bypass	Left	—	Bypass	Left	—	Bypass	Left	—	Bypass
Follow-Up Headway (s)	2.609	—	—	2.609	—	—	2.609	—	—	2.609	—	—
Critical Headway (s)	4.976	—	—	4.976	—	—	4.976	—	—	4.976	—	—
Designated Moves	LT	—	R	LT	—	R	LT	—	R	LT	—	R
Assumed Moves	LT	—	—	LT	—	—	LT	—	—	LT	—	—
Right Turn Channelized	—	—	Free	—	—	Free	—	—	Free	—	—	Free
Lane Utilization	1.000	—	—	1.000	—	—	1.000	—	—	1.000	—	—
Entry Flow Rate (pc/h)	216	—	44	275	—	131	715	—	68	308	—	301
Capacity, Entry Lane (pc/h)	911	—	1938	606	—	1938	1009	—	1938	873	—	1938
Entry HV Adjustment Factor	0.979	—	0.980	0.980	—	0.980	0.981	—	0.980	0.980	—	0.980
Flow Rate, Entry (vph)	212	—	43	270	—	128	701	—	67	302	—	295
Capacity, Entry (vph)	892	—	1900	594	—	1900	990	—	1900	855	—	1900
Volume to Capacity Ratio	0.237	—	0.023	0.454	—	0.067	0.709	—	0.035	0.353	—	0.155
Control Delay (sec/veh)	6.5	—	0.0	13.3	—	0.0	15.5	—	0.0	8.3	—	0.0
Level of Service	A	—	A	B	—	A	C	—	A	A	—	A
95th-Percentile Queue (veh)	1	—	0	2	—	0	6	—	0	2	—	1

2045 AM Build

2045 AM Build Synchro Report
Highway 12 and 211th Lane

15: Highway 12 & 211th Lane Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	1.0	1.9	3.3	0.5	0.8
Total Del/Veh (s)	44.3	19.0	2.7	0.5	11.6	0.4	3.1

Queuing and Blocking Report
Baseline

Intersection: 15: Highway 12 & 211th Lane

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	105	53
Average Queue (ft)	28	16
95th Queue (ft)	70	44
Link Distance (ft)	1382	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		300
Storage Blk Time (%)		
Queuing Penalty (veh)		

2045 Build at 211th Ln (without RaB impact) – SimTraffic does not model RaB correctly

2045 AM Build SimTraffic Report with Mitigation Strategies

5: TH 22 & Hoffman Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.3	0.3	3.5	1.7	0.8	1.7	2.3	0.3	2.3	2.8	0.4	2.7
Total Del/Veh (s)	44.7	41.0	13.3	53.2	43.9	41.3	42.3	48.3	24.8	42.6	20.4	4.7

5: TH 22 & Hoffman Rd Performance by movement

Movement	All
Denied Del/Veh (s)	1.2
Total Del/Veh (s)	37.2

10: Highway 12 & Hoffman Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.4	0.5	2.0	0.0	0.0	0.0	0.2	0.3	0.3
Total Del/Veh (s)	10.7	4.4	5.7	15.1	13.2	6.6	110.9	86.4	85.2	7.3	10.1	3.7

10: Highway 12 & Hoffman Rd Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	32.9

15: Highway 12 & 211th Lane Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.8	2.6	1.8	0.2	0.6
Total Del/Veh (s)	61.6	35.6	3.2	1.6	17.5	1.7	4.8

Total Network Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	47.9

Intersection: 5: TH 22 & Hoffman Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	T	R	L	T
Maximum Queue (ft)	270	374	255	256	405	447	324	414	416	325	260	237
Average Queue (ft)	125	242	32	113	254	304	62	251	222	109	162	100
95th Queue (ft)	211	380	157	194	376	418	157	360	338	221	260	172
Link Distance (ft)	1142	1142			2488			1490	1490			1311
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			230	300		980	300			300	300	
Storage Blk Time (%)		15	0		3			4	1	0		
Queuing Penalty (veh)		3	0		23			2	3	0		

Intersection: 5: TH 22 & Hoffman Rd

Movement	SB
Directions Served	T
Maximum Queue (ft)	162
Average Queue (ft)	89
95th Queue (ft)	151
Link Distance (ft)	1311
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: Highway 12 & Hoffman Rd

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	LT	R	LT	R	LT	R
Maximum Queue (ft)	133	35	186	88	1097	225	135	60
Average Queue (ft)	51	3	67	36	664	165	49	10
95th Queue (ft)	103	18	120	60	1163	329	93	39
Link Distance (ft)	2488		1670		1128		891	891
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		200		200		200		
Storage Blk Time (%)			0		85	0		
Queuing Penalty (veh)			0		58	1		

Intersection: 15: Highway 12 & 211th Lane

Movement	WB	NB	SB
Directions Served	LR	T	L
Maximum Queue (ft)	168	71	73
Average Queue (ft)	43	4	25
95th Queue (ft)	115	29	60
Link Distance (ft)	1382	1240	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			300
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 90

2045 AM Build Synchro Report
with Mitigation Strategies

HCM 6th ROUNDABOUT	
Node #	10
Zone:	
X East (ft):	3088
Y North (ft):	-1385
Z Elevation (ft):	0
Description	
Max v/c Ratio:	0.71
Intersection Delay (s):	9.1
Intersection LOS:	A
ICU:	0.86
ICU LOS:	E
Inside Radius (ft):	28
Outside Radius (ft):	60
Roundabout Lanes (#):	1
Circle Speed (mph):	18
Inside Color:	
Transparent Circle:	☐

HCM 6th ROUNDABOUT	EB			WB			NB			SB		
Entry Lanes	1			1			1			1		
Conflicting Circle Lanes	1			1			1			1		
Exit Lanes	1			1			1			1		
Adjusted Approach Flow (vph)	255			398			768			597		
Demand Flow Rate (pc/h)	260			406			783			609		
Vehicles Circulating (pc/h)	407			807			307			449		
Vehicles Exiting (pc/h)	350			215			316			633		
Ped Vol. Crossing Leg (#/hr)	0			0			0			0		
Ped Capacity Adjustment	1.000			1.000			1.000			1.000		
Approach Delay (sec/veh)	5.4			9.0			14.1			4.2		
Approach LOS	A			A			B			A		
Lane	Left	—	Bypass	Left	—	Bypass	Left	—	Bypass	Left	—	Bypass
Follow-Up Headway (s)	2.609	—	—	2.609	—	—	2.609	—	—	2.609	—	—
Critical Headway (s)	4.976	—	—	4.976	—	—	4.976	—	—	4.976	—	—
Designated Moves	LT	—	R	LT	—	R	LT	—	R	LT	—	R
Assumed Moves	LT	—	—	LT	—	—	LT	—	—	LT	—	—
Right Turn Channelized	—	—	Free	—	—	Free	—	—	Free	—	—	Free
Lane Utilization	1.000	—	—	1.000	—	—	1.000	—	—	1.000	—	—
Entry Flow Rate (pc/h)	216	—	44	275	—	131	715	—	68	308	—	301
Capacity, Entry Lane (pc/h)	911	—	1938	606	—	1938	1009	—	1938	873	—	1938
Entry HV Adjustment Factor	0.979	—	0.980	0.980	—	0.980	0.981	—	0.980	0.980	—	0.980
Flow Rate, Entry (vph)	212	—	43	270	—	128	701	—	67	302	—	295
Capacity, Entry (vph)	892	—	1900	594	—	1900	990	—	1900	855	—	1900
Volume to Capacity Ratio	0.237	—	0.023	0.454	—	0.067	0.709	—	0.035	0.353	—	0.155
Control Delay (sec/veh)	6.5	—	0.0	13.3	—	0.0	15.5	—	0.0	8.3	—	0.0
Level of Service	A	—	A	B	—	A	C	—	A	A	—	A
95th-Percentile Queue (veh)	1	—	0	2	—	0	6	—	0	2	—	1

2045 AM Build w/mitigation

2045 AM No Build SimTraffic Report

5: TH 22 & Hoffman Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.3	0.3	2.8	1.4	0.7	1.6	2.4	0.3	2.4	2.8	0.4	2.7
Total Del/Veh (s)	32.5	28.9	6.1	38.3	50.9	25.7	48.6	33.6	15.1	47.4	20.1	4.2

5: TH 22 & Hoffman Rd Performance by movement

Movement	All
Denied Del/Veh (s)	1.1
Total Del/Veh (s)	30.4

10: Highway 12 & Hoffman Rd Performance by movement

Movement	EBL	EBT	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0
Total Del/Veh (s)	6.8	3.0	4.8	6.0	7.7	6.7	3.4	5.1

15: Highway 12 & 211th Lane Performance by movement

Movement	WBR	NBT	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.6	3.0	0.1	0.5
Total Del/Veh (s)	7.2	1.1	1.7	0.6	1.0

Total Network Performance

Denied Del/Veh (s)	1.0
Total Del/Veh (s)	28.4

Intersection: 5: TH 22 & Hoffman Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	161	294	31	255	942	255	114	295	298	166	282	171
Average Queue (ft)	101	158	10	103	316	147	43	179	163	73	147	76
95th Queue (ft)	149	244	32	233	670	302	88	254	243	135	219	130
Link Distance (ft)	1142	1142			2490			1490	1490			1311
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			230	230		230	300			300	300	
Storage Blk Time (%)		1			18	1		0	0		0	
Queuing Penalty (veh)		0			74	4		0	0		0	

Intersection: 5: TH 22 & Hoffman Rd

Movement	SB
Directions Served	T
Maximum Queue (ft)	138
Average Queue (ft)	61
95th Queue (ft)	109
Link Distance (ft)	1311
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: Highway 12 & Hoffman Rd

Movement	EB	NB	SB	SB
Directions Served	L	LT	T	R
Maximum Queue (ft)	56	95	68	40
Average Queue (ft)	17	30	20	3
95th Queue (ft)	51	74	52	18
Link Distance (ft)	2490	1127	891	891
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 15: Highway 12 & 211th Lane

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	21	26
Average Queue (ft)	5	2
95th Queue (ft)	19	12
Link Distance (ft)	1382	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 78

2045 AM No Build Synchro Report

HCM 6th ROUNDABOUT	
Node #	10
Zone:	
X East (ft):	3088
Y North (ft):	-1385
Z Elevation (ft):	0
Description	
Max v/c Ratio:	0.55
Intersection Delay (s):	5.8
Intersection LOS:	A
ICU:	0.58
ICU LOS:	B
Inside Radius (ft):	28
Outside Radius (ft):	60
Roundabout Lanes (#):	1
Circle Speed (mph):	18
Inside Color:	
Transparent Circle:	☐

HCM 6th ROUNDABOUT	EB			NB			SB		
Entry Lanes		1			1			1	
Conflicting Circle Lanes		1			1			1	
Exit Lanes		1			1			1	
Adjusted Approach Flow (vph)		120			675			498	
Demand Flow Rate (pc/h)		123			688			508	
Vehicles Circulating (pc/h)		207			92			162	
Vehicles Exiting (pc/h)		162			207			618	
Ped Vol. Crossing Leg (#/hr)		0			0			0	
Ped Capacity Adjustment		1.000			1.000			1.000	
Approach Delay (sec/veh)		3.0			9.1			1.9	
Approach LOS		A			A			A	
Lane	Left	—	Bypass	Left	—	—	Left	—	Bypass
Follow-Up Headway (s)	2.609	—	—	2.609	—	—	2.609	—	—
Critical Headway (s)	4.976	—	—	4.976	—	—	4.976	—	—
Designated Moves	L	—	R	LT	—	—	T	—	R
Assumed Moves	L	—	—	LT	—	—	T	—	—
Right Turn Channelized	—	—	Free	—	—	Free	—	—	Free
Lane Utilization	1.000	—	—	1.000	—	—	1.000	—	—
Entry Flow Rate (pc/h)	92	—	31	688	—	—	207	—	301
Capacity, Entry Lane (pc/h)	1117	—	1938	1256	—	—	1170	—	1938
Entry HV Adjustment Factor	0.978	—	0.980	0.981	—	—	0.980	—	0.980
Flow Rate, Entry (vph)	90	—	30	675	—	—	203	—	295
Capacity, Entry (vph)	1093	—	1900	1232	—	—	1147	—	1900
Volume to Capacity Ratio	0.082	—	0.016	0.548	—	—	0.177	—	0.155
Control Delay (sec/veh)	4.0	—	0.0	9.1	—	—	4.7	—	0.0
Level of Service	A	—	A	A	—	—	A	—	A
95th-Percentile Queue (veh)	0	—	0	3	—	—	1	—	1

2045 AM No Build

2045 PM No Build SimTraffic Report

5: TH 22 & Hoffman Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.2	0.2	2.8	0.0	0.0	0.1	3.0	0.2	2.6	2.3	0.6	2.0
Total Del/Veh (s)	27.7	34.9	11.2	34.0	37.3	10.5	47.8	26.4	9.6	41.8	17.8	6.0

5: TH 22 & Hoffman Rd Performance by movement

Movement	All
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	23.2

10: Highway 12 & Hoffman Rd Performance by movement

Movement	EBL	EBT	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.2
Total Del/Veh (s)	8.2	2.6	5.7	4.9	8.0	10.1	4.5	6.5

15: Highway 12 & 211th Lane Performance by movement

Movement	WBR	NBT	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.3	1.3	0.2	0.2
Total Del/Veh (s)	4.4	0.5	3.5	1.2	1.0

Total Network Performance

Denied Del/Veh (s)	0.7
Total Del/Veh (s)	22.5

Intersection: 5: TH 22 & Hoffman Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	128	198	78	136	213	103	70	270	246	64	324	339
Average Queue (ft)	75	115	19	77	99	48	23	155	138	29	154	181
95th Queue (ft)	123	185	53	131	172	88	52	228	217	61	241	295
Link Distance (ft)	1142	1142			2490			1490	1490			1311
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			230	230		230	300			300	300	
Storage Blk Time (%)					0							0
Queuing Penalty (veh)					0							1

Intersection: 5: TH 22 & Hoffman Rd

Movement	SB
Directions Served	T
Maximum Queue (ft)	301
Average Queue (ft)	166
95th Queue (ft)	261
Link Distance (ft)	1311
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 10: Highway 12 & Hoffman Rd

Movement	EB	EB	NB	SB	SB
Directions Served	L	R	LT	T	R
Maximum Queue (ft)	55	47	66	185	40
Average Queue (ft)	30	5	23	44	3
95th Queue (ft)	62	28	58	121	20
Link Distance (ft)	2490		1127	891	891
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		200			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 15: Highway 12 & 211th Lane

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	20	28
Average Queue (ft)	1	9
95th Queue (ft)	7	30
Link Distance (ft)	1382	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 1

2045 PM No Build Synchro Report

HCM 6th ROUNDABOUT	
Node #	10
Zone:	
X East (ft):	3088
Y North (ft):	-1385
Z Elevation (ft):	0
Description	
Max v/c Ratio:	0.44
Intersection Delay (s):	5.2
Intersection LOS:	A
ICU:	0.68
ICU LOS:	C
Inside Radius (ft):	28
Outside Radius (ft):	60
Roundabout Lanes (#):	1
Circle Speed (mph):	18
Inside Color:	
Transparent Circle:	☐

HCM 6th ROUNDABOUT	EB			NB			SB		
Entry Lanes	1			1			1		
Conflicting Circle Lanes	1			1			1		
Exit Lanes	1			1			1		
Adjusted Approach Flow (vph)	148			530			996		
Demand Flow Rate (pc/h)	151			541			1016		
Vehicles Circulating (pc/h)	559			110			79		
Vehicles Exiting (pc/h)	79			559			572		
Ped Vol. Crossing Leg (#/hr)	0			0			0		
Ped Capacity Adjustment	1.000			1.000			1.000		
Approach Delay (sec/veh)	4.5			7.5			4.0		
Approach LOS	A			A			A		
Lane	Left	—	Bypass	Left	—	—	Left	—	Bypass
Follow-Up Headway (s)	2.609	—	—	2.609	—	—	2.609	—	—
Critical Headway (s)	4.976	—	—	4.976	—	—	4.976	—	—
Designated Moves	L	—	R	LT	—	—	T	—	R
Assumed Moves	L	—	—	LT	—	—	T	—	—
Right Turn Channelized	—	—	Free	—	—	Free	—	—	Free
Lane Utilization	1.000	—	—	1.000	—	—	1.000	—	—
Entry Flow Rate (pc/h)	110	—	41	541	—	—	559	—	457
Capacity, Entry Lane (pc/h)	780	—	1938	1233	—	—	1273	—	1938
Entry HV Adjustment Factor	0.982	—	0.980	0.980	—	—	0.980	—	0.980
Flow Rate, Entry (vph)	108	—	40	530	—	—	548	—	448
Capacity, Entry (vph)	766	—	1900	1208	—	—	1248	—	1900
Volume to Capacity Ratio	0.141	—	0.021	0.439	—	—	0.439	—	0.236
Control Delay (sec/veh)	6.2	—	0.0	7.5	—	—	7.3	—	0.0
Level of Service	A	—	A	A	—	—	A	—	A
95th-Percentile Queue (veh)	0	—	0	2	—	—	2	—	1

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2045 PM Build SimTraffic Report

5: TH 22 & Hoffman Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.3	0.2	3.0	0.0	0.0	0.0	2.1	0.2	2.4	2.4	0.7	2.2
Total Del/Veh (s)	29.8	42.3	12.5	39.6	38.4	22.7	42.0	34.4	13.9	43.2	24.2	7.6

5: TH 22 & Hoffman Rd Performance by movement

Movement	All
Denied Del/Veh (s)	0.8
Total Del/Veh (s)	29.5

10: Highway 12 & Hoffman Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.3	2.3	0.8	1.5	0.4	82.9	95.4	98.2
Total Del/Veh (s)	23.4	8.6	7.0	15.7	17.2	6.0	96.1	95.7	51.4	181.3	187.6	21.9

10: Highway 12 & Hoffman Rd Performance by movement

Movement	All
Denied Del/Veh (s)	37.0
Total Del/Veh (s)	70.8

15: Highway 12 & 211th Lane Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.5	3.0	1.1	0.2	0.4
Total Del/Veh (s)	15.9	4.4	1.1	0.1	5.5	2.9	2.4

Total Network Performance

Denied Del/Veh (s)	19.7
Total Del/Veh (s)	59.6

Intersection: 5: TH 22 & Hoffman Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	T	R	L	T
Maximum Queue (ft)	157	333	250	154	242	324	67	303	291	104	325	436
Average Queue (ft)	76	199	34	79	99	157	21	202	180	45	205	238
95th Queue (ft)	128	309	132	137	191	264	54	281	265	89	318	352
Link Distance (ft)	1142	1142			2488			1490	1490			1311
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			230	250		980	300			300	300	
Storage Blk Time (%)		8	0		0			0	0		0	3
Queuing Penalty (veh)		2	0		0			0	0		3	8

Intersection: 5: TH 22 & Hoffman Rd

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	448	325
Average Queue (ft)	243	32
95th Queue (ft)	368	193
Link Distance (ft)	1311	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		300
Storage Blk Time (%)	4	0
Queuing Penalty (veh)	9	0

Intersection: 10: Highway 12 & Hoffman Rd

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	LT	R	LT	R	LT	R
Maximum Queue (ft)	202	44	174	75	757	225	930	930
Average Queue (ft)	89	10	78	32	505	202	858	620
95th Queue (ft)	177	39	137	56	732	313	1024	1279
Link Distance (ft)	2488		1485		1128		891	891
Upstream Blk Time (%)							61	46
Queuing Penalty (veh)							0	0
Storage Bay Dist (ft)		200		200		200		
Storage Blk Time (%)	0				89	0		
Queuing Penalty (veh)	0				81	1		

Intersection: 15: Highway 12 & 211th Lane

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	22	52
Average Queue (ft)	15	15
95th Queue (ft)	29	41
Link Distance (ft)	1382	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 106

2045 PM Build Synchro Report

HCM 6th ROUNDABOUT	
Node #	10
Zone:	
X East (ft):	3088
Y North (ft):	-1385
Z Elevation (ft):	0
Description	
Max v/c Ratio:	0.71
Intersection Delay (s):	9.9
Intersection LOS:	A
ICU:	0.99
ICU LOS:	F
Inside Radius (ft):	28
Outside Radius (ft):	60
Roundabout Lanes (#):	1
Circle Speed (mph):	18
Inside Color:	
Transparent Circle:	☐

HCM 6th ROUNDABOUT	EB			WB			NB			SB		
Entry Lanes	1			1			1			1		
Conflicting Circle Lanes	1			1			1			1		
Exit Lanes	1			1			1			1		
Adjusted Approach Flow (vph)	340			335			650			1138		
Demand Flow Rate (pc/h)	346			342			663			1161		
Vehicles Circulating (pc/h)	788			674			417			322		
Vehicles Exiting (pc/h)	238			307			657			584		
Ped Vol. Crossing Leg (#/hr)	0			0			0			0		
Ped Capacity Adjustment	1.000			1.000			1.000			1.000		
Approach Delay (sec/veh)	11.0			6.5			11.7			9.5		
Approach LOS	B			A			B			A		
Lane	Left	—	Bypass	Left	—	Bypass	Left	—	Bypass	Left	—	Bypass
Follow-Up Headway (s)	2.609	—	—	2.609	—	—	2.609	—	—	2.609	—	—
Critical Headway (s)	4.976	—	—	4.976	—	—	4.976	—	—	4.976	—	—
Designated Moves	LT	—	R	LT	—	R	LT	—	R	LT	—	R
Assumed Moves	LT	—	—	LT	—	—	LT	—	—	LT	—	—
Right Turn Channelized	—	—	Free	—	—	Free	—	—	Free	—	—	Free
Lane Utilization	1.000	—	—	1.000	—	—	1.000	—	—	1.000	—	—
Entry Flow Rate (pc/h)	286	—	60	232	—	110	564	—	99	704	—	457
Capacity, Entry Lane (pc/h)	618	—	1938	694	—	1938	902	—	1938	994	—	1938
Entry HV Adjustment Factor	0.981	—	0.980	0.979	—	0.980	0.980	—	0.980	0.980	—	0.980
Flow Rate, Entry (vph)	281	—	59	227	—	108	553	—	97	690	—	448
Capacity, Entry (vph)	606	—	1900	679	—	1900	884	—	1900	974	—	1900
Volume to Capacity Ratio	0.463	—	0.031	0.334	—	0.057	0.625	—	0.051	0.709	—	0.236
Control Delay (sec/veh)	13.3	—	0.0	9.6	—	0.0	13.7	—	0.0	15.7	—	0.0
Level of Service	B	—	A	A	—	A	B	—	A	C	—	A
95th-Percentile Queue (veh)	2	—	0	1	—	0	5	—	0	6	—	1

2045 PM Build

Wetland Delineation Report and Minnesota Wetland Conservation Act Notice of Decision

BOARD OF WATER AND SOIL RESOURCES

Minnesota Wetland Conservation Act
Notice of Decision

Local Government Unit: Blue Earth County	**County:** Blue Earth
Applicant Name: Mesenbrink Development	**Applicant Representative:** Wayne Jacobson – Jacobson Environmental
Project Name: Mesenbrink Wetland Delineation #2	**LGU Project No. (if any):** PL2021195
Date Application Received by LGU: 12/29/21	
Date of LGU Decision: 2/22/2022	
Date this Notice was Sent: 2/22/22	

WCA Decision Type - check all that apply

☒Wetland Boundary/Type ☐Sequencing ☐Replacement Plan ☐Bank Plan (not credit purchase)
☐No-Loss (8420.0415) ☐Exemption (8420.0420)
Part: ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G ☐ H Subpart: ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

Replacement Plan Impacts (replacement plan decisions only)

Total WCA Wetland Impact Area:
Wetland Replacement Type: ☐ Project Specific Credits: ☐ Bank Credits:
Bank Account Number(s):

Technical Evaluation Panel Findings and Recommendations (attach if any)

☒ Approve ☐ Approve w/Conditions ☐ Deny ☐ No TEP Recommendation

LGU Decision

☐ Approved with Conditions (specify below)[1] ☒ Approved[1] ☐ Denied
List Conditions:

Decision-Maker for this Application: ☒ Staff ☐ Governing Board/Council ☐ Other:

Decision is valid for: ☒ 5 years (default) ☐ Other (specify):

[1] *Wetland Replacement Plan approval is not valid until BWSR confirms the withdrawal of any required wetland bank credits. For project-specific replacement a financial assurance per MN Rule 8420.0522, Subp. 9 and evidence that all required forms have been recorded on the title of the property on which the replacement wetland is located must be provided to the LGU for the approval to be valid.*

LGU Findings – Attach document(s) and/or insert narrative providing the basis for the LGU decision[1].

☐ Attachment(s) (specify):
☒ Summary: Ashley Mack of Jacobson Environmental submitted a wetland delineation on behalf of Mesenbrink Development. The submitted delineation identifies 12 wetland basins. This property was previously delineated in 2021 by Paul Brandt of Soil Investigations and Design. The previous wetland delineation Boundary/Type application was denied for not identifying all of the wetlands on the site. According to MN 8420.0310 Blue Earth County reviewed the submitted report with the TEP at regularly scheduled TEP meetings and found the report to be mostly accurate. On January 25th, 2022 revision to some of the basins were requested. On January 26th revisions to the requested basins were submitted in an amended report. The amended report was again reviewed and found that it needed to be amended again to fix an error. On January 31st, 2022 a final copy of the report was submitted and reviewed by the TEP. The TEP is in concurrence that 12 wetlands exist on the site and that the boundaries appear accurate.

For more information regarding this application go to:
https://cityview.blueearthcountymn.gov/CityViewPortal/Planning/Status?planningId=14720

[1] *Findings must consider any TEP recommendations.*

Attached Project Documents

☒ Site Location Map ☒ Project Plan(s)/Descriptions/Reports (specify): Delineation Boundary Map

Appeals of LGU Decisions

If you wish to appeal this decision, you must provide a written request within 30 calendar days of the date you received the notice. All appeals must be submitted to the Board of Water and Soil Resources Executive Director along with a check payable to BWSR for $500 *unless* the LGU has adopted a local appeal process as identified below. The check must be sent by mail and the written request to appeal can be submitted by mail or e-mail. The appeal should include a copy of this notice, name and contact information of appellant(s) and their representatives (if applicable), a statement clarifying the intent to appeal and supporting information as to why the decision is in error. Send to:

Appeals & Regulatory Compliance Coordinator
Minnesota Board of Water & Soils Resources
520 Lafayette Road North
St. Paul, MN 55155
travis.germundson@state.mn.us

Does the LGU have a local appeal process applicable to this decision?

☒ Yes[1] ☐ No

[1]*If yes, all appeals must first be considered via the local appeals process.*

Local Appeals Submittal Requirements (LGU must describe how to appeal, submittal requirements, fees, etc. as applicable)

Appeal of an LGU staff decision. Send petition and $500.00 fee to:
Blue Earth County Property and Environmental Resources
PO BOX 3566
Mankato, MN 56002

Notice Distribution (include name)

Required on all notices:

☒ SWCD TEP Member: Jake Fritz	☒ BWSR TEP Member: Alyssa Core
☐ LGU TEP Member (if different than LGU contact):	
☒ DNR Representative: Dan Girolamo	
☐ Watershed District or Watershed Mgmt. Org.:	
☒ Applicant (notice only): Mesenbrink Development – John Mesenbrink ☒ Agent/Consultant (notice only): Wayne Jacobson – Jacobson Environmental	

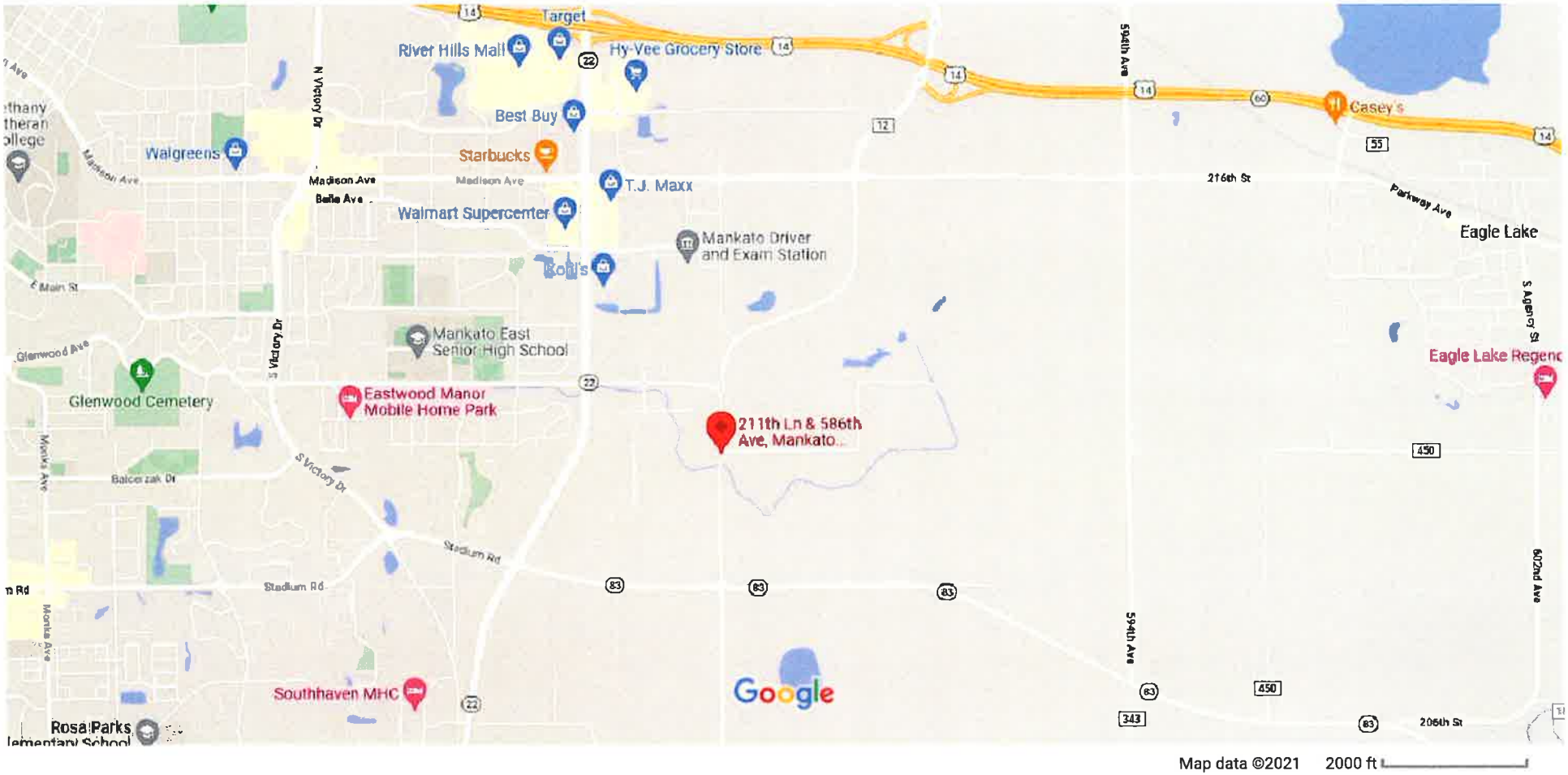
Optional or As Applicable:

☒ Corps of Engineers: David Studenski and Raelene Hegge	
☐ BWSR Wetland Mitigation Coordinator (required for bank plan applications only):	
☐ Members of the Public (notice only):	☒ Other: Chris Talamantez, Molly Westman – City of Mankato

Signature:	**Date:**
Dave Lynch	2/22/22

This notice and accompanying application materials may be sent electronically or by mail. The LGU may opt to send a summary of the application to members of the public upon request per 8420.0255, Subp. 3.

Figure 1 Site Map



Jacobson Environmental, PLLC **www.jacobsonenvironmental.com**
Environmental Consultants **Wayne Jacobson, P.S.S., W.D.C., P.W.S., A.F.S.**

5821 Humboldt Avenue North, Brooklyn Center, MN 55430 **(612) 802-6619 Cell**
Email: jacobsonenv@msn.com

1.0 SUMMARY

Jacobson Environmental, PLLC (JE) visited the project site at PIDs R430915400003 and R430915400009 on November 29, 2021. The site was approximately 106.63 acres in size, and was located at Sec. 15, T108W, R26W, Mankato, Minnesota. See Figure 1 for a Site Location Map.

The purpose of the investigation was to identify areas within the project boundary meeting the technical criteria for wetlands, delineate the jurisdictional extent of the wetland basins, and classify the wetland habitat according to the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual and the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation: Midwest Region.

Wetlands are areas that are saturated or inundated with surface and or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in hydric soil conditions. Examples of wetlands include seasonally flooded basins, floodplain forests, wet meadows, shallow and deep marshes, shrub swamps, wooded swamps, fens, and bogs.

Wetland boundaries were determined through both a level one off-site hydrology analysis and a level two on site delineation.

Twelve basins were delineated within the project area, which are summarized below and shown on Figure 5.

Basin ID	Circular 39	Cowardin	Eggers & Reed	Dominant Vegetation	Size (acres)
1	Type 1/3/5/7	PEM1A/C/P UBH/PFO1 A	Seasonally flooded basin/shallow marsh/hardwood swamp/shallow open water community	Reed Canary Grass, Narrowleaf Cattail, Box Elder	21.50
2	Type 1	PEM2Af	Farmed seasonally flooded basin	-	0.069
3	Type 1	PEM2Af	Farmed seasonally flooded basin	-	1.63
4	Type 1	PEM2Af	Farmed seasonally flooded basin	-	0.327

5821 Humboldt Avenue North, Brooklyn Center, MN 55430 **(612) 802-6619 Cell**
Email: jacobsonenv@msn.com

5	Type 1	PEM2Af	Farmed seasonally flooded basin	-	0.267
6	Type 1	PEM2Af	Farmed seasonally flooded basin	-	0.620
7	Type 1	PEM2Af	Farmed seasonally flooded basin	-	0.325
8	Type 1	PEM2Af	Farmed seasonally flooded basin	-	0.148
9	Type 1	PEM2Af	Farmed seasonally flooded basin	-	1.71
10	Type 1	PEM2Af	Farmed seasonally flooded basin	-	1.30
12	Type 1	PEM2Af	Farmed seasonally flooded basin	-	0.119
15	Type 1	PEM2Af	Farmed seasonally flooded basin	-	0.575

All figures and appendices referenced by this report are presented at the end of the text.

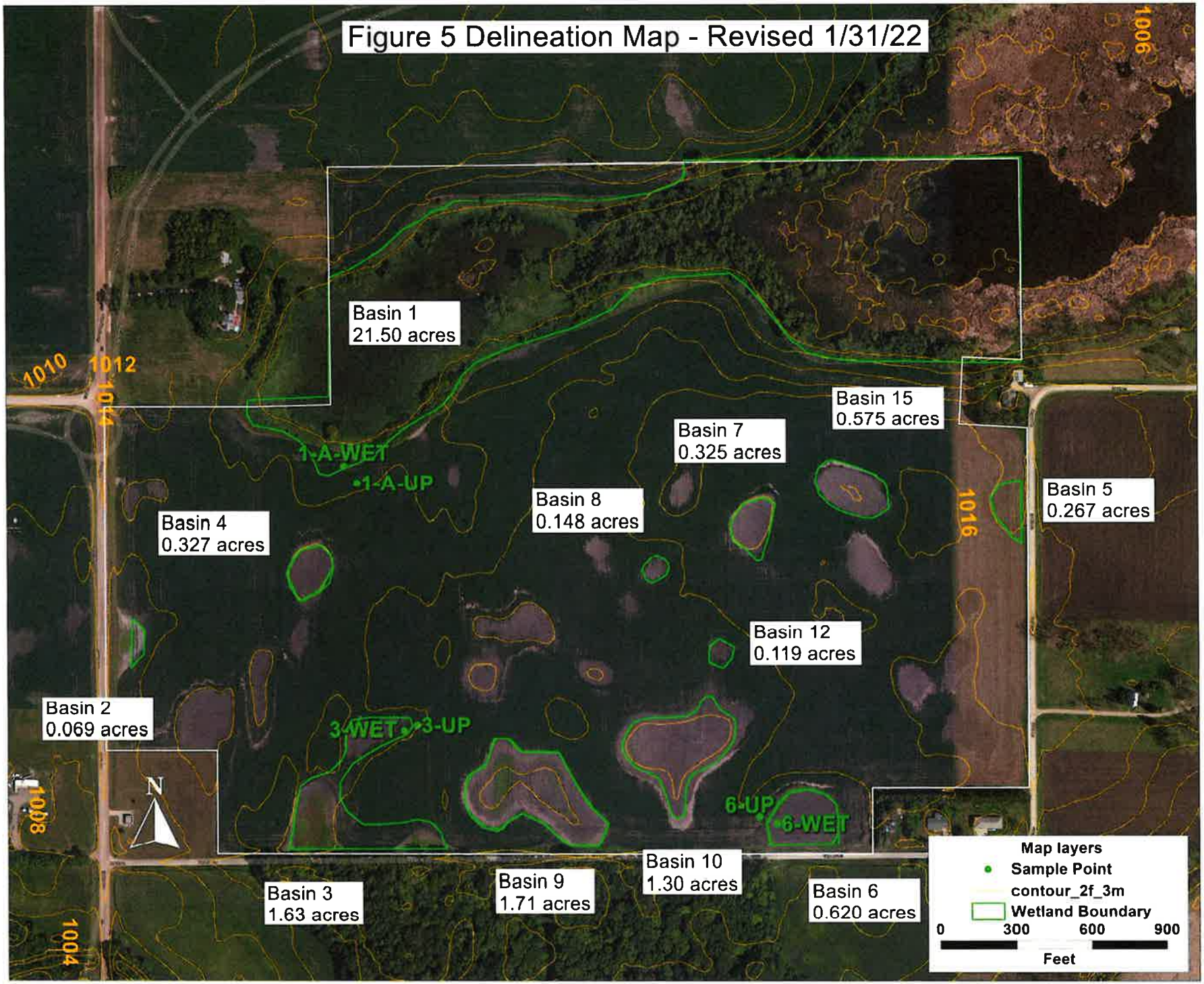


Figure 5 Delineation Map - Revised 1/31/22
1006
Basin 1
21.50 acres
1010
1012
1014
1-A-WET
1-A-UP
Basin 15
0.575 acres
Basin 7
0.325 acres
Basin 8
0.148 acres
Basin 4
0.327 acres
1016
Basin 5
0.267 acres
Basin 12
0.119 acres
Basin 2
0.069 acres
3-WET
3-UP
6-UP
6-WET
1008
N
Basin 10
1.30 acres
Basin 3
1.63 acres
Basin 9
1.71 acres
Basin 6
0.620 acres
1004
Map layers
Sample Point
contour_2f_3m
Wetland Boundary
0
300
600
900
Feet

Appendix C: Agency Correspondence

MnDNR Natural Heritage Determination Letter

DEPARTMENT OF NATURAL RESOURCES

Formal Natural Heritage Review - Cover Page

See next page for results of review. A draft watermark means the project details have not been finalized and the results are not official.

Project Name: Mesenbrink Residential Development

Project Proposer: Mesenbrink Construction & Engineering, Inc.

Project Type: Development, Mixed Use

Project Type Activities: Tree Removal;Wetland impacts (e.g., discharge, runoff, sedimentation, fill, excavation)

TRS: T108 R26 S15, T108 R26 S22

County(s): Blue Earth

DNR Admin Region(s): South

Reason Requested: State EAW

Project Description: Mesenbrink Construction & Engineering, Inc. is proposing a residential development project with a small commercial component along 586th Ave in Mankato ...

Existing Land Uses: Current landuse is mostly agricultural with the northern portion of the property covered in undeveloped green space.

Landcover / Habitat Impacted: Agricultural land will be developed to be suitable for building the abovementioned residential structures. Some tree removal around existing roadway boulevards will likely be removed.

Waterbodies Affected: A small wetland that intersects with the property is not anticipated to be directly impacted by the proposed work.

Groundwater Resources Affected: N/A

Previous Natural Heritage Review: No

Previous Habitat Assessments / Surveys: No

SUMMARY OF AUTOMATED RESULTS

Category	Results	Response By Category
Project Details	No Comments	No Further Review Required
Ecologically Significant Area	No Comments	No Further Review Required
State-Listed Endangered or Threatened Species	No Comments	No Further Review Required
State-Listed Species of Special Concern	No Comments	No Further Review Required
Federally Listed Species	No Records	Visit IPaC For Federal Review

DEPARTMENT OF NATURAL RESOURCES

Minnesota Department of Natural Resources
Division of Ecological & Water Resources
500 Lafayette Road, Box 25
St. Paul, MN 55155-4025

September 15, 2022

Project ID: MCE #2022-00619

Matthew Sitek
Bolton & Menk, Inc.
12224 Nicollet Avenue S
Burnsville, MN 55337-1649

RE: Automated Natural Heritage Review of the proposed Mesenbrink Residential Development
See Cover Page for location and project details.

Dear Matthew Sitek,

As requested, the above project has been reviewed for potential effects to rare features. Given the project details provided on the cover page, I do not believe the proposed project will negatively affect any known occurrences of rare features. To ensure compliance with federal law, conduct a federal regulatory review using the U.S. Fish and Wildlife Service's (USFWS) online Information for Planning and Consultation (IPaC) tool.

Project Type and/or Project Type Activity Comments

- The Natural Heritage Information System (NHIS) tracks bat roost trees and hibernacula plus some acoustic data, but this information is not exhaustive. Even if there are no bat records listed below, all seven of Minnesota's bats, including the federally threatened northern long-eared bat (*Myotis septentrionalis*), can be found throughout Minnesota. Tree removal can negatively impact bats by destroying roosting habitat, especially during the pup rearing season when females are forming maternity roosting colonies and the pups cannot yet fly. To minimize these impacts, the DNR recommends that tree removal be avoided during the months of June and July.

The Natural Heritage Information System (NHIS), a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Division of Ecological and Water Resources, Department of Natural Resources. The NHIS is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. However, the NHIS is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. Therefore, ecologically significant features for which we have no records may exist within the project area. If additional information becomes available regarding rare features in the vicinity of the project, further review may be necessary.

For environmental review purposes, the results of this Natural Heritage Review are valid for one year; the results are only valid for the project location and the project description provided on the cover page. If project details change or construction has not occurred within one year, please resubmit the project for review.

The Natural Heritage Review does not constitute project approval by the Department of Natural Resources. Instead, it identifies issues regarding known occurrences of rare features and potential effects to these rare features. For information on the environmental review process or other natural resource concerns, you may contact your DNR Regional Environmental Assessment Ecologist.

Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources.

Sincerely,



Samantha Bump
Natural Heritage Review Specialist
Samantha.Bump@state.mn.us

Links: USFWS Information for Planning and Consultation (IPaC) tool
Information for Planning and Consultation (IPaC) tool
DNR Regional Environmental Assessment Ecologist Contact Info
https://www.dnr.state.mn.us/eco/ereview/erp_regioncontacts.html

Mesenbrink Residential Development

Aerial Imagery With Locator Map



N
W E
S

0 0.130.25 0.5 0.75 1 Miles

Project Boundary

Project Type: Development, Mixed Use

Project Size (acres): 102.74

County(s): Blue Earth

TRS: T108 R26 S15, T108 R26 S22

Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA
Esri, HERE, Garmin, FAO, NOAA, USGS, EPA



Mesenbrink Residential Development

USA Topo Basemap With Locator Map





Project Type: Development, Mixed Use

Project Size (acres): 102.74

County(s): Blue Earth

TRS: T108 R26 S15, T108 R26 S22

Esri, NASA, NGA, USGS, FEMA
Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA

MN SHPO Determination Letter and Request Form

DEPARTMENT OF ADMINISTRATION
STATE HISTORIC PRESERVATION OFFICE

October 12, 2022

Matthew Sitek
Bolton & Menk Inc.
12224 Nicollet Ave
Burnsville, MN 55407

RE: Mesenbrink Residential Development
T108 R26 S15 SE, Mankato, Blue Earth County
SHPO Number: 2022-2791

Dear Matthew Sitek:

Thank you for consulting with our office during the preparation of an Environmental Assessment Worksheet for the above-referenced project.

Based on our review of the project information, we conclude that there are no properties listed in the National or State Registers of Historic Places and no known or suspected archaeological properties in the area that will be affected by this project.

Please note that this comment letter does not address the requirements of Section 106 of the National Historic Preservation Act of 1966 and 36 CFR § 800. If this project is considered for federal financial assistance, or requires a federal permit or license, then review and consultation with our office will need to be initiated by the lead federal agency. Be advised that comments and recommendations provided by our office for this state-level review may differ from findings and determinations made by the federal agency as part of review and consultation under Section 106.

Please contact Kelly Gragg-Johnson, Environmental Review Program Specialist, at 651-201-3285 or kelly.graggjohnson@state.mn.us if you have any questions regarding our review of this project.

Sincerely,

Sarah J. Beimers
Environmental Review Program Manager

USFWS IPaC Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Minnesota-Wisconsin Ecological Services Field Office
4101 American Blvd E
Bloomington, MN 55425-1665
Phone: (952) 252-0092 Fax: (952) 646-2873

In Reply Refer To: September 15, 2022
Project Code: 2022-0085937
Project Name: Mesenbrink Residential Development

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

This response has been generated by the Information, Planning, and Conservation (IPaC) system to provide information on natural resources that could be affected by your project. The U.S. Fish and Wildlife Service (Service) provides this response under the authority of the Endangered Species Act of 1973 (16 U.S.C. 1531-1543), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d), the Migratory Bird Treaty Act (16 U.S.C. 703-712), and the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*).

Threatened and Endangered Species
The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and may be affected by your proposed project. The species list fulfills the requirement for obtaining a Technical Assistance Letter from the U.S. Fish and Wildlife Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the ECOS IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS IPaC system by completing the same process used to receive the enclosed list.

Consultation Technical Assistance
Please refer to refer to our Section 7 website for guidance and technical assistance, including step-by-step instructions for making effects determinations for each species that might be present and for specific guidance on the following types of projects: projects in developed areas, HUD, CDBG, EDA, pipelines, buried utilities, telecommunications, and requests for a Conditional Letter of Map Revision (CLOMR) from FEMA.

Using the IPaC Official Species List to Make No Effect and May Affect Determinations for Listed Species

1. If IPaC returns a result of "There are no listed species found within the vicinity of the project," then project proponents can conclude the proposed activities will have **no effect** on any federally listed species under Service jurisdiction. Concurrence from the Service is not required for **no effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.
2. If IPaC returns one or more federally listed, proposed, or candidate species as potentially present in the action area of the proposed project – other than bats (see below) – then project proponents must determine if proposed activities will have **no effect** on or **may affect** those species. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain Life History Information for Listed and Candidate Species on our office website. If no impacts will occur to a species on the IPaC species list (e.g., there is no habitat present in the project area), the appropriate determination is **no effect**. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.
3. Should you determine that project activities **may affect** any federally listed, please contact our office for further coordination. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

Northern Long-Eared Bats
Northern long-eared bats occur throughout Minnesota and Wisconsin and the information below may help in determining if your project may affect these species.

This species hibernates in caves or mines only during the winter. In Minnesota and Wisconsin, the hibernation season is considered to be November 1 to March 31. During the active season (April 1 to October 31) they roost in forest and woodland habitats. Suitable summer habitat for northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥3 inches dbh for northern long-eared bat that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat and evaluated for use by bats. If your project will impact caves or mines or will involve clearing forest or woodland habitat containing suitable roosting habitat, northern long-eared bats could be affected.

Examples of unsuitable habitat include:

- Individual trees that are greater than 1,000 feet from forested or wooded areas,
- Trees found in highly developed urban areas (e.g., street trees, downtown areas),

- A pure stand of less than 3-inch dbh trees that are not mixed with larger trees, and
- A stand of eastern red cedar shrubby vegetation with no potential roost trees.

If IPaC returns a result that northern long-eared bats are potentially present in the action area of the proposed project, project proponents can conclude the proposed activities **may affect** this species **IF** one or more of the following activities are proposed:

- Clearing or disturbing suitable roosting habitat, as defined above, at any time of year,
- Any activity in or near the entrance to a cave or mine,
- Mining, deep excavation, or underground work within 0.25 miles of a cave or mine,
- Construction of one or more wind turbines, or
- Demolition or reconstruction of human-made structures that are known to be used by bats based on observations of roosting bats, bats emerging at dusk, or guano deposits or stains.

If none of the above activities are proposed, project proponents can conclude the proposed activities will have **no effect** on the northern long-eared bat. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.

If any of the above activities are proposed, please use the northern long-eared bat determination key in IPaC. This tool streamlines consultation under the 2016 rangewide programmatic biological opinion for the 4(d) rule. The key helps to determine if prohibited take might occur and, if not, will generate an automated verification letter. No further review by us is necessary.

Please note that on March 23, 2022, the Service published a proposal to reclassify the northern long-eared bat as endangered under the Endangered Species Act. The U.S. District Court for the District of Columbia has ordered the Service to complete a new final listing determination for the bat by November 2022 (Case 1:15-cv-00477, March 1, 2021). The bat, currently listed as threatened, faces extinction due to the range-wide impacts of white-nose syndrome (WNS), a deadly fungal disease affecting cave-dwelling bats across the continent. The proposed reclassification, if finalized, would remove the current 4(d) rule for the NLEB, as these rules may be applied only to threatened species. Depending on the type of effects a project has on NLEB, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective (anticipated to occur by December 30, 2022). If your project may result in incidental take of northern long-eared bats after the new listing goes into effect this will first need to addressed in an updated consultation that includes an Incidental Take Statement. If your project may require re-initiation of consultation, please contact our office for additional guidance.

Whooping Crane

Whooping crane is designated as a non-essential experimental population in Wisconsin and consultation under Section 7(a)(2) of the Endangered Species Act is only required if project activities will occur within a National Wildlife Refuge or National Park. If project activities are proposed on lands outside of a National Wildlife Refuge or National Park, then you are not required to consult. For additional information on this designation and consultation requirements, please review "Establishment of a Nonessential Experimental Population of

Whooping Cranes in the Eastern United States."

Other Trust Resources and Activities
Bald and Golden Eagles - Although the bald eagle has been removed from the endangered species list, this species and the golden eagle are protected by the Bald and Golden Eagle Act and the Migratory Bird Treaty Act. Should bald or golden eagles occur within or near the project area please contact our office for further coordination. For communication and wind energy projects, please refer to additional guidelines below.

Migratory Birds - The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. The Service has the responsibility under the MBTA to proactively prevent the mortality of migratory birds whenever possible and we encourage implementation of recommendations that minimize potential impacts to migratory birds. Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

Communication Towers - Construction of new communications towers (including radio, television, cellular, and microwave) creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. However, the Service has developed voluntary guidelines for minimizing impacts.

Transmission Lines - Migratory birds, especially large species with long wingspans, heavy bodies, and poor maneuverability can also collide with power lines. In addition, mortality can occur when birds, particularly hawks, eagles, kites, falcons, and owls, attempt to perch on uninsulated or unguarded power poles. To minimize these risks, please refer to guidelines developed by the Avian Power Line Interaction Committee and the Service. Implementation of these measures is especially important along sections of lines adjacent to wetlands or other areas that support large numbers of raptors and migratory birds.

Wind Energy - To minimize impacts to migratory birds and bats, wind energy projects should follow the Service's Wind Energy Guidelines. In addition, please refer to the Service's Eagle Conservation Plan Guidance, which provides guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities.

State Department of Natural Resources Coordination
While it is not required for your Federal section 7 consultation, please note that additional state endangered or threatened species may also have the potential to be impacted. Please contact the Minnesota or Wisconsin Department of Natural Resources for information on state listed species that may be present in your proposed project area.

Minnesota
Minnesota Department of Natural Resources - Endangered Resources Review Homepage
Email: Review.NHIS@state.mn.us

Wisconsin
Wisconsin Department of Natural Resources - Endangered Resources Review Homepage
Email: DNRERReview@wi.gov

We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Minnesota-Wisconsin Ecological Services Field Office
4101 American Blvd E
Bloomington, MN 55425-1665
(952) 252-0092

Project Summary

Project Code: 2022-0085937
Project Name: Mesenbrink Residential Development
Project Type: Residential Construction
Project Description: Mesenbrink Construction & Engineering, Inc. is proposing a residential development project with a small commercial component along 586th Ave in Mankato on an approximate 105-acre property. Of the 105 acres, only about 80 acres is buildable. The other 25 acres include wetland areas which will not be impacted directly. Parcel numbers for the study area include: R430915400009 and R430915400003. The current concept plan is attached to this proposal for reference. The EAW study area is proposed to include:

- 113 Single Family Residential Units
- 30 Townhomes (6 Unit Buildings)
- 530 Apartment Units (includes standalone buildings and units over the retail center)
- 21,000 sq ft of Retail Center
- 5,400 sq ft Gas Station/Commercial Node
- Internal Roadway and Parking
- Stormwater Ponds
- Open Green Space

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@44.1551489,-93.9338733924331,14z



Counties: Blue Earth County, Minnesota

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the

FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

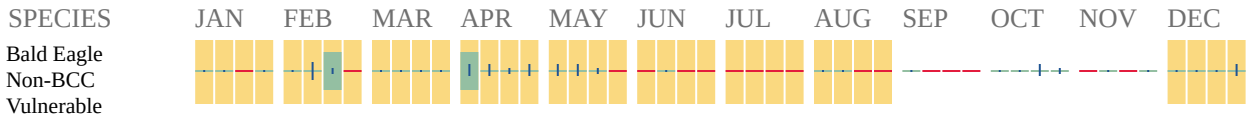
1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

WETLAND INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE VISIT HTTPS://WWW.FWS.GOV/WETLANDS/DATA/MAPPER.HTML OR CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

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