North Dayton Development AUAR

DRAFT Alternative Urban Areawide Review

Dayton, MN

6/29/2018

North Dayton Development Partnership, LLC

Sambatek
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June 29, 2018

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This Alternative Urban Areawide Review (AUAR) examines approximately 560 acres of land in Dayton, MN to analyze impacts and mitigation measures necessary to accommodate proposed development.

1.	**Project Title**	North Dayton Development
2.	**Proposer**	Dayton Development Partnership, LLC
	Contact Person	Jake Walesch
	Company	Dayton Development Partnership, LLC
	Address	10850 Old County Road 15, Suite 200
	City, State, Zip	Plymouth, MN 55441
	Phone	(763) 546-2727
	Prepared By	Sambatek, Inc.
3.	**RGU**	City of Dayton
	Contact Person	Tina Goodroad
	Address	12260 South Diamond Lake Road
	City, State, Zip	Dayton, Minnesota 55327
	Phone	(763) 421-3487
	E-mail	tgoodroad@cityofdaytonmn.com
4.	**Reason for EAW Preparation**	Over 1,500 residential units proposed for development in a fourth class city triggers a mandatory EIS/AUAR [MN Statute 4410.4400, subpart 14(d)].
5.	**Location and Maps**	The index of figures can be found on the following page.
	County	Hennepin
	City	Dayton
	PLS Location	T120, R22, S8 & T120, R22, S9
	Watershed	Elm Creek Watershed Management Organization
	GPS Coordinates	45°13'07.0"N, 93°28'45.3"W

PIDs and Legal Descriptions

Parcel #	PID	Legal Descriptions
1	912022130001	The Northwest Quarter of the Southeast Quarter of Section 9, Township 120, Range 22, Hennepin County, Minnesota. AND The south 9.17 acres of the Southwest Quarter of the Northeast Quarter of Section 9, Township 120, Range 22, Hennepin County, Minnesota. The east 508.00 feet of the Southwest Quarter of the Northeast Quarter of Section 9, Township 120, Range 22, Hennepin County, Minnesota lying north of the south 9.17 acres thereof. AND The west 500.00 feet of the east 508.00 feet of the Northwest Quarter of the Northeast Quarter of Section 9, Township 120, Range 22, Hennepin County, Minnesota lying southerly of HENNEPIN COUNTY STATE AID HIGHWAY NO, 12, PLAT 23, said Hennepin County, Minnesota.
2	912022120004	That part of the Northwest Quarter of the Northeast Quarter or Section 9, Township 120, Range 22, Hennepin County, Minnesota lying west of the east 508.00 feet thereof and also lying southerly of Hennepin County State Aid Highway No. 12, Plat 23, said Hennepin County, Minnesota. That part of the Southwest Quarter of the Northeast Quarter of Section 9, Township 120, Range 22, Hennepin County, Minnesota lying west of the east 508.00 feet thereof and also lying north of the south 9.17 acres thereof.
3	912022310001	That part of Section 9, Township 120N, Range 22W, described as follows: Commencing at a point 25 feet East of the center of the SIV 1/4 of said Section 9, thence NW 41 feet to a point 32.5 feet North of the center of said SW 1/4; thence North to the NW corner of the NE 1/4 SW 1/4, thence East 80 Rods; thence South 80 Rods; thence West to the Point of beginning, all in Hennepin County, Minnesota.
4	912022240001	That part of the E 1/2 of NW 1/4 of Section 9, Township 120N, Range 22W, lying East of the West 600.66 feet thereof, and Southerly of Dayton River Road, and that part of the West 600.66 feet of the SE 1/4 of the NW 1/4 of said Section 9 lying South of the North 440.1 feet thereof.
5	912022210005	The West 600.66 of the Northwest Quarter of the Northwest Quarter of Section 9, Township 120, Range 22, lying South of the centerline of Hennepin County State Aid Highway No. 12, Plat 23. AND The North 440.10 feet of the West 600.66 feet of the Southeast Quarter of the Northwest Quarter of Section 9, Township 120, Range 22.

6	912022320002	The Northwest Quarter of the Southwest Quarter (NW'/« of SW'/‹) of Section Nine (9), Township One Hundred Twenty (120), Range Twenty-two (22), except that part described as follows: Commencing at the Northwest corner of said NW1/4 of SW1/4; thence South along the West line of said NW1/4 of SW1/4 a distance of 208.71 feet; thence East and parallel with the North line of said NW1/4 of SW1/4 a distance of 208.71 feet; thence North and parallel with the West line of said NW1/4 of SW1/4 to the point of intersection with the North line of said NW1/4 of SW1/4; thence West along the North line of said NW1/4 of SW1/4 to the point of beginning. ALSO: That part of the Northeast Quarter of the Southwest Quarter of Section Nine (9), Township One Hundred Twenty (120), Range Twenty-two (22), beginning at the northeast corner of the Southwest Quarter of the Southwest Quarter (SW'/‹ of SW'/‹) of Section Nine (9), Township One Hundred Twenty (120), Range Twenty-two (22), thence East on quarter-section line Twenty-five (25) feet, thence Northwesterly to quarter-section line Forty-one (41) feet, thence South to the place of beginning.
7	912022320001	That part of the Northwest Quarter of the Southwest Quarter of Section 9, Township 120, Range 22 that is described as follows: Commencing at the Northwest corner of said Northwest Quarter of Southwest Quarter; thence South along the West line of sild Northwest Quarter of the Southwest Quarter a distance of 208.71 feet; thence East and parallel with the North line of said Northwest Quarter of the Southwest Quarter a distance of 208.71 feet; thence North and parallel with the West line of said Northwest Quarter of the Southwest Quarter to the point of intersection with the North line of said Northwest Quarter of the Southwest Quarter; thence West along the North line of said Northwest Quarter of the Southwest Quarter to the point of beginning. Hennepin County, Minnesota
8	912022230003	That part of the West One-Half of the Northwest Quarter, in Section Nine (9), Township One Hundred Twenty (120) and Range Twenty-two (22) lying Southerly of the centerline of Hennepin County State Aid Highway No. 12. Subject to Hennepin County State Aid Highway No. 12.
9	812022410001	The Northeast Quarter of the Southeast Quarter, and the North 66 feet of the Southeast Quarter of the Southeast Quarter, Section 8, Township 120, Range 22, according to the Government Survey thereof.
10	812022140001	Lot 1, Block 1, Dahlheimers Hill.
11	812022140002	The North 676.40 feet of the South 1006.40 feet of the Eat Half of the Northeast Quarter of Section 8, Township 120, Range 22, Hennepin County, Minnesota.
12	812022110004	The North 676.65 feet of the South 1683.05 feet of the Eat 1/2 of the Northeast 1/4 of Section 8, Township 120, Range 22, Hennepin County, Minnesota.
13	812022110006	The North 338.18 feet of the South 2021.23 feet of the East Half of the Northeast Quarter of Section 8, Township 120, Range 22.

14	812022110007	The East Half of the Northeast Quarter of Section 8, Township 120, Range 22, Hennepin County, Minnesota, lying North of the South 2,02 1.33 of the East Half of the Northeast Quarter and except that part thereof platted as Wingard Estates.
15	512022440004	That part of Government Lot 5 of Section 5, Township 120, Range 22, lying southerly of the centerline of Hennepin County State Aid Highway No. 12, Plat 23.
16	512022430004	The East 200 feet of Government Lot 4, Section 5, Township 120, Range 22, West of the 5th Principal Meridian, lying South of Hennepin County Road Number 12, all in Hennepin County, Minnesota.
17	512022430006	All that part of Government Lot 4, Section 5, Township 120, Range 22, Hennepin County, Minnesota described as follows: Commencing at a point on the West line of said Government Lot 4 a distance of 18.28 chains (1206.48 ft) South from the Northwest corner thereof also being 797.13 feet North from the Southwest corner of said Government Lot 4; thence N 80° 00' E 234.13 feet to the actual point of beginning of the land to be described; thence continue N 80° 00' E to the center line of County Road No. 12; thence S 45° 52' E along center line 200.80 feet; thence S 44° 08' W 233.05 feet; thence N 45°54' W 369.42 feet to the point of beginning. Subject to road easement over the Northeasterly 33 feet For the purposes of this description, the West line of Government Lot 4 is assumed to be due North.
18	512022430005	That part of Section 5, Township 120N, Range 22W, described as follows: Commencing at the SW corner of Government Lot 4, thence North along the West line thereof 797.13 feet; thence North 80 degrees East a distance of 234.13 feet; thence South 45 degrees 54 minutes East a distance of 369.42 feet; thence North 44 degrees 08 minutes East to the center line of County Road 12; thence Southeasterly along said center line to a point 200 feet West as measured at right angles from the East line of government lot 4; thence South to the South line thereof; thence West to the Point of Beginning, except road, Hennepin County, Minnesota.
19	812022120001	The SW 1/4 of the NE 1/4; the NW 1/4 of the NE 1/4, except for the road, all in Section 8, Township 120N, Range 22W.
20	812022130001	
21	812022420001	The Northwest Quarter of the Southeast Quarter of Section 8, Township 120, Range 22; AND That part of the North 300 feet of the Northeast Quarter of the Northwest Quarter lying East of a line par with and a distance of 1688.71 feet East from a West line of the Northwest Quarter and that part of the East 300 feet of the Northeast Quarter of the Northwest Quarter lying South of the North 300 feet thereof; all of Section 8, Township 120, Range 22; AND That part of the Northwest Quarter of the Northwest Quarter described as beginning at a point on the West line thereof a distance of 274.71 feet South from the Northwest Corner thereof; thence East 208.71 feet; thence South 25.29 feet; thence East 91.29 feet; thence South 535 feet; thence East 83 feet; thence South 295 feet; thence West 383 feet to the West line thereof; thence North to the point of beginning, excepting the road; all of Section 8, Township 120, Range 22.

The following is a complete list of figures in this AUAR which can be found in **Appendix "A"**.

Figure #	Figure Title
1	Project Regional Location
2	AUAR Study Boundary
3	USGS Map
4	Existing Conditions Aerial
5	Draft Proposed Master Planned Development
6	Existing Cover Types
7	Proposed Cover Types
8	Soils
9	Existing Land Use
10	Future Land Use
11	Mississippi River Critical Area Districts
12	National Wetland Inventory
13	Well Locations
14	Dayton 2010 City Sewer Service Areas
15	Dayton Trunk Sanitary Sewer Plan
16	Dayton Trunk Stormwater Plan
17	Dayton 2010 City Water Service Areas
18	Draft Dayton Comprehensive Trail Plan
19	West Mississippi River Regional Trail Search Corridor

6. Description

The description section of an AUAR should include the following elements for each major development scenario included:

a. Provide a project summary of 50 words or less to be published in the EQB Monitor.

EQB Monitor Heading..... Alternative Urban Areawide Review

Comment Deadline..... August 8, 2018

Project Title ..... North Dayton Development

Project Description..... The proposed North Dayton Development project would entail the development of approximately 560 acres within the City of Dayton, MN. The land in question is generally located north of North Diamond Lake Road, south of Dayton River Road, east of the Daytona Golf Club, and west of Oxbow Lane and the adjacent farmstead. The site currently consists primarily of open farm fields, homesteads, wooded areas and wetlands. Complete development of the site would result in multi-phased development consisting primarily of single family residential surrounding a core of commercial development. The development density is expected to average approximately 3 units per acre, with 1,500 to 1,700 single-family residential homes and a small commercial node consisting of neighborhood retail. City of Dayton's 2030 Future Land Use plan has a higher density than the preferred land use designation proposed by the developer. As outlined in the table below, the single (preferred) scenario studied by this AUAR is less impactful than the City's 2030 Land Use designation.

2030 Future Land Use Designation (2040 Full Build)		**Preferred Land Use Designation (2040 Full Build)**	
Single Family	954 units	Single Family	1,342 units
Multifamily Housing	745 units	Multifamily Housing	267 units
Commercial	168.6 KSF	Commercial	58.2 KSF

By State statute, this level of development requires a mandatory environmental review, so a Scoping Environmental Assessment Worksheet (EAW) was completed in late 2017, and this Alternative Urban Areawide Review (AUAR) was subsequently prepared in accordance with the findings of that document. The EAW Scoping process and comment period did not identify additional scenarios for study.

Copies of the AUAR have been distributed to agencies listed on the most current Minnesota Environmental Quality Board distribution list. The AUAR may be accessed by anyone electronically on the City of Dayton's website; and copies are available for review at City Hall and the Minneapolis Branch of the Hennepin County Public Library (300 Nicollet Mall, Minneapolis).

RGU..... City of Dayton

Contact Person..... Tina Goodroad, AICP

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b. Give a complete description of the proposed project and related new construction. Attach additional sheets as necessary. Emphasize construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes. Include modifications to existing equipment or industrial processes and significant demolition, removal or remodeling of

existing structures. Indicate the timing and duration of construction activities.

The area studied by this AUAR is located in the northern portion of the City of Dayton, MN, within Hennepin County (see **Figure 1**). The proposed development site encompasses approximately 560 acres generally located north of North Diamond Lake Road, south of Dayton River Road, east of the Daytona Golf Club, and west of Oxbow Lane and the adjacent farmstead (see **Figure 2**). The topography is comprised of rolling hills (see **Figure 3**). A vast majority of the study area is currently active farmland, with the remaining acreage used for single-family farm dwellings with outbuildings, scattered woods and wetlands. The proposer owns or controls about 500 acres of the study area, with the balance being large lot, single family homesteads or farms located just west of Vicksburg Lane N.

The proposed size and extent of the facility triggers a mandatory environmental review and the RGU has elected to prepare an AUAR to fulfill this requirement. Approximately 1,500 to 1,700 single-family residential homes and a small commercial node consisting of neighborhood retail are anticipated in the project area, **Figure 5** provides a draft representation of the proposed master planned development.

The proposed development of the project area is anticipated to take 10 to 15 years and will begin with single family development on the east side of the project area. The first phase will be graded in 2019 and home construction could begin in late 2019 or possibly 2020. The first phase will be accessed from the east via Riverside Parkway in the adjacent residential development. In the future, the project area is anticipated to develop from east to west based on market demand for homes in the area.

The overall timeline for development (10 to 15 years) may be impacted by the extension of Zanzibar Lane to the project area. It is anticipated that Zanzibar Lane will be connected to Interstate 94 with a new interchange. If this connection is made and Zanzibar Lane is extended to the project area, the pace of development may increase and it would also precipitate the development of a small commercial and multifamily node at the intersection of Zanzibar Lane and the future East/West collector road as shown on **Figure 5**.

The uses for the proposed project consist of residential, commercial and multifamily. The commercial and multifamily uses are anticipated along Zanzibar Lane (see **Figure 5**).

City of Dayton's Draft Park and Trail Plan includes a search area for a Community Park and a Neighborhood Park within the project site; this need is acknowledged and will be addressed by the project (see **Figure 18**).

For purposes of this study we have assumed that 33% of the development will occur at the east side of the project area by 2025. We have also assumed that Zanzibar Lane has not been extended through the project area by 2025 and that access is provided to the project area via Dayton River Road and North Diamond Lake Road.

Development of the site will involve general grading as necessary to facilitate proper drainage, trench cuts for the installation of needed utilities, and grading as needed for overall stormwater management including on-site ponding. A significant focus of grading and stormwater management will be the

adequate treatment of all stormwater and/or potential contaminants on-site prior to discharge. Wetland areas will be preserved in most areas; however, there may be some impacts from new roadways and structures that may require mitigation.

New public roads are planned through the AUAR study area and the AUAR will examine these and adjacent road capacities and intersection configurations to assess whether the existing infrastructure is sufficient to accommodate the proposed development and to identify any needed upgrades.

c. Project Magnitude Data

Total project acreage .....560 acres

Total Building Area..... 1,500 to 1,700 single-family homes

Building Heights.....up to 3 story single family or attached homes

North Dayton Development - Potential Development Yield:

Gross Parcel Acreage (AUAR Study Area) ..... 577.79 acres

-- *less Dayton River Road ROW* .....*3.98 acres*

-- *less Proposed ROW (Arterials)*.....*34.13 acres*

-- *less MRCCA Tree Preservation Area*.....*5.01 acres*

Net Developable Acres..... 534.68 acres

Proposed Land Use	Gross Developable Acres [1]	Land Use Break-down	Residential Units / Acre [2]	City of Dayton Land Use	Total Residential Units	Total Residents [3]	Commercial Building Square Footage (est.)
Low Density Residential - Single Family				2.3 to 4.0 units/acre			
Large Lot (80'x140')	64.2	12%	2.50	–	160	401	–
Traditional Lot (65'x135')	133.7	25%	3.00	–	401	962	–
Village Lot (55'x135')	133.7	25%	3.50	–	468	1,123	–
Low-Medium Density Residential				4.0 to 8.0 units/acre			–
Detached Single-Family Lots (55'x 135')	58.8	11%	3.50	–	206	494	–
Villa Lots (52' x 115')	26.7	5%	4.00	–	107	257	–
Medium Density Residential				6.0 to 12.0 units/acre			–
Attached Rowhomes	26.7	5%	10.00	–	267	642	–

Commercial - Neighborhood/Retail	5.3	1%	–	–	–	–	58,226
Wetlands/Wetland Buffers/Greenspace	49.0	9%	–	–	–	–	–
Parks/Open Space/Clubhouse/ Recreational	36.6	7%	–	–	–	–	–
Totals	534.7	100%	**3.01 units/ acre** [4]		**1,609**	3,879	58,226

[1] *Gross Developable Acreage= Gross Acreage Less Proposed Arterial ROW & MRCCA Tree Preservation Area*

[2] *Development Specific Target Density, including stormwater management areas*

[3] *Total Residential Units x Generic 2.4/unit*

[4] *Average Development Density (1609 total residential units divided by 534.68 acres)*

d. 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 project is to provide needed residential housing and neighborhood oriented commercial uses. A governmental unit is not carrying out the project.

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

Full project development is proposed to be completed by 2035. No future phases of development are proposed on the project site and planned development in the area is not proposed at this time.

f. Is this project a subsequent stage of an earlier project?

No

MITIGATION MEASURES (QUESTION 6):

- Mitigation measures for the potential development scenario are detailed throughout this AUAR.

7. Cover Types

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

- Wetlands – identified by type (Circular 39)
- Watercourses – rivers, streams, creeks ditches
- Lakes – identify protected waters status and shoreland management classification
- Woodlands – breakdown by classes where possible
- Grassland – identify native and old field
- Cropland
- Current development

Please refer to **Figure 6** for a visual depiction of the following existing cover types within the study area:

Cover Types	Before Acres
Types 1-8 wetlands [1]	22.0
Deep Water/Streams	0.0
Wooded/forest	51.0
Brush/Grassland	0.0
Cropland	467.0
Lawn/landscaping	10.0
Impervious surfaces	10.0
Stormwater Pond	0.0
Other (describe)	0.0
TOTALS:	**560.0**

[1] *Wetland acreages are currently estimated based on the available aerial imagery. Future wetland delineations and determinations will ultimately determine the amount of wetland on the site. As development of the site may include wetland impacts, it is recognized that replacement will be needed at a ratio of 2.0:1 or 2.5:1 as part of any final development plan. The future mitigation plan will identify specific requirements.*

MN DNR National Wetland Inventory:

The Minnesota DNR National Wetland Inventory Update was reviewed for the Project Area. The NWI map (see **Figure 12**) identifies 34.1 acres of wetland within the Project Area with the following breakdown:

- 16.5 acres are categorized as Type 1 Seasonally Flooded wetlands. Many of the Type 1 wetlands are farmed or fringe deeper wetland habitats.
- 7.3 acres area classified as Type 5, Open Water wetlands, both of the Type 5 wetlands identified within the Project Area are also listed on the DNR Public Water Inventory.
- 5.6 acres are identified as Type 3, Shallow Marsh wetlands;
- 2.9 acres are identified as Type 6, Shrub-scrub wetlands;
- 1.8 acres of wetland are characterized as Type 4, Deep Marsh wetlands.

The wetland area provided by the NWI map is estimated based on the available aerial imagery and topographic data. A wetland delineation will need to be completed to confirm the presence or absence of wetlands and to determine actual boundaries.

Post Development Cover Types:

A development scenario has not been completed to determine what cover types will exist after the development of the site; however, based on preliminary planning some generalizations about changes to cover types can be made (see **Figure 7**). In general, impervious surfaces and stormwater ponding areas will go up while the remaining cover types will go down. This will be due to the construction of residential units and the streets to service them. The average development density will entail approximately 3.01 residential units per acre. Some commercial units will be constructed along the main thoroughfare of the community to serve the new residents. Stormwater ponds and other structures will be

installed to treat the additional runoff created by the new impervious surfaces. Approximately 9% of the site will be maintained as wetland, wetland buffers, and/or greenspace. Efforts will be made to avoid or minimize wetland impacts where feasible. Parks and open space cover types will be maintained on approximately 7% of the site. This will provide recreational opportunities for the local residents while maintaining some of the natural communities on the site.

MITIGATION MEASURES (QUESTION 7):

- Mitigation measures to address changes in cover type are identified throughout the AUAR.
- The AUAR recognizes that the City has a tree preservation ordinance in place to preserve open space within Dayton. The project will strive to avoid impacts to significant wooded areas and will comply with local ordinances.
- Wetland impacts, when unavoidable to accommodate the proposed project, shall require mitigation as required at the time of application.

8. Permits and approvals required.

List all known local, state and federal permits, approvals 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.

Currently Assumed Approvals Needed:

Unit of Government	Type of Application	Status
FEDERAL		
US Army Corps of Engineers	404 Wetland Permit	To be applied for if needed
US Fish & Wildlife Service	Endangered Species Review	To be applied for if needed
STATE		
MN Pollution Control Agency	Sanitary Sewer Extension Permit	To be applied for
	National Pollution Discharge Elimination System Construction Permit (NPDES)	To be applied for
	401 Certification (concurrent with Corps Section 404 review)	To be applied for

DNR	MN Natural Heritage Database Review	Complete
State Historic Preservation Office	Archeological/historic sites review	Complete
MN Dept. of Health	Watermain Extension	To be applied for
	Abandonment of Water Wells	To be applied for
Metropolitan Council Environmental Services	Sanitary Sewer Extension Permit	To be applied for
LOCAL		
Hennepin County	Roadway Access Permit	To be applied for
	Plat Approval	To be applied for
City of Dayton	Scoping EAW Approval	Complete
	AUAR Approval	In Process
	Draft 2040 Future Land Use—Master Plan Designation *(proposed use for the study area)*	In Process—Land in question is being re-guided through the City's official planning process for their 2040 Comprehensive Plan Update
	Preliminary/Final Plat	To be applied for
	Site Plan Review	To be applied for
	Master Plan Review	To be applied for
	Preliminary & Final Plat	To be applied for
	Grading Permit	To be applied for
	Building Permit(s)	To be applied for
	Sign Permit	To be applied for
	HVAC Permits	To be applied for
	Plumbing Permits	To be applied for
	Electrical Permits	To be applied for
	Permit for fire sprinkler work	To be applied for
	Permit for fire alarm work	To be applied for
Elm Creek Management Commission	Grading/Erosion Control Permit	To be applied for
	Stormwater Permit	To be applied for

MITIGATION MEASURES (QUESTION 8):

- Project proposers will be required to obtain all necessary permits and approvals at the appropriate times throughout the development process and prior to building construction.

9. Land Use

a. Describe:

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

As indicated on the Existing Land Use Map (see **Figure 9**), existing use of the study area is identified as Agriculture. Approximately 82% of the proposed study area is currently being used for agricultural crop production, and the remaining 18% is dominated by wooded open space, wetlands, and farmsteads.

An initial review of soils in the area (see **Figure 8**) shows that approximately 36% of the site qualifies as prime farmland, 19% of the site qualifies as prime farmland if drained, and 36% of the site is farmland of statewide significance. Only 10% of the site (approximately) has soils that do not qualify as prime farmland. The breakdown of soil types based on the Hennepin County Soil Survey is as follows:

Map Symbol	SCS Soils Classification	≈ Acres	% of site	Farmland Rating
D4A	Dorset sandy loam, 0 to 2 percent slopes	0.8	0.1%	Farmland of statewide importance
D67B	Hubbard loamy sand, Mississippi River Valley, 2 to 6 percent slopes	0.2	0.0%	Not prime farmland
L16A	Muskego, Blue Earth, and Houghton soils, ponded, 0 to 1 percent slopes	0.4	0.1%	Not prime farmland
L22C2	Lester loam, 6 to 10 percent slopes, moderately eroded	179.7	32.2%	Farmland of statewide importance
L22D2	Lester loam, 10 to 16 percent slopes, moderately eroded	33.5	6.0%	Not prime farmland
L22F	Lester loam, morainic, 25 to 35 percent slopes	5.8	1.0%	Not prime farmland
L23A	Cordova loam, 0 to 2 percent slopes	21.8	3.9%	Prime farmland if drained
L24A	Glencoe clay loam, 0 to 1 percent slopes	15.4	2.8%	Prime farmland if drained
L25A	Le Sueur loam, 1 to 3 percent slopes	19.4	3.5%	Prime farmland if drained
L36A	Hamel, overwash-Hamel complex, 0 to 3 percent slopes	26.3	4.7%	Prime farmland if drained

L37B	Angus loam, 2 to 6 percent slopes	111.2	19.9%	All areas are prime farmland
L44A	Nessel loam, 1 to 3 percent slopes	73.6	13.2%	All areas are prime farmland
L45A	Dundas-Cordova complex, 0 to 3 percent slopes	12.3	2.2%	Prime farmland if drained
L49A	Klossner soils, depressional, 0 to 1 percent slopes	5.1	0.9%	Not prime farmland
L60B	Angus-Moon complex, 2 to 5 percent slopes	13.8	2.5%	All areas are prime farmland
L61C2	Lester-Metea complex, 6 to 12 percent slopes, eroded	12.6	2.3%	Farmland of statewide importance
L64A	Tadkee-Tadkee, depressional, complex, 0 to 2 percent slopes	1.6	0.3%	Not prime farmland
L70D2	Lester-Malardi complex, 12 to 18 percent slopes, eroded	9.2	1.6%	Farmland of statewide importance
L132A	Hamel-Glencoe complex, 0 to 2 percent slopes	9.9	1.8%	Prime farmland if drained
W	Water	5.1	0.9%	Not prime farmland

Per the City of Dayton Park and Open Space Plan, a potential future trail could be developed adjacent to the proposed four lane county collector road that would bisect the site and run north/south.

The AUAR area is adjacent to the West Mississippi River Regional Trail Search Corridor (see **Figure 19**) which will be planned, developed, and operated by Three Rivers Park District and governed by the 2040 Regional Parks Policy Plan. Per the Dayton Park and Open Space Plan, the City will work to connect surrounding communities to greenways and trails. The City of Dayton does not have a coordinated plan for open space, but does focus on accommodating greenways and open spaces in conjunction with development. According to the Dayton Park and Open Space plan, these corridors will ideally "…protect waterways; …restore, protect and enhance land and water connections between existing habitat to create wildlife corridors; and…connect with surrounding communities' greenways and trails." Development of the site will need to take these local planning efforts into consideration and establish the identified connections.

ii. 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.

City of Dayton's 2030 Future Land Use Map (see **Figure 10**) indicates future planned land uses in the

AUAR study area will be Mixed Use, Low-Medium Density Residential, Low-Density Residential, and Agricultural Preserve. The Agricultural Preserve land that is located on the eastern edge of the project area is currently enrolled in the Metropolitan Agricultural Preserve Program and the enrollment will expire in 2019. The entire AUAR study area is also a main focus of the City's official 2040 Comprehensive Plan Update, and the entirety of the study area is currently being re-guided for the mix of uses outlined in this AUAR.

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

The current zoning of the site consists of A-1 Agricultural District and S-A Special Agriculture District. The proposed zoning of the study area will be a Master Plan area to allow for a creative site design that maximizes land use while providing superior building design and stormwater management to protect surrounding sensitive natural areas. The area surrounding the site is planned for low-density residential housing. The northern portion of the site is located within the Mississippi River Corridor Critical Area Program district CA -SR, separated from the river.

The Mississippi River and adjacent river corridor lands are designated and classified as "Wild & Scenic River" and "Critical Area" and are regulated by provisions of the Mississippi River Corridor Overlay District Section and any other applicable City ordinance provisions including Section 1001.07 Mississippi River Corridor of the Zoning Code.(see **Figure 11**).

b. Discuss the project's compatibility with nearby land uses, zoning, and plans listed in Item 9a above, concentrating on implications for environmental effects.

The current zoning of the site consists of A-1 Agricultural District and S-A Special Agriculture District. As discussed earlier, the proposed zoning of the study area will be a Master Plan and the entirety of the study area is currently being re-guided. The existing use of the study area is identified as Agriculture and the 2030 future land uses are identified as Mixed Use, Low-Medium Density Residential, Low-Density Residential, and Agricultural Preserve. The proposed land uses for the site will include Low-Density Residential - Single Family, Low-Medium Density Residential, Medium Density Residential, Commercial - Neighborhood/Retail, Wetlands/Wetland Buffers/Greenspace, and Parks/Open Space/Clubhouse/ Recreational. While the mix of anticipated uses will change somewhat between the 2030 Comprehensive Plan and the 2040 Comprehensive Plan, this area of the community has long been viewed as a prime development site and a main target for urbanization. Surrounding areas are also guided for low-density single-family residential use which cannot be realized until this development takes place. There are no anticipated land use incompatibilities as a result of this proposed development.

c. Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 9b above.

MITIGATION MEASURES (QUESTION 9):

Mitigation measures that will be incorporated into the proposed project to mitigate against the potential

incompatibility of surrounding land uses include:

- Select wetlands on the project site will be maintained.
- Wetland impacts, when unavoidable to accommodate the proposed development, shall require mitigation as required at the time of application.
- Disturbed areas shall be stabilized and protected as soon as possible following disturbances, and facilities will be implemented to retain sediment on the site.
- Building design shall include the following features or characteristics to offset the proposed building heights and potential visual impacts:
  - Building are to be constructed utilizing high quality materials and architectural design;
  - Lighting must be down directional;
  - A high quality landscaping plan will be submitted to provide additional screening to the north and generally beautify the project throughout.

10. Geology, soils and 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.

According to the Hennepin County Geologic Atlas, surficial deposits beneath the study area consist primarily of loamy till. Franconia bedrock is located below the surficial deposits across most of the site. The majority of the study area is noted to have a low sensitivity to groundwater from pollution. According to the Minnesota Karst Inventory dataset, no sinkholes, seeps, or springs are identified within the study area. The closest instance of Karst conditions is 6.19 miles northeast of the study area.

b. Soils and 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 the stormwater "water resources" question.

For an AUAR, the number of acres to be graded and number of cubic yards of soil to be moved need not be given; instead, a general discussion of the likely earthmoving needs for development of the area should be given, with an emphasis on unusual or problem areas. In discussing mitigation measures, both the

standard requirements of the local ordinances and any special measures that would be added for AUAR purposes should be included.

The project area includes a number of rolling hills and wetland depressions with approximately 84 feet of elevation difference between the lowest and highest points on the site (lowest points are in the NE corner of the property as land slopes towards the Mississippi River, and highest points are generally south-central on the site atop four main hills). Slope changes on the site have the potential to generate erosion, impact wetlands, and introduce discharge to the Mississippi River. Erosion control measures will be implemented to minimize erosion and protect both wetlands and the river from sediment.

In general, earthmoving will involve the flattening of slopes to accommodate the proposed development. This may involve the removal of material from the south central portion of the site to create a more even surface. Since the site currently slopes towards the Mississippi River, special considerations should be made during grading to minimize erosion and sediment delivery to the river.

As shown on **Figure 8**, the soils on the site consist of the following:

Map Symbol	SCS Soils Classification	Percent of Project Area
D4A	Dorset sandy loam, 0 to 2 percent slopes	0.1%
D67B	Hubbard loamy sand, Mississippi River Valley, 2 to 6 percent slopes	0.04%
L16A	Muskego, Blue Earth, and Houghton soils, ponded, 0 to 1 percent slopes	0.1%
L22C2	Lester loam, morainic, 6 to 12 percent slopes, eroded	32.2%
L22D2	Lester loam, morainic, 12 to 18 percent slopes, eroded	6.0%
L22F	Lester loam, morainic, 25 to 35 percent slopes	1.0%
L23A	Cordova loam, 0 to 2 percent slopes	3.9%
L24A	Glencoe loam, depressional, 0 to 1 percent slopes	2.8%
L25A	Le Sueur loam, 1 to 3 percent slopes	3.5%
L36A	Hamel, overwash-Hamel complex, 1 to 4 percent slopes	4.7%
L37B	Angus loam, 2 to 6 percent slopes	19.9%
L44A	Nessel loam, 1 to 3 percent slopes	13.2%
L45A	Dundas-Cordova complex, 0 to 3 percent slopes	2.2%
L49A	Klossner soils, depressional, 0 to 1 percent slopes	0.9%
L60B	Angus-Moon complex, 2 to 5 percent slopes	2.5%
L61C2	Lester-Metea complex, 6 to 12 percent slopes, eroded	2.3%
L64A	Tadkee-Tadkee, depressional, complex, 0 to 2 percent slopes	0.3%
L70D2	Lester-Malardi complex, 12 to 18 percent slopes, eroded	1.6%
L132A	Hamel-Glencoe, depressional, complex, 0 to 3 percent slopes	1.8%

The USDA maps show the majority of the site consists of Lester loam, morainic, 6-12% slopes, eroded and Angus loam, 2-6 % slopes. Both Lester loam and Angus loam consist of loam overlaying clay loam.

The project area will be mass graded in several phases beginning at the east side of the site. The phases will be market driven and likely exist of 20 to 80 acres in each phase. As is typical with residential site grading, the street section will be established following the existing terrain filling some lower areas and cutting the hilltops. Home pads will be graded adjacent to the roadways. Typical cut or fill depths are in the 2 to 10 ft. range. Existing topsoil in the project area is anticipated to be 1 to 3 ft. in depth with greater depths near wetland areas. Topsoil will be stripped and salvaged such that a minimum four inch topsoil layer will be provided for the project area, according to local code requirements.

At this time no unusual requirements are anticipated for the site grading operations.

County Well Index data was used to determine the elevation of the aquifer (see **Appendix B**). Based on well log data for wells located on site, the elevation of the aquifer beneath the site is approximately 65 feet below ground surface. Test wells completed on the site did not identify static water table levels.

MITIGATION MEASURES (QUESTION 10):

Mitigation measures that will be incorporated into the proposed project to mitigate against the potential incompatibility of surrounding land uses include:

- Any vegetation, topsoil, organics, and/or soft clays should be removed from within the building footprints and oversize areas prior to construction.
- Excavation bottoms should be observed by a geotechnical engineer, or their representative, to judge if excavation bottom soils are similar to those encountered within the geotechnical report. Actual depths of excavation will need to be determined in the field at the time of construction by a geotechnical engineer prior to new fill or concrete placement.
- To provide lateral support of structural loads, it is recommend that oversizing (widening) excavations one (1) foot horizontally beyond the footings for each foot excavations extend below bottom-of-footing elevations.
- The contractor should develop a groundwater control plan for use if groundwater is encountered during construction.
- If groundwater is encountered, a dewatering permit from the Minnesota DNR may be required if the dewatering is expected to exceed 10,000 gallons per day or one million gallons per year.
- In areas where site grading will be performed early in the construction phasing (i.e., where a construction delay of at least 6 months can be accommodated), backfill materials should be composed of non-organic mineral soils containing no debris and having a PI (Plastic Index) less than 20. In areas where a construction delay will not be accommodated (i.e., Building E soil corrections), it is recommend that the balance of excavation backfill greater than 10 feet in thickness below bottom of

footing elevations be composed of granular soils. Any fill depths in excess of 10 feet in thickness below footings should consist of granular soil (sand containing less than 10 percent, by weight, of particles passing a size No. 200 sieve) to minimize the risk of detrimental settlement.

- Fill and backfill should be placed in loose lifts no thicker than 12 inches.

11. Water Resources

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

i. Surface water - lakes, streams, wetlands, intermittent channels, and county/judicial ditches. Include any special designations such as public waters, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include 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.

Several wetlands are located within the AUAR study area including the following Unnamed DNR Wetlands; 27-104, 27-215, 27-216, 27-217, and 27-124 (also listed as a natural environment lake). The Mississippi River is located just north of the site. The stretch of the river in the vicinity of the project is impaired for fecal coliform, nutrients, polychlorinated biphenyls in fish tissue, and mercury in fish tissue. The study area is located within one mile of two additional impaired waterbodies: Diamond Creek and Diamond Lake (27-125). Diamond Creek is impaired for E. Coli and dissolved oxygen. Diamond Lake is impaired for nutrients. These waterbodies are located south of the study area and do not receive runoff from the study area.

ii. Groundwater – 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.

Depth to groundwater is estimated at approximately 65 feet below ground level. According to the Minnesota Well Index seven private wells are identified within the study area. The Minnesota Well Index also identifies fourteen test wells within the study area. No geotechnical report is proposed for the site at this time. The development site is located within the vicinity of the proposed North Dayton Well Field. Once completed, the North Dayton Well Field will supply water to future developments within the North Dayton District. The study area is not within an identified MDH wellhead protection area.

b. 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.

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.

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.

The project site is currently included within the 2030 MUSA Boundary. The study area is in the NE Dayton service area and sewer flows from this site will be routed to the Metropolitan Council Metro Wastewater Treatment Plant which is capable of treating all estimated flows produced by this development (see **Figure 14**). Based on the location of the existing sanitary sewer lines, an extension of the system will be necessary to bring service to the site. The City of Dayton Comprehensive Plan includes proposed trunk sanitary sewer and force main coverage for this project area (see **Figure 15**). Wastewater discharge from the development would be domestic wastewater. The estimated volumes for the development shown below vary based on number of residential homes. Volumes are estimated based on the Metropolitan Council Environmental Services Service Availability Charge (SAC) Procedure Manual dated January 2017. One sac per 274 gallons per day. The receiving water body from the Metropolitan Wastewater Treatment Plant is the Mississippi River.

Use	Building SF	SAC Equivalent	Unit	Rate (Unit/SAC)	SAC	GPD	GPM	Peak GPM	Peak CFS
Residential	NA	1500	Each	1	1500	411,000	381	1142	2.54
Residential	NA	1700	Each	1	1700	465,800	431	1294	2.88

Based on SAC guidelines, daily maximum wastewater generated by the proposed development will vary between 411,000 and 465,800 gallons per day based on the number of residential homes. At a peaking factor of 3, the proposed development is expected to generate a peak wastewater flow of 1,233,000 to 1,397,400 gallons per day.

The Metropolitan Council's Metropolitan Wastewater Treatment Plant, located in St. Paul, has experienced an average wet weather design flow of 314 mgd with an average daily influent of 131.35 mgd from November of 2016 to November of 2017. The facility is capable of treating the volume and composition of wastewater projected to be generated by the development without pretreatment or other plant facility improvements. The receiving waterbody from the Metropolitan Wastewater Treatment Plant is the Mississippi River.

The southwest portion of the project area is outside the 2020 staging of the 2030 Comprehensive Plan Update. The City of Dayton will need to revise the 2020 staging to include this portion of the project either through a comprehensive plan amendment or incorporation within the 2040 Comprehensive Plan Update.

ii. **Stormwater** - Describe the quantity and quality of stormwater runoff at the site prior to and post construction. Include the routes and receiving water bodies for runoff from the site (major downstream water bodies as well as the immediate receiving waters). Discuss any environmental effects from stormwater discharges. Describe stormwater pollution prevention plans including temporary and permanent runoff controls and potential BMP site locations to manage or treat stormwater runoff. Identify specific erosion control, sedimentation control or stabilization measures to address soil limitations during and after project construction.

The existing site consists primarily of previously farmed land, wetlands and some brushy wooded areas. The majority of existing site runoff would be from the previously farmed areas. The type of runoff is typical pasture and previously farmed land (i.e. residual fertilizer, herbicide, pesticide, sediment from tilling and planting, etc.). Ultimately, the area drains to the Mississippi River.

The proposed development will include significant impervious surfaces, but such surfaces would be accompanied by water quality treatment and quantity discharge controls in accordance with current day regulations. Specifically, stormwater would be treated prior to discharge according to the MPCA requirements for Permanent Stormwater Management System in the NPDES Construction Stormwater General Permit and the City of Dayton requirements for stormwater treatment and rate control. Elm Creek Watershed Management Organization (ECWMO) rules will also guide final design.

ECWMO requires rate control, water quality, and water quantity conditions to be met onsite. Post development discharge rates are not to exceed existing rates for the 2-, 10-, and 100-year, 24 hour NOAA Atlas 14 rainfall events. Water quality on site must be such that there is no net increase in total phosphorus or total suspended solids from pre-development to post-development conditions. Abstraction must be provided on site equal to the equivalent of 1.1 inches of runoff from all impervious surfaces.

The project will be required to provide both temporary and permanent erosion and sediment control as required by the City of Dayton, Elm Creek Watershed Management Commission, and the MPCA NPDES Construction Stormwater Permit. Temporary erosion control measures may include rock entrances, silt fences, silt curtain, biorolls, erosion control mats, inlet protection, rock check dams, temporary seeding and mulching, and temporary sediment basins, as needed. Due to the Mississippi River being an impaired waterbody and a Scenic or Recreational River segment, stabilization of exposed soils must occur within 7 days after construction activity has ceased, rather than the typical 14 days. Additionally, temporary sedimentation basins will be required for all drainage locations receiving runoff from 5 or more acres of disturbed area, rather than the typical 10 days. In compliance with the Permanent Stormwater Management System in the NPDES Construction Permit, permanent BMPs will be constructed onsite.

Prior to discharging stormwater runoff into infiltration and filtration facilities, runoff will be pretreated to remove solids in order to maintain the facilities capacities. It is anticipated that permanent stormwater treatment may include the construction of detentions ponds to remove

suspended solids prior to the discharge of stormwater runoff. Storm water ponds and outlet control structures would be designed and constructed to minimize sediment transport. Storage within detention ponds will be sized to contain a volume greater than or equal to a 2.5 inch rainfall over the contributing area.

The majority of the project area consists of loam type soils which may not be suitable for infiltration. Where feasible, infiltration will be the preferred stormwater treatment. Where infiltration is infeasible, credit towards abstraction may be met through soil quality amendments, preservation of undisturbed forest or grassland areas, providing excess wetland buffers, or disconnection of impervious surfaces. Further details on the requirements for these credits are provided in section 3.C.ix of the ECWMO 'Appendix O Rules and Standards'. Additionally, where infiltration is infeasible, biofiltration will be provided for the remainder of the abstraction volume. Where biofiltration is infeasible, filtration through an engineered media to remove soluble phosphorus will be required.

Predevelopment phosphorus loadings are based on existing land cover. The MIDS calculator will be used to determine existing suspended solids loading and proposed phosphorus and suspended solids loading onsite.

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. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation.

The project site is located in the North Dayton Service Area and will be served by the City of Dayton municipal water supply system for domestic water use and fire protection (see **Figure 17**). A city well exists in the northwest part of Dayton that serves the area known as the Historic Village. The construction of a second well on this system is currently being considered for construction (in 2018). The second well is being considered only to serve as a redundant source, and is not required to serve and additional capacity need. Extension of the network required to serve this development, to connect to the system in the northwest, should be considered for an alternate means for gaining the additional capacity (production) required to support the development. The timing of the extension has not been determined and an additional well to the northeast may be required to provide additional water service if the extension is not completed prior to the completion of the proposed development. The project is anticipated to require 150,000 to 170,000 gallons per day based on typical demand factors for the proposed number of residential units as outlined in the following table.

Use	Building SF	Unit	Number of units per use	Gallon per unit per day	Average Daily demand (GPD)	Peaking Factor	Peak GPD	Peak GPM
Residential	NA	Each	1500	100	150,000	3.0	450,000	417
Residential	NA	Each	1700	100	170,000	3.0	510,000	472

Dewatering may be necessary for installation of underground utilities. Dewatering volumes of less than 50 million gallons will be permitted under the Department of Natural Resources "General Permit for Temporary Water Appropriations." Volumes over 50 million gallons will require an individual permit from the MnDNR. Dewatering volumes will be discharged on site.

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. 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.

   Several wetlands are located within the AUAR study area including the following Unnamed DNR Wetlands; 27-104, 27-215, 27-216, 27-217, and 27-124 (also listed as a natural environment lake).Wetland areas will be preserved in most areas. However, there may be some impacts from new roadways and structures that may require mitigation. Any wetlands used for stormwater treatment must undergo the wetland mitigation process. All wetland impacts would need to be permitted through local, state, and federal agencies as needed at an anticipated replacement ration of 2:1. In accordance with Hennepin County all wetland mitigation will be completed on-site or purchased from an approved wetland bank within Hennepin County. Mitigation measures to reduce wetland impacts may include silt fence, silt curtain, and buffers in addition to permanent stormwater management practices such as sedimentation basins and infiltration basins.

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. 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.

The proposed project will not involve physical or hydrologic alterations of surface waters.

MITIGATION MEASURES (QUESTION 11):

- A Stormwater Pollution Prevention Plan (SWPPP) must be prepared to ensure compliance to applicable regulations. The plan will include references to the following:
  - Erosion control blanket will be placed as soon as feasible after the slopes are constructed
  - Only "wildlife friendly" erosion control mesh will be used
  - Permanent vegetation installation procedures will follow MNDOT's "Standard Specifications for Construction", 2005 edition, as may be amended
- Discharge rates will not exceed the existing rates for 2, 10, and 100 year storm events.
- Phosphorus loading in the discharged stormwater runoff will not exceed existing phosphorus loading.
- Infiltration of 1 inch of runoff from new impervious surfaces will be provided, where feasible.
- The project will comply with all applicable setbacks and ordinances, including a 150 foot setback from Public Water Wetland 27-124 and an undisturbed 100 foot buffer zone from the Mississippi River.
- Steep slopes will be protected to avoid downstream degradation of soils.
- Duration of disturbed soils will be minimized through construction phasing.
- All wetlands mitigation will be completed on-site or purchased from an approved wetland bank within Hennepin County.
- In-water construction activity will be avoided, but where it does occur best management practices such as silt curtain will be utilized.

12. Contamination/Hazardous Materials/Wastes

a. Pre-project site conditions - Describe existing contamination or potential environmental hazards on 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.

Based on past land uses and review of the Minnesota Pollution Control Agency's What's in My Neighborhood database, environmental hazards are not expected to be found in the study area. A majority of the subject site is still currently used for agricultural purposes with portions of the property

covered by woods or wetlands. There are no present records of enforcement or other active producers or users of hazardous materials within the study area.

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 solid waste including source reduction and recycling.

The generation of regulated solid and liquid wastes by future tenants is anticipated to be at levels typical of residential land and neighborhood supporting commercial uses elsewhere. Solid waste generation by residents would occur as buildings are completed and occupied. Solid waste disposal or recycling would be privately managed and contracted by the tenants from a licensed hauler. The City of Dayton and the developer will require up-to date recycling in accordance with the Minnesota State Building code. Waste minimization will be encouraged through the development project design and will be encouraged of the tenants.

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 above or below ground tanks to store petroleum or other materials. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.

No hazardous materials are anticipated to be used or stored on site other than those consistent with residential and neighborhood commercial uses. If any tenants require storage of petroleum products or other liquid chemicals, that storage will designed and permitted in accordance with the applicable codes such as the International Building Code, Mechanical Code, Plumbing Code and other requirements that the City of Dayton may require of similar installations.

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, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of hazardous waste including source reduction and recycling.

If any tenants of the new development generate or store hazardous wastes, all such activity will be designed and permitted in accordance with the applicable codes such as the International Building Code, Mechanical Code, Plumbing Code and other requirements that the City of Dayton may require of similar installations.

MITIGATION MEASURES (QUESTION 12):

Mitigation measures that will be incorporated into the proposed project to mitigate against the potential incompatibility of surrounding land uses include:

- Any existing discarded materials or debris found onsite will be properly disposed offsite. Upon removal of any discarded materials and debris, areas of surficial soil staining, odors, or other evidence of impact, if encountered, will be characterized and appropriately disposed offsite.
- Solid waste produced on site shall be stored appropriately and disposed of correctly. Any tenant that causes extra solid waste beyond the normal use of the site must comply with federal, state, and local rules regarding storage and disposal.
- Any chemicals/hazardous materials generated or stored on site must meet all federal, state, and local requirements.

13. Fish, wildlife, plant communities, and sensitive ecological resources (rare features)

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

The area being studied is largely dominated by cultivated land with a few areas of wetlands and woods. Wildlife resources that exist throughout the site likely include those species that have adapted to open lands and cropland habitats such as rabbit, fox, coyote, white-tailed deer, wild turkey, songbirds, field mice, and a variety of insects. Cropland habitat is dependent on the established crop or farming use at any given time and is not considered year-round habitat.

b. Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-____) and/or correspondence number (ERDB 20180177) 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 overlaps with the North Metro Mississippi River Important Bird Area (IBA). Important Birds Areas, identified by Audubon Minnesota in partnership with the DNR, are part of an international conservation effort aimed at conserving critical bird habitats. They are voluntary and nonregulatory, but the designation does demonstrate the biological value of this surrounding area. The Mississippi Flyway is extremely important for all migratory birds. While the IBA boundaries and the proposed project boundary include disturbed land, the proposed development has the potential to further impact the Mississippi River and the IBA through the loss of wetlands and mature trees and through additional runoff due to increased impervious cover.

The proposed project boundary is near an area of statewide importance to Blanding's turtles (Emydoidea blandingii), a state-listed threatened species, and this rare turtle may be encountered on site. Blanding's turtles use wetlands as well as upland areas over a mile distant from wetlands. Uplands are used for

nesting, basking, periods of dormancy, and traveling between wetlands. Factors believed to contribute to the decline of this species include collisions with vehicles, wetland drainage and degradation, and the development of upland habitat. Any added fatality can be detrimental to populations of Blanding's turtles, as these turtles have a low reproduction rate that depends upon a high survival rate to maintain population levels. The project has the potential to impact this rare turtle through direct fatalities or habitat disturbance/destruction due to dewatering, excavation, fill, or other construction activities associated with the project.

The black sandshell (Ligumia recta), a state-listed mussel of special concern, has been documented in the Mississippi River in the vicinity of the proposed project. Mussels are particularly vulnerable to deterioration in water quality, especially increased siltation. As such, it is important that effective erosion prevention and sediment control practices be implemented and maintained near the river during construction and incorporated into any stormwater management plan.

The northern long-eared bat (Myotis septentrionalis), federally listed as threatened and state-listed as special concern, can be found throughout Minnesota. During the winter this species hibernates in caves and mines, and during the active season (approximately April-October) it roosts underneath bark, in cavities, or in crevices of both live and dead trees. Pup rearing is during June and July. Activities that may impact this species include, but are not limited to, wind farm operation, any disturbance to hibernacula, and destruction/degradation of habitat (including tree removal). The U.S. Fish and Wildlife Service (USFWS) has published a final 4(d) rule that identifies prohibited take. The NHIS does not contain any known occurrences of northern long-eared bat roosts or hibernacula within an approximate one-mile radius of the proposed project.

c. Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.

Populations of species that depend upon cropland will likely be displaced to nearby farm fields and the Three Rivers 3,000 acre park area; some songbirds that readily adapt to suburban habitats may become more numerous. Overall, the project is not expected to result in a regionally significant decline in wildlife abundance or species diversity.

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

The creation of new stormwater ponds will help to mitigate the adverse effects on some wildlife. Stormwater management plans will be drawn up to ensure rates and volumes of surface water discharge are acceptable or better than pre-development conditions, which in turn will support the health of surrounding ecosystems. Preservation of open space will also be implemented to reduce impacts to trees and tree removal as is relates to the Mississippi River IBA.

MITIGATION MEASURES (QUESTION 13):

Mitigation measures that will be incorporated into the proposed project to mitigate against the potential incompatibility of surrounding land uses include:

- Project design will minimize impacts to wooded and wetland areas.
- Development should not encroach into the wetland areas to preserve existing habitat in the area. Loss of wetlands on the interior of the development site shall be mitigated in accordance with all Local, State or Federal regulations as may be applicable.
- Development shall be required to meet all wetland replacement requirements to replace habitat being lost as a result of the proposed development.
- The City will provide Blanding's turtle information sheets prepared by the DNR to contractors working in the study area.
- If Blanding's turtle are encountered during construction activity, the contractor will be required to move turtles that are in harm's way. Turtles that are not in imminent danger shall be left undisturbed.
- Silt fencing shall be set up to keep turtles out of construction areas. It is critical that silt fencing be removed after the area has been re-vegetated.
- All wetlands should be protected from pollution; use of fertilizers and pesticides should be avoided, and run-off from lawns and streets should be controlled.
- Roads should be kept to minimum standards on widths and lanes.
- The development should consider roads that are ditched, and are not curbed or below grade. If curbs must be used in areas adjacent to wetlands and ponds, 4" high curbs at a 3:1 slope are preferred.
- Because trenches can trap turtles, trenches should be checked for turtles by the contractor prior to being backfilled.
- Open space areas should be re-vegetated with native grasses and forbs.
- Vegetation management in infrequently mowed areas -- such as in ditches, along utility access roads, and under power lines -- should be done mechanically (chemicals should not be used). Work should occur fall through spring (after October 1st and before June 1st).
- Erosion control measures will be implemented to limit sedimentation.
- Wildlife friendly erosion control methods such as "Natural Netting" erosion control blanket should be used to prevent wildlife entanglement

14. 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.

The SHPO was contacted regarding the potential for historic, cultural, or architectural resources on and near the site. In correspondence dated September 29, 2017, in their search of the Minnesota Archaeological Inventory and Historic Structures Inventory, SHPO identified no historic structures in the project area. SHPO's records indicates there are three archaeological resources in the project vicinity. Offsite resources including the three archaeological sites that are outside of the project area are not anticipated to be impacted by the development of the project. SHPO went on to note that because the majority of archaeological sites in the state and many historic architectural properties have not been recorded, important sites or structures may exist within the search area and may be affected by development projects within that area. Although no known resources have been identified onsite, in the event that a possible resource is encountered during project construction, all activities will cease and proper authorities will be contacted. The SHPO correspondence is included in **Appendix C.**

MITIGATION MEASURES (QUESTION 14):

- None.

15. 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.

Any change from cropland to developed land will have an impact on the visual look of the property, but the development in general is not anticipated to have an impact on specific scenic views or vistas within the community. To offset the general visual impact that comes with any development, the proposed buildings will be constructed using high-quality materials. Landscaping will be introduced throughout the site especially to provide screening from a nearby residential development. All lighting for the development will be shielded and down directional so as to minimize glare onto surrounding properties.

MITIGATION MEASURES (QUESTION 15):

- To offset the general visual impact that comes with any development, the proposed buildings will be constructed using high-quality materials.
- Landscaping should be introduced throughout the site—especially in the northeast corner—to provide screening from a nearby residential development.

- All lighting for the development should be shielded and down directional so as to minimize glare onto surrounding properties.
- Wooded areas along the lakes shall be preserved to maintain a visual barrier when possible.
- The project will comply with the City's Buffering Requirements along all major roads.

16. 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, and any greenhouse gases. 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 effects from stationary source emissions.

The project would not result in stationary source air emissions, and therefore this item is not applicable to the AUAR. Any stationary air emissions source large enough to merit environmental review requires individual review.

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.

Motor vehicle emissions will be associated with vehicles traveling to and from the redevelopment site and from construction equipment necessary for the proposed construction activities. The most critical pollutant associated with vehicular traffic in Minnesota is carbon monoxide (CO). Carbon monoxide (CO) is one of five vehicle emission pollutants for which the US Environmental Protection Agency has standards. CO is a colorless, odorless and tasteless toxic gas produced by the incomplete burning of carbon in fuel. Concentrations of carbon monoxide are typically greatest at intersections with poor levels of service because of excessive idling or acceleration of vehicles. The existing concentration of carbon monoxide at the project location is considered to be low because no part of Dayton has been identified as a Carbon Monoxide Level Non-Attainment Location. The Minnesota Pollution Control Agency has a nearby ambient air quality monitoring station in Anoka (MPC Station 6020). In addition, charging stations for electric vehicles will be considered in pertinent public areas.

c. Dust and odors - Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project construction and operation. (Fugitive dust may be discussed under item 16a). 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 or mitigate the effects of dust and odors.

Odors generated during construction will be mitigated by maintenance of the construction equipment to the manufacturers' specifications and by using appropriate fuel additives when necessary. Grading and

construction will temporarily generate dust. BMPs and other standard construction methods will be used to reduce construction impacts such as intermittent applications of water to exposed soils as needed to reduce dust during dry weather. Construction equipment is expected to be dispersed on the site rather than concentrated in one limited area for extended periods of time to limit potential impacts.

Once the site is developed, the resulting vehicular traffic is not anticipated to generate unusual amounts of dust or odors. Both, arguably, will be lessened when compared to the existing agricultural use. There are no sensitive receptors (such as hospitals) near the site.

MITIGATION MEASURES (QUESTION 16):

- Measures to offset the anticipated traffic impacts are discussed in Question 18. All such mitigation factors should be implemented to address air related concerns.

17. 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.

Grading and construction will temporarily generate noise. BMPs and other standard construction methods will be used to reduce construction impacts such as limiting hours of operation to comply with the noise regulations in City ordinance. Construction equipment is expected to be dispersed on the site rather than concentrated in one limited area for extended periods of time to limit potential impacts.

Special consideration will be given to noise levels and proximity to surrounding areas. City of Dayton's Noise Control Ordinance specifies the maximum noise levels by receiving land use as the following:

Sound Levels by Receiving Land Use				
	Day (7:00 a.m. - 10:00 p.m.)		Night (10:00 p.m. - 7:00 a.m.)	
Zoning district	**L50**	**L10**	**L50**	**L10**
Commercial	65	70	65	70
Industrial	75	80	75	80
Residential	60	65	50	55

Once the site is developed and the structures are occupied, the resulting vehicular traffic is anticipated to generate a limited increase in noise in the area. There are no sensitive receptors (such as hospitals) near the site. Vehicular noise will be addressed further in Item 18.

MITIGATION MEASURES (QUESTION 17):

- The project will comply with Dayton's Public Peace and Safety Code, Section 130.08 Noise Control as well as the State's noise regulations to minimize impacts.

18. Transportation

a. 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.

1) Existing and proposed additional parking spaces,

There are currently no parking spaces provided where the proposed development will be constructed. The residential lots will include separate driveways and garages for off-street vehicle parking and storage. The commercial component will provide off-street parking commensurate with the type of retail development that occurs.

2) Estimated total average daily traffic generated,

The proposed development was analyzed under two development scenarios: existing City of Dayton Land-Use plans and a Developer Preferred land use plan. Under the City's land use designations, approximately 20,822 daily trips (10,411 entering and 10,411 exiting) during an average weekday are expected. The Developer's preferred land use results in approximately 16,820 daily trips during an average weekday are expected (8,410 entering and 8,410 exiting).

3) Estimated maximum peak hour traffic generated and time of occurrence,

The maximum peak hour traffic within the study area occurs during the PM peak, which depending on the intersection, occurs between 4:15 PM to 5:15 PM. It is expected that the proposed development's maximum traffic will also occur during this time. Within this peak hour, the City's proposed land use plan is expected to generate 2,003 trips, consisting of 1,166 entering vehicles and 837 exiting vehicles. The Developer's proposed land use plan is expected to generate 1,699 trips, consisting of 1,037 entering vehicles and 662 exiting vehicles.

See the Traffic Impact Study (**Appendix D**) for a full description of the peak hour traffic in addition to its analyses and recommendations.

4) Indicate source of trip generation rates used in the estimates,

The trip generation analysis for the development site was established using the methods and rates published in the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition*.

It should be noted that Spack Consulting has also completed trip generation studies in the Metro area and found the local trip generation rates for residential uses to be lower than the comparable ITE rates. For the purposes of this study, ITE trip generation rates were used to provide a conservatively high estimate.

See the Traffic Impact Study for full details of the traffic expectations and any recommended mitigation.

5) Availability of transit and/or other alternative transportation modes.

Transit and alternative transportation modes are limited for this site with bus service provided along Dayton River Road and TH 169 only. Also, trails/sidewalks are provided on the east and west end of Dayton River Road, as well as on S. Diamond Lake Road, TH 169, River Hills Parkway, and 141st Avenue near Trunk Highway 101.

b. 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.

A Traffic Impact Study for the proposed site was completed in May 2018. Each scenario (City's land use and Developer's land use) assumed the proposed development was one-third complete by 2025 with full occupation by 2040. Since the Developer's land use plan is expected to have less traffic than the City's land use plan, traffic operations were only evaluated using the Developer's land use plan.

Due to general background growth and adjacent specific developments, the following mitigation is recommended with or without the proposed North Dayton development for the year 2025:

- Continue to explore options for corridor improvements on the TH 169 and CSAH 81 corridor with other agencies.
- Re-stripe the Dayton River Road approach to TH 169 to provide dual left turn lanes, a left turn/through lane, and a right turn lane. Additional pavement on northbound TH 169 will be needed.
- Update signal timing at all signalized intersections at least every three to five years.
- Construct a single-lane roundabout at the N Diamond Lake Road/Brockton Lane, reserving right-of-way for future right turn lanes, or a traffic signal with dedicated turn lanes.

Accounting for additional traffic from the proposed development, the following mitigation will also be necessary to accommodate the full projected 2025 volumes:

- Construct a single-lane roundabout at the Dayton River Road/Pineview Lane intersection, reserving right-of-way for future right turn lanes, or a traffic signal with dedicated turn lanes.

Hennepin County prefers dedicated turn lanes at its county road intersections and could request them at the proposed development key access intersections. Three study intersections are considered these key access points with entering and exiting traffic from the development: Dayton River Road/River Hills Parkway, Dayton River Road/Vicksburg Lane, and North Diamond Lake Road/Zanzibar Lane. Although the capacity analyses suggest no improvements are necessary, the County may still request dedicated turn lanes at these intersections.

Beyond year 2025, the long-range time frame and uncertainty of potential developments, roadway network, and travel patterns result in multiple assumptions for this analysis. Due to this inherent uncertainty, year 2040 recommendations should not be constructed today. Instead, right-of-way should be preserved for these needs when required based on actual traffic growth.

The following modifications to the study roads and intersections, assuming the planned roadway network is implemented, are recommended for the year 2040 to address potential issues due to general background growth and other specific development traffic with or without the proposed North Dayton site:

- Continue to work on long-term solutions with other agencies to accommodate future congestion on the TH 169 and CSAH 81 corridors.
- Construct a multi-lane roundabout at the Dayton River Road/South Diamond Lake Road intersection, with two-lane Dayton River Road approaches, or a traffic signal with dedicated turn lanes.
- Construct single-lane roundabouts or traffic signals with dedicated turn lanes at the intersections of 129th Avenue/Pineview Lane, Dayton River Road/Brockton Lane, and South Diamond Lake Road/Pineview Lane.
- Continue to update signal timing at all signalized intersections at least every three to five years.

With the North Dayton proposed development traffic contributing to the study area volumes, the following additional 2040 mitigation is recommended:

- Provide dedicated right turn lanes for the Dayton River Road/Pineview Lane intersection single-lane roundabout using the reserved right-of-way if a roundabout was constructed as part of the 2025 mitigation.
- Construct a single-lane roundabout or a traffic signal with dedicated turn lanes at the N Diamond Lake Road/Zanzibar Lane intersection.
- Construct multi-lane roundabout at the Dayton River Road/N Diamond Lake Road intersection, with two-lane Dayton River Road approaches, or a traffic signal with dedicated turn lanes.

- Provide dedicated right turn lanes for the N Diamond Lake Road/Brockton Lane intersection single-lane roundabout using the reserved right-of-way if a roundabout was constructed as part of the 2025 mitigation.

In addition to these roadway improvements, the following items are also recommended based upon the traffic analysis for the proposed development:

- Reserve space, if necessary, for the future trail network in this area.
- Consider internal sidewalks/trails to connect to a future trail network and between the residential/commercial components of the proposed Developer's plan.
- Consider potential bicycle parking areas and other amenities (repair stations) on-site for when the future trail network is developed.
- Follow the requirements of the MnMUTCD for signing and striping.
- Work with the City, as necessary, in their continued dialogue with Metro Transit and Hennepin County on the potential expansion of the transit system.

See the Traffic Impact Study for a further description of the traffic associated with the proposed development and its impact on the surrounding transportation network.

c. Identify measures that will be taken to minimize or mitigate project-related transportation effects.

Beyond the measures identified above, the proposed development is expected to work with the City on the transportation network beyond the streets for vehicles. This work potentially includes internal sidewalks and trails with connections to external routes and expansion of the transit network and facilities to serve these new residents. Development of a trail system is typically seen as an amenity by residents and provides for recreational and commuter trips by non-motorized means. With more residents in a concentrated area, expansion of the fixed transit routes currently operating in Champlin or Maple Grove may be appropriate. Although the developer will assist as possible, any new or expanded transit routes are likely a long-term improvement requiring initiative by the City in cooperation with Metro Transit.

MITIGATION MEASURES (QUESTION 18):

Due to general background growth and adjacent specific developments, the following mitigation is recommended with or without the proposed North Dayton development for the year 2025:

- Continue to explore options for corridor improvements on the TH 169 and CSAH 81 corridor with other agencies.
- Re-stripe the Dayton River Road approach to TH 169 to provide dual left turn lanes, a left turn/through lane, and a right turn lane. Additional pavement on northbound TH 169 will be needed.
- Update signal timing at all signalized intersections at least every three to five years.

- Construct a single-lane roundabout at the N Diamond Lake Road/Brockton Lane, reserving right-of-way for future right turn lanes, or a traffic signal with dedicated turn lanes.

Accounting for additional traffic from the proposed development, the following mitigation will also be necessary to accommodate the full projected 2025 volumes:

- Construct a single-lane roundabout at the Dayton River Road/Pineview Lane intersection, reserving right-of-way for future right turn lanes, or a traffic signal with dedicated turn lanes.

Hennepin County prefers dedicated turn lanes at its county road intersections and could request them at the proposed development key access intersections. Three study intersections are considered these key access points with entering and exiting traffic from the development: Dayton River Road/River Hills Parkway, Dayton River Road/Vicksburg Lane, and North Diamond Lake Road/Zanzibar Lane. Although the capacity analyses suggest no improvements are necessary, the County may still request dedicated turn lanes at these intersections.

Beyond year 2025, the long-range time frame and uncertainty of potential developments, roadway network, and travel patterns result in multiple assumptions for this analysis. Due to this inherent uncertainty, year 2040 recommendations should not be constructed today. Instead, right-of-way should be preserved for these needs when required based on actual traffic growth.

The following modifications to the study roads and intersections, assuming the planned roadway network is implemented, are recommended for the year 2040 to address potential issues due to general background growth and other specific development traffic with or without the proposed North Dayton site:

- Continue to work on long-term solutions with other agencies to accommodate future congestion on the TH 169 and CSAH 81 corridors.
- Construct a multi-lane roundabout at the Dayton River Road/South Diamond Lake Road intersection, with two-lane Dayton River Road approaches, or a traffic signal with dedicated turn lanes.
- Construct single-lane roundabouts or traffic signals with dedicated turn lanes at the intersections of 129th Avenue/Pineview Lane, Dayton River Road/Brockton Lane, and South Diamond Lake Road/Pineview Lane.
- Continue to update signal timing at all signalized intersections at least every three to five years.

With the North Dayton proposed development traffic contributing to the study area volumes, the following additional 2040 mitigation is recommended:

- Provide dedicated right turn lanes for the Dayton River Road/Pineview Lane intersection single-lane roundabout using the reserved right-of-way if a roundabout was constructed as part of the 2025 mitigation.
- Construct a single-lane roundabout or a traffic signal with dedicated turn lanes at the N Diamond Lake Road/Zanzibar Lane intersection.

- Construct multi-lane roundabout at the Dayton River Road/N Diamond Lake Road intersection, with two-lane Dayton River Road approaches, or a traffic signal with dedicated turn lanes.
- Provide dedicated right turn lanes for the N Diamond Lake Road/Brockton Lane intersection single-lane roundabout using the reserved right-of-way if a roundabout was constructed as part of the 2025 mitigation.

In addition to these roadway improvements, the following items are also recommended based upon the traffic analysis for the proposed development:

- Reserve space, if necessary, for the future trail network in this area.
- Consider internal sidewalks/trails to connect to a future trail network and between the residential/commercial components of the proposed Developer's plan.
- Consider potential bicycle parking areas and other amenities (repair stations) on-site for when the future trail network is developed.
- Follow the requirements of the MnMUTCD for signing and striping.
- Work with the City, as necessary, in their continued dialogue with Metro Transit and Hennepin County on the potential expansion of the transit system.

See the Traffic Impact Study for a further description of the traffic associated with the proposed development and its impact on the surrounding transportation network.

19. Cumulative potential effects

(Preparers can leave this item blank if cumulative potential effects are addressed under the applicable EAW Items)

The AUAR, by design, will examine and address cumulative impacts of development for the scenarios being studied.

Cumulative effects were considered for the overall project and known surrounding projects that are being developed or will be developed. The only cumulative effect that was identified was for traffic impacts. The current and future developments will have a cumulative effect on the transportation network. This impact is included in the traffic analysis; the traffic study has looked at the year 2025 No-Build Scenarios based on development staging plans from the City of Dayton. Using these plans the developments were sorted into several geographic areas and a trip generation analysis was done on each area. These trip generation tables can be found in the Traffic Study Appendices, Appendix D – Trip Generation Tables, Pages D3 and D4.

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

N/A

b. 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.

N/A

c. 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.

N/A

MITIGATION MEASURES (QUESTION 19):

- None

20. Other potential environmental effects

If the project may cause any additional environmental effects not addressed by items 1 to 19, 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.

At this time, no environmental impacts beyond what will be studied in question 1 through 19 of the AUAR have been identified.

MITIGATION MEASURES (QUESTION 20):

- None

RGU Certification

I hereby certify that:

- The information contained in this document is accurate and complete to the best of my knowledge.
- The AUAR 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 AUAR are being sent to the entire EQB distribution list.

Signature: Tina Goodroad **Date:** 6-27-18

Title: City Administrator/Development Director

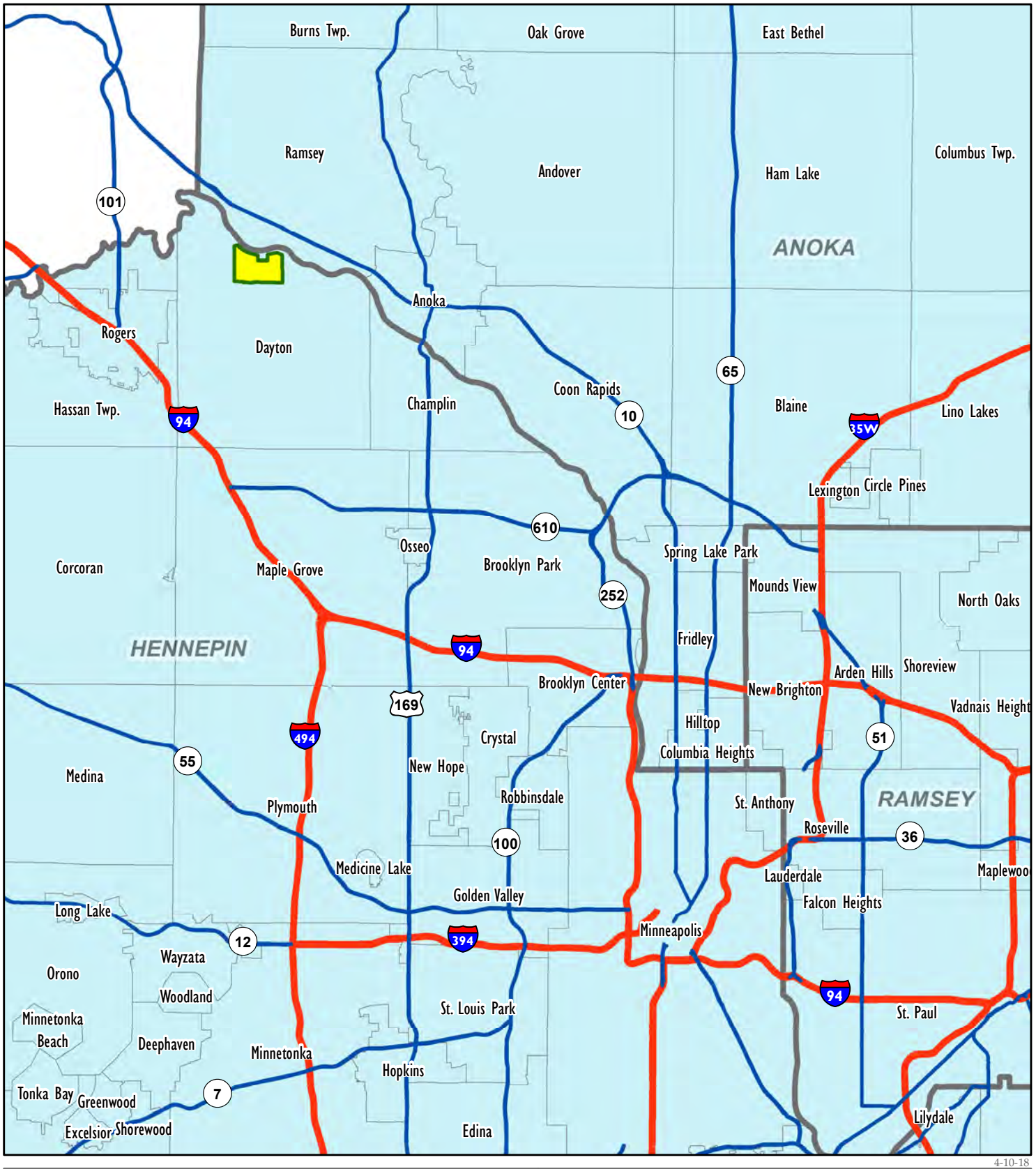
APPENDIX

A

FIGURES

Appendix "A" contains the following Figures:

Figure #	Figure Title
1	Project Regional Location
2	AUAR Study Boundary
3	USGS Map
4	Existing Conditions Aerial
5	Draft Proposed Master Planned Development
6	Existing Cover Types
7	Proposed Cover Types
8	Soils
9	Existing Land Use
10	Future Land Use
11	Mississippi River Critical Area Districts
12	National Wetland Inventory
13	Well Locations
14	Dayton 2010 City Sewer Service Areas
15	Dayton Trunk Sanitary Sewer Plan
16	Dayton Trunk Stormwater Plan
17	Dayton 2010 City Water Service Areas
18	Draft Dayton Comprehensive Trail Plan
19	West Mississippi River Regional Trail Search Corridor



4-10-18

Project Regional Location

North Dayton Development

Dayton, MN

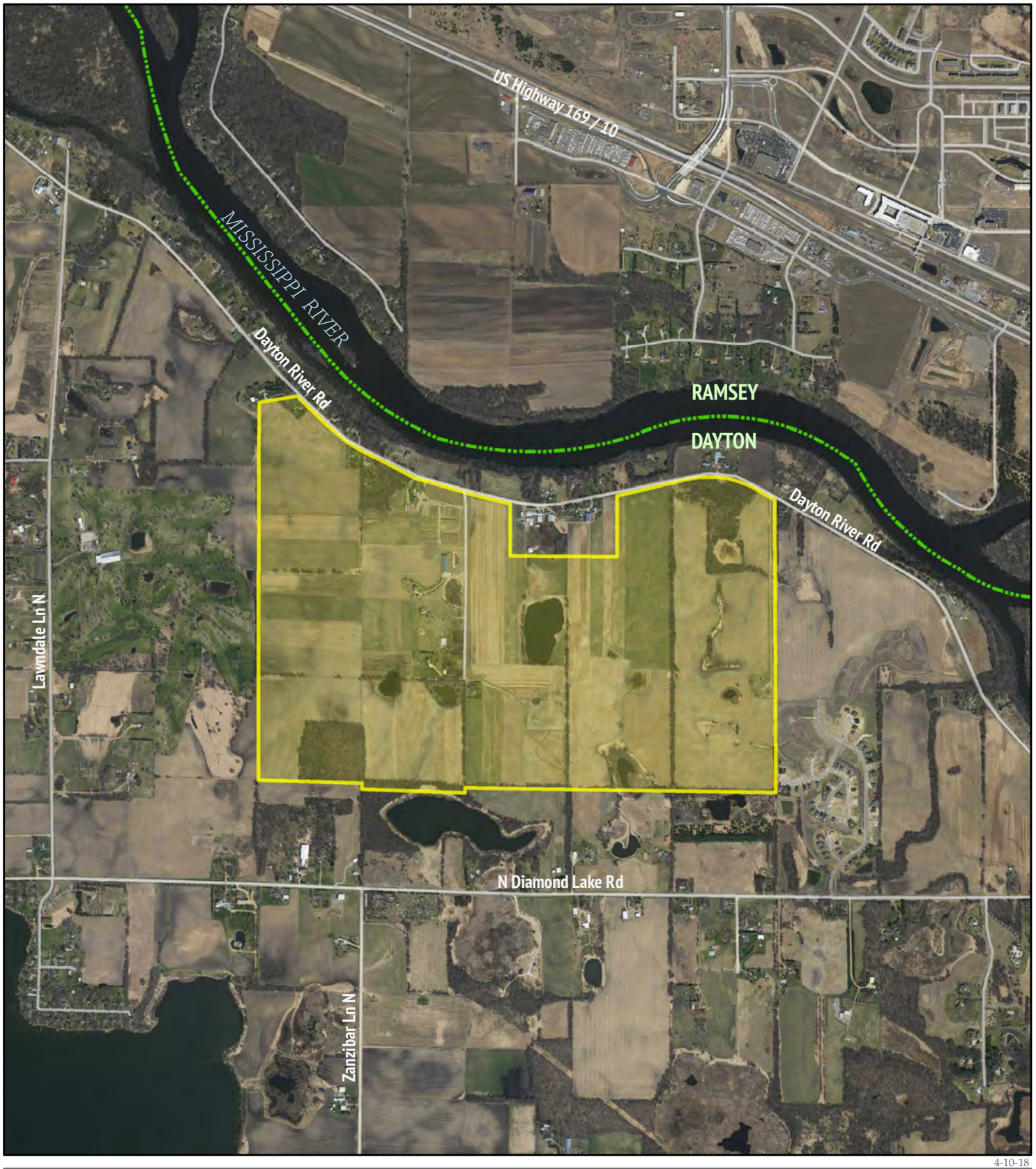
Legend

- US or State Highway
- Interstate
- AUAR Study Area
- County Lines

N

Sources: MetroGIS, MnDOT

FIGURE 2



4-10-18

AUAR Boundary

North Dayton Development

Dayton, MN

Legend

AUAR Study Area

Municipal Boundary Line

Sources: MetroGIS, MnDOT

4-10-18

USGS Map

North Dayton Development

Dayton, MN

Legend

AUAR Study Area

Municipal Boundary Line

Sources: MetroGIS, MnDOT

FIGURE 4

4-10-18

AUAR Boundary

North Dayton Development

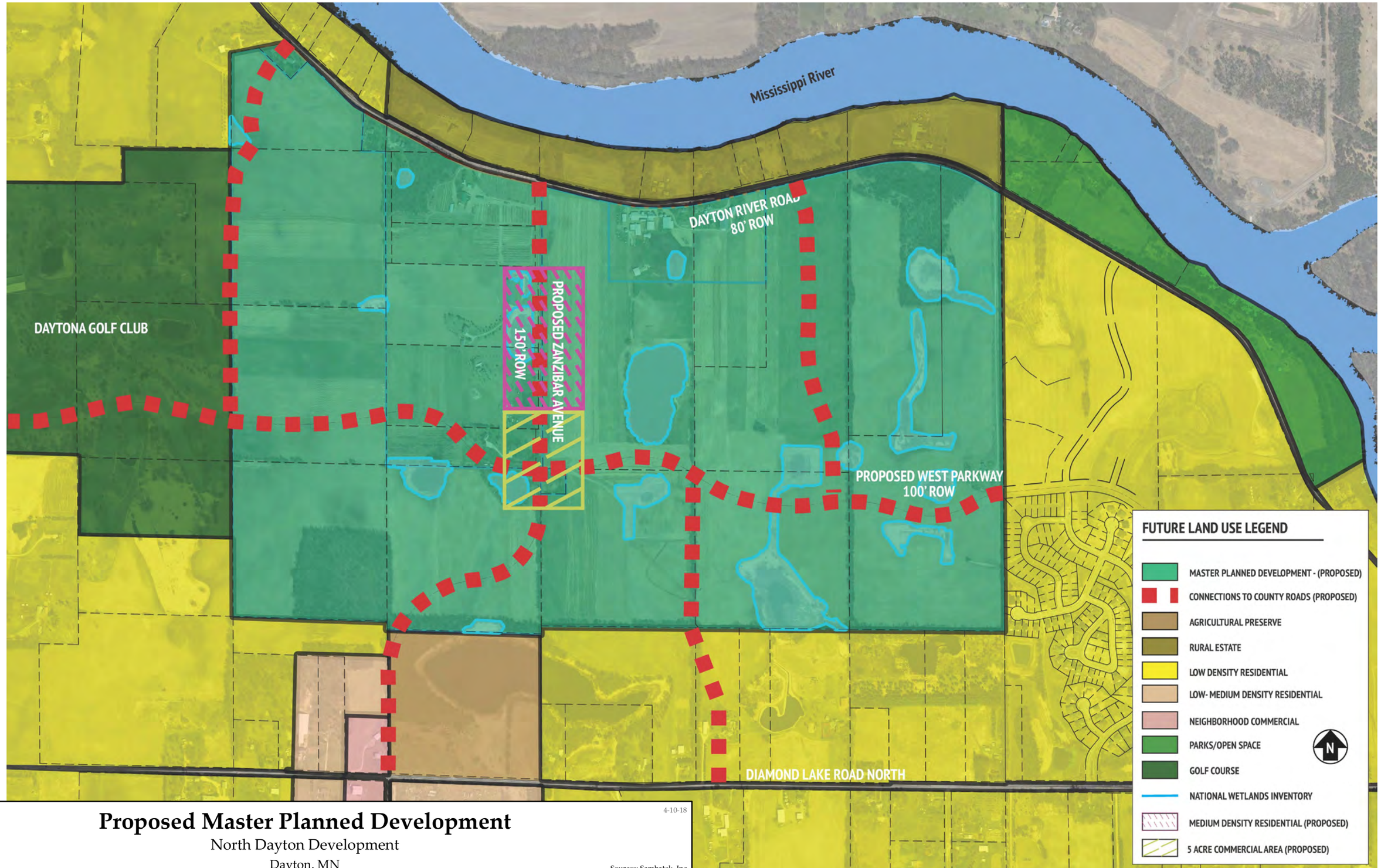
Dayton, MN

Legend

AUAR Study Area

Municipal Boundary Line

Sources: MetroGIS, MnDOT



Proposed Master Planned Development

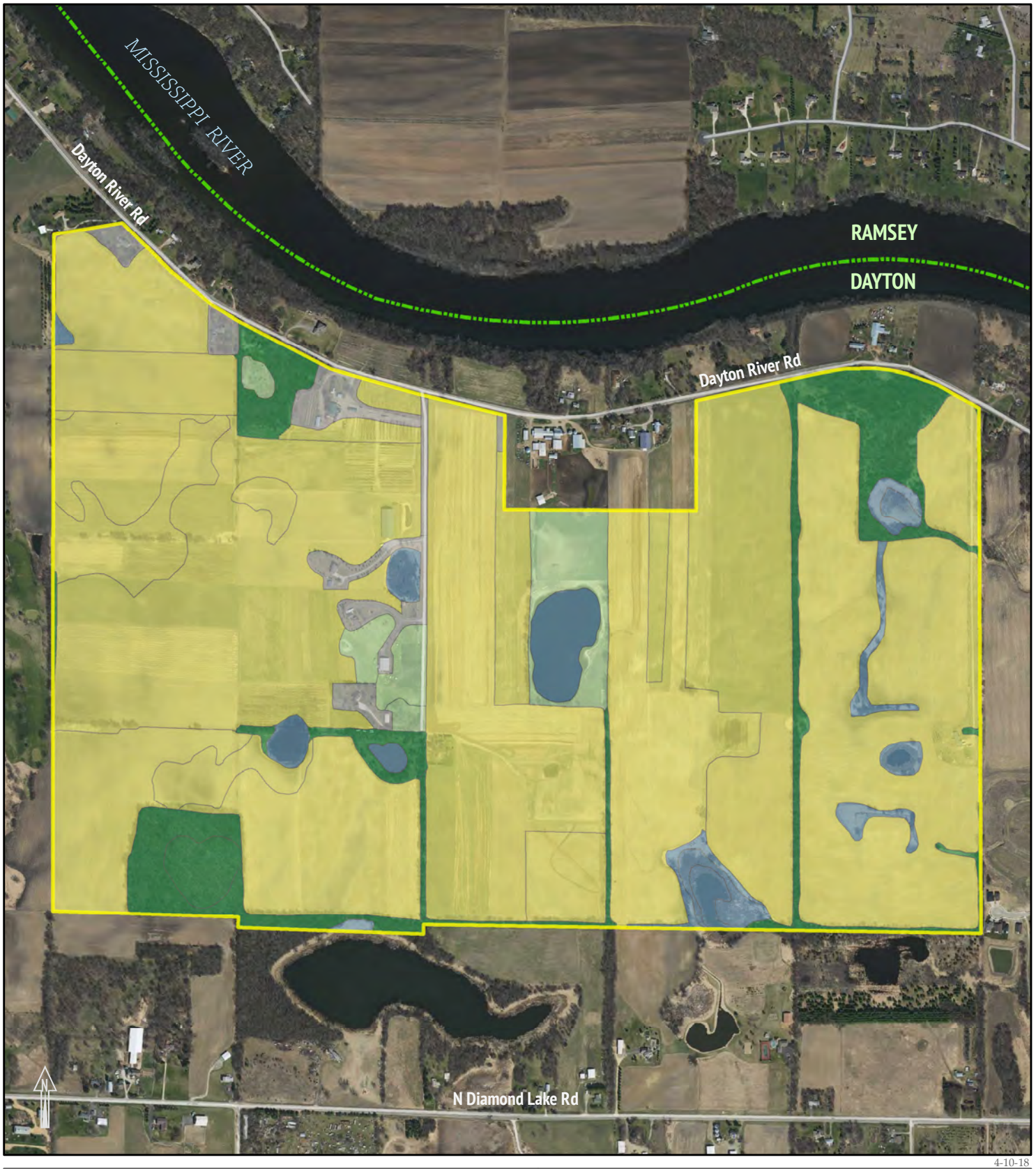
North Dayton Development

Dayton, MN

4-10-18

Sources: Sambatek, Inc

This map was created using MFRA's Geographic Information Systems (GIS), it is a compilation of information and data from various sources. This map is not a surveyed or legally recorded map and is intended to be used as a reference. MFRA is not responsible for any inaccuracies contained herein.



4-10-18

Existing MLCCS Cover Types

North Dayton Development

Dayton, MN

Generalized MLCCS Cover Types

Sources: MetroGIS, MnDOT, USFWS

- Cropland
- Grassland
- Wetland
- Forest/Woodland
- Developed Land
- AUAR Study Area

4-10-18

Proposed MLCCS Cover Types

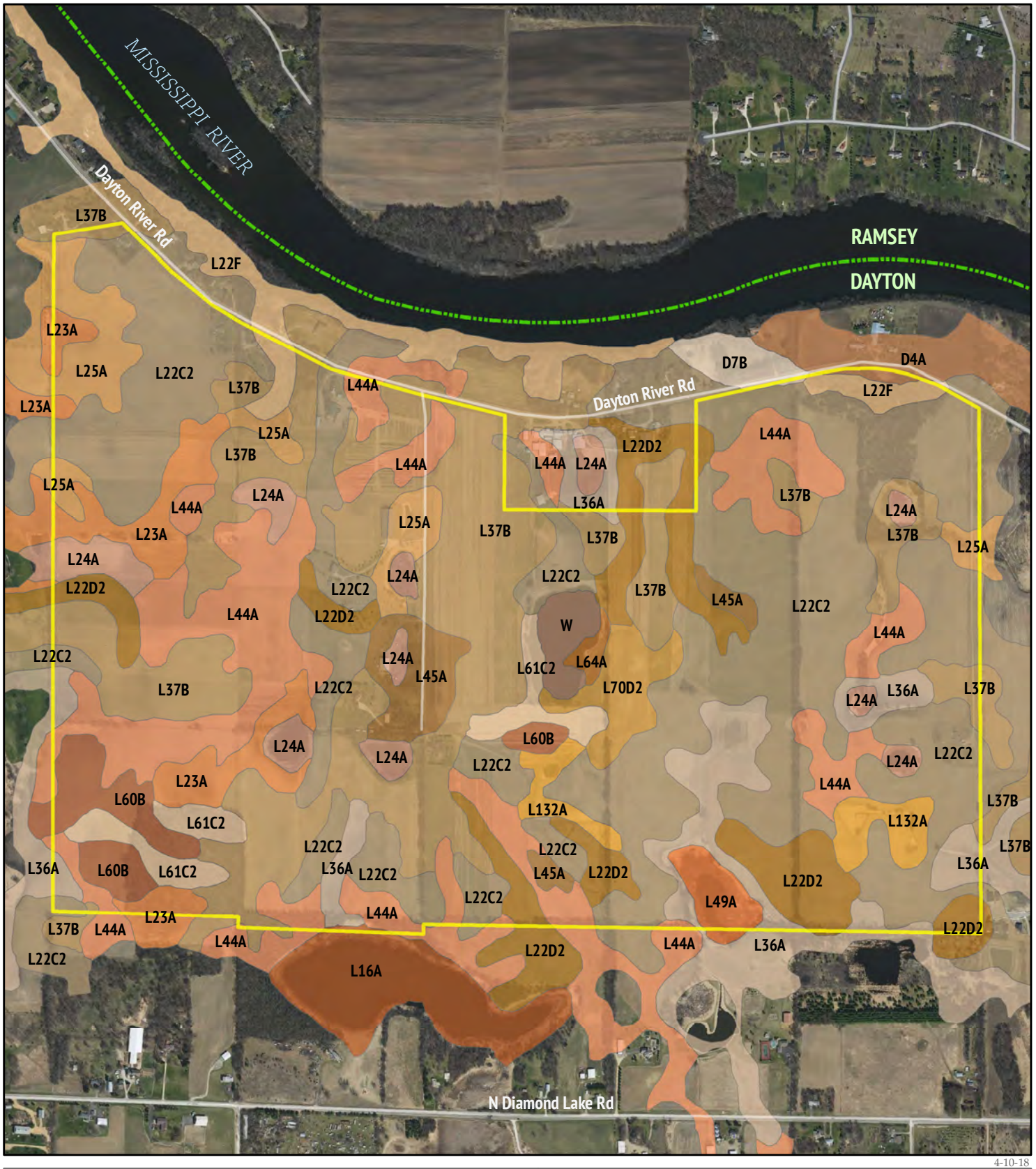
North Dayton Development

Dayton, MN

Generalized MLCCS Cover Types

Sources: MetroGIS, MnDOT, USFWS

- Wetland
- Developed Land 20% to 50% Impervious
- AUAR Study Area



4-10-18

Soils

North Dayton Development

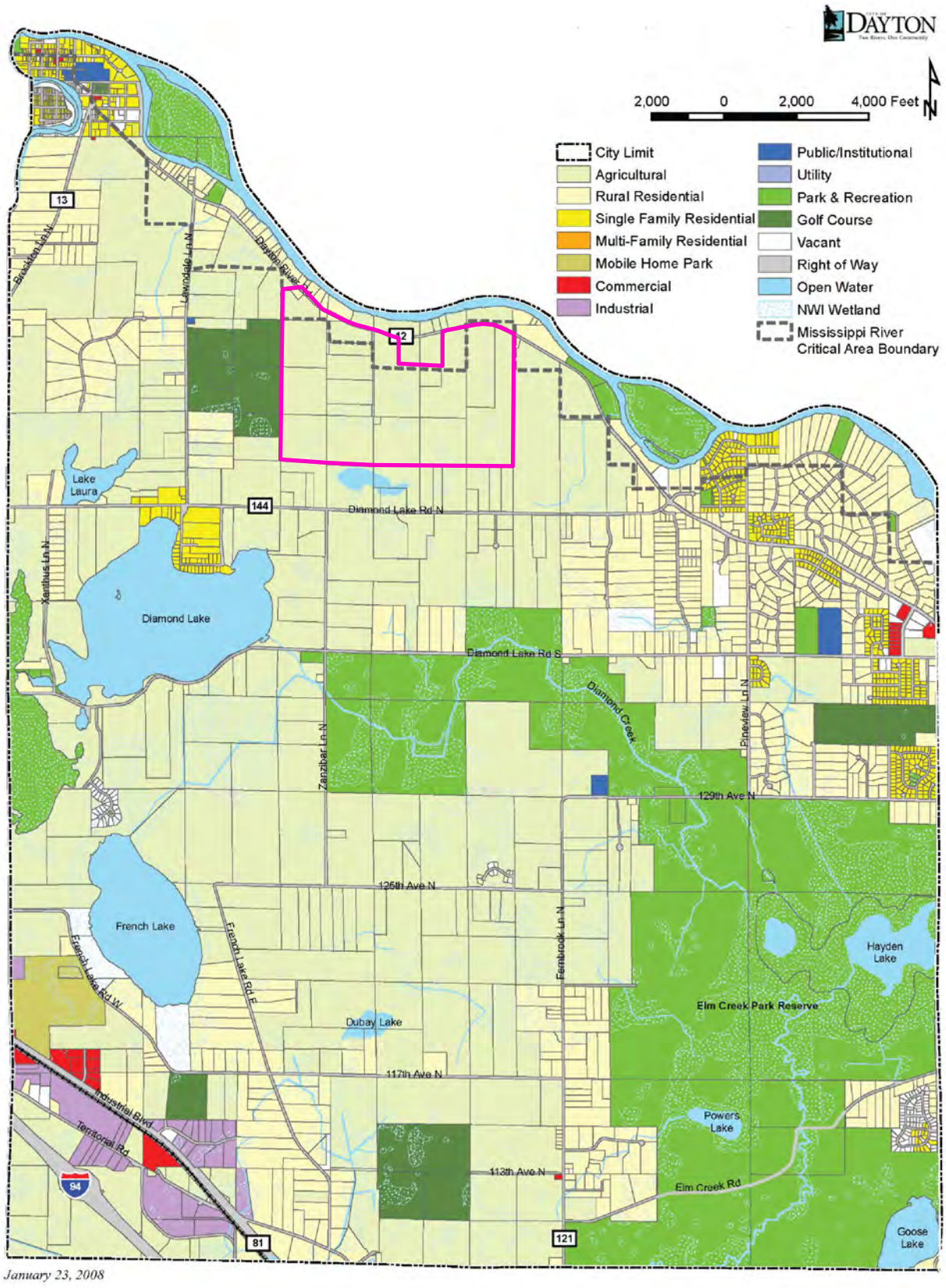
Dayton, MN

Legend

AUAR Study Area

Municipal Boundary Line

Sources: MetroGIS, NRCS, LMIC



January 23, 2008

4-10-18

Dayton Existing Land Use Map

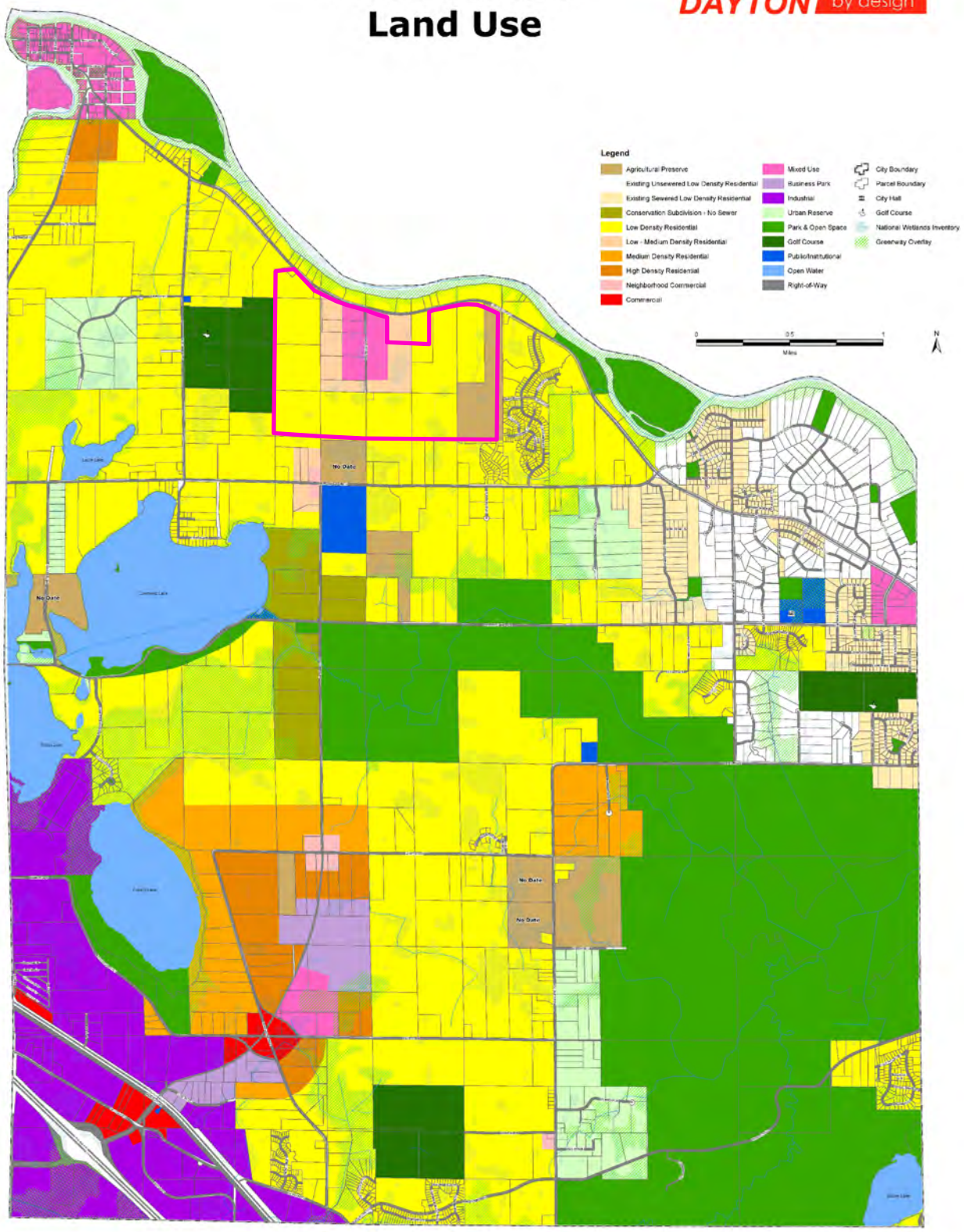
North Dayton Development

Dayton, MN

Legend

AUAR Study Area

Sources: City of Dayton Comprehensive Plan



4-13-18

Dayton Planned Land Use Map

North Dayton Development

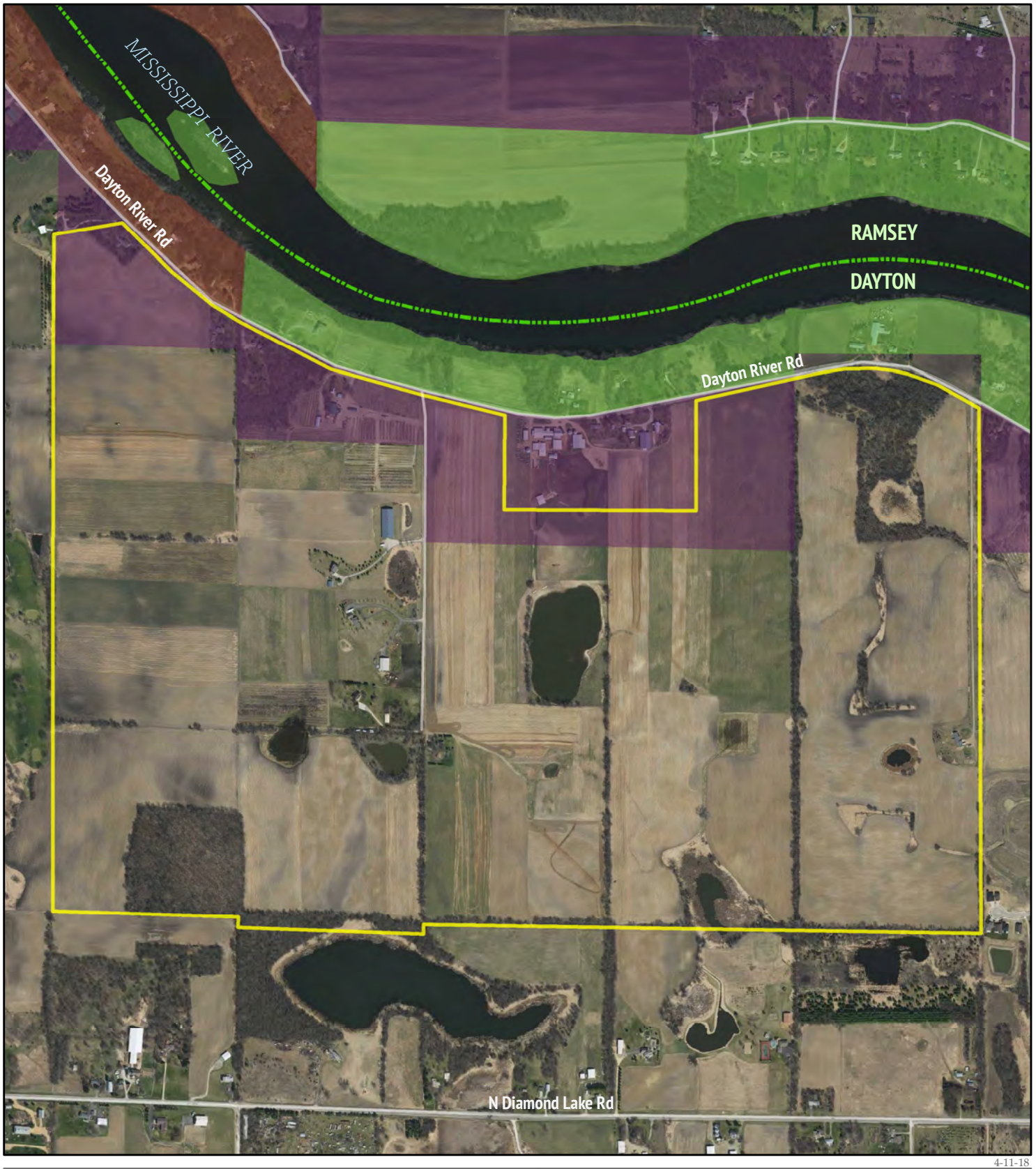
Dayton, MN

Legend

AUAR Study Area

Sources: MetroGIS, MnDOT

FIGURE 11



4-11-18

Mississippi River Critical Area Districts

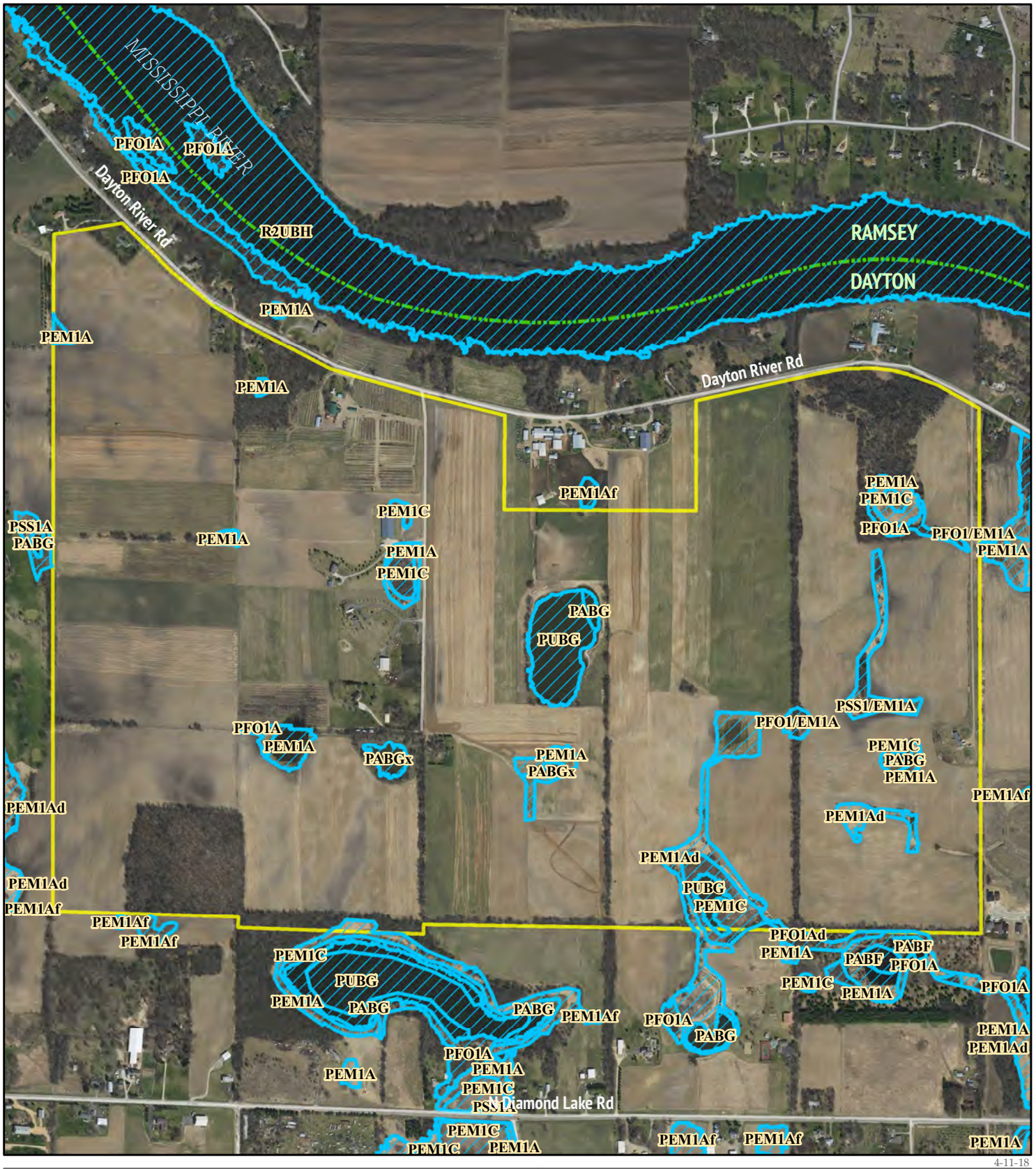
North Dayton Development

Dayton, MN

Legend

Sources: MetroGIS, MnDOT

- Rural and Open Space District (CA-ROS)
- River Neighborhood District (CA-RN)
- Separated from River District (CA-SR)
- Municipal Boundary Line
- AUAR Study Area



4-11-18

National Wetlands Inventory

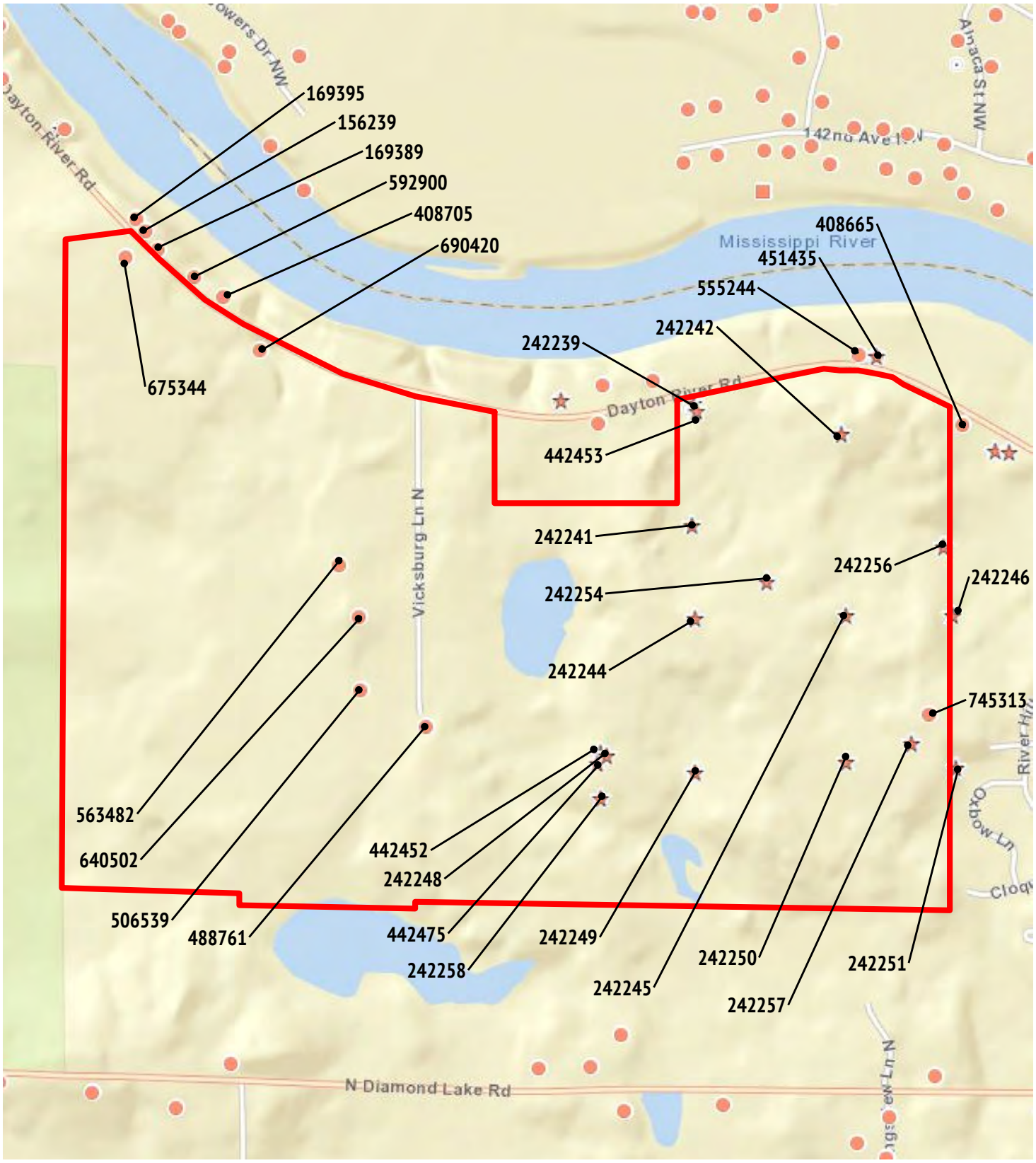
North Dayton Development

Dayton, MN

Legend

- NWI Wetlands
- AUAR Study Area
- Municipal Boundary Line

Sources: National Wetlands Inventory



4-10-18

Well Locations & Numbers

North Dayton Development

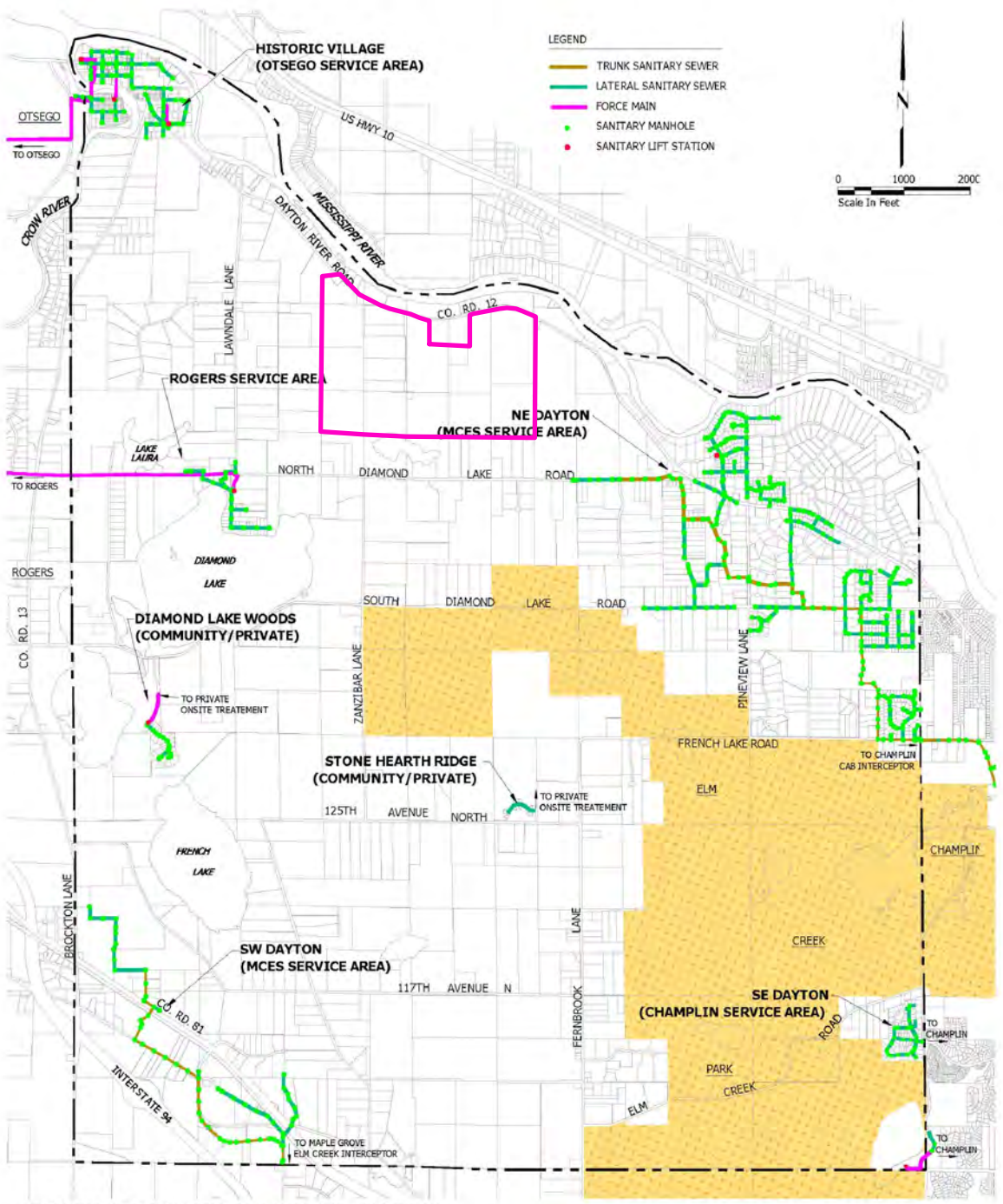
Dayton, MN

Legend

AUAR Study Area

Municipal Boundary Line

Sources: Minnesota Well Index



EXISTING SANITARY SEWER SYSTEM

CITY OF DAYTON

NOVEMBER 2010

CITY SEWER 2010.DWG DATE: NOV. 2010 COMM: 174MAP

CITY OF DAYTON
Two Rivers, One Community

4-11-18

Dayton 2010 City Sewer Service Areas

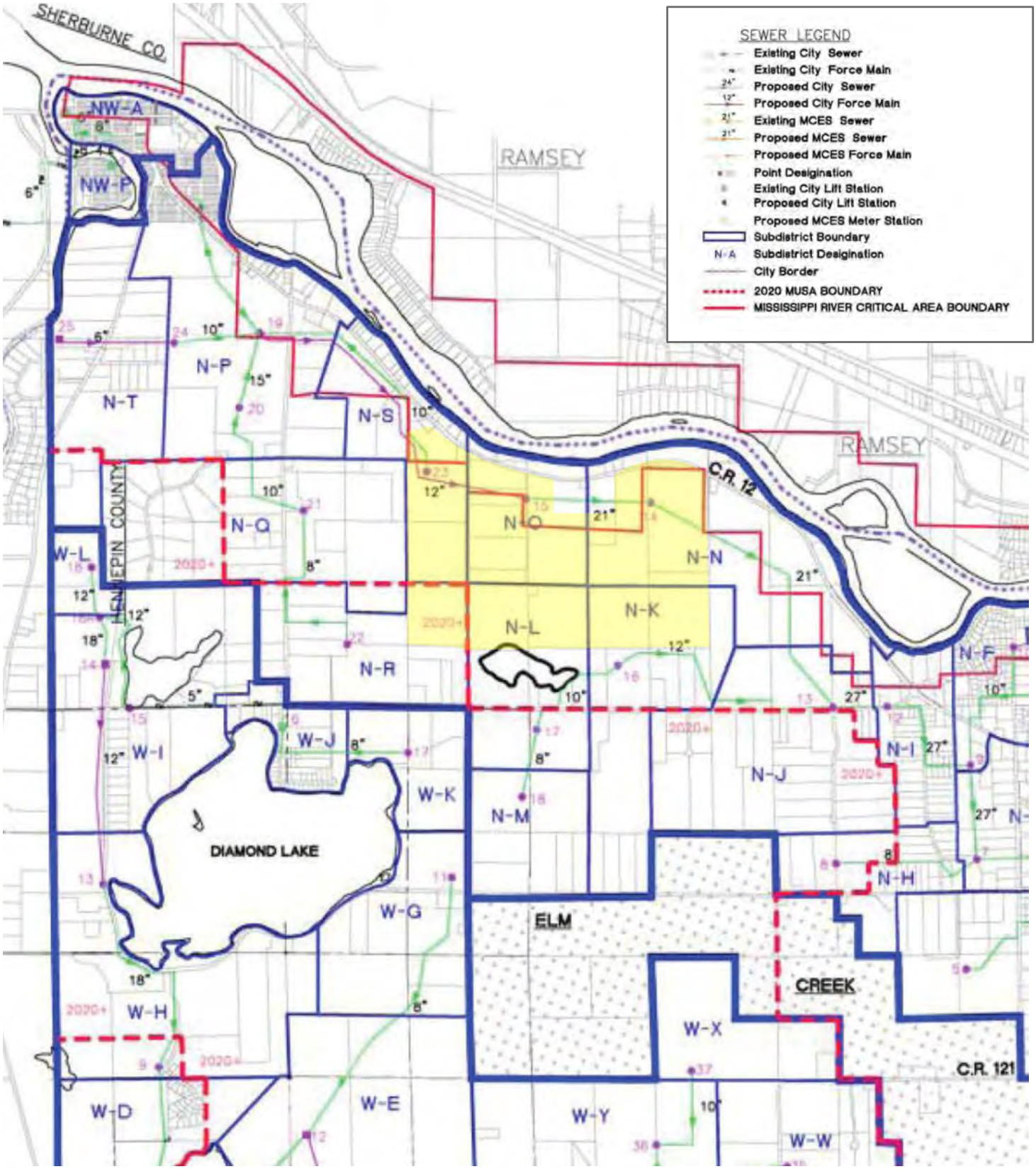
North Dayton Development

Dayton, MN

Legend

AUAR Study Area

Sources: City of Dayton 2010 Comprehensive Plan



4-11-18

Dayton 2010 Trunk Sanitary Sewer Plan

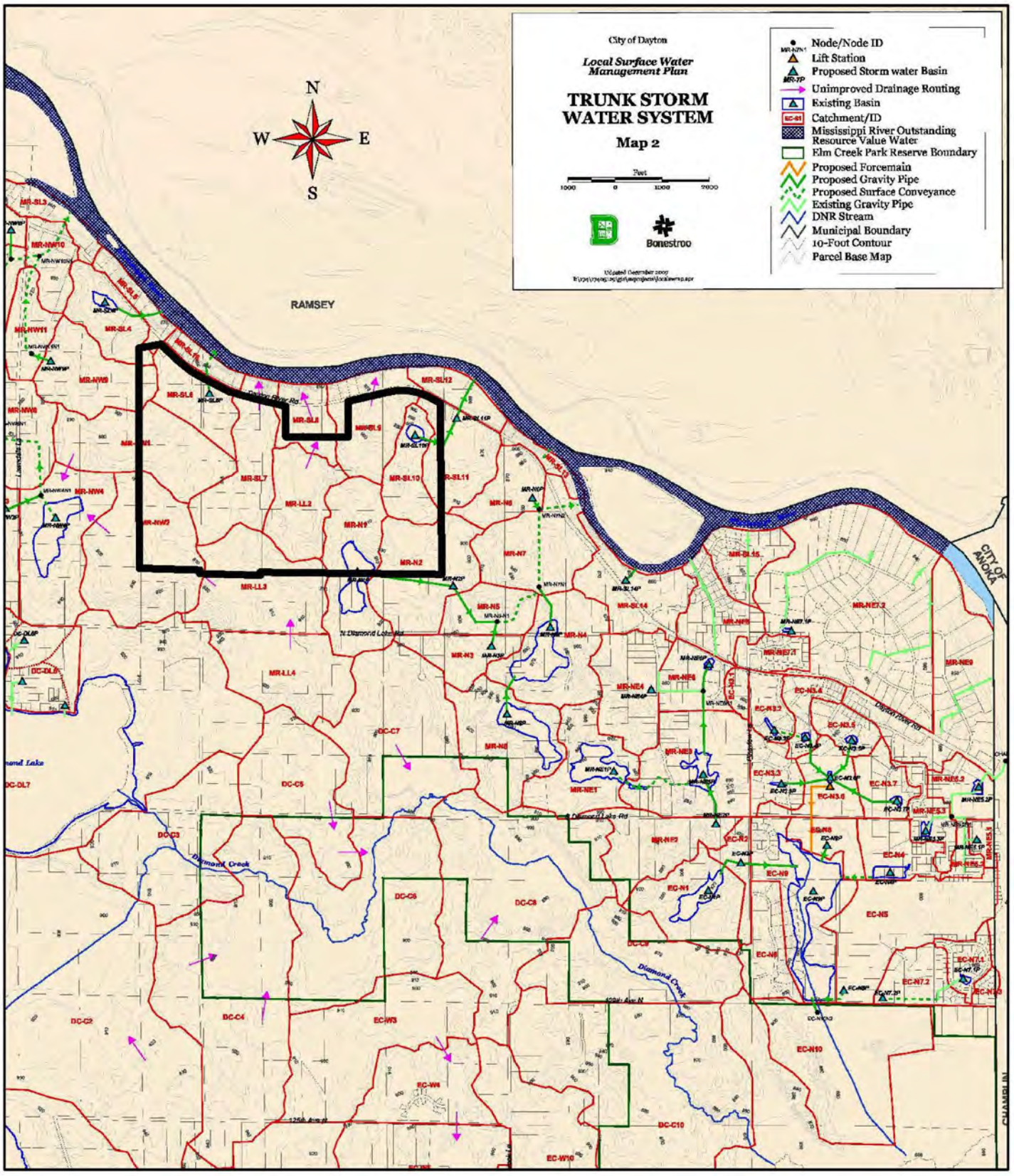
North Dayton Development

Dayton, MN

Legend

AUAR Study Area

Sources: City of Dayton 2010 Comprehensive Plan



4-11-18

Dayton 2010 Trunk Stormwater Plan

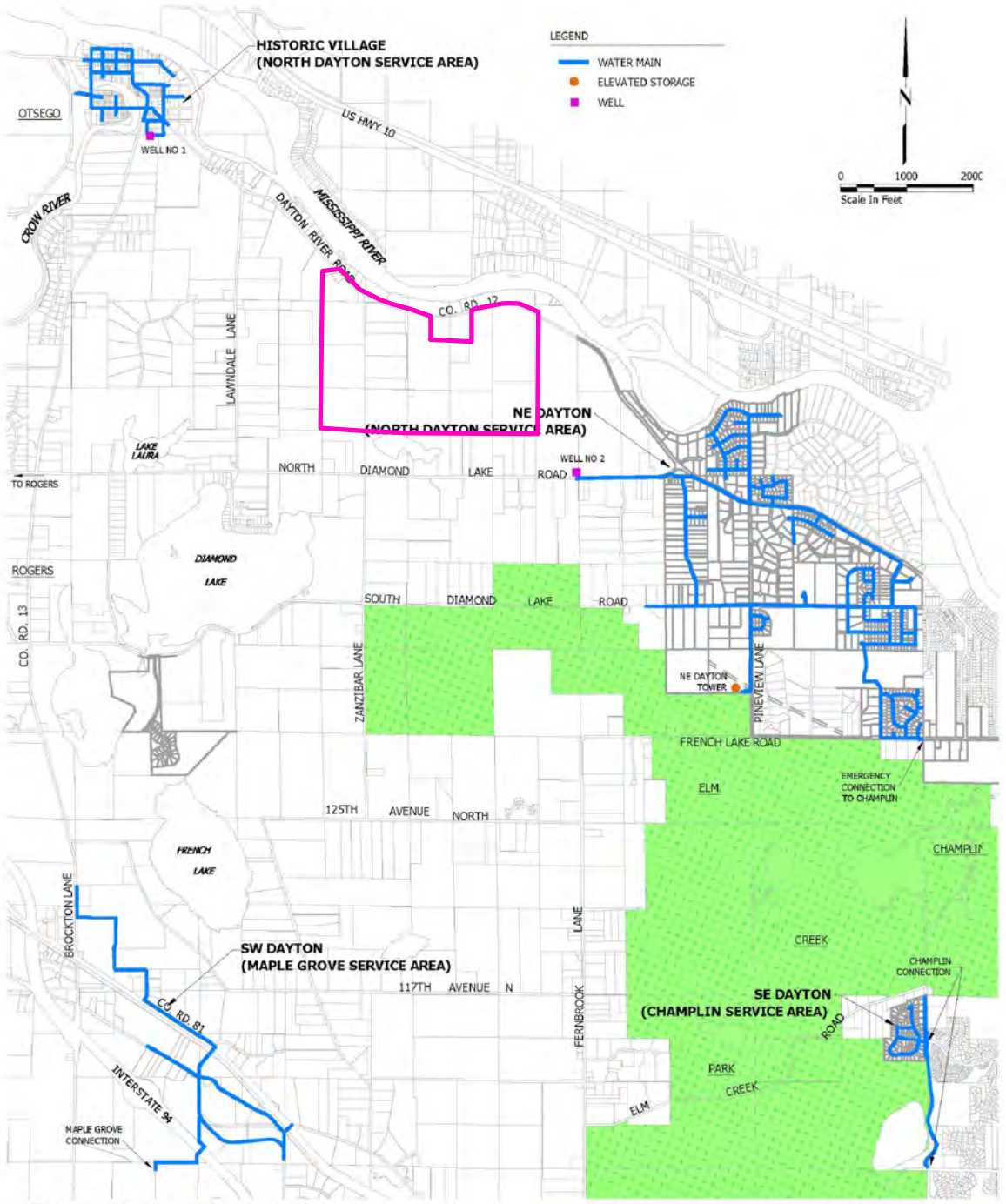
North Dayton Development

Dayton, MN

Legend

AUAR Study Area

Sources: City of Dayton Local Surface Water Managment Plan



4-11-18

Dayton 2010 City Water Service Areas

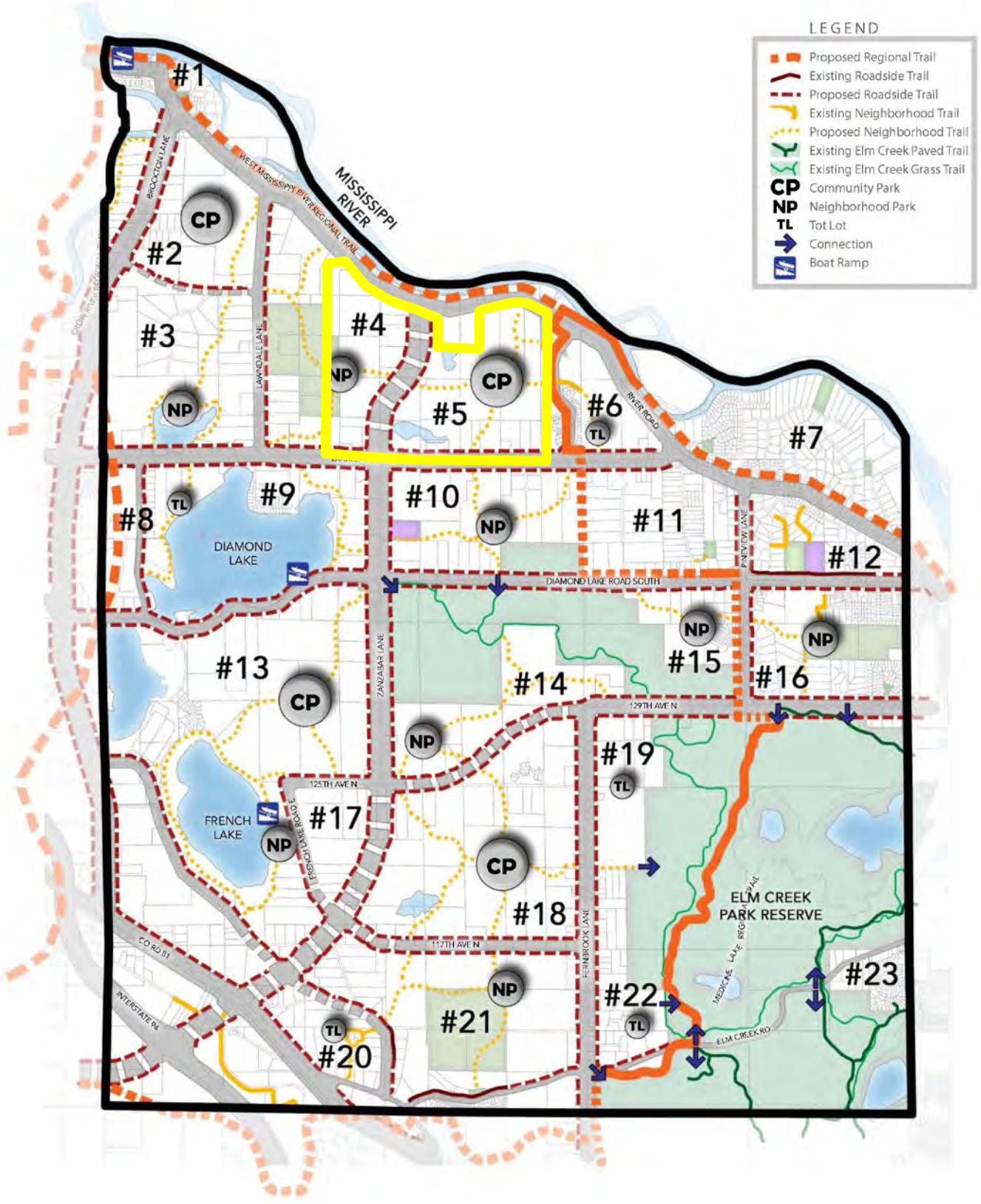
North Dayton Development

Dayton, MN

Legend

AUAR Study Area

Sources: City of Dayton 2010 Comprehensive Plan



6-15-18

Dayton Comprehensive Trail Plan

North Dayton Development

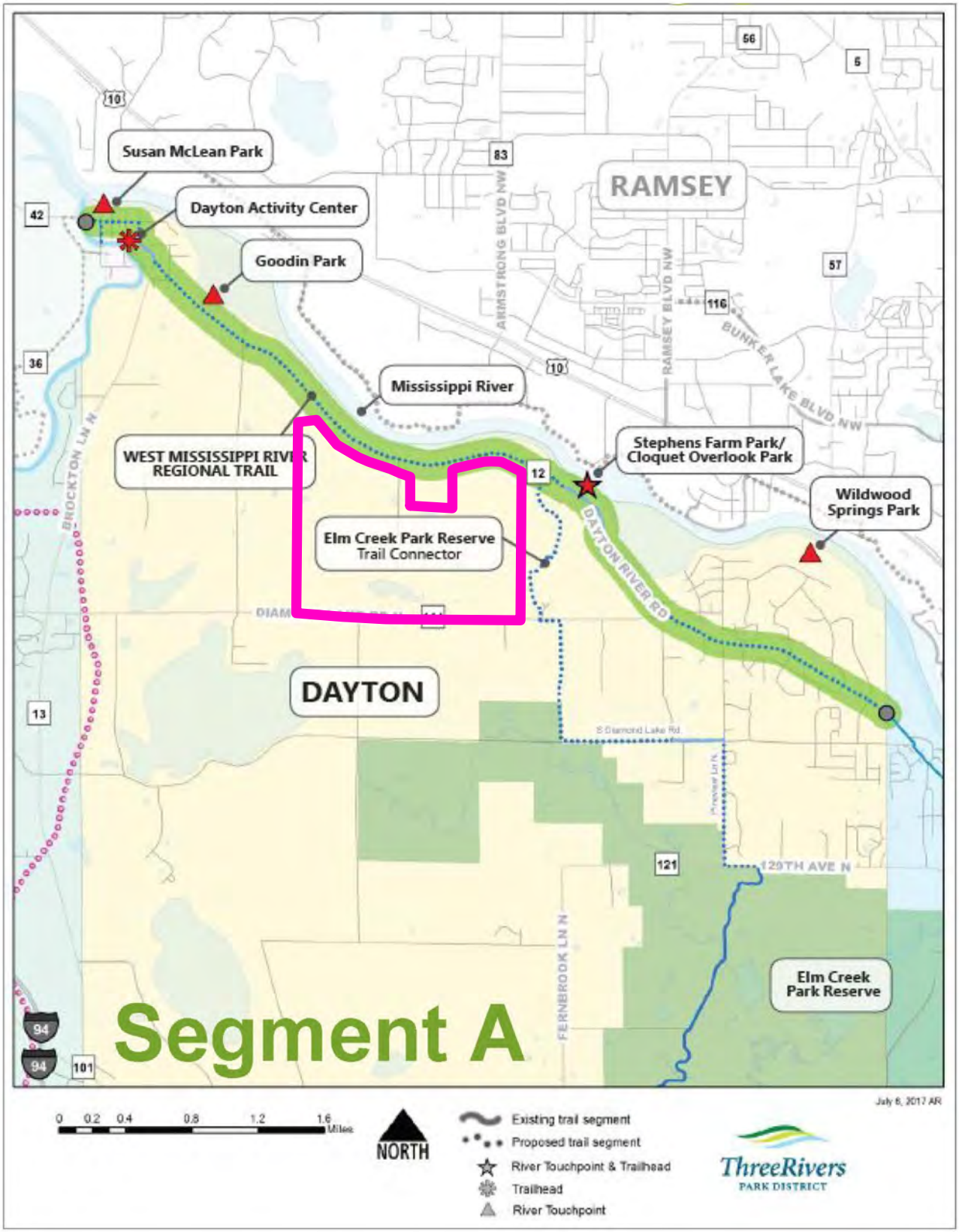
DRAFT

Dayton, MN

Legend

AUAR Study Area

Sources: Loucks Associates, Comprehensive Trail Plan



6-15-18

West Mississippi River Regional Trail Search Corridor

North Dayton Development

Dayton, MN

Legend

AUAR Study Area

Sources: Three Rivers Park District

APPENDIX

B

WELL RECORDS

Appendix “B” contains Well Records for nearby well sites.

Minnesota Unique Well Number

242241

County Hennepin
Quad Anoka
Quad ID 120B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 12/23/2008
Update Date 02/09/2016
Received Date

Well Name	Township	Range	Dir	Section	Subsection
DAYTON -	120	22	W	9	BADCCB

Elevation 903 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
SILTY CLAY	0	2	DK. BRN	MEDIUM
SANDY LEAN CLAY	2	4	BROWN	MEDIUM
SANDY LEAN CLAY	4	13	BROWN	
SAND W/ SILT SM	13	16	LT. BRN	
SANDY LEAN CLAY W/	16	25	BROWN	
SILTY SAND W/ SM	25	28	BROWN	
SAND W/ SILT SM	28	30	BROWN	
SAND W/ SILT LITTLE	30	33	BROWN	
SILT FE W LENSE OF	33	36	BROWN	
SAND F DRY TO MOIST	36	52	LT. BRN	

Remarks

M.G.S. NO. 3779. SEE DETAILED SOIL BORING.

BORING BACKFILLED WITH NEAT CEMENT GROUT TO 3 FT. FROM LAND SURFACE.

Well Depth 52 ft. **Depth Completed** 52 ft. **Date Well Completed** 07/28/1987

Drill Method **Drill Fluid**

Use test well **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type **Joint**
Drive Shoe? Yes ☐ No ☐ **Above/Below**

Open Hole From ft. To ft.

Screen? ☐ **Type** **Make**

Static Water Level

Pumping Level (below land surface)

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
neat cement		3 ft.	52 ft.
cuttings		ft.	3 ft.

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Manufacturer's name

Model Number HP Volt

Length of drop pipe ft Capacity g.p. Typ

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous

First Bedrock Aquifer

Last Strat sand+silt-brown Depth to Bedrock ft

Located by Minnesota Geological Survey

Locate Method Digitization (Screen) - Map (1:24,000)

System UTM - NAD83, Zone 15, Meters X 462697 Y 5007590

Unique Number Verification Site Plan Input Date 12/23/2008

Angled Drill Hole

Well Contractor

Twin City Testing M0112

Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

242242

County Hennepin
Quad Anoka
Quad ID 120B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 12/23/2008
Update Date 02/10/2016
Received Date

Well Name	Township	Range	Dir	Section	Subsection
DAYTON -	120	22	W	9	ABBDCA

Elevation 907 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
SANDY LEAN CLAY W/	0	4	BROWN	
CLAYEY SAND W/	4	7	BROWN	
SAND W/ SILT LITTLE	7	10	BROWN	
SILTY SAND W/	10	12	BROWN	
SAND W/ SILT F DRY	12	14	BROWN	
LEAN CLAY W/ SAND	14	19	BROWN	
SAND W/ SILT LITTLE	19	33	BROWN	
SAND W/ SILT F	33	34	BROWN	
SAND F	34	37	LT. BRN	
SAND W/ SILT F MOIST	37	42	LT. BRN	
SAND W/ SILT LITTLE	42	47	BROWN	
SAND W/ SILT LITTLE	47	62	BROWN	
SAND W/ SILT F WET V	62	70	BROWN	
CLAYEY SAND LITLE	70	73	VARIED	
SILTY SAND F WET V	73	76	BROWN	
SILTY SAND W/ LITTLE	76	79	GRY/BRN	

Remarks

M.G.S. NO. 3786. SEE DETAILED SOIL BORING.

BORING BACKFILLED WITH NEAT CEMENT GROUT TO 3 FT. FROM LAND SURFACE.

Well Depth 79 ft. **Depth Completed** 79 ft. **Date Well Completed** 09/30/1987

Drill Method **Drill Fluid**

Use test well **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type **Joint**
Drive Shoe? Yes ☐ No ☐ **Above/Below**

Open Hole From ft. To ft.

Screen? ☐ **Type** **Make**

Static Water Level

Pumping Level (below land surface)

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
neat cement		3 ft.	79 ft.
cuttings		ft.	3 ft.

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Manufacturer's name

Model Number HP Volt

Length of drop pipe ft Capacity g.p. Typ

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous

First Bedrock Aquifer

Last Strat pebbly sand/silt/clay Depth to Bedrock ft

Located by Minnesota Geological Survey

Locate Method Digitization (Screen) - Map (1:24,000)

System UTM - NAD83, Zone 15, Meters X 463029 Y 5007790

Unique Number Verification Site Plan Input Date 12/23/2008

Angled Drill Hole

Well Contractor

Twin City Testing M0112

Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

242245

County Hennepin
Quad Anoka
Quad ID 120B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 07/08/1996
Update Date 04/01/2016
Received Date

Well Name	Township	Range	Dir	Section	Subsection
DAYTON -	120	22	W	9	ACBDDB

Elevation 903 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOPSOIL	0	1		
SILTY CLAY RATHER	1	2	DK. BRN	
LEAN CLAY W/ SAND	2	4	BROWN	
SANDY LEAN CLAY	4	25	BROWN	
SAND W/ SILT F MOIST	25	30	BROWN	
SAND F MOIST DENSE	30	40	LT. BRN	
SILTY CLAY / SAND	40	42	GRY/BRN	SOFT
SAND W/ LITTLE	42	47	LT. BRN	
SAND F MOIST V	47	50	LT. BRN	
SAND W/ SILT LITTLE	50	54	LT. BRN	
FINE SAND DRY	54	55	LT. BRN	
SAND W/ SILT &	55	58	BROWN	
SAND W/ SILT &	58	60	BROWN	
GRAVEL SILT & SAND	60	65	BROWN	
SAND W/ SILT LITTLE	65	76	BROWN	
CLAYEY SAND W/	76	78	RED/BRN	
SILTY SAND LITTLE	78	81	BROWN	
SILTY SAND F WB V	81	84	BROWN	
SILTY SAND W/	84	93	BROWN	
SAND W/ SILT F-M WB	93	96	BROWN	
SILTYSAND F WET	96	99	RED/BRN	
SILTY GRAVEL W/	99	103	BROWN	
SANDSTONE	103	125	VARIED	

Remarks

M.G.S. NO. 3587. SEE DETAILED SOIL BORING.

BORING BACKFILLED WITH NEAT CEMENT GROUT TO 3 FT. FROM LAND SURFACE.

Well Depth 125 ft. **Depth Completed** 125 ft. **Date Well Completed** 09/28/1987

Drill Method **Drill Fluid**

Use test well **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type **Joint**
Drive Shoe? Yes ☐ No ☐ **Above/Below**

Open Hole From ft. To ft.

Screen? ☐ **Type** **Make**

Static Water Level

Pumping Level (below land surface)

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
neat cement		3 ft.	125 ft.
cuttings		ft.	3 ft.

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Manufacturer's name

Model Number HP Volt

Length of drop pipe ft Capacity g.p. Typ

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous

First Bedrock Jordan Sandstone Aquifer
Last Strat Jordan Sandstone Depth to Bedrock 103 ft
Located by Minnesota Geological Survey
Locate Method Digitization (Screen) - Map (1:24,000)
System UTM - NAD83, Zone 15, Meters X 463036 Y 5007387
Unique Number Verification Site Plan Input Date 12/23/2008

Angled Drill Hole

Well Contractor

Twin City Testing M0112
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Well Index Report | **242245** | Printed on 09/22/2017 HE-01205-15

Minnesota Unique Well Number

242249

County Hennepin
Quad Anoka
Quad ID 120B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 12/23/2008
Update Date 11/03/2015
Received Date

Well Name	Township	Range	Dir	Section	Subsection
DAYTON -	120	22	W	9	CAACBB

Elevation 909 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
SILTY CLAY	0	2	GRY/BRN	SOFT
LEAN CLAY BRN/GRY	2	3	VARIED	SOFT
LEAN CLAY W/ SAND	3	7	GRAY	MEDIUM
SANDY LEAN CLAY	7	10	BROWN	MEDIUM
SILTY SAND F MOIST M	10	13	BROWN	
CLAYEY SAND W/	13	16	BROWN	
SAND W/ SILT LITTLE	16	18	BROWN	
CLAYEY SAND W/	18	23	BROWN	
SAND W/ SILT LITTLE	23	42	BROWN	
SAND W/ SILT F MOIST	42	52	BROWN	

Remarks

M.G.S. NO. 3791. SEE DETAILED SOIL BORING.

BORING BACKFILLED WITH NEAT CEMENT GROUT TO 3 FT. FROM LAND SURFACE.

Well Depth 52 ft. **Depth Completed** 52 ft. **Date Well Completed** 07/29/1987

Drill Method **Drill Fluid**

Use test well **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type **Joint**
Drive Shoe? Yes ☐ No ☐ **Above/Below**

Open Hole From ft. To ft.

Screen? ☐ **Type** **Make**

Static Water Level

Pumping Level (below land surface)

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
neat cement		3 ft.	52 ft.
cuttings		ft.	3 ft.

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Manufacturer's name

Model Number HP Volt

Length of drop pipe ft Capacity g.p. Typ

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous

First Bedrock Aquifer

Last Strat sand+silt-brown Depth to Bedrock ft

Located by Minnesota Geological Survey

Locate Method Digitization (Screen) - Map (1:24,000)

System UTM - NAD83, Zone 15, Meters X 462698 Y 5007044

Unique Number Verification Site Plan Input Date 12/23/2008

Angled Drill Hole

Well Contractor

Twin City Testing M0112

Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

242251

County Hennepin
Quad Anoka
Quad ID 120B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 12/23/2008
Update Date 09/01/2015
Received Date

Well Name	Township	Range	Dir	Section	Subsection
DAYTON -	120	22	W	9	DBADAA

Elevation 910 ft. **Elev. Method** Surveyed

Address

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
SANDY LEAN CLAY W/	0	4	BROWN	MEDIUM
SANDY LEAN CLAY	4	10	BROWN	
SAND W/ SILT F MOIST	10	28	LT. BRN	
SAND W/ LITTLE	28	33	LT. BRN	
SAND F DRY DENSE	33	40	LT. BRN	
SAND W/ SILT &	40	43	LT. BRN	
SAND F MOIST V	43	54	LT. BRN	
SILTY SAND FINE	54	55	LT. BRN	
SAND W/ SILT F DRY	55	57	BROWN	
SAND F MOIST THEN	57	67	BROWN	

Remarks

M.G.S. NO. 3793. SEE DETAILED SOIL BORING.

BORING BACKFILLED WITH NEAT CEMENT GROUT TO 3 FT. FROM LAND SURFACE.

Well Depth 67 ft. **Depth Completed** 67 ft. **Date Well Completed** 07/31/1987

Drill Method **Drill Fluid**

Use test well **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type **Joint**
Drive Shoe? Yes ☐ No ☐ **Above/Below**

Open Hole From ft. To ft.

Screen? ☐ **Type** **Make**

Static Water Level

Pumping Level (below land surface)

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☐ Yes ☐ No ☐ Not Specified

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Manufacturer's name

Model Number HP Volt

Length of drop pipe ft Capacity g.p. Typ

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous

First Bedrock Aquifer

Last Strat sand-brown Depth to Bedrock ft

Located by Minnesota Geological Survey

Locate Method Digitization (Screen) - Map (1:24,000)

System UTM - NAD83, Zone 15, Meters X 463277 Y 5007050

Unique Number Verification Site Plan Input Date 12/23/2008

Angled Drill Hole

Well Contractor

Twin City Testing M0112

Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

242254

County Hennepin
Quad Anoka
Quad ID 120B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 12/23/2008
Update Date 02/08/2016
Received Date

Well Name	Township	Range	Dir	Section	Subsection
DAYTON -	120	22	W	9	BDAADD

Elevation 911 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
SANDY SILT DRY	0	2	BROWN	
SANDY LEAN CLAY W/	2	4	BROWN	MEDIUM
SANDY LEAN CLAY W/	4	18	BROWN	
SILTY SAND W/ LITTLE	18	22	BROWN	
SAND W/ SILT F MOIST	22	32	LT. BRN	
SAND W/ LITTLE	32	48	LT. BRN	
SAND W/ LITTLE	48	62	LT. BRN	
SAND F MOIST THEN	62	67	GRY/BRN	

Remarks

M.G.S. NO. 3794. SEE DETAILED SOIL BORING.

BORING BACKFILLED WITH NEAT CEMENT GROUT TO 3 FT. FROM LAND SURFACE.

Well Depth	Depth Completed	Date Well Completed
67 ft.	67 ft.	08/03/1987

Drill Method **Drill Fluid**

Use test well **Status** Active

Well Hydrofractured? **Yes** ☐ **No** ☐ **From** **To**

Casing Type **Joint**
Drive Shoe? **Yes** ☐ **No** ☐ **Above/Below**

Open Hole From ft. To ft.

Screen? ☐ **Type** **Make**

Static Water Level

Pumping Level (below land surface)

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
neat cement		3 ft.	67 ft.
cuttings		ft.	3 ft.

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Manufacturer's name

Model Number HP Volt

Length of drop pipe ft Capacity g.p. Typ

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous

First Bedrock Aquifer

Last Strat sand Depth to Bedrock ft

Located by Minnesota Geological Survey

Locate Method Digitization (Screen) - Map (1:24,000)

System UTM - NAD83, Zone 15, Meters X 462862 Y 5007464

Unique Number Verification Site Plan Input Date 12/23/2008

Angled Drill Hole

Well Contractor

Twin City Testing M0112

Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

242257

County Hennepin
Quad Anoka
Quad ID 120B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 12/23/2008
Update Date 09/01/2015
Received Date

Well Name	Township	Range	Dir	Section	Subsection
DAYTON -	120	22	W	9	DBAABC

Elevation 917 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
SILTY CLAY DARK	0	3	GRY/BRN	MEDIUM
LEAN CLAY	3	9	VARIED	
SANDY LEAN CLAY W/	9	14	BRN/GRY	MEDIUM
SANDY LEAN CLAY W/	14	28	BRN/GRY	
CLAYEY SAND W/	28	33	BRN/GRY	
SAND F, MOIST, M	33	42	LT. BRN	

Remarks

M.G.S. NO. 3797. SEE DETAILED SOIL BORING.

BORING BACKFILLED WITH NEAT CEMENT GROUT TO 3 FT. FROM LAND SURFACE.

Well Depth	Depth Completed	Date Well Completed
42 ft.	42 ft.	08/07/1987

Drill Method **Drill Fluid**

Use test well **Status** Active

Well Hydrofractured? **Yes** ☐ **No** ☐ **From** **To**

Casing Type **Joint**
Drive Shoe? **Yes** ☐ **No** ☐ **Above/Below**

Open Hole From ft. To ft.

Screen? ☐ **Type** **Make**

Static Water Level

Pumping Level (below land surface)

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☐ Yes ☐ No ☐ Not Specified

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Manufacturer's name

Model Number HP Volt

Length of drop pipe ft Capacity g.p. Typ

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous

First Bedrock Aquifer

Last Strat sand-brown Depth to Bedrock ft

Located by Minnesota Geological Survey

Locate Method Digitization (Screen) - Map (1:24,000)

System UTM - NAD83, Zone 15, Meters X 463179 Y 5007106

Unique Number Verification Site Plan Input Date 12/23/2008

Angled Drill Hole

Well Contractor

Twin City Testing M0112

Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

242258

County Hennepin
Quad Anoka
Quad ID 120B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 12/23/2008
Update Date 11/03/2015
Received Date

Well Name	Township	Range	Dir	Section	Subsection
DAYTON -	120	22	W	9	CABCCB

Elevation 914 ft. **Elev. Method** Surveyed

Address

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
NO SAMPLES	0	5		
CLAYEY SAND W/	5	17	BROWN	
SAND W/ SILT LITTLE	17	23	LT. BRN	
CLAYEY SAND W/	23	27	GRAY	
SAND W/ SILT LITTLE	27	32	BROWN	

Remarks

M.G.S. NO. 3798. SEE DETAILED SOIL BORING.

BORING BACKFILLED WITH NEAT CEMENT GROUT TO 3 FT. FROM LAND SURFACE.

Well Depth	Depth Completed	Date Well Completed
32 ft.	32 ft.	10/01/1987

Drill Method **Drill Fluid**

Use test well **Status** Active

Well Hydrofractured? **Yes** ☐ **No** ☐ **From** **To**

Casing Type **Joint**
Drive Shoe? **Yes** ☐ **No** ☐ **Above/Below**

Open Hole From ft. To ft.

Screen? ☐ **Type** **Make**

Static Water Level

Pumping Level (below land surface)

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
neat cement		3 ft.	32 ft.
cuttings		ft.	3 ft.

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed

Manufacturer's name

Model Number HP Volt

Length of drop pipe ft Capacity g.p. Typ

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous

First Bedrock Aquifer

Last Strat sand+silt-brown Depth to Bedrock ft

Located by Minnesota Geological Survey

Locate Method Digitization (Screen) - Map (1:24,000)

System UTM - NAD83, Zone 15, Meters X 462491 Y 5006990

Unique Number Verification Site Plan Input Date 12/23/2008

Angled Drill Hole

Well Contractor

Twin City Testing M0112

Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

416179

County Hennepin
Quad Anoka
Quad ID 120B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 08/24/1991
Update Date 03/21/2017
Received Date

Well Name	Township	Range	Dir	Section	Subsection
GUIMONT,	120	22	W	9	BABCBD

Elevation 902 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W 15501 DAYTON RIVER RD DAYTON MN 55327

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	1	BLACK	
CLAY & SAND	1	22	TAN	
SANDY CLAY	22	24	TAN	
GRAVEL	24	67	TAN	
FINE SAND	67	73	BROWN	
CLAY & GRAVEL	73	165	BROWN	
CLAY	165	178	GRAY	
CLAY & GRAVEL	178	206	BROWN	
SHALE	206	244	WHT/YEL	
SANDSTONE & SHALE	244	251	TAN/WHT	SOFT
SANDSTONE SHALE	251	258	WHITE	
SHALE & SANDSTONE	258	295	WHT/BLU	

Remarks

Well Depth	Depth Completed	Date Well Completed
295 ft.	295 ft.	12/05/1986

Drill Method Non-specified Rotary **Drill Fluid**

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint** Threaded
Drive Shoe? Yes ☒ No ☐ **Above/Below** 1 ft.

Casing Diameter	Weight	Hole Diameter
4 in. To 260 ft.	10.7 lbs./ft.	4 in. To 295 ft.

Open Hole From 260 ft. To 295 ft.

Screen? ☐ **Type** **Make**

Static Water Level
65 ft. land surface Measure 12/05/1986

Pumping Level (below land surface)
90 ft. 2 hrs. Pumping at 50 g.p.m.

Wellhead Completion
Pitless adapter manufacturer BAKER Model SNAPPY
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
bentonite		0 ft.	259 ft.

Nearest Known Source of Contamination
100 feet Southeas Direction Septic tank/drain field Type
Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 12/09/1986
Manufacturer's name GRUNDFOS
Model Number SP2-12 HP 0.5 Volt 115
Length of drop pipe 90 ft Capacity 12 g.p. Typ Submersible

Abandoned
Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous
First Bedrock St.Lawrence-Tunnel City Aquifer Tunnel City
Last Strat Tunnel City Group Depth to Bedrock 206 ft
Located by Minnesota Geological Survey
Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)
System UTM - NAD83, Zone 15, Meters X 462493 Y 5007815
Unique Number Verification Information from Input Date 01/01/1990

Angled Drill Hole

Well Contractor

Licensee Business	Lic. or Reg. No.	Name of Driller
Renner E.H. Well	71015	ROSGA, T.

Minnesota Well Index Report | **416179** | Printed on 09/20/2017 HE-01205-15

Minnesota Unique Well Number

488761

County Hennepin
Quad Anoka
Quad ID 120B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 12/30/1993
Update Date 03/21/2017
Received Date 04/01/1992

Well Name	Township	Range	Dir	Section	Subsection
DAHLHEINER,	120	22	W	9	CBBBBB

Elevation 923 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

Well 14700 VICKSBERG LA DAYTON MN 55327

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
CLAY	0	30	YELLOW	MEDIUM
SAND	30	40	YELLOW	SOFT
CLAY & SAND	40	103	YEL/BRN	MEDIUM
CLAY	103	122	RED/BRN	MEDIUM
SAND	122	126	BROWN	SOFT
CLAY	126	165	BROWN	MEDIUM
SHALE & SAND YEL	165	219	VARIED	SFT-HRD
SHALE & SANDROCK	219	260	VARIED	HARD

Remarks

Well Depth 260 ft. **Depth Completed** 260 ft. **Date Well Completed** 02/18/1992

Drill Method Non-specified Rotary **Drill Fluid** Qwik gel

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? Yes ☒ No ☐ **Above/Below** 1 ft.

Casing Diameter	Weight	Hole Diameter
4 in. To 222 ft.	11 lbs./ft.	8 in. To 30 ft.
		6.5 in. To 222 ft.
		4 in. To 260 ft.

Open Hole From 222 ft. To 260 ft.

Screen? ☐ **Type** **Make**

Static Water Level
77 ft. land surface Measure 02/18/1992

Pumping Level (below land surface)
100 ft. 3 hrs. Pumping at 40 g.p.m.

Wellhead Completion
Pitless adapter manufacturer WHITEWATER Model SU5.5
☐ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
bentonite		ft.	222 ft.

Nearest Known Source of Contamination
60 feet South Direction Septic tank/drain field Type
Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 02/22/1992
Manufacturer's name TEEL 9 (OWNERS)
Model Number HP 0.5 Volt 230
Length of drop pipe 100 ft Capacity 12 g.p. Typ Submersible

Abandoned
Does property have any not in use and not sealed well(s)? ☒ Yes ☐ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous
First Bedrock Jordan-St.Lawrence Aquifer St.Lawrence-
Last Strat St.Lawrence-Tunnel City Depth to Bedrock 165 ft
Located by Minnesota Geological Survey
Locate Method Digitization (Screen) - Map (1:24,000)
System UTM - NAD83, Zone 15, Meters X 462108 Y 5007150
Unique Number Verification Address verification Input Date 07/15/2008

Angled Drill Hole

Well Contractor

Licensee Business	Lic. or Reg. No.	Name of Driller
Mc Alpine's Well Co.	27186	MCALPINE, T.

Minnesota Unique Well Number

506539

County Hennepin
Quad Anoka
Quad ID 120B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 12/04/1991
Update Date 04/01/2016
Received Date 09/21/1989

Well Name	Township	Range	Dir	Section	Subsection
DAHLHIEMER,	120	22	W	8	ADDCAC

Elevation 923 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

Well 14747 VICKSBURG LA DAYTON MN 55327

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
CLAY	0	25	YELLOW	SOFT
SAND & CLAY	25	35	YELLOW	SOFT
CLAY	35	54	YELLOW	SOFT
SAND & GRAVEL	54	68	YELLOW	SOFT
CLAY	68	125	RED/BRN	MEDIUM
CLAY & ROCKS	125	135	BROWN	HARD
SHALE & SANDROCK	135	211	YEL/WHT	MEDIUM
SHALE & SANDROCK	211	260	VARIED	HARD

Remarks

Well Depth 260 ft. **Depth Completed** 260 ft. **Date Well Completed** 08/28/1989

Drill Method Non-specified Rotary **Drill Fluid** Qwik gel

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint**
Drive Shoe? Yes ☒ No ☐ **Above/Below** 1 ft.

Casing Diameter	Weight	Hole Diameter
4 in. To 214 ft.	11 lbs./ft.	6 in. To 214 ft.
		4 in. To 260 ft.

Open Hole From 214 ft. To 260 ft.

Screen? ☐ **Type** **Make**

Static Water Level
68 ft. land surface Measure 08/28/1989

Pumping Level (below land surface)
78 ft. 3 hrs. Pumping at 50 g.p.m.

Wellhead Completion
Pitless adapter manufacturer WHITEWATER Model SU5.5
☐ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
bentonite		ft. 214	ft.
neat cement		ft.	ft.

Nearest Known Source of Contamination
75 feet Southwes Direction Septic tank/drain field Type
Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 08/29/1989
Manufacturer's name AERMOTOR
Model Number SD1275 HP 0.75 Volt 230
Length of drop pipe 100 ft Capacity 12 g.p. Typ Submersible

Abandoned
Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous
First Bedrock Jordan Sandstone Aquifer St.Lawrence-
Last Strat St.Lawrence-Tunnel City Depth to Bedrock 135 ft
Located by Minnesota Geological Survey
Locate Method Digitization (Screen) - Map (1:24,000)
System UTM - NAD83, Zone 15, Meters X 461965 Y 5007231
Unique Number Verification Address verification Input Date 07/18/2008

Angled Drill Hole

Well Contractor
Mc Alpine's Well Co. 27186 MCALPINE, T.
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

563482

County Hennepin
Quad Anoka
Quad ID 120B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 12/12/1996
Update Date 04/01/2016
Received Date 08/14/1995

Well Name	Township	Range	Dir	Section	Subsection
KLOSTERMAN,	120	22	W	8	ADABCB

Elevation 929 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

Well 14847 VICKSBURG LA DAYTON MN 55327

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
CLAY	0	27	YELLOW	SOFT
CLAY & SAND	27	106	BROWN	SOFT
CLAY & SAND	106	119	DK. BRN	M.HARD
CLAY & GRAVEL RED	119	135	VARIED	HARD
ROCKS, GRAVEL &	135	195	VARIED	HARD
SHALE & SANDROCK	195	254	VARIED	HARD

Remarks

Well Depth	Depth Completed	Date Well Completed
254 ft.	254 ft.	08/03/1995

Drill Method Non-specified Rotary **Drill Fluid** Qwik gel

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint** Threaded
Drive Shoe? Yes ☒ No ☐ **Above/Below**

Casing Diameter	Weight	Hole Diameter
4 in. To 202 ft.	11 lbs./ft.	6.2 in. To 202 ft.
		4 in. To 254 ft.

Open Hole From 202 ft. To 254 ft.

Screen? ☐ **Type** **Make**

Static Water Level
65 ft. land surface Measure 08/03/1995

Pumping Level (below land surface)
100 ft. 5 hrs. Pumping at 50 g.p.m.

Wellhead Completion
Pitless adapter manufacturer MERRILL Model SPK5.5
☐ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
cuttings		30 ft.	254 ft.
bentonite	2 Sacks	ft.	30 ft.

Nearest Known Source of Contamination
50 feet Northwes Direction Septic tank/drain field Type
Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 08/08/1995
Manufacturer's name AERMOTOR
Model Number 12T75 HP 0.75 Volt 230
Length of drop pipe 100 ft Capacity 12 g.p. Typ Submersible

Abandoned
Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous
First Bedrock Jordan-Tunnel City Aquifer Jordan-Tunnel
Last Strat Jordan-Tunnel City Depth to Bedrock 195 ft
Located by Minnesota Geological Survey
Locate Method Digitization (Screen) - Map (1:24,000)
System UTM - NAD83, Zone 15, Meters X 461916 Y 5007505
Unique Number Verification Address verification Input Date 07/15/2008

Angled Drill Hole

Well Contractor
Mc Alpine's Well Co. 27186 MCALPINE, S.
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

690420

County Hennepin
Quad Anoka
Quad ID 120B

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
Minnesota Statutes Chapter 1031

Entry Date
Update Date 08/12/2008
Received Date 04/11/2003

Well Name	Township	Range	Dir	Section	Subsection
LAUREL TREE	120	22	W	5	DDCCCD

Elevation 883 ft. **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

Well 16301 DAYTON RIVER RD DAYTON MN 55327

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
CLAY	0	18	YELLOW	MED-HRD
SAND	18	42	BROWN	SOFT
COARSE GRAVEL	42	50	BRN/BLK	SFT-MED
CLAY & GRAVEL	50	65	GRY/BLK	SOFT
CLAY & GRAVEL	65	74	GRY/BLK	SOFT
CLAY	74	80	RED/BRN	MEDIUM
CLAY, GRAVEL & ROCK	80	137	BRN/BLK	SFT-HRD
SAND BRN, YEL, &	137	156	VARIED	M.HARD

Remarks

Well Depth	Depth Completed	Date Well Completed
156 ft.	156 ft.	03/14/2003

Drill Method Non-specified Rotary **Drill Fluid** Qwik gel

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint** Welded
Drive Shoe? Yes ☐ No ☐ **Above/Below**

Casing Diameter	Weight	Hole Diameter
4 in. To 137 ft.	lbs./ft.	6.5 in. To 148 ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** stainless **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set	
2 in.	10	8 ft.	148 ft.	156 ft.

Static Water Level
40 ft. land surface Measure 03/14/2003

Pumping Level (below land surface)
80 ft. 2 hrs. Pumping at 50 g.p.m.

Wellhead Completion
Pitless adapter manufacturer MERRILL Model MCK6.5
☒ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
high solids bentonite	2 Sacks	0 ft.	30 ft.
cuttings		30 ft.	148 ft.

Nearest Known Source of Contamination
50 feet Northwes Direction Septic tank/drain field Type
Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 03/17/2003
Manufacturer's name AERMOTOR
Model Number 12T75 HP 0.75 Volt 230
Length of drop pipe 80 ft Capacity 12 g.p. Typ Submersible

Abandoned
Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☒ No

Miscellaneous
First Bedrock Aquifer Quat. buried
Last Strat sand Depth to Bedrock ft
Located by Minnesota Geological Survey
Locate Method Digitization (Screen) - Map (1:24,000)
System UTM - NAD83, Zone 15, Meters X 461745 Y 5007979
Unique Number Verification Address verification Input Date 07/10/2008

Angled Drill Hole

Well Contractor
McAlpine Well Drilling 27695 MCALPINE, T.
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

745313

County Hennepin
Quad Anoka
Quad ID 120B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 07/19/2007
Update Date 12/02/2014
Received Date 12/28/2006

Well Name	Township	Range	Dir	Section	Subsection
FAUSTAD	120	22	W	9	ACDDCC

Elevation 924 ft. **Elev. Method** LiDAR 1m DEM (MNDNR)

Address

Well 14771 DAYTON RIVER RD DAYTON MN 55327

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
CLAY	0	37	BRN/YEL	MED-HRD
CLAY & SAND	37	43	BROWN	SOFT
SAND	43	70	BROWN	SOFT
CLAY, GRAVEL, SAND	70	142	BRN/BLK	SFT-HRD
CLAY & SAND	142	150	BROWN	SFT-HRD
SAND	150	160	BRN/YEL	MED-HRD
CLAY	160	165	YELLOW	MED-HRD
SAND	165	182	BRN/WHT	MEDIUM

Remarks

Well Depth 182 ft. **Depth Completed** 182 ft. **Date Well Completed** 10/30/2006

Drill Method Non-specified Rotary **Drill Fluid** Qwik gel

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint** Welded
Drive Shoe? Yes ☐ No ☐ **Above/Below**

Casing Diameter	Weight	Hole Diameter
4 in. To 174 ft.	lbs./ft.	6.5 in. To 174 ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** stainless **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set	
2 in.	10	8 ft.	174 ft.	182 ft.

Static Water Level

77 ft. land surface Measure 11/22/2006

Pumping Level (below land surface)

120 ft. 4 hrs. Pumping at 40 g.p.m.

Wellhead Completion

Pitless adapter manufacturer MERRILL Model MCK6

☒ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
cuttings		30 ft.	174 ft.
bentonite	3 Sacks	ft.	30 ft.

Nearest Known Source of Contamination

50 feet South Direction Septic tank/drain field Type

Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 11/22/2006

Manufacturer's name AERMOTER

Model Number S20-150 HP 1.5 Volt 230

Length of drop pipe 120 ft Capacity 20 g.p. Typ Submersible

Abandoned

Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

Variance

Was a variance granted from the MDH for this well? ☐ Yes ☒ No

Miscellaneous

First Bedrock Jordan Sandstone Aquifer Jordan

Last Strat Jordan Sandstone Depth to Bedrock 165 ft

Located by Minnesota Geological Survey

Locate Method GPS SA Off (averaged)

System UTM - NAD83, Zone 15, Meters X 463218 Y 5007170

Unique Number Verification Address verification Input Date 10/21/2014

Angled Drill Hole

Well Contractor

McAlpines Well Drilling of 1477 MCALPINE, T.

Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Well Index Report | **745313** | Printed on 09/20/2017

HE-01205-15

APPENDIX

C

STATE HISTORIC PRESERVATION OFFICE LETTER

Appendix “C” contains the State Historic Preservation Office Letter.

From: Jesse Kling <jesse.kling@mnhs.org>
Sent: Thursday, September 28, 2017 12:14 PM
To: Data Requests to SHPO
Cc: Michele Ross
Subject: Re: Cultural Recourse Consultation - North Dayton Development
Attachments: HennepinArchaeology2.rtf

THIS EMAIL IS NOT A PROJECT CLEARANCE.

This message simply reports the results of the cultural resources database search you requested. The database search produced results for only previously known archaeological sites and historic properties. Please read the note below carefully.

No historic structures were identified in a search of the Minnesota Archaeological Inventory and Historic Structures Inventory for the search area requested. **A report containing the archaeological sites identified is attached.**

The result of this database search provides a listing of recorded archaeological sites and historic architectural properties that are included in the current SHPO databases. Because the majority of archaeological sites in the state and many historic architectural properties have not been recorded, important sites or structures may exist within the search area and may be affected by development projects within that area. Additional research, including field survey, may be necessary to adequately assess the area's potential to contain historic properties.

Properties that are listed in the National Register of Historic Places (NRHP) or have been determined eligible for listing in the NRHP are indicated on the reports you have received. The following codes on the reports you received are:

NR – National Register listed. The properties may be individually listed or may be within the boundaries of a National Register District.

CEF – Certified Eligible to the National Register findings are usually made during the federal review process, these properties have been evaluated as being eligible for listing in the National Register.

SEF – Staff eligible findings to the National Register are properties that have been determined eligible by SHPO staff.
DOE – Determination of Eligibility is made by the National Park Service and typically refers to properties deemed eligible but the owner objects to the listing.

CNEF – Certified Not Eligible to the National Register. SHPO has begun to record properties that have been evaluated as **not eligible** for listing in the National Register. If the box on the form has a check the property has been determined to be **not eligible.**

Properties without **NR, CEF, SEF, DOE, or CNEF** designations in the reports you received may not have been evaluated and therefore no assumption to their eligibility can be made.

If you require a comprehensive assessment of a project's potential to impact archaeological sites or historic architectural properties, you may need to hire a qualified archaeologist and/or historian. If you need assistance with a project review, please contact Kelly Gragg-Johnson in Review and Compliance @ 651-259-3455 or by email at kelly.graggjohnson@mnhs.org.

The Minnesota SHPO Survey Manuals and Database Metadata can be found at
http://www.mnhs.org/shpo/survey/inventories.htm
SHPO research hours are 8:30 AM – 4:00 PM Tuesday-Friday.

The Office is closed on Mondays.

On Thursday, September 28, 2017 at 11:54:05 AM UTC-5, Michele Ross wrote:

I am preparing a scoping EAW for an AUAR in the City of Dayton, MN in Hennepin County and am requesting a cultural resources review for the site to inform the impact analysis. The proposed North Dayton Development project would entail the development of approximately 560 acres within the City of Dayton, MN. The land in question is generally located north of North Diamond Lake Road, south of Dayton River Road, east of the Daytona Golf Club, and west of Oxbow Lane and the adjacent farmstead. The site currently consists primarily of open farm fields, homesteads, wooded areas and wetlands. Complete development of the site would result in multi-phased development consisting primarily of single family residential surrounding a core of mixed-use development. The development density is expected to average approximately 3 units per acre, with 1,500 to 1,700 single-family residential homes and approximately 50 acres of mixed-use development. Parcels are : 08-120-22-12-0001; 08-120-22-13-0001; 08-120-22-11-0006; 08-120-22-11-0004; 08-120-22-14-0002; 08-120-22-14-0001; 08-120-22-41-0001; 08-120-22-42-0001; 09-120-22-23-0003; 09-120-22-32-0001; 09-120-22-32-0002; 09-120-22-21-0005; 09-120-22-24-0001; 09-120-22-31-0001; 09-120-22-12-0004; 0-9120-22-13-0001 and I've also attached a map. Furthermore the site is located in Sections 8 and 9, Range 22 of Township 120. Thank you!

Michele Ross
Associate Planner
C 612.607.3542 **E** MRoss@sambatek.com

Engineering | Surveying | Planning | Environmental

Archaeological Site Locations

Site Number	Site Name	Twp.	Range	Sec.	Quarter Sections	Acres	Phase	Site Description	Tradition	Context	Reports	NR	CEF	DOE
County:	**Hennepin**													
21HE0326	Dayton A	120	22	9	NE-NW-NE	3	1	LS						
21HE0327	Dayton B	120	22	9	SE-NE-SW	0.1	1	SA						
21HE0328	Dayton D	120	22	9	NE-SE-SE	9	1	LS						

APPENDIX

D

TRAFFIC STUDY

Appendix “D” contains the Traffic Study.

Spack CONSULTING
ENGINEERING TRAFFIC FORWARD

Traffic Impact Study

NORTH DAYTON DEVELOPMENT
DAYTON, MINNESOTA

I hereby certify this report was prepared by me or under my direct supervision, and I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

By: _____
Bryant Ficek, P.E.
License No. 42802

Date: 06/26/2018

Executive Summary

Background:

A 560-acre single family residential development is proposed on the south side of Dayton River Road around the area of Vicksburg Lane and River Hills Parkway in Dayton, Minnesota. The purpose of this study is to determine the traffic impacts associated with the build-out of the proposed development on the study roads and intersections where significant impact is anticipated.

Results:

The principal findings of this study for the 2025 analysis year are:

- The proposed North Dayton Site development is expected to generate similar traffic compared to the 2030 Future Land Use plan, with 4,882 trips compared to approximately 4,820 trips during an average weekday (assuming 1/3 of the total residential units are developed).
- The peak hour trip generation is also similar between the two different land use options.
- The TH 169 and CSAH 81 corridors are currently at or over the planning-level capacities for their types of facilities and volumes are expected to continue to increase into the future.
- Due to background growth, other area developments, and the proposed North Dayton site, corridor volumes on 141st Avenue near Brockton Lane are close to its nearing-capacity planning level.
- Similarly, the intersections of Dayton River Road/TH 169, N Diamond Lake Road/Brockton Lane operate with failing delays by the 2025 No-Build scenarios while Dayton River Road/Pineview Lane operates with failing delays or queuing by 2025 Build scenario.

Additional analysis was completed for the year 2040 with the following findings:

- The proposed North Dayton Site development is expected to generate significantly less traffic compared to the 2030 Future Land Use plan, 16,820 trips compared to approximately 20,822 trips during an average weekday.
- The peak hour trip generation has a similar comparison with the proposed North Dayton plan generating about 15% less traffic than would be expected under the 2030 Land Use plan.
- Additional roadway upgrades are expected by 2040 including the I-94 interchange connecting I-94, CSAH 81, French Lake Road, Brockton Lane, and Zanzibar Lane.
- The TH 169 and CSAH 81 corridors will continue to operate above capacity as volumes from general growth, specific development in the area, and this proposed North Dayton development contribute to higher volumes.
- Dayton River Road, Brockton Lane, and 141st Avenue begin to see volumes close to or just above the nearing congestion range under the 2040 Build scenarios.
- Dayton River Road/TH 169 operates with failing LOS delays under the expanded configuration by the 2040 No-Build Scenario. Further expansion may not be feasibly due to adjacent developments and the roadways proximity to the northern river crossing.
- S Diamond Lake Road/Pineview Lane, Dayton River Road/S Diamond Lake Road, Dayton River Road/Brockton Lane, and 129th Avenue/Pineview Lane experience failing operations by the 2040 No-Build scenario.
- N Diamond Lake Road/Brockton Lane, Dayton River Road/Pineview Lane, Dayton River Road/N Diamond Lake Road, and N Diamond Lake Road/Zanzibar Lane experience failing operations by the 2040 Build scenarios.

Recommendations:

Due to general background growth and adjacent specific developments, the following mitigation is recommended with or without the proposed North Dayton development for the year 2025:

- Continue to explore options for corridor improvements on the TH 169 and CSAH 81 corridor with other agencies.
- Re-stripe the Dayton River Road approach to TH 169 to provide dual left turn lanes, a left turn/through lane, and a right turn lane. Additional pavement on northbound TH 169 will be needed.
- Update signal timing at all signalized intersections at least every three to five years.
- Construct a single-lane roundabout with reserved right-of-way for future right turn lanes or a traffic signal with dedicated turn lanes at the N Diamond Lake Road/Brockton Lane intersection.

Accounting for additional traffic from the proposed development, the following mitigation will also be necessary to accommodate the full projected 2025 volumes:

- Construct a single-lane roundabout with reserved right-of-way for future right turn lanes or a traffic signal with dedicated turn lanes at the Dayton River Road/Pineview Lane intersection.

For intersections where a roundabout or a traffic signal is proposed, a detail Intersection Control Evaluation will be necessary. This document will evaluate the two control options and document the decision for which option is ultimately constructed. For the purposed of this document, roundabouts are the preferred option.

Beyond year 2025, the long-range time frame and uncertainty of potential developments, roadway network, and travel patterns result in multiple assumptions for this analysis. Due to this inherent uncertainty, year 2040 recommendations should not be constructed today. Instead, right-of-way should be preserved for these needs when required based on actual traffic growth.

The following modifications to the study roads and intersections, assuming the planned roadway network is implemented, are recommended for the year 2040 to address potential issues due to general background growth and other specific development traffic with or without the proposed North Dayton site:

- Continue to work on long-term solutions with other agencies to accommodate future congestion on the TH 169 and CSAH 81 corridors.
- Construct a multi-lane roundabout at the Dayton River Road/South Diamond Lake Road intersection, with two-lane Dayton River Road approaches or a traffic signal with dedicated turn lanes.
- Construct single-lane roundabouts or traffic signals with dedicated turn lanes at the intersections of 129th Avenue/Pineview Lane, Dayton River Road/Brockton Lane, and South Diamond Lake Road/Pineview Lane.
- Continue to update signal timing at all signalized intersections at least every three to five years.

With the North Dayton proposed development traffic contributing to the study area volumes, the following additional 2040 mitigation is recommended:

- Provide dedicated right turn lanes for the Dayton River Road/Pineview Lane intersection single-lane roundabout using the reserved right-of-way if a roundabout was constructed as part of the 2025 mitigation.
- Construct a single-lane roundabout or traffic signal with dedicated turn lanes at the N Diamond Lake Road/Zanzibar Lane intersection.
- Construct multi-lane roundabout at the Dayton River Road/N Diamond Lake Road intersection, with two-lane Dayton River Road approaches or a traffic signal with dedicated turn lanes.
- Provide dedicated right turn lanes for the N Diamond Lake Road/Brockton Lane intersection single-lane roundabout using the reserved right-of-way if a roundabout was constructed as part of the 2025 mitigation.

As before, for intersections where a roundabout or a traffic signal is proposed, a detail Intersection Control Evaluation will be necessary. This document will evaluate the two control options and document the decision for which option is ultimately constructed. For the purposed of this document, roundabouts are the preferred option.

In addition to these roadway improvements, the following items are also recommended based upon the traffic analysis for the proposed development:

- Reserve space, if necessary, for the future trail network in this area.
- Consider internal sidewalks/trails to connect to a future trail network and between the residential/commercial components of the proposed Developer's plan.
- Consider potential bicycle parking areas and other amenities (repair stations) on-site for when the future trail network is developed.
- Follow the requirements of the MnMUTCD for signing and striping.
- Work with the City, as necessary, in their continued dialogue with Metro Transit and Hennepin County on the potential expansion of the transit system.

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1. Introduction

a. Proposed Development

A 560-acre primarily single family residential development is proposed on the south side of Dayton River Road around the area of Vicksburg Lane and River Hills Parkway in Dayton, Minnesota. Following are key attributes of the proposed development:

i. Access to the site will be provided along Vicksburg Lane, Zanzibar Lane's future northern extension, a future north-south road between Dayton River Road and N Diamond Lake Road east of Vicksburg Lane, Lawndale Lane, and an additional north-south roadway proposed between Lawndale Lane and Vicksburg Lane per the concept development plan in the Appendix.

ii. The site's 2030 Future Land Use plan includes a mix of single-family residential homes, rowhomes or other multifamily units, and mixed-use commercial. This land use has a higher density than proposed by the developer.

iii. The proposed development's preferred land use plan decreases the number of rowhomes or other multifamily units and the commercial component.

iv. The development is expected to be one third (1/3) occupied by 2025 and fully built and occupied by 2040.

b. Purpose of Study

The purpose of this study is to determine the traffic impacts associated with the build out of the proposed development. The traffic impacts are studied on the roads and intersections where significant impact is anticipated and improvements are recommended where mitigation is needed. For those not familiar with the general concepts and terms associated with traffic engineering, *The Language of Traffic Engineering* guide is included in the Appendix.

c. Study Objectives

The objectives of this study are:

i. Document how the study intersections and roadways currently operate.

ii. Forecast the amount of traffic expected to be generated by the proposed development under each land use scenarios:
   a. Using the land uses designated in the 2030 Comprehensive Plan.
   b. Using the preferred build alternative proposed by the developer.

iii. Determine how the study intersections and roadways will operate in the future year 2025 (short-term) with and without the proposed development scenarios.

iv. Determine how the study intersections and roadways will operate in the future year 2040 (long-term) with and without the proposed development scenarios accounting for potential upgrades of the future roadway network.

v. Recommend appropriate mitigation if poor operations are identified.

The roadways corridors studied in this document, including those surrounding the proposed site, are:

- Dayton River Road
- South Diamond Lake Road
- North Diamond Lake Road
- US Trunk Highway (TH) 169
- Pineview Lane
- River Hills Parkway
- Vicksburg Lane
- Lawndale Lane
- Brockton Lane
- Zanzibar Lane
- Minnesota TH 101
- 141st Avenue
- 129th Avenue
- Hennepin County State Aid Highway (CSAH) 81

For the purposes of this traffic study, the study intersections near to the proposed development and where the greatest impact is expected were chosen for review and include:

- Dayton River Road/TH 169
- Dayton River Road/South Diamond Lake Road
- Dayton River Road/Pineview Lane
- Dayton River Road/North Diamond Lake Road
- Dayton River Road/River Hills Parkway
- Dayton River Road/Vicksburg Lane
- Dayton River Road/Lawndale Lane
- Dayton River Road/Brockton Lane
- South Diamond Lake Road/Pineview Lane
- North Diamond Lake Road/Zanzibar Lane
- North Diamond Lake Road/Lawndale Lane
- North Diamond Lake Road/Brockton Lane
- 141st Avenue/TH 101
- 129th Avenue/Pineview Lane
- Brockton Lane/CSAH 81
- Future Site Access Roads

It should be noted traffic expected from the proposed development will have minor impacts on other corridors and intersections beyond those studied here.

Furthermore, this study does not account for the existing roadway conditions such as pavement quality or appropriate drainage.

2. Existing Conditions

a. Corridor Characteristics

As mentioned, the proposed site is located on the south side of Dayton River Road surrounding Vicksburg Lane as seen in the concept plan in the Appendix. Table 1 shows the characteristics of the key roadway corridors around this site and within the study area.

Table 1 – Study Corridor Characteristics

Name	Designation[1]	Classification[2]	Speed Limit	Lanes	Fixed Route Transit[3]	Peds/ Bicycles
Dayton River Road	Hennepin CSAH 12	A Minor Connector	30 - 50 mph	2 Undivided	1 10-30 min	Trail on East & West Ends
South Diamond Lake Road	Local	B Minor Arterial	35 mph	2 Undivided	None	Trail
North Diamond Lake Road	Hennepin CSAH 144	A Minor Expander	50 mph	2 Undivided	None	None
TH 169	US TH 169	Principal Arterial	35 mph	4 Partially Divided	1 10-30 min	Sidewalks
Pineview Lane	Local	A Minor Connector	40 mph	2 Undivided	None	None
River Hills Parkway	Local	Local[4]	30 mph	2 Undivided	None	Sidewalk
Vicksburg Lane	Local	Future A Minor Connector	40 mph	2 Undivided	None	None
Lawndale Lane	Local	Collector	40 mph	2 Undivided	None	None
Brockton Lane	Hennepin CSAH 13	A Minor Reliever	50 - 55 mph	2 Undivided	None	None
Zanzibar Lane	Dayton MSAS 104	A Minor Connector	40 mph	2 Undivided	None	None
TH 101	Minnesota TH 101	Principal Arterial	55 - 65 mph	4 Divided	None	None
141st Avenue	Hennepin CSAH 144	A Minor Expander	40 - 50 mph	2 Undivided – 4 Divided	None	Trail near TH 101
129th Avenue	Hennepin CSAH 121	A Minor Connector	55 mph	2 Undivided	None	None
CSAH 81	Hennepin CSAH 81	A Minor Reliever	55 mph	2 Undivided	None	None

[1] TH = Trunk Highway, CSAH = County State Aid Highway, MSA = Municipal State Aid Route.
[2] Source: Dayton, MN 2030 Comprehensive Plan
[3] Number of routes around the proposed site followed by the frequency of transit service during the peak periods.
[4] Based on driveway accesses to roadway

b. Traffic Volumes

Intersection video was collected at the existing study intersections under normal weekday conditions in February 2018. Using these videos, 48-hour turning movement counts were obtained at the study intersections. The data from the two days was averaged to provide the base traffic for a "typical weekday". Due to current construction activities at the time of data collection, year 2016 counts at the Dayton River Road/TH 169 and Brockton Lane/CSAH 81 intersections were obtained for use in this study. Due to other recent studies within the last year, year 2017 counts at the South Diamond Lake Road/Pineview Lane and 129th Avenue/Pineview Lane intersections were obtained for use in this study.

The average a.m. and p.m. peak hours were found to be from 7:00 to 8:00 a.m. and 4:15 to 5:15 p.m. The "typical day" counts from these two peak hours were used at the study intersections for analysis. The turning movement count data from the counts are contained in fifteen-minute intervals in the Appendix.

Based on the "typical day" turning movement volumes, the current daily traffic volumes on each study corridor are shown in the Appendix.

3. Forecasted Traffic

a. Site Traffic Forecasting

A trip generation analysis was performed for the development site based on the rates and methods published in the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition*. The ITE manual compiles studies from across the country to provide a national average traffic generation for various land uses.

The resultant new trips generated by the proposed development are shown in Table 2 and Table 3. Table 2 shows the trip generation based on the 2030 Future Land Use plan, as specified in the City of Dayton's Comprehensive Plan. Table 3 shows the trip generation based on the preferred developer land use which includes single family homes, attached multifamily homes, and commercial developments.

Furthermore, it is assumed that for the year 2025 one third (1/3) of the development will be build and occupied with full development and occupation occurring by 2040 under both land use options. The 2025 partial development does not include the commercial components. A detailed trip generation table showing the exact breakdowns for both scenarios is provided in the Appendix.

As shown, the two land use plans are similar for the year 2025 development. Under full development in 2040, the proposed North Dayton site is expected to generate significantly less traffic compared to the 2030 Future Land Use plan. Based on these results only the developer preferred land use was analyzed as it represents the highest traffic generator case for the surrounding area.

Table 2 – 2030 Future Land Use Designation - New Trip Generation

Land Use Code	Description & Size	Daily		AM Peak Hour		PM Peak Hour	
		In	Out	In	Out	In	Out
210 - ITE	Single Family (318 units) (2025 1/3 build)	1,501	1,501	59	176	198	116
220 - ITE	Multifamily Housing (248 units) (2025 1/3 build)	909	909	26	88	88	51
820 - ITE	Commercial (0 KSF) (2025 not built yet)	0	0	0	0	0	0
TOTALS (2025 - 1/3 Build)		**2,410**	**2,410**	**85**	**264**	**286**	**167**
210 - ITE	Single Family (954 units) (2040 Full build)	4,503	4,503	176	529	595	349
220 - ITE	Multifamily Housing (745 units) (2040 Full build)	2,727	2,727	79	264	263	154
820 - ITE	Commercial (168.6 KSF) (2040 Full build)	3,181	3,181	98	60	308	334
TOTALS (2040 - Full build)		**10,411**	**10,411**	**353**	**853**	**1,166**	**837**

Table 3 – Preferred Land Use Designation – New Trip Generation

Land Use Code	Description & Size	Daily		AM Peak Hour		PM Peak Hour	
		In	Out	In	Out	In	Out
210 - ITE	Single Family (448 units) (2025 1/3 build)	2,115	2,115	83	249	279	164
220 - ITE	Multifamily Housing (89 units) (2025 1/3 build)	326	326	9	32	31	18
820 - ITE	Commercial (0 KSF) (not built yet)	0	0	0	0	0	0
TOTALS (2025 - 1/3 Build)		**2,441**	**2,441**	**92**	**281**	**310**	**182**
210 - ITE	Single Family (1,342 units) (2040 Full build)	6,334	6,334	248	745	837	492
220 - ITE	Multifamily Housing (267 units) (2040 Full build)	977	977	28	95	94	55
820 - ITE	Commercial (58.2 KSF) (2040 Full build)	1,099	1,099	34	21	106	115
TOTALS (2040 - Full build)		**8,410**	**8,410**	**310**	**861**	**1,037**	**662**

As the Preferred Land Use Designation is expected to generate slightly less traffic than the current 2030 Future Land Use Designation, only the Preferred Land Use is carried forward though the full forecasts and analyses. The 2030 Future Land Use with higher traffic could have additional impacts to the roadway system. However, since it is not a proposed plan, there is no reason to determine those added impacts.

A trip distribution pattern was developed for the generated traffic going to and from the proposed development. This pattern is based on the existing traffic volumes, site access, competing land uses, and access to the regional transportation system and was used in the 2025 future models. The general trip distribution pattern for this study is:

i. 20% of the generated traffic to/from the west on 141 Avenue, TH 81, and Interstate 94.
ii. 29% of the generated traffic to/from the north on TH 101, Dayton River Road, and TH 169.
iii. 28% of the generated traffic to/from the east/southeast on TH 81, TH 169, and Dayton River Road.
iv. 23% percent of the generated traffic to/from the south on Brockton Lane and Interstate 94.

Traffic generated by the site development was assigned to the area roadways per this distribution pattern. A detailed presentation of the trip distribution can be seen in the Appendix.

A second trip distribution was created assuming upgraded roadway configurations for the year 2040 which is discussed in 2040 Planned Roadway Network.

b. 2025 Non-Site Traffic Forecasting

Traffic forecasts were developed for the year 2025 No-Build Scenarios based on development staging plans from the City of Dayton. Using these plans the developments were sorted into several geographic areas and a trip generation analysis was done on each area. These trip generation tables can be seen in the Appendix. The generated trips for each of these areas was routed through the study area based on the 2025 trip distribution pattern, while factoring in the specific location for each area.

The majority of expected growth in the immediate area of Dayton is covered by the specific development staging plans detailed above. Beyond this specific growth, additional development in the surrounding region is expected to increase traffic through the study intersections. To account for this additional traffic growth, a generic background growth factor was added to the study intersections. Historic counts, the City's comprehensive plan traffic projections, and the MnDOT State Aid projection growth factor for Hennepin County were examined to determine the non-specific growth rate. These rates were adjusted down to reflect that a significant portion of this growth is reflected in the traffic for the specific developments.

Based on this information, and after discussion with the City, a two percent annual traffic increase was applied to all movements not directly entering or exiting any developments. These specific development movements were not increased as the trip generations completed for the development already accounted for the increase in vehicles expected along the development access roadways. An increase of ½-percent was added to the residential neighborhoods to the north of Dayton River Road where lack of available land and fully built residential parcels will result in lower increases in traffic growth. The ½-percent growth rate per year, through 2025, accounts for development of the few remaining parcels of land as well as a small increase in trips (no cut-through or commuter traffic in this area expected). These growth rates were applied to volume calculations.

Finally, after a review of additional studies near the project area, a lump sum increase in traffic was added to Brockton Lane/CSAH 81 traveling to and from the southern Rogers area. This traffic accounts for the expected developments just outside of our project model, but which are still expected to interact at Brockton Lane/CSAH 81 study intersection, the southern-most intersection in the traffic model.

c. 2040 Planned Roadway Network

Multiple changes to the roadway network in the study area are planned by the year 2040. These changes include a new interchange with Interstate 94 near the existing Holly Lane, an extension of French Lake Road to Brockton Lane, and re-routing and extension of 113th Avenue and TH 81 to Zanzibar Lane. Appendix F shows these planned roadway changes.

For the purposes of this study, these roadway changes were implemented for the 2040 analyses. Due to these changes, the trip distribution was adjusted to reflect new driving patterns that will certainly occur. These patterns include an increase in traffic from the south along Interstate 94 and a decrease in traffic along TH 169, TH 81, and Dayton River Road as vehicles shift to Interstate 94 from these routes. The trip distribution for the 2040 scenarios is:

i. 20% of the generated traffic to/from the west on 141 Avenue, TH 81, and Interstate 94.
ii. 27% of the generated traffic to/from the north on TH 101, Dayton River Road, and TH 169.
iii. 21% of the generated traffic to/from the east/southeast on TH 81, TH 169, and Dayton River Road.
iv. 32% percent of the generated traffic to/from the south on Brockton Lane and Interstate 94.

Traffic generated by the site development was assigned to the area roadways per this distribution pattern for the 2040 Build scenarios. The full detailed trip distribution percentages can be seen in the Appendix.

d. 2040 Non-Site Traffic Forecasting

Similar to the 2025 No-Build Scenarios, traffic forecasts were developed for 2040 based on the development plans from the City of Dayton. These new developments are located on the southwest corner of Dayton and do not cause significant impact to the traffic model roadways due to their geographic location and relation to major roadways. Based on this, the new trips were manually distributed to the sites through the roadway network. The Trip generation for the 2040 No-Build scenarios can be seen in the Appendix.

As with the 2025 scenario, growth in the surrounding region is expected beyond that specified for the City of Dayton. Therefore, the two percent annual growth rate was continued through the year 2040. The ½-percent growth rate used for the residential areas north of Dayton River Road were assumed to be fully built by this time and no additional growth was added.

Due to the planned changes to the roadway network in the area by 2040, additional modifications were made to the existing volumes in the study network. These adjustments were based upon a comparison of the existing and forecasted volumes from the December 2015 *Brockton Lane Area Transportation Study* as well as other previous traffic studies and considering likely travel patterns to the regional transportation system.

e. Total Traffic

Traffic forecasts were developed for the year 2025 and 2040 Build Scenarios by adding the traffic generated by the proposed development to the No-Build volumes. The resultant Build peak hour forecasts are shown in the Appendix under the capacity analysis section for each scenario.

4. Existing and 2025 Analyses

a. *Existing and 2025 Corridor Vehicular Analysis*

While many factors contribute to a road feeling congested, the two biggest factors are volume, how many vehicles are using the road, and capacity, how many vehicles the road can accommodate a day. Transportation professionals use these pieces of information to create a ratio of volume to capacity. For example, a road with a volume to capacity ratio of 1.0, where the traffic demand is nearly equal to the traffic supply, will feel congested to motorists.

Below is a rough guide of the daily traffic volumes different types of roads can accommodate based on Exhibits 16-16 and 12-39 of the *Highway Capacity Manual, 6th Edition*. If the Average Daily Traffic (ADT) volume on a roadway is below the threshold, then it is considered un-congested. If the daily volume falls inside the range, the road is almost congested, and if the daily volume is over the threshold the road is congested.

- 2-Lane (one in each direction with left turn lanes at busy intersections and coordinated signals), undivided street, are considered congested with a volume between 8,900 to 18,300 vehicles per day.
- 4-Lane, undivided street (two in each direction with left turn lanes at busy intersections and coordinated signals), – 18,600 to 36,800 vehicles per day.
- 6-Lane, divided street (three in each direction with left turn lanes at busy intersections and coordinated signals), – 29,100 to 55,300 vehicles per day.

The above capacities represent physical capacity in ideal roadway conditions. Research from UC Berkley, for example, indicates quality of life along a residential street is negatively impacted when the ADT exceeds 1,000 vehicles per day. Therefore, the 1,000 vehicle per day threshold is used for the capacity along neighborhood two lane roads even though its physical capacity is approximately ten times larger.

To provide an initial planning level screening, Chart 1 provides volume to capacity ratios of the study corridors during each of the study years to determine if any of the roadway corridors are candidates for additional through lanes.

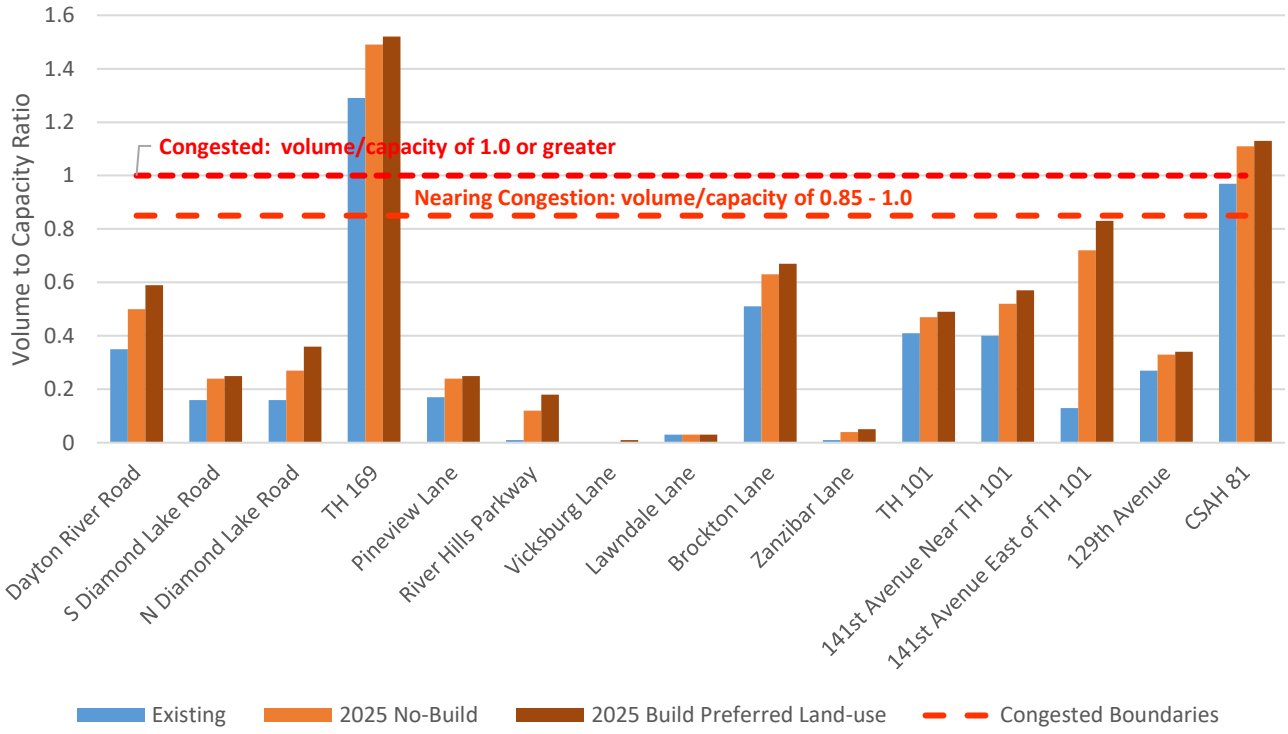

Chart 1 – Study Corridor Volume to Capacity

As Chart 1 shows, all roadways are under their 85% planning level volumes through the 2025 build scenario with the exception of TH 169 and CSAH 81. These two roadways are projected to fall above the planning-level capacity by 2025 with TH 169 currently operating above a volume/capacity ratio of 1.0 and CSAH 81 experiencing volumes within the nearing congestion level. Both corridors are known for having higher than preferred volume to capacity ratios and will require mitigation to improve overall vehicle flow.

The TH 169 and CSAH 81 corridors are recognized by MnDOT, Hennepin County, and several cities as becoming increasingly congested in the future. Neither MnDOT nor Hennepin County have current plans for expansion due to funding constraints. However, various improvements to adjacent collector roads and at-grade intersections will continue to be necessary to maintain acceptable corridor operations. The City of Dayton is recommended to continue to work with these and other agencies to identify spot improvements and long-term upgrades for safe and acceptable operations into the future.

River Hills Parkway is also worth mentioning as a unique situation. Based on the provided preliminary access sketches, River Hills Parkway will act as an additional access to the North Dayton site with a future east/west connection being added to the middle of the roadway. This will provide access to future western developments and eventual connect to Lawndale Lane. This layout results in an increase in through vehicles along River Hills Parkway due to north-westbound vehicles

destined for the North Dayton development. As River Hills Parkway is a two-lane roadway the daily volume capacity is up to 18,300 vehicles per day. However, as the road is a residential roadway a livability threshold of 1,000 vehicles can also be considered. This means that the roadway has sufficient capacity for the projected 2025 build volumes and issues are not expected due to traffic volumes. However, volumes may be higher than preferred by residents. Once additional accesses are added to the North Dayton site along N Diamond Lake Road, such as the northern Zanzibar Lane extension, these volumes are expected to decrease.

An additional planning level review of 70th Street and River Road north of the development and east of TH 101 was completed to determine if the existing two-lane configuration with by-pass lanes is sufficient for the expected 2025 volumes. With less than five percent of expected trip generation originating from this area, only minor increases in traffic are expected due to developments within Dayton. Based on MnDOT's most recent AADT counts, River Road carries roughly 5,300 vehicles a day with 70th Street carrying less than 1,000 vehicles per day. Based on the determined trip generation and a two percent per year traffic increase, both roadways are well below their planning level capacities even if all the generated traffic entering Dayton River Road from the north was condensed on either of the roadways.

b. Existing and 2025 Intersection Vehicular Analysis

Individual intersections can perform poorly during peak periods while the overall roadway corridor is operating with an uncongested daily volume to capacity ratio lower than 1.0. Therefore, capacity analyses are performed for the study intersections to determine if they need improvements such as turn lanes or an upgrade in traffic control.

The existing and forecasted turning movement volumes along with the existing intersection configurations and traffic control were used to develop the average delay per intersection in each study scenario. The delay calculations were done in accordance with the *Highway Capacity Manual, 6th Edition* using the Vistro software package. The full calculations for each study scenario, including Level of Service (LOS) grades and queue lengths, are included in the Appendix. Also, included in the Appendix is a guide explaining the Level of Service grade concept.

Chart 2 (a.m. peak hour) and Chart 3 (p.m. peak hour) show the average peak hour delay per traffic signal-controlled intersection for each study scenario. The LOS D/E boundary of 55 seconds of delay per vehicle is considered the threshold between acceptable and unacceptable traffic signal operation in Minnesota.

The initial signal timing for the existing conditions was provided by the County and MnDOT. Based on ITE's recommendation of updating traffic signal timing plans every three to five years, the signal timing plans used in the 2025 analysis models were optimized to best accommodate the forecasted traffic volumes.

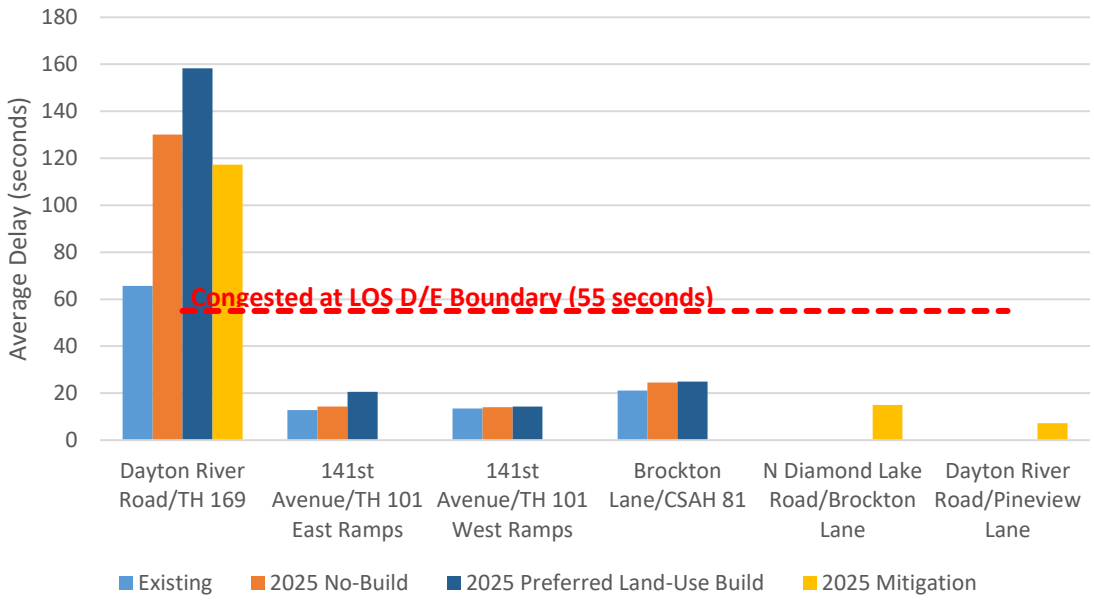

Chart 2 – A.M. Peak Hour Delays: Signal Controlled Intersections

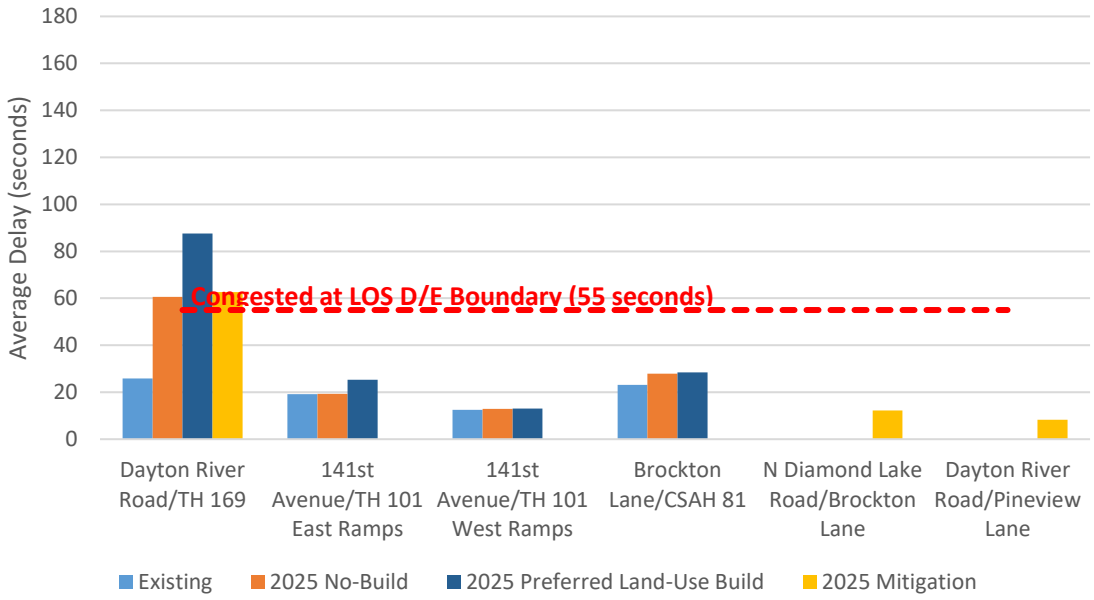

Chart 3 – P.M. Peak Hour Delays: Signal Controlled Intersections

As Chart 2 and Chart 3 show, the Dayton River Road/TH 169 experiences higher than preferred delays, even with the current improvements, currently operating at a LOS E and LOS C during the a.m. peak hour and p.m. peak hour, respectively. The a.m. peak hour begins to fail under the 2025 No-Build scenario. The addition of the North Dayton site increases these already failing delays.

Chart 4 (a.m. peak hour) and Chart 5 (p.m. peak hour) show the average peak hour delay per all-way stop sign and roundabout controlled intersections for each study

scenario. The LOS D/E boundary of 35 seconds of delay per vehicle is considered the threshold between acceptable and unacceptable all-way stop sign and roundabout controlled intersection operation in Minnesota. The *Highway Capacity Manual* sets the threshold lower at all-way stop signs and roundabouts then at traffic signal-controlled intersections based on motorists having more patience at a traffic signal and accepting longer delays.

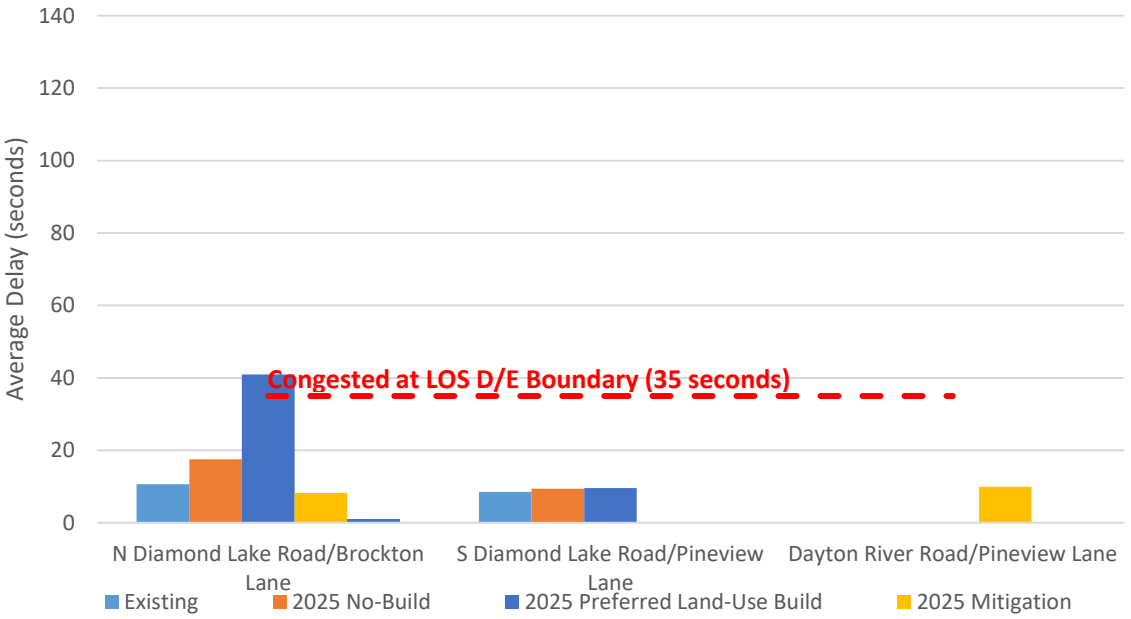

Chart 4 – A.M. Peak Hour Delays: All-Way Stop Sign/Roundabout Controlled Intersections

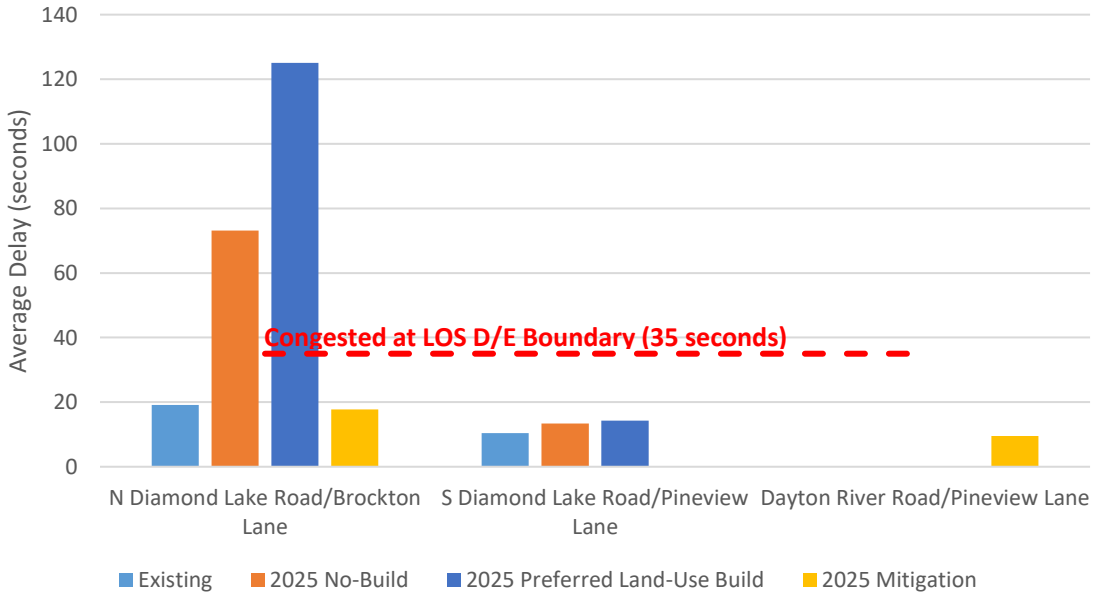

Chart 5 – P.M. Peak Hour Delays: All-Way Stop Sign/Roundabout Controlled Intersections

As Chart 4 and Chart 5 show, the N Diamond Lake Road/Brockton Road intersection begins to have excessive delays in the 2025 p.m. No-Build scenario, with a LOS F. The a.m. peak hour operation remains below the LOS D/E boundary up to the developer preferred land-use, where operations jump to a LOS E. These delays are due to an increase in through volumes on N Diamond Lake Road which can no longer be handled with the all-way stop controlled layout. Diamond Lake/Road/Pineview Lane operates acceptable through all 2025 peak periods and scenarios.

Chart 6 (a.m. peak hour) and Chart 7 (p.m. peak hour) show the 95th percentile queue lengths on the busiest stop sign controlled approach at intersections with side street stop sign control. Average delays are not calculated for intersections with side street stop sign control because the vast majority of vehicles going through the intersection are on the main roadway and have zero delay, which leads to low overall average delays. At side street stop sign controlled approaches to busy roadways, the average delay for all the vehicles on the approach often exceeds 60 seconds. This can be the case for a few vehicles waiting at the stop sign where improvements would not be justified for the low traffic volume.

Instead of reporting average approach delays like the previous charts, Charts 6 and Chart 7 show the 95th percentile queue as the measure of effectiveness at intersections with side street stop sign control. Based on our experience, improvements are not warranted at these types of intersections until the 95th percentile queue at a stop sign is in the five to ten vehicle range.

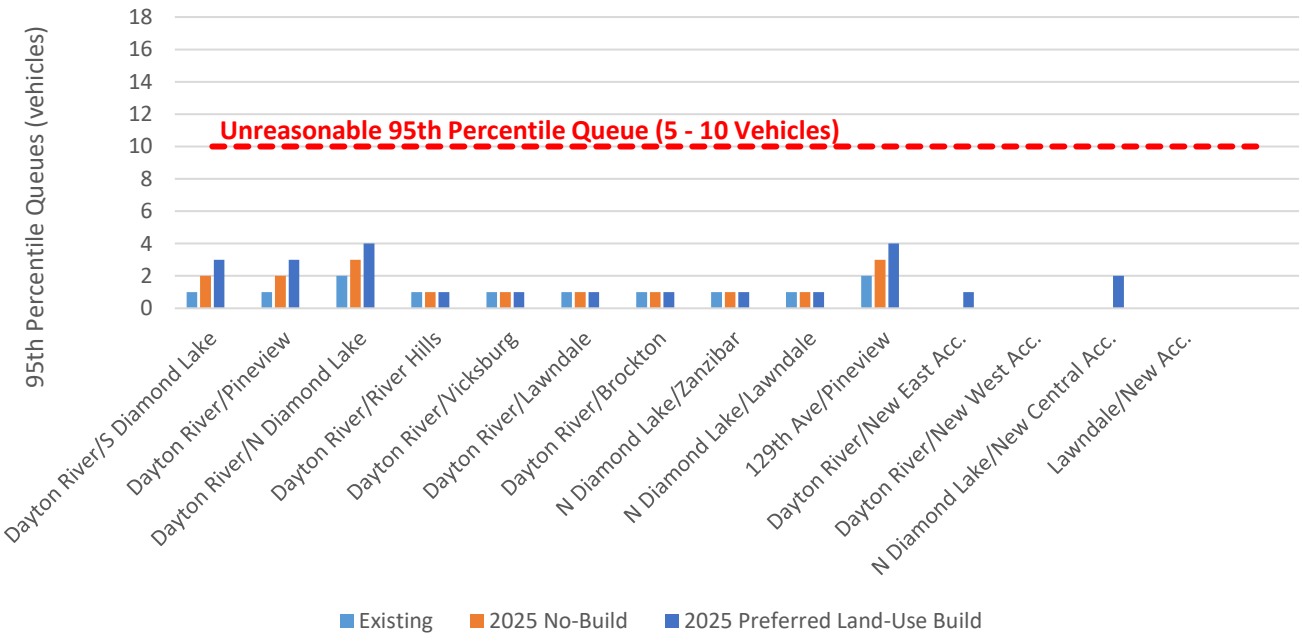

Chart 6 – A.M. Peak Hour Queues: Side Street Stop Sign Controlled Intersections

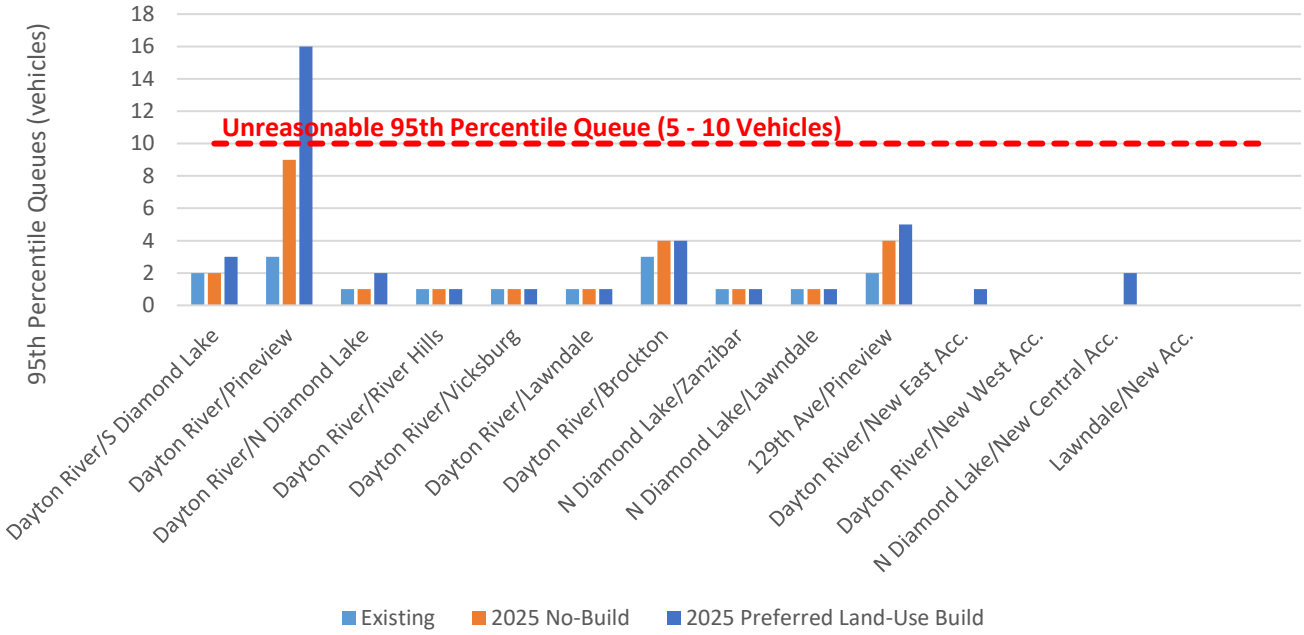

Chart 7 – P.M. Peak Hour Queues: Side Street Stop Sign Controlled Intersections

All side street stop-controlled intersections are projected to operating acceptable through all 2025 scenarios except for Dayton River Road/Pineview Lane. This intersection begins to break down in the p.m. peak hour due to the increased volumes along Dayton River Road. The northbound left turn movement is not able to complete a safe maneuver onto Dayton River Road due to these volumes and begins to show higher than preferred queuing in the 2025 No-Build scenario with a nine-car queue. The addition of the North Dayton development increases this queue to above ten vehicles under either land-use development scenario.

c. 2025 Vehicular Mitigation Analysis

Per the above analyses, most of the study intersections and corridors will operate acceptably throughout the study scenarios. However, the following intersections and corridors are identified as having sub-standard operation as discussed earlier:

i. TH 169
ii. CSAH 81
iii. Dayton River Road/TH 169
iv. N Diamond Lake Road/Brockton Lane
v. Dayton River Road/Pineview Lane

Alternatives were explored to provide appropriate mitigation at these locations, improving the vehicle operations. The highest vehicle demand scenario, the 2025 developer preferred scenario, was analyzed with the mitigation to determine the effectiveness. Generally, the least expensive alternative providing acceptable operations is recommended (i.e. stop signs over a traffic signal if stop signs will be

sufficient). Based on these analyses, the following improvements are recommended to provide acceptable operations with reasonable queuing:

Corridors:

The TH 169 and CSAH 81 were discussed earlier, noting that many agencies have recognized the existing congestion and expected continued congestion due to increases in traffic from regional development. The City of Dayton is recommended to continue working with other agencies to identify spot improvements and long-term upgrades for safe and acceptable operations into the future.

Intersection:

Dayton River Road/TH 169: The addition of a second dedicated eastbound left turn lane, resulting in two dedicated eastbound left turn lanes and one shared through-left turn lane, from Dayton Road onto TH 169, decreases delays at the intersection. While not bringing operations back into an acceptable range, the delays are significantly reduced with this improvement. Additional pavement between this intersection and the river crossing bridge will be needed for the three left turns to merge before the two northbound lanes over the bridge. Chart 2 and Chart 3 show the a.m. and p.m. mitigated delays are reduced.

As noted, additional improvements will likely be necessary for the corridor with or without this proposed development.

N Diamond Lake Road/Brockton Lane: As previously mentioned, N Diamond Lake Road/Brockton Lane begins to operate at LOS F during the 2025 No-Build p.m. peak period due to the increase in vehicles along N Diamond Lake Road. However, the a.m. peak hour operates within the acceptable limits up the to 2025 developer preferred land use. These results suggest that a traffic signal would cause un-needed stoppages in traffic flow outside the p.m. peak hour and may decrease overall efficiency of the intersection over a full day. For these reasons a single-lane roundabout is recommended for the intersection. As Chart 4 and Chart 5 shows, the LOS is improved to a LOS A in the a.m. peak hour and LOS C in the p.m. peak hour. Also, outside of the peak periods, vehicles will not need to stop at the intersection and wait for a green light with little or no conflicting traffic as the roundabout does not have the lost-time that a traffic signal would.

While a roundabout is preferred, a traffic signal is an acceptable option. With dedicated turn lanes, a traffic signal would operate at an overall LOS B or better during the peak periods. As both Brockton Lane and N Diamond Lake Road are County Roads, separated left and right turn lanes may be required, though not needed for capacity reasons.

Dayton River Road/Pineview Lane: Due to the increased mainline volume on Dayton River Road, the northbound left turning traffic experiences significant delays and queuing as shown in Chart 7. Much like N Diamond Lake Road/Brockton Lane the intersection is projected to operate acceptably during the a.m. peak period and all other non-peak periods. Again, these results are mitigated by a single-lane roundabout. The roundabout does cause an increase in queue during the a.m. peak hour from three to six vehicles, as shown in Chart 6. However, the p.m. peak hour queues drop to six vehicles from more than 14 in the 2025 build scenarios. Additionally, as shown in Chart 4 and Chart 5, the roundabout operates with delays within the LOS A boundary.

While a roundabout is preferred, a traffic signal is an acceptable option. With dedicated turn lanes, a traffic signal would operate at an overall LOS A during the peak periods. Separated left and right turn lanes may be required, though not needed for capacity reasons, along Dayton River Road as it is a County Road.

The 2040 a.m. and p.m. peak hour scenarios were then analyzed assuming the 2025 mitigation mentioned above was implemented and added to the modified roadway network as described in the 2040 Planned Roadway Network section from earlier.

A figure in the Appendix shows the recommended intersection mitigation.

5. 2040 Analyses

a. 2040 Corridor Vehicular Analysis

The 2040 corridor volumes are shown against the 2025 scenario volumes in Chart 8, below. The recommended corridor upgrades along TH 169 (six lanes divided) and CSAH 81 (four lanes divided) were used for this analysis.

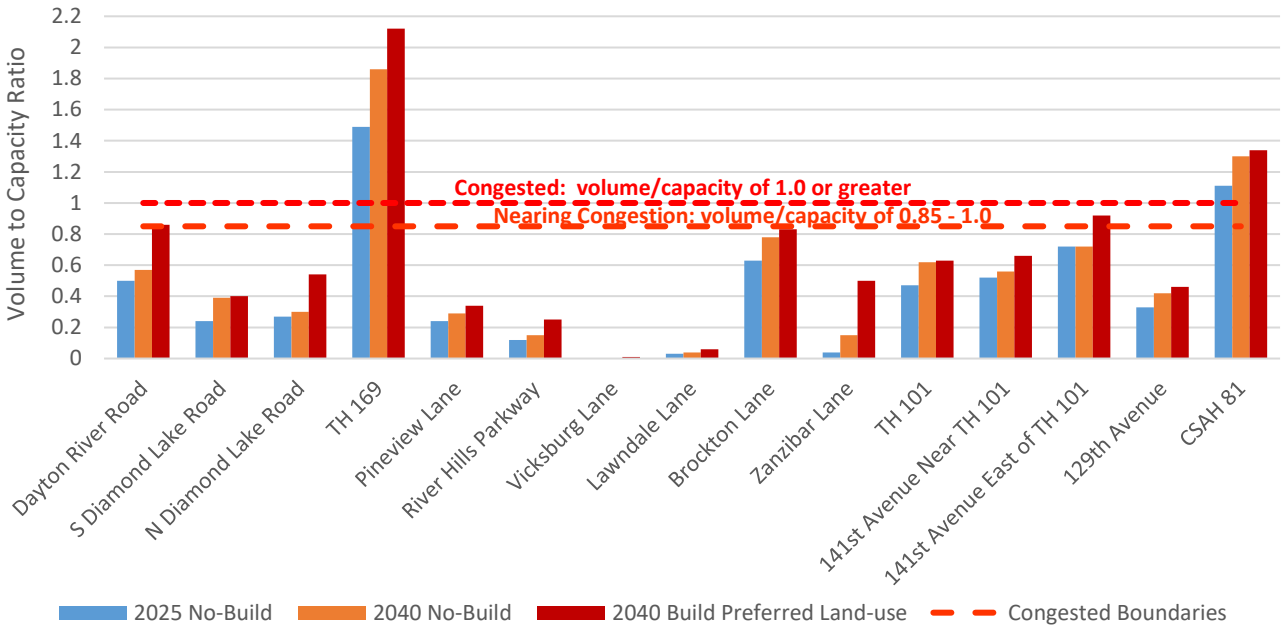

Chart 8 – 2040 Study Corridor Volume to Capacity

As Chart 8 shows all roadways, with the exception of TH 169 and CSAH 81, remain below their congested boundary for all 2040 scenarios. Dayton River Road, Brockton Lane, and 141st Avenue, east of TH 101, start to operate with volumes at or close to the nearing congested range. However, all other roadway remaining well within their planning level capacity ranges.

As previously discussed, the TH 169 and CSAH 81 corridors will need agency coordination for improvements to realize acceptable operations according to the planning-level capacity thresholds. Dayton River Road, Brockton Lane, and 141st Avenue will need continued monitoring to determine when future improvements may be necessary. Further discussion of the corridors needs will be discussed in the following mitigation section.

70th Street and River Road north of the development and east of TH 101 were reviewed again under 2040 conditions to ensure capacities are sufficient through the 2040 build scenario. Based on the determined trip generation and a two percent per year traffic increase projected to 2040 both roadways are well below their planning level capacities with River Road projecting less than 9,000 vehicles a day

if all the generated traffic entering Dayton River Road from the north was condensed onto its roadway. 70th street would have less vehicles than River Road with an ADT of less than 3,000 vehicles per day.

b. 2040 Intersection Vehicular Analysis

Chart 9 (a.m. peak hour) and Chart 10 (p.m. peak hour) show the average peak hour delay per traffic signal-controlled intersection for each study scenario compared to the 2025 mitigated results. Again, The LOS D/E boundary of 55 seconds of delay per vehicle is considered the threshold between acceptable and unacceptable traffic signal operation in Minnesota.

For this analysis, the TH 169/Dayton River Road intersection is not analyzed. Due to increased volumes, the existing and 2025 mitigated geometry will not adequately accommodate the 2040 volumes, with or without this proposed development.

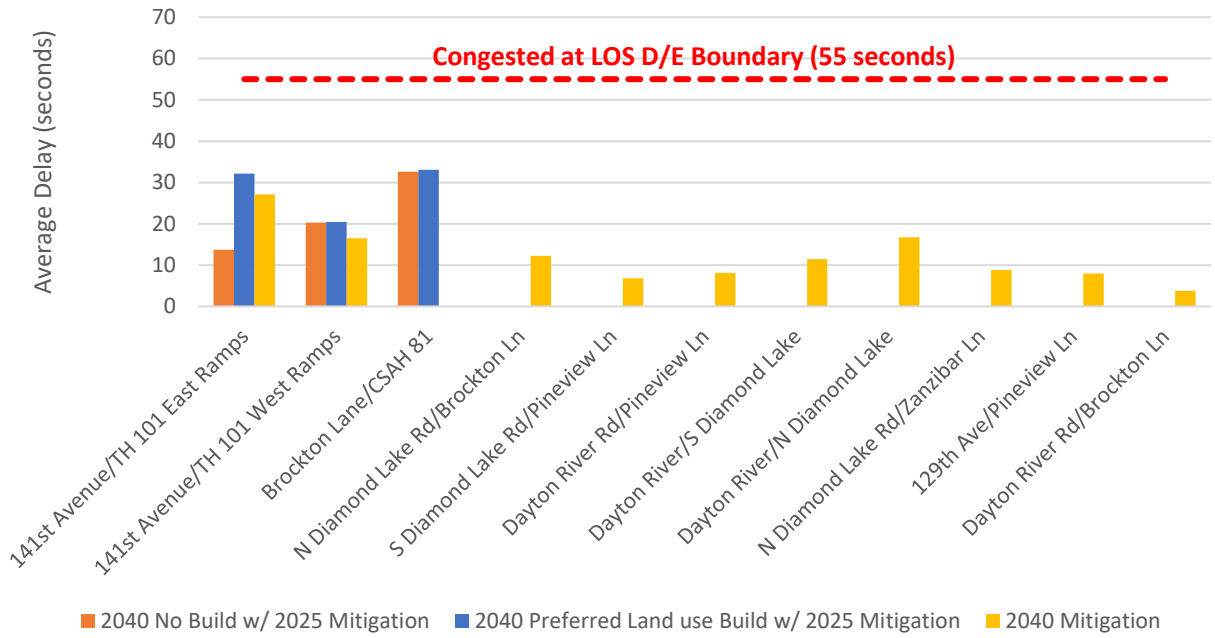

Chart 9 – A.M. Peak Hour Delays: Signal Controlled Intersections

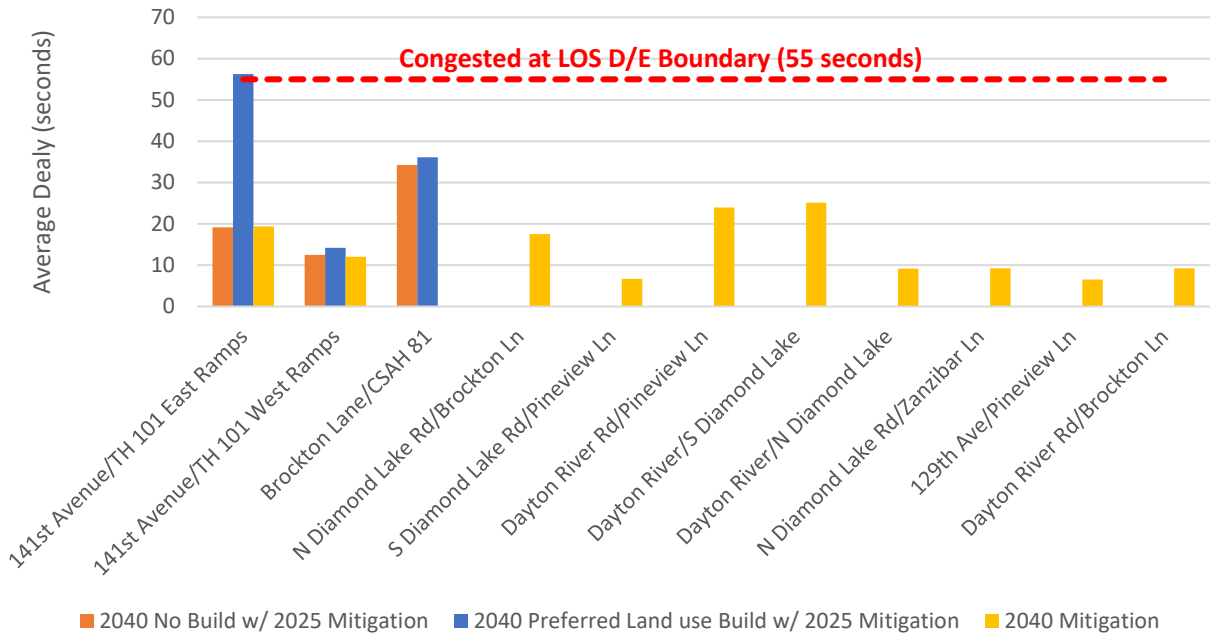

Chart 10 – P.M. Peak Hour Delays: Signal Controlled Intersections

Retiming of the Diverging Diamond Interchange at 141st Avenue/TH 101 should occur to achieve better traffic flow through the intersection. The increased westbound volumes will require more green time to proceed through the intersection. The interchange has sufficient capacity for the volumes and upgrading of signal timing every three to five years, as required by state law, will suffice at the intersection with the projected volumes. Brockton Lane/CSAH 81 continues to operate acceptably in the 2040 scenarios as traffic volumes become more spread out due to the addition of the future I-94 interchange and Zanzibar Lane extension.

Chart 11 (a.m. peak hour) and Chart 12 (p.m. peak hour) show the 2040 average peak hour delay per all-way stop sign and roundabout controlled intersection for each study scenario against the 2025 mitigated scenario.

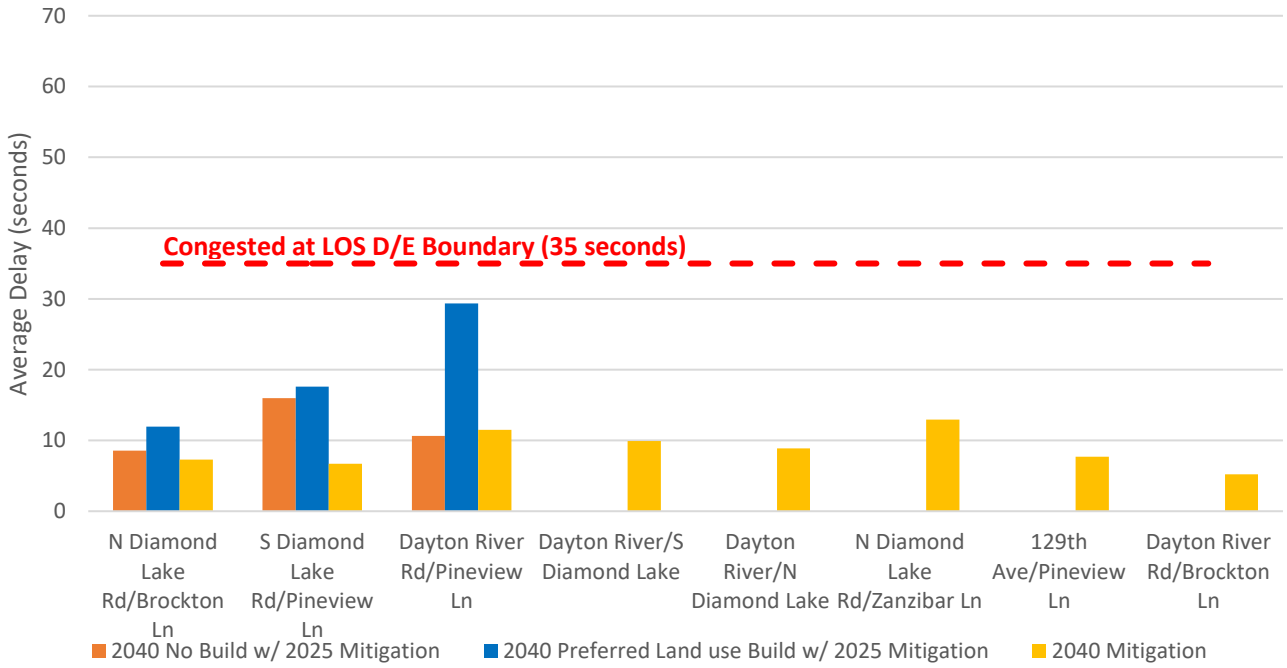

Chart 11 – A.M. Peak Hour Delays: All-Way Stop Sign/Roundabout Controlled Intersections

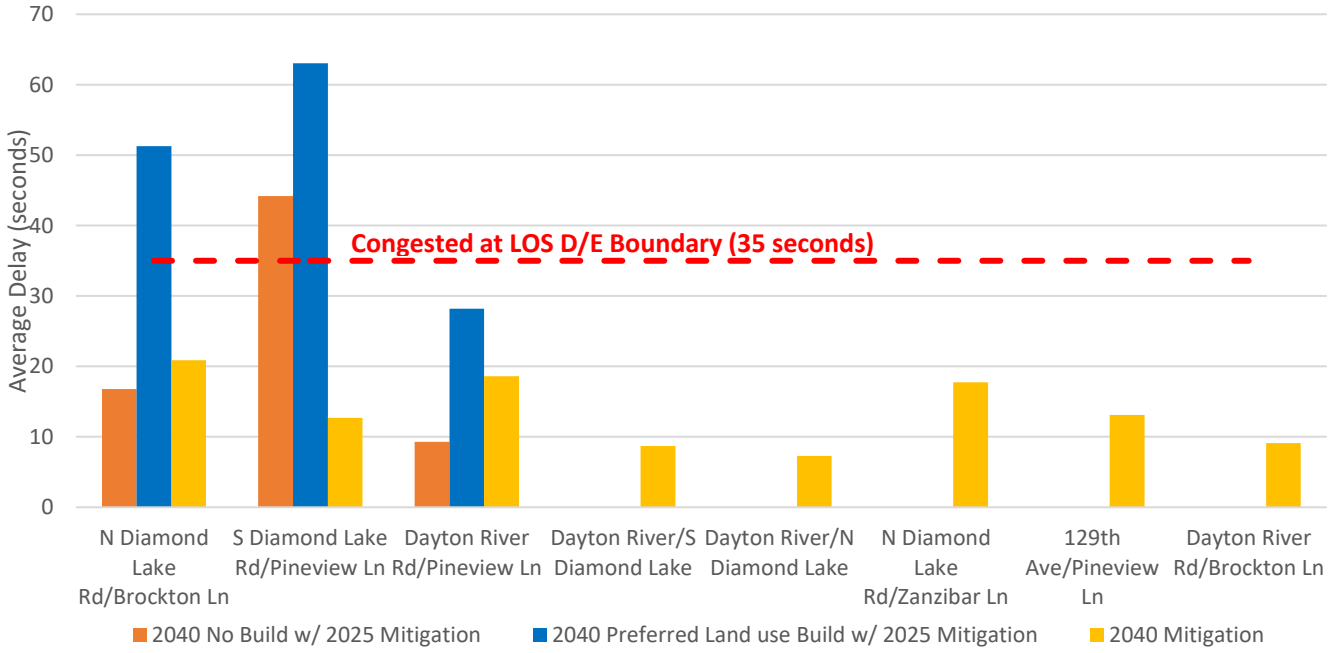

Chart 12 – P.M. Peak Hour Delays: All-Way Stop Sign/Roundabout Controlled Intersections

As Chart 11 and Chart 12 show, the N Diamond Lake Road/Brockton Road roundabout begins to operate at LOS E with the addition of the North Dayton development while S Diamond Lake Road/Pineview Lane all-way stop intersection

operates at a LOS E in the 2040 No-Build scenario and LOS F in the 2040 Build scenario. As these delays only occur in the PM peak hour, signalization is not preferred as it may adversely affect the remaining 23 hours of the day. Therefore, additional expansion of the N Diamond Lake Road roundabout will be needed by 2040 and reconstruction of the S Diamond Lake Road/Pineview Lane intersection to a roundabout should also be pursued by 2040. Additional discussion of the specific mitigation will follow.

The five additional intersections in Chart 11 and Chart 12 are two-way stop control intersections that begin to break down in the 2040 scenarios, as shown in Chart 13 and Chart 14 below. As roundabouts are the most appropriate mitigation for the intersections, their mitigated results are shown in the all-way Stop/Roundabout charts.

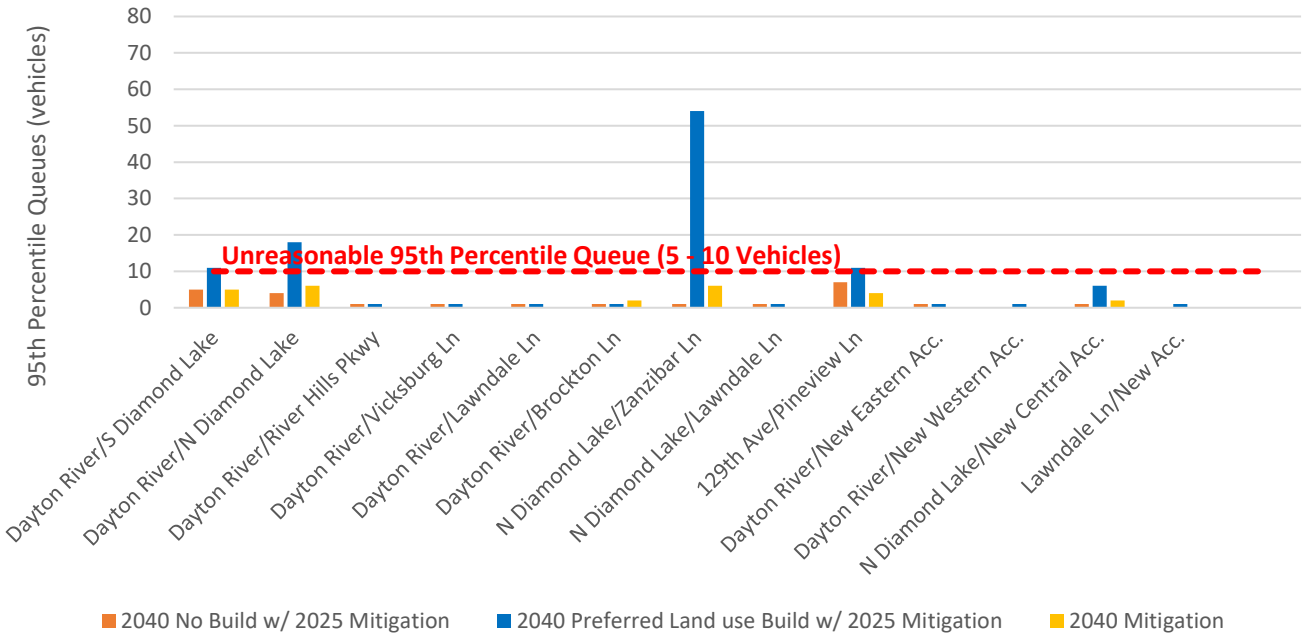

Chart 13 – A.M. Peak Hour Queues: Side Street Stop Sign Controlled Intersections

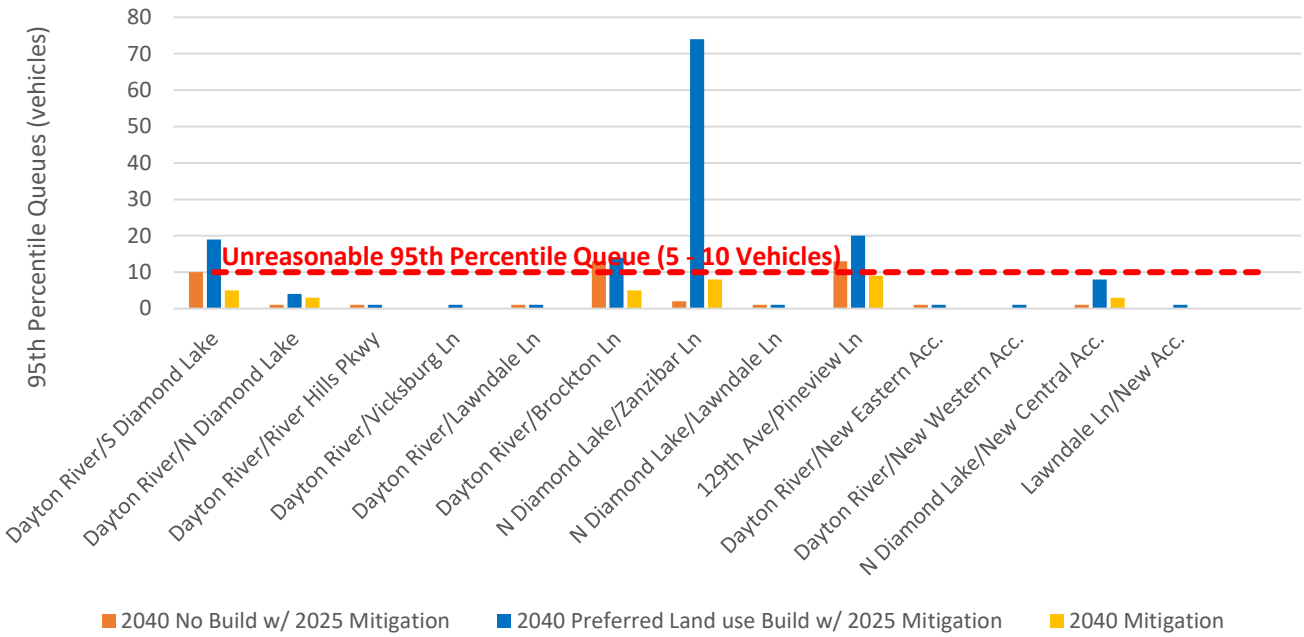

Chart 14 – P.M. Peak Hour Queues: Side Street Stop Sign Controlled Intersections

As Chart 13 and Chart 14 show, five of the side street stop-controlled intersections begin to break down in the 2040 scenarios. These intersections are:

i. Dayton River Road/S Diamond Lake Road
ii. Dayton River Road/S Diamond Lake Road
iii. N Diamond Lake Road/Zanzibar Lane
iv. 129th/Pineview Lane
v. Dayton River Road/Brockton Lane

Due to increased mainline volumes, these intersections begin to have trouble with cross street turning movements and mainline left turn movements. Again, as volumes are relatively low outside of the peak hour periods, signalized traffic control is not recommended as it will result in un-necessary stoppages of traffic outside of peak periods. Based on these results roundabouts were selected for mitigation as they facilitate sufficient flow and will not cause the mainline to stop during low volume periods. A more detailed discussion on the specific roundabout layouts will follow in the mitigation section and the resulting intersection delays with roundabout control can be seen in Chart 11 and Chart 12.

c. 2040 Vehicular Mitigation Analysis

Per the above analyses, an increase in insufficient intersection and corridor operation occur in the 2040 scenarios. Based on these results the following mitigation is recommended:

Intersection:

N Diamond Lake Road/Brockton Lane: The single-lane roundabout required for 2025 begins to break down in the 2040 p.m. build scenarios due to increased turning traffic on Brockton Lane and increased through volumes on N Diamond Lake Road. By adding dedicated right turn lanes to each approach leg the overall intersection delay is improved to a LOS C with the northbound approach experiencing a LOS D. These delays are only expected in the p.m. peak period as the a.m. peak period operates with all movements at LOS A.

Roundabouts are generally recommended to be constructed with the smallest number of approach lanes initially. Therefore, the single-lane roundabout should be constructed for the 2025 conditions, reserving right-of-way for the right turn lanes (the 2040 mitigation) at a later date.

If the signalized intersection, with separated turn lanes, was implemented with the 2025 mitigation, retiming of the signal will support the projected volumes with a overall LOS B or better.

Dayton River Road/Pineview Lane: The single-lane roundabout at Dayton River Road/Pineview Lane begins to experience significant delays for the mainline movements due to an increase in traffic along Dayton River Road. These delays occur for eastbound traffic in the a.m. peak hour and westbound traffic in the p.m. peak hour. By adding dedicated right turn lanes to each approach leg, the overall intersection delay is reduced and operates at a LOS C during the p.m. peak hour. Chart 11 and Chart 12 show the corresponding LOS under the mitigated layout.

Roundabouts are generally recommended to be constructed with the smallest number of approach lanes initially. Therefore, the single-lane roundabout should be constructed for the 2025 conditions, reserving right-of-way for the right turn lanes (the 2040 mitigation) at a later date.

If the traffic signal was implemented, expansion of the Pineview Lane approaches is required. For the northbound approach separate left and right turn lanes are required, while the southbound approach can operate with a dedicated right and shared through/left lane. These lanes could potentially be provided initially eliminating the need for future construction.

S Diamond Lake Road/Pineview Lane: The All Way stop at South Diamond Lake Road/Pineview Lane begins to experience failing delays during the 2040

No-Build scenario during the p.m. peak hour. As these delays are only present during the p.m. peak period, a single-lane roundabout is recommended for mitigation and results in p.m. peak build period operation of LOS B.

A four-phase traffic signal with single approach lanes is sufficient to handle the volumes as well and results with LOS A operations. However, turn lanes may be required or desired beyond capacity reasons.

Dayton River Road/N Diamond Lake Road and Dayton River Road/S Diamond Lake Road: The side street stop control at these intersections begin to experience unreasonable queueing by the 2040 build scenarios. Much like Dayton River Road/Pineview Lane, these delays are due to the increased mainline volumes creating lack of gaps for cross street movements. Multi-lane roundabouts are recommended at these intersections with shared through-right and through-left layouts along Dayton River Road. This layout provides sufficient capacity for the increased Dayton River Road volumes while still allowing cross street vehicle progression. Chart 11 and Chart 12 show the corresponding LOS under the roundabout mitigation.

Traffic signals can be installed to accommodate the 2040 volumes if sufficient approach lanes are provided. Dedicated left turn and right turn lanes are required for Dayton River Road approaches with the potential need for an additional through lane for the S Diamond Lake Road intersection (not the full corridor) and dual northbound left turn lanes for the N Diamond Lake Road intersection. S Diamond Lake Road can operate as a single lane westbound and shared left turn/through lane with dedicated right turn lane for eastbound traffic. The N Diamond Lake Road approach will need dedicated left turn and right turn lanes while the opposing approach of 142nd Avenue only needs a single lane for capacity purposes. Additional dedicated turn lanes for several approaches may be required beyond capacity reasons. Chart 9 and Chart 10 show the signalized mitigation results.

Dayton River Road/Brockton Lane, N Diamond Lake Road/Zanzibar Lane, and 129th Avenue/Pineview Lane: The side street stop control at these intersections begin to experience unreasonable queueing during the 2040 No-Build scenario for 129th Avenue/Pineview and Dayton River Road/Brockton Lane and during the 2040 build scenario at N Diamond Lake Road/Zanzibar. Single-lane roundabouts provide sufficient traffic flow and reduce delays to LOS C or better at all the intersections under the preferred developer land use. Chart 11 and Chart 12 present the mitigated delays for these intersections.

If signalized intersections are preferred, the following can be implemented:

i. Dayton River Road/Brockton Lane – Three phase signal with dedicated turn lanes on all approaches.
ii. N Diamond Lake Road/Zanzibar Lane – Four phase signal with dedicated turn lanes on N Diamond Lake Road while the Zanzibar Lane approaches

can be accommodated with a shared left turn/through lane and dedicated right turn lane.

iii. 129th Avenue/Pineview Lane – Three phase signal with dedicated turn lanes on the 129th Avenue approaches.

Although not necessary for capacity reasons, additional dedicated turn lanes beyond those detailed here may be required or desired.

The above mitigation recommendations provide sufficient traffic flow and LOS for the projected 2040 volumes. Due to the extended forecast of these volumes, and the amount of variability in city growth and development that may occur, the 2040 mitigation should not be implemented in the short term. However, purchasing of sufficient right-of-way to install the mitigation when need is recommended.

A figure in the Appendix shows the recommended intersection mitigation.

6. Conclusions and Recommendations

The traffic impacts of the proposed development, and background city developments, were thoroughly studied and the principal findings for the 2025 analysis are:

- The proposed North Dayton Site development is expected to generate similar traffic compared to the 2030 Future Land Use plan, with 4,882 trips compared to approximately 4,820 trips during an average weekday (assuming 1/3 of the total residential units are developed).
- During an average weekday, the a.m. peak hour trip generation is about 373 trips for the proposed North Dayton Site compared to 349 trips for the 2030 Future Land Use plan. The p.m. peak hour trip generation comparison is 492 trips and 453 trips for the proposed North Dayton Site and 2030 Future Land Use plan, respectively.
- The TH 169 and CSAH 81 corridors are currently at or over the planning-level capacities for their types of facilities and volumes are expected to continue to increase into the future.
- Due to background growth, other area developments, and the proposed North Dayton site, corridor volumes on 141st Avenue near Brockton Lane are close to its nearing-capacity planning level.
- Similarly, the intersections of Dayton River Road/TH 169, N Diamond Lake Road/Brockton Lane operate with failing delays by the 2025 No-Build scenarios while Dayton River Road/Pineview Lane operates with failing delays or queuing by 2025 Build scenario.

Additional analysis was completed for the year 2040 with the following findings:

- The proposed North Dayton Site development is expected to generate significantly less traffic compared to the 2030 Future Land Use plan, 16,820 trips compared to approximately 20,822 trips during an average weekday.
- The peak hour trip generation has a similar comparison with the proposed North Dayton plan generating about 15% less traffic than would be expected under the 2030 Land Use plan.
- Additional roadway upgrades are expected by 2040 including the I-94 interchange connecting I-94, CSAH 81, French Lake Road, Brockton Lane, and Zanzibar Lane.
- The TH 169 and CSAH 81 corridors will continue to operate above capacity as volumes from general growth, specific development in the area, and this proposed North Dayton development contribute to higher volumes.
- Dayton River Road, Brockton Lane, and 141st Avenue begin to see volumes close to or just above the nearing congestion range under the 2040 Build scenarios.
- Dayton River Road/TH 169 operates with failing LOS delays under the expanded configuration by the 2040 No-Build Scenario. Further expansion may not be feasibly due to adjacent developments and the roadways proximity to the northern river crossing.

- S Diamond Lake Road/Pineview Lane, Dayton River Road/S Diamond Lake Road, Dayton River Road/Brockton Lane, and 129th Avenue/Pineview Lane experience failing operations by the 2040 No-Build scenario.
- N Diamond Lake Road/Brockton Lane, Dayton River Road/Pineview Lane, Dayton River Road/N Diamond Lake Road, and N Diamond Lake Road/Zanzibar Lane experience failing operations by the 2040 Build scenarios.

Due to general background growth and adjacent specific developments, the following mitigation is recommended with or without the proposed North Dayton development for the year 2025:

- Continue to explore options for corridor improvements on the TH 169 and CSAH 81 corridor with other agencies.
- Re-stripe the Dayton River Road approach to TH 169 to provide dual left turn lanes, a left turn/through lane, and a right turn lane. Additional pavement on northbound TH 169 between the Dayton River Road and river bridge will be necessary to accommodate this change.
- Update signal timing at all signalized intersections at least every three to five years.
- Construct a single-lane roundabout at the N Diamond Lake Road/Brockton Lane intersection. Reserve right-of-way at this intersection for future dedicated right turn lanes. A traffic signal with dedicated turn lanes could also provide the necessary capacity at the intersection, although a roundabout is preferred due to improved safety and better off-peak operations.

Accounting for additional traffic from the proposed development, the following mitigation will also be necessary to accommodate the full projected 2025 volumes:

- Construct a single-lane roundabout at the Dayton River Road/Pineview Lane intersection. Reserve right-of-way at this intersection for future dedicated right turn lanes. A traffic signal with dedicated turn lanes could also provide the necessary capacity at the intersection, although a roundabout is preferred due to improved safety and better off-peak operations.

For intersections where a roundabout or a traffic signal is proposed, a detail Intersection Control Evaluation will be necessary. This document will evaluate the two control options and document the decision for which option is ultimately constructed. For the purposed of this document, roundabouts are the preferred option.

Beyond year 2025, the long-range time frame and uncertainty of potential developments, roadway network, and travel patterns result in multiple assumptions for this analysis. Due to this inherent uncertainty, year 2040 recommendations should not be constructed today. Instead, right-of-way should be preserved for these needs when required based on actual traffic growth.

The following modifications to the study roads and intersections, assuming the planned roadway network is implemented, are recommended for the year 2040 to address

potential issues due to general background growth and other specific development traffic with or without the proposed North Dayton site:

- Continue to work on long-term solutions with other agencies to accommodate future congestion on the TH 169 and CSAH 81 corridors.
- Construct a multi-lane roundabout at the Dayton River Road/South Diamond Lake Road intersection, with two-lane Dayton River Road approaches. A traffic signal with dedicated turn lanes could also provide the necessary capacity at the intersection, although a roundabout is preferred due to improved safety and better off-peak operations.
- Construct single-lane roundabouts at the intersections of 129th Avenue/Pineview Lane, Dayton River Road/Brockton Lane, and South Diamond Lake Road/Pineview Lane. Traffic signals with dedicated turn lanes could also provide the necessary capacity at the intersection, although roundabouts are preferred due to improved safety and better off-peak operations.
- Continue to update signal timing at all signalized intersections at least every three to five years.

With the North Dayton proposed development traffic contributing to the study area volumes, the following additional 2040 mitigation is recommended:

- Provide dedicated right turn lanes for the Dayton River Road/Pineview Lane intersection single-lane roundabout using the reserved right-of-way if a roundabout was constructed as part of the 2025 mitigation.
- Construct a single-lane roundabout at the N Diamond Lake Road/Zanzibar Lane intersection. A traffic signal with dedicated turn lanes could also provide the necessary capacity at the intersection, although a roundabout is preferred due to improved safety and better off-peak operations.
- Construct multi-lane roundabout at the Dayton River Road/N Diamond Lake Road intersection, with two-lane Dayton River Road approaches. A traffic signal with dedicated turn lanes could also provide the necessary capacity at the intersection, although a roundabout is preferred due to improved safety and better off-peak operations.
- Provide dedicated right turn lanes for the N Diamond Lake Road/Brockton Lane intersection single-lane roundabout using the reserved right-of-way if a roundabout was constructed as part of the 2025 mitigation.

As before, for intersections where a roundabout or a traffic signal is proposed, a detail Intersection Control Evaluation will be necessary. This document will evaluate the two control options and document the decision for which option is ultimately constructed. For the purposed of this document, roundabouts are the preferred option.

In addition to these roadway improvements, the following items are also recommended based upon the traffic analysis for the proposed development:

- Reserve space, if necessary, for the future trail network in this area as planned by the City of Dayton.

- Consider internal sidewalks/trails to connect to a future trail network and between the residential/commercial components of the proposed Developer's plan.
- Consider potential bicycle parking areas and other amenities (repair stations) on-site for when the future trail network is developed.
- Follow the requirements of the MnMUTCD for signing and striping.
- Work with the City, as necessary, in their continued dialogue with Metro Transit and Hennepin County on the potential expansion of the transit system.

Appendix

A. Figures

B. The Language of Traffic Engineering

C. Traffic Counts (Available Upon Request)

D. Trip Generation Tables

E. Trip Distribution

F. 2040 Roadway Upgrades

G. Level of Service (LOS)

H. Capacity Analysis Backup (Available Upon Request)

- AM Existing
- PM Existing
- 2025 AM No-Build
- 2025 PM No-Build
- 2025 Developer Preferred Land-Use AM Build
- 2025 Developer Preferred Land-Use PM Build
- Roundabout Mitigated 2025 Developer Preferred Land-Use AM Build
- Roundabout Mitigated 2025 Developer Preferred Land-Use PM Build
- Signalized Mitigated 2025 Developer Preferred Land-Use AM Build
- Signalized Mitigated 2025 Developer Preferred Land-Use PM Build
- 2040 AM No-Build with 2025 Mitigation
- 2040 PM No-Build with 2025 Mitigation
- 2040 Preferred Land-Use AM Build with 2025 Mitigation
- 2040 Preferred Land-Use PM Build with 2025 Mitigation
- Mitigated 2040 Preferred Land-Use AM Build
- Mitigated 2040 Preferred Land-Use PM Build
- Signalized 2040 Preferred Land-Use AM Build
- Signalized 2040 Preferred Land-Use PM Build

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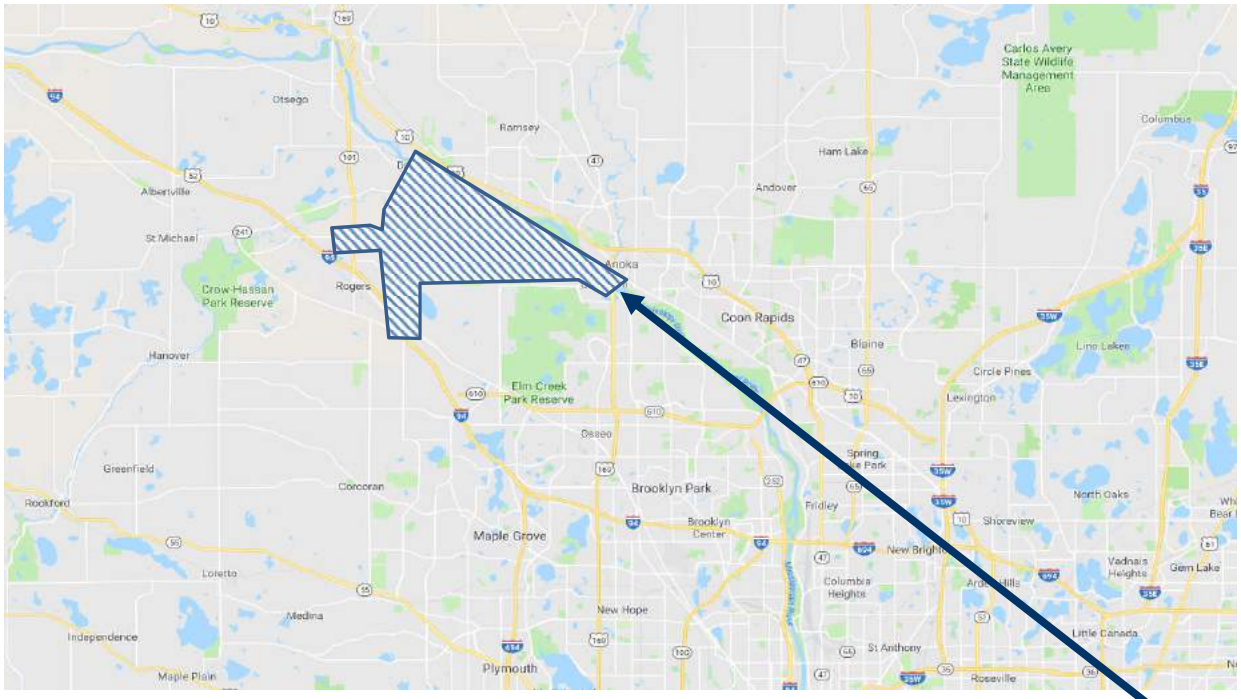
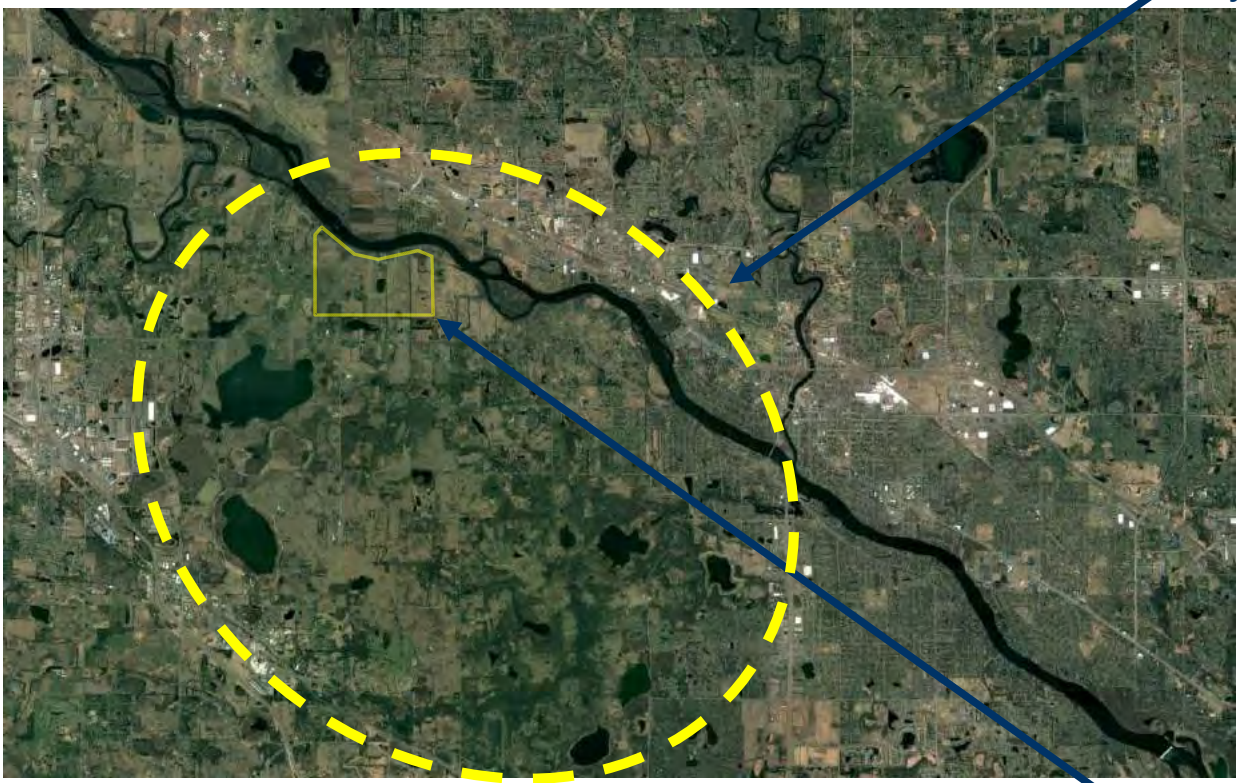
ENGINEERING TRAFFIC FORWARD

Figure 1
Location Maps

North
No Scale



Study Area



Proposed Site

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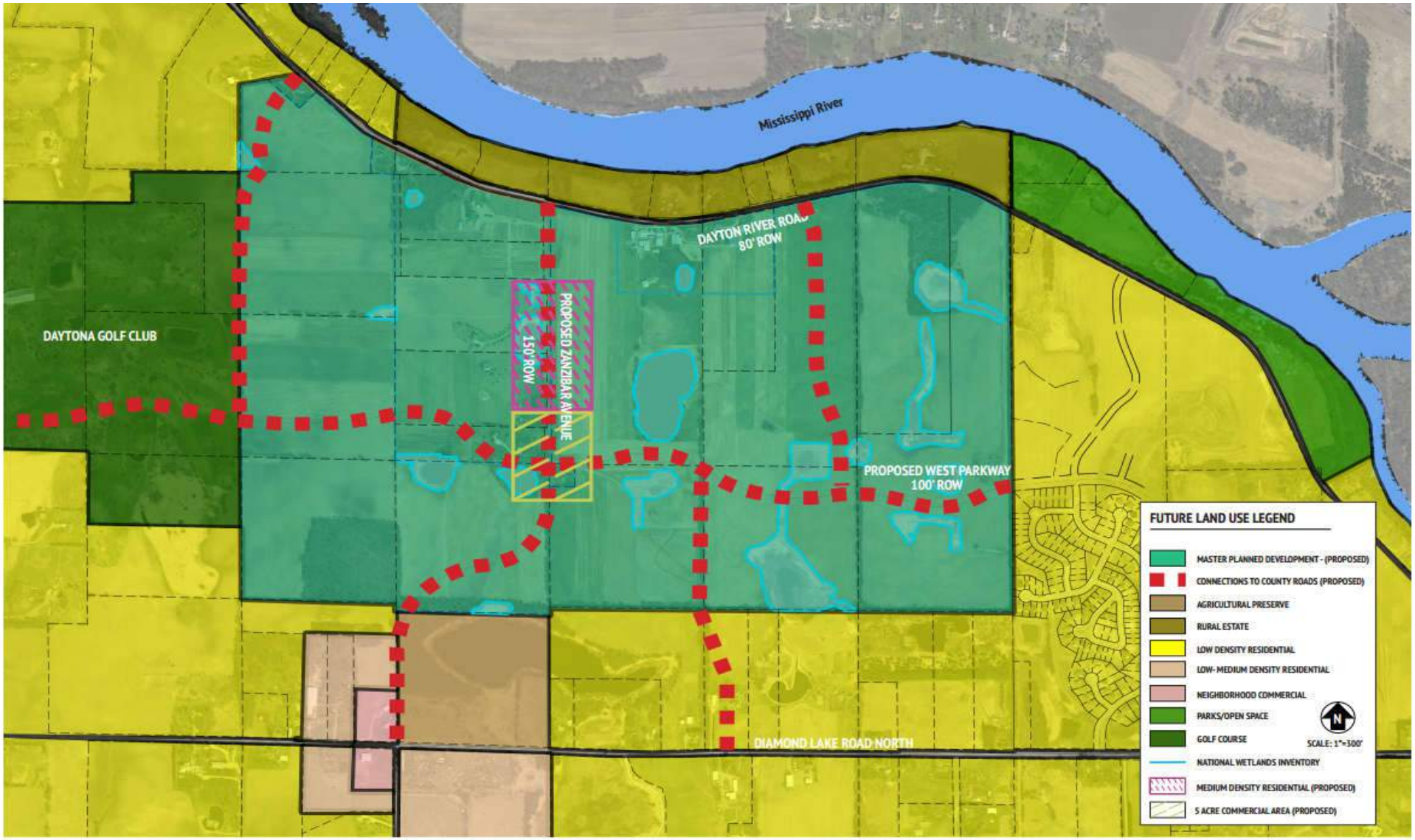
Figure 2
Concept Plan

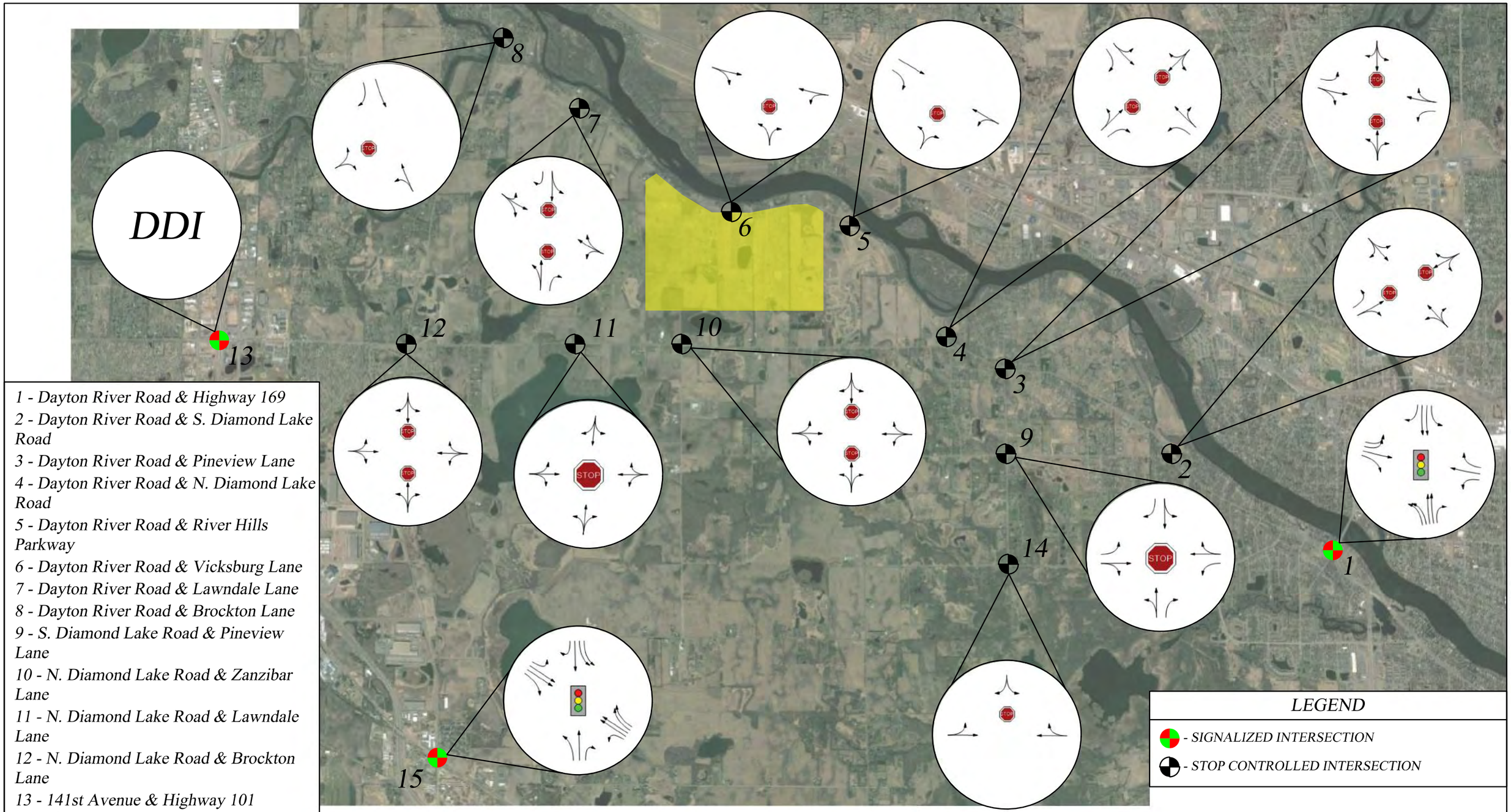


north dayton development
GONYEA COMPANY / RAMSAY PROPERTIES , LLC

DRAFT 2040 FUTURE LAND USE
(PROPOSED)

09.27.17

Sambatek



1 - Dayton River Road & Highway 169
2 - Dayton River Road & S. Diamond Lake Road
3 - Dayton River Road & Pineview Lane
4 - Dayton River Road & N. Diamond Lake Road
5 - Dayton River Road & River Hills Parkway
6 - Dayton River Road & Vicksburg Lane
7 - Dayton River Road & Lawndale Lane
8 - Dayton River Road & Brockton Lane
9 - S. Diamond Lake Road & Pineview Lane
10 - N. Diamond Lake Road & Zanzibar Lane
11 - N. Diamond Lake Road & Lawndale Lane
12 - N. Diamond Lake Road & Brockton Lane
13 - 141st Avenue & Highway 101 Interchange
14 - 129th Avenue & Pineview Lane
15 - Brockton Lane & County Road 81

Figure 3: Existing Intersection Layouts
Northern Dayton Development

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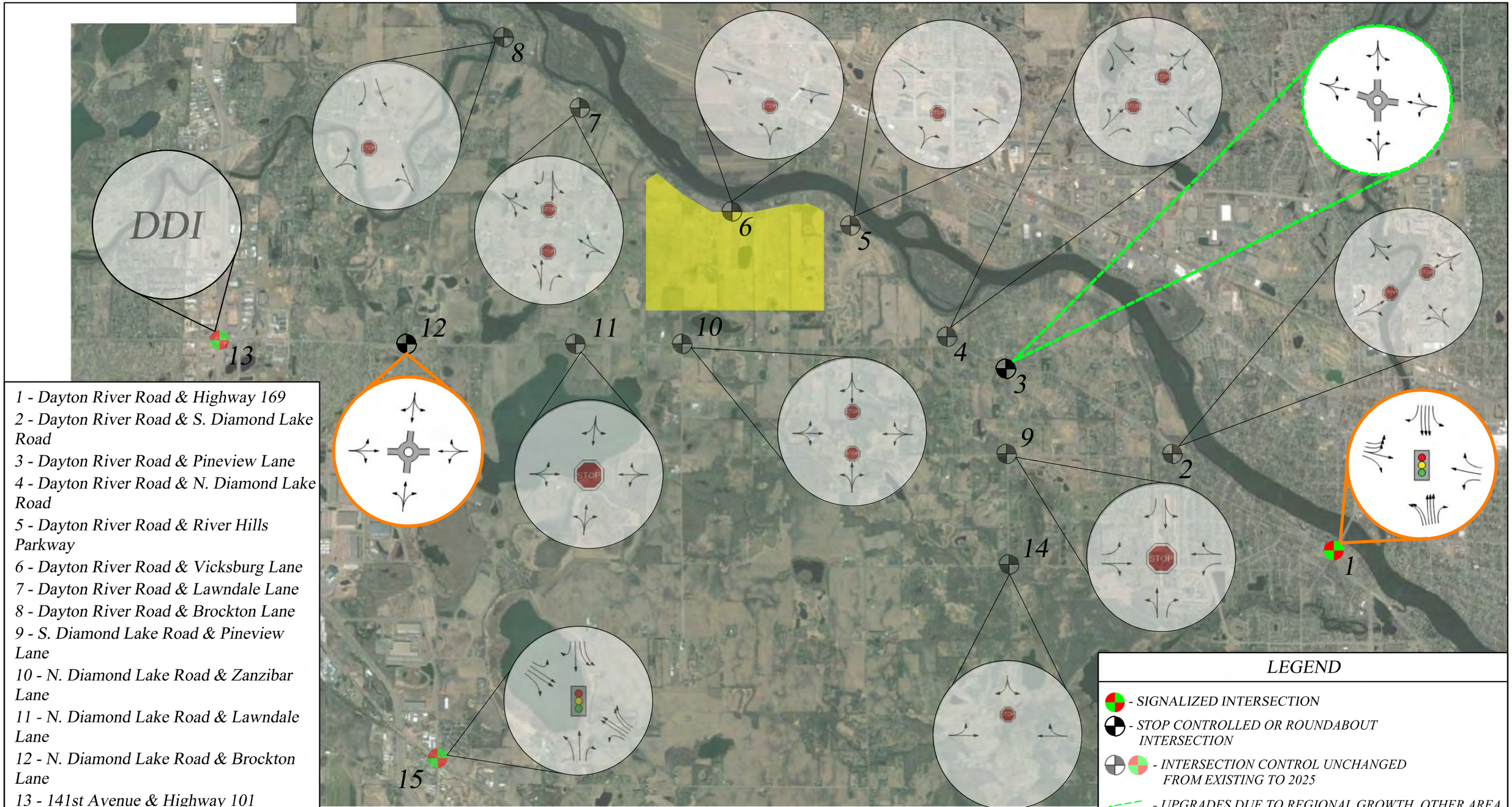

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Figure 4A: 2025 Intersection Layouts
Northern Dayton Development

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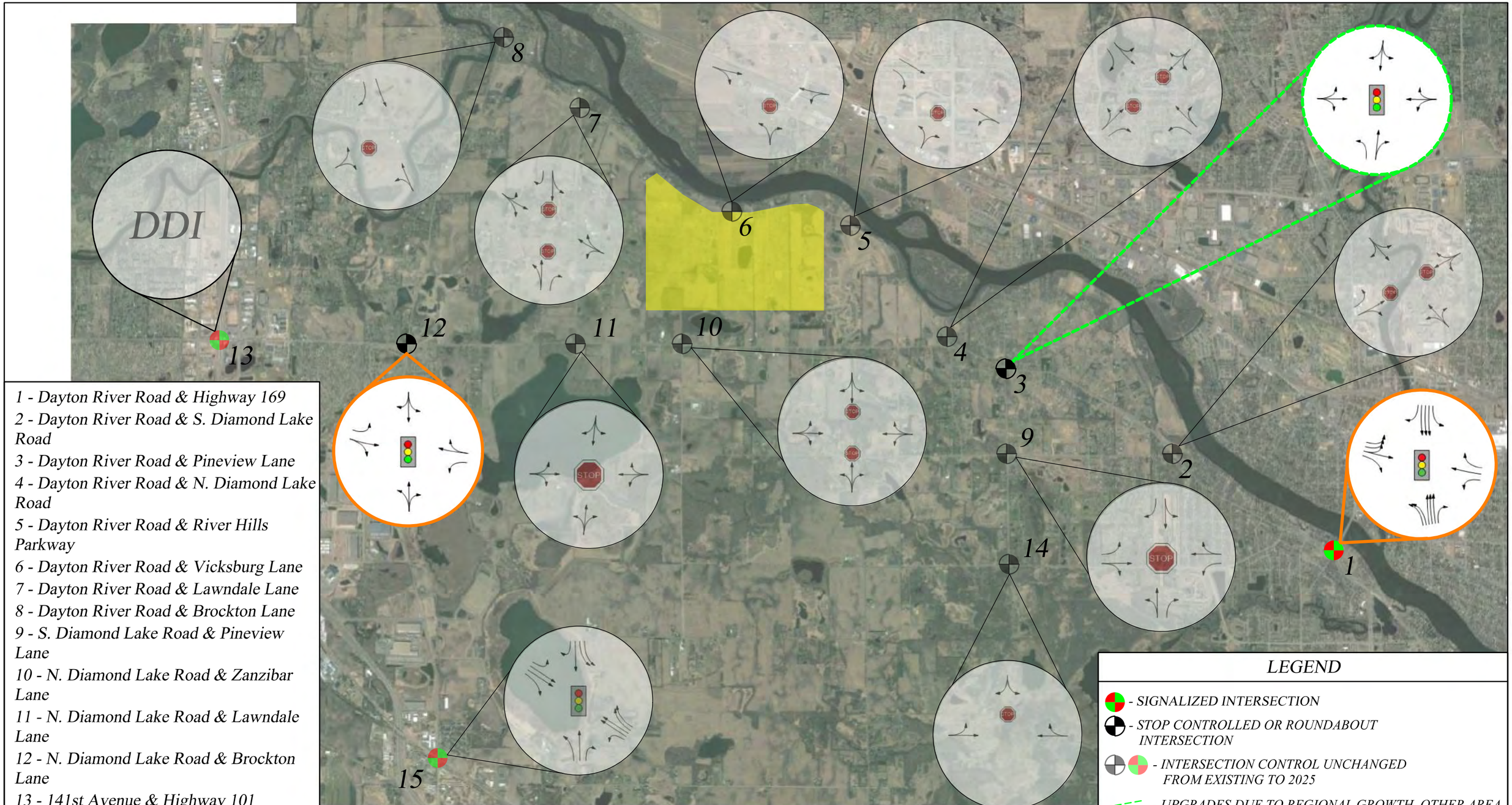

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12 - N. Diamond Lake Road & Brockton Lane
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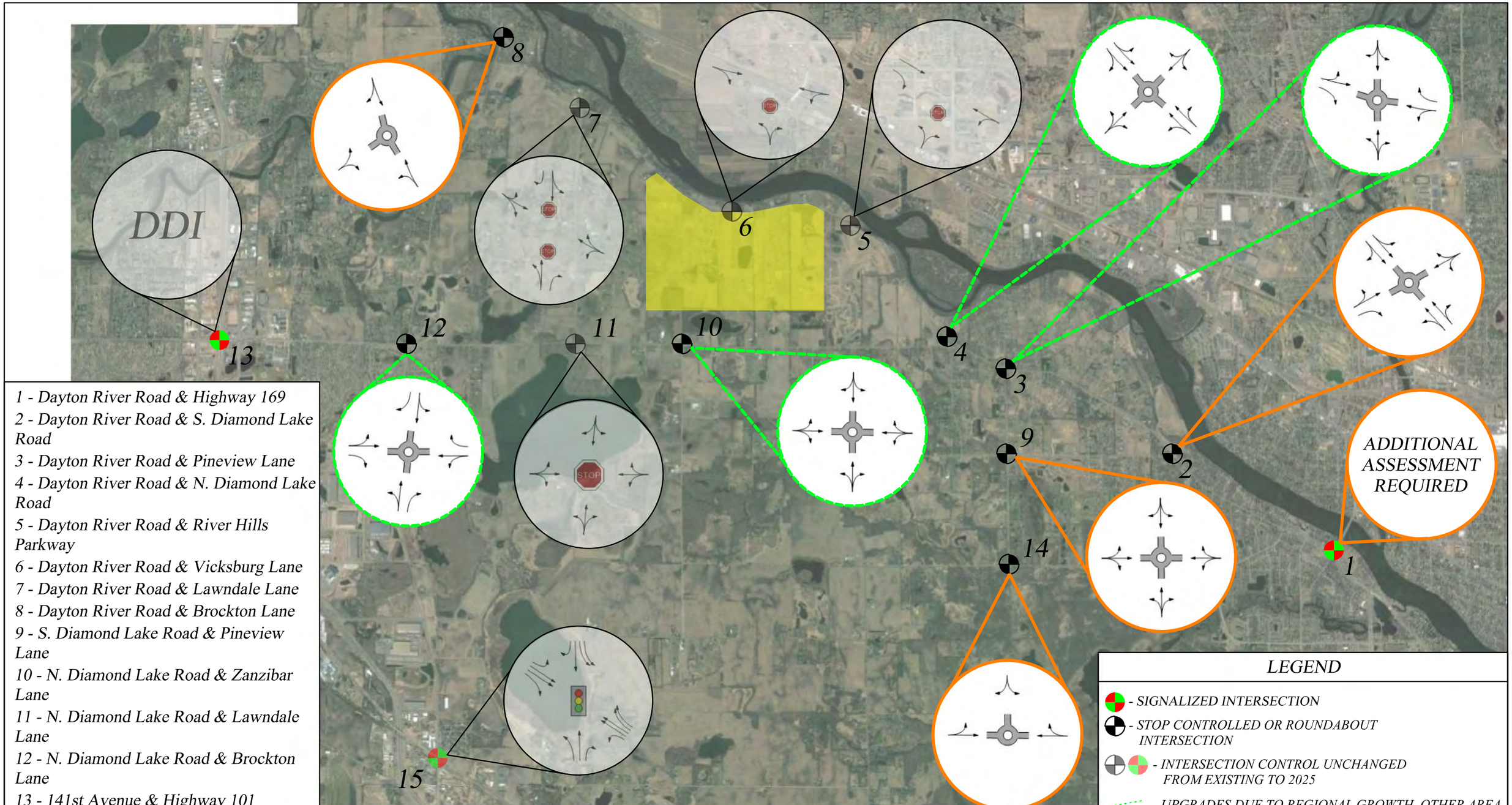
14 - 129th Avenue & Pineview Lane
15 - Brockton Lane & County Road 81

LEGEND

- SIGNALIZED INTERSECTION
- STOP CONTROLLED OR ROUNDABOUT INTERSECTION
- INTERSECTION CONTROL UNCHANGED FROM EXISTING TO 2025
- UPGRADES DUE TO REGIONAL GROWTH, OTHER AREA DEVELOPMENTS, AND PROPOSED DEVELOPMENT
- UPGRADES DUE TO REGIONAL GROWTH AND OTHER AREA DEVELOPMENTS

Figure 4B: 2025 Intersection Layouts
Northern Dayton Development

Spack CONSULTING ENGINEERING TRAFFIC FORWARD



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12 - N. Diamond Lake Road & Brockton Lane
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15 - Brockton Lane & County Road 81

LEGEND

- SIGNALIZED INTERSECTION
- STOP CONTROLLED OR ROUNDABOUT INTERSECTION
- INTERSECTION CONTROL UNCHANGED FROM EXISTING TO 2025
- UPGRADES DUE TO REGIONAL GROWTH, OTHER AREA DEVELOPMENTS, AND PROPOSED DEVELOPMENT
- UPGRADES DUE TO REGIONAL GROWTH AND OTHER AREA DEVELOPMENTS

Figure 5A: 2040 Intersection Layouts
Northern Dayton Development

Spack CONSULTING ENGINEERING TRAFFIC FORWARD

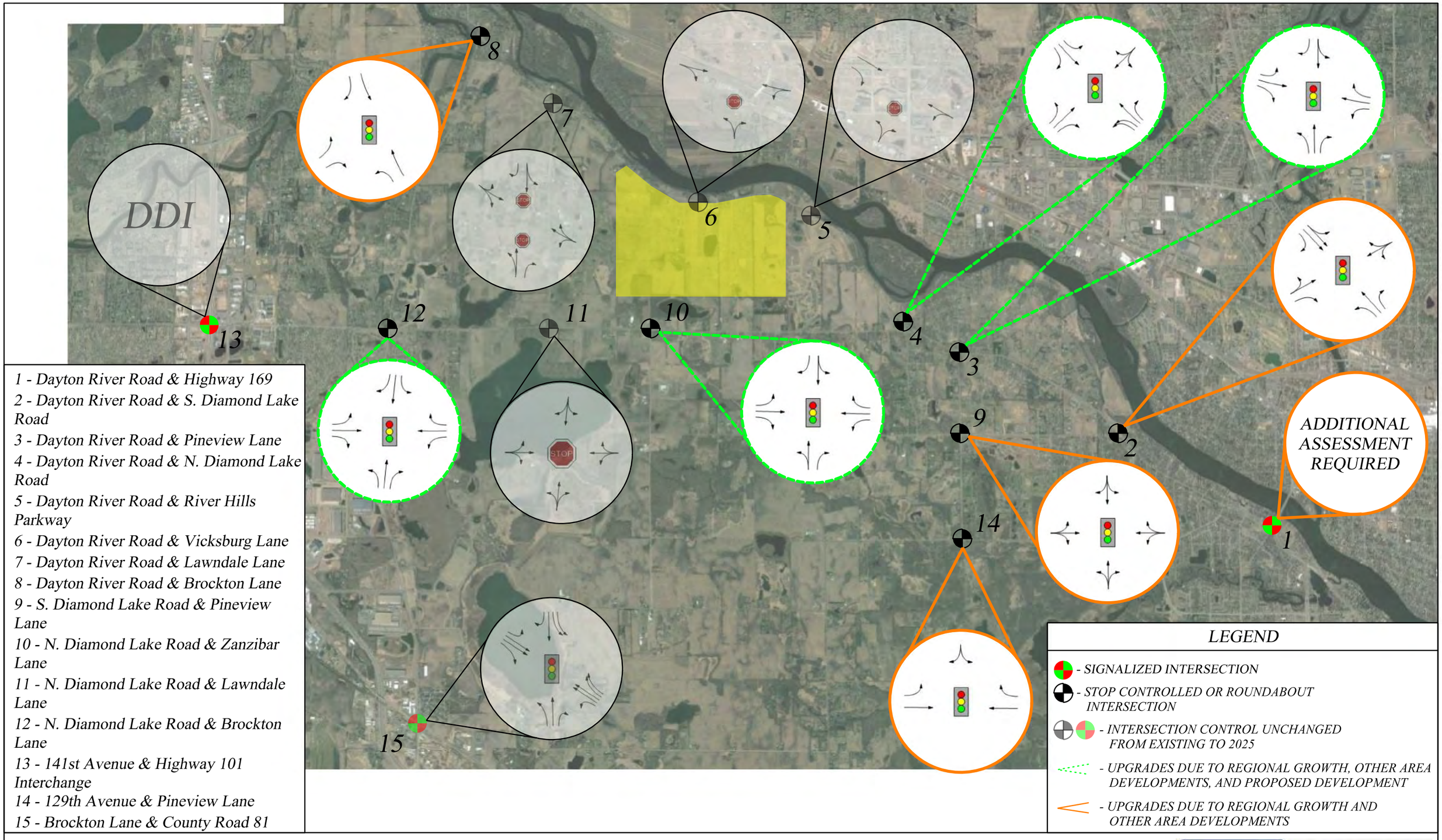

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Figure 5B: 2040 Intersection Layouts
Northern Dayton Development

Spack CONSULTING ENGINEERING TRAFFIC FORWARD

The Language of Traffic Engineering

Traffic Engineering, and Traffic Engineers, often use technical terms or jargon that may be confusing or tough to understand even within the context of a sentence. Key terms and acronyms that can generally be found in all types of traffic studies are defined in this document.

Types of Studies

Access Management – The practice of government agencies limiting the amount of intersections (both public roadway crossings and private driveways) along a roadway corridor based on the function of the roadway to improve safety and mobility while streamlining access.

Corridor Study – A transportation review and analysis of the existing and future traffic operations of a roadway segment. Varies in length from a couple blocks to a few miles and typically covers all modes of travel.

Intersection Control Evaluation (ICE) Report – A document that examines and determines the most appropriate type of control (stop sign, signal, roundabout, or other) at one or more intersections.

Safety Study – An examination of crash records to identify potential trends, issues, and problem intersections/ corridors. Usually includes potential mitigation options expected to decrease crash rates in the future.

Speed Study – A review of existing travel speeds and the corridor characteristics to determine if speeding is an issue, the appropriate speed to post as the limit, and/or areas to provide reduced speed warnings.

Traffic Impact Study (TIS) – A document that addresses the expected traffic impacts of a development and, if necessary, mitigation options that will reduce or eliminate negative impacts. Also referred to as a Traffic Impact Analysis.

Transportation Plan – A document developed by a government agency to take inventory of their transportation network, identify concerns or issues and lay out the path for improvement of the system.

Travel Demand Management Plan (TDMP) – A plan that documents the existing infrastructure around a site, including transit and non-motorized vehicle options, and develops measures to be implemented to encourage those alternative modes of travel.

Warrant Evaluation – Review of traffic volumes and other characteristics at an intersection against thresholds to determine if a traffic signal or other traffic control option is needed/warranted.

Source: ETH Zurich

Traffic Engineering is a branch of civil engineering that focuses on the safe and efficient movement of people and vehicles. It is part science and part art, requiring not only technical skills for analysis but an understanding of motivations in choosing travel routes.

Key Organizations

AASHTO – American Association of State Highway and Transportation Officials. A nonprofit, nonpartisan association representing transportation departments with a primary goal of fostering the development, operation, and maintenance of an integrated national transportation system.

DOT – Department of Transportation. Government organizations within federal and state agencies dedicated to serving the transportation needs of the community and typically responsible for study, design, operation, and maintenance of all facets of transportation.

FHWA – Federal Highway Administration. An agency within the US Department of Transportation that supports State and local governments in the design, construction, and maintenance of the highway system.

ITE – Institute of Transportation Engineers. An international educational and scientific association of transportation professionals who are responsible for meeting mobility and safety needs.

Appendix B - Language of Traffic Engineering

Results

85th Percentile Speed – Speed at which 85 percent of drivers are traveling at or below. Speed limits are typically set at the 85th percentile speed.

95th Percentile Queue – The distance, generally measured in feet or number of vehicles, which will be exceeded in a lane, typically at an intersection, only five percent of the time. Usually used to help determine intersection turn lane lengths.

Control Delay – The total amount of time a motorist takes to get through a road segment or intersection minus the time it would take without stopping due to traffic controls (like stop signs or traffic signals). Control delay includes decelerating and accelerating back to full driving speed.

Functional Classification – the grouping of streets and highways into categories according to their characteristics and emphasis on mobility or access. Generally, categories include arterials (emphasizing mobility and fast travel), local roads (emphasizing access to adjoining properties), and collector roads (emphasizing a balance between the two and usually connecting arterials to local roads).

Intersection Delay – The average amount of time, usually expressed in seconds, experienced by any vehicle traveling through an intersection.

Level of Service (LOS) – Qualitative measure of traffic operations related to the amount of average delay experienced. Expressed in letter grades with LOS A representing the best operations with little to no delay and LOS F representing the worst operations with excessive delays and congestion.

Measures of Effectiveness – Performance measures that define how well traffic is moving along a corridor or thru an intersection. The common MOEs are travel time, corridor speed, delay, and queues.

Mitigation – Measures intended to reduce the impact of a development or improve an identified traffic issue by either improving capacity (like adding lanes) or reducing demand (like encouraging carpooling).

Queue – Length of line of cars waiting at an intersection or at a bottleneck in a corridor, typically measured for each individual lane of traffic in feet or number of vehicles.

Volume to Capacity (v/c) ratio – the number of vehicles through an intersection or roadway segment in a specific amount of time divided by the expected capacity of the road. Less than 1.0 indicates available capacity and above 1.0 indicates more vehicles than can be accommodated. Typically, a v/c ratio above 0.85 suggests operational issues.

Trip Generation – The amount of vehicle traffic generated by a land use. One trip is equal to one vehicle traveling from an origin to a destination (traveling to and from work equals two trips).

Warrants – Criteria based on volumes and other Measures of Effectiveness for determining when all way stop signs, roundabouts, traffic signals, or other type of control should be installed.

Important Manuals/Guides

HCM – Highway Capacity Manual (released by the Transportation Research Board, or TRB). The guide for engineers and planners to assess traffic and environmental effects of highway projects. This manual presents the foundation of traffic analysis procedures in the US.

MUTCD – Manual of Uniform Traffic Control Devices. A document that sets minimum standards and provides guidance to ensure uniformity of traffic control devices (such as messages, location, size, shapes, and colors) across the nation. All roads are subject to its jurisdiction.

HSM – Highway Safety Manual (released by AASHTO). A guide that presents a variety of methods for quantitatively estimating crash frequency or severity.

Resources

MUTCD, 2009 Edition, published by FHWA

Highway Capacity Manual, HCM2010

Highway Safety Manual, HSM

About This Brief

Spack Consulting prepared this brief as part of our company's vision to significantly improve the practice of traffic engineering and transportation planning. Transportation professionals from around the world have assisted us in developing this document. We are providing this brief under the Creative Commons Attribution License. Feel free to use-modify-share this guide, but please give us some credit in your document. To request our whole series of Design Briefs and to be included on our distribution list for new materials, please email mspack@spackconsulting.com. And please reach out if you have any comments or questions related to this Design Brief.

Spack CONSULTING
ENGINEERING TRAFFIC FORWARD

Table D1A
2030 Future Land Use

Weekday Daily Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	DAILY RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family	210	Units	954.0	9.44	50%	50%	4,503	4,503
Multifamily Housing (Low-Rise)	220	Units	745.0	7.32	50%	50%	2,727	2,727
Commercial	820	KSF	168.6	37.75	50%	50%	3,181	3,181
Total							**10,411**	**10,411**

AM Peak Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family	210	Units	954.0	0.74	25%	75%	176	529
Multifamily Housing (Low-Rise)	220	Units	745.0	0.46	23%	77%	79	264
Commercial	820	KSF	168.6	0.94	62%	38%	98	60
Total							**353**	**853**

PM Peak Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family	210	Units	954.0	0.99	63%	37%	595	349
Multifamily Housing (Low-Rise)	220	Units	745.0	0.56	63%	37%	263	154
Commercial	820	KSF	168.6	3.81	48%	52%	308	334
Total							**1,166**	**837**

NOTES:

1. **All trip generation rates based on "Trip Generation", Institute of Transportation Engineers, 9th Edition unless otherwise noted.**
2. **A.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 7 and 9 a.m.).**
3. **P.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 4 and 6 p.m.).**

Spack CONSULTING
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Table D1B
2030 Future Land Use Partial Build

Weekday Daily Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	DAILY RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family	210	Units	318.0	9.44	50%	50%	1,501	1,501
Multifamily Housing (Low-Rise)	220	Units	248.3	7.32	50%	50%	909	909
Commercial	820	KSF	0.0	37.75	50%	50%	0	0
Total							**2,410**	**2,410**

AM Peak Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family	210	Units	318.0	0.74	25%	75%	59	176
Multifamily Housing (Low-Rise)	220	Units	248.3	0.46	23%	77%	26	88
Commercial	820	KSF	0.0	0.94	62%	38%	0	0
Total							**85**	**264**

PM Peak Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family	210	Units	318.0	0.99	63%	37%	198	116
Multifamily Housing (Low-Rise)	220	Units	248.3	0.56	63%	37%	88	51
Commercial	820	KSF	0.0	3.81	48%	52%	0	0
Total							**286**	**167**

NOTES:

1. **All trip generation rates based on "Trip Generation", Institute of Transportation Engineers, 9th Edition unless otherwise noted.**
2. **A.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 7 and 9 a.m.).**
3. **P.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 4 and 6 p.m.).**

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ENGINEERING TRAFFIC FORWARD

Table D2A
Preferred Land Use Full Build Trip

Weekday Daily Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	DAILY RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family	210	Units	1342.0	9.44	50%	50%	6,334	6,334
Multifamily Housing (Low-Rise)	220	Units	267.0	7.32	50%	50%	977	977
Commercial	820	KSF	58.2	37.75	50%	50%	1,099	1,099
Total							**8,410**	**8,410**

AM Peak Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family	210	Units	1342.0	0.74	25%	75%	248	745
Multifamily Housing (Low-Rise)	220	Units	267.0	0.46	23%	77%	28	95
Commercial	820	KSF	58.2	0.94	62%	38%	34	21
Total							**310**	**861**

PM Peak Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family	210	Units	1342.0	0.99	63%	37%	837	492
Multifamily Housing (Low-Rise)	220	Units	267.0	0.56	63%	37%	94	55
Commercial	820	KSF	58.2	3.81	48%	52%	106	115
Total							**1,037**	**662**

NOTES:

1. **All trip generation rates based on "Trip Generation", Institute of Transportation Engineers, 9th Edition unless otherwise noted.**
2. **A.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 7 and 9 a.m.).**
3. **P.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 4 and 6 p.m.).**

Spack CONSULTING
ENGINEERING TRAFFIC FORWARD

Table D2B
Preferred Land Use Partial Build

Weekday Daily Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	DAILY RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family	210	Units	448.0	9.44	50%	50%	2,115	2,115
Multifamily Housing (Low-Rise)	220	Units	89.0	7.32	50%	50%	326	326
Commercial	820	KSF	0.0	37.75	50%	50%	0	0
Total							**2,441**	**2,441**

AM Peak Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family	210	Units	448.0	0.74	25%	75%	83	249
Multifamily Housing (Low-Rise)	220	Units	89.0	0.46	23%	77%	9	32
Commercial	820	KSF	0.0	0.94	62%	38%	0	0
Total							**92**	**281**

PM Peak Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family	210	Units	448.0	0.99	63%	37%	279	164
Multifamily Housing (Low-Rise)	220	Units	89.0	0.56	63%	37%	31	18
Commercial	820	KSF	0.0	3.81	48%	52%	0	0
Total							**310**	**182**

NOTES:

1. **All trip generation rates based on "Trip Generation", Institute of Transportation Engineers, 9th Edition unless otherwise noted.**
2. **A.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 7 and 9 a.m.).**
3. **P.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 4 and 6 p.m.).**

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ENGINEERING TRAFFIC FORWARD

Table D3A
2025 Additional NE Developments

Weekday Daily Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	DAILY RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family	210	Units	391.0	9.44	50%	50%	1,846	1,846
Total							**1,846**	**1,846**

AM Peak Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family	210	Units	391.0	0.74	25%	75%	72	217
Total							**72**	**217**

PM Peak Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family	210	Units	391.0	0.99	63%	37%	244	143
Total							**244**	**143**

NOTES:

1. **All trip generation rates based on "Trip Generation", Institute of Transportation Engineers, 9th Edition unless otherwise noted.**
2. **A.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 7 and 9 a.m.).**
3. **P.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 4 and 6 p.m.).**

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ENGINEERING TRAFFIC FORWARD

Table D3B
2025 Additional Adjacent Developments

Weekday Daily Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	DAILY RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family	210	Units	423.0	9.44	50%	50%	1,997	1,997
Total							**1,997**	**1,997**

AM Peak Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family	210	Units	423.0	0.74	25%	75%	78	235
Total							**78**	**235**

PM Peak Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family	210	Units	423.0	0.99	63%	37%	264	155
Total							**264**	**155**

NOTES:

1. **All trip generation rates based on "Trip Generation", Institute of Transportation Engineers, 9th Edition unless otherwise noted.**
2. **A.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 7 and 9 a.m.).**
3. **P.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 4 and 6 p.m.).**

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Table D4A
2040 Additional SW Developments

Weekday Daily Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	DAILY RATE	ENTER PERCENT	EXIT PERCENT	PASSBY/INTERNAL PERCENT	PASSBY TRIPS	NEW TRIPS ENTER	NEW TRIPS EXIT
French Lake Industrial Park	110	KSF	2700.0	4.96	50%	50%	20%	2,678	5,357	5,357
SW Area Business	710	KSF	545.0	9.74	50%	50%	20%	1,062	2,123	2,123
French Lake	From French Lake Study								2,456	2,456
Gove	210	Units	60.0	9.44	50%	50%	0%	0	283	283
Total								**2,678**	**10,219**	**10,219**

AM Peak Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	PASSBY PERCENT	PASSBY TRIPS	NEW TRIPS ENTER	NEW TRIPS EXIT
French Lake Industrial Park	110	KSF	2700.0	0.70	88%	12%	20%	378	1,331	181
SW Area Business	710	KSF	545.0	1.16	86%	14%	20%	126	435	71
	From French Lake Study								400	87
Gove	210	Units	60.0	0.74	25%	75%	0%	0	11	33
Total								**378**	**2,177**	**372**

PM Peak Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	PASSBY PERCENT	PASSBY TRIPS	NEW TRIPS ENTER	NEW TRIPS EXIT
French Lake Industrial Park	110	KSF	2700.0	0.63	13%	87%	20%	340	177	1,184
SW Area Business	710	KSF	545.0	1.15	16%	84%	20%	125	80	421
		From French Lake Study							111	388
Gove	210	Units	60.0	0.99	63%	37%	0%	0	37	22
Total								**340**	**405**	**2,015**

NOTES:

1. **All trip generation rates based on "Trip Generation", Institute of Transportation Engineers, 9th Edition unless otherwise noted.**
2. **A.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 7 and 9 a.m.).**
3. **P.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 4 and 6 p.m.).**

Spack CONSULTING
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Table D4B
2040 Additional S Developmnts

Weekday Daily Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	DAILY RATE	ENTER PERCENT	EXIT PERCENT	PASSBY/INTERNAL PERCENT	PASSBY TRIPS	NEW TRIPS ENTER	NEW TRIPS EXIT
Pulte, Rush Creek, Sundance, Brayburn	210	Units	1086.0	9.44	50%	50%	0%	0	5,126	5,126
Total								**0**	**5,126**	**5,126**

AM Peak Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	PASSBY PERCENT	PASSBY TRIPS	NEW TRIPS ENTER	NEW TRIPS EXIT
Pulte, Rush Creek, Sundance, Brayburn	210	Units	1086.0	0.74	25%	75%	0%	0	201	603
Total								**0**	**201**	**603**

PM Peak Volumes

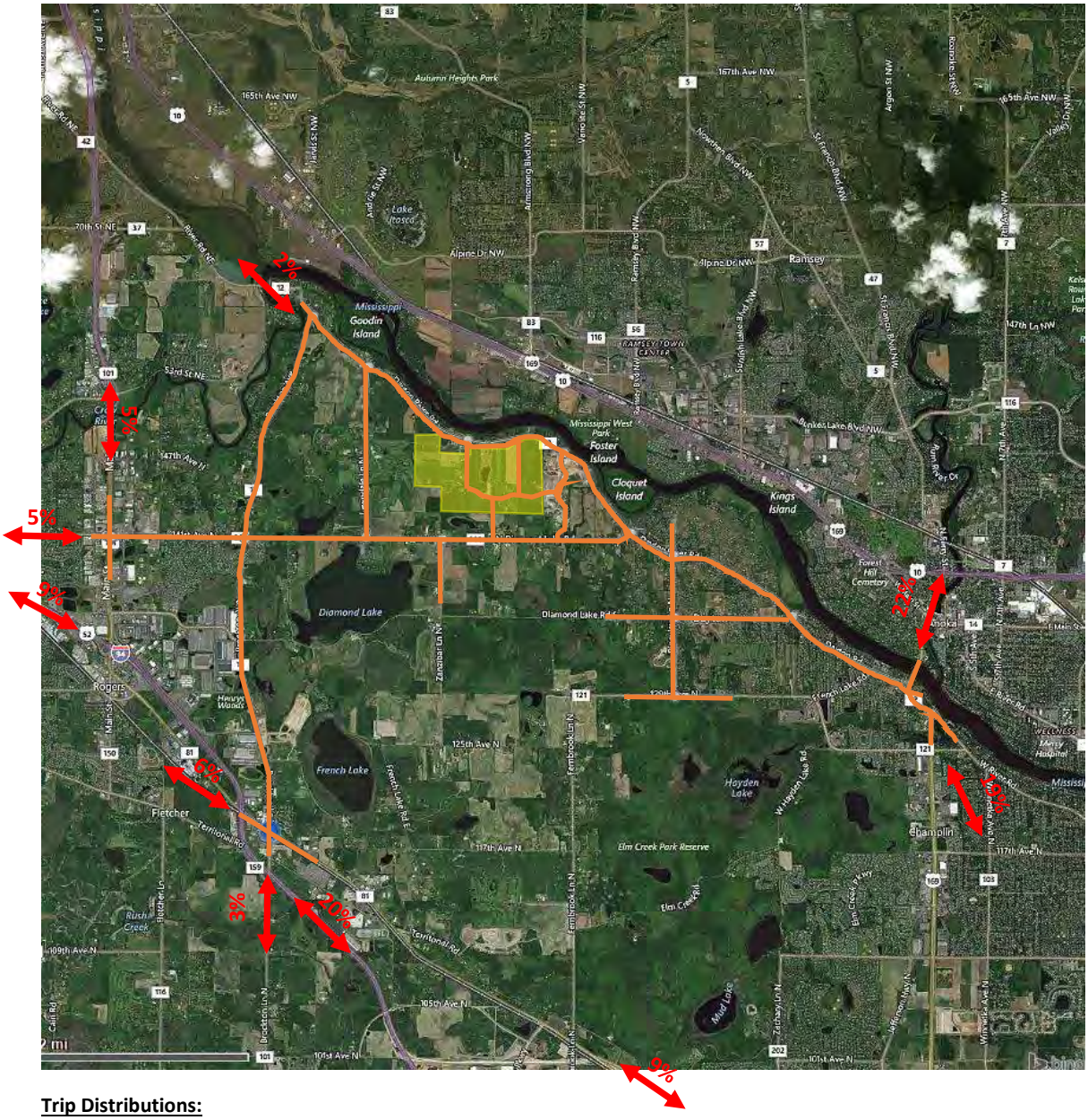
LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	PASSBY PERCENT	PASSBY TRIPS	NEW TRIPS ENTER	NEW TRIPS EXIT
Pulte, Rush Creek, Sundance, Brayburn	210	Units	1086.0	0.99	63%	37%	0%	0	677	398
Total								**0**	**677**	**398**

NOTES:

1. **All trip generation rates based on "Trip Generation", Institute of Transportation Engineers, 9th Edition unless otherwise noted.**
2. **A.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 7 and 9 a.m.).**
3. **P.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 4 and 6 p.m.).**

Appendix E - Trip Distribution Tables

FIGURE 1E: 2025 Development Distribution

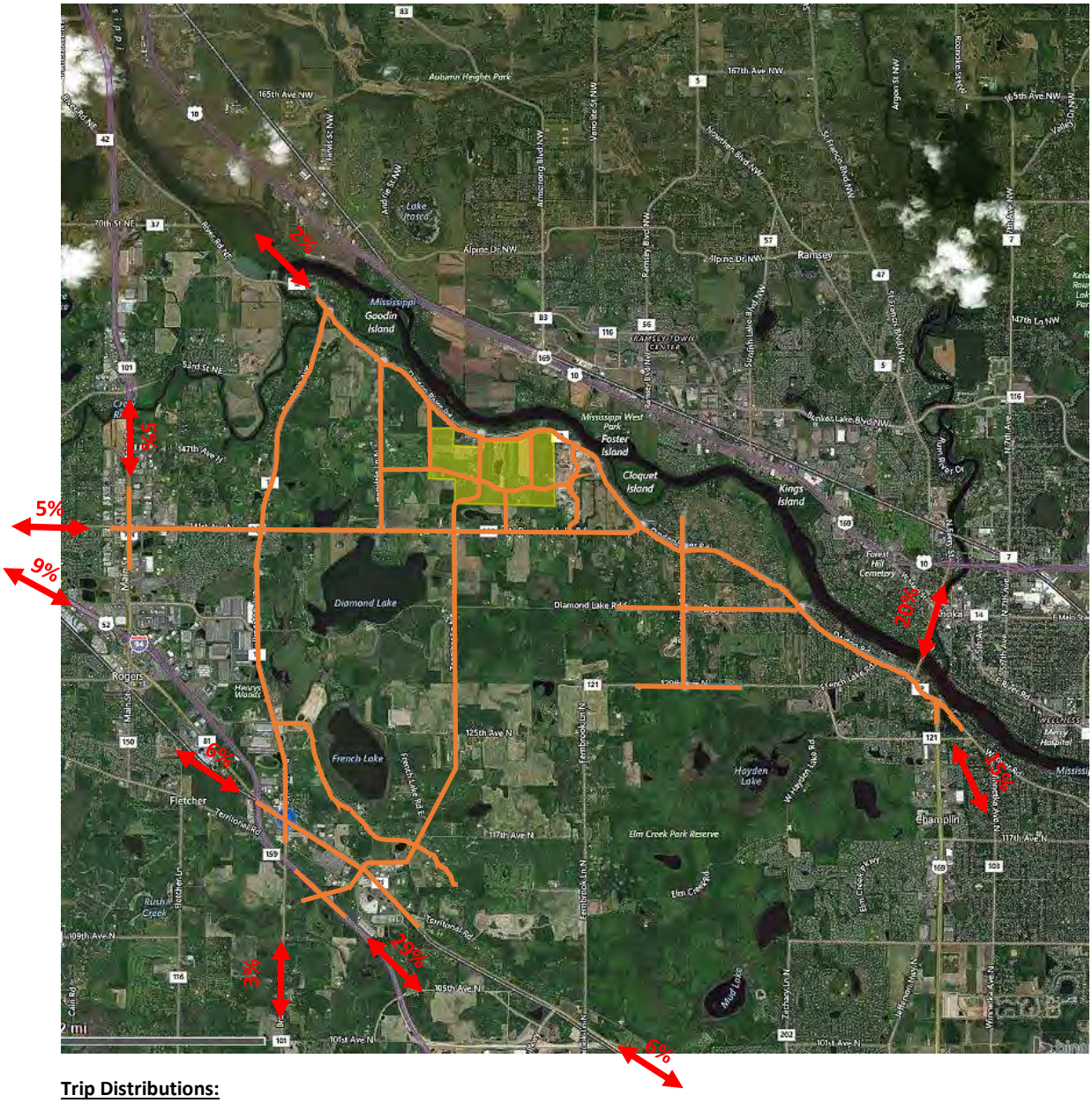


Trip Distributions:

To/ From the North on Dayton River Road – 2%
To/From the North on Hwy 169 – 22%
To/From the South on Hwy 169 and Dayton River Road – 19%
To/From the South on TH 81 – 9%
To/From the South on Hwy 94 – 20%
To/From the South on Brockton Lane – 3%
To/From the North on TH 81 – 6%
To/From the North on Hwy 94 – 9%
To/From the West on 141st Avenue – 5%
To/From the North on TH 101 – 5%

Appendix E - Trip Distribution Tables

FIGURE 2E: 2040 Development Distribution

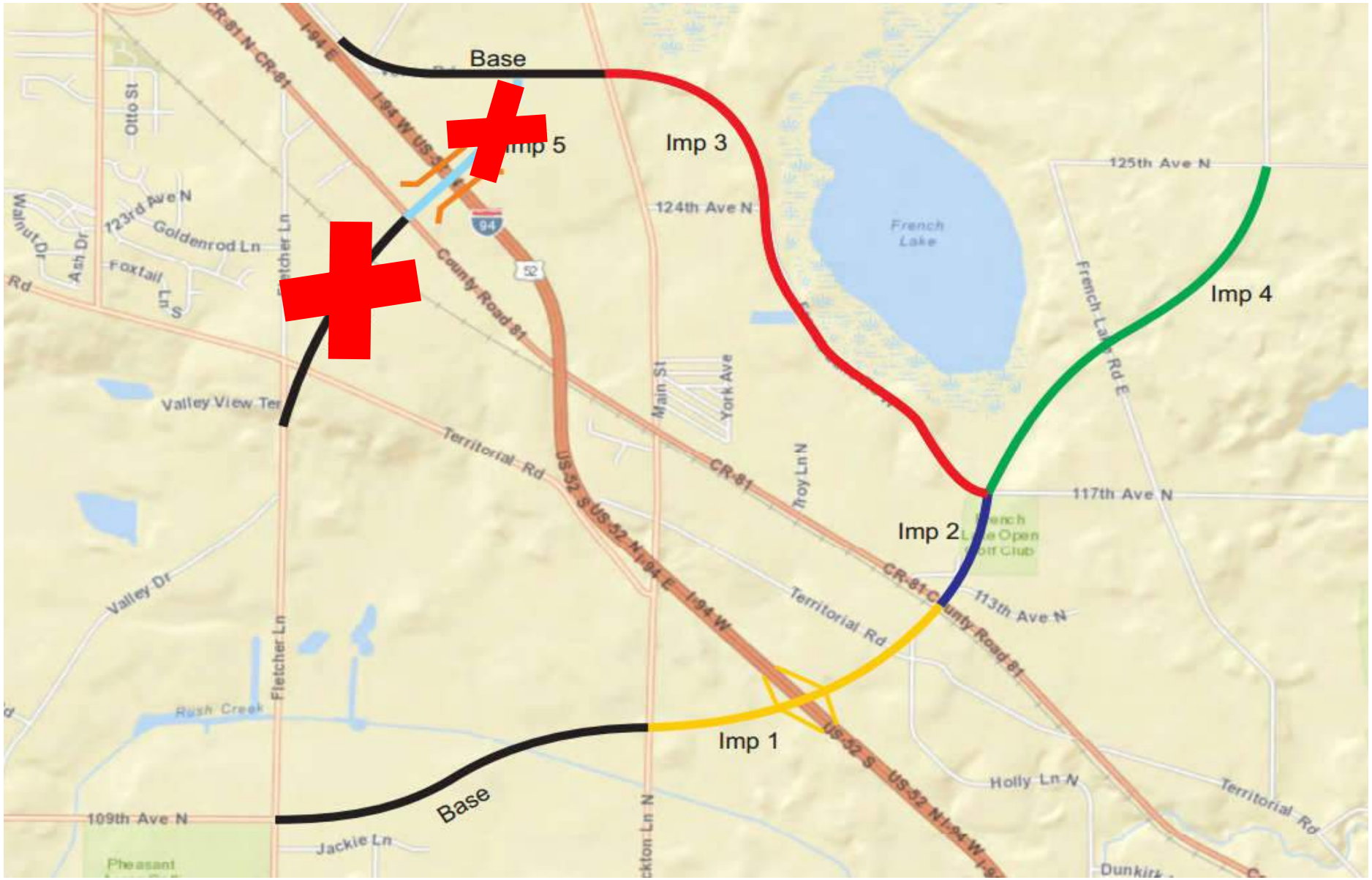


Trip Distributions:

To/ From the North on Dayton River Road – 2%
To/From the North on Hwy 169 – 20%
To/From the South on Hwy 169 and Dayton River Road – 15%
To/From the South on TH 81 – 6%
To/From the South on Hwy 94 – 29%
To/From the South on Brockton Lane – 3%
To/From the North on TH 81 – 6%
To/From the North on Hwy 94 – 9%
To/From the West on 141st Avenue – 5%
To/From the North on TH 101 – 5%

Spack CONSULTING
ENGINEERING TRAFFIC FORWARD

Figure 1F
2040 Roadway Upgrades



Level of Service (LOS)

Level of Service (LOS) is a qualitative description, similar to typical school grades, that traffic engineers use to communicate how good or bad traffic operations are on a corridor, intersection, or interchange.

Common Factors

Traffic can be a hard thing to quantify as everyone has a different tolerance for congestion. What seems excessively long to one person may seem good enough for another. These differences are readily apparent when comparing small towns or rural areas, where five cars an hour can be the norm, to big cities or downtowns, where less than hundred cars an hour, even in the middle of night, is rare.

To combat this issue and provide a consistent measuring tool for traffic studies, a "Level of Service" rating was developed. Level of Service ratings are based on the roadway or intersection characteristics and the amount of traffic. Just like grade school, LOS A represents the best traffic operations, where traffic flows freely. LOS F, on the other hand, represents failing operations, where the road or intersection is congested and running beyond maximum capacity. LOS E is typically considered "at capacity" which means the amount of traffic is right at the level the roadway or intersection can adequately accommodate. Using Level of Service letter grades provides an easy way to convey road operations to the general public and has been adopted across the United States.

Common Factors Impacting Level of Service

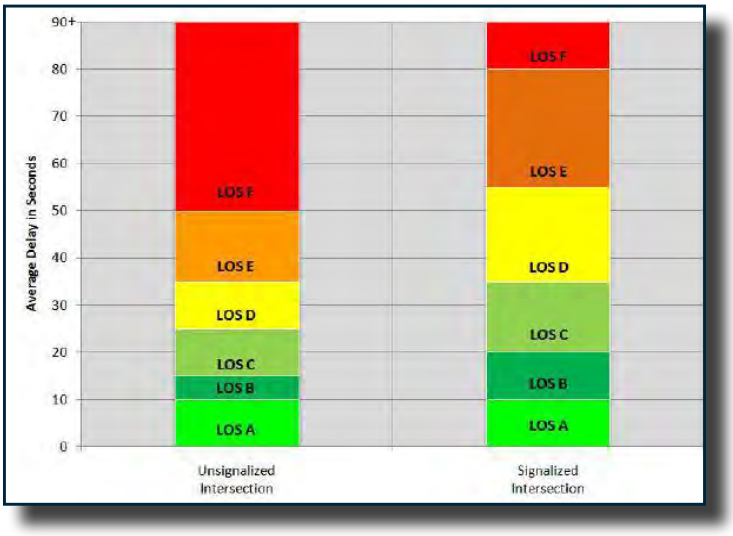
- **Number of Lanes.**
- **Traffic Volumes.**
- **Intersection Control (stop sign, signal, roundabout, interchange.)**
- **Amount of access on a corridor.**
- **Percentage of turning traffic.**
- **Traffic signal cycle length (green time devoted to each approach) and phasing (one green for all approach movements or separate green arrows.)**
- **Percentage of heavy trucks.**
- **Roadway Grades.**
- **Distribution of traffic within a peak hour as well as over the course of a day.**
- **Pedestrian activity.**
- **Bicycle activity.**

Level of Service criteria have been developed for multiple types of traffic operations including:

- Intersections
- Urban Corridors
- Freeways
- Transit Service
- Bicycle Operations
- Pedestrian Operations

The most common LOS criteria used is for car operations at intersections; both signalized and unsignalized. For an intersection Level of Service analysis, average delay for cars travelling through the intersection is used to determine the appropriate grade. A high delay results in a poor LOS rating and equates to poor operations. Similarly, low delay results in a good LOS rating and equates to good or great operations.

LOS can be determined for the intersection as a whole, or for individual movements. It is common during peak periods in major population areas for an intersection to have an acceptable overall LOS rating, but fail to achieve a good grade for individual movements.



Appendix F - Level of Service

LOS A

LOS C

LOS D = Acceptable

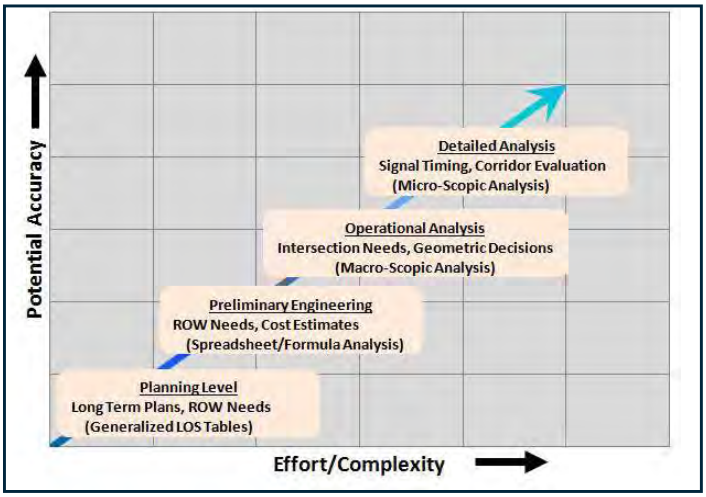
LOS F = Unacceptable

Source: City of San Jose, CA.

Although a Level of Service rating of A represents the best traffic operations, it is not always the most desirable. Providing LOS A for all corridors and all operations at all times would require a significant amount of land to be devoted to the road infrastructure, which makes it extremely costly to build and maintain. During non-peak times, like overnight, much of that infrastructure would sit unused.

On the opposite side of the spectrum, a Level of Service rating of E and F represent traffic operations close to breaking down, or that already have. These ratings mean high delays, long queues, and slow speeds, not to mention driver frustration. Instead of trying to achieve one or the other, government agencies try to strike a balance between providing acceptable operations, neither falling nor flowing too freely. Because of this, LOS D is typically considered the lowest LOS acceptable by government agencies and is reflective of a balanced approach between cost and benefit.

There are many tools and guidelines used to determine a roads Level of Service rating. Simple tools like generalized roadway capacities allow for planning-level efforts. While inexpensive and quick to complete, they are not as accurate as other options. More complicated tools, such as micro-simulations, provide more accurate results, but cost more and take more time. It is important to understand the trade-offs between the analysis types as well as the purpose of the study.



Source: Florida Deptarment of Transportation

Resources

- Highway Capacity Manual, fifth edition
- Nation Cooperative Highway Research Program Report 616; Multimodal Level of Service Analysis for Urban Streets
- http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_616.pdf
- Florida Department of Transportation Quality/Level of Service Handbook
- http://www.dot.state.fl.us/planning/systems/programs/sm/los/pdfs/2009FDOTQLOS_Handbook.pdf

About This Brief

Spack Consulting prepared this brief as part of our company's vision to significantly improve the practice of traffic engineering and transportation planning. Transportation professionals from around the world have assisted us in developing this document. We are providing this brief under the Creative Commons Attribution License. Feel free to use-modify-share this guide, but please give us some credit in your document. To request our whole series of Design Briefs and to be included on our distribution list for new materials, please email mspack@spackconsulting.com. And please reach out if you have any comments or questions related to this Design Brief.

APPENDIX

E

OFFICIAL PUBLIC COMMENTS

Appendix “E” contains all official public comments received during the official comment periods.

Scoping EAW Document Official Comment Submittals

Memorandum

DATE: January 9, 2018

SUBJECT: Response to Official Comments – Draft Scoping EAW for a Proposed AUAR

The Draft Scoping Environmental Assessment Worksheet (Scoping EAW) Document for a Proposed AUAR for the North Dayton Development was distributed for public comments on Monday, November 13th, 2017, and multiple comments were received by the 30-Day Public Comment Period deadline of Wednesday, December 13th, 2017. This memorandum documents all of the comments received along with the various ways each comment will be addressed by the AUAR.

MINNESOTA DEPARTMENT OF THE ARMY CORPS OF ENGINEERS COMMENTS

1) The purpose of this letter is to inform you that based on available information a Department of the Army (DA) permit will likely be required for your proposed activity.

Response: *All applicable permitting requirements will be included in the AUAR. To this end, wetlands within the development site will be delineated, and determinations will be made as to which agency (or agencies) have jurisdiction. A DA permit may be required for potential wetland impacts.*

2) If the proposal involves activity in navigable waters of the United States, it may be subject to the Corps of Engineers' jurisdiction under Section 10 of the Rivers and Harbors Act of 1899 (Section 10). Section 10 prohibits the construction, excavation, or deposition of materials in, over, or under navigable waters of the United States, or any work that would affect the course, location, condition, or capacity of those waters, unless the work has been authorized by a Department of the Army permit.

Response: *All applicable permitting requirements will be included in the AUAR. Navigable waters will be identified to determine if Section 10 applies. A DA permit may be required for potential impacts. At the present time, no activity is anticipated within navigable waters of the United States and we anticipate Section 10 will not be applicable.*

3) If the proposal involves discharge of dredged or fill material into waters of the United States, it may be subject to the Corps of Engineers' jurisdiction under Section 404 of the Clean Water Act (CWA Section 404). Waters of the United States include navigable waters, their tributaries, and adjacent wetlands (33 CFR § 328.3). CWA Section 301(a) prohibits discharges of dredged or fill material into waters of the United States, unless the work has been authorized by a Department of the Army permit under Section 404. Information about the Corps permitting process can be obtained online at http://www.mvp.usace.army.mil/regulatory

Response: *The project will be designed to minimize impacts to wetlands. Construction activities will disturb soils and there will be potential for erosion and sedimentation. Best management practices (BMPs) will be implemented to reduce the potential for sediments reaching wetlands and the Mississippi River. The AUAR will describe all potential impacts to wetlands and include mitigation measures including applicable BMPs.*

4) The Corps' evaluation of a Section 10 and/or a Section 404 permit application involves multiple analyses, including (1) evaluating the proposal's impacts in accordance with the National Environmental Policy Act (NEPA) (33 CFR part 325), (2) determining whether the proposal is contrary to the public interest (33 CFR § 320.4), and (3) in the case of a Section 404 permit, determining whether the proposal complies with the Section 404(b)(1) Guidelines (Guidelines) (40 CFR part 230).

Response: *The AUAR will include an assessment of the potential for impacts to wetlands and the Mississippi River. The noted analysis will be performed if navigable waters are impacted.*

5) If the proposal requires a Section 404 permit application, the Guidelines specifically require that "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences" (40 CFR § 230.10(a)). Time and money spent on the proposal prior to applying for a Section 404 permit cannot be factored into the Corps' decision whether there is a less damaging practicable alternative to the proposal.

Response: *Comment noted.*

6) If an application for a Corps permit has not yet been submitted, the project proposer may request a pre-application consultation meeting with the Corps to obtain information regarding the data, studies or other information that will be necessary for the permit evaluation process. A pre-application consultation meeting is strongly recommended if the proposal has substantial impacts to waters of the United States, or if it is a large or controversial project.

Response: *Comment noted.*

MINNESOTA DEPARTMENT OF NATURAL RESOURCES COMMENTS

1) As requested, the Minnesota Natural Heritage Information System has been queried to determine if any rare species or other significant natural features are known to occur within an approximate one-mile radius of the proposed project. Based on this query, rare features have been documented within the search area. Please note that the proposed project has the potential to negatively affect the following rare features in the following comments.

Response: *The results of the NHIS will be included in the AUAR.*

2) Ecologically Significant Areas:

The proposed project overlaps with the North Metro Mississippi River Important Bird Area (IBA). Important Birds Areas, identified by Audubon Minnesota in partnership with the DNR, are part of an international conservation effort aimed at conserving critical bird habitats. They are voluntary and non- regulatory, but the designation does demonstrate the biological value of this surrounding area. The Mississippi Flyway is extremely important for all migratory birds. While the IBA boundaries and the proposed project boundary include disturbed land, the proposed development has the potential to further impact the Mississippi River and the IBA through the loss of wetlands and mature trees and through additional runoff due to increased impervious cover.

Response: *Impacts of the proposed project will be assessed in the AUAR. Site design will seek to minimize impacts to wetlands and significant wooded areas where feasible, and the boundaries of the Mississippi River Important Bird Area (IBA) will be identified.*

3) State-listed Species:

- The proposed project boundary is near an area of statewide importance to Blanding's turtles (*Emydoidea blandingii*), a state-listed threatened species, and this rare turtle may be encountered on site. Blanding's turtles use wetlands as well as upland areas up to and over a mile distant from wetlands. Uplands are used for nesting, basking, periods of dormancy, and traveling between wetlands. Factors believed to contribute to the decline of this species include collisions with vehicles, wetland drainage and degradation, and the development of upland habitat. Any added fatality can be detrimental to populations of Blanding's turtles, as these turtles have a low reproduction rate that depends upon a high survival rate to maintain population levels.

  This project has the potential to impact this rare turtle through direct fatalities or habitat disturbance/destruction due to dewatering, excavation, fill, or other construction activities associated with the project. Actions to avoid or minimize disturbance to this state-protected turtle may include, but are not limited to, the following recommendations:

- Avoid or minimize impacts to wetlands,
- To avoid any incidental takings, avoid filling or dewatering wetlands during the winter,
- Implement stringent sediment and erosion control methods,
- Use wildlife-friendly erosion control methods (see links below),
- Monitor for turtles during construction and report any sightings to the DNR,
- Refer to the first list of recommendations in the enclosed Blanding's Turtle Fact Sheet. If greater protection for turtles is desired, the second list of recommendations can be implemented as well. The fact sheet contains specific recommendations regarding roads, utilities, and landscaping that will pertain to this project.
- For specific recommendations pertaining to roads, please refer to Curb Design and Small Animals, Preventing Entanglement, & Reducing Wildlife Vehicle Collisions in Chapter One of the Minnesota Department of Transportation's Best Practices Manual: (http://www.dnr.state.mn.us/waters/watermgmt_section/pwpermits/gp_2004_0001_manual.html).

The attached flyer that is inserted to this response memo along with the official letter from DNR should be given to all contractors working in the area. If Blanding's turtles are encountered on site, please remember that state law and rules prohibit the destruction of threatened or endangered species, except under certain prescribed conditions. If turtles are in imminent danger they must be moved by hand out of harm's way, otherwise they are to be left undisturbed.

- The black sandshell (*Ligumia recta*), a state-listed mussel of special concern, has been documented in the Mississippi River in the vicinity of the proposed project. Mussels are particularly vulnerable to deterioration in water quality, especially increased siltation. As such, it is important that effective erosion prevention and sediment control practices be implemented and maintained near the river during construction and incorporated into any stormwater management plan.

Response: *The potential for impacts to state-listed threatened species and state-listed species of special concern will be assessed in the AUAR. All applicable mitigation measures will be included in the Mitigation Plan provided in the AUAR including but not limited to: 1) minimization of wetland impacts; 2) installation of mountable curb throughout the project; 3) implementation of protection measures during construction (i.e. what is to be done if a state-listed species is encountered); and 4) requiring erosion control measures to limit sedimentation.*

4) Federally Protected Species:

- The northern long-eared bat (Myotis septentrionalis), federally listed as threatened and state-listed as special concern, can be found throughout Minnesota. During the winter this species hibernates in caves and mines, and during the active season (approximately April-October) it roosts underneath bark, in cavities, or in crevices of both live and dead trees. Pup rearing is during June and July. Activities that may impact this species include, but are not limited to, wind farm operation, any disturbance to hibernacula, and destruction/degradation of habitat (including tree removal).

The U.S. Fish and Wildlife Service (USFWS) has published a final 4(d) rule that identifies prohibited take. To determine whether you need to contact the USFWS, please refer to the USFWS Key to the Northern Long-Eared Bat 4(d) Rule (see links below). Please note that the NHIS does not contain any known occurrences of northern long-eared bat roosts or hibernacula within an approximate one-mile radius of the proposed project.

Response: *Potential impacts to federally listed threatened and state-listed species of special concern will be assessed in the AUAR. The project will coordinate with the U.S. Fish and Wildlife Service to confirm there are no known occurrences of northern long-eared bat roosts or hibernacula within an approximate one-mile radius of the proposed project. If occurrences are identified, mitigation measures will be outlined in the AUAR, and/or tree removal in such areas will need to occur within permitted timeframes.*

5) Environmental Review and Permitting:

- The Alternative Urban Areawide Review (AUAR) should address whether the proposed project has the potential to adversely affect the above rare features and, if so, it should identify specific measures that will be taken to avoid or minimize disturbance.
- Please include a copy of this letter in any state or local license or permit application. To the extent applicable, measures to avoid or minimize disturbance to the above rare features should be included as restrictions or conditions in any required permits or licenses.

Response: *The AUAR will assess impacts of the proposed project on rare features and will identify mitigation measures.*

6) Landcover:

The cover types table on page 5 shows that the AUAR boundary contains 51 acres of wooded/forest land. We suggest that trees and larger wooded areas be retained as much as possible. Aerial imagery and Minnesota landcover maps shows two larger wooded areas within the project boundary (one in the northeast of the project area surrounding public water wetland 27-104 and one in the southwest of the project area north/northwest of

public water wetland 27-124), in addition to several smaller wooded areas. Preserving these wooded areas as parks/community green space should be considered. In addition to providing environmental benefits such as wildlife habitat and clean air and water, wooded areas within communities offer many benefits to residents including recreation and health benefits, as well as increased property values. The book Conserving Wooded Areas in Developing Communities: Best Management Practices in Minnesota is a great reference for community planners and developers to use when considering development that contains wooded areas, with information on benefits of wooded areas and trees, as well as best management practices to conserve wooded areas at the subdivision and lot levels.

Response: *The project will strive to avoid impacts to significant wooded areas and will comply with local ordinances.*

7) Public waters:

Public water wetlands are DNR Public Waters. Public Water Wetland, 27-104, is located within the proposed boundary and should be included on the list of DNR Public Waters present on site. As noted, Public Water Wetland 27-124 is also listed as a natural environment lake. Any development occurring near this waterbody will require a 150 foot setback and be subject to different zoning standards, per the City of Dayton's adopted shoreland zoning ordinance (City of Dayton Code of Ordinances Chapter 1000 Section 1001.8).

Response: *The project will comply with all applicable setbacks and ordinances.*

8) Fish, wildlife, and rare features:

The Natural Heritage review has been completed and a letter was sent on December 6, 2017 (attached). The letter provides information on rare features that may be negatively affected by the project along with suggestions on mitigation measures. Rare species identified in the letter include: Blanding's turtles (Emydoidea blandingii), a state-listed threatened species; black sandshell (Ligumia recta), a state-listed mussel of special concern (documented in the Mississippi River); and the northern long-eared bat (Myotis septentrionalis), federally listed as threatened and state-listed as special concern (found throughout Minnesota). In addition, the North Metro Mississippi River Important Bird Area (IBA) overlaps the proposed project area. As noted on page 16 of the scoping EAW, the sensitive features identified in the Natural Heritage letter should be detailed in the AUAR and mitigation plans should be laid out to protect these resources.

Cumulative potential effects on these features should also be addressed.

Response: *Impacts to rare species and habitat will be assessed in the AUAR and applicable mitigation measures will be included.*

HENNEPIN COUNTY COMMENTS

1) Thanks for the "heads up". We did receive your previous transmittal on November 3rd. Jason Gottfried and David Jaeger will be assisting in assembling our formal comments once the Scoping EAW is published.

Based on the magnitude of the potential development, we expect that significant impacts will be identified, and hopefully reasonable mitigation measures can ultimately be identified. Some items we will likely comment on later:

- We believe the list of intersections to be evaluated needs to include CSAH-13 (Brockton Lane) / CSAH-81 and CSAH-12 (Dayton River Road) / TH-169.
- The future traffic analysis should focus on a 20-year time period after build-out.
- Background traffic growth should be assumed at an average of 2% per year consistent with current trends.

Response: *These comments will be considered in the assessment of traffic impacts that will be discussed in the AUAR.*

METROPOLITAN COUNCIL COMMENTS

1) Item 6 - Project Description:

Environmental Quality Board guidance states that the AUAR document must review at least one development scenario based on and consistent with the City's comprehensive plan update (CPU) in effect when the AUAR is officially ordered, which we assume is the 2030 CPU.

Additionally, at least one proposed development scenario should be consistent with the City's draft 2040 CPU, should its land use guidance for this area be different from the 2030 CPU, to minimize the need for a comprehensive plan amendment (CPA) following the environmental review process.

The SEAW indicates the City's 2030 Comprehensive Plan's future planned land uses are being re-guided through the City's official planning process for the 2040 CPU. The project description indicates that approximately 1,500 to 1,700 single-family residential homes and approximately 28 acres of mixed-use development are anticipated in the project area (see Figure 4). Mixed use is only briefly mentioned in this context. Please provide additional context for this area and its mix of uses in the AUAR. Also, please note the referenced Figure 4 did not appear to be in the SEAW.

Response: *One scenario consistent with the 2030 Comprehensive Plan and one scenario consistent with the 2040 Comprehensive Plan Update will be assessed in the AUAR along with the no build scenario.*

2) Item 8 – Permits:

Please include in the permit section that amendment to the 2030 CPU or incorporation into the 2040 CPU is needed. Beginning July I, 2018, we will no longer accept amendments to 2030 comprehensive plans. Linked here is the Council's guidelines on 2030 comprehensive plan amendment review through 2018 https://metrocouncil.org/Communities/Publications-And- Resources/Comp-Plan-Amendment-Review-Through-2018.aspx.

Response: *The project will be incorporated into the 2040 Comprehensive Plan Update which will be described in the AUAR.*

3) Item 9 - Land Use:

The SEAW discusses the City of Dayton Land Use Map (Figure 7) and indicates that the future planned land uses in the AUAR area are commercial, low-medium density residential, low-density residential, and agricultural preserve and that the northern part of the site is located in the Mississippi River Corridor Critical Area. However, please note that Figure 7 is the City's Existing Land Use Map versus 2030 CPU Future Land Use (Approved 2030 CPU Future Land Use: https://metrocouncil.org/Council-Meetings/Committees/Community-Development-Committee/20l4/0ctober-6,-2014/2014-241.aspx). Also, please note that the 2030 CPU future land uses for the AUAR area include mixed use rather than commercial.

As noted in the SEAW, the eastern edge of the site includes land is guided Agricultural Preserves. Please confirm in the AUAR if this area is still currently enrolled.

The Appendix includes Figure 8 "Proposed Land Use," which shows the entire development area as "Master Plan Land Use," but should be updated to show future land use categories consistent with the City's comprehensive plan (i.e. Mixed Use, Low-Density Residential).

- Regional Parks and Trails:

  The AUAR area is adjacent to the West Mississippi River Regional Trail Search Corridor, which will be planned, developed, and operated by Three Rivers Park District and governed by the 2040 Regional Parks Policy Plan. Per the Dayton Park and Open Space Plan, the City will work to connect surrounding communities to greenways and trails. The SEAW states the development of the site will take these local planning efforts into consideration and establish the identified connections.

- Housing:

  The City's share of the region's need for affordable housing for the 2021-2030 decade is 333 units. The size and sewer serviced capacity of this area suggests that some higher density housing could be wo1th considering as a part of the overall project; perhaps in a mixed use capacity or as a buffer between the commercial areas and the single family housing Areas. Creating some opportunities for housing at densities of at least 8 units per acre would also contribute to Dayton's ability to address their affordable housing share for the next decade and could provide more housing options within the North Dayton area.

- Traffic Analysis Zones (TAZ):

  TAZ forecasts are not discussed, but this would be helpful information. A draft set of TAZ forecasts for 2040 has been prepared by Metropolitan Council and is available for local governments to review.

  The North Dayton development is a part of TAZ #803. The TAZ is mainly farmland, and currently forecasted by Metropolitan Council to gain +318 households during 2010-2040. The North Dayton SEAW discusses 1,500 to 1,700 new units. The TAZ #803 forecast should be revised higher as part of the City's upcoming 2040 CPU.

Response: *These comments will be incorporated and assessed in the AUAR.*

4) Item 11 – Wastewater:

The southwest portion of the project area is beyond the current 2020 staging in the 2030 CPU. Prior to the installation of any sanitary sewer improvements within this portion of the project area, the City will need to re-guide the staging from 2030 expansion area to existing 2020 through the submittal of a comprehensive plan amendment or through incorporation in the 2040 CPU.

Response: *Wastewater impacts will be assessed in the AUAR, and a discussion of the staging will be included.*

5) Item 13 - Fish, wildlife, plant communities, and sensitive ecological resources:

The SEAW indicates that there are currently approximately 51 acres of isolated woodland areas remain within the proposed 560-acre AUAR area. The wooded area located in the south west corner of the AUAR area that is approximately 12 acres in size, which also contains several wetland areas, is identified in the City's 2005 Natural Resource Inventory as a map le-basswood forest remnant. We encourage the City and project proposer to plan to preserve and incorporate as open space this wooded parcel, the continued wooded habitat around the wetland immediately to the south east of the 1 2-ac re parcel, and the wooded parcels along the northern boundary of the AUAR area that incorporate the ravines draining the area toward the Mississippi River (as

discussed in SEAW Item 9.a.i. on page 8). They will add value to the ultimate development in the area, as visual amenities, wildlife corridors, and erosion protection within the steep ravines leading toward the River.

Response: *Project design will minimize impacts to wooded and wetland areas.*

MINNESOTA POLLUTION CONTROL AGENCY COMMENTS

1) Item 7 - Cover Types:

The table of cover types in this section is lacking entries in the "After" column so it is not possible to determine the changes in cover types as a result of the Project. The MPCA recommends column A be completed in the AUAR.

Response: *Changes in cover type acreages will be provided in the AUAR.*

2) Item 11 – Water Resources:

- The process to avoid, minimize, and mitigate wetlands is required and specific in-water best management practices must be included in the AUAR.
- Also, if a U.S. Army Corps of Engineers 404/MPCA 401 Certification are required, an antidegradation assessment, (Minn. R. 7050.0250 to 7050.0335) may now be needed for the Project. For questions regarding 401 Certification, please contact Bill Wilde at 651-757-2825.
- The SEAW focuses primarily on post development stormwater controls to be utilized by the project and does not address the temporary stormwater sediment controls as specified in Item 11. ii. required to prevent impacts to area surface waters during construction. Questions regarding Construction Stormwater Permit requirements should be directed to Roberta Getman at 507-206-2629.

  The following should be included in the AUAR based on the site description and as required in MPCA's National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) General Construction Stormwater permit (CSW Permit):

  a) Ensure down gradient sediment controls are specifically designed for the steep slopes at the Project site to provide adequate runoff protection during construction.

  b) Minimize the duration of exposed soils by phasing construction of the Project.

c) Because the Mississippi River is classified as a special water, soils will need to be stabilized within seven days of temporarily or permanently ceasing soil disturbing activity on any portion of the Project site. In addition, an undisturbed 100-foot buffer zone must be maintained between the river and the Project unless an encroachment is necessary to complete the Project and the area will be restored.

d) The wetlands located at the site cannot be utilized for stormwater management or treatment unless they have gone through the mitigation process.

e) The CSW Permit requires that one inch of stormwater runoff from new impervious surfaces is retained on the Project site via infiltration or other volume reduction method and not discharged to a surface water unless prohibited due to a high seasonal water table or bedrock.

f) Assuming 50 or more acres will be disturbed as a result of the Project, the Stormwater Pollution Prevention Plan must be submitted to the MPCA for review at least 30 days prior to applying for permit coverage even if only a smaller portion of the Project site will be constructed at one time.

- Please include Diamond Lake under Water Resources, part (a.,i.) (pg. 11). Diamond Lake (27-0125) is on the MPCA 303d Impaired Waters List and is impaired by nutrients. This lake appears to be within one mile of the Project site.

Response: *These items will be included and assessed in the AUAR.*

NATIONAL PARK SERVICE COMMENTS

1) The northern portion of the proposed project would lie within the boundary of the Mississippi National River and Recreation Area (NRRA). Congress established the Mississippi NRRA in 1988 to preserve, protect, and enhance the significant values of the Mississippi River Corridor in the Twin Cities metropolitan area.

Response: *The location of the NRRA will be noted in the AUAR.*

2) Under Item 9a the document states only that "the northern portion of the site is located within the Mississippi River Corridor Critical Area Program district CA-SR..." The Mississippi River Corridor Critical Area (MRCCA) shares the same boundary as the Mississippi NRRA. The Minnesota Department of Natural Resources (DNR) administers the MRCCA program allowing for cooperative management of the Mississippi NRRA with local governments including the City of Dayton. A notation should be made that this area is also part of the Mississippi NRRA.

Response: *This correction will be made in the AUAR.*

3) Additionally, under Item 9a the claim is made that "the Mississippi River and adjacent river corridor lands are designated and classified as 'Wild & Scenic River' and 'Critical Area'..." In 2012, the Minnesota State Legislature revised the Mississippi River Wild and Scenic River (WSR) boundaries to remove any land in the cities of Dayton and Ramsey. This action was taken to reduce the number of shoreland-related regulations pertinent in these areas, because the Mississippi River in these cities is also regulated under the MRCCA rules as well as standard shoreland rules. The reference to the WSR designation should be removed from the document while retaining the MRCCA reference.

Response: *This correction will be made in the AUAR.*

4) It should be noted that there is a Primary Conservation Area (PCA) located on the northern edge of the study area (see attached map). PCA's are afforded protections under the MRCCA rules that went into effect in January 2017. PCA's are to be set aside as open space in whole or part as applicable in large developments such as the one proposed here. This is meant to provide opportunities to protect or restore valuable resources in the Mississippi River Corridor.

Subdivision and land development standards, including percentages and acreages for PCA protection in large developments can be found in Minnesota Rules, part 6106.0170.

Response: *The location of the PCA will be noted in the AUAR.*

5) Lastly, given the proximity of the site to the Great River Road and Mississippi River Trail on Dayton River Road efforts should be made to make pedestrian and bike connections between the site and the Mississippi River. This would increase access and recreational opportunities in the Mississippi NRRA and surrounding community.

Response: *The project will incorporate pedestrian and bicycle connections as feasible.*

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
180 FIFTH STREET EAST, SUITE 700
ST. PAUL, MN 55101-1678

11/01/2017

REPLY TO ATTENTION OF
REGULATORY BRANCH

Regulatory File No. MVP-2017-03815-SMD

THIS IS NOT A PERMIT

Michele Ross
Sambatek
12800 Whitewater Drive, Suite 300
Minnetonka, MN 55343

To Whom It May Concern:

We have received your submittal described below. You may contact the Project Manager with questions regarding the evaluation process. The Project Manager may request additional information necessary to evaluate your submittal.

File Number: MVP-2017-03815-SMD

Applicant: Dayton Development Partnership, LLC c/o Jake Walesch

Project Name: Dayton Development Partnership, LLC / North Dayton Development

Received Date: 10/31/2017

Project Manager: Michael Davis
(651) 290-5268
Stephen.M.Davis@usace.army.mil

Additional information about the St. Paul District Regulatory Program, including the new Clean Water Rule, can be found on our web site at http://www.mvp.usace.army.mil/missions/regulatory.

Please note that initiating work in waters of the United States prior to receiving Department of the Army authorization could constitute a violation of Federal law. If you have any questions, please contact the Project Manager.

Thank you.

U.S. Army Corps of Engineers
St. Paul District
Regulatory Branch

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
180 FIFTH STREET EAST, SUITE 700
ST. PAUL, MN 55101-1678

REPLY TO ATTENTION OF
REGULATORY BRANCH

NOV 0 9 2017

Regulatory File No. MVP-2017-03815-SMD

Sambatek
c/o Michele Ross
12800 Whitewater Drive, Suite 300
Minnetonka, MN 55343

Dear Ms. Ross:

We have received the document entitled, "North Dayton Development," received on October 31, 2017. The purpose of this letter is to inform you that based on available information a Department of the Army (DA) permit will likely be required for your proposed activity. This letter also provides general information regarding the U.S. Army Corps of Engineers (Corps) regulatory program.

If the proposal involves activity in navigable waters of the United States, it may be subject to the Corps of Engineers' jurisdiction under Section 10 of the Rivers and Harbors Act of 1899 (Section 10). Section 10 prohibits the construction, excavation, or deposition of materials in, over, or under navigable waters of the United States, or any work that would affect the course, location, condition, or capacity of those waters, unless the work has been authorized by a Department of the Army permit.

If the proposal involves discharge of dredged or fill material into waters of the United States, it may be subject to the Corps of Engineers' jurisdiction under Section 404 of the Clean Water Act (CWA Section 404). Waters of the United States include navigable waters, their tributaries, and adjacent wetlands (33 CFR § 328.3). CWA Section 301(a) prohibits discharges of dredged or fill material into waters of the United States, unless the work has been authorized by a Department of the Army permit under Section 404. Information about the Corps permitting process can be obtained online at http://www.mvp.usace.army.mil/regulatory.

The Corps' evaluation of a Section 10 and/or a Section 404 permit application involves multiple analyses, including (1) evaluating the proposal's impacts in accordance with the National Environmental Policy Act (NEPA) (33 CFR part 325), (2) determining whether the proposal is contrary to the public interest (33 CFR § 320.4), and (3) in the case of a Section 404 permit, determining whether the proposal complies with the Section 404(b)(1) Guidelines (Guidelines) (40 CFR part 230).

If the proposal requires a Section 404 permit application, the Guidelines specifically require that "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences" (40 CFR § 230.10(a)). Time and money spent on the proposal prior to applying for a Section 404 permit cannot be factored into the Corps' decision whether there is a less damaging practicable alternative to the proposal.

Regulatory Branch (File No. MVP-2017-03815-SMD)

If an application for a Corps permit has not yet been submitted, the project proposer may request a pre-application consultation meeting with the Corps to obtain information regarding the data, studies or other information that will be necessary for the permit evaluation process. A pre-application consultation meeting is strongly recommended if the proposal has substantial impacts to waters of the United States, or if it is a large or controversial project.

If you have any questions, please contact me in our St. Paul office at (651) 290-5268 or Stephen.m.davis@usace.army.mil. In any correspondence or inquiries, please refer to the Regulatory file number shown above.

Sincerely,

Michael Davis
Project Manager

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

December 6, 2017 **Correspondence # ERDB 20180177**

Ms. Michele Ross
Sambatek, Inc.
12800 Whitewater Drive, Suite 300
Minnetonka, MN 55343

RE: Natural Heritage Review of the proposed North Dayton Development; T120N R22W, Sections 5, 8, & 9; Hennepin County

Dear Ms. Ross,

As requested, the Minnesota Natural Heritage Information System has been queried to determine if any rare species or other significant natural features are known to occur within an approximate one-mile radius of the proposed project. Based on this query, rare features have been documented within the search area. Please note that the proposed project has the potential to negatively affect the following rare features:

Ecologically Significant Areas

- The proposed project overlaps with the North Metro Mississippi River Important Bird Area (IBA). Important Birds Areas, identified by Audubon Minnesota in partnership with the DNR, are part of an international conservation effort aimed at conserving critical bird habitats. They are voluntary and non-regulatory, but the designation does demonstrate the biological value of this surrounding area. The Mississippi Flyway is extremely important for all migratory birds. While the IBA boundaries and the proposed project boundary include disturbed land, the proposed development has the potential to further impact the Mississippi River and the IBA through the loss of wetlands and mature trees and through additional runoff due to increased impervious cover.

State-listed Species

- The proposed project boundary is near an area of statewide importance to Blanding's turtles (*Emydoidea blandingii*), a state-listed threatened species, and this rare turtle may be encountered on site. Blanding's turtles use wetlands as well as upland areas up to and over a mile distant from wetlands. Uplands are used for nesting, basking, periods of dormancy, and traveling between wetlands. Factors believed to contribute to the decline of this species include collisions with vehicles, wetland drainage and degradation, and the development of upland habitat. Any added fatality can be detrimental to populations of Blanding's turtles, as these turtles have a low reproduction rate that depends upon a high survival rate to maintain population levels.

This project has the potential to impact this rare turtle through direct fatalities or habitat disturbance/destruction due to dewatering, excavation, fill, or other construction activities associated with the project. Actions to avoid or minimize disturbance to this state-protected turtle may include, but are not limited to, the following recommendations:

- Avoid or minimize impacts to wetlands,
- To avoid any incidental takings, avoid filling or dewatering wetlands during the winter,
- Implement stringent sediment and erosion control methods,
- Use wildlife-friendly erosion control methods (see links below),
- Monitor for turtles during construction and report any sightings to the DNR,
- Refer to the first list of recommendations in the enclosed Blanding's Turtle Fact Sheet. If greater protection for turtles is desired, the second list of recommendations can be implemented as well. The fact sheet contains specific recommendations regarding roads, utilities, and landscaping that will pertain to this project.
- For specific recommendations pertaining to roads, please refer to Curb Design and Small Animals, Preventing Entanglement, & Reducing Wildlife Vehicle Collisions in Chapter One of the Minnesota Department of Transportation's Best Practices Manual (http://www.dnr.state.mn.us/waters/watermgmt_section/pwpermits/gp_2004_0001_manual.html).

The attached flyer should be given to all contractors working in the area. If Blanding's turtles are encountered on site, please remember that state law and rules prohibit the destruction of threatened or endangered species, except under certain prescribed conditions. If turtles are in imminent danger they must be moved by hand out of harm's way, otherwise they are to be left undisturbed.

- The black sandshell (*Ligumia recta*), a state-listed mussel of special concern, has been documented in the Mississippi River in the vicinity of the proposed project. Mussels are particularly vulnerable to deterioration in water quality, especially increased siltation. As such, it is important that effective erosion prevention and sediment control practices be implemented and maintained near the river during construction and incorporated into any stormwater management plan.

Federally Protected Species

- The northern long-eared bat (*Myotis septentrionalis*), federally listed as threatened and state-listed as special concern, can be found throughout Minnesota. During the winter this species hibernates in caves and mines, and during the active season (approximately April-October) it roosts underneath bark, in cavities, or in crevices of both live and dead trees. Pup rearing is during June and July. Activities that may impact this species include, but are not limited to, wind farm operation, any disturbance to hibernacula, and destruction/degradation of habitat (including tree removal).

  The U.S. Fish and Wildlife Service (USFWS) has published a final 4(d) rule that identifies prohibited take. To determine whether you need to contact the USFWS, please refer to the USFWS Key to the Northern Long-Eared Bat 4(d) Rule (see links below). Please note that the NHIS does not contain any known occurrences of northern long-eared bat roosts or hibernacula within an approximate one-mile radius of the proposed project.

Environmental Review and Permitting

- The Alternative Urban Areawide Review (AUAR) should address whether the proposed project has the potential to adversely affect the above rare features and, if so, it should identify specific measures that will be taken to avoid or minimize disturbance.

- Please include a copy of this letter in any state or local license or permit application. **To the extent applicable, measures to avoid or minimize disturbance to the above rare features should be included as restrictions or conditions in any required permits or licenses.**

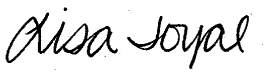
The Natural Heritage Information System (NHIS), a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Division of Ecological and Water Resources, Department of Natural Resources. The NHIS is continually updated as new information becomes available, 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 (noted above) and the project description provided on the NHIS Data Request Form. Please contact me if project details change or for an updated review if construction has not occurred within one year.

The Natural Heritage Review does not constitute review or approval by the Department of Natural Resources as a whole. Instead, it identifies issues regarding known occurrences of rare features and potential effects to these rare features. If you have not done so already, please contact your DNR Regional Environmental Assessment Ecologist to determine whether there are other natural resource concerns associated with the proposed project (contact information available at http://www.dnr.state.mn.us/eco/ereview/erp_regioncontacts.html). Please be aware that additional site assessments or review may be required.

Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources. An invoice will be mailed to you under separate cover.

Sincerely,



Lisa Joyal
Endangered Species Review Coordinator
lisa.joyal@state.mn.us

enc. Blanding's Turtle Fact Sheet and Flyer

cc: Becky Horton

Links: DNR Rare Species Guide
www.dnr.state.mn.us/rsg/index.html
Provides information on the biology, habitat use, and conservation measures of rare species

Wildlife Friendly Erosion Control
http://files.dnr.state.mn.us/eco/nongame/wildlife-friendly-erosion-control.pdf
https://www.coastal.ca.gov/nps/Wildlife-Friendly_Products.pdf
Erosion Control Suppliers
http://files.dnr.state.mn.us/assistance/backyard/gardens/native_plant/suppliers_erosioncontrol.pdf

USFWS Key to the Northern Long-Eared Bat 4(d) Rule for Non-Federal Activities
http://www.fws.gov/midwest/endangered/mammals/nleb/KeyFinal4dNLEB.html
USFWS Key to the Northern Long-Eared Bat 4(d) Rule for Federal Actions
http://www.fws.gov/midwest/endangered/mammals/nleb/KeyFinal4dNLEBFedProjects.html
USFWS Northern Long-eared Bat Website
http://www.fws.gov/midwest/endangered/mammals/nleb/index.html
USFWS Northern Long-eared Bat Fact Sheet
http://www.fws.gov/midwest/endangered/mammals/nleb/nlebFactSheet.html

DEPARTMENT OF NATURAL RESOURCES

Minnesota Department of Natural Resources
Ecological and Water Resource
1200 Warner Road
St. Paul, MN 55106

December 13, 2017 Transmitted Electronically

Tina Goodroad
12260 South Diamond Lake Road
Dayton, MN 55327

Re: North Dayton Development Scoping EAW

Dear Tina Goodroad,

The Minnesota Department of Natural Resources (DNR) has reviewed the scoping Environmental Assessment Worksheet (EAW) for the proposed North Dayton Alternative Urban Areawide Review (AUAR). We offer the following comments as you prepare the AUAR.

Landcover. The cover types table on page 5 shows that the AUAR boundary contains 51 acres of wooded/forest land. We suggest that trees and larger wooded areas be retained as much as possible. Aerial imagery and Minnesota landcover maps shows two larger wooded areas within the project boundary (one in the northeast of the project area surrounding public water wetland 27-104 and one in the southwest of the project area north/northwest of public water wetland 27-124), in addition to several smaller wooded areas. Preserving these wooded areas as parks/community green space should be considered. In addition to providing environmental benefits such as wildlife habitat and clean air and water, wooded areas within communities offer many benefits to residents including recreation and health benefits, as well as increased property values. The book Conserving Wooded Areas in Developing Communities: Best Management Practices in Minnesota is a great reference for community planners and developers to use when considering development that contains wooded areas, with information on benefits of wooded areas and trees, as well as best management practices to conserve wooded areas at the subdivision and lot levels.

Public waters. Public water wetlands are DNR Public Waters. Public Water Wetland, 27-104, is located within the proposed boundary and should be included on the list of DNR Public Waters present on site. As noted, Public Water Wetland 27-124 is also listed as a natural environment lake. Any development occurring near this waterbody will require a 150 foot setback and be subject to different zoning standards, per the City of Dayton's adopted shoreland zoning ordinance (City of Dayton Code of Ordinances Chapter 1000 Section 1001.8).

Fish, wildlife, and rare features. The Natural Heritage review has been completed and a letter was sent on December 6, 2017 (attached). The letter provides information on rare features that may be negatively affected by the project along with suggestions on mitigation measures. Rare species identified in the letter include: Blanding's turtles (Emydoidea blandingii), a state-listed threatened species; black sandshell (Ligumia recta), a state-listed mussel of special concern (documented in the Mississippi River); and the northern long-eared bat (Myotis septentrionalis), federally listed as threatened and state-listed as special concern (found throughout Minnesota). In addition, the North Metro Mississippi River Important Bird Area (IBA) overlaps the proposed project area. As noted on page 16 of the scoping EAW, the sensitive features identified in the Natural Heritage letter should be detailed in the AUAR and mitigation plans should be laid out to protect these resources. Cumulative potential effects on these features should also be addressed.

Thank you for the consideration of our comments as you prepare the AUAR.

Sincerely,

/s/ Rebecca Horton
Region Environmental Assessment Ecologist

CC: Lisa Joyal, Jason Spiegel, Michelle Martin

Website link:

Conserving Wooded Areas in Developing Communities: Best Management Practices in Minnesota
http://www.dnr.state.mn.us/forestry/urban/bmps.html

Environmental Review Fact Sheet Series

Endangered, Threatened, and Special Concern Species of Minnesota

Blanding's Turtle

(*Emydoidea blandingii*)

Minnesota Status:	Threatened	State Rank[1]:	S2
Federal Status:	none	Global Rank[1]:	G4

HABITAT USE

Blanding's turtles need both wetland and upland habitats to complete their life cycle. The types of wetlands used include ponds, marshes, shrub swamps, bogs, and ditches and streams with slow-moving water. In Minnesota, Blanding's turtles are primarily marsh and pond inhabitants. Calm, shallow water bodies (Type 1-3 wetlands) with mud bottoms and abundant aquatic vegetation (e.g., cattails, water lilies) are preferred, and extensive marshes bordering rivers provide excellent habitat. Small temporary wetlands (those that dry up in the late summer or fall) are frequently used in spring and summer -- these fishless pools are amphibian and invertebrate breeding habitat, which provides an important food source for Blanding's turtles. Also, the warmer water of these shallower areas probably aids in the development of eggs within the female turtle. Nesting occurs in open (grassy or brushy) sandy uplands, often some distance from water bodies. Frequently, nesting occurs in traditional nesting grounds on undeveloped land. Blanding's turtles have also been known to nest successfully on residential property (especially in low density housing situations), and to utilize disturbed areas such as farm fields, gardens, under power lines, and road shoulders (especially of dirt roads). Although Blanding's turtles may travel through woodlots during their seasonal movements, shady areas (including forests and lawns with shade trees) are not used for nesting. Wetlands with deeper water are needed in times of drought, and during the winter. Blanding's turtles overwinter in the muddy bottoms of deeper marshes and ponds, or other water bodies where they are protected from freezing.

LIFE HISTORY

Individuals emerge from overwintering and begin basking in late March or early April on warm, sunny days. The increase in body temperature which occurs during basking is necessary for egg development within the female turtle. Nesting in Minnesota typically occurs during June, and females are most active in late afternoon and at dusk. Nesting can occur as much as a mile from wetlands. The nest is dug by the female in an open sandy area and 6-15 eggs are laid. The female turtle returns to the marsh within 24 hours of laying eggs. After a development period of approximately two months, hatchlings leave the nest from mid-August through early-October. Nesting females and hatchlings are often at risk of being killed while crossing roads between wetlands and nesting areas. In addition to movements associated with nesting, all ages and both sexes move between wetlands from April through November. These movements peak in June and July and again in September and October as turtles move to and from overwintering sites. In late autumn (typically November), Blanding's turtles bury themselves in the substrate (the mud at the bottom) of deeper wetlands to overwinter.

IMPACTS / THREATS / CAUSES OF DECLINE

- loss of wetland habitat through drainage or flooding (converting wetlands into ponds or lakes)
- loss of upland habitat through development or conversion to agriculture
- human disturbance, including collection for the pet trade* and road kills during seasonal movements
- increase in predator populations (skunks, raccoons, etc.) which prey on nests and young

*It is illegal to possess this threatened species.

RECOMMENDATIONS FOR AVOIDING AND MINIMIZING IMPACTS

These recommendations apply to typical construction projects and general land use within Blanding's turtle habitat, and are provided to help local governments, developers, contractors, and homeowners minimize or avoid detrimental impacts to Blanding's turtle populations. **List 1** describes minimum measures which we recommend to prevent harm to Blanding's turtles during construction or other work within Blanding's turtle habitat. **List 2** contains recommendations which offer even greater protection for Blanding's turtles populations; this list should be used *in addition to the first list* in areas which are known to be of state-wide importance to Blanding's turtles (contact the DNR's Natural Heritage and Nongame Research Program if you wish to determine if your project or home is in one of these areas), or in any other area where greater protection for Blanding's turtles is desired.

List 1. Recommendations for all areas inhabited by Blanding's turtles.	**List 2. *Additional* recommendations for areas known to be of state-wide importance to Blanding's turtles.**
GENERAL	
A flyer with an illustration of a Blanding's turtle should be given to all contractors working in the area. Homeowners should also be informed of the presence of Blanding's turtles in the area.	Turtle crossing signs can be installed adjacent to road-crossing areas used by Blanding's turtles to increase public awareness and reduce road kills.
Turtles which are in imminent danger should be moved, by hand, out of harms way. Turtles which are not in imminent danger should be left undisturbed.	Workers in the area should be aware that Blanding's turtles nest in June, generally after 4pm, and should be advised to minimize disturbance if turtles are seen.
If a Blanding's turtle nests in your yard, do not disturb the nest.	If you would like to provide more protection for a Blanding's turtle nest on your property, see "Protecting Blanding's Turtle Nests" on page 3 of this fact sheet.
Silt fencing should be set up to keep turtles out of construction areas. It is critical that silt fencing be removed after the area has been revegetated.	Construction in potential nesting areas should be limited to the period between September 15 and June 1 (this is the time when activity of adults and hatchlings in upland areas is at a minimum).
WETLANDS	
Small, vegetated temporary wetlands (Types 2 & 3) should not be dredged, deepened, filled, or converted to storm water retention basins (these wetlands provide important habitat during spring and summer).	Shallow portions of wetlands should not be disturbed during prime basking time (mid morning to mid- afternoon in May and June). A wide buffer should be left along the shore to minimize human activity near wetlands (basking Blanding's turtles are more easily disturbed than other turtle species).
Wetlands should be protected from pollution; use of fertilizers and pesticides should be avoided, and run-off from lawns and streets should be controlled. Erosion should be prevented to keep sediment from reaching wetlands and lakes.	Wetlands should be protected from road, lawn, and other chemical run-off by a vegetated buffer strip at least 50' wide. This area should be left unmowed and in a natural condition.
ROADS	
Roads should be kept to minimum standards on widths and lanes (this reduces road kills by slowing traffic and reducing the distance turtles need to cross).	Tunnels should be considered in areas with concentrations of turtle crossings (more than 10 turtles per year per 100 meters of road), and in areas of lower density if the level of road use would make a safe crossing impossible for turtles. Contact your DNR Regional Nongame Specialist for further information on wildlife tunnels.
Roads should be ditched, not curbed or below grade. If curbs must be used, 4 inch high curbs at a 3:1 slope are preferred (Blanding's turtles have great difficulty climbing traditional curbs; curbs and below grade roads trap turtles on the road and can cause road kills).	Roads should be ditched, not curbed or below grade.

ROADS cont.	
Culverts between wetland areas, or between wetland areas and nesting areas, should be 36 inches or greater in diameter, and elliptical or flat-bottomed.	Road placement should avoid separating wetlands from adjacent upland nesting sites, or these roads should be fenced to prevent turtles from attempting to cross them (contact your DNR Nongame Specialist for details).
Wetland crossings should be bridged, or include raised roadways with culverts which are 36 in or greater in diameter and flat-bottomed or elliptical (raised roadways discourage turtles from leaving the wetland to bask on roads).	Road placement should avoid bisecting wetlands, or these roads should be fenced to prevent turtles from attempting to cross them (contact your DNR Nongame Specialist for details). This is especially important for roads with more than 2 lanes.
Culverts under roads crossing streams should be oversized (at least twice as wide as the normal width of open water) and flat-bottomed or elliptical.	Roads crossing streams should be bridged.
UTILITIES	
Utility access and maintenance roads should be kept to a minimum (this reduces road-kill potential).	
Because trenches can trap turtles, trenches should be checked for turtles prior to being backfilled and the sites should be returned to original grade.	
LANDSCAPING AND VEGETATION MANAGEMENT	
Terrain should be left with as much natural contour as possible.	As much natural landscape as possible should be preserved (installation of sod or wood chips, paving, and planting of trees within nesting habitat can make that habitat unusable to nesting Blanding's turtles).
Graded areas should be revegetated with native grasses and forbs (some non-natives form dense patches through which it is difficult for turtles to travel).	Open space should include some areas at higher elevations for nesting. These areas should be retained in native vegetation, and should be connected to wetlands by a wide corridor of native vegetation.
Vegetation management in infrequently mowed areas -- such as in ditches, along utility access roads, and under power lines -- should be done mechanically (chemicals should not be used). Work should occur fall through spring (after October 1st and before June 1st).	Ditches and utility access roads should not be mowed or managed through use of chemicals. If vegetation management is required, it should be done mechanically, as infrequently as possible, and fall through spring (mowing can kill turtles present during mowing, and makes it easier for predators to locate turtles crossing roads).

Protecting Blanding's Turtle Nests: Most predation on turtle nests occurs within 48 hours after the eggs are laid. After this time, the scent is gone from the nest and it is more difficult for predators to locate the nest. Nests more than a week old probably do not need additional protection, unless they are in a particularly vulnerable spot, such as a yard where pets may disturb the nest. Turtle nests can be protected from predators and other disturbance by covering them with a piece of wire fencing (such as chicken wire), secured to the ground with stakes or rocks. The piece of fencing should measure at least 2 ft. x 2 ft., and should be of medium sized mesh (openings should be about 2 in. x 2 in.). It is ***very important*** that the fencing be **removed before August 1st** so the young turtles can escape from the nest when they hatch!

REFERENCES

[1]Association for Biodiversity Information. "Heritage Status: Global, National, and Subnational Conservation Status Ranks." NatureServe. Version 1.3 (9 April 2001). http://www.natureserve.org/ranking.htm (15 April 2001).

Coffin, B., and L. Pfannmuller. 1988. Minnesota's Endangered Flora and Fauna. University of Minnesota Press, Minneapolis, 473 pp.

REFERENCES (cont.)

Moriarty, J. J., and M. Linck. 1994. Suggested guidelines for projects occurring in Blanding's turtle habitat. Unpublished report to the Minnesota DNR. 8 pp.

Oldfield, B., and J. J. Moriarty. 1994. Amphibians and Reptiles Native to Minnesota. University of Minnesota Press, Minneapolis, 237 pp.

Sajwaj, T. D., and J. W. Lang. 2000. Thermal ecology of Blanding's turtle in central Minnesota. Chelonian Conservation and Biology 3(4):626-636.

CAUTION

BLANDING'S TURTLES

MAY BE ENCOUNTERED IN THIS AREA

The unique and rare Blanding's turtle has been found in this area. Blanding's turtles are state-listed as Threatened and are protected under Minnesota Statute 84.095, Protection of Threatened and Endangered Species. Please be careful of turtles on roads and in construction sites. For additional information on turtles, or to report a Blanding's turtle sighting, contact the DNR Nongame Specialist nearest you: Bemidji (218-308-2641); Grand Rapids (218-327-4518); New Ulm (507-359-6033); Rochester (507-206-2820); or St. Paul (651-259-5772).

DESCRIPTION: The Blanding's turtle is a medium to large turtle (5 to 10 inches) with a black or dark blue, dome-shaped shell with muted yellow spots and bars. The bottom of the shell is hinged across the front third, enabling the turtle to pull the front edge of the lower shell firmly against the top shell to provide additional protection when threatened. The head, legs, and tail are dark brown or blue-gray with small dots of light brown or yellow. A distinctive field mark is the bright yellow chin and neck.

BLANDING'S TURTLES DO NOT MAKE GOOD PETS
IT IS ILLEGAL TO KEEP THIS THREATENED SPECIES IN CAPTIVITY

SUMMARY OF RECOMMENDATIONS FOR AVOIDING AND MINIMIZING IMPACTS TO BLANDING'S TURTLE POPULATIONS

(see Blanding's Turtle Fact Sheet for full recommendations)

- This flyer should be given to all contractors working in the area. Homeowners should also be informed of the presence of Blanding's turtles in the area.
- Turtles that are in imminent danger should be moved, by hand, out of harm's way. Turtles that are not in imminent danger should be left undisturbed to continue their travel among wetlands and/or nest sites.
- If a Blanding's turtle nests in your yard, do not disturb the nest and do not allow pets near the nest.
- Silt fencing should be set up to keep turtles out of construction areas. It is critical that silt fencing be removed after the area has been revegetated.
- Small, vegetated temporary wetlands should not be dredged, deepened, or filled.
- All wetlands should be protected from pollution; use of fertilizers and pesticides should be avoided, and run-off from lawns and streets should be controlled. Erosion should be prevented to keep sediment from reaching wetlands and lakes.
- Roads should be kept to minimum standards on widths and lanes.
- Roads should be ditched, not curbed or below grade. If curbs must be used, 4" high curbs at a 3:1 slope are preferred.
- Culverts under roads crossing wetland areas, between wetland areas, or between wetland and nesting areas should be at least 36 in. diameter and flat-bottomed or elliptical.
- Culverts under roads crossing streams should be oversized (at least twice as wide as the normal width of open water) and flat-bottomed or elliptical.
- Utility access and maintenance roads should be kept to a minimum.
- Because trenches can trap turtles, trenches should be checked for turtles prior to being backfilled and the sites should be returned to original grade.
- Terrain should be left with as much natural contour as possible.
- Graded areas should be revegetated with native grasses and forbs.
- Vegetation management in infrequently mowed areas -- such as in ditches, along utility access roads, and under power lines -- should be done mechanically (chemicals should not be used). Work should occur fall through spring (after October 1st and before June 1st).

Compiled by the Minnesota Department of Natural Resources Division of Ecological and Water Resources, Updated August 2012
Endangered Species Review Coordinator, 500 Lafayette Rd., Box 25, St. Paul, MN 55155 / 651-259-5109

Farveh Makhssous

From: Robert H. Byers <Robert.Byers@hennepin.us>
Sent: Monday, November 06, 2017 8:58 AM
To: Michele Ross
Cc: Jason D Gottfried; David J Jaeger
Subject: RE: North Dayton Scoping EAW

Michele:

Thanks for the "heads up".

We did receive your previous transmittal on November 3rd.

Jason Gottfried and David Jaeger will be assisting in assembling our formal comments once the Scoping EAW is published.

Based on the magnitude of the potential development, we expect that significant impacts will be identified, and hopefully reasonable mitigation measures can ultimately be identified.

Some items we will likely comment on later:

- We believe the list of intersections to be evaluated needs to include CSAH-13 (Brockton Lane) / CSAH-81 and CSAH-12 (Dayton River Road) / TH-169.
- The future traffic analysis should focus on a 20-year time period after build-out.
- Background traffic growth should be assumed at an average of 2% per year consistent with current trends.

Thanks again!

- Bob

Bob Byers, P.E.
Hennepin County Transportation Planning
1600 Prairie Drive
Medina, MN 55340-5421
(612) 596-0354

From: Michele Ross [mailto:MRoss@sambatek.com]
Sent: Monday, November 6, 2017 8:03 AM
To: Robert H. Byers <Robert.Byers@hennepin.us>
Subject: [External] North Dayton Scoping EAW

Bob,
A Scoping Environmental Assessment Worksheet for the North Dayton Development project will be published in the EQB Monitor on November 13, 2017 with comments due on December 13, 2017. The proposed North Dayton Development project would entail the development of approximately 560 acres within the City of Dayton, MN. The land in question is generally located north of North Diamond Lake Road, south of Dayton River Road, east of the Daytona Golf Club, and west of Oxbow Lane and the adjacent farmstead. The site currently consists primarily of open farm fields, homesteads, wooded areas and wetlands. Complete development of the site would result in multi-phased development consisting primarily of single family residential surrounding a core of mixed-use development. The development density is

expected to average approximately 3 units per acre, with 1,500 to 1,700 single-family residential homes and approximately 28 acres of mixed-use development. By State statute, this level of development requires a mandatory environmental review, so an Alternative Urban Areawide Review will be prepared based upon the findings resulting from this EAW scoping document.

We are requesting your feedback on environmental issues of concern for this site and alternatives that could be considered by the RGU for additional study. Please contact me with questions. Thank you!

Michele Ross
Associate Planner
MRoss@sambatek.com
Sambatek
trusted advisors since 1966
Engineering | Surveying | Planning | Environmental

December 13, 2017

Tina Goodroad
Administrator/Planning and Development Director
City of Dayton
12260 South Diamond Lake Road
Dayton, MN 55327

RE: City of Dayton Scoping Environmental Assessment Worksheet (SEAW) – North Dayton Development
Metropolitan Council Review No. 21813-1
Metropolitan Council District 1

Dear Tina:

The Metropolitan Council received the North Dayton Development Project Scoping Environmental Assessment Worksheet (SEAW) on October 31, 2017. The proposed project would entail the development of approximately 560 acres. Complete development of the site would result in multi-phased development consisting primarily of single-family residential surrounding a core of mixed-use development. The development density is expected to average approximately 3 units per acre, with 1,500 to 1,700 single-family residential homes and approximately 28 acres of mixed-use development. An Alternative Urban Areawide Review (AUAR) will be prepared based upon the findings from this SEAW. The project is planned to begin in 2019. The project area (AUAR area) is generally located north of North Diamond Lake Road, south of Dayton River Road, and east of the Dayton Golf Course.

Council staff reviewed the SEAW to determine its adequacy and accuracy in addressing regional concerns, and its potential for significant environmental impact. The following comments are offered concerning specific items that should be incorporated into the AUAR document.

Item 6 – Project Description
Environmental Quality Board guidance states that the AUAR document must review at least one development scenario based on and consistent with the City's comprehensive plan update (CPU) in effect when the AUAR is officially ordered, which we assume is the 2030 CPU.

Additionally, at least one proposed development scenario should be consistent with the City's draft 2040 CPU, should its land use guidance for this area be different from the 2030 CPU, to minimize the need for a comprehensive plan amendment (CPA) following the environmental review process.

The SEAW indicates the City's 2030 Comprehensive Plan's future planned land uses are being re-guided through the City's official planning process for the 2040 CPU. The project description indicates that approximately 1,500 to 1,700 single-family residential homes and approximately 28 acres of mixed-use development are anticipated in the project area (see Figure 4). Mixed use is only briefly mentioned in this context. Please provide additional context for this area and its mix of uses in the AUAR. Also, please note the referenced Figure 4 did not appear to be in the SEAW.

Item 8 – Permits
Please include in the permit section that amendment to the 2030 CPU or incorporation into the 2040 CPU is needed. Beginning July 1, 2018, we will no longer accept amendments to 2030 comprehensive plans. Linked here is the Council's guidelines on 2030 comprehensive plan amendment review through 2018 https://metrocouncil.org/Communities/Publications-And-Resources/Comp-Plan-Amendment-Review-Through-2018.aspx.

Item 9 – Land Use
The SEAW discusses the City of Dayton Land Use Map (Figure 7) and indicates that the future planned land uses in the AUAR area are commercial, low-medium density residential, low-density residential, and agricultural preserve and that the northern part of the site is located in the Mississippi River Corridor Critical Area. However, please note that Figure 7 is the City's Existing Land Use Map versus 2030 CPU Future Land Use (Approved 2030 CPU Future Land Use: https://metrocouncil.org/Council-Meetings/Committees/Community-Development-Committee/2014/October-6,-2014/2014-241.aspx). Also, please note that the 2030 CPU future land uses for the AUAR area include mixed use rather than commercial.

As noted in the SEAW, the eastern edge of the site includes land is guided Agricultural Preserves. Please confirm in the AUAR if this area is still currently enrolled.

The Appendix includes Figure 8 "Proposed Land Use," which shows the entire development area as "Master Plan Land Use," but should be updated to show future land use categories consistent with the City's comprehensive plan (i.e. Mixed Use, Low-Density Residential).

Regional Parks and Trails
The AUAR area is adjacent to the West Mississippi River Regional Trail Search Corridor, which will be planned, developed, and operated by Three Rivers Park District and governed by the *2040 Regional Parks Policy Plan*. Per the Dayton Park and Open Space Plan, the City will work to connect surrounding communities to greenways and trails. The SEAW states the development of the site will take these local planning efforts into consideration and establish the identified connections.

Housing
The City's share of the region's need for affordable housing for the 2021-2030 decade is 333 units. The size and sewer serviced capacity of this area suggests that some higher density housing *could* be worth considering as a part of the overall project; perhaps in a mixed use capacity or as a buffer between the commercial areas and the single family housing areas. Creating some opportunities for housing at densities of at least 8 units per acre would also contribute to Dayton's ability to address their affordable housing share for the next decade and could provide more housing options within the North Dayton area.

Traffic Analysis Zones (TAZ)
TAZ forecasts are not discussed, but this would be helpful information. A draft set of TAZ forecasts for 2040 has been prepared by Metropolitan Council and is available for local governments to review.

The North Dayton development is a part of TAZ #803. The TAZ is mainly farmland, and currently forecasted by Metropolitan Council to gain +318 households during 2010-2040. The North Dayton SEAW discusses 1,500 to 1,700 new units. The TAZ #803 forecast should be revised higher as part of the City's upcoming 2040 CPU.

Item 11 - Wastewater
The southwest portion of the project area is beyond the current 2020 staging in the 2030 CPU. Prior to the installation of any sanitary sewer improvements within this portion of the project area, the City will need to re-guide the staging from 2030 expansion area to existing 2020 through the submittal of a comprehensive plan amendment or through incorporation in the 2040 CPU.

Item 13 – Fish, wildlife, plant communities, and sensitive ecological resources
The SEAW indicates that there are currently approximately 51 acres of isolated woodland areas remaining within the proposed 560-acre AUAR area. The wooded area located in the southwest corner of the AUAR area that is approximately 12 acres in size, which also contains several wetland areas, is identified in the City's 2005 Natural Resource Inventory as a maple-basswood forest remnant. We encourage the City and project proposer to plan to preserve and incorporate as open space this wooded parcel, the continued wooded habitat around the wetland immediately to the southeast of the 12-acre parcel, and the wooded parcels along the northern boundary of the AUAR area that incorporate the ravines draining the area toward the Mississippi River (as discussed in SEAW *Item 9.a.i.* on page 8). They will add value to the ultimate development in the area, as visual amenities, wildlife corridors, and erosion protection within the steep ravines leading toward the River.

This concludes the Council's review of the SEAW. The Council will take no formal action on the SEAW. If you have any questions or need further information, please contact Freya Thamman, Principal Reviewer, at 651-602-1750.

Sincerely,

LisaBeth Barajas, Manager
Local Planning Assistance

CC: Steve O'Brien, MHFA
Tod Sherman, Development Reviews Coordinator, MnDOT - Metro Division
Katie Rodriguez, Metropolitan Council District 1
Freya Thamman, Principal Reviewer/ Sector Representative
Raya Esmaeili, Reviews Coordinator

MINNESOTA POLLUTION CONTROL AGENCY

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December 12, 2017

Tina Goodroad
City of Dayton
12260 South Diamond Lake Road
Dayton, MN 55327

Re: North Dayton Development Scoping Environmental Assessment Worksheet

Dear Tina Goodroad:

Thank you for the opportunity to review and comment on the Scoping Environmental Assessment Worksheet (SEAW) for the North Dayton Development project (Project) in Dayton, Hennepin County, Minnesota. The Project consists of development of 560 acres of mixed use development and the SEAW is prepared to inform the Alternative Urban Areawide Review (AUAR). Regarding matters for which the Minnesota Pollution Control Agency (MPCA) has regulatory responsibility or other interests, the MPCA staff has the following comments for your consideration.

Cover Types (Item 7)

The table of cover types in this section is lacking entries in the "After" column so it is not possible to determine the changes in cover types as a result of the Project. The MPCA recommends column A be completed in the AUAR.

Water Resources (Item 11)

- The process to avoid, minimize, and mitigate wetlands is required and specific in-water best management practices must be included in the AUAR.

- Also, if a U.S. Army Corps of Engineers 404/MPCA 401 Certification are required, an antidegradation assessment, (Minn. R. 7050.0250 to 7050.0335) may now be needed for the Project. For questions regarding 401 Certification, please contact Bill Wilde at 651-757-2825.

- The SEAW focuses primarily on post development stormwater controls to be utilized by the project and does not address the temporary stormwater sediment controls as specified in Item 11. ii. required to prevent impacts to area surface waters during construction. Questions regarding Construction Stormwater Permit requirements should be directed to Roberta Getman at 507-206-2629.

  The following should be included in the AUAR based on the site description and as required in MPCA's National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) General Construction Stormwater permit (CSW Permit):

  1. Ensure down gradient sediment controls are specifically designed for the steep slopes at the Project site to provide adequate runoff protection during construction.
  2. Minimize the duration of exposed soils by phasing construction of the Project.

3. Because the Mississippi River is classified as a special water, soils will need to be stabilized within seven days of temporarily or permanently ceasing soil disturbing activity on any portion of the Project site. In addition, an undisturbed 100-foot buffer zone must be maintained between the river and the Project unless an encroachment is necessary to complete the Project and the area will be restored.
4. The wetlands located at the site cannot be utilized for stormwater management or treatment unless they have gone through the mitigation process.
5. The CSW Permit requires that one inch of stormwater runoff from new impervious surfaces is retained on the Project site via infiltration or other volume reduction method and not discharged to a surface water unless prohibited due to a high seasonal water table or bedrock.
6. Assuming 50 or more acres will be disturbed as a result of the Project, the Stormwater Pollution Prevention Plan must be submitted to the MPCA for review at least 30 days prior to applying for permit coverage even if only a smaller portion of the Project site will be constructed at one time.

- Please include Diamond Lake under Water Resources, part (a.,i.) (pg. 11). Diamond Lake (27-0125) is on the MPCA 303d Impaired Waters List and is impaired by nutrients. This lake appears to be within one mile of the Project site.

We appreciate the opportunity to review this Project. Please provide your specific responses to our comments and notice of decision on the need for an Environmental Impact Statement. Please be aware that this letter does not constitute approval by the MPCA of any or all elements of the Project for the purpose of pending or future permit action(s) by the MPCA. Ultimately, it is the responsibility of the Project proposer to secure any required permits and to comply with any requisite permit conditions. If you have any questions concerning our review of this SEAW, please contact me by email at Karen.kromar@state.mn.us or by telephone at 651-757-2508.

Sincerely,

Karen Kromar

Karen Kromar
Environmental Consultant
Environmental Review Unit
Resource Management and Assistance Division

KK:bt

cc: Dan Card, MPCA, St. Paul
Bill Wilde, MPCA, St. Paul
Rachel Olmanson, MPCA, St. Paul
Roberta Getman, MPCA, Rochester
Teresa McDill, MPCA, St. Paul

United States Department of the Interior

NATIONAL PARK SERVICE
Mississippi National River and Recreation Area
111 E. Kellogg Blvd., Ste 105
St. Paul, Minnesota 55101-1256

IN REPLY REFER TO:
L3303

December 12, 2017

Tina Goodroad
City of Dayton
12260 South Diamond Lake Road
Dayton, MN 55327

RE: Scoping EAW for North Dayton Development

Dear Ms. Goodroad:

The National Park Service (NPS) is pleased to provide comments on the Scoping EAW for the North Dayton Development. The northern portion of the proposed project would lie within the boundary of the Mississippi National River and Recreation Area (NRRA). Congress established the Mississippi NRRA in 1988 to preserve, protect, and enhance the significant values of the Mississippi River Corridor in the Twin Cities metropolitan area.

Under Item 9a the document states only that "the northern portion of the site is located within the Mississippi River Corridor Critical Area Program district CA-SR…" The Mississippi River Corridor Critical Area (MRCCA) shares the same boundary as the Mississippi NRRA. The Minnesota Department of Natural Resources (DNR) administers the MRCCA program allowing for cooperative management of the Mississippi NRRA with local governments including the City of Dayton. A notation should be made that this area is also part of the Mississippi NRRA.

Additionally, under Item 9a the claim is made that "the Mississippi River and adjacent river corridor lands are designated and classified as 'Wild & Scenic River' and 'Critical Area'…" In 2012, the Minnesota State Legislature revised the Mississippi River Wild and Scenic River (WSR) boundaries to remove any land in the cities of Dayton and Ramsey. This action was taken to reduce the number of shoreland-related regulations pertinent in these areas, because the Mississippi River in these cities is also regulated under the MRCCA rules as well as standard shoreland rules. The reference to the WSR designation should be removed from the document while retaining the MRCCA reference.

It should be noted that there is a Primary Conservation Area (PCA) located on the northern edge of the study area (see attached map). PCA's are afforded protections under the MRCCA rules that went into effect in January 2017. PCA's are to be set aside as open space in whole or part as applicable in large developments such as the one proposed here. This is meant to provide opportunities to protect or restore valuable resources in the Mississippi River Corridor.

Subdivision and land development standards, including percentages and acreages for PCA protection in large developments can be found in Minnesota Rules, part 6106.0170.

Lastly, given the proximity of the site to the Great River Road and Mississippi River Trail on Dayton River Road efforts should be made to make pedestrian and bike connections between the site and the Mississippi River. This would increase access and recreational opportunities in the Mississippi NRRA and surrounding community.

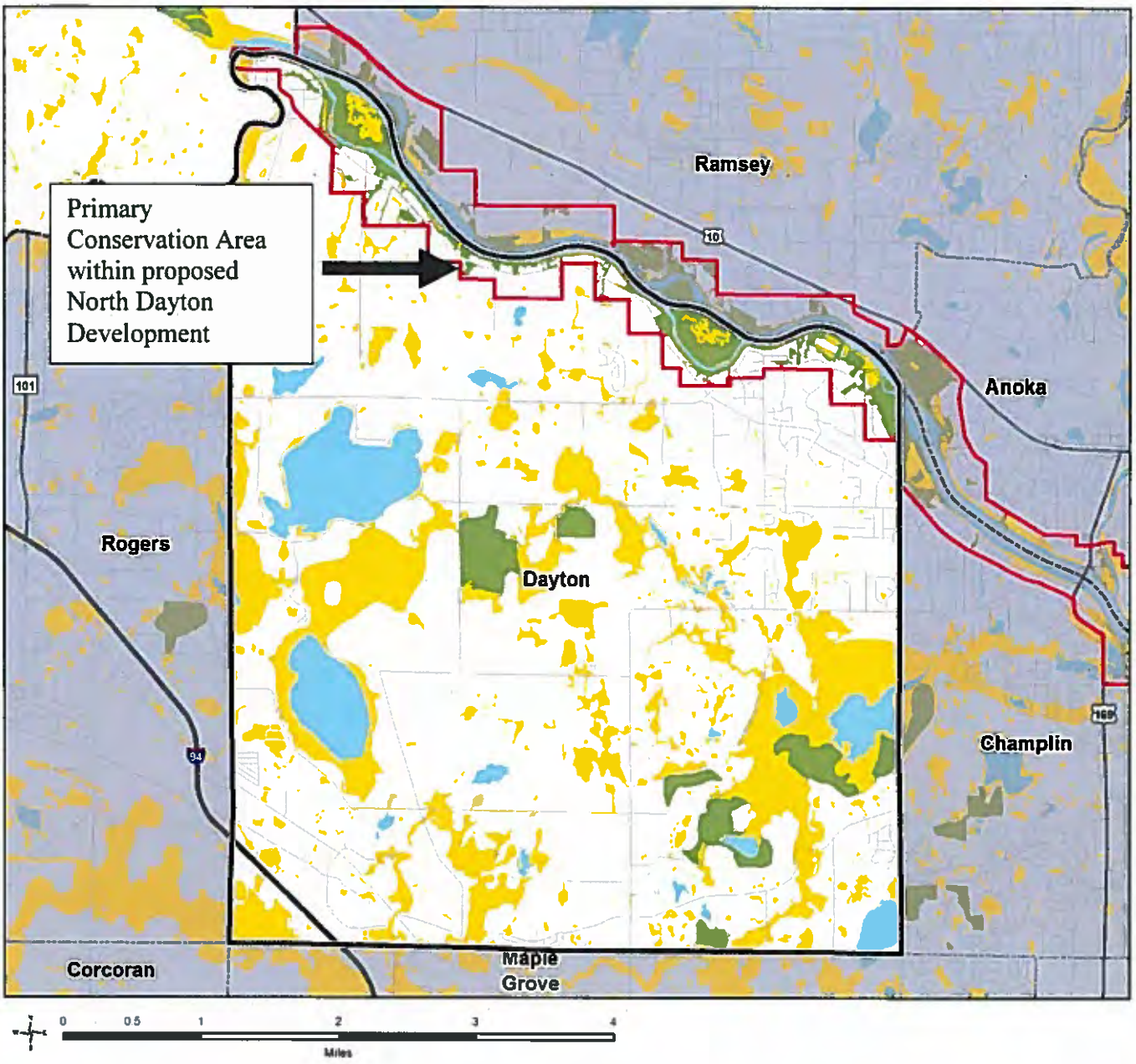
If you any questions regarding these comments please contact me at alan_robbins_fenger@nps.gov or by calling 651-293-8438.

Sincerely,

Alan Robbins-Fenger
Acting Superintendent

Attachment:
Map of MRCCA – Vegetation Restoration Priorities, Dayton

Mississippi River Corridor Critical Area - Vegetation Restoration Priorities
City of Dayton, Hennepin County



MRCCA Boundary

DNR Native Plant Communities & Significant Existing Vegetative Stands

Vegetation Restoration Priorities (Bluff and shore impact zones, floodplains and wetlands not already covered by native plant communities and significant existing vegetative stands)

County Boundaries

City and Township Boundaries

NCompass Street Centerlines