Haviland Fields

Environmental Assessment Worksheet

July 2023

Prepared For:

SENIOR HOUSING PARTNERS

BKV GROUP

Prepared by:

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Table of Contents

List of Tables

List of Figures

List of Appendices

December 2022 Version

Environmental Assessment Worksheet

This most recent Environmental Assessment Worksheet (EAW) form and guidance documents are available at the Environmental Quality Board's (EQB's) website at: https://www.eqb.state.mn.us. The EAW form provides information about a project that may have the potential for significant environmental effects. Guidance documents provide additional detail and links to resources for completing the EAW form.

Cumulative potential effects can either be addressed under each applicable EAW Item or can be addressed collectively under EAW Item 21.

Note to reviewers: Comments must be submitted to the RGU during the 30-day comment period following notice of the EAW in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation, and the need for an EIS.

1. Project Title

Haviland Fields

2. Proposer

Proposer: Senior Housing Partners
Contact Person: Sam Jagodzinski
Title: Development Manager
Address: 2823 Hamline Avenue N
City, State, ZIP: Roseville, MN 55113
Phone: 651.383.5689
Email: sjagodzinski@seniorpartners.com

3. RGU

RGU: City of Ramsey
Contact Person: Todd Larson
Title: Community Development
Address: 7550 Sunwood Drive NW
City, State, ZIP: Ramsey, MN 55303
Phone: (763) 433-9821
Email: tlarson@cityoframsey.com

4. Reason for EAW Preparation

Check one:

Required:	Discretionary:
☐EIS Scoping	☐Citizen petition
☒Mandatory EAW	☐RGU discretion
	☐Proposer initiated

If EAW or EIS is mandatory, give EQB rule category subpart number(s) and name(s):
Minnesota Rules, part 4410.4300, subpart 19: Residential development

5. Project Location

County: Anoka
City/Township: Ramsey
PLS Location (¼, ¼, Section, Township, Range): SE ¼, NW ¼, Section 25, Township 32N, Range 25W
Watershed (81 major watershed scale): Rum River
GPS Coordinates: 45.235108, -93.402587
Tax Parcel Number: 253225240059
At a minimum, attach each of the following to the EAW:

- **County map showing the general location of the project** (see Figure 1)
- **US Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries** (see Figure 2)
- **Site plans showing all significant project and natural features. Pre-construction site plan and post-construction site plan** (see Figure 3 and Appendix A)

6. Project Description

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

The Haviland Fields project is a proposed development that is anticipated to consist of 22 townhomes and three multifamily residential buildings located between MN Highway 47 (St. Francis Blvd NW) and County Rd 5 (Nowthen Blvd NW) in Ramsey, Anoka County, Minnesota. The 35.5-acre site consists of existing institutional use and two residential properties. The two existing residential buildings will be demolished.

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

Senior Housing Partners is proposing to redevelop an approximately 35.5-acre site. See Figure 1 and Figure 2 for the project location and Figure 3 for the existing site conditions.

There are two existing residential buildings on site that would be demolished. The redevelopment would include the following:

- **Townhouse Units:** 22 townhouse units on the northern portion of the site for a total of approximately 33,000 square feet and 40 parking spaces.
- **Three Multifamily Residential Buildings:** Three residential buildings with 476 multifamily units totaling approximately 113,529 square feet of gross residential area and 579 parking spaces.
- **Institutional Building:** The existing institutional (church) building will remain in place.

The development will also include stormwater management areas throughout the site and preserved green space. Utilities will be extended to the townhomes and the multifamily residential buildings, including sanitary sewer, water, and electrical. Construction is anticipated to begin in Spring 2024 and be completed in multiple phases over the next three to four years.

c. Project magnitude

Table 1: Project Magnitude

Measure	Magnitude
Total Project Acreage	35.5 acres
Number and Type of Residential Units	22 townhome units, 476 multifamily units
Residential Building Area (square feet)	514,076 sq ft
Institutional Building Area (square feet)	86,038 sq ft (existing church)
Other Uses - Impervious Surface (square feet)	310,703 sq ft
Other Uses – Green Space (square feet)	1,002,000 sq ft of green space
Structure Height(s)	30 -55 ft for the multifamily buildings

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 project is a private development proposed to develop the existing institutional and undeveloped parcel with two residential units into a residential development in order to provide multifamily housing to address the housing needs in Ramsey.

e. Are future stages of this development, including development on any other property, planned or likely to happen? ☐ Yes ☒ No

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

Not applicable.

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

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

Not applicable.

7. Climate Adaption and Resilience

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

Trends in temperature, precipitation, flood risk, and cooling degree days are described below for the general project location. Some of the climate projections summarized below use Representative Concentration Pathways (RCPs), which are greenhouse gas concentration scenarios used by the Intergovernmental Panel on Climate Change. RCP 4.5 is an intermediate scenario in which emissions decline after peaking around 2040, and RCP 8.5 is a worst-case scenario in which emissions continue to rise through the 21st century.[1]

Temperature

According to the Minnesota Climate Explorer,[2] the historical average temperature in Anoka County between 2002-2022 was approximately 44.95 °F, with the lowest average in 2014 (41.5°F) and the highest average in 2012 (47.89°F). The average annual temperature in Anoka County is projected to be 48.42°F from 2040-2059 under RCP 4.5. In 2080-2099, the average annual temperature is projected to be 50.84°F and 54.58 °F under RCP 4.5 and 8.5, respectively.

Urban Heat Island

Surfaces and structures such as roads, parking lots, and buildings absorb and re-emit more heat from the sun than natural landscapes. This can significantly raise air temperature and overall extreme heat vulnerability in urban areas where there are dense concentrations of these surfaces. This is referred to as urban heat island effect. According to the Metropolitan Council's Extreme Heat Map Tool, based on the land surface temperate at the project site during a heatwave in 2016, the site is susceptible to extreme heat.[3]

Precipitation

According to the Minnesota Climate Explorer, historic average precipitation in Anoka County between 2002-2022 was approximately 31.63 inches, with the lowest average in 2008 (25.67 inches) and the highest average in 2002 (41.01 inches). Average annual precipitation in Anoka County from 2040-2059 is projected to be 32.79 inches under RCP 4.5. From 2080-2099, average annual precipitation is projected to be 33.62 inches under RCP 4.5 and 35.87 inches under RCP 8.5.

Localized Flood Risk

The Metropolitan Council's Localized Flood Map Screening Tool[4] identifies localized flood hazards, referred to as Bluespots, which are broken into categories based on potential flood

[1] Climate Explorer Metadata. Available at https://www.dnr.state.mn.us/climate/climate-explorer-metadata.html.
[2] Minnesota Climate Explorer. Minnesota Department of Natural Resources. Available at https://arcgis.dnr.state.mn.us/ewr/climateexplorer/main/historical.
[3] Extreme Heat Map Tool. Metropolitan Council. Available at https://metrocouncil.org/Communities/Planning/Local-Planning-Assistance/CVA/Tools-Resources.aspx
[4] Localized Flood Map Screening Tool. Metropolitan Council. Available at https://metrocouncil.org/Communities/Planning/Local-Planning-Assistance/CVA/Tools-Resources.aspx.

water depth. This tool shows Primary, Secondary, and Tertiary Bluespots along throughout the site, with a maximum depth of 12.15 feet. Most Bluespots are centered around the wetland features on the site. Primary Bluespots are the first areas to fill with water, followed by Secondary.

Cooling Degree Days

As defined by the National Weather Service, degree days are based on the assumption that when the outside temperature is 65°F, heating or cooling is not needed to be comfortable. Degree days are the difference between the daily temperature mean and 65°F. If the temperature mean is above 65°F, 65 is subtracted from the mean and the result is the cooling degree days. For example, if the mean temperature over a 24-hour period is 70°F, then there have been five cooling degree days.[5] Cooling degree days are used as a proxy to estimate cooling needs for buildings.

According to Heat Vulnerability in Minnesota, [6] the number of cooling degree days in 2019 for Anoka County was 379. The number of cooling days in 2050 for Anoka County is projected to be 453 and 598 for RCP 4.5 and 8.5, respectively.

b. For each resource category in the table below, describe the project's proposed activities and how the project's design will interact with those climate trends. Describe proposed adaptations to address the project effects identified.

Table 2: Climate Considerations and Adaptations

Resource Category	Climate Considerations	Project Information	
		Climate Change Risks and Vulnerabilities	Adaptations
Project Design	Aspects of the building architecture/materials choices and site design may negatively affect urban heat island conditions in the area considering changing climate zones, temperature trends, and potential for extended heat waves.	The site is in an area with risk of urban heat island effect, increased temperature and precipitation, and increased frequency of freeze/thaw cycles.	• Landscaping and stormwater management systems will reduce runoff and urban heat island effect. • Wetlands and green spaces on site will be preserved.
Land Use	The project is proposing changing some vegetated areas to impervious surfaces.	Minnesota climate trends predict an increase in precipitation and urban heat island effects in the general project area.	• Stormwater management facilities will be designed to minimize standing water and reduce the

[5] "What Are Heating and Cooling Degree Days." National Weather Service. Available at https://www.weather.gov/key/climate_heat_cool.

[6] Heat Vulnerability in Minnesota. Minnesota Department of Health and the University of Minnesota. Available at https://maps.umn.edu/climatehealthtool/heat_app/.

Resource Category	Climate Considerations	Project Information	
		Climate Change Risks and Vulnerabilities	Adaptations
			risk of flooding on the project site. These facilities would improve water quality and stormwater runoff in the project vicinity. • Wetlands and greenspaces are to be preserved.
Water Resources	The project design proposes an increase in impermeable surface, altering surface water flow.	• Change in weather could cause higher frequency of freeze/thaw cycles, resulting in the need for increased salting. • Chlorides from salting degrade nearby water quality and impact aquatic life.	• Using native plants and perennials for landscaping and stormwater features will absorb water and reduce the water demand for irrigation. • The stormwater system will be sized for the additional impervious areas and changes in stormwater requirements.
Contamination/ Hazardous Materials/ Wastes	Current Minnesota climate trends and anticipated climate change in the general location of the project may influence the potential environmental effects of generation/use/storage of hazardous waste and materials.	Construction and the creation of additional residential units will generate an increase of emissions, particulate matter, and waste.	• Any hazardous waste products generated or stored within the proposed development will be registered and kept in accordance with Minnesota Pollution Control Agency (MPCA) requirements.
Fish, Wildlife, Plant Communities, and Sensitive Ecological	Project site contains potential suitable habitat for potentially state listed species.	The wetlands on site represent potential suitable habitat for Blanding's Turtle.	• Wetlands and greenspaces on site will be preserved.

Resource Category	Climate Considerations	Project Information	
		Climate Change Risks and Vulnerabilities	Adaptations
Resources (Rare Features)			
Green House Gases	The proposed project is project to generate an increased amount of greenhouse gases than the existing conditions.	Construction equipment and an increased number of residential units will require an increased use of energy.	• Existing on-site geothermal panels will provide a portion of the sites energy usage. • Roof solar panels to be considered in site design.

8. Cover Types

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

Table 3: Cover Types

Cover Type	Before (Acres)	After (Acres)
Wetlands and Shallow Lakes (less than 2 meters deep)	3.52	3.52
Wooded/Forest	12.4	5.03
Brush/Grassland	2.4	0
Lawn/Landscaping	9.76	11.36
Green Infrastructure (total from Table 4)	0	1.56
Impervious Surface	7.3	12.47
Stormwater Pond (wet sedimentation basin)	0.12	1.56
Total	35.50	35.50

Table 4: Green Infrastructure

Green Infrastructure	Before (Acres)	After (Acres)
Constructed Infiltration Systems (infiltration basins, infiltration trenches, rainwater gardens, bioretention areas without underdrains, swales with impermeable check dams)	0	1.56
Constructed Tree Trenches and Tree Boxes	0	0
Constructed Wetlands		
Constructed Green Roofs	0	0
Constructed Permeable Pavements	0	0
Other (describe)	0	0
Total	0	1.56

Table 5: Trees

Trees	Approximate Percent	Approximate Number of Trees
Percent Tree Canopy Removed or Number of Mature Trees Removed During Development	59.4	+/-964
Number of New Trees Planted	N/A	0

Further ways to minimize tree removal, including planting new trees, will be considered as the project design advances. Tree removal will occur between November 1st and March 31st, outside of the active bat season.

9. Permits and Approvals Required

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

Table 6: Permits and Approvals Required

Unit of Government	Type of Application	Status
Federal		
U.S. Army Corps of Engineers	Section 404 Permit	To be applied for, if needed
State		
Minnesota Department of Health	Water Extension Permit	To be applied for, if needed
Minnesota Department of Natural Resources	Water Appropriation Permit	To be applied for, if needed
	Public Waters Work Permit	To be applied for, if needed
Minnesota Pollution Control Agency	Construction Site Stormwater Permit	To be applied for, if needed
	Section 401 Water Quality Certification	To be applied for, if needed
	Sanitary Sewer Extension Permit	To be applied for, if needed
	Notice of Intent of Demolition	To be applied for, if needed
	National Pollution Discharge Elimination System (NPDES) Permit	To be applied for, if needed
Regional		
Anoka County	Access Permit	To be applied for, if needed
Metropolitan Council	Comprehensive Plan Amendment	To be applied for, if needed
Lower Rum River Watershed Management Organization	Grading, Stormwater management and Erosion/Sediment Control Permit	To be applied for, if needed

Unit of Government	Type of Application	Status
	Application for Minnesota WCA Decisions and Procedure Requirements	To be applied for, if needed
Local		
City of Ramsey	Grading Permit	To be applied for, if needed
	Excavation Permit	To be applied for, if needed
	Obstruction Permit	To be applied for, if needed
	Commercial Building Permit	To be applied for, if needed
	Residential Demolition Permit	To be applied for, if needed
	Residential New Townhouse Unit	To be applied for, if needed
	Municipal Water Connection Permit	To be applied for, if needed
	Sanitary Sewer Connection Permit	To be applied for, if needed
	Planned Unit Development	To be applied for, if needed
	Plat Application	To be applied for, if needed

10. Land Use

a. Describe:

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

The existing site is a church with two single family homes and undeveloped vegetated areas. Surrounding land use is largely residential, along with commercial developments, undeveloped vegetated areas, wetlands, and waterways. The nearest park or recreation area is Solstice Park, located directly north of the site. Other nearby parks include Flintwood Terrace Park (0.2-mile south), and the Rum River Nature Area (0.2-mile east). On-road trails are located along County Road 5 and MN Highway 47 adjacent to the site as shown in the city's parks and trails map.

The project site does not include prime or unique farmland.

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

Ramsey's 2040 Comprehensive Plan identifies the existing land use as undeveloped, institutional, and single family detached (see Figure 4). The future land use map shows the project site as public/institutional and high density residential (see Figure 5).

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

According to the City of Ramsey Planning Department Interactive Zoning Map, existing zoning is designated as R-1 MUSA-80, R-2 Medium Density Residential, R-3 High Density Residential (see Figure 6). The R-1 zone is designated to accommodate single-family dwelling units on suitable land. The R-2 zone is designated to accommodate multiple dwellings at a density of four to seven dwelling units per acre and multiple-dwelling complexes. The R-3 zone is designated to accommodate high density residential housing at a density greater than seven units per acre but not to exceed 15 units per acre. The site is not within any overlay districts.

iv. **If any critical facilities (i.e., facilities necessary for public health and safety, those storing hazardous materials, or those housing occupants who may be insufficiently mobile) are proposed in floodplain areas and other areas identified as at risk for localized flooding, describe the risk potential considering changing precipitation and event intensity.**

No critical facilities are proposed as part of the project, and the project is not located within a FEMA 100-Year floodplain area.

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

The proposed residential development is generally compatible with existing and future land uses. There are three different zoning districts within the site that have differing requirements for density and building requirements.

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

It is anticipated that the developer will work with the city on unifying the proposed zoning through a Planned Unit Development to comply with building and design requirements for the site.

11. Geology, Soils, and Topography/Landforms

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 Geologic Atlas of Anoka County (2013)[7], bedrock geology of the project site consists of St. Lawrence Formation, dolomitic, feldspathic siltstone with interbedded very fine-grained sandstone and shale, and Tunnel City Group, fine- to medium grained, cross-stratified, generally friable, quartz sandstone; or very fine- to fine-grained, glauconitic, feldspathic sandstone. The estimated depth to bedrock is approximately 151-250 feet below grade. The surficial geology consists of Richfield terrace, which consists of sand and gravelly sand, and peat and much which consists of partially decomposed plant matter.

[7] Available at https://conservancy.umn.edu/handle/11299/116119

No sinkholes, unconfined/shallow aquifers, or karst conditions were identified in the project area. The geology of the project site does not result in limitations for the proposed development.

a. 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 soil limitations, such as steep slopes or highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections, or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 12.b.ii.

According to the Natural Resources Conservation Service (NRCS) Web Soil Survey, there are five soil types within the site, which are generally loamy sands (see Table 7).

Table 7. Soil Types

Map Unit Symbol	Map Unit Name	Acres within Project Site	Percent of Site
D90B	Nymore loamy sand, 1 to 6 percent slopes	1.7	4.7%
Mc	Marsh	3.3	9.3%
NrD	Nymore loamy coarse sand, 12 to 25 percent slopes	3.6	10.2%
NyA	Nymore loamy sand, 0 to 2 percent slopes	13.6	38.4%
NyC	Nymore loamy sand, 6 to 12 percent slopes	13.3	37.3%

The site earthwork is estimated be a net cut of 2,500 cubic yards based on the excavations for ponding, underground stormwater management, vehicle infrastructure, and building foundations.

A National Pollutant Discharge Elimination System (NPDES) permit is required because the project will disturb more than one acre of land. A Stormwater Pollution Prevention Plan (SWPPP) will be prepared. All unpaved areas disturbed during construction will be revegetated in accordance with the standard NPDES permit requirements. In areas with steep slopes, special consideration will be given to prevent erosion during construction, such as erosion control blankets, along with vegetation establishment to permanently stabilize side slopes and any areas impacted as a result of construction.

12. Water Resources

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

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

Minnesota Department of Natural Resources (DNR) Public Waters within one mile of the project site includes Rum River (M-063), Grass Lake (DNR# 61989), and 14 unnamed basins (DNR# 61648, 61991, 61619, 62546, 71459, 61990, 61997, 62788, 65935, 70837, 71329, 71541, 71612, 71579), with Unnamed Basin 70837 located within the project site (see Figure 7). Rum River is listed on the Minnesota Pollution Control Agency's (MPCA's) 303d Impaired Waters List[8]for mercury in fish tissue.

A previous on-site wetland delineation performed by Pinnacle Engineering, Inc. in 2022 identified two wetlands (Wetland 1 is 3.05 acres and Wetland 2 is 0.47 acres) within the project site (see Figure 8 and Appendix B). The wetlands general align with the NWI mapped wetlands on the eastern portion of the site.

ii. Groundwater – aquifers, springs, and seeps. Include 1) depth to groundwater; 2) if project is within a MDH wellhead protection area; and 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.

According to the Minnesota Hydrogeology Atlas, depth to the water table varies from 0 to 30 feet across the project site (see Figure 9). Based on the Minnesota Department of Health (MDH) Well Index, static ground water appears to be between 25 to 28 feet below the surface in the area. According to the MDH Source Water Protection Web Map Viewer, the project site is within the Minneapolis, St. Paul, and St. Cloud Priority A and Priority B Drinking Water Supply Management Areas.

According to the Well Index, there are two active domestic wells on the project site (Unique Well ID 668043 and 430267, see Figure 10). No additional wells are within 150 feet of the project site. The onsite wells will be located and abandoned during construction of this project. Well reuse for irrigation purposes may be considered. If any other wells are encountered during construction, they will be capped and sealed according to Minnesota Department of Health regulations.

[8] Available at https://www.pca.state.mn.us/air-water-land-climate/minnesotas-impaired-waters-list

Table 8. Wells

Well ID Number	Well Status	Well Name	Static Water Level (ft)	Well Depth (ft)	Entry Date	Location
430267	Active	STEENERSON, LARRY	24	187	4/15/1991	Onsite
668043	Active	LORD OF LIFE LUTHERAN CH	28	147	3/11/2002	Onsite

b. Describe effects from project activities on water resources and measures to minimize or mitigate the effects below.

i. Wastewater – For each of the following, describe the sources, quantities, and composition of all sanitary, municipal/domestic, and industrial wastewaters projected or treated at the site.

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

The daily wastewater flow for the proposed development was calculated by utilizing the Metropolitan Council Sewer Availability Charge (SAC) Criteria Calculator to determine the equivalent number of SAC units for the proposed residential units on site. The proposed 498 units, along with the existing church, yielded a total of 500 SAC units for the proposed development. A flow of 274 gallons per day (GPD) per SAC unit (per Metropolitan Council) was used to get an estimated daily sewage flow of 136,452 GPD for the proposed development.

The property will be served by the publicly owned Metropolitan Council Metropolitan Wastewater Treatment Plan in Saint Paul. The plant currently treats an average of 172 million GPD, with a total capacity up to 251 million GPD. Based on the Twin Cities Metropolitan Council Sewer Availability Charge Guidelines, the estimated wastewater from the proposed development is anticipated to consist primarily of normal commercial sewage resulting from the proposed residential and institutional areas on site. The proposed site is expected to generate approximately 136,452 GPD (0.1364 million GPD). The Metropolitan Council's Metropolitan Wastewater Treatment Plan has the capacity to treat the volume and composition of wastewater generated by the proposed project without pretreatment or other plan facility improvements. It is anticipated that the 8" stubs on the property will be able to handle the added water and waste loadings, although additional expansion or reconfiguration of existing sanitary sewers may be required.

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

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

Not applicable.

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

   Not applicable.

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

Prior to construction, stormwater runoff on the east of the site drains directly to the wetland on the east side of the property. Any drainage captured on the west side of the site by storm sewer is collected in a depression near the northwest entrance of the site, where the water infiltrates or overtops into swales along County Road 5. The proposed development includes five additional acres of impervious surface, increasing the runoff rate. After construction, water will be directed to one of four infiltration basins, where the water will then be directed to the same previous receiving water bodies. For ponds on the east side of the site, the eventual receiving water body will be the wetland that occupies the east side of the site. For ponds on the west side of the site, the outlet will tie into stormwater further south along County Road 5 and eventually make it to wetlands south of the site.

A SWPPP will be developed for the project in accordance with the NPDES permit administered by the MPCA. The SWPPP will cover temporary measures to prevent

pollution during construction (erosion and sediment control as well as controls to minimize spills, leaks, or other discharges of pollutants) and permanent measures to prevent stormwater pollution after construction. These BMPs may include one or more of the following: silt fencing, inlet sediment filters, sediment traps, grit chambers, temporary ditch checks, rock filter dikes, fiber logs, turf reinforcement mats, temporary seeding, riprap and erosion control blankets for disturbed areas, and seeding or placement of sod or other plant material for restoration.

Additionally, the project will comply with all City of Ramsey Erosion Control Requirements[9] and Lower Rum River Watershed Management Organization (LRRWMO) Storm Water Standards[10]. Per the City of Ramsey, an erosion control escrow must be submitted, and a silt fence (or other approved erosion control measures) must be installed prior to issuance of a building permit.

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

No additional permanent dewatering is expected as part of this project. A Water Use Appropriations Permit would be obtained if permanent dewatering was determined to be necessary for the final design of the project. A Water Use Appropriation Permit is required for permanent water appropriations and applies to users withdrawing more than 10,000 gallons of water per day or one million gallons per year.

If unidentified wells are found, the MPCA and MDH must be contacted to determine the course of action, which may include sealing, relocating, or preserving by a licensed well contractor according to Minnesota Rules Chapter 4725.

[9] Available at: https://www.ci.ramsey.mn.us/DocumentCenter/View/1590/Erosion-Control--EDITED-2-PDF

[10] Available at: https://lrrwmo.org/wp-content/uploads/2018/04/AppendixE_SW_standards_revised_4_2018.pdf

iv. Surface Waters

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

   The City of Ramsey requires a 16.5-foot buffer around all wetlands and stormwater ponds. The wetlands must be protected from disturbance and erosion during the construction process. Post construction, certain activities shall be prohibited within 16.5 feet of the wetland edge. The freshwater emergent wetlands on the site will be avoided, maintaining the existing function and value of the wetlands.

   If designs would change to impact wetlands, any wetland impacted would require Minnesota Wetland Conservation Act (WCA) approval with the City of Ramsey as the WCA LGU, and an US Army Corps of Engineers (USACE) Section 404 of the Clean Water Act permit. Wetland impacts would be mitigated based on current rules and requirements from the City and USACE.

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

   No alternations to other surface waters are anticipated.

13. 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

groundwater 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.

MPCA's What's In My Neighborhood (WIMN) database was reviewed to determine if any known contaminated properties or potential environmental hazards are located on the project site or within 150 feet of the project site. The database includes one site within the project site, and one site within 150 feet (see Table 9 and Figure 11).

Using the following criteria established by the Minnesota Department of Transportation (MnDOT), the sites were classified into high, medium, and low risk sites:

- **High risk:** In general, sites with high environmental risks are properties that have documented releases of chemicals or hazardous or regulated substances (e.g., active and inactive state and federal cleanup sites, active and inactive dump sites, and active leaking underground storage tank sites), strong evidence of contamination (e.g., soil staining, stressed vegetation), or storage of large volumes of petroleum or other chemicals (e.g., bulk storage tank facilities).
- **Medium risk:** Sites of medium environmental risk are properties where smaller volumes of petroleum, chemicals, or hazardous materials are frequently stored and used (e.g., registered underground and aboveground storage tanks, vehicle repair facilities, metal working shops), but at which no evidence of spills or releases exists, or properties with documented releases that have been "closed" (signifying no further cleanup actions deemed necessary) by the MPCA. Closed sites, such as closed leaking underground storage tank sites, are considered medium risks because residual soil or groundwater contamination may exist.
- **Low risk:** Low environmental risk sites include properties where minor volumes of chemicals or hazardous materials have been used or stored (e.g., hazardous waste generators, and possibly some farmsteads and residences).

Table 9. MPCA WIMN Sites Within 150 Feet of the Project Site

Site ID	Site Name	Activity	Risk Level	Status
26494	Oil Change Anywhere Inc	Hazardous Waste, Very small quantity generator	Low	Active
140834	Stoney River	Construction Stormwater	Low	Inactive

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.

Construction Generated Waste
Demolition debris and earth materials will be generated during demolition of the existing residential structures. The solid wastes generated during demolition will be recycled or disposed of at a state-permitted landfill.

Asbestos-containing materials (ACM) will require management prior to any demolition, renovation, or operations and maintenance work that might disturb identified or assumed asbestos materials. If ACM is discovered during renovation/demolition activities, disturbance work will immediately stop until a determination regarding asbestos content within the material is discovered.

Construction of the proposed development will generate construction-related waste materials such as wood, packaging, excess materials, and other wastes, which will either be recycled or disposed of in the proper facilities in accordance with state regulations and guidelines.

Operationally Generated Waste
The proposed development would generate new demands on solid waste management and sanitation services provided in the project site. Based on the proposed area of 215,290 square feet, it is estimated that the residential waste stream will be around 2,321 tons per year. Hazardous waste products are not anticipated to be produced or stored within the proposed development.

c. Project Related Use/Storage of Hazardous Materials – Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location, and size of any new above or below ground tanks to store petroleum or other materials. Indicate the number, location, size, and age of existing tanks on the property that the project will use. Discuss potential environmental effects from accidental spills or releases 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.

One 265-gallon underground storage tank and one 300-gallon aboveground storage tank were identified on-site during a 2022 survey. The underground storage tank is a heating oil tank located to the northeast of the existing single-family homes. The aboveground storage tank is a propane tank and is located to the northwest of the existing single-family homes. Based on the age of the 265-gallon heating oil underground storage tank (50+ years) and that it has been 24 years since the subsurface investigation was completed, there is an inherent risk of release and leakage associated with the tank. The 2022 survey recommended a Phase II Subsurface Investigation to assess potential impacts associated with the active 265-gallon tank.

Any hazardous waste materials used/stored during construction and/or operation of the project will be disposed of in the manner specified by local or state regulation or by the manufacturer. A spill prevention plan will be developed, and proper spill prevention controls will be in place for any vehicle refueling or maintenance that occurs on site during construction.

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 wastes including source reduction and recycling.

Regulated material and/or waste will be managed in accordance with state requirements. No known toxic or hazardous wastes are anticipated to be generated on site. If any toxic or hazardous waste is generated on the site, it will be properly handled to current state and federal regulations. Toxic or hazardous wastes to be stored on site during construction will include fuel and oil necessary for maintaining and running heavy construction equipment and during operations may include commercial cleaning supplies. The MPCA regulates asbestos management activities and disposal activities. Any disposal of asbestos regulated waste will be in accordance with MPCA rules.

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

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

One DNR Public Watercourse, Rum River, is located within one mile of the site and is not classified as a trout stream. One Unnamed Public Water Basin is located within the site, and 14 Public Water Basins are located within one mile of the site (see Figure 7). The wetlands on site, along with the waterbodies adjacent to the site, could provide suitable fish habitat.

Potential wildlife habitat is located primarily within the eastern portion of the project site within the green space and wetlands. Adjacent land uses include residential, road right-of-way, and parks, which provide potential wildlife habitat. Given the urban setting of the project site, wildlife including white-tailed deer, small mammals, and bird species that are currently using the project site for potential habitat are well adapted to highly disturbed suburban environments.

Three Minnesota Biological Survey Sites of Biodiversity Significance and nine Regionally Significant Ecological Areas are located within one mile of the project site. According to 2022 DNR Native Plant Communities database, no native plant communities are within or adjacent to the project site. According to the City of Ramsey's 2007 Natural Resources Inventory (NRI), there are two moderate quality native plant communities (Aspen Forest and Oak Woodland-Brushland) and one good quality native plant community (Wet Meadow) located in the forested area on the northeast side of the site.

b. Describe rare features such as state-listed (endangered, threatened, or special concern) species, native plant communities, Minnesota 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-1074) and/or correspondence number (MCE_____) from which the data were obtained and attach the Natural Heritage Review letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe results.

State-Listed Threatened and Endangered Species
A review of the DNR Natural Heritage Inventory System (LA-1074) database was conducted for the project site and the area within one mile of the project site. This review identified two species within one mile of the project site and one species within the project site itself.

A record for the Blanding's Turtle (*Emys blandingii*), a state-listed threatened species, is located within the project site. Three records for the Blanding's Turtle are located within one mile of the project site. Blanding's Turtles prefer wetland complexes and adjacent sandy uplands, including calm, shallow waters associated with river and stream. In southeastern Minnesota, open marshes and bottomland wetlands provide summer and winter habitat. Ephemeral wetlands are utilized in spring and early summer, while deeper marshes and backwater pools are utilized in both the summer and winter.

A record for the Creek Heelsplitter (*Lasmigona compressa*), a state-listed species of special concern, is located within one mile of the project site. The Creek Heelsplitter prefers creeks, small rivers, and the upstream portions of large rivers. The wetlands on site do not represent suitable habitat; therefore, no long-term adverse impacts to Creek Heelsplitters are anticipated.

Federally Listed Threatened and Endangered Species
A review of the U.S. Fish and Wildlife Service's Information for Planning and Consultation (IPaC) tool was completed for Anoka County. This review identified two federally listed endangered or proposed endangered species that may be present within the project site.

A record for the Northern Long-Eared Bat, a federally endangered species, was identified within Anoka County. During the summer, Northern Long-Eared Bats roost singly or in colonies underneath bark, in cavities, or crevices of both live and dead trees. The bat uses tree species based on suitability to retain bark or provide cavities or crevices. It has also been found, rarely, roosting in structures like barns or sheds. Tree stands in the eastern portion of the project site may present suitable habitat for the Northern Long-Eared Bat.

A record for the Tricolored Bat, a proposed federally endangered species, was identified within Anoka County. During the summer, Tricolored Bats roost among live and dead leaf clusters of live or recently dead deciduous hardwood trees Tree stands in the eastern portion of the project site may present suitable habitat for the Tricolored Bat.

Other Sensitive Ecological Resources
The identified Sites of Biodiversity Significance and Regionally Significant Ecological Areas are not within the project site, therefore; no adverse impacts in these areas are anticipated.

c. Discuss how the identified fish, wildlife, plant communities, rare features, and ecosystems may be affected by the project, including how current Minnesota climate

trends and anticipated climate change in the general location of the project may influence the effects. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.

Effects to Wildlife Habitat and Sensitive Ecological Resources

Minimal tree removal will be required as part of the project; however, most trees will be preserved and a tree replacement plan will be developed and implemented per city code requirements. Limited tree removal is anticipated on the northeast side of the site where the City of Ramsey's 2007 survey identifies native plant species. Effective erosion prevention and sediment control practices will be implemented and maintained near the water resources on site throughout the duration of the project. Redevelopment will not have a significant adverse impact to any wildlife currently utilizing the site or the surrounding area.

Wildlife currently using the site are highly adaptive and should not be adversely affected by the project. Invasive species will be controlled on site during construction, and turf grass and other ornamental landscape plants will be used on the site and may provide some additional habitat for songbirds, small mammals, and insects.

Impacts to Threatened and Endangered Species

The wetlands within the project site are likely to be suitable habitat for Blanding's Turtle. Development is not proposed within the wetland areas; therefore, no long-term adverse impacts to Blanding's Turtle are anticipated.

Adverse impacts are not anticipated to the Creek Heelsplitter due to the lack of suitable habitat within the project site or the likelihood that the species is present in the area given the historical observation dates for the species.

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

Invasive Species

The proposed project would not result in the introduction of invasive species. Disturbed areas would be reestablished using appropriate native and stabilization seed mix. Invasive species will be controlled on site during construction, and proposed landscaping will not include any DNR-identified invasive species. Additionally, best management practices will be followed when relocating construction equipment from other sites (see correspondence in Appendix C).

Threatened and Endangered Species

If Blanding's turtles are found on the project site, state law and rules prohibit the destruction of threatened or endangered species, except under certain prescribed conditions. The DNR provided several required avoidance measures in their NHIS correspondence:

- Avoid wetland and aquatic impacts during hibernation season, between September 15th and April 15th, if the area is suitable for hibernation.
- The use of erosion control blankets shall be limited to "bio-netting" or "natural-netting" types, and specifically not products containing plastic mesh netting or other plastic components. Be aware that hydro mulch products may contain small synthetic

(plastic) fibers. Review mulch products and do not allow materials with synthetic (plastic) fiber additives in areas that drains into Public Waters.

- Construction areas should be thoroughly checked for turtles before the use of heavy equipment or any ground disturbance. If turtles are in imminent danger, they should be moved out of harm's way. Otherwise, they should be left undisturbed.

A Blanding's turtle fact sheet that describes the habitat use and life history of the species along with two lists of recommendations for avoiding and minimizing impacts to the turtles is included in Appendix C.

If tree clearing or structure demolition is anticipated, it is recommended to occur from November 1st-March 31st, which is outside of the active bat season.

Wildlife Habitat and Sensitive Ecological Resources

The developer will prepare a tree replacement plan to meet city code as site planning progresses.

15. Historic Properties

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

A search of the Minnesota State Historic Preservation Office's (SHPO) Statewide Inventory was requested to identify known historic properties and archaeological sites in the vicinity of the project (see Appendix C). Within Section 25, Township 32, Range 25 three archaeological records and one historic property record was identified. The historic property, District No. 28 School, is listed on the National Register of Historic places and is within a half-mile of the project site. None of the sites or property will be impacted by the development.

It is not anticipated that unknown archaeological sites will be uncovered during the construction of this project as the site has been previously disturbed. However, if cultural materials are encountered during construction, unanticipated discovery protocols will be followed.

16. Visual

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

The site includes existing institutional and residential land that is not near any unique designated scenic views or vistas. Future development would conform with the zoning regulations for building height, building form, landscape screening, and lighting would be in conformance with city ordinances. Adverse visual effects are not anticipated.

17. Air

a. Stationary Source Emissions – Describe the type, sources, quantities, and compositions of any emissions from stationary sources such as boilers or exhaust stacks. Include any hazardous air pollutants and criteria pollutants. Discuss effects to air quality including any sensitive receptors, human health, or applicable regulatory criteria. Include a discussion of any methods used to 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.

No stationary source air emissions are anticipated; therefore, no mitigation is required.

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 vehicles emit a variety of air pollutants including carbon monoxide (CO), hydrocarbons, nitrogen oxides, and particulates. The primary pollutant of concern is CO, which is a byproduct of the combustion process of motor vehicles. CO concentrations are highest where vehicles idle for extended periods of time. For this reason, CO concentrations are generally highest in the vicinity of signalized intersections where vehicles are delayed and emitting CO. Generally, concentrations approaching state air quality standards are found within about 100 feet of a roadway source. Further from the road, the CO in the air is dispersed by the wind such that concentrations rapidly decrease.

The Minnesota Department of Transportation (MnDOT) has developed a screening method designed to identify intersections that will not cause a carbon monoxide (CO) impact above state standards. MnDOT has demonstrated that even the 10 highest traffic volume intersections in the Twin Cities do not experience CO impacts. Therefore, intersections with traffic volumes lower than these 10 highest intersections will not cause a CO impact above state standards. MnDOT's screening method demonstrates that intersections with total daily approaching traffic volumes below 82,300 vehicles per day will not have the potential for causing CO air pollution problems. None of the intersections impacted by the project exceed the criteria that would lead to a violation of the air quality standards

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 17a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors.

The project may generate temporary fugitive dust emissions during construction. These emissions would be controlled by sweeping, watering, or sprinkling, as appropriate or as prevailing weather and soil conditions dictate. Dust emissions are not anticipated during operations as all surfaces will either be impervious or vegetated.

The construction and operation of the project are not expected to generate objectionable odors.

18. Greenhouse Gas (GHG) Emissions/Carbon Footprint

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

Certain gases in the earth's atmosphere, classified as greenhouse gases (GHGs), play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface and a smaller portion of this radiation is reflected back toward space. This absorbed radiation is then emitted from the earth as low-frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. Because the earth has a much lower temperature than the sun, it emits lower-frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth.

The primary GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Fluorinated gases also make up a small fraction of the GHGs that contribute to climate change. Examples of fluorinated gases include chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3); however, it is noted that these gases are not associated with typical land use development. Human-caused emissions of GHGs exceeding natural ambient concentrations are believed to be responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change or global warming.[11]

This section includes an estimated quantification of the following GHG emissions associated with the proposed project:

- Carbon Dioxide (CO_2)
- Nitrous Oxide (N_2O)
- Methane (CH_4)

The projected GHG emissions are provided on an average annual basis using the CO_2 equivalent (CO_2e) and include the proposer's best estimate of average annual emissions over the proposed life/design service life of the project. Emissions were estimated using the US Environmental Protection Agency's Simplified GHG Emissions Calculator (Version 7 June 2021)[12] and are summarized in Appendix D and Table 10 and Table 11 by project phase (i.e., construction and operations) and source type (e.g., combustion from mobile equipment, off-site electricity (see Appendix D for background analysis).

[11] Summarized from U.S. EPA, Overview of Greenhouse Gases: https://www.epa.gov/ghgemissions/overview-greenhouse-gases

[12] Source: https://www.epa.gov/climateleadership/simplified-ghg-emissions-calculator

Construction emissions are based on length of construction and are from mobile equipment including passenger cars, light-duty trucks, medium and heavy-duty trucks, and construction equipment (both gasoline and diesel). Emissions associated with construction materials were not analyzed, as these are outside the scope of this analysis.

Emissions from cooling and refrigeration systems are not accounted for in this operational emissions analysis as GHGs from refrigerants are approximately less than 5 percent of the total GHG emissions of a building.[13] The project does not include any owned or leased vehicles anticipated to be used by the organization during operation, plans to purchase gases during operation, or land use conversions.

Table 10: Existing Operational Emissions

Scope	Emission Type	Emission Sub-Type	CO_{2e} Emissions (tons/year)
Scope 1	Combustion	Stationary equipment	838
Scope 2	Off-site electricity	Grid-based	48
Scope 3	Off-site waste management[14]	Area	2,084
Total			**2,970**

Table 11: Construction Emissions

Scope	Emission Type	Emission Sub-Type	Project-Related CO_{2e} Emissions (total)
Scope 1	Combustion	Mobile equipment	1,145
Total			**1,145**

Table 12: Proposed Emissions

Scope	Emission Type	Emission Sub-Type	Proposed CO_{2e} Emissions (tons/year)
Scope 1	Combustion	Stationary equipment	1,295
Scope 2	Off-site electricity	Grid-based	1,423
Scope 3	Off-site waste management	Area	2,373
Total			**5,091**

b. GHG Assessment

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

[13] Source: https://practicegreenhealth.org/sites/default/files/2019-06/PracticeGreenhealth_GHG_Toolkit_0.pdf
[14] Based on calculations from CalRecycle's website titled "Estimated Solid Waste Generation Rates," available at https://www2.calrecycle.ca.gov/wastecharacterization/general/rates.

Design strategies and other sustainability measures anticipated to be implemented in the proposed development to reduce emissions include:

- Energy end-use efficient appliances and equipment.
- Energy efficient lighting.
- Energy efficient building shells (i.e, a well insulated building).
- On-site geothermal energy use. There is an existing geothermal system on site and one or multiple of the cells that may continue to be used as an energy source that provides energy that can be extracted without burning fossil fuels.

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

The proposed mitigation listed in Item 18.b.i. includes best management practices for new construction and reducing GHG emissions where practicable during operations. Additionally, the project will develop a travel demand management plan to reduce use of single occupancy motor vehicles, and increase walking, bicycling, and transit as primary modes of travel to reduce GHG emissions from mobile sources.

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

The Next Generation Energy Act requires the state to reduce greenhouse gas emissions in the state by 80 percent between 2005 and 2050, while supporting clean energy, energy efficiency, and supplementing other renewable energy standards in Minnesota. The MPCA's biennial GHG emissions reduction report from 2021[15] identifies strategies for reducing emissions in the three economic sectors with the highest emissions – transportation, electricity generation, and agriculture, forestry, and land use.

The expected lifespan of the project is 50 years, which equates to an estimated 255,695 CO_2e metric tons over the lifetime of the building (including both construction and operations phases). The proposer is committed to implementing the sustainability measures listed in Item 18.b.i. to reduce operational emissions to the extent practicable. The proposed project will be built in compliance with state regulations and City of Ramsey code.

19. Noise

Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area; 2) nearby sensitive receptors;

[15] Available at https://www.pca.state.mn.us/air/state-and-regional-initiatives

3) conformance to state noise standards; and 4) quality of life. Identify measures that will be taken to minimize or mitigate the effects of noise.

Existing Noise

The project site is in an urban area, and existing noise at the site is largely from the surrounding roadways. Nearby sensitive receptors include residences to the west and north.

Construction Noise

Typical construction noise will be temporarily generated by construction activities. The City of Ramsey Code of Ordinances regulates both the hours of operation for construction equipment and allowable noise levels. Construction of the project will adhere to requirements identified in City of Ramsey Code of Ordinance, Sec. 105-1, which states "It shall be unlawful to engage in or conduct any activity in the construction of any building or structure, or the laying of any pavement, including but not limited to the making of any excavation, clearing of surface land and loading or unloading material, equipment or supplies in any residential district of the city, except between the hours of 7:00 a.m. and 10:00 p.m. Monday through Saturday." A permit will be obtained from the City for work outside these hours. Additionally, all equipment shall be maintained and operated in such a manner to minimize noises as far as practicable.

Operational Noise

The City of Ramsey Code of Ordinances and the MPCA regulate noise. A noise study will be completed as part of the City's entitlement process to understand the existing and proposed noise conditions and identify any potential mitigation that may be needed so the proposed project complies with the local and state regulations.

20. 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) source of trip generation rates used in the estimates; and 5) availability of transit and/or other alternative transportation modes.

For the sake of making a high-end estimate regarding the site's generated traffic, it was advised that the number of units should be estimated 10% higher than the current design includes.

Parking

The proposed project is anticipated to include approximately 619 new parking stalls for the residential developments and the existing church parking is unchanged.

Traffic Generation

It is estimated that the development will generate 153 new trips during the AM peak hour (40 entering, 113 exiting), 168 new trips during the PM peak hour (100 entering, 68 exiting), 161 new trips in the Sunday peak hour (86 entering, 75 exiting), and 1,849 daily trips. Trip generation estimates were based on Land Use Code (LUC) 221 (Multifamily Housing), ITE LUC 251 (Senior Adult Housing – Single-Family), and ITE LUC 252 (Senior Adult Housing – Multi-Family) in the ITE Trip Generation Manual, 11th Edition.

Table 7: Trip Generation Forecast

Land Use Description	Intensity	Daily	AM Peak Hour			SUN Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total	In	Out	Total
Multifamily Housing	303 Units	1,376	26	86	112	53	44	97	72	46	118
Senior Adult Housing – Townhomes	22 Units	94	2	4	6	3	2	5	4	3	7
Senior Adult Housing – Multi-Family	173 Units	561	12	23	35	30	29	59	24	19	43
Total Trip Generation		**1,849**	**40**	**113**	**153**	**86**	**75**	**161**	**100**	**68**	**168**

Pedestrians and Bicycles

There are existing pedestrian facilities/trails on both sides of Sunwood Dr, Dysprosium Rd and County Road 5. MN Highway 47 has a pedestrian/bicycle path on its east side only. There are marked crosswalks at all intersections that the pedestrian paths cross, as well as push-buttons at both of the stoplight controlled intersections. Internal walkways will connect buildings to each other; connections will be made with the existing trails along County Road 5.

Transit Service

There are no transit routes within a mile of the proposed site.

a. 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 will be completed for this project based on the projected trip generation of the site (see Appendix E). The area's transportation network is expected to support the development within the project site with current intersection geometry. Metrics for traffic analysis include intersection delay as measured by level of service (LOS) and 95th percentile queue lengths. LOS grades range from A to F, with LOS A being the highest (best traffic flow and least delay), LOS E as saturated or at-capacity conditions, and LOS F being the lowest (oversaturated conditions). LOS D or better is generally considered acceptable operating conditions.

The traffic impact study will include intersection capacity analyses for intersections adjacent to the project site along County Road 5, MN Highway 47, and Sunwood Drive. Based on the results of the traffic impact study capacity analysis, all intersections are anticipated to operate

with acceptable LOS in all analysis scenarios. Table 8 shows the LOS for the project site intersections in each analysis scenario.

Table 8: LOS Summary

Scenario			Intersection							
			CSAH 5 & Sunwood Drive	Sunwood Drive & Cobalt Street	MN-47 & Sunwood Road	CSAH 5 & 146th Avenue	CSAH 5 & Lord of Life Access	CSAH 5 & Iodine Street	CSAH 5 & Dysprosium Street	MN-47 & CSAH 5
Existing Year (2023)	**AM**	**Delay (s)**	13.9	4.5	7.2	10	2.3	10.1	15.2	16.8
		LOS	B	A	A	A	A	B	C	B
	PM	**Delay (s)**	28.6	4.5	13.1	4.6	2.4	40.2	8.4	20.4
		LOS	D	A	B	A	A	E	A	C
	Sunday	**Delay (s)**	8.5	2.1	7.1	4.3	2.6	6.1	8.4	17.3
		LOS	A	A	A	A	A	A	A	B
Opening Year (2027) No-Build	**AM**	**Delay (s)**	11.8	4.4	8.7	9.8	1.4	8.9	14.1	17.1
		LOS	B	A	A	A	A	A	B	B
	PM	**Delay (s)**	20.2	2	12.7	14.5	0.8	7	18.7	21.5
		LOS	C	B	B	B	A	A	C	C
	Sunday	**Delay (s)**	7.8	2	7	4.2	5.5	9.8	4.6	20
		LOS	A	A	A	A	A	A	A	B
Opening Year (2027) Build	**AM**	**Delay (s)**	13	4.6	8.8	6.4	10	24.5	25.2	17.6
		LOS	B	A	A	A	A	C	D	B
	PM	**Delay (s)**	20.6	4.6	8.5	19.2	0.7	26.8	18.5	21.7
		LOS	C	A	A	C	A	D	C	C
	Sunday	**Delay (s)**	19.2	4.1	8.4	15.3	2.5	19.5	25.1	17.3
		LOS	C	A	A	C	A	C	D	B
Horizon Year (2040) No-Build	**AM**	**Delay (s)**	15.4	4.2	8.2	10.6	3.1	25	18.1	17.7
		LOS	C	A	A	B	A	C	C	B
	PM	**Delay (s)**	15.8	4.1	14	10.7	14.1	15.4	17	22.7
		LOS	C	A	B	B	B	C	C	C

Scenario			Intersection							
			CSAH 5 & Sunwood Drive	Sunwood Drive & Cobalt Street	MN-47 & Sunwood Road	CSAH 5 & 146th Avenue	CSAH 5 & Lord of Life Access	CSAH 5 & Iodine Street	CSAH 5 & Dysprosium Street	MN-47 & CSAH 5
	Sunday	Delay (s)	7.8	2.5	6.5	6	5.8	15.3	6.5	17.6
		LOS	A	A	A	A	A	C	A	B
Horizon Year (2040) Build	AM	Delay (s)	15.5	4.4	8.3	60.2	10	31.5	35.7	19.6
		LOS	C	A	A	F	A	D	E	B
	PM	Delay (s)	19.3	2.9	14.7	17.5	14.1	18.5	20.4	25
		LOS	C	A	B	C	B	C	C	C
	Sunday	Delay (s)	7.5	2.3	6.9	6.9	5.7	11.1	7	19.3
		LOS	A	A	A	A	A	B	A	B

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

In all five analysis conditions, the study intersections generally operate at acceptable LOS, with only a few minor side street movements operating at a LOS worse than D. Additionally, all queues were maintained within their allotted storage areas. Since the conditions are acceptable in all scenarios, there are no mitigation changes recommended for this project.

21. Cumulative Potential Effects

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.

Cumulative potential effects are defined as "the effect on the environment that results from the incremental effects of a project in addition to other projects in the environmentally relevant area that might reasonably be expected to affect the same environmental resources, including future projects actually planned or for which a basis of expectation has been laid, regardless of what person undertakes the other projects or what jurisdictions have authority over the projects."[16] The geographic areas considered for cumulative potential effects are those near the project site (within approximately one-half mile), and the timeframe considered includes projects that would be constructed in the reasonably foreseeable future.

[16] Minnesota Rules, part 4410.0200, subpart 11a

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.

According to the Anoka County Highway Department Construction Finder[17], there are no foreseeable future projects within a half mile.

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.

If reasonably foreseeable future projects are identified, potential impacts of these projects will be addressed as required by regulatory permitting and approval processes, minimizing the potential for cumulative effects.

22. Other Potential Environmental Effects

If the project may cause any additional environmental effects not addressed by Items 1 to 21, 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.

All known potentially adverse environmental impacts are addressed in the preceding EAW items.

[17] Available at http://gis.anokacountymn.gov/highway/

RGU Certification

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

I hereby certify that:

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

Signature  Date July 24, 2023

Title Todd A. Larson, Planning Manager

Figures

Figure 1. County Map

Figure 2. USGS Topographic Map

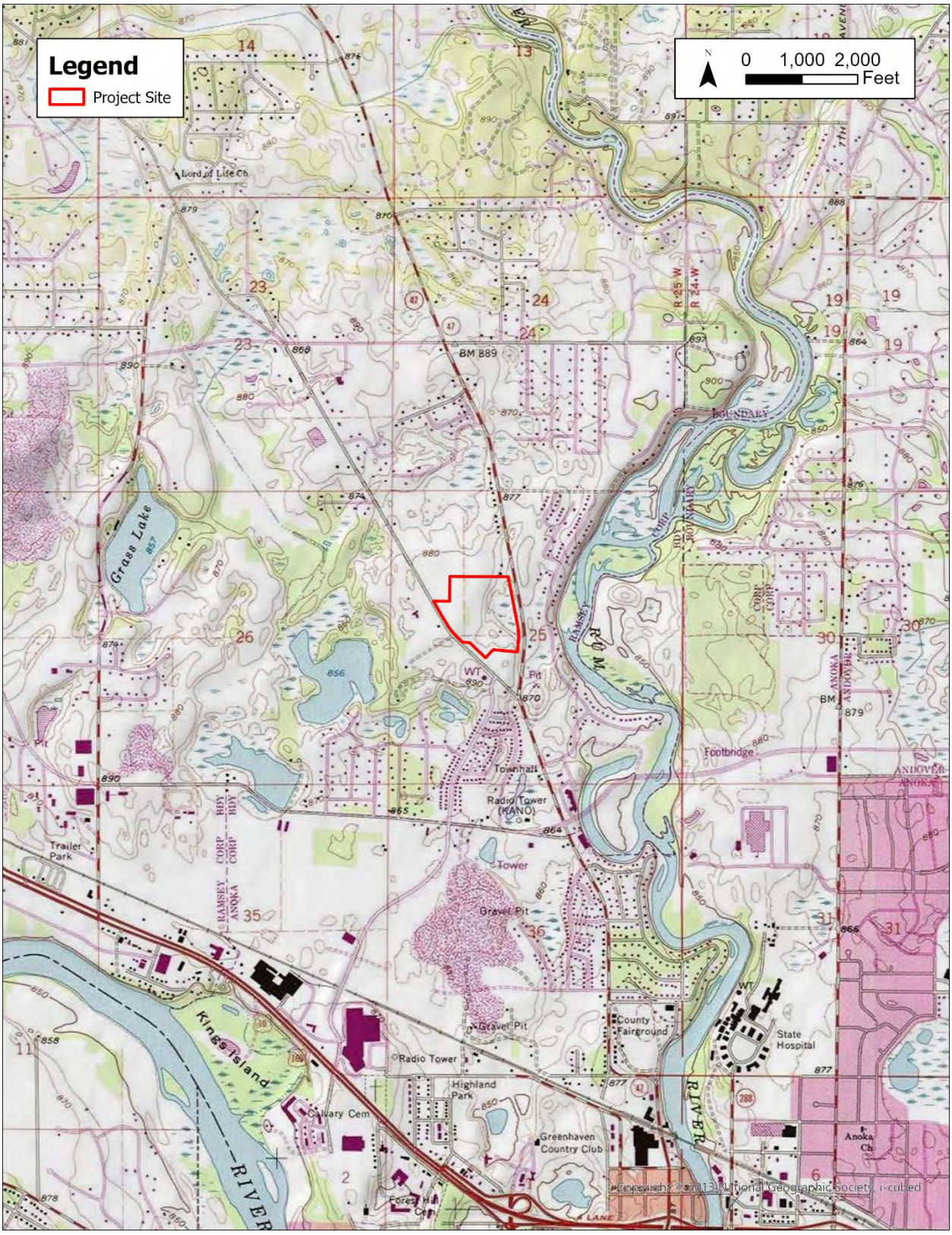


Figure 3: Existing Conditions

Figure 4. Existing Land Use

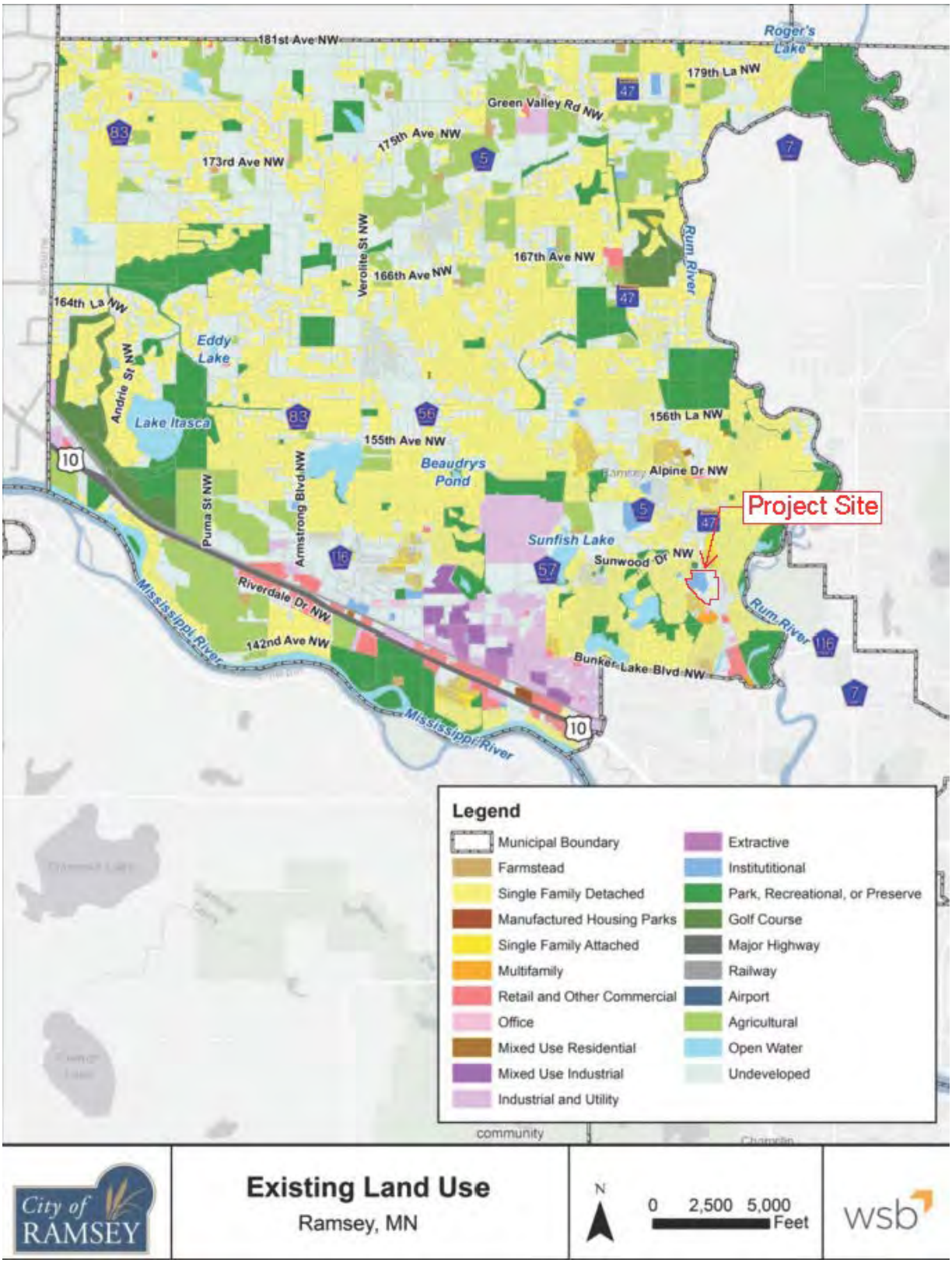


Figure 5. Future Land Use

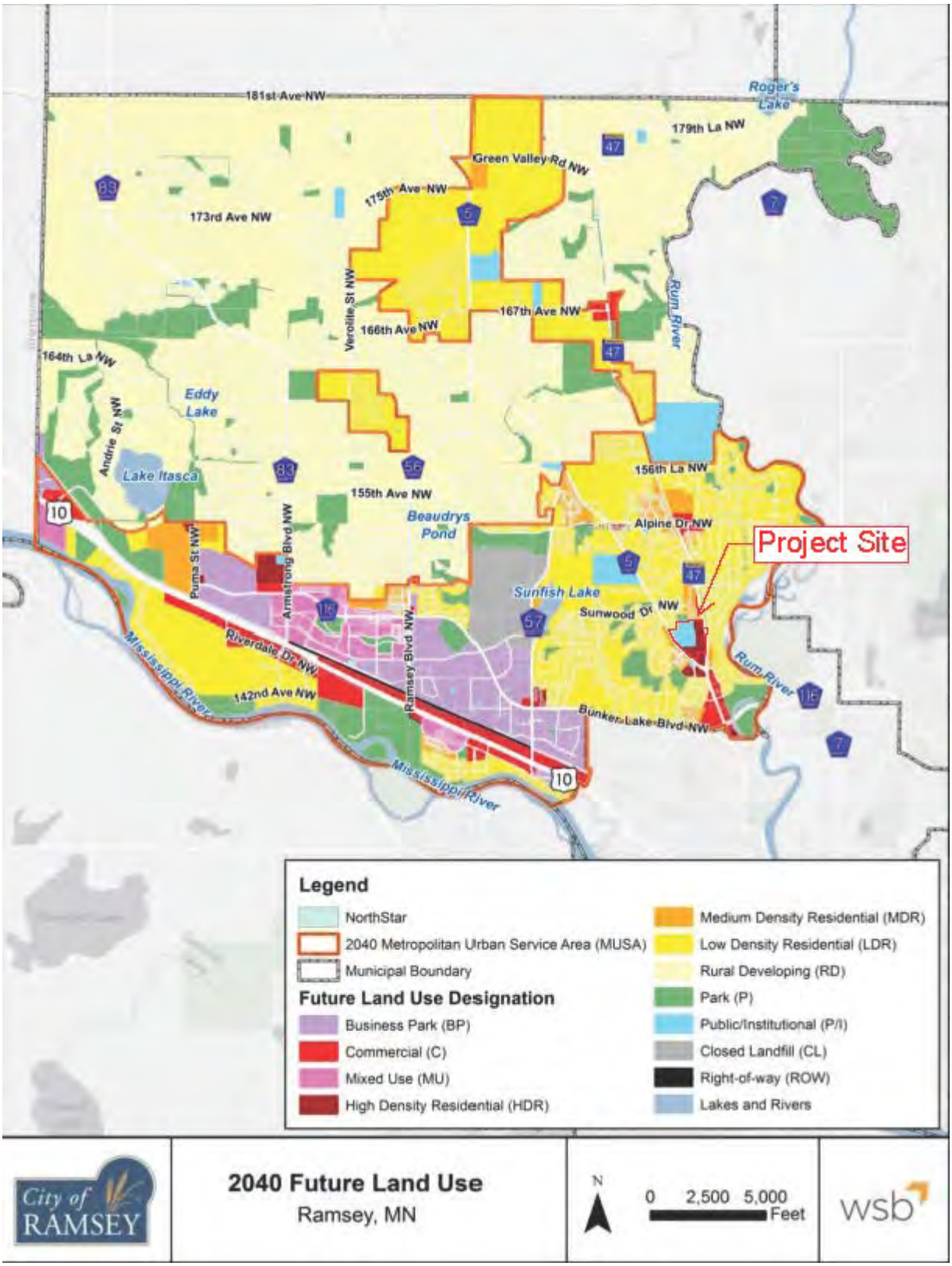


Figure 6. Existing Zoning

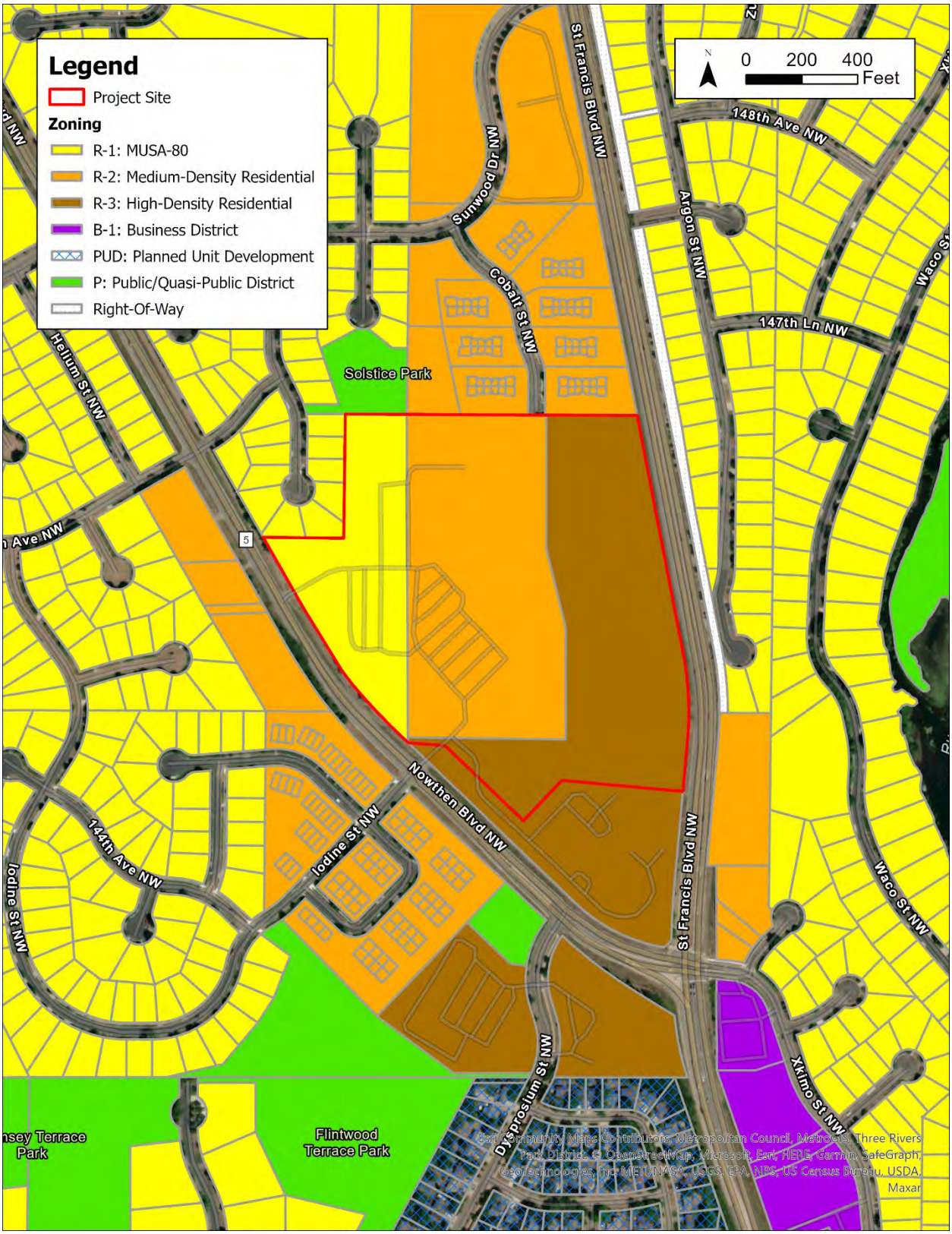


Figure 7. MnDNR Public Waters

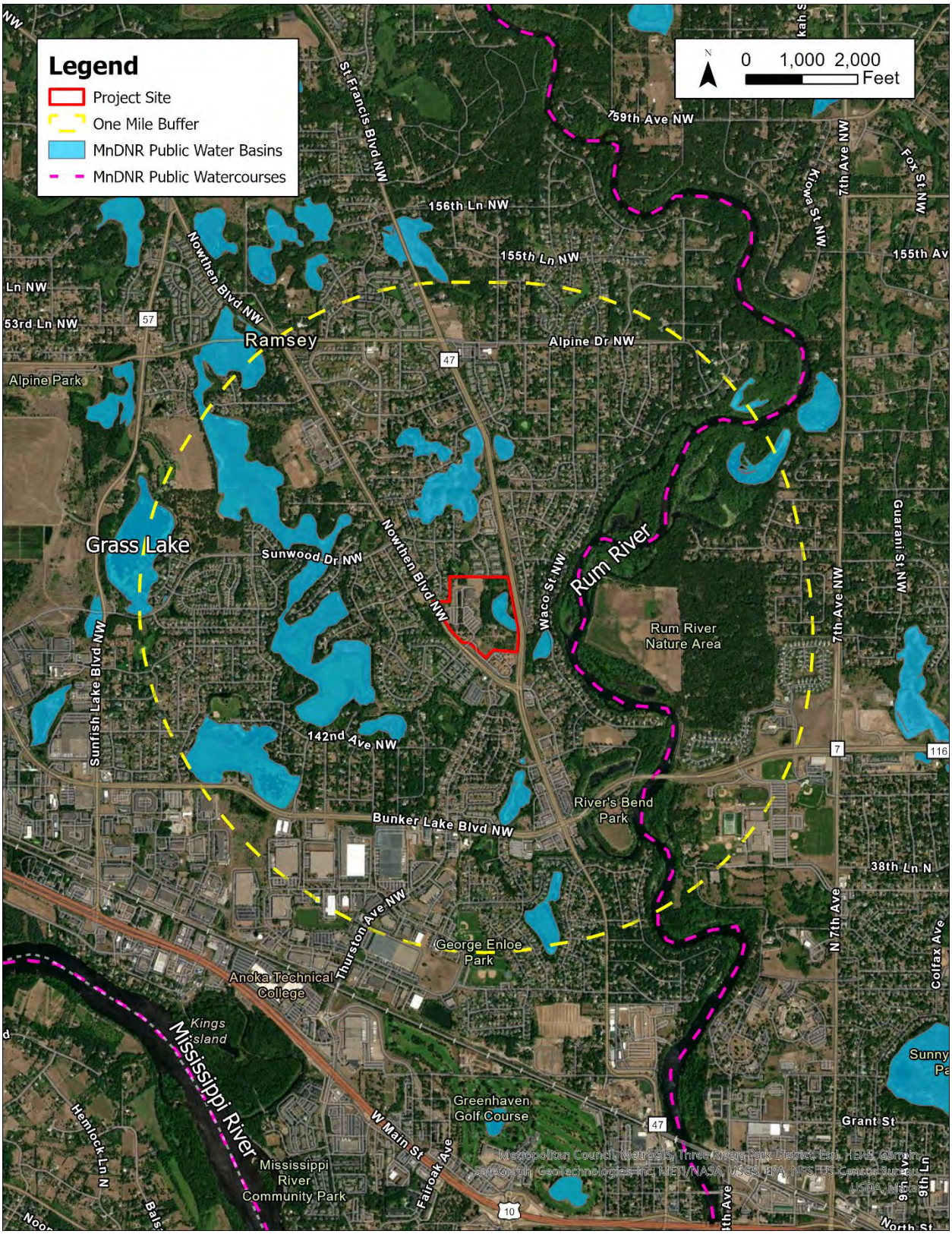


Figure 8. Delineated Wetlands

Figure 9. Depth to Water Table

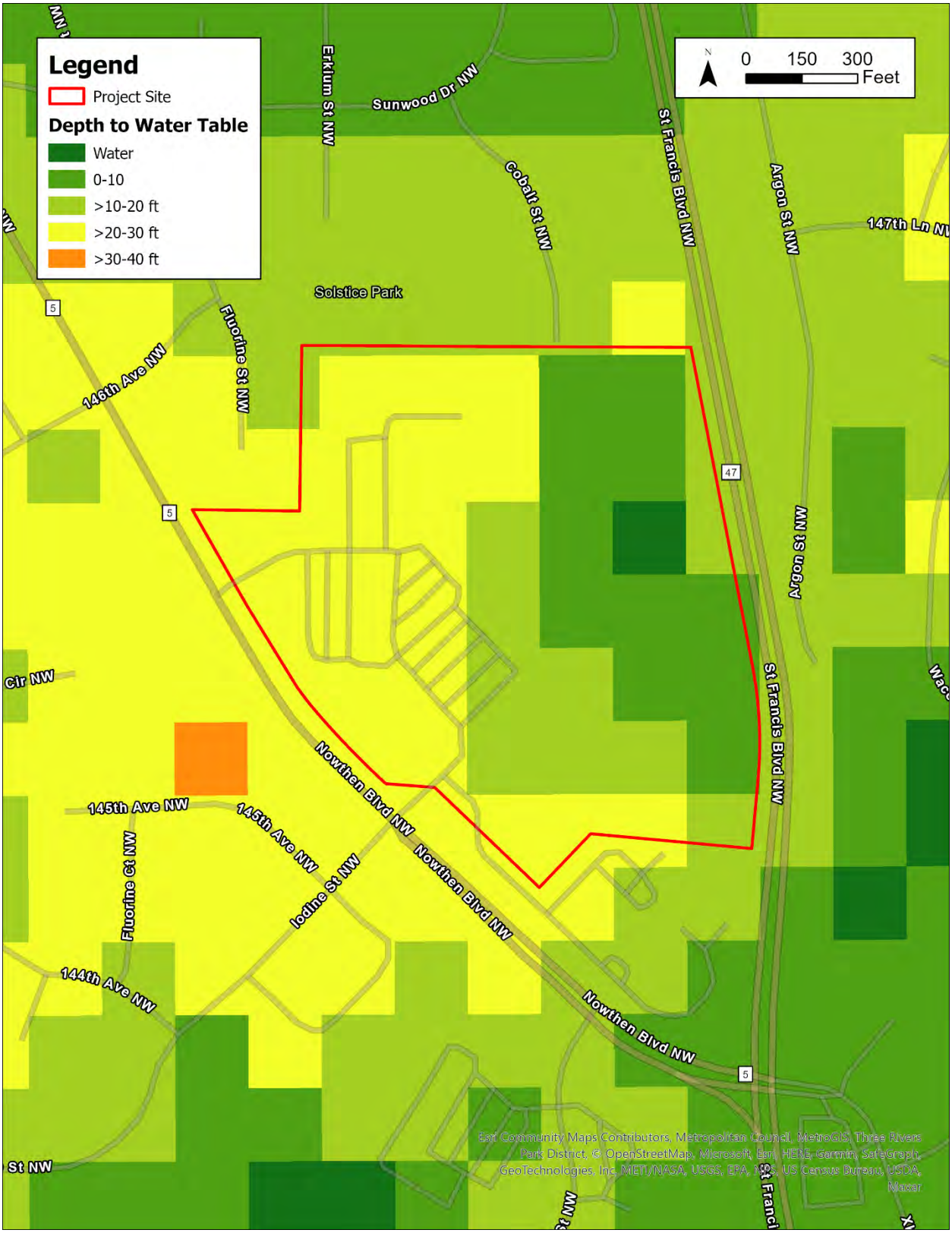
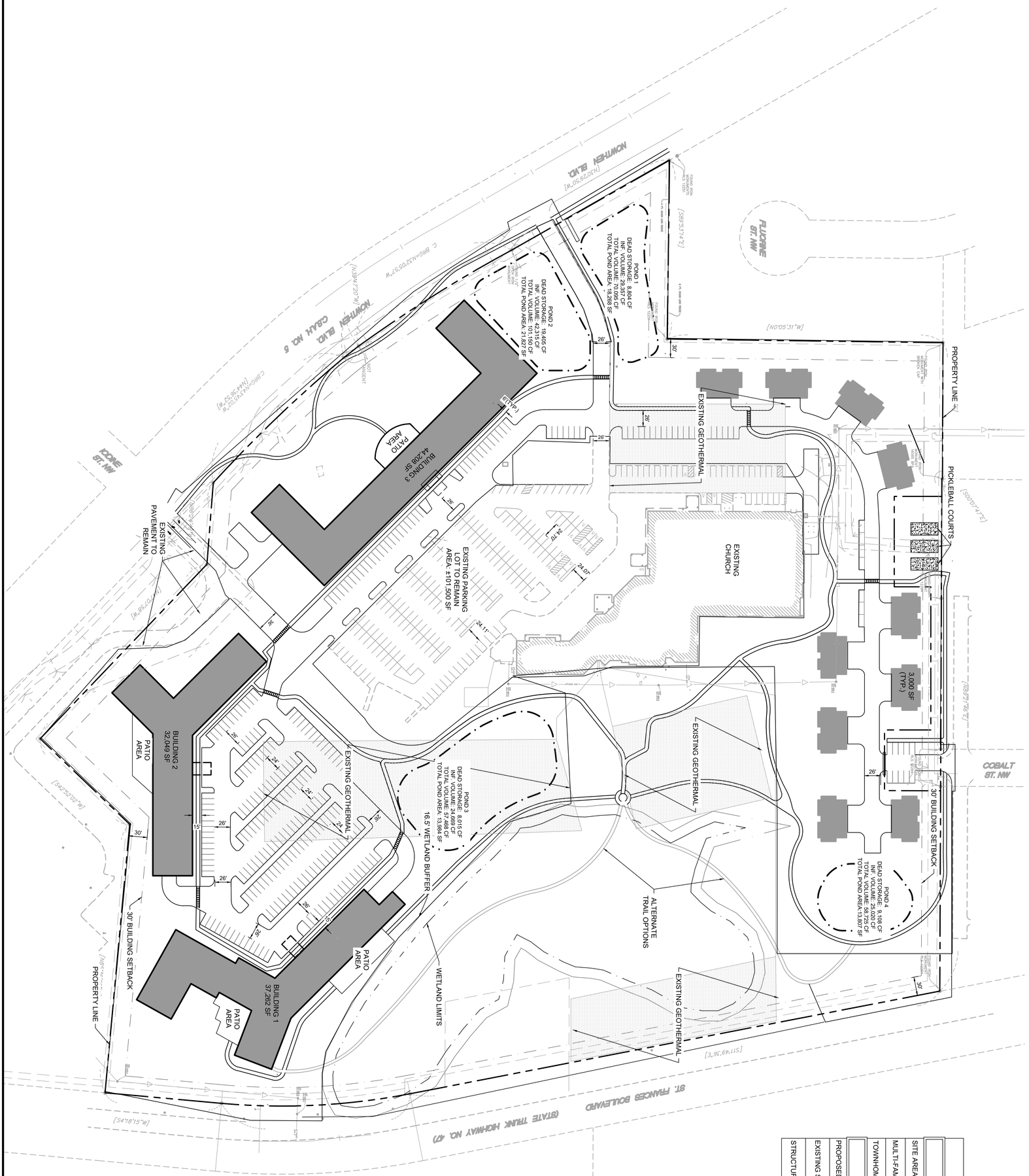


Figure 10. Minnesota Well Index

Figure 11. What's In My Neighborhood

Appendix A

Site Plan



BUILDING DATA SUMMARY	
AREAS	
SITE AREA	35.53 AC
MULTI-FAMILY UNITS	476
TOWNHOME UNITS	22
PARKING	
PROPOSED SURFACE PARKING	263 STALLS
EXISTING SURFACE PARKING	231 STALLS
STRUCTURED PARKING	350 STALLS

GRAPHIC SCALE IN FEET
0 40 80 160

NORTH

Know what's below. Call before you dig. 811

PRELIMINARY - NOT FOR CONSTRUCTION

SHEET NUMBER C400

HAVILAND FIELDS

PREPARED FOR
BKV & SENIOR HOUSING PARTNERS
RAMSEY MN

CONCEPT SITE PLAN

KHA PROJECT	12345678
DATE	06/14/2023
SCALE	AS SHOWN
DESIGNED BY	RBW
DRAWN BY	GAR
CHECKED BY	MGC

Kimley»Horn
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767 EUSTIS STREET, SUITE 100, ST. PAUL, MN 55114
PHONE: 651-645-4197
WWW.KIMLEY-HORN.COM

No.	REVISIONS	DATE	BY

Appendix B

Delineation Report

Pinnacle Engineering
Owning Challenges. Winning Trust.

MINNEAPOLIS, MN
763.315.4501
11541 95th Ave N
Minneapolis, MN 55369

July 26, 2022

Mr. Jon Fletcher
Vice President
Presbyterian Homes & Services and Senior Housing Partners
2823 Hamline Avenue N, Roseville, MN 55113

RE: Level 2 Wetland Delineation Services
Lord of Life Lutheran Church
14501 Nowthen Blvd. NW
Ramsey, MN 55303
Pinnacle Project No.: EM20225225

Dear Mr. Fletcher:

Presbyterian Homes & Services and Senior Housing Partners retained Pinnacle Engineering, Inc. (Pinnacle) to conduct a Level 2, On-Site, Wetland Delineation of the Lord of Life Lutheran Church located at 14501 Nowthen Blvd. NW in Ramsey, Anoka County, Minnesota (Site). The wetland delineation was conducted as part of a potential Site improvements.

It was determined that two wetland areas are present at the Site. The determination was conducted in substantial conformance with the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual and consisted of a Level 2 On-Site Wetland Determination utilizing soil surveys, wetland inventory maps, topographic maps, and climatic records. The determination will be reviewed by a representative of the Army Corps of Engineers. The delineation will also be reviewed by the Lower Rum River watershed Management Organization (LRRWMO) which is the Local Governmental Unit (LGU) administering the Minnesota Wetland Conservation Act (WCA). The following report documents the methods and findings of the determination.

If you have any questions or wish to discuss any aspect of the project, please contact me at (612) 432-5590. We look forward to being of continued service to you.

Sincerely,
PINNACLE ENGINEERING, INC.

Scott Thelen
Staff Scientist, Certified Wetland Scientist #1249

WETLAND DETERMINATION and DELINEATION REPORT

FOR:

LORD OF LIFE LUTHERAN CHURCH
14501 NOWTHEN BLVD. NW
RAMSEY, MN 55303

Prepared For:

Presbyterian Homes & Services
and Senior Housing Partners
2823 Hamline Avenue N
Roseville, MN 55113

PREPARED BY:

Pinnacle Engineering, Inc.
11541 95th Avenue North
Maple Grove, Minnesota 55369

July 26, 2022

Pinnacle Project Number: EM20225225

Pinnacle Engineering
Owning Challenges. Winning Trust.

11541 95th Avenue N
Minneapolis, MN 55369
Phone: 763.315.4501

WETLAND DETERMINATION AND DELINEATION

FOR:

LORD OF LIFE LUTHERAN CHURCH
14501 NOWTHEN BLVD. NW
RAMSEY, MN 55303

PREPARED FOR:

PRESBYTERIAN HOMES & SERVICES AND SENIOR HOUSING PARTNERS
2823 HAMLINE AVENUE N
ROSEVILLE, MN 55113

PREPARED BY:

PINNACLE ENGINEERING, INC.
11541 95th AVENUE NORTH
MAPLE GROVE, MINNESOTA 55369

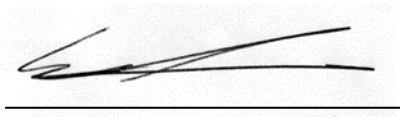
PINNACLE PROJECT NUMBER: EM20225225

July 26, 2022

Prepared By:

Scott Thelen
Senior Scientist
MN Wetland Delineator #1249

Reviewed By:



Eric Simonson
Senior Scientist

Table of Contents

FIGURES

APPENDICES

1.0 INTRODUCTION

1.1 Introduction

Presbyterian Homes & Services and Senior Housing Partners retained Pinnacle Engineering, Inc. (Pinnacle) to conduct a Level 2, On-Site, Wetland Delineation of the Lord of Life Lutheran Church located at 14501 Nowthen Blvd. NW, Ramsey, Anoka County, Minnesota (Site). The Site consists of one parcel of land approximately 35.5 acres in size. The Site is within the SE ¼ of the NW ¼ of Section 25, Township 32N, Range 25W (Lat: 45.235659°, Long: -93.403106°). The Site includes the Lord of Life Lutheran Church, two houses, parking lots, fallow areas, uplands, and wetlands.

The purpose of the wetland delineation was to determine the presence of wetland areas on the Site. The Level 2 wetland delineation was conducted in substantial conformance with the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual, updated February 25, 1997, and utilizes the Midwest Regional Supplement. This report documents the methods and findings of the delineation. The local governmental unit (LGU) is the Lower Rum River Watershed Management Organization (LRRWMO).

1.2 Scope

Pinnacle conducted a Level 2 Onsite Wetland Determination and Delineation in accordance with the criteria established in the 1987 U. S. Army Corps of Engineers (ACOE) Wetland Delineation Manual, updated in 1997, utilizing the Midwest Regional Supplement. The work included the following items:

- Review of County Soil Surveys, USGS topographic maps, National Wetland Inventory (NWI) Maps, Public Water Inventory (PWI) maps, and aerial photographs.
- A site reconnaissance to determine if and where wetlands exist.
- Delineation of the identified wetlands within the area of interest boundaries.
- Preparation and submittal of this report summarizing the findings of our work.

2.0 BACKGROUND INFORMATION

2.1 Site Location and Use

The Site consists of one parcel approximately 35.5-acres in size, is within the SE ¼ of NW ¼ of Section 25, Township 32N, Range 25W (Lat: 45.235659°, Long: -93.403106°). The Site contains portions of the Lord of Life Lutheran church, parking lots, fallow areas, and wetlands. The property totals approximately 35.5-acres in size with property identification number (PID) 25-32-25-24-0059. Figure 1 shows the Site location and its current configuration.

2.2 Surveys and Maps

Pinnacle conducted a review of the Natural Resource Conservation Soil Survey, topographic maps, NWI, and PWI maps for the vicinity of the Site. The following sections summarize the information available at the time of this review.

2.2.1 Topographic Maps

The central property featuring the church building and parking lot appears to have an elevation of 886 elevation above mean sea level (AMSL). The Site appears to drain to the east and the west with elevations of 856 AMSL and 880 AMSL, respectively. The Site generally slopes to the wetland areas in the east and to a suspect wetland area in the western portion of the Site. Topographic contours are shown on Figure 2.

2.2.2 Soil Survey

The Natural Resources Conservation Service (NRCS) Web Soil Survey map, which is included as Figure 3, was reviewed for information pertaining to the Site soils. The Soil Survey indicated the Site soil units consist of:

- Nymore loamy sand, 1 to 6 percent slopes (D90B)
- Marsh (Mc)
- Nymore loamy coarse sand, 12 to 25 percent slopes (NrD)
- Nymore loamy sand, 0 to 2 percent slopes (NyA)
- Nymore loamy sand, 6 to 12 percent slopes (NyC)

Of the identified soil types, Marsh is considered a hydric soil.

2.2.3 Wetland Inventory Maps

The United States Fish and Wildlife Service (USFWS) NWI map for the Site area (Figure 4) depicted three wetland basins and four wetland types, as follows:

- Two wetland areas consisting of palustrine, emergent, persistent, temporary flooded, (PEM1A) wetlands.
- Two wetland areas consisting of palustrine, emergent, persistent, seasonally flooded, (PEM1C) wetlands.
- One wetland area consists of a palustrine, emergent, persistent, semi-permanently flooded, (PEM1F) wetland.
- One wetland area consists of a palustrine, unconsolidated bottom, semi-permanently flooded, (PUBF) wetland.

NWI maps generally show the approximate location of wetlands as of the time of publication.

2.2.4 Public Waters Inventory

The Minnesota Department of Natural Resources Public Waters Inventory (PWI) produces a map of the protected wetlands and waters of the State. The PWI map, which is included as Figure 5, identified a PWI protected basin number 02066500 within the Site. No PWI watercourses were identified within the Site boundaries.

3.0 WETLAND DETERMINATION

3.1 Methodology

The wetland determination was made utilizing the techniques of the Routine Level 2 Onsite Method, as described in the 1987 U. S. Army Corps of Engineers Wetland Delineation Manual, updated February 25, 1997 and utilizing the Midwest Regional Supplement. Determination of hydric soils, site hydrology, and hydrophytic vegetation were made according to the procedures and guidelines described in the manual. Sampling locations were selected to be representative of wetland/upland transition areas.

Scott Thelen of Pinnacle assessed the wetlands within the project area on July 19, 2022. The assessment included probing the soils to observe the color and moisture, as well as other available hydric soil indicators, such as mottling, gleying, and oxidized root channels. The characteristics noted for each sampling location are documented in the data forms, which are included in Appendix A. Potential wetland boundaries were collected using a handheld GPS unit and were flagged for survey by Sunde. The wetland areas are depicted on Figure 2. The wetland delineation was conducted at the beginning of the growing season with some remnant dormant vegetation present.

The 2022 seasonal antecedent rainfall amounts were below the normal precipitation amounts for this area. Precipitation amounts of 0.26 inches of rain occurred the fourteen days prior to the wetland delineation field visit. Hydrology was not anticipated to be present during the field visit.

3.2 Wetland Descriptions

Pinnacle identified two wetlands within the Site as depicted on Figure 2. NWI descriptions of the wetland classifications and types are found below. Table 3.2.1 below summarizes the findings of the field investigation. Data forms for the field investigation can be found in Appendix A and photographs in Appendix C.

Table 3.2.1
Wetlands Table
14501 Nowthen Blvd. NW,
Ramsey, Minnesota

Wetland ID	Delineated Wetland Type	Wetland Size ac/sf		NWI Wetland Type	Dominant Wetland Vegetation	Hydric Soil Indicator	Hydrology
W-1	PEM1C	3.05	132,858	PEM1C/PEM1F/ PEM1A	Cattails, et al.	Redox Dark Surface (F6)	Saturation (A3), Geomorphic Position ((D2)
W2	PEM1C/PUBF	0.47	20,473	PEM1C/PUBF	Cattails, et al.	Redox Dark Surface (F6)	Saturation (A3), Geomorphic Position ((D2)

Wetland Type PEM1A

The NWI Cowardin wetland classification system identifies the PEM1A label for a wetland that consists of a palustrine basin, dominated by persistent emergent vegetation, consisting of erect, rooted, herbaceous hydrophyte species that normally remain standing at least until the beginning of the next growing season, that is temporarily flooded. Surface water is present for brief periods during the growing season, but the water table usually lies well below the ground surface for most of the season. The NWI map for the Site area indicated two PEM1A wetlands, including one isolated wetland located in the west central portion of the Site, in the location of Suspect Area-1 (SA-1), and the other located in the southern portion of Wetland 1. The soils survey did not indicate hydric soils located within the SA-1 aera. The soil survey indicated hydric soils were present in the area of Wetland 1. The SA-1 area is most likely an excavated infiltration pond with a large culvert draining into it.

Wetland Type PEM1C

The NWI Cowardin wetland classification system identifies the PEM1C label for a wetland that consists of a palustrine basin, dominated by persistent emergent vegetation, consisting of erect, rooted, herbaceous hydrophyte species that normally remain standing at least until the beginning of the next growing season, that is seasonally flooded. Surface water is present for extended periods especially early in the growing season but is absent by the end of the growing season in most years. The water table, after flooding ceases, is variable, extending from saturated to the surface to a water table well below the ground surface. The NWI map for the Site area indicated two PEM1C wetlands contained within the Site boundaries. One of the these depicted areas corresponds to the northern portion of Wetland 1 and the other corresponds to the fringe of Wetland 2. The soils survey did

indicate hydric soils located within the Wetland 1 area. The soil survey did not depict hydric soils within the Wetland 2 area.

Wetland Type PUBF

The NWI Cowardin wetland classification system identifies the PUBF label for a wetland that consists of a palustrine basin, with an unconsolidated bottom that is semi-permanently flooded. This means that surface water persists throughout the growing season in most years, however when surface water is absent, the water table is usually at or very near the land surface. The NWI map for the Site area does indicates the PBUF wetland corresponds to Wetland 2. The soil survey did not indicate hydric soils are located within the Wetland 2 area. The Wetland 2 basin is most likely an excavated stormwater pond used to treat surficial runoff prior to entering the regional stormwater system .

4.0 DISCUSSION

Pinnacle performed a Level 2, On-Site, Wetland Delineation of the Lord of Life Lutheran Church located at 14501 Nowthen Blvd. NW, Ramsey, Anoka County, Minnesota (Site). The Site of approximately 35.5 acres consists of one parcel of land within the SE ¼ of NW ¼ of Section 25, Township 32N, Range 25W (Lat: 45.235659°, Long: -93.403106°). The underlying property contains the Lord of Life Lutheran Church, parking lots, fallow areas, and wetlands. The Site area has the PID of 25-32-25-24-0059. The Level 2 delineation was conducted in substantial conformance with the 1987 U.S. ACOE Wetland Delineation Manual, updated February 25, 1997, and utilized the Midwest Regional Supplement.

Site elevations range from approximately 886 feet AMSL to elevations of 856 feet AMSL and 880 feet AMSL in the east and the west areas of the Site. The NWI map indicated three wetland basins within the Site. The Soil Survey indicated hydric soils are located in the area of Wetland 2. The PWI map did not identify any PWI watercourses, however it did identify one PWI basin, number 02066500, within the Site.

The 2022 seasonal antecedent rainfall amounts were drier the normal precipitation amounts for this area. Precipitation amounts 0.26 inches of rain occurred the fourteen days prior to the wetland delineation field visit.

Wetland 1 is a depressional basin located in the north central portion of the Site. Under the Cowardin system a portion of Wetland 1 would be considered a palustrine, emergent, seasonally flooded (PEM1C) basin. Wetland 1 consists of a wetland area receiving drainage from the surrounding upland area. Under the Circular 39 system, the emergent portion of the wetland would be considered a type 3 wetland. Wetland 1 is dominated by hydrophytes comprised primarily of cattails. Hydric soils were found to be present. Hydrology appeared to be present and was based on saturation and standing water in the wetland basin. The wetland edge was determined along the edge of the wetland and

followed a distinct topographical and vegetation change. A weir connects Wetland 1 and Wetland 2. Wetland 1 is a public wetland basin (Basin number 02066500) protected by the Minnesota Department of Natural Resources.

Wetland 2 is a basin located in the east central portion of the Site. Under the Cowardin system portions of Wetland 2 would be considered a palustrine, emergent, seasonally flooded, (PEM1Cd) drained basin. The emergent portion of the wetland is surrounded in places by scrub shrub and forested wetlands and uplands. Wetland 2 consists of a depressional area receiving drainage from the surrounding upland area, from Wetland 1 through a weir, and a culvert appears to drain the wetland to the east. Under the Circular 39 system, the emergent portion of the wetland would be considered a type 3 wetland fringed with wetland types 6 and 7. Wetland 2 is dominated by hydrophytes comprised primarily of cattails. Hydric soils were found to be present. Hydrology appeared to be present and was based on saturation and standing water in the wetland basin. The wetland edge was determined along the edge of the wetland and followed a topography and vegetation change.

SA-1 is a basin located in the west central portion of the Site. SA-1 consists of a depressional area receiving drainage from the surrounding upland area and a large culvert in the northwest that appears adjacent to the parking lot. The SA-1 basin is depicted on the NWI map as an emergent wetland (PEM1A). SA-1 is not dominated by hydrophytes but is dominated by upland plants. Hydric soils and hydrology were not found to be present.

SA-2 is a basin located in the southwest portion of the Site. SA-2 consists of a depressional area receiving drainage from the surrounding upland area and a drainage from the adjacent the parking lot. SA-2 is not dominated by hydrophytes but is dominated by upland plants. Hydric soils and hydrology were not found to be present.

5.0 CONCLUSION

Pinnacle conducted a Level 2, On-Site, Wetland Delineation at the Lord of Life Lutheran Church located at 14501 Nowthen Blvd. NW, Ramsey, Anoka County, Minnesota. The approximately 35.5-acre Site contains the Lord of Life Lutheran Church, two houses, parking lots, fallow areas, uplands, and wetlands.

During the field assessment, it was determined that two areas within the Site met all three of the mandatory criteria of a wetland, and the wetland boundaries were recorded utilizing a handheld GPS device and were flagged for survey by others. One of the wetlands appears to be a storm water pond. The delineation will be reviewed by the Lower Rum River Watershed Management Organization which serves as the LGU administering Minnesota's Wetland Conservation Act and the U.S. Army Corps of Engineers, which administers the Clean Water Act.

6.0 STANDARD OF CARE

Environmental services performed by Pinnacle for the project have been conducted in a manner consistent with the degree of care and technical skill appropriately exercised by environmental professionals currently practicing in this area under similar budget and time constraints. Recommendations or opinions contained in this report represent our professional judgment and are generally based upon available information and currently accepted practices for environmental professionals. Other than this, no other warranty is implied nor is it expressed.

7.0 REFERENCES

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U. S. Army Corps of Engineers, U. S. Army Corps of Engineers Wetland Delineation Manual, 1987, updated on February 25, 1997, Washington, D. C.

Anoka County GIS. <https://gis.anokacountymn.gov/propertysearch/> (July 15, 2022).

FIGURE 1

Site Location Map

WETLAND DETERMINATION AND DELINEATION

Pinnacle Engineering
11541 95th Ave N.
Minneapolis, MN 55369
(763) 315-4501
www.pineng.com

PROJECT NUMBER: EM20225225 | DRAWN: ST | REVIEWED: ES | DATE: 07/14/2022

Figure 1.
Site Location

Lord of Life Lutheran Church
14501 Nowthen Blvd. NW
Ramsey, MN 55303

LEGEND
Site
Site Boundary

File: Figure 1 - Site Location.mxd

FIGURE 2

Site Layout

WETLAND DETERMINATION AND DELINEATION

Pinnacle Engineering

11541 95th Ave N.
Minneapolis, MN 55369
(763) 315-4501
www.pineng.com

PROJECT NUMBER: EM20225225
DRAWN: ST
REVIEWED: ES
DATE: 07/20/2022

Figure 2.
Site Layout

Lord of Life Lutheran Church
14501 Nowthen Blvd. NW
Ramsey, MN 55303

LEGEND
- Site Boundary
- Suspect Area
- 2ft Contour
- Wetland
- Sampling Point
- Transect

File: Figure 2 - Site Layout.mxd

FIGURE 3

Soil Survey

WETLAND DETERMINATION AND DELINEATION

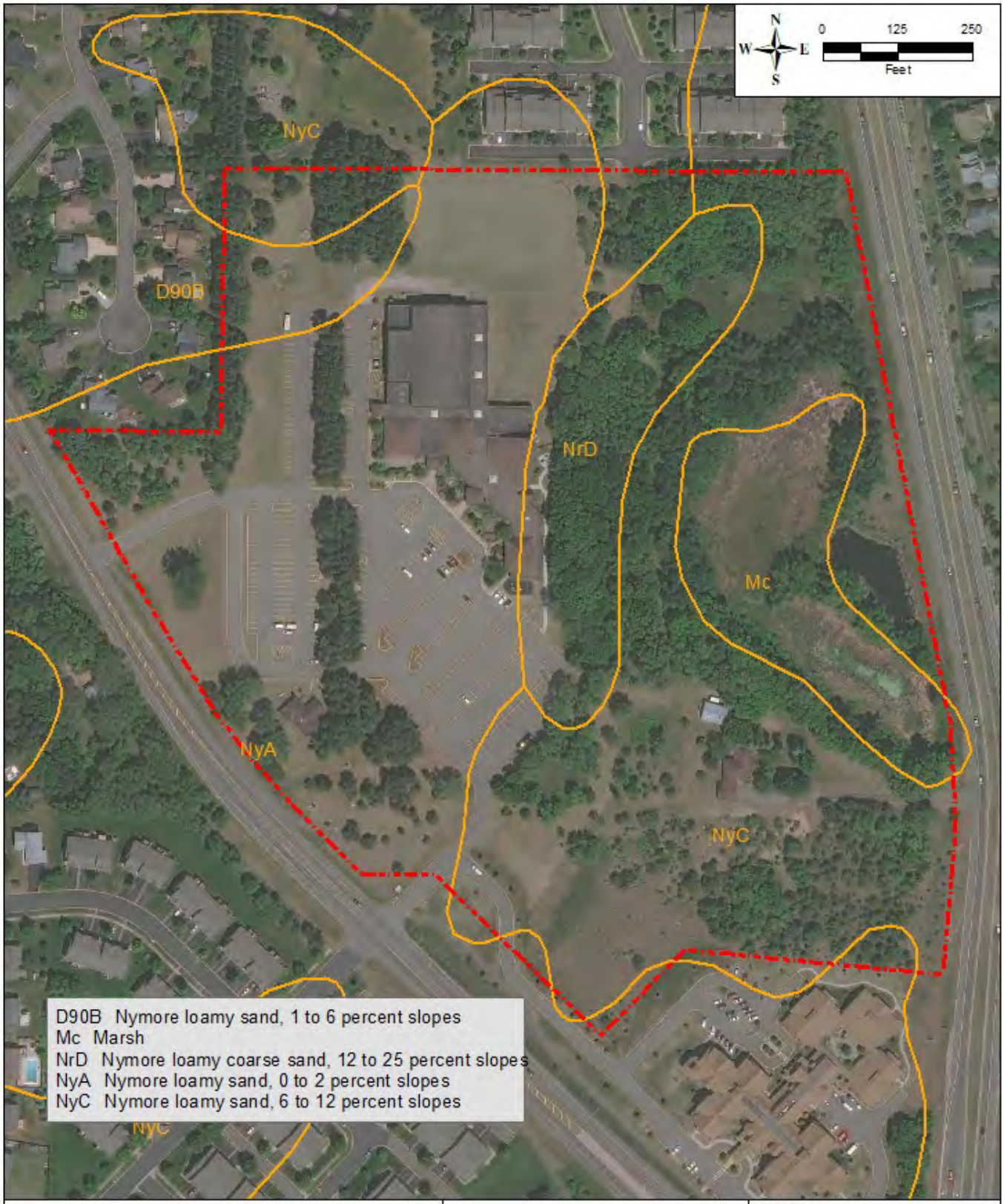

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Figure 3.
NCRS Soils Map

Lord of Life Lutheran Church
14501 Nowthen Blvd. NW
Ramsey, MN 55303

LEGEND
Site Boundary
NCRS Soils

File: Figure 3 - Soils.mxd

FIGURE 4

National Wetland Inventory

WETLAND DETERMINATION AND DELINEATION

File: Figure 4 - NWI.mxd

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PROJECT NUMBER: EM20225225

DRAWN: ST
REVIEWED: ES

DATE: 07/14/2022

Figure 4.
NWI Map

Lord of Life Lutheran Church
14501 Nowthen Blvd. NW
Ramsey, MN 55303

LEGEND

Site Boundary

FIGURE 5

Public Waters Inventory

WETLAND DETERMINATION AND DELINEATION

File: Figure 5 - PWI.mxd

Pinnacle Engineering

11541 95th Ave N.
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PROJECT NUMBER: EM20225225 | DRAWN: ST | REVIEWED: ES | DATE: 07/14/2022

Figure 5.
PWI Map

Lord of Life Lutheran Church
14501 Nowthen Blvd. NW
Ramsey, MN 55303

LEGEND
- Site Boundary
- PWI Basins
- PWI Watercourses

FIGURE 6

Wetland Communities

WETLAND DETERMINATION AND DELINEATION

Pinnacle Engineering

11541 95th Ave N.
Minneapolis, MN 55369
(763) 315-4501
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PROJECT NUMBER: EM20225225 | DRAWN: ST | REVIEWED: ES | DATE: 07/20/2022

Figure 6.
Wetland Communities

Lord of Life Lutheran Church
14501 Nowthen Blvd. NW
Ramsey, MN 55303

LEGEND
- Site Boundary
- Emergent
- Scrub Shrub
- Forested

File: Figure 6 - Wetland Communities.mxd

APPENDICES

APPENDIX A

Midwest Region Data Forms

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Lord of Life Church City/County: Anoka/Anoka Sampling Date: 2022-07-19

Applicant/Owner: Presbyterian Homes State: MN Sampling Point: W1-1U

Investigator(s): Scott Thelen Section, Township, Range: S25, T32N, R25W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 3-7 Lat: 45.235996 Long: -93.401184 Datum: WGS84

Soil Map Unit Name: Nymore, loamy sand NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus tremuloides*	30	Y	FAC
2. *Quercus alba*	20	Y	FACU
3.			
4.			
5.			
	50	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Lonicera tatarica*	20	Y	FACU
2. *Cornus racemosa*	10	Y	FAC
3.			
4.			
5.			
	30	= Total Cover	
Herb Stratum (Plot size: 5)			
1. *Solidago canadensis*	20	Y	FACU
2. *Galium boreale*	10	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	30	= Total Cover	
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	50.00	x 3 =	150.00
FACU species	60.00	x 4 =	240.00
UPL species	0.00	x 5 =	0.00
Column Totals:	110.00 (A)		390.00 (B)

Prevalence Index = B/A = 3.55

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W1-1U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					LS	
10-16	10YR 4/3	100					LS	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Lord of Life Church City/County: Anoka/Anoka Sampling Date: 2022-07-19

Applicant/Owner: Presbyterian Homes State: MN Sampling Point: W1-1W

Investigator(s): Scott Thelen Section, Township, Range: S25, T32N, R25W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 3-7 Lat: 45.235996 Long: -93.401184 Datum: WGS84

Soil Map Unit Name: Nymore, loamy sand NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus tremuloides*	30	Y	FAC
2. *Fraxinus pennsylvanica*	10	Y	FACW
3.			
4.			
5.			
	40 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1. *Cornus racemosa*	20	Y	FAC
2.			
3.			
4.			
5.			
	20 = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Typha latifolia*	30	Y	OBL
2. *Carex lacustris*	20	Y	OBL
3. *Solidago canadensis*	10	N	FACU
4. *Onoclea sensibilis*	10	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50.00	x 1 =	50.00
FACW species	20.00	x 2 =	40.00
FAC species	50.00	x 3 =	150.00
FACU species	10.00	x 4 =	40.00
UPL species	0.00	x 5 =	0.00
Column Totals:	130.00 (A)		280.00 (B)

Prevalence Index = B/A = 2.15

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W1-1W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/1	100					LS	
10-15	10YR 4/1	95	10YR 4/6	5			LS	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ✓ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 6

Wetland Hydrology Present? Yes ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Lord of Life Church City/County: Anoka/Anoka Sampling Date: 2022-07-19

Applicant/Owner: Presbyterian Homes State: MN Sampling Point: W1-2U

Investigator(s): Scott Thelen Section, Township, Range: S25, T32N, R25W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 3-7 Lat: 45.235996 Long: -93.401184 Datum: WGS84

Soil Map Unit Name: Nymore, loamy sand NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus rubra*	20	Y	FACU
2. *Quercus alba*	20	Y	FACU
3.			
4.			
5.			
	40	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Rhamnus cathartica*	20	Y	FAC
2. *Lonicera tatarica*	10	Y	FACU
3. *Cornus racemosa*	10	Y	FAC
4.			
5.			
	40	= Total Cover	
Herb Stratum (Plot size: 5)			
1. *Solidago canadensis*	20	Y	FACU
2. *Galium boreale*	10	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	30	= Total Cover	
Woody Vine Stratum (Plot size: 30)			
1. ***Vitis riparia***	5	Y	FACW
2.			
	5	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	5.00	x 2 =	10.00
FAC species	40.00	x 3 =	120.00
FACU species	70.00	x 4 =	280.00
UPL species	0.00	x 5 =	0.00
Column Totals:	115.00 (A)		410.00 (B)

Prevalence Index = B/A = 3.57

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W1-2U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	100					LS	
8-15	10YR 5/4	100					LS	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Lord of Life Church City/County: Anoka/Anoka Sampling Date: 2022-07-19

Applicant/Owner: Presbyterian Homes State: MN Sampling Point: W1-2W

Investigator(s): Scott Thelen Section, Township, Range: S25, T32N, R25W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 3-7 Lat: 45.235996 Long: -93.401184 Datum: WGS84

Soil Map Unit Name: Nymore, loamy sand NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus alba*	10	Y	FACU
2. *Fraxinus pennsylvanica*	10	Y	FACW
3.			
4.			
5.			
	20	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Rhamnus cathartica*	30	Y	FAC
2. *Cornus racemosa*	20	Y	FAC
3.			
4.			
5.			
	50	= Total Cover	
Herb Stratum (Plot size: 5)			
1. *Typha latifolia*	20	Y	OBL
2. *Onoclea sensibilis*	10	Y	FACW
3. *Solidago canadensis*	10	Y	FACU
4. *Carex lacustris*	10	Y	OBL
5.			
6.			
7.			
8.			
9.			
10.			
	50	= Total Cover	
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30.00	x 1 =	30.00
FACW species	20.00	x 2 =	40.00
FAC species	50.00	x 3 =	150.00
FACU species	20.00	x 4 =	80.00
UPL species	0.00	x 5 =	0.00
Column Totals:	120.00 (A)		300.00 (B)

Prevalence Index = B/A = 2.5

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W1-2W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1	100					LS	
8-16	10YR 4/1	95	10YR 4/6	5			LS	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ✓ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 8

Wetland Hydrology Present? Yes ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Lord of Life Church City/County: Anoka/Anoka Sampling Date: 2022-07-19

Applicant/Owner: Presbyterian Homes State: MN Sampling Point: W2-1U

Investigator(s): Scott Thelen Section, Township, Range: S25, T32N, R25W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0-2 Lat: 45.235996 Long: -93.401184 Datum: WGS84

Soil Map Unit Name: Nymore, loamy sand NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Cornus racemosa*	10	Y	FAC
2.			
3.			
4.			
5.			
	10	= Total Cover	
Herb Stratum (Plot size: 5)			
1. *Solidago canadensis*	20	Y	FACU
2. *Dactylis glomerata*	20	Y	FACU
3. *Rudbeckia hirta*	10	Y	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	50	= Total Cover	
Woody Vine Stratum (Plot size: 30)			
1. ***Vitis riparia***	5	Y	FACW
2.			
	5	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	5.00	x 2 =	10.00
FAC species	10.00	x 3 =	30.00
FACU species	50.00	x 4 =	200.00
UPL species	0.00	x 5 =	0.00
Column Totals:	65.00 (A)		240.00 (B)

Prevalence Index = B/A = 3.69

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W2-1U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	100					LS	
10-18	10YR 4/3	100					LCOS	
12-16	10YR 4/1	100					LS	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Lord of Life Church City/County: Anoka/Anoka Sampling Date: 2022-07-19

Applicant/Owner: Presbyterian Homes State: MN Sampling Point: W2-1W

Investigator(s): Scott Thelen Section, Township, Range: S25, T32N, R25W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0-2 Lat: 45.235996 Long: -93.401184 Datum: WGS84

Soil Map Unit Name: Nymore, loamy sand NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix interior*	40	Y	FACW
2. *Fraxinus pennsylvanica*	5	N	FACW
3.			
4.			
5.			
	45	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Salix interior*	30	Y	FACW
2.			
3.			
4.			
5.			
	30	= Total Cover	
Herb Stratum (Plot size: 5)			
1. *Typha latifolia*	20	Y	OBL
2. *Carex lacustris*	10	Y	OBL
3. *Onoclea sensibilis*	10	Y	FACW
4. *Lycopus americanus*	10	Y	OBL
5.			
6.			
7.			
8.			
9.			
10.			
	50	= Total Cover	
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40.00	x 1 =	40.00
FACW species	85.00	x 2 =	170.00
FAC species	0.00	x 3 =	0.00
FACU species	0.00	x 4 =	0.00
UPL species	0.00	x 5 =	0.00
Column Totals:	125.00 (A)		210.00 (B)

Prevalence Index = B/A = 1.68

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W2-1W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/1	100					LS	
6-12	10YR 4/1	95	10YR 4/6	5			LS	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ✓ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 8

Wetland Hydrology Present? Yes ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Standing water in middle of wetland.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Lord of Life Church City/County: Anoka/Anoka Sampling Date: 2022-07-19

Applicant/Owner: Presbyterian Homes State: MN Sampling Point: SA-1

Investigator(s): Scott Thelen Section, Township, Range: S25, T32N, R25W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 3-7 Lat: 45.235996 Long: -93.401184 Datum: WGS84

Soil Map Unit Name: Nymore, loamy sand NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	20	Y	FAC
2.			
3.			
4.			
5.			
	20 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Poa pratensis*	20	Y	FAC
2. *Digitaria ischaemum*	20	Y	FACU
3. *Ambrosia artemisiifolia*	10	N	FACU
4. *Taraxacum officinale*	5	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	55 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.67 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	40.00	x 3 =	120.00
FACU species	35.00	x 4 =	140.00
UPL species	0.00	x 5 =	0.00
Column Totals:	75.00 (A)		260.00 (B)

Prevalence Index = B/A = 3.47

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SA-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/1	100					LS	
6-16	10YR 3/1	100					LS	
16-24	10YR 4/4	100					LCOS	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Lord of Life Church City/County: Anoka/Anoka Sampling Date: 2022-07-19

Applicant/Owner: Presbyterian Homes State: MN Sampling Point: SA-2

Investigator(s): Scott Thelen Section, Township, Range: S25, T32N, R25W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0-2 Lat: 45.235996 Long: -93.401184 Datum: WGS84

Soil Map Unit Name: Nymore, loamy sand NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Rubus idaeus*	10	Y	FACU
2.			
3.			
4.			
5.			
	10	= Total Cover	
Herb Stratum (Plot size: 5)			
1. *Bromus inermis*	60	Y	FACU
2. *Asclepias syriaca*	10	N	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	70	= Total Cover	
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	0.00	x 3 =	0.00
FACU species	80.00	x 4 =	320.00
UPL species	0.00	x 5 =	0.00
Column Totals:	80.00 (A)		320.00 (B)

Prevalence Index = B/A = 4.0

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SA-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/3	100					LS	
4-16	10YR 5/4	100					LS	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX B

Wetland Boundary Applications

Project Name and/or Number:

PART ONE: Applicant Information

If applicant is an entity (company, government entity, partnership, etc.), an authorized contact person must be identified. If the applicant is using an agent (consultant, lawyer, or other third party) and has authorized them to act on their behalf, the agent's contact information must also be provided.

Applicant/Landowner Name: Presbyterian Homes & Services and Senior Housing Partners, 553
Mailing Address: 2823 Hamline Avenue N, Roseville, MN 55113
Phone: 651.383.5689
E-mail Address: jfletcher@seniorpartners.com

Authorized Contact (do not complete if same as above): Pinnacle Engineering, Inc.
Mailing Address: 11541 95th Avenue North, Maple Grove, MN 55369
Phone: 612-432-5590
E-mail Address: sthelen@pineng.com

Agent Name: Scott Thelen
Mailing Address: 11541 95th Avenue North, Maple Grove, MN 55369
Phone: 612.432.5590
E-mail Address: sthelen@pineng.com

PART TWO: Site Location Information

County: Anoka County **City/Township:** Ramsey
Parcel ID and/or Address: 25-32-25-24-0059
Legal Description (Section, Township, Range): Section 25, Township 32N, Range 25W
Lat/Long (decimal degrees): Lat: 45.235659°, Long: -93.403106°
Attach a map showing the location of the site in relation to local streets, roads, highways.
Approximate size of site (acres) or if a linear project, length (feet): 35.5 acre

If you know that your proposal will require an individual Permit from the U.S. Army Corps of Engineers, you must provide the names and addresses of all property owners adjacent to the project site. This information may be provided by attaching a list to your application or by using block 25 of the Application for Department of the Army permit which can be obtained at:

http://www.mvp.usace.army.mil/Portals/57/docs/regulatory/RegulatoryDocs/engform_4345_2012oct.pdf

PART THREE: General Project/Site Information

If this application is related to a delineation approval, exemption determination, jurisdictional determination, or other correspondence submitted ***prior to*** this application then describe that here and provide the Corps of Engineers project number.

Describe the project that is being proposed, the project purpose and need, and schedule for implementation and completion. The project description must fully describe the nature and scope of the proposed activity including a description of all project elements that effect aquatic resources (wetland, lake, tributary, etc.) and must also include plans and cross section or profile drawings showing the location, character, and dimensions of all proposed activities and aquatic resource impacts.

Potential grounds improvement project.

Project Name and/or Number:

PART FOUR: Aquatic Resource Impact[1] Summary

If your proposed project involves a direct or indirect impact to an aquatic resource (wetland, lake, tributary, etc.) identify each impact in the table below. Include all anticipated impacts, including those expected to be temporary. Attach an overhead view map, aerial photo, and/or drawing showing all of the aquatic resources in the project area and the location(s) of the proposed impacts. Label each aquatic resource on the map with a reference number or letter and identify the impacts in the following table.

Aquatic Resource ID (as noted on overhead view)	**Aquatic Resource Type** (wetland, lake, tributary etc.)	**Type of Impact** (fill, excavate, drain, or remove vegetation)	**Duration of Impact** Permanent (P) or Temporary (T)[1]	**Size of Impact**[2]	**Overall Size of Aquatic Resource** [3]	**Existing Plant Community Type(s)** in Impact Area[4]	**County, Major Watershed #, and Bank Service Area #** of Impact Area[5]

[1]If impacts are temporary; enter the duration of the impacts in days next to the "T". For example, a project with a temporary access fill that would be removed after 220 days would be entered "T (220)".
[2]Impacts less than 0.01 acre should be reported in square feet. Impacts 0.01 acre or greater should be reported as acres and rounded to the nearest 0.01 acre. Tributary impacts must be reported in linear feet of impact and an area of impact by indicating first the linear feet of impact along the flowline of the stream followed by the area impact in parentheses). For example, a project that impacts 50 feet of a stream that is 6 feet wide would be reported as 50 ft (300 square feet).
[3]This is generally only applicable if you are applying for a de minimis exemption under MN Rules 8420.0420 Subp. 8, otherwise enter "N/A".
[4]Use *Wetland Plants and Plant Community Types of Minnesota and Wisconsin* 3rd Ed. as modified in MN Rules 8420.0405 Subp. 2.
[5]Refer to Major Watershed and Bank Service Area maps in MN Rules 8420.0522 Subp. 7.

If any of the above identified impacts have already occurred, identify which impacts they are, and the circumstances associated with each:

PART FIVE: Applicant Signature

☐ Check here if you are requesting a pre-application consultation with the Corps and LGU based on the information you have provided. Regulatory entities will not initiate a formal application review if this box is checked.

By signature below, I attest that the information in this application is complete and accurate. I further attest that I possess the authority to undertake the work described herein.

Signature: _____ July 26, 2022

I hereby authorize _____ to act on my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this application.

[1] The term "impact" as used in this joint application form is a generic term used for disclosure purposes to identify activities that may require approval from one or more regulatory agencies. For purposes of this form it is not meant to indicate whether or not those activities may require mitigation/replacement.

Project Name and/or Number:

Attachment A
Request for Delineation Review, Wetland Type Determination, or Jurisdictional Determination

By submission of the enclosed wetland delineation report, I am requesting that the U.S. Army Corps of Engineers, St. Paul District (Corps) and/or the Wetland Conservation Act Local Government Unit (LGU) provide me with the following (check all that apply):

☐ **Wetland Type Confirmation**

☒ **Delineation Concurrence**. Concurrence with a delineation is a written notification from the Corps and a decision from the LGU concurring, not concurring, or commenting on the boundaries of the aquatic resources delineated on the property. Delineation concurrences are generally valid for five years unless site conditions change. Under this request alone, the Corps will not address the jurisdictional status of the aquatic resources on the property, only the boundaries of the resources within the review area (including wetlands, tributaries, lakes, etc.).

☐ **Preliminary Jurisdictional Determination**. A preliminary jurisdictional determination (PJD) is a non-binding written indication from the Corps that waters, including wetlands, identified on a parcel may be waters of the United States. For purposes of computation of impacts and compensatory mitigation requirements, a permit decision made on the basis of a PJD will treat all waters and wetlands in the review area as if they are jurisdictional waters of the U.S. PJDs are advisory in nature and may not be appealed.

☐ **Approved Jurisdictional Determination**. An approved jurisdictional determination (AJD) is an official Corps determination that jurisdictional waters of the United States are either present or absent on the property. AJDs can generally be relied upon by the affected party for five years. An AJD may be appealed through the Corps administrative appeal process.

In order for the Corps and LGU to process your request, the wetland delineation must be prepared in accordance with the 1987 Corps of Engineers Wetland Delineation Manual, any approved Regional Supplements to the 1987 Manual, and the *Guidelines for Submitting Wetland Delineations in Minnesota* (2013).
http://www.mvp.usace.army.mil/Missions/Regulatory/DelineationJDGuidance.aspx

Lower Rum River WMO

Permit # _____

APPLICATION FOR MINNESOTA WETLAND CONSERVATION ACT (WCA) DECISIONS AND PROCEDURE REQUIREMENTS

A $75.00 LRRWMO initial application fee and the appropriate escrow deposits (determined in accordance with Attachment W3) must accompany this permit application for any Wetland Conservation Act (WCA) decisions. These are separate and in addition to permit and escrow fees for Grading, Stormwater Management, and Erosion/Sediment Control permit application, if applicable.

Permits are to be processed at the same time as the site plan, preliminary plat or other city land use or building application submitted to the city in which the work or project is located.

Wetland permit processing takes longer than other permit processing. The permit application and supporting documentation should be submitted to the LRRWMO AT LEAST 60 DAYS PRIOR TO THE REGULARLY SCHEDULED MONTHLY LRRWMO MEETING AT WHICH A DECISION IS REQUESTED. A PERMIT NUMBER WILL NOT BE ASSIGNED UNTIL CITY AUTHORIZATION IS RECEIVED.

Project Name: Presbyterian Homes & Services and Senior Housing Partners/Lord of Life Lutheran Church

Address/Location: 14501 Nowthen Blvd. NW, Ramsey, Anoka County, Minnesota

Project Description/Purpose: Potential grounds improvement project.

Lord of Life Lutheran Church	Jon Fletcher Presbyterian Homes & Services and Senior Housing Partners
Name of Applicant (Site Owner or Property Owner)	**Applicant's Contact Organization Name**
14501 Nowthen Blvd	2823 Hamline Avenue N,
Address	**Address**
Ramsey, MN 55303	Roseville, MN 55113
City, State, Zip	**City, State, Zip**
	651.383.5689
Phone Fax	**Phone Fax**
	jfletcher@seniorpartners.com
Email	**Email**

Submittal Requirements

Complete applications are to be submitted as per LRRWMO attachments W1 (Permit Requirements), W2 (Office Procedure), and W3 (Fees, Deposit, and Sureties for Wetland Conservation Act) included with this application. Projects may also require a LRRWMO Grading, Stormwater Management, and Erosion/Sediment Control Permit (separate application and fee/escrow amounts)

PROJECT SUBMITTALS (check all that apply):

- [X] **WETLAND BOUNDARY DELINEATION AND TYPE CONCURRENCE**
- [ ] **REQUEST FOR NO LOSS OR EXEMPTION UNDER THE WETLAND CONSERVATION ACT (WCA)**
- [ ] **WETLAND REPLACEMENT PLAN AND/OR SEQUENCING**
- [ ] **WETLAND BANKING PLAN**
- [ ] **OTHER**

Lower Rum River WMO

START OF PROJECT: _____ EST. COMPLETION DATE: _____ APPROVAL DATE: _____

By signing this Permit Application, the undersigned consents and agrees on behalf of the Applicant that:

1. The permit application fee is non-refundable. Escrow deposits will be held by the LRRWMO until the project has been completed and all conditions of issuance of the permit are satisfied. The Applicant is responsible for all expenses incurred by the LRRWMO in the processing, administration and enforcement of the permit application and permit. The escrow deposit will be used to reimburse the LRRWMO for all expenses incurred by the LRRWMO in processing, administering and enforcing the permit application and permit, including engineering, legal and other consultant costs. If such expenses exceed the escrow deposit, the LRRWMO will bill the Applicant or Permittee for such excess amount and payment will be due within twenty (20) days of mailing the invoice. Timely payment of such invoices is a condition of all permits and work may be stopped on the project for failure to make payments when due.
2. The undersigned, its agents, principal, assigns and/or representatives (hereinafter "Permittee") shall abide by all the standard conditions and special terms and conditions of the LRRWMO.
3. Any work that violates the terms of the permit may result in the LRRWMO or the City in which the work is being done immediately causing the work on the project relating to the permit to cease and desist. All work on the project shall cease until the permit conditions are met and approved by the LRRWMO and/or the City in which the work is being done.
4. The Permittee agrees to be bound by the terms of the LRRWMO permit requirements, final permit, standard conditions, and special conditions required by the LRRWMO for approval of the permit. The undersigned has the authority to bind the permit holder, the owner of the property and/or any entity performing work on the property pursuant to the terms of LRRWMO permit, and shall be responsible for complying with terms of the LRRWMO permit.

"I certify that I have thoroughly read and understand the above information."

Signature of property owner or designated Agent (no agent without a letter of authority)	Date	Signature of applicant if different from property owner	Date
Print Signer's name		Print Signer's name	

Application Acknowledged by City:

Name of City Official	City	Date

SIGNATURE OF LRRWMO CHAIRMAN: **

NOTE: Subject to conditions as designated in the WCA Notice of Decision as recommended by the Technical Evaluation Panel and Barr Engineering (see attached)

PERMIT IS NOT VALID IF PROJECT HAS NOT STARTED WITHIN ONE YEAR FROM DATE OF APPROVAL

LRRWMO Attachment W1

PERMIT REQUIREMENTS

APPLICATION DEADLINE: Third Thursday of the month for consideration at the following regularly scheduled monthly LRRWMO board meeting on third Thursday of month.

REQUIRED SUBMITTALS:

1. Completed Permit Application Form (attached)
2. $75 LRRWMO initial application fee plus an escrow deposit determined in accordance with Attachment W3 for any Wetland Conservation Act (WCA) decisions.
3. Wetland Permitting Information
   a. The permit applicant is responsible for ensuring wetland applications are in complete compliance with the Wetland Conservation Act of 1991 and applicable documentation is provided as listed on the Minnesota Board of Water and Soil Resources (BWSR) website:

      http://www.bwsr.state.mn.us/.

      Permit applicants shall refer to the BWSR website for sample application forms and check lists. These forms will be used for reviewing wetland applications. Failure to provide a complete application will result in delays in permit review.

   b. When working near DNR public waters, applicants shall submit information indicating the OHW (ordinary high water) level and the wetland boundary according to the WCA of 1991. Availability of OHW information is available from the MDNR Area Hydrologist. When working in DNR Public Waters, an online Minnesota DNR Permitting and Reporting System (MPARS) application may also be required by the DNR.

SUBMITTAL NOTES:

- Permit applicants shall submit the attached Joint Application Form for Activities Affecting Water Resources in Minnesota (Attachment W4).
- Failure to fully follow the application requirements of the Wetland Conservation Act will result in delays in permit review.
- Applicants can expect a 60-day review period provided all applicable materials have been submitted and reviews are completed within the growing season, if applicable.

Lower Rum River WMO

LRRWMO Attachment W2

OFFICE PROCEDURE

Procedure to Accept LRRWMO Permit:

1. Complete LRRWMO Permit Application for Minnesota Wetland Conservation Act (WCA) Decisions and Procedure Requirements form. Requires signature of acknowledgement from City official prior to submittal to LRRWMO. For appropriate City contact information refer to the LRRWMO website at www.lrrwmo.org/
   NOTE: See "PROJECT SUBMITTALS" section of Application

2. Submit Application, $75 initial application fee plus an escrow deposit* in accordance with LRRWMO Attachment W3 for Wetland Conservation Act applications, as applicable, payable to the Lower Rum River WMO, and one (1) set of plan submittals (electronic) to:

   Lower Rum River WMO
   City of Anoka
   2015 First Street N.
   Anoka, MN 55303
   763-576-2773

   (This set of plans is for LRRWMO file copy) **escrow deposits: The LRRWMO costs related to the project will be charged to permit escrow fund. Funds remaining in the permit escrow account when the project is closed will be returned to the applicant.*

3. Forward electronic copy of Application and associated submittals to:

   Karen Wold
   Barr Engineering Co.
   kwold@barr.com

4. Wetland permit decisions are usually made within 60 days from receipt of a complete application.

Procedure to Request Return of Permit Fund Balance:

1. When project reaches status of 100% completion (as contained in Quarterly Report), the respective City prepares a written request to LRRWMO for return of escrow deposit balance with copy to Anoka's Finance Department. The request must be submitted prior to the third Thursday of each month to meet the next month regular meeting agenda deadline.

Lower Rum River WMO

LRRWMO ATTACHMENT W3

Fees, Deposit and Sureties for Wetland Conservation Act (WCA) Applications

Updated ***April 2011***

FEES

Activity		**Fee**
Initial WCA Application Fee		***$75***
Office and Field Review of Wetland Boundary Delineation or Type Determination (Applicant is responsible for submitting a complete Wetland Delineation Report, according to BWSR guidance).	Evaluation Area < 10 acres and less than 3 wetlands being evaluated	$1,000 ***Escrow***
	Evaluation Area < 100 acres and < 6 wetlands being evaluated	$1,500 ***Escrow***
	Evaluation Area =/> 100 acres and/or =/> 6 wetlands being evaluated	$2,000 ***Escrow***
Review of WCA exemptions and No Loss requests.		$1,000 ***Escrow***
Review of Wetland ***Replacement Plans*** (needed for all projects requiring replacement for wetland impacts).		$1,000 ***Escrow*** plus $100/acre of wetland plus $5,000/acre of wetland impact plus $5,000 for mitigation monitoring review
Creating a Wetland Bank		$15,000

Note: escrow amounts are cumulative if more than activity is being reviewed.

Cash Surety Deposit for Performance

For Wetland Replacement Plans:
The Permittee or owner shall provide a cash surety ***(or an automatically renewable Letter of Credit from a bank approved by the Treasurer of the LRRWMO)*** in an amount determined by the LRRWMO, so that, if needed, a third party has the funds to create, manage, and monitor the wetland replacement area should the applicant fail to comply with the required creation of the wetland mitigation site. If the Letter of Credit is not honored by the issuer, the LRRWMO may choose litigation to obtain the necessary funds or to obtain a court order to require the permittee or owner to create the wetland mitigation area. The LRRWMO will determine a cash surety ***(or letter of credit)*** amount in addition to the permit application fee and escrow deposit.

Proposed WCA LRRWMO Surety Amount

Activity	Performance Surety Amount
Wetland Replacement	***$1 per sq. ft. of mitigation with a minimum of $5,000 unless a higher or lower amount is deemed necessary by the LRRWMO.***

- The permit application, fee escrow deposit and cash surety deposit may be in one check payable to the Lower Rum River Watershed Management Organization.
- Only actual work done by the LRRWMO or its consultants will be charged against the escrow deposit or performance security.
- The performance surety may be waived if approved wetland banking credits are purchased for fulfilling the required mitigation provisions of the permit.

Joint Application Form for Activities Affecting Water Resources in Minnesota

This joint application form is the accepted means for initiating review of proposals that may affect a water resource (wetland, tributary, lake, etc.) in the State of Minnesota under state and federal regulatory programs. Applicants for Minnesota Department of Natural Resources (DNR) Public Waters permits **MUST** use the MPARS online permitting system for submitting applications to the DNR. Applicants can use the information entered into MPARS to substitute for completing parts of this joint application form (see the paragraph on MPARS at the end of the joint application form instructions for additional information). This form is only applicable to the water resource aspects of proposed projects under state and federal regulatory programs; other local applications and approvals may be required. Depending on the nature of the project and the location and type of water resources impacted, multiple authorizations may be required as different regulatory programs have different types of jurisdiction over different types of resources.

Regulatory Review Structure

Federal

The St. Paul District of the U.S. Army Corps of Engineers (Corps) is the federal agency that regulates discharges of dredged or fill material into waters of the United States (wetlands, tributaries, lakes, etc.) under Section 404 of the Clean Water Act (CWA) and regulates work in navigable waters under Section 10 of the Rivers and Harbors Act. Applications are assigned to Corps project managers who are responsible for implementing the Corps regulatory program within a particular geographic area.

State

There are three state regulatory programs that regulate activities affecting water resources. The Wetland Conservation Act (WCA) regulates most activities affecting wetlands. It is administered by local government units (LGUs) which can be counties, townships, cities, watershed districts, watershed management organizations or state agencies (on state-owned land). The Minnesota DNR Division of Ecological and Water Resources issues permits for work in specially-designated public waters via the Public Waters Work Permit Program (DNR Public Waters Permits). The Minnesota Pollution Control Agency (MPCA) under Section 401 of the Clean Water Act certifies that discharges of dredged or fill material authorized by a federal permit or license comply with state water quality standards. One or more of these regulatory programs may be applicable to any one project.

Required Information

Prior to submitting an application, applicants are **strongly encouraged** to seek input from the Corps Project Manager and LGU staff to identify regulatory issues and required application materials for their proposed project. Project proponents can request a pre-application consultation with the Corps and LGU to discuss their proposed project by providing the information required in Sections 1 through 5 of this joint application form to facilitate a meaningful discussion about their project. Many LGUs provide a venue (such as regularly scheduled technical evaluation panel meetings) for potential applicants to discuss their projects with multiple agencies prior to submitting an application. Contact information is provided below.

The following bullets outline the information generally required for several common types of determinations/authorizations.

- For delineation approvals and/or jurisdictional determinations, submit Parts 1, 2 and 5, and Attachment A.
- For activities involving CWA/WCA exemptions, WCA no-loss determinations, and activities not requiring mitigation, submit Parts 1 through 5, and Attachment B.
- For activities requiring compensatory mitigation/replacement plan, submit Parts 1 thru 5, and Attachments C and D.
- For local road authority activities that qualify for the state's local road wetland replacement program, submit Parts 1 through 5, and Attachments C, D (if applicable), and E to both the Corps and the LGU.

Submission Instructions

Send the completed joint application form and all required attachments to:

U.S Army Corps of Engineers. Applications may be sent directly to the appropriate Corps Office. For a current listing of areas of responsibilities and contact information, visit the St. Paul District's website at: http://www.mvp.usace.army.mil/Missions/Regulatory.aspx and select "Minnesota" from the contact Information box. Alternatively, applications may be sent directly to the St. Paul District Headquarters and the Corps will forward them to the appropriate field office.

Section 401 Water Quality Certification: Applicants do not need to submit the joint application form to the MPCA unless specifically requested. The MPCA will request a copy of the completed joint application form directly from an applicant when they determine an individual 401 water quality certification is required for a proposed project.

Wetland Conservation Act Local Government Unit: Send to the appropriate Local Government Unit. If necessary, contact your county Soil and Water Conservation District (SWCD) office or visit the Board of Water and Soil Resources (BWSR) web site (www.bwsr.state.mn.us) to determine the appropriate LGU.

DNR Public Waters Permitting: In 2014 the DNR will begin using the Minnesota DNR Permitting and Reporting System (MPARS) for submission of Public Waters permit applications (https://webapps11.dnr.state.mn.us/mpars/public/authentication/login). Applicants for Public Waters permits **MUST** use the MPARS online permitting system for submitting applications to the DNR. To avoid duplication and to streamline the application process among the various resource agencies, applicants can use the information entered into MPARS to substitute for completing parts of this joint application form. The MPARS print/save function will provide the applicant with a copy of the Public Waters permit application which, at a minimum, will satisfy Parts one and two of this joint application. For certain types of activities, the MPARS application may also provide all of the necessary information required under Parts three and four of the joint application. However, it is the responsibility of the Applicant to make sure that the joint application contains all of the required information, including identification of all aquatic resources impacted by the project (see Part four of the joint application). After confirming that the MPARS application contains all of the required information in Parts one and two the Applicant may attach a copy to the joint application and fill in any missing information in the remainder of the joint application.

PART ONE: Applicant Information

If applicant is an entity (company, government entity, partnership, etc.), an authorized contact person must be identified. If the applicant is using an agent (consultant, lawyer, or other third party) and has authorized them to act on their behalf, the agent's contact information must also be provided.

Applicant/Landowner Name:
Mailing Address:
Phone:
E-mail Address:

Authorized Contact (do not complete if same as above):
Mailing Address:
Phone:
E-mail Address:

Agent Name:
Mailing Address:
Phone:
E-mail Address:

PART TWO: Site Location Information

County: **City/Township:**
Parcel ID and/or Address:
Legal Description (Section, Township, Range):
Lat/Long (decimal degrees):
Attach a map showing the location of the site in relation to local streets, roads, highways.
Approximate size of site (acres) or if a linear project, length (feet):

If you know that your proposal will require an individual Permit from the U.S. Army Corps of Engineers, you must provide the names and addresses of all property owners adjacent to the project site. This information may be provided by attaching a list to your application or by using block 25 of the Application for Department of the Army permit which can be obtained at:

http://www.mvp.usace.army.mil/Portals/57/docs/regulatory/RegulatoryDocs/engform_4345_2012oct.pdf

PART THREE: General Project/Site Information

If this application is related to a delineation approval, exemption determination, jurisdictional determination, or other correspondence submitted ***prior to*** this application then describe that here and provide the Corps of Engineers project number.

Describe the project that is being proposed, the project purpose and need, and schedule for implementation and completion. The project description must fully describe the nature and scope of the proposed activity including a description of all project elements that effect aquatic resources (wetland, lake, tributary, etc.) and must also include plans and cross section or profile drawings showing the location, character, and dimensions of all proposed activities and aquatic resource impacts.

Project Name and/or Number:

PART FOUR: Aquatic Resource Impact[1] Summary

If your proposed project involves a direct or indirect impact to an aquatic resource (wetland, lake, tributary, etc.) identify each impact in the table below. Include all anticipated impacts, including those expected to be temporary. Attach an overhead view map, aerial photo, and/or drawing showing all of the aquatic resources in the project area and the location(s) of the proposed impacts. Label each aquatic resource on the map with a reference number or letter and identify the impacts in the following table.

Aquatic Resource ID (as noted on overhead view)	**Aquatic Resource Type** (wetland, lake, tributary etc.)	**Type of Impact** (fill, excavate, drain, or remove vegetation)	**Duration of Impact** Permanent (P) or Temporary (T)[1]	**Size of Impact**[2]	**Overall Size of Aquatic Resource** [3]	**Existing Plant Community Type(s)** in Impact Area[4]	**County, Major Watershed #, and Bank Service Area #** of Impact Area[5]

[1]If impacts are temporary; enter the duration of the impacts in days next to the "T". For example, a project with a temporary access fill that would be removed after 220 days would be entered "T (220)".
[2]Impacts less than 0.01 acre should be reported in square feet. Impacts 0.01 acre or greater should be reported as acres and rounded to the nearest 0.01 acre. Tributary impacts must be reported in linear feet of impact and an area of impact by indicating first the linear feet of impact along the flowline of the stream followed by the area impact in parentheses). For example, a project that impacts 50 feet of a stream that is 6 feet wide would be reported as 50 ft (300 square feet).
[3]This is generally only applicable if you are applying for a de minimis exemption under MN Rules 8420.0420 Subp. 8, otherwise enter "N/A".
[4]Use *Wetland Plants and Plant Community Types of Minnesota and Wisconsin* 3rd Ed. as modified in MN Rules 8420.0405 Subp. 2.
[5]Refer to Major Watershed and Bank Service Area maps in MN Rules 8420.0522 Subp. 7.

If any of the above identified impacts have already occurred, identify which impacts they are and the circumstances associated with each:

PART FIVE: Applicant Signature

☐ Check here if you are requesting a pre-application consultation with the Corps and LGU based on the information you have provided. Regulatory entities will not initiate a formal application review if this box is checked.

By signature below, I attest that the information in this application is complete and accurate. I further attest that I possess the authority to undertake the work described herein.

Signature: _____ Date:

I hereby authorize to act on my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this application.

[1] **The term "impact" as used in this joint application form is a generic term used for disclosure purposes to identify activities that may require approval from one or more regulatory agencies. For purposes of this form it is not meant to indicate whether or not those activities may require mitigation/replacement.**

Project Name and/or Number:

Attachment A
Request for Delineation Review, Wetland Type Determination, or Jurisdictional Determination

By submission of the enclosed wetland delineation report, I am requesting that the U.S. Army Corps of Engineers, St. Paul District (Corps) and/or the Wetland Conservation Act Local Government Unit (LGU) provide me with the following (check all that apply):

☐ **Wetland Type Confirmation**

☐ **Delineation Concurrence**. Concurrence with a delineation is a written notification from the Corps and a decision from the LGU concurring, not concurring, or commenting on the boundaries of the aquatic resources delineated on the property. Delineation concurrences are generally valid for five years unless site conditions change. Under this request alone, the Corps will not address the jurisdictional status of the aquatic resources on the property, only the boundaries of the resources within the review area (including wetlands, tributaries, lakes, etc.).

☐ **Preliminary Jurisdictional Determination**. A preliminary jurisdictional determination (PJD) is a non-binding written indication from the Corps that waters, including wetlands, identified on a parcel may be waters of the United States. For purposes of computation of impacts and compensatory mitigation requirements, a permit decision made on the basis of a PJD will treat all waters and wetlands in the review area as if they are jurisdictional waters of the U.S. PJDs are advisory in nature and may not be appealed.

☐ **Approved Jurisdictional Determination**. An approved jurisdictional determination (AJD) is an official Corps determination that jurisdictional waters of the United States are either present or absent on the property. AJDs can generally be relied upon by the affected party for five years. An AJD may be appealed through the Corps administrative appeal process.

In order for the Corps and LGU to process your request, the wetland delineation must be prepared in accordance with the 1987 Corps of Engineers Wetland Delineation Manual, any approved Regional Supplements to the 1987 Manual, and the *Guidelines for Submitting Wetland Delineations in Minnesota* (2013).
http://www.mvp.usace.army.mil/Missions/Regulatory/DelineationJDGuidance.aspx

Project Name and/or Number:

Attachment B
Supporting Information for Applications Involving Exemptions, No Loss Determinations, and Activities Not Requiring Mitigation

Complete this part ***if*** you maintain that the identified aquatic resource impacts in Part Four do not require wetland replacement/compensatory mitigation OR ***if*** you are seeking verification that the proposed water resource impacts are either exempt from replacement or are not under CWA/WCA jurisdiction.

Identify the specific exemption or no-loss provision for which you believe your project or site qualifies:

Provide a detailed explanation of how your project or site qualifies for the above. Be specific and provide and refer to attachments and exhibits that support your contention. Applicants should refer to rules (e.g. WCA rules), guidance documents (e.g. BWSR guidance, Corps guidance letters/public notices), and permit conditions (e.g. Corps General Permit conditions) to determine the necessary information to support the application. Applicants are strongly encouraged to contact the WCA LGU and Corps Project Manager prior to submitting an application if they are unsure of what type of information to provide:

Attachment C
Avoidance and Minimization

Project Purpose, Need, and Requirements. Clearly state the purpose of your project and need for your project. Also include a description of any specific requirements of the project as they relate to project location, project footprint, water management, and any other applicable requirements. Attach an overhead plan sheet showing all relevant features of the project (buildings, roads, etc.), aquatic resource features (impact areas noted) and construction details (grading plans, storm water management plans, etc.), referencing these as necessary:

Avoidance. Both the CWA and the WCA require that impacts to aquatic resources be avoided if practicable alternatives exist. Clearly describe all on-site measures considered to avoid impacts to aquatic resources and discuss at least two project alternatives that avoid all impacts to aquatic resources on the site. These alternatives may include alternative site plans, alternate sites, and/or not doing the project. Alternatives should be feasible and prudent (see MN Rules 8420.0520 Subp. 2 C). Applicants are encouraged to attach drawings and plans to support their analysis:

Minimization. Both the CWA and the WCA require that all unavoidable impacts to aquatic resources be minimized to the greatest extent practicable. Discuss all features of the proposed project that have been modified to minimize the impacts to water resources (see MN Rules 8420.0520 Subp. 4):

Off-Site Alternatives. An off-site alternatives analysis is not required for all permit applications. If you know that your proposal will require an individual permit (standard permit or letter of permission) from the U.S. Army Corps of Engineers, you may be required to provide an off-site alternatives analysis. The alternatives analysis is not required for a complete application but must be provided during the review process in order for the Corps to complete the evaluation of your application and reach a final decision. Applicants with questions about when an off-site alternatives analysis is required should contact their Corps Project Manager.

Project Name and/or Number:

Attachment D
Replacement/Compensatory Mitigation

Complete this part ***if*** your application involves wetland replacement/compensatory mitigation not associated with the local road wetland replacement program. Applicants should consult Corps mitigation guidelines and WCA rules for requirements.

Replacement/Compensatory Mitigation via Wetland Banking. Complete this section if you are proposing to use credits from an existing wetland bank (with an account number in the State wetland banking system) for all or part of your replacement/compensatory mitigation requirements.

Wetland Bank Account #	**County**	**Major Watershed #**	**Bank Service Area #**	**Credit Type** (if applicable)	**Number of Credits**

Applicants should attach documentation indicating that they have contacted the wetland bank account owner and reached at least a tentative agreement to utilize the identified credits for the project. This documentation could be a signed purchase agreement, signed application for withdrawal of credits or some other correspondence indicating an agreement between the applicant and the bank owner. *However, applicants are advised not to enter into a binding agreement to purchase credits until the mitigation plan is approved by the Corps and LGU.*

Project-Specific Replacement/Permittee Responsible Mitigation. Complete this section if you are proposing to pursue actions (restoration, creation, preservation, etc.) to generate wetland replacement/compensatory mitigation credits for this proposed project.

WCA Action Eligible for Credit[1]	**Corps Mitigation Compensation Technique**[2]	**Acres**	**Credit % Requested**	**Credits Anticipated**[3]	**County**	**Major Watershed #**	**Bank Service Area #**

[1]Refer to the name and subpart number in MN Rule 8420.0526.
[2]Refer to the technique listed in *St. Paul District Policy for Wetland Compensatory Mitigation in Minnesota*.
[3]If WCA and Corps crediting differs, then enter both numbers and distinguish which is Corps and which is WCA.

Explain how each proposed action or technique will be completed (e.g. wetland hydrology will be restored by breaking the tile……) and how the proposal meets the crediting criteria associated with it. Applicants should refer to the Corps mitigation policy language, WCA rule language, and all associated Corps and WCA guidance related to the action or technique:

Attach a site location map, soils map, recent aerial photograph, and any other maps to show the location and other relevant features of each wetland replacement/mitigation site. Discuss in detail existing vegetation, existing landscape features, land use (on and surrounding the site), existing soils, drainage systems (if present), and water sources and movement. Include a topographic map showing key features related to hydrology and water flow (inlets, outlets, ditches, pumps, etc.):

Project Name and/or Number:

Attach a map of the existing aquatic resources, associated delineation report, and any documentation of regulatory review or approval. Discuss as necessary:

For actions involving construction activities, attach construction plans and specifications with all relevant details. Discuss and provide documentation of a hydrologic and hydraulic analysis of the site to define existing conditions, predict project outcomes, identify specific project performance standards and avoid adverse offsite impacts. Plans and specifications should be prepared by a licensed engineer following standard engineering practices. Discuss anticipated construction sequence and timing:

For projects involving vegetation restoration, provide a vegetation establishment plan that includes information on site preparation, seed mixes and plant materials, seeding/planting plan (attach seeding/planting zone map), planting/seeding methods, vegetation maintenance, and an anticipated schedule of activities:

For projects involving construction or vegetation restoration, identify and discuss goals and specific outcomes that can be determined for credit allocation. Provide a proposed credit allocation table tied to outcomes:

Provide a five-year monitoring plan to address project outcomes and credit allocation:

Discuss and provide evidence of ownership or rights to conduct wetland replacement/mitigation on each site:

Quantify all proposed wetland credits and compare to wetland impacts to identify a proposed wetland replacement ratio. Discuss how this replacement ratio is consistent with Corps and WCA requirements:

By signature below, the applicant attests to the following (only required if application involves project-specific/permittee responsible replacement):

- All proposed replacement wetlands were not:
  - Previously restored or created under a prior approved replacement plan or permit
  - Drained or filled under an exemption during the previous 10 years
  - Restored with financial assistance from public conservation programs
  - Restored using private funds, other than landowner funds, unless the funds are paid back with interest to the individual or organization that funded the restoration and the individual or organization notifies the local government unit in writing that the restored wetland may be considered for replacement.
- The wetland will be replaced before or concurrent with the actual draining or filling of a wetland.
- An irrevocable bank letter of credit, performance bond, or other acceptable security will be provided to guarantee successful completion of the wetland replacement.
- Within 30 days of either receiving approval of this application or beginning work on the project, I will record the Declaration of Restrictions and Covenants on the deed for the property on which the replacement wetland(s) will be located and submit proof of such recording to the LGU and the Corps.

Applicant or Representative: Title:

Signature: _____ Date:

Project Name and/or Number:

Attachment E
Local Road Replacement Program Qualification

Complete this part ***if*** you are a local road authority (county highway department, city transportation department, etc.) seeking verification that your project (or a portion of your project) qualifies for the MN Local Government Road Wetland Replacement Program (LGRWRP). If portions of your project are not eligible for the LGRWRP, then Attachment D should be completed and attached to your application.

Discuss how your project is a repair, rehabilitation, reconstruction, or replacement of a currently serviceable road to meet state/federal design or safety standards/requirements. Applicants should identify the specific road deficiencies and how the project will rectify them. Attach supporting documents and information as applicable:

Provide a map, plan, and/or aerial photograph accurately depicting wetland boundaries within the project area. Attach associated delineation/determination report or otherwise explain the method(s) used to identify and delineate wetlands. Also attach and discuss any type of review or approval of wetland boundaries or other aspects of the project by a member or members of the local Technical Evaluation Panel (TEP) or Corps of Engineers:

In the table below, identify only the wetland impacts from Part 4 that the road authority has determined should qualify for the LGRWRP.

Wetland Impact ID (as noted on overhead view)	**Type of Impact** (fill, excavate, drain)	**Size of Impact** (square feet or acres to 0.01)	**Existing Plant Community Type(s)** in Impact Area[1]	**County, Major Watershed #, and Bank Service Area #** of Impact[2]

[1]Use *Wetland Plants and Plant Community Types of Minnesota and Wisconsin* 3rd Ed. as modified in MN Rules 8420.0405 Subp. 2.
[2]Refer to Major Watershed and Bank Service Area maps in MN Rules 8420.0522 Subp. 7.

Discuss the feasibility of providing onsite compensatory mitigation/replacement for important site-specific wetland functions:

Please note that under the MN Wetland Conservation Act, projects with less than 10,000 square feet of wetland impact are allowed to commence prior to submission of this notification so long as the notification is submitted within 30 days of the impact. The Clean Water Act has no such provision and requires that permits be obtained prior to any regulated discharges into water of the United States. To avoid potential unauthorized activities, road authorities must, at a minimum, provide a complete application to the Corps and receive a permit prior to commencing work.

By signature below, the road authority attests that they have followed the process in MN Rules 8420.0544 and have determined that the wetland impacts identified in Part 4 are eligible for the MN Local Government Road Wetland Replacement Program.

Road Authority Representative: Title:

Signature: _____ Date:

Technical Evaluation Panel Concurrence: Project Name and/or Number:

TEP member: Representing:

Concur with road authority's determination of qualification for the local road wetland replacement program? ☐ Yes ☐ No

Signature: _____ Date:

TEP member: Representing:

Concur with road authority's determination of qualification for the local road wetland replacement program? ☐ Yes ☐ No

Signature: _____ Date:

TEP member: Representing:

Concur with road authority's determination of qualification for the local road wetland replacement program? ☐ Yes ☐ No

Signature: _____ Date:

TEP member: Representing:

Concur with road authority's determination of qualification for the local road wetland replacement program? ☐ Yes ☐ No

Signature: _____ Date:

Upon approval and signature by the TEP, application must be sent to: **Wetland Bank Administration**
Minnesota Board of Water & Soil Resources
520 Lafayette Road North
Saint Paul, MN 55155

APPENDIX C

Wetland Photographs

View of Wetland 1 looking east.

View of Wetland 1 looking south.

Weir between wetland 1 and Wetland 2.

View of Wetland 2 looking southeast.

View of Wetland 2 looking south near sampling point.

View of Wetland 2 culvert.

View of SA-1 looking north.

View of SA-2 looking north.

Appendix C

SHPO and NHIS Correspondence

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

July 7, 2023
Correspondence # MCE 2023-00323

Cole Kiernan
Kimley-Horn and Associates, Inc.

RE: Natural Heritage Review of the proposed Lord of Life Church Campus,
T32N R25W Section 25; Anoka County

Dear Cole Kiernan,

As requested, the Minnesota Natural Heritage Information System has been reviewed to determine if the proposed project has the potential to impact any rare species or other significant natural features. Based on the project details provided with the request, the following rare features may be impacted by the proposed project:

State-listed Species

- Blanding's turtles (*Emydoidea blandingii*), a state-listed threatened species, have been documented in the vicinity of the proposed project. Blanding's turtles use upland areas up to and over a mile distant from wetlands, waterbodies, and watercourses. 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 mortality 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 and habitat disturbance/destruction due to excavation, fill, and other construction activities associated with the project. Minnesota's Endangered Species Statute (*Minnesota Statutes*, section 84.0895) and associated Rules (*Minnesota Rules*, part 6212.1800 to 6212.2300 and 6134) prohibit the take of threatened or endangered species without a permit. As such, **the following avoidance measures are required**:

- Avoid wetland and aquatic impacts during hibernation season, between September 15th and April 15th, if the area is suitable for hibernation.
- The use of erosion control blanket shall be limited to 'bio-netting' or 'natural-netting' types, and specifically not products containing plastic mesh netting or other plastic components.
    - Also, be aware that hydro-mulch products may contain small synthetic (plastic) fibers to aid in their matrix strength. These loose fibers could potentially re-suspend and make their way into Public Waters. As such, please review mulch products and do not allow any materials with synthetic (plastic) fiber additives in areas that drain into Public Waters.
- Construction areas, especially aquatic or wetland areas, should be thoroughly checked for turtles before the use of heavy equipment or any ground disturbance.
    - The Blanding's turtle flyer must be given to all contractors working in the area.
    - Monitor for turtles during construction and report any sightings to the DNR Nongame Specialist, Erica Hoaglund (Erica.Hoaglund@state.mn.us).
    - If turtles are in imminent danger they must be moved by hand out of harm's way, otherwise, they are to be left undisturbed.

If following the above avoidance measures is not possible, please contact NHIS.Review@state.mn.us as further action may be needed.

For additional information, see the Blanding's turtle fact sheet, which describes the habitat use and life history of this species. The fact sheet also provides two lists of recommendations for avoiding and minimizing impacts to this rare turtle. **Please refer to both lists of recommendations and apply those that are relevant to your project.** For further assistance regarding the Blanding's turtle, please contact the DNR Regional Nongame Specialist, Erica Hoaglund.

- The Natural Heritage Information System (NHIS) tracks bat roost trees and hibernacula plus some acoustic data, but this information is not exhaustive. Even if there are no bat records listed nearby, all seven of Minnesota's bats, including the federally endangered northern long-eared bat (*Myotis septentrionalis*), can be found throughout Minnesota. During the active season (approximately April-November) bats roost underneath bark, in cavities, or in crevices of both live and dead trees. Tree removal can negatively impact bats by destroying roosting habitat, especially during the pup rearing season when females are forming maternity roosting colonies and the pups cannot yet fly. To minimize these impacts, the DNR recommends that tree removal be avoided from June 1 through August 15.

- Please visit the DNR Rare Species Guide for more information on the habitat use of these species and recommended measures to avoid or minimize impacts. For further assistance with these species, please contact the appropriate DNR Regional Nongame Specialist or Regional Ecologist.

Federally Protected Species

- To ensure compliance with federal law, conduct a federal regulatory review using the U.S. Fish and Wildlife Service's (USFWS) online Information for Planning and Consultation (IPaC) tool.

Environmental Review and Permitting

- The Environmental Assessment Worksheet 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. Sufficient information should be provided so the DNR can determine whether a takings permit will be needed for any of the above protected species.

- Please include a copy of this letter and the MCE-generated Final Project Report in any state or local license or permit application. Please note that measures to avoid or minimize disturbance to the above rare features may be included as restrictions or conditions in any required permits or licenses.

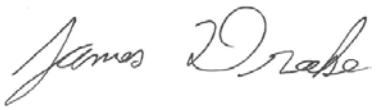
The Natural Heritage Information System (NHIS), a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Division of Ecological and Water Resources, Department of Natural Resources. The NHIS is continually updated as new information becomes available, 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 and project description provided with the request. If project details change or the project has not occurred within one year, please resubmit the project for review within one year of initiating project activities.

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

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

Sincerely,



James Drake
Natural Heritage Review Specialist
James.F.Drake@state.mn.us

Cc: Melissa Collins

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, racoons, 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.

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Project information

NAME

Haviland Fields

LOCATION

Anoka County, Minnesota

DESCRIPTION

None

Local office

Minnesota-Wisconsin Ecological Services Field Office

(952) 858-0793
(952) 646-2873

3815 American Blvd East
Bloomington, MN 55425-1659

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of

Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat Perimyotis subflavus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

Birds

NAME	STATUS
Whooping Crane Grus americana No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/758	EXPN

Insects

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

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Migratory birds

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

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

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

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

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

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

NAME	BREEDING SEASON

Bald Eagle Haliaeetus leucocephalus — Breeds Dec 1 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Black Tern Chlidonias niger — Breeds May 15 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3093

Black-billed Cuckoo Coccyzus erythropthalmus — Breeds May 15 to Oct 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9399

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Canada Warbler Cardellina canadensis — Breeds May 20 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Cerulean Warbler Dendroica cerulea — Breeds Apr 22 to Jul 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/2974

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Eastern Whip-poor-will Antrostomus vociferus — Breeds May 1 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Golden-winged Warbler Vermivora chrysoptera — Breeds May 1 to Jul 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8745

Henslow's Sparrow Ammodramus henslowii — Breeds May 1 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3941

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Rusty Blackbird Euphagus carolinus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

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

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

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

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

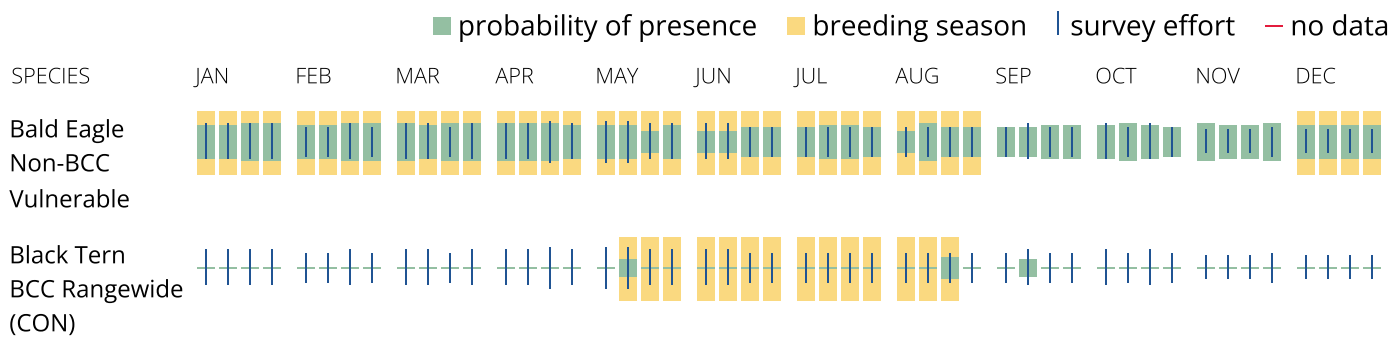
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

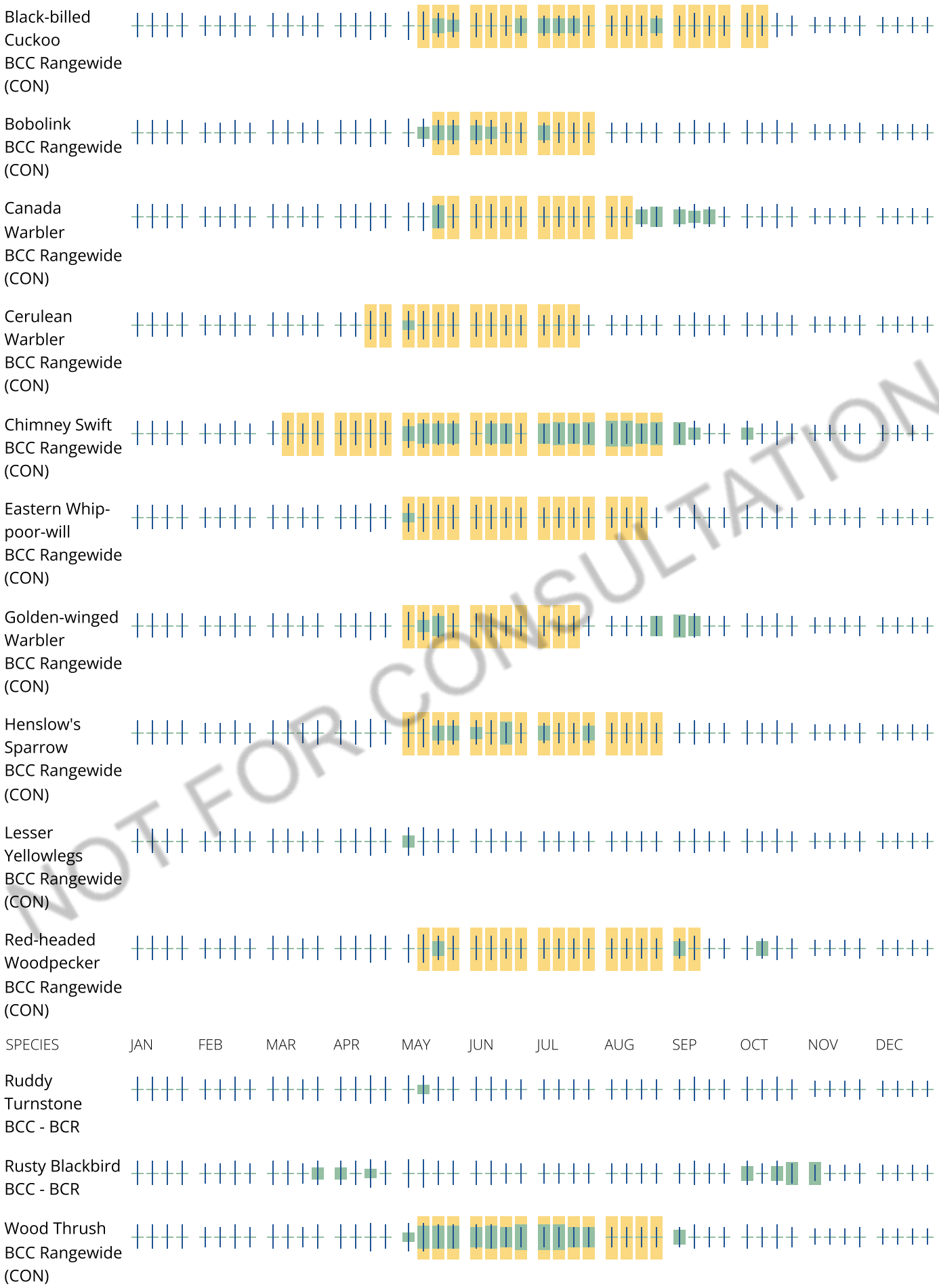
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

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

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





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

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

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

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

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

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

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

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

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

How do I know if a bird is breeding, wintering or migrating in my area?

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

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

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

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

Details about birds that are potentially affected by offshore projects

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

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

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

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

more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

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

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

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

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

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

SHPO Historical Properties in Section 25 T32N R25W										
COUNTY	CITYTWP	PROPNAME	ADDRESS	TWNSHP	RANGE	SECT	QUARTERS	USGS	NRH	INVENTNUM
Anoka	Ramsey	District No. 28 School	14100 St. Francis Blvd. NW	32	25	25	SW-SW-SE	Anoka	Y	AN-RMC-001

SHPO Archaeology Surveys in Section 25 T32N R25W											
COUNTY	SITENUM	TOWNSHIP	RANGE	SECTION	XQUARTERS	ACRES	WORKTYPE	DESCRIPT	TRADITION	CONTEXT	ReportNum
Anoka											
	21AN0144	32	25	25	NW-SE-NE,NE-SW-NE	1.3	1	AS	W-1		
	21AN0145	32	25	25	SE-NE-NE	0.8	1	AS	W-1		AN-97-04
	21AN0146	32	25	25	W-SE-E-NE	0.8	1	AS		RA-1	

Appendix D

Greenhouse Gas Analysis

Back to Intro

EPA CENTER FOR CORPORATE CLIMATE LEADERSHIP
U.S. Environmental Protection Agency

Emissions Summary

Guidance

The total GHG emissions from each source category are provided below. You may also use this summary sheet to fill out the *Annual GHG Inventory Summary and Goal Tracking Form* as this calculator only quantifies one year of emissions at a time.

https://www.epa.gov/climateleadership/center-corporate-climate-leadership-annual-ghg-inventory-summary-and-goal-tracking

By entering the data below into the appropriate cell of the *Annual GHG Inventory Summary and Goal Tracking Form,* you will be able to compare multiple years of data.

If you have multiple Calculator files covering sub-sets of your inventory for a particular reporting period, sum each of the emission categories (e.g. Stationary Combustion) to an organizational total, which then can be entered into the *Annual GHG Inventory Summary and Goal Tracking Form* .

(A) Enter organization information into the orange cells. Other cells on this sheet will be automatically calculated from the data entered in the sheets in this workbook. Blue cells indicate required emission sources if applicable. Green cells indicate scope 3 emission sources and offsets, which organizations may optionally include in their inventory.

(B) The "Go To Sheet" buttons can be used to navigate to the data entry sheets.

Organizational Information:

Organization Name:	Senior Housing Partners
Organization Address:	14501 Nowthen Blvd NW, Ramsey, MN 55303
Inventory Reporting Period:	*Existing Conditions*
Start:	*2024*
End:	*2028*
Name of Preparer:	Kimley-Horn
Phone Number of Preparer:	612-400-9099
Date Prepared:	2023

Summary of Organization's Emissions:

Scope 1 Emissions

Go To Sheet	Stationary Combustion	838	CO_2-e (metric tons)
Go To Sheet	Mobile Sources	0	CO_2-e (metric tons)
Go To Sheet	Refrigeration / AC Equipment Use	0	CO_2-e (metric tons)
Go To Sheet	Fire Suppression	0	CO_2-e (metric tons)
Go To Sheet	Purchased Gases	0	CO_2-e (metric tons)

Location-Based Scope 2 Emissions

Go To Sheet	Purchased and Consumed Electricity	48	CO_2-e (metric tons)
Go To Sheet	Purchased and Consumed Steam	0	CO_2-e (metric tons)

Market-Based Scope 2 Emissions

Go To Sheet	Purchased and Consumed Electricity	48	CO_2-e (metric tons)

Go To Sheet	Purchased and Consumed Steam	0	CO_2-e (metric tons)

Total organization Emissions

Total Scope 1 & Location-Based Scope 2	886	CO_2-e (metric tons)
Total Scope 1 & Market-Based Scope 2	886	CO_2-e (metric tons)

Reductions

Go To Sheet	Offsets	0	CO_2-e (metric tons)

Net Scope 1 and 2 Location-Based Emissions	886	CO_2-e (metric tons)
Net Scope 1 and 2 Market-Based Emissions	886	CO_2-e (metric tons)

Scope 3 Emissions

Go To Sheet	Employee Business Travel	0	CO_2-e (metric tons)
Go To Sheet	Employee Commuting	0	CO_2-e (metric tons)
Go To Sheet	Product Transport	0	CO_2-e (metric tons)
Go To Sheet	Waste	2,084	CO_2-e (metric tons)

Required Supplemental Information

Go To Sheet	Biomass CO_2 Emissions from Stationary Sources	0	CO_2-e (metric tons)
Go To Sheet	Biomass CO_2 Emissions from Mobile Sources	0	CO_2-e (metric tons)

Back to Intro | Back to Summary | Heat Content | Help

Scope 1 Emissions from Stationary Combustion Sources

EPA CENTER FOR CORPORATE CLIMATE LEADERSHIP
U.S. Environmental Protection Agency

Guidance

(A) Enter annual data for each combustion unit, facility, or site (by fuel type) in ORANGE cells on **Table 1**. Example entry is shown in first row (*GREEN Italics*).

- Select "Fuel Combusted" from drop down box.
- Enter "Quantity Combusted" and choose the appropriate units from the drop down box in the unit column. If it's necessary to convert units, common heat contents can be found on the "Heat Content" sheet and unit conversions on the "Unit Conversion" sheet.

(B) If fuel is consumed in a facility but stationary fuel consumption data are not available, an estimate should be made for completeness. See the "Items to Note" section of the Help sheet for suggested estimation approaches.

(C) Biomass CO_2 emissions are not reported in the total emissions, but are reported separately at the bottom of the sheet.

Table 1. Stationary Source Fuel Combustion

Source ID	Source Description	Source Area (sq ft)	Fuel Combusted	Quantity Combusted	Units
BLR-012	*East Power Plant*	*12,517*	*Natural Gas*	*10,000*	*MMBtu*
Institutional	Natural Gas Use	557,568	Natural Gas	15,668	MMBtu
Single Fam	Natural Gas Use	2	Natural Gas	115	MMBtu

GHG Emissions

Total Organization-Wide Stationary Source Combustion by Fuel Type

Fuel Type	Quantity Combusted	Units
Anthracite Coal	0	short tons
Bituminous Coal	0	short tons
Sub-bituminous Coal	0	short tons

Lignite Coal	0	short tons
Natural Gas	15,382,710	scf
Distillate Fuel Oil No. 2	0	gallons
Residual Fuel Oil No. 6	0	gallons
Kerosene	0	gallons
Liquefied Petroleum Gases (LPG)	0	gallons
Wood and Wood Residuals	0	short tons
Landfill Gas	0	scf

Total Organization-Wide CO_2, CH_4 and N_2O Emissions from Stationary Source Fuel Combustion

Fuel Type	CO_2 (kg)	CH_4 (g)	N_2O (g)
Anthracite Coal	0.0	0.0	0.0
Bituminous Coal	0.0	0.0	0.0
Sub-bituminous Coal	0.0	0.0	0.0
Lignite Coal	0.0	0.0	0.0
Natural Gas	837,434.8	15,844.2	1,538.3
Distillate Fuel Oil No. 2	0.0	0.0	0.0
Residual Fuel Oil No. 6	0.0	0.0	0.0
Kerosene	0.0	0.0	0.0
Liquefied Petroleum Gases (LPG)	0.0	0.0	0.0
Total Fossil Fuel Emissions	**837,434.8**	**15,844.2**	**1,538.3**
Wood and Wood Residuals	0.0	0.0	0.0
Landfill Gas	0.0	0.0	0.0
Total Non-Fossil Fuel Emissions	**0.0**	**0.0**	**0.0**
Total Emissions for all Fuels	**837,434.8**	**15,844.2**	**1,538.3**

Total CO_2 Equivalent Emissions (metric tons) - Stationary Combustion	**838.3**
Total Biomass CO_2 Equivalent Emissions (metric tons) - Stationary Combustion	**0.0**

Back to Intro | Back to Summary | Help | Help - Market-Based Method

Scope 2 Emissions from Purchase of Electricity

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Guidance

The Indirect Emissions from Purchased Electricity Guidance document provides guidance for quantifying two scope 2 emissions totals, using a **location-based method** and a **market-based method**. The organization should quantify and report both totals in its GHG inventory. The location-based method considers average emission factors for the electricity grids that provide electricity. The market-based method considers contractual arrangements under which the organization procures electricity from specific sources, such as renewable energy.

(A) Enter total annual electricity purchased in kWh and each eGRID subregion for each facility or site in ORANGE cells of **Table 1**.
(B) If electricity consumption data are not available for a facility, an estimate should be made for completeness.
See the "Items to Note" section of the Help sheet for suggested estimation approaches.
(C) Select "eGRID subregion" from drop box and enter "Electricity Purchased."
- Use map (Figure 1) at bottom of sheet to determine appropriate eGRID subregion. If subregion cannot be determined from the map, find the correct subregion by entering the location's zip code into EPA's Power Profiler:
https://www.epa.gov/egrid/power-profiler#/
(D) See the market-based emission factor hierarchy on the market-based method Help sheet. If any of the first four types of emission factors are applicable, enter the factors in the yellow cells marked as "<enter factor>". If not, leave the yellow cells as is, and eGRID subregion factors will be used for market-based emissions.
Example entry is shown in first row (*GREEN Italics*) for a facility that purchases RECs for 100% of its consumption, and therefore has a market-based emission factor of 0.

Help - Market-Based Method

Tips: Enter electricity usage by location and then look up the eGRID subregion for each location.
If you purchase renewable energy that is less than 100% of your site's electricity, see the example in the market-based method Help sheet.

Table 1. Total Amount of Electricity Purchased by eGRID Subregion

					Market-Based						Location-Based		
					Use these cells to enter applicable market-based emission factors								
					Emission Factors			Emissions			Emissions		
Source ID	Source Description	Source Area (sq ft)	eGRID Subregion *where electricity is consumed*	Electricity Purchased (kWh)	CO_2 Emissions (lb/MWh)	CH_4 Emissions (lb/MWh)	N_2O Emissions (lb/MWh)	CO_2 Emissions (lb)	CH_4 Emissions (lb)	N_2O Emissions (lb)	CO_2 Emissions (lb)	CH_4 Emissions (lb)	N_2O Emissions (lb)
Bldg-012	*East Power Plant*	*12,517*	*HIMS (HICC Miscellaneous)*	*200,000*	*0*	*0*	*0*	*0.0*	*0.0*	*0.0*	*237,120.0*	*28.6*	*4.4*
Institutional	Electricity Use	557,568	MROW (MRO West)	78,880	<enter factor>	<enter factor>	<enter factor>	86,641.8	9.4	1.3	86,641.8	9.4	1.3
Single Fami	Electricity Use	2	MROW (MRO West)	16,084	<enter factor>	<enter factor>	<enter factor>	17,666.7	1.9	0.3	17,666.7	1.9	0.3
					<enter factor>	<enter factor>	<enter factor>					

Back to Intro | Back to Summary | Help

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Scope 3 Emissions from Waste

Guidance

(A) Enter annual waste data in ORANGE cells. Example entry is shown in first row (*GREEN Italics*).

(B) Choose the appropriate material and disposal method from the drop down options. For the average-data method, use one of the mixed material types, such as mixed MSW. If the exact waste material is not available, consider an appropriate proxy. For example, dimensional lumber can be used as a proxy for wood furniture.

(C) Choose an appropriate disposal method. Note that not all disposal methods are available for all materials. If there is a #NA or # Value error in the emissions column, you must pick a new material type or appropriate disposal method.

Table 1. Waste Disposal Weight by Waste Material and Disposal Method (CO_2, CH_4 and N_2O)

Source ID	Source Description	Waste Material	Disposal Method	Weight	Unit	CO_2e Emissions (kg)
Bldg-012	*East Power Plant Finished Goods*	*Steel Cans*	*Landfilled*	*1,000*	*metric ton*	*22,040*
Nonresidential Buildings	Nonresidential Waste	Mixed MSW municipal solid waste	Combusted	3,345	metric ton	*1,585,062*
Residential	Residential Waste	Mixed MSW municipal solid waste	Combusted	2	metric ton	*948*
Nonresidential Buildings	Nonresidential Waste	Mixed Recyclables	Recycled	5,018	metric ton	*497,685*
Residential	Residential Waste	Mixed Recyclables	Recycled	3	metric ton	*298*

GHG Emissions

Total Emissions by Disposal Method

Waste Material	CO_2e (kg)
Recycled	497,983
Landfilled	-
Combusted	1,586,009
Composted	-
Anaerobically Digested (Dry Digestate with Curing)	-
Anaerobically Digested (Wet Digestate with Curing)	-

Total CO_2 Equivalent Emissions (metric tons) - Waste	**2,084.0**

Back to Intro

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Emissions Summary

Guidance

The total GHG emissions from each source category are provided below. You may also use this summary sheet to fill out the *Annual GHG Inventory Summary and Goal Tracking Form* as this calculator only quantifies one year of emissions at a time.

https://www.epa.gov/climateleadership/center-corporate-climate-leadership-annual-ghg-inventory-summary-and-goal-tracking

By entering the data below into the appropriate cell of the *Annual GHG Inventory Summary and Goal Tracking Form,* you will be able to compare multiple years of data.

If you have multiple Calculator files covering sub-sets of your inventory for a particular reporting period, sum each of the emission categories (e.g. Stationary Combustion) to an organizational total, which then can be entered into the *Annual GHG Inventory Summary and Goal Tracking Form* .

(A) Enter organization information into the orange cells. Other cells on this sheet will be automatically calculated from the data entered in the sheets in this workbook. Blue cells indicate required emission sources if applicable. Green cells indicate scope 3 emission sources and offsets, which organizations may optionally include in their inventory.

(B) The "Go To Sheet" buttons can be used to navigate to the data entry sheets.

Organizational Information:

Organization Name:	Senior Housing Partners
Organization Address:	14501 Nowthen Blvd NW, Ramsey, MN 55303
Inventory Reporting Period:	*Proposed Development*
Start:	*2024*
End:	*2028*
Name of Preparer:	Kimley-Horn
Phone Number of Preparer:	612-400-9099
Date Prepared:	2023

Summary of Organization's Emissions:

Scope 1 Emissions

Go To Sheet	Stationary Combustion	1,295	CO_2-e (metric tons)
Go To Sheet	Mobile Sources	1,145	CO_2-e (metric tons)
Go To Sheet	Refrigeration / AC Equipment Use	0	CO_2-e (metric tons)
Go To Sheet	Fire Suppression	0	CO_2-e (metric tons)
Go To Sheet	Purchased Gases	0	CO_2-e (metric tons)

Location-Based Scope 2 Emissions

Go To Sheet	Purchased and Consumed Electricity	1,423	CO_2-e (metric tons)
Go To Sheet	Purchased and Consumed Steam	0	CO_2-e (metric tons)

Market-Based Scope 2 Emissions

Go To Sheet	Purchased and Consumed Electricity	1,423	CO_2-e (metric tons)

Go To Sheet	Purchased and Consumed Steam	0	CO_2-e (metric tons)

Total organization Emissions

Total Scope 1 & Location-Based Scope 2	3,863	CO_2-e (metric tons)
Total Scope 1 & Market-Based Scope 2	3,863	CO_2-e (metric tons)

Reductions

Go To Sheet	Offsets	0	CO_2-e (metric tons)

Net Scope 1 and 2 Location-Based Emissions	3,863	CO_2-e (metric tons)
Net Scope 1 and 2 Market-Based Emissions	3,863	CO_2-e (metric tons)

Scope 3 Emissions

Go To Sheet	Employee Business Travel	0	CO_2-e (metric tons)
Go To Sheet	Employee Commuting	0	CO_2-e (metric tons)
Go To Sheet	Product Transport	0	CO_2-e (metric tons)
Go To Sheet	Waste	2,373	CO_2-e (metric tons)

Required Supplemental Information

Go To Sheet	Biomass CO_2 Emissions from Stationary Sources	0	CO_2-e (metric tons)
Go To Sheet	Biomass CO_2 Emissions from Mobile Sources	0	CO_2-e (metric tons)

Back to Intro | Back to Summary | Heat Content | Help

Scope 1 Emissions from Stationary Combustion Sources

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Guidance

(A) Enter annual data for each combustion unit, facility, or site (by fuel type) in ORANGE cells on **Table 1**. Example entry is shown in first row (*GREEN Italics*).

- Select "Fuel Combusted" from drop down box.
- Enter "Quantity Combusted" and choose the appropriate units from the drop down box in the unit column. If it's necessary to convert units, common heat contents can be found on the "Heat Content" sheet and unit conversions on the "Unit Conversion" sheet.

(B) If fuel is consumed in a facility but stationary fuel consumption data are not available, an estimate should be made for completeness. See the "Items to Note" section of the Help sheet for suggested estimation approaches.

(C) Biomass CO_2 emissions are not reported in the total emissions, but are reported separately at the bottom of the sheet.

Table 1. Stationary Source Fuel Combustion

Source ID	Source Description	Source Area (sq ft)	Fuel Combusted	Quantity Combusted	Units
BLR-012	*East Power Plant*	*12,517*	*Natural Gas*	*10,000*	*MMBtu*
Institutional	Natural Gas Use	557,568	Natural Gas	15,668	MMBtu
Multifamily	Natural Gas Use	146,529	Natural Gas	8,715	MMBtu

GHG Emissions

Total Organization-Wide Stationary Source Combustion by Fuel Type

Fuel Type	Quantity Combusted	Units
Anthracite Coal	0	short tons
Bituminous Coal	0	short tons
Sub-bituminous Coal	0	short tons

Lignite Coal	0	short tons
Natural Gas	23,764,777	scf
Distillate Fuel Oil No. 2	0	gallons
Residual Fuel Oil No. 6	0	gallons
Kerosene	0	gallons
Liquefied Petroleum Gases (LPG)	0	gallons
Wood and Wood Residuals	0	short tons
Landfill Gas	0	scf

Total Organization-Wide CO_2, CH_4 and N_2O Emissions from Stationary Source Fuel Combustion

Fuel Type	CO_2 (kg)	CH_4 (g)	N_2O (g)
Anthracite Coal	0.0	0.0	0.0
Bituminous Coal	0.0	0.0	0.0
Sub-bituminous Coal	0.0	0.0	0.0
Lignite Coal	0.0	0.0	0.0
Natural Gas	1,293,754.4	24,477.7	2,376.5
Distillate Fuel Oil No. 2	0.0	0.0	0.0
Residual Fuel Oil No. 6	0.0	0.0	0.0
Kerosene	0.0	0.0	0.0
Liquefied Petroleum Gases (LPG)	0.0	0.0	0.0
Total Fossil Fuel Emissions	**1,293,754.4**	**24,477.7**	**2,376.5**
Wood and Wood Residuals	0.0	0.0	0.0
Landfill Gas	0.0	0.0	0.0
Total Non-Fossil Fuel Emissions	**0.0**	**0.0**	**0.0**
Total Emissions for all Fuels	**1,293,754.4**	**24,477.7**	**2,376.5**

Total CO_2 Equivalent Emissions (metric tons) - Stationary Combustion	**1,295.1**
Total Biomass CO_2 Equivalent Emissions (metric tons) - Stationary Combustion	**0.0**

Back to Intro | Back to Summary | Help

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Scope 1 Emissions from Mobile Sources

Guidance

(A) Enter annual data for each vehicle or group of vehicles (grouped by vehicle type, vehicle year, and fuel type) in ORANGE cells in **Table 1**. Example entry is shown in first row (GREEN *Italics*). Only enter vehicles owned or leased by your organization on this sheet. All other vehicle use such as employee commuting or business travel is considered a scope 3 emissions source and should be reported in the corresponding scope 3 sheets.

- Select "On-Road" or "Non-Road" from drop down box to determine the Vehicle Types available.
- Select "Vehicle Type" from drop down box (closest type available).
- Enter "Fuel Usage" in appropriate units (units appear when vehicle type is selected).
- If mileage or fuel usage is unknown, estimate using approximate fuel economy values (see **Reference Table** below).
- Vehicle year and Miles traveled are not necessary for non-road equiment.

(B) When using biofuels, typically the biofuel (biodiesel or ethanol) is mixed with a petroleum fuel (diesel or gasoline) for use in vehicles. Enter the biodiesel and ethanol percentages of the fuel if known, or leave default values.

Biodiesel Percent:	20	%
Ethanol Percent:	80	%

(C) Biomass CO_2 emissions from biodiesel and ethanol are not reported in the total emissions, but are reported separately at the bottom of the sheet.

Table 1. Mobile Source Fuel Combustion and Miles Traveled

Source ID	Source Description	On-Road or Non-Road?	Vehicle Type	Vehicle Year	Fuel Usage	Units	Miles Traveled
Fleet-012	*HQ Fleet*	*NonRoad*	*Ships and Boats - Diesel*	*1990*	*500*	*gal*	*3,670*
Construction Equipment (non-road g	Construction Equipment	NonRoad	Construction/Mining Equipment - Gasoline (2 stroke)	2007	24,750	gal	0
Passenger Cars	Construction Equipment	OnRoad	Passenger Cars - Gasoline	2007	84	gal	4,368
Construction Equipment (non-road d	Construction Equipment	NonRoad	Construction/Mining Equipment - Diesel	2007	88,391	gal	0
Medium- and Heavy- Duty Trucks	Construction Equipment	OnRoad	Medium- and Heavy-Duty Vehicles - Diesel	2007	177	gal	1,560
Light Trucks	Construction Equipment	OnRoad	Light-Duty Trucks - Gasoline	2007	165	gal	1,560

Reference Table: Average Fuel Economy by Vehicle Type

Vehicle Type	Average Fuel Economy (mpg)
Passenger Cars	24.1
Motorcycles	44.0
Diesel Buses (Diesel Heavy-Duty Vehicles)	7.3
Other 2-axle, 4-Tire Vehicles	17.6
Single unit 2-Axle 6-Tire or More Trucks	7.5
Combination Trucks	6.1

GHG Emissions

Total Organization-Wide Mobile Source Fuel Usage and CO_2 Emissions (On-Road and Off-Road Vehicles)

Fuel Type	Fuel Usage	Units	CO_2 (kg)	
Motor Gasoline	24,999	gallons	219,491.2	
Diesel Fuel	88,568	gallons	904,279.3	
Residual Fuel Oil	0	gallons	0.0	
Aviation Gasoline	0	gallons	0.0	
Kerosene-Type Jet Fuel	0	gallons	0.0	
Liquefied Petroleum Gas (LPG)	0	gallons	0.0	
Ethanol	0	gallons	0.0	*Note: emissions here are only for the g*
Biodiesel	0	gallons	0.0	*Note: emissions here are only for the d*
Liquefied Natural Gas (LNG)	0	gallons	0.0	
Compressed Natural Gas (CNG)	0	scf	0.0	

Total Organization-Wide On-Road Gasoline Mobile Source Mileage and CH_4/N_2O Emissions

Vehicle Type	Vehicle Year	Mileage (miles)	CH_4 (g)	N_2O (g)
Passenger Cars - Gasoline	1984-93	0	0.0	0.0
	1994	0	0.0	0.0
	1995	0	0.0	0.0
	1996	0	0.0	0.0
	1997	0	0.0	0.0
	1998	0	0.0	0.0
	1999	0	0.0	0.0
	2000	0	0.0	0.0
	2001	0	0.0	0.0
	2002	0	0.0	0.0
	2003	0	0.0	0.0
	2004	0	0.0	0.0
	2005	0	0.0	0.0
	2006	0	0.0	0.0
	2007	4,368	31.4	22.7
	2008	0	0.0	0.0
	2009	0	0.0	0.0
	2010	0	0.0	0.0
	2011	0	0.0	0.0
	2012	0	0.0	0.0
	2013	0	0.0	0.0
	2014	0	0.0	0.0
	2015	0	0.0	0.0
	2016	0	0.0	0.0
	2017	0	0.0	0.0
	2018	0	0.0	0.0
Light-Duty Trucks - Gasoline (Vans, Pickup Trucks, SUVs)	1987-93	0	0.0	0.0
	1994	0	0.0	0.0
	1995	0	0.0	0.0
	1996	0	0.0	0.0
	1997	0	0.0	0.0
	1998	0	0.0	0.0
	1999	0	0.0	0.0
	2000	0	0.0	0.0
	2001	0	0.0	0.0
	2002	0	0.0	0.0
	2003	0	0.0	0.0
	2004	0	0.0	0.0
	2005	0	0.0	0.0
	2006	0	0.0	0.0
	2007	1,560	16.1	9.5
	2008	0	0.0	0.0
	2009	0	0.0	0.0
	2010	0	0.0	0.0
	2011	0	0.0	0.0
	2012	0	0.0	0.0
	2013	0	0.0	0.0
	2014	0	0.0	0.0
	2015	0	0.0	0.0
	2016	0	0.0	0.0
	2017	0	0.0	0.0
	2018	0	0.0	0.0
Heavy-Duty Vehicles - Gasoline	1985-86	0	0.0	0.0
	1987	0	0.0	0.0
	1988-1989	0	0.0	0.0
	1990-1995	0	0.0	0.0
	1996	0	0.0	0.0
	1997	0	0.0	0.0
	1998	0	0.0	0.0
	1999	0	0.0	0.0
	2000	0	0.0	0.0
	2001	0	0.0	0.0
	2002	0	0.0	0.0
	2003	0	0.0	0.0
	2004	0	0.0	0.0
	2005	0	0.0	0.0
	2006	0	0.0	0.0
	2007	0	0.0	0.0
	2008	0	0.0	0.0
	2009	0	0.0	0.0
	2010	0	0.0	0.0
	2011	0	0.0	0.0
	2012	0	0.0	0.0
	2013	0	0.0	0.0
	2014	0	0.0	0.0
	2015	0	0.0	0.0
	2016	0	0.0	0.0
	2017	0	0.0	0.0
	2018	0	0.0	0.0
Motorcycles - Gasoline	1960-1995	0	0.0	0.0
	1996-present	0	0.0	0.0

Total Organization-Wide On-Road Non-Gasoline Mobile Source Mileage and CH_4/N_2O Emissions

Vehicle Type	Fuel Type	Vehicle Year	Mileage (miles)	CH_4 (g)	N_2O (g)
Passenger Cars - Diesel	Diesel	1960-1982	0	0.0	0.0
		1983-1995	0	0.0	0.0
		1996-2006	0	0.0	0.0
		2007-2018	0	0.0	0.0
Light-Duty Trucks - Diesel	Diesel	1960-1982	0	0.0	0.0
		1983-1995	0	0.0	0.0

Light-Duty Trucks - Diesel	Diesel	1996-2006	0	0.0	0.0
		2007-2018	0	0.0	0.0
Medium- and Heavy-Duty Vehicles -	Diesel	1960-2006	0	0.0	0.0
		2007-2018	1,560	14.8	67.2
Light-Duty Cars	Methanol		0	0.0	0.0
	Ethanol		0	0.0	0.0
	CNG		0	0.0	0.0
	LPG		0	0.0	0.0
	Biodiesel		0	0.0	0.0
Light-Duty Trucks	Ethanol		0	0.0	0.0
	CNG		0	0.0	0.0
	LPG		0	0.0	0.0
	LNG		0	0.0	0.0
	Biodiesel		0	0.0	0.0
Medium-Duty Trucks	CNG		0	0.0	0.0
	LPG		0	0.0	0.0
	LNG		0	0.0	0.0
	Biodiesel		0	0.0	0.0
Heavy-Duty Trucks	Methanol		0	0.0	0.0
	Ethanol		0	0.0	0.0
	CNG		0	0.0	0.0
	LPG		0	0.0	0.0
	LNG		0	0.0	0.0
	Biodiesel		0	0.0	0.0
Buses	Methanol		0	0.0	0.0
	Ethanol		0	0.0	0.0
	CNG		0	0.0	0.0
	LPG		0	0.0	0.0
	LNG		0	0.0	0.0
	Biodiesel		0	0.0	0.0

Total Organization-Wide Non-Road Mobile Source Fuel Usage and CH_4/N_2O Emissions

Vehicle Type	Fuel Type	Fuel Usage (gallons)	CH_4 (g)	N_2O (g)
Ships and Boats	Residual Fuel Oil	-	-	-
	Gasoline (2 stroke)	-	-	-
	Gasoline (4 stroke)	-	-	-
	Diesel	-	-	-
Locomotives	Diesel	-	-	-
Aircraft	Jet Fuel	-	-	-
	Aviation Gasoline	-	-	-
Agricultural Equipment	Gasoline (2 stroke)	-	-	-
	Gasoline (4 stroke)	-	-	-
	Diesel	-	-	-
	LPG	-	-	-
Agricultural Offroad Trucks	Gasoline	-	-	-
	Diesel	-	-	-
Construction/Mining Equipment	Gasoline (2 stroke)	24,750	307,395	1,733
	Gasoline (4 stroke)	-	-	-
	Diesel	88,391	17,678	41,544
	LPG	-	-	-
Construction/Mining Offroad Trucks	Gasoline	-	-	-
	Diesel	-	-	-
Lawn and Garden Equipment	Gasoline (2 stroke)	-	-	-
	Gasoline (4 stroke)	-	-	-
	Diesel	-	-	-
	LPG	-	-	-
Airport Equipment	Gasoline	-	-	-
	Diesel	-	-	-
	LPG	-	-	-
Industrial/Commercial Equipment	Gasoline (2 stroke)	-	-	-
	Gasoline (4 stroke)	-	-	-
	Diesel	-	-	-
	LPG	-	-	-
Logging Equipment	Gasoline (2 stroke)	-	-	-
	Gasoline (4 stroke)	-	-	-
	Diesel	-	-	-
Railroad Equipment	Gasoline	-	-	-
	Diesel	-	-	-
	LPG	-	-	-
Recreational Equipment	Gasoline (2 stroke)	-	-	-
	Gasoline (4 stroke)	-	-	-
	Diesel	-	-	-
	LPG	-	-	-

Total CO_2 Equivalent Emissions (metric tons) - Mobile Sources	**1,144.8**
Total Biomass CO_2 Equivalent Emissions (metric tons) - Mobile Sources	**0.0**

Notes:

1. Average mpg values from the U.S. Department of Transportation, Federal Highway Administration, Highway Statistics 2019 (Nov 2020), Table VM-1.

Back to Intro | Back to Summary | Help | Help - Market-Based Method

Scope 2 Emissions from Purchase of Electricity

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Guidance

The Indirect Emissions from Purchased Electricity Guidance document provides guidance for quantifying two scope 2 emissions totals, using a **location-based method** and a **market-based method**. The organization should quantify and report both totals in its GHG inventory. The location-based method considers average emission factors for the electricity grids that provide electricity. The market-based method considers contractual arrangements under which the organization procures electricity from specific sources, such as renewable energy.

(A) Enter total annual electricity purchased in kWh and each eGRID subregion for each facility or site in ORANGE cells of **Table 1**.
(B) If electricity consumption data are not available for a facility, an estimate should be made for completeness.
See the "Items to Note" section of the Help sheet for suggested estimation approaches.
(C) Select "eGRID subregion" from drop box and enter "Electricity Purchased."
- Use map (Figure 1) at bottom of sheet to determine appropriate eGRID subregion. If subregion cannot be determined from the map, find the correct subregion by entering the location's zip code into EPA's Power Profiler:
https://www.epa.gov/egrid/power-profiler#/
(D) See the market-based emission factor hierarchy on the market-based method Help sheet. If any of the first four types of emission factors are applicable, enter the factors in the yellow cells marked as "<enter factor>". If not, leave the yellow cells as is, and eGRID subregion factors will be used for market-based emissions.
Example entry is shown in first row (*GREEN Italics*) for a facility that purchases RECs for 100% of its consumption, and therefore has a market-based emission factor of 0.

Help - Market-Based Method

Tips: Enter electricity usage by location and then look up the eGRID subregion for each location.
If you purchase renewable energy that is less than 100% of your site's electricity, see the example in the market-based method Help sheet.

Table 1. Total Amount of Electricity Purchased by eGRID Subregion

					Market-Based *Use these cells to enter applicable market-based emission factors*						**Location-Based**		
					Emission Factors			**Emissions**			**Emissions**		
Source ID	**Source Description**	**Source Area (sq ft)**	**eGRID Subregion** *where electricity is consumed*	**Electricity Purchased (kWh)**	**CO_2 Emissions (lb/MWh)**	**CH_4 Emissions (lb/MWh)**	**N_2O Emissions (lb/MWh)**	**CO_2 Emissions (lb)**	**CH_4 Emissions (lb)**	**N_2O Emissions (lb)**	**CO_2 Emissions (lb)**	**CH_4 Emissions (lb)**	**N_2O Emissions (lb)**
Bldg-012	*East Power Plant*	*12,517*	*HIMS (HICC Miscellaneous)*	*200,000*	*0*	*0*	*0*	*0.0*	*0.0*	*0.0*	*237,120.0*	*28.6*	*4.4*
Institutional	Electricity Use	557,568	MROW (MRO West)	78,880	<enter factor>	<enter factor>	<enter factor>	86,641.8	9.4	1.3	86,641.8	9.4	1.3
Multifamily h	Electricity Use	146,529	MROW (MRO West)	2,756,928	<enter factor>	<enter factor>	<enter factor>	3,028,209.7	328.1	46.9	3,028,209.7	328.1	46.9
					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
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					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
					<enter factor>	<enter factor>	<enter factor>						
Total Emissions for All Sources				2,835,808				3,114,851.5	337.5	48.2	3,114,851.5	337.5	48.2

GHG Emissions

CO_2 Equivalent Emissions (metric tons)	
Location-Based Electricity Emissions	**1,423.2**
Market-Based Electricity Emissions	**1,423.2**

Notes:
1. CO_2, CH_4 and N_2O emissions are estimated using methodology provided in EPA's Center for Corporate Climate Leadership Greenhouse Gas Inventory Guidance - Indirect Emissions from Purchased Electricity (January 2016).

Back to Intro   Back to Summary   Help

EPA CENTER FOR CORPORATE CLIMATE LEADERSHIP
U.S. Environmental Protection Agency

Scope 3 Emissions from Waste

Guidance

(A) Enter annual waste data in ORANGE cells. Example entry is shown in first row (*GREEN Italics*).

(B) Choose the appropriate material and disposal method from the drop down options. For the average-data method, use one of the mixed material types, such as mixed MSW. If the exact waste material is not available, consider an appropriate proxy. For example, dimensional lumber can be used as a proxy for wood furniture.

(C) Choose an appropriate disposal method. Note that not all disposal methods are available for all materials. If there is a #NA or # Value error in the emissions column, you must pick a new material type or appropriate disposal method.

Table 1. Waste Disposal Weight by Waste Material and Disposal Method (CO$_2$, CH$_4$ and N$_2$O)

Source ID	Source Description	Waste Material	Disposal Method	Weight	Unit	CO$_2$e Emissions (kg)
Bldg-012	*East Power Plant Finished Goods*	*Steel Cans*	*Landfilled*	*1,000*	*metric ton*	*22,040*
Nonresidential Buildings	Nonresidential Waste	Mixed MSW municipal solid waste	Combusted	3,345	metric ton	*1,585,062*
Residential	Residential Waste	Mixed MSW municipal solid waste	Combusted	467	metric ton	*221,293*
Nonresidential Buildings	Nonresidential Recycling	Mixed Recyclables	Recycled	5,018	metric ton	*497,696*
Residential	Residential Recycling	Mixed Recyclables	Recycled	700	metric ton	*69,426*

Total Emissions by Disposal Method

Waste Material	CO_2e (kg)
Recycled	567,122
Landfilled	-
Combusted	1,806,354
Composted	-
Anaerobically Digested (Dry Digestate with Curing)	-
Anaerobically Digested (Wet Digestate with Curing)	-

Total CO_2 Equivalent Emissions (metric tons) - Waste	**2,373.5**

Appendix E

Traffic Analysis

TRAFFIC IMPACT ANALYSIS

HAVILAND FIELDS

RAMSEY, MINNESOTA

Prepared for:

Senior Housing Partners

Prepared By:

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JULY 2023

Kimley»Horn

TRAFFIC IMPACT ANALYSIS

HAVILAND FIELDS

RAMSEY, MINNESOTA

REPORT CERTIFICATION

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

Jacob Rojer, P.E., PTOE

License No. 56767

July 17, 2023

Date

TABLE OF CONTENTS

APPENDIX

INTRODUCTION

Presbyterian Homes is proposing a new residential development on the +/- 35-acre Lord of Life Church site in Ramsey, MN. The development would include includes 303 multifamily housing (Mid-rise) units, 22 senior adult housing – single family units and 173 senior adult housing – multi-family units for a total of 498 units. The existing church will remain on site. **Exhibit 1** shows the proposed project location. All exhibits are included in **Appendix A.**

EXISTING ROADWAY CONDITIONS

The proposed development is located on the northwest corner of MN-47 and CSAH 5. The following intersections will be included in the traffic capacity analysis:

- MN-47 (St Francis Blvd) & Nowthen Blvd NW
- MN-47 (St Francis Blvd) & Sunwood Dr NW
- CSAH 5 (Nowthen Blvd) & Dysprosium St NW
- CSAH 5 (Nowthen Blvd) & Iodine St NW
- CSAH 5 (Nowthen Blvd) & Lord of Life Church Access
- CSAH 5 (Nowthen Blvd) & 146th Ave NW
- CSAH 5 (Nowthen Blvd) & Sunwood Dr
- Sunwood Dr & Cobalt St NW

The study intersection locations are shown in **Exhibit 1**.

EXISTING ROADWAYS

The following provides a detailed description of the major surrounding roadways.

MN-47 (St Francis Blvd) is a north-south, two-lane, divided highway, with a single through lane and turn lanes provided at all accesses. The MnDOT Functional Classification Map classifies MN-47 as A-Minor Connector. The MnDOT Traffic Mapping Application reports an annual average daily traffic (AADT) of 22,000 vehicles per day (vpd) in 2019 south of CSAH 5 and 12,100 vpd in 2021 north of CSAH 5. The posted speed limit is 45 mph south of CSAH 5 and 55 mph north of CSAH 5.

CSAH 5 (Nowthen Blvd) is a two-lane County Road with a single through lane in each direction and right turn lanes provided at all studied intersections. The highway is divided from MN-47 to Dysprosium St. The roadway runs in a southeast-northwest direction within the study area. The MnDOT Functional Classification Map Classifies CSAH 5 as A-Minor Expander. The MnDOT Traffic Mapping Application reports an AADT of 8,700 vpd in 2021, between MN-47 and Dysprosium St NW. The posted speed limit on CSAH 5 is 30 mph east of MN-47, and 50 mph to the west.

Sunwood Dr NW is an east-west two-lane undivided road with one travel lane in each direction. The Anoka County 2040 Functional Classification Map classifies Sunwood Dr as a local road. The MnDOT Traffic Mapping Application reports that the AADT ranges from 730 (west of MN-47) to

1,950 (east of CSAH 5). The posted speed limit on Sunwood Dr is 30 mph except west of CSAH 5, where it is 35 mph.

Dysprosium St NW is a two-lane north-south roadway with one lane in each direction. Dysprosium St NW is classified as a local Road according to the Anoka Functional Classification Map. In 2021, Dysprosium St NW had an AADT of 3100 vpd, according to the MnDOT Traffic Mapping Application. The current posted speed limit on Dysprosium St NW is 30 mph.

All other roadways are one-lane roadways with no turn lanes. They are all considered to be local roads by Anoka County, have no MnDOT count data, and have a speed limit of 30 mph.

EXISTING TRAFFIC VOLUMES

To analyze the traffic operations at the study intersection, weekday and weekend peak period turning movement counts were collected. The weekend data was collected on 1/29/2023 while the weekday data was collected on 1/27/2023 except for the intersection of CSAH 5 & Sunwood Dr which was collected on 1/30/2023. Weekday and weekend data collection occurred on a typical weekday and typical Sunday when church was in service. **Exhibit 2** provides a summary of the weekday AM and PM peak hour turning traffic volumes. The turning movement count data is provided in **Appendix B**.

The network AM peak hour was determined to be 7:00 AM to 8:00 AM and the network PM peak hour was determined to be 4:30 PM to 5:30 PM. The Sunday peak hours were determined to be 12:00pm to 1:00pm.

BACKGROUND GROWTH AND COMMITTED TRAFFIC

The growth rates were calculated using the forecast in the City of Ramsey's 2040 comprehensive plan. The growth rate was found to be 0.6 % for MN-47, and 0.9% for CSAH 5. These were used to forecast the peak hour traffic at intersections along these corridors in 2027 and 2040. The rest of the roadways in the study area are local/fully developed and are thus considered to have a growth rate of 0%.

Exhibit 4 shows the Opening Year No-Build (2027) turning movement volumes and **Exhibit 5** shows the Horizon Year No-Build (2040) turning movement volumes.

PEDESTRIANS AND BICYCLES

There are existing pedestrian facilities/trails on both sides of Sunwood Dr, Dysprosium Rd and CSAH 5. MN-47 has a pedestrian/bicycle path on its east side only. There are marked crosswalks at all intersections that the pedestrian paths cross, as well as push-buttons at both of the stoplight controlled intersections.

PROPOSED DEVELOPMENT

SITE TRIP GENERATION

The trip-generating potential of the proposed development was calculated using the Institute of Transportation Engineers (ITE) *Trip Generation Manual, Eleventh Edition*. Standard ITE trip rates were used to develop the anticipated total trips generated by the site.

The average rate for ITE Land Use Code (LUC) 221 (Multifamily Housing), ITE LUC 251 (Senior Adult Housing – Single-Family), and ITE LUC 252 (Senior Adult Housing – Multi-Family) were used to calculate the trip generation potential of the site. **Table 1** provides a summary of the number of trips anticipated to be generated during the weekday AM and PM peak hours, including internal capture and pass-by reduction.

As shown, the site is anticipated to generate 153 new trips during the AM peak hour (40 entering, 113 exiting), 168 new trips during the PM peak hour (100 entering, 68 exiting), and 161 new trips in the Sunday peak hour (86 entering, 75 exiting).

Table 1 – Site Trip Generation

Land Use Description	Intensity	Daily	AM Peak Hour			SUN Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total	In	Out	Total
Multifamily Housing	303 Units	1,376	26	86	112	53	44	97	72	46	118
Senior Adult Housing – Single-Family (Twin homes)	22 Units	94	2	4	6	3	2	5	4	3	7
Senior Adult Housing – Multi-Family	173 Units	561	12	23	35	30	29	59	24	19	43
Total Vehicle Trips		1,849	40	113	153	86	75	161	100	68	168

For this analysis, it was assumed that all site trips would be new trips and no mode split reductions for trips via transit, bike or walking were used.

SITE TRIP DISTRIBUTION

The site trips were distributed to the adjacent roadways based on the current traffic patterns in the area and a general assessment of the major regional roadways surrounding the study area. In general, the following global trip distribution was assumed for the development:

- 70% to/from the south on MN-47
- 15% to/from the north on MN-47
- 10% to/from the north on CSAH 5
- 5% to/from the south on Dysprosium Road NW

The trip distribution for the primary site-generated traffic is shown in **Exhibit 5.**

SITE ACCESSES AND ASSIGNMENT

The site will include three (3) accesses. The northern access will be via Cobalt St to the north. The Cobalt St access is expected to only be used by vehicles destined to/from the north. The north access along CSAH 5 which leads to the north of the parking lot for the residential and church. All of the residential parking garages would be located closer to the access further to the south on CSAH 5, it is expected that most of the traffic to this access would come from the north along CSAH 5, with only a small percentage of the traffic originating from MN-47 choosing this access. The third access is across from Iodine St on CSAH 5, this access is expected to be the busiest of the three. The two accesses on CSAH 5 are in the same locations as the existing accesses and the Cobalt St access would be an extension of the current dead end road.

The proposed site plan is included in **Appendix C**. The primary site trips were assigned to the study intersections as shown in **Exhibit 6**. The total site-generated trips are depicted in **Exhibit 7.**

CAPACITY ANALYSIS

A capacity analysis was performed to quantify the delay and level of service at the study intersections during the weekday AM and PM peak hours. The capacity analysis was performed using Synchro/SimTraffic. Existing signal timings used in the analysis were used in the 2020 Center Village Traffic Study.

The capacity of an intersection quantifies its ability to accommodate traffic volumes and is measured in average delay per vehicle. It is expressed in terms of level of service (LOS) which ranges from A to F, with LOS A as the highest (best traffic flow and least delay), LOS E as saturated or at-capacity conditions, and LOS F as the lowest (oversaturated conditions). The LOS grades shown below, which are provided in the Transportation Research Board's Highway Capacity Manual (HCM), quantify and categorize the driver's discomfort, frustration, fuel consumption, and travel times experienced as a result of intersection control and the resulting traffic queuing. A detailed description of each LOS rating can be found in **Table 2**. The range of control delay for each rating (as detailed in the HCM) is also shown in Table 2. Because signalized intersections are expected to carry a larger volume of vehicles and stopping is required during red time, higher delays are tolerated for the corresponding LOS ratings.

Table 2 – Level of Service Information

Level of Service	Average Control Delay (seconds/vehicle)	Description
A	0-10 (Unsignalized); 0-10 (Signalized)	Minimal control delay; traffic operates at primarily free-flow conditions; unimpeded movement within traffic stream.
B	>10-15 (Unsignalized); >10-20 (Signalized)	Minor control delay at signalized intersections; traffic operates at a fairly unimpeded level with slightly restricted movement within traffic stream.
C	>15-25 (Unsignalized); >20-35 (Signalized)	Moderate control delay; movement within traffic stream more restricted than at LOS B; formation of queues contributes to lower average travel speeds.
D	>25-35 (Unsignalized); >35-55 (Signalized)	Considerable control delay that may be substantially increased by small increases in flow; average travel speeds continue to decrease.
E	>35-50 (Unsignalized); >55-80 (Signalized)	High control delay; average travel speed no more than 33 percent of free flow speed.
F	>50 (Unsignalized); >80 (Signalized)	Extremely high control delay; extensive queuing and high volumes create exceedingly restricted traffic flow.

Traffic models for each scenario were developed using Synchro/SimTraffic, and the delay and queueing were evaluated for each scenario. The scenarios that were analyzed are as follows:

- Existing Year (2023)
- Opening Year (2027) No-Build
- Opening Year (2027) Build
- Design Year (2040) No-Build
- Design Year (2040) Build

EXISTING YEAR (2023) CONDITIONS

A capacity analysis was performed for Existing Year (2023) conditions in order to develop baseline operating conditions for the current year. The analysis was performed using Synchro/SimTraffic. The three site accesses were modeled with the existing geometry and intersection control. The four study intersections were also modeled with the existing geometry and intersection control as summarized in Exhibit 2. Signal timings were obtained from MnDOT. The traffic volumes are provided in Exhibit 3.

The results of the analysis are provided in **Table 3**.

Table 3 – Existing Year (2023) Intersection Analysis

Lord of Life SimTraffic Delay Summary - Existing AM Peak Traffic										
Intersection	Control	Approach	Operations by Movement						Overall Intersection	
			Left		Through		Right			
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	Delay (sec/veh)	LOS	LOS
CSAH 5 & Sunwood Drive	Minor Road Stop	EB	13.7	B	11.0	B	6.9	A	13.9	B
		WB	13.9	B	11.1	B	1.5	A		
		NB	2.0	A	0.8	A	0.2	A		
		SB	-	-	1.3	A	0.1	A		
Sunwood Drive & Cobalt Street	Minor Road Stop	EB	0.0	A	2.1	A	2.4	A	4.5	B
		WB	1.7	A	0.6	A	0.0	A		
		NB	4.5	A	-	-	2.3	A		
		SB	-	-	-	-	-	-		
MN-47 & Sunwood Drive	Signal	EB	44.8	D	45.0	D	6.3	A	7.2	A
		WB	40.1	D	41.8	D	5.8	A		
		NB	51.8	D	5.8	A	3.5	A		
		SB	63.6	E	3.5	A	1.6	A		
CSAH 5 & 146th Avenue	Minor Road Stop	EB	5.1	A	0.0	A	10.0	A	10.0	A
		WB	2.2	A	-	-	-	-		
		NB	0.4	A	0.1	A	1.3	A		
		SB	-	-	0.4	A	1.4	A		
CSAH 5 & Lord of Life Access	Minor Road Stop	EB	-	-	-	-	-	-	2.3	A
		WB	-	-	-	-	2.3	A		
		NB	-	-	0.4	A	-	-		
		SB	-	-	0.7	A	-	-		
CSAH 5 & Iodine Street	Minor Road Stop	EB	10.1	B	-	-	6.3	A	10.1	B
		WB	-	-	-	-	-	-		
		NB	6.1	A	0.7	A	0.2	A		
		SB	0.7	A	1.3	A	0.2	A		
CSAH 5 & Dysprosium Street	Minor Road Stop	EB	-	-	2.2	A	0.8	A	15.2	C
		WB	11.3	B	1.3	A	-	-		
		NB	15.2	C	-	-	5.1	A		
		SB	-	-	-	-	-	-		
MN-47 & CSAH 5	Signal	EB	23.2	C	34.5	C	3.5	A	16.8	B
		WB	42.1	D	32.8	C	6.6	A		
		NB	46.3	D	6.6	A	1.4	A		
		SB	45.7	D	18.5	B	6.8	A		

Table 3 – Existing Year (2023) Intersection Analysis (Cont.)

Lord of Life SimTraffic Delay Summary - Existing PM Peak Hour										
Intersection	Control	Approach	Operations by Movement						Overall Intersection	
			Left		Through		Right			
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
CSAH 5 & Sunwood Drive	Minor Road Stop	EB	21.0	C	9.0	A	2.2	A	28.6	D
		WB	28.6	D	15.8	C	1.4	A		
		NB	1.8	A	2.8	A	1.7	A		
		SB	1.2	A	1.1	A	0.3	A		
Sunwood Drive & Cobalt Street	Minor Road Stop	EB	0.0	A	0.0	A	0.0	A	4.5	A
		WB	0.0	A	0.0	A	0.0	A		
		NB	1.1	A	0.3	A	0.7	A		
		SB	4.5	A	2.4	A	1.8	A		
MN-47 & Sunwood Drive	Signal	EB	49.3	D	0.2	A	3.4	A	13.1	B
		WB	59.1	E	72.1	E	0.0	A		
		NB	31.3	C	13.4	B	7.7	A		
		SB	20.1	C	2.9	A	0.0	A		
CSAH 5 & 146th Avenue	Minor Road Stop	EB	4.6	A	0.0	A	-	-	4.6	A
		WB	-	-	0.0	A	-	-		
		NB	0.3	A	0.5	A	0.0	A		
		SB	-	-	0.5	A	0.1	A		
CSAH 5 & Lord of Life Access	Minor Road Stop	EB	-	-	-	-	-	-	2.4	A
		WB	-	-	-	-	2.4	A		
		NB	-	-	0.4	A	-	-		
		SB	-	-	0.4	A	-	-		
CSAH 5 & Iodine Street	Minor Road Stop	EB	40.2	E	-	-	2.8	A	40.2	E
		WB	-	-	-	-	-	-		
		NB	-	-	1.3	A	0.0	A		
		SB	7.9	A	0.5	A	-	-		
CSAH 5 & Dysprosium Street	Minor Road Stop	EB	-	-	1.4	A	0.3	A	8.4	A
		WB	3.4	A	1.9	A	-	-		
		NB	8.4	A	-	-	3.6	A		
		SB	-	-	-	-	-	-		
MN-47 & CSAH 5	Signal	EB	58.1	E	26.8	C	1.6	A	20.4	C
		WB	58.3	E	55.6	E	39.3	D		
		NB	40.2	D	9.6	A	2.2	A		
		SB	34.3	C	13.7	B	12.9	B		

Table 3 – Existing Year (2023) Intersection Analysis (Cont.)

Lord of Life SimTraffic Delay Summary - Existing Sunday Peak Traffic										
Intersection	Control	Approach	Operations by Movement						Overall Intersection	
			Left		Through		Right			
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
CSAH 5 & Sunwood Drive	Minor Road Stop	EB	5.2	A	7.2	A	2.5	A	8.5	A
		WB	5.5	A	8.5	A	1.5	A		
		NB	1.4	A	1.2	A	0.1	A		
		SB	-	-	0.8	A	0.1	A		
Sunwood Drive & Cobalt Street	Minor Road Stop	EB	0.0	A	1.4	A	1.6	A	2.1	A
		WB	1.9	A	1.1	A	0.0	A		
		NB	-	-	-	-	2.1	A		
		SB	-	-	-	-	-	-		
MN-47 & Sunwood Drive	Signal	EB	36.6	D	16.1	B	5.6	A	7.1	A
		WB	44.1	D	36.8	D	5.7	A		
		NB	30.1	C	5.7	A	3.2	A		
		SB	31.5	C	2.9	A	0.1	A		
CSAH 5 & 146th Avenue	Minor Road Stop	EB	4.3	A	0.0	A	2.5	A	4.3	A
		WB	4.2	A	0.0	A	-	-		
		NB	0.4	A	0.6	A	0.1	A		
		SB	-	-	0.4	A	0.6	A		
CSAH 5 & Lord of Life Access	Minor Road Stop	EB	-	-	-	-	-	-	2.6	A
		WB	6.3	A	-	-	2.6	A		
		NB	-	-	0.5	A	-	-		
		SB	-	-	0.3	A	-	-		
CSAH 5 & Iodine Street	Minor Road Stop	EB	-	-	6.1	A	2.8	A	6.1	A
		WB	4.8	A	5.7	A	2.5	A		
		NB	1.7	A	0.7	A	0.1	A		
		SB	3.2	A	0.6	A	0.1	A		
CSAH 5 & Dysprosium Street	Minor Road Stop	EB	-	-	1.0	A	0.1	A	8.4	A
		WB	4.4	A	1.4	A	-	-		
		NB	8.4	A	-	-	2.6	A		
		SB	-	-	-	-	-	-		
MN-47 & CSAH 5	Signal	EB	64.2	E	41.1	D	2.0	A	17.3	B
		WB	51.4	D	37.6	D	21.7	C		
		NB	46.7	D	5.2	A	1.4	A		
		SB	68.5	E	14.6	B	3.3	A		

Based on the Existing Year (2023) capacity analysis, the study intersections are anticipated to operate at LOS B or better in the morning and C or better at the evening peak hour. The SimTraffic reports are provided in **Appendix D.** All 95th percentile queues are anticipated to remain within their respective storage bays. All individual movements are anticipated to operate at LOS D or better, except for the following:

During the morning peak hours, the northbound through movement of MN-47 operates at LOS E. This is likely due to the signal timing favoring the southbound through/left movement which sees around four times as much traffic at this time. At the same intersection, the westbound left and through movements are also operating at LOS E in the PM peak hours. Finally, the eastbound left and southbound left intersections operate at LOS E in the Sunday peak, these movements are low volume and are not anticipated to have queuing issues.

All movements at stop-controlled intersections operate at LOS D or better except the eastbound left movement at CSAH 5 & Iodine St which operates at LOS E. Queues for the movement are minimal and delays are expected for minor side street movements along a corridor like CSAH 5.

OPENING YEAR (2027) NO-BUILD CONDITIONS

A capacity analysis was performed for Opening Year (2027) No-Build conditions in order to develop baseline operating conditions for the opening year. The analysis was performed using Synchro/SimTraffic. The three site accesses were modeled with the existing geometry and intersection control. The four study intersections were also modeled with the existing geometry and intersection control. The traffic volumes are provided in **Exhibit 4**. The results of the analysis are provided in **Table 4**.

Table 4 – Opening Year (2027) No-Build Intersection Analysis

Lord of Life SimTraffic Delay Summary - 2027 AM No Build Peak Traffic										
Intersection	Control	Approach	Operations by Movement						Overall Intersection	
			Left		Through		Right			
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
CSAH 5 & Sunwood Drive	Minor Road Stop	EB	8.5	A	11.6	B	6.2	A	11.8	B
		WB	11.3	B	11.8	B	2.6	A		
		NB	4.4	A	0.8	A	0.2	A		
		SB	0.7	A	1.3	A	0.2	A		
Sunwood Drive & Cobalt Street	Minor Road Stop	EB	0.0	A	2.3	A	1.5	A	4.4	A
		WB	-	-	1.0	A	0.0	A		
		NB	4.4	A	-	-	2.2	A		
		SB	-	-	-	-	-	-		
MN-47 & Sunwood Drive	Signal	EB	46.6	D	50.1	D	7.6	A	8.7	A
		WB	44.2	D	48.4	D	5.4	A		
		NB	38.8	D	5.4	A	3.1	A		
		SB	50.9	D	4.3	A	1.1	A		
CSAH 5 & 146th Avenue	Minor Road Stop	EB	5.1	A	0.0	A	9.8	A	9.8	A
		WB	3.2	A	-	-	-	-		
		NB	0.6	A	0.0	A	1.3	A		
		SB	-	-	0.4	A	1.5	A		
CSAH 5 & Lord of Life Access	Minor Road Stop	EB	-	-	-	-	-	-	1.4	A
		WB	-	-	-	-	1.4	A		
		NB	-	-	0.3	A	-	-		
		SB	-	-	0.7	A	-	-		
CSAH 5 & Iodine Street	Minor Road Stop	EB	8.9	A	-	-	7.5	A	8.9	A
		WB	-	-	-	-	-	-		
		NB	6.0	A	0.6	A	0.2	A		
		SB	1.8	A	1.3	A	0.2	A		
CSAH 5 & Dysprosium Street	Minor Road Stop	EB	-	-	2.2	A	0.8	A	14.1	B
		WB	8.8	A	1.2	A	-	-		
		NB	14.1	B	-	-	6.0	A		
		SB	-	-	-	-	-	-		
MN-47 & CSAH 5	Signal	EB	39.0	D	37.0	D	3.6	A	17.1	B
		WB	48.5	D	34.9	C	8.5	A		
		NB	47.3	D	6.0	A	1.6	A		
		SB	44.0	D	18.2	B	6.4	A		

For Side Street Stop intersections, the worst individual movement was reported for the overall intersection LOS.

Table 4 – Opening Year (2027) No-Build Intersection Analysis (Cont.)

Lord of Life SimTraffic Delay Summary – 2027 No Build PM Peak Hour										
Intersection	Control	Approach	Operations by Movement						Overall Intersection	
			Left		Through		Right			
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
CSAH 5 & Sunwood Drive	Minor Road Stop	EB	20.2	C	20.0	C	6.9	A	20.2	C
		WB	19.5	C	5.6	A	-	-		
		NB	3.5	A	4.3	A	1.3	A		
		SB	3.9	A	1.0	A	0.1	A		
Sunwood Drive & Cobalt Street	Minor Road Stop	EB	0.0	A	2.0	A	1.3	A	2.0	A
		WB	0.0	A	0.0	A	0.0	A		
		NB	-	-	-	-	2.0	A		
		SB	-	-	-	-	-	-		
MN-47 & Sunwood Drive	Signal	EB	16.7	B	74.5	E	3.9	A	12.7	B
		WB	66.3	E	0.0	A	3.2	A		
		NB	-	-	13.8	B	6.9	A		
		SB	35.3	D	1.6	A	-	-		
CSAH 5 & 146th Avenue	Minor Road Stop	EB	6.7	A	0.0	A	3.3	A	14.5	B
		WB	14.5	B	0.0	A	-	-		
		NB	0.6	A	1.6	A	-	-		
		SB	0.2	A	0.6	A	-	-		
CSAH 5 & Lord of Life Access	Minor Road Stop	EB	-	-	-	-	-	-	0.8	A
		WB	-	-	-	-	-	-		
		NB	-	-	0.8	A	-	-		
		SB	-	-	0.6	A	-	-		
CSAH 5 & Iodine Street	Minor Road Stop	EB	-	-	-	-	5.0	A	7.0	A
		WB	-	-	-	-	5.5	A		
		NB	-	-	1.7	A	0.8	A		
		SB	7.0	A	0.8	A	-	-		
CSAH 5 & Dysprosium Street	Minor Road Stop	EB	-	-	1.8	A	0.3	A	18.7	C
		WB	3.0	A	2.3	A	-	-		
		NB	18.7	C	-	-	3.7	A		
		SB	-	-	-	-	-	-		
MN-47 & CSAH 5	Signal	EB	59.2	E	42.2	D	2.2	A	21.5	C
		WB	24.6	C	53.4	D	27.1	C		
		NB	40.1	D	11.6	B	2.0	A		
		SB	42.2	D	20.6	C	2.2	A		

For Side Street Stop intersections, the worst individual movement was reported for the overall intersection LOS.

Lord of Life SimTraffic Delay Summary - Sunday 2027 No Build Peak Traffic										
Intersection	Control	Approach	Operations by Movement						Overall Intersection	
			Left		Through		Right			
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
CSAH 5 & Sunwood Drive	Minor Road Stop	EB	4.5	A	7.8	A	1.6	A	7.8	A
		WB	6.4	A	6.5	A	1.4	A		
		NB	1.7	A	1.3	A	0.5	A		
		SB	-	-	0.6	A	0.2	A		
Sunwood Drive & Cobalt Street	Minor Road Stop	EB	0.0	A	1.3	A	1.3	A	2.0	A
		WB	2.0	A	0.9	A	0.0	A		
		NB	-	-	-	-	2.0	A		
		SB	-	-	-	-	-	-		
MN-47 & Sunwood Drive	Signal	EB	76.4	E	48.8	D	4.0	A	7.0	A
		WB	36.0	D	57.2	E	3.1	A		
		NB	45.6	D	5.4	A	2.6	A		
		SB	29.3	C	3.7	A	0.8	A		
CSAH 5 & 146th Avenue	Minor Road Stop	EB	-	-	0.0	A	2.7	A	4.2	A
		WB	4.2	A	0.0	A	-	-		
		NB	0.5	A	0.8	A	0.1	A		
		SB	-	-	0.4	A	0.1	A		
CSAH 5 & Lord of Life Access	Minor Road Stop	EB	-	-	-	-	-	-	5.5	A
		WB	5.5	A	-	-	3.5	A		
		NB	-	-	0.6	A	-	-		
		SB	-	-	0.2	A	-	-		
CSAH 5 & Iodine Street	Minor Road Stop	EB	-	-	9.8	A	2.5	A	9.8	A
		WB	4.4	A	-	-	-	-		
		NB	1.6	A	0.9	A	0.0	A		
		SB	2.7	A	0.4	A	0.0	A		
CSAH 5 & Dysprosium Street	Minor Road Stop	EB	-	-	1.0	A	0.2	A	4.6	A
		WB	4.1	A	1.9	A	-	-		
		NB	4.6	A	-	-	1.6	A		
		SB	-	-	-	-	-	-		
MN-47 & CSAH 5	Signal	EB	58.6	E	32.2	C	1.7	A	20.0	B
		WB	55.0	D	43.2	D	11.1	B		
		NB	55.5	E	7.5	A	1.4	A		
		SB	56.4	E	15.1	B	6.0	A		

With the addition of background traffic growth, the study area intersections are projected to experience very little change in delay with the majority of movements and approaches projected to operate at the same LOS as compared to existing conditions. All intersections operate at the same level of service as the existing conditions and no movement has significantly worsened delay.

The SimTraffic reports are provided in **Appendix D.** All 95th percentile queues are anticipated to remain within their respective storage bays.

OPENING YEAR (2027) BUILD CONDITIONS

Opening Year (2027) Build conditions were analyzed to determine any traffic impacts from the addition of the site traffic to the study intersections. The site accesses were modeled as side street stop control. Opening Year (2027) Build turning movement volumes were developed by adding the site trips in **Exhibit 8** to the Opening Year (2027) No-Build turning movement volumes in **Exhibit 4**. The Opening Year (2027) Build turning movement volumes are shown in **Exhibit 8**. The results of the analysis are provided in **Table 5**.

Table 5 – Opening Year (2027) Build Intersection Analysis

Lord of Life SimTraffic Delay Summary - 2027 AM Build Peak Traffic											
Intersection	Control	Approach	Operations by Movement						Overall Intersection	
			Left		Through		Right			
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
CSAH 5 & Sunwood Drive	Minor Road Stop	EB	7.3	A	10.9	B	6.3	A	13.0	B
		WB	12.6	B	13.0	B	2.9	A		
		NB	3.1	A	0.8	A	0.1	A		
		SB	0.5	A	1.3	A	0.1	A		
Sunwood Drive & Cobalt Street	Minor Road Stop	EB	0.0	A	2.2	A	2.0	A	4.6	A
		WB	1.9	A	1.1	A	0.0	A		
		NB	4.6	A	-	-	2.6	A		
		SB	-	-	-	-	-	-		
MN-47 & Sunwood Drive	Signal	EB	31.2	C	43.4	D	6.5	A	8.8	A
		WB	44.3	D	44.9	D	8.6	A		
		NB	48.3	D	5.3	A	2.9	A		
		SB	44.1	D	4.5	A	1.4	A		
CSAH 5 & 146th Avenue	Minor Road Stop	EB	6.4	A	0.0	A	8.1	A	6.4	A
		WB	2.7	A	-	-	-	-		
		NB	0.5	A	0.0	A	1.4	A		
		SB	-	-	0.8	A	1.5	A		
CSAH 5 & Lord of Life Access	Minor Road Stop	EB	-	-	-	-	-	-	10.0	A
		WB	10.0	A	-	-	3.0	A		
		NB	-	-	0.4	A	0.0	A		
		SB	1.0	A	0.8	A	-	-		
CSAH 5 & Iodine Street	Minor Road Stop	EB	11.6	B	-	-	15.5	C	24.5	C
		WB	24.5	C	-	-	18.2	C		
		NB	9.6	A	0.7	A	0.4	A		
		SB	1.7	A	2.1	A	0.4	A		
CSAH 5 & Dysprosium Street	Minor Road Stop	EB	-	-	2.7	A	1.1	A	25.2	D
		WB	12.6	B	1.2	A	-	-		
		NB	25.2	D	-	-	10.7	B		
		SB	-	-	-	-	-	-		
MN-47 & CSAH 5	Signal	EB	36.8	D	37.7	D	4.0	A	17.6	B
		WB	46.7	D	34.5	C	9.1	A		
		NB	45.8	D	5.9	A	1.2	A		
		SB	46.8	D	18.9	B	7.1	A		

For Side Street Stop intersections, the worst individual movement was reported for the overall intersection LOS.

Table 5 – Opening Year (2027) Build Intersection Analysis (Cont.)

Lord of Life SimTraffic Delay Summary - 2027 Build PM Peak Hour										
Intersection	Control	Approach	Operations by Movement						Overall Intersection	
			Left		Through		Right			
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
CSAH 5 & Sunwood Drive	Minor Road Stop	EB	13.0	B	12.9	B	7.1	A	20.6	C
		WB	20.6	C	12.8	B	2.7	A		
		NB	3.9	A	0.9	A	0.2	A		
		SB	1.3	A	1.8	A	0.2	A		
Sunwood Drive & Cobalt Street	Minor Road Stop	EB	0.0	A	0.9	A	1.3	A	4.6	A
		WB	0.0	A	1.0	A	0.0	A		
		NB	4.6	A	-	-	2.1	A		
		SB	-	-	-	-	-	-		
MN-47 & Sunwood Drive	Signal	EB	48.1	D	2.3	A	13.3	B	8.5	A
		WB	49.1	D	63.2	E	10.2	B		
		NB	70.3	E	7.3	A	2.8	A		
		SB	37.2	E	4.1	A	0.6	A		
CSAH 5 & 146th Avenue	Minor Road Stop	EB	19.2	C	0.0	A	5.0	A	19.2	C
		WB	8.4	A	0.0	A	-	-		
		NB	2.3	A	0.3	A	0.0	A		
		SB	-	-	1.5	A	1.0	A		
CSAH 5 & Lord of Life Access	Minor Road Stop	EB	-	-	-	-	-	-	0.7	A
		WB	-	-	-	-	-	-		
		NB	-	-	0.3	A	-	-		
		SB	0.3	A	0.7	A	-	-		
CSAH 5 & Iodine Street	Minor Road Stop	EB	26.8	D	-	-	18.5	C	26.8	D
		WB	23.8	C	-	-	14.6	B		
		NB	5.2	A	0.6	A	0.3	A		
		SB	2.8	A	1.9	A	0.4	A		
CSAH 5 & Dysprosium Street	Minor Road Stop	EB	-	-	2.6	A	1.1	A	18.5	C
		WB	7.6	A	1.0	A	-	-		
		NB	18.5	C	-	-	8.2	A		
		SB	-	-	-	-	-	-		
MN-47 & CSAH 5	Signal	EB	51.2	D	41.5	D	3.5	A	21.7	C
		WB	52.8	D	46.0	D	21.1	C		
		NB	45.6	D	7.6	A	1.3	A		
		SB	64.2	E	30.0	C	7.6	A		

For Side Street Stop intersections, the worst individual movement was reported for the overall intersection LOS.

Lord of Life SimTraffic Delay Summary - Sunday 2027 Build Peak Traffic										
Intersection	Control	Approach	Operations by Movement						Overall Intersection	
			Left		Through		Right			
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
CSAH 5 & Sunwood Drive	Minor Road Stop	EB	15.5	C	17.0	C	5.8	A	19.2	C
		WB	19.2	C	13.6	B	1.7	A		
		NB	4.3	A	1.1	A	0.2	A		
		SB	1.3	A	1.8	A	0.2	A		
Sunwood Drive & Cobalt Street	Minor Road Stop	EB	0.0	A	1.1	A	0.3	A	4.1	A
		WB	0.0	A	0.8	A	0.0	A		
		NB	4.1	A	-	-	2.3	A		
		SB	-	-	-	-	-	-		
MN-47 & Sunwood Drive	Signal	EB	43.6	D	33.6	C	4.8	A	8.4	A
		WB	40.3	D	41.0	D	10.0	A		
		NB	28.4	C	4.1	A	1.1	A		
		SB	77.1	E	5.6	A	0.6	A		
CSAH 5 & 146th Avenue	Minor Road Stop	EB	8.1	A	0.0	A	6.2	A	15.3	C
		WB	15.3	C	0.0	A	-	-		
		NB	4.7	A	0.6	A	0.0	A		
		SB	-	-	1.6	A	0.0	A		
CSAH 5 & Lord of Life Access	Minor Road Stop	EB	-	-	-	-	-	-	2.5	A
		WB	-	-	-	-	2.5	A		
		NB	-	-	0.3	A	0.0	A		
		SB	0.3	A	0.8	A	-	-		
CSAH 5 & Iodine Street	Minor Road Stop	EB	5.5	A	-	-	17.7	C	19.5	C
		WB	19.5	C	-	-	7.6	A		
		NB	8.1	A	0.6	A	0.4	A		
		SB	2.1	A	2.1	A	0.4	A		
CSAH 5 & Dysprosium Street	Minor Road Stop	EB	-	-	2.8	A	1.2	A	25.1	D
		WB	15.8	C	1.1	A	-	-		
		NB	25.1	D	-	-	6.5	A		
		SB	-	-	-	-	-	-		
MN-47 & CSAH 5	Signal	EB	65.5	E	47.9	D	4.2	A	17.3	B
		WB	45.6	D	39.2	D	4.2	A		
		NB	52.4	D	7.2	A	1.0	A		
		SB	58.1	E	16.1	B	6.4	A		

With the addition of site-generated traffic, the study area intersections are projected to experience very little change in delay with all of the intersections and almost all movements operating at the same level of service. A few of the left turn movements do however operate very close to level of service F which is not ideal but is considered acceptable for low volume movements.

The SimTraffic reports are provided in **Appendix D**.

HORIZON YEAR (2040) NO-BUILD CONDITIONS

A capacity analysis was performed for Horizon Year (2040) No-Build conditions in order to develop baseline operating conditions for the design year. The two site accesses were modeled with the existing geometry and intersection control. The traffic volumes are provided in Exhibit 5. The results of the analysis are provided in **Table 6.**

Table 6 – Horizon Year (2040) No-Build Intersection Analysis

Lord of Life SimTraffic Delay Summary - 2040 AM No Build Peak Traffic											
Intersection	Control	Approach	Operations by Movement						Overall Intersection	
			Left		Through		Right			
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
CSAH 5 & Sunwood Drive	Minor Road Stop	EB	13.6	B	12.3	B	7.6	A	15.4	C
		WB	13.6	B	15.4	C	2.1	A		
		NB	5.0	A	1.2	A	0.2	A		
		SB	0.5	A	1.4	A	0.2	A		
Sunwood Drive & Cobalt Street	Minor Road Stop	EB	0.0	A	1.8	A	1.9	A	4.2	A
		WB	-	-	1.1	A	0.0	A		
		NB	4.2	A	-	-	2.4	A		
		SB	-	-	-	-	-	-		
MN-47 & Sunwood Drive	Signal	EB	44.9	D	38.0	D	7.3	A	8.2	A
		WB	48.9	D	39.6	D	5.2	A		
		NB	59.5	E	5.7	A	3.2	A		
		SB	53.5	D	4.2	A	0.9	A		
CSAH 5 & 146th Avenue	Minor Road Stop	EB	7.8	A	0.0	A	10.6	B	10.6	B
		WB	4.2	A	-	-	-	-		
		NB	0.6	A	0.0	A	1.5	A		
		SB	-	-	0.4	A	1.7	A		
CSAH 5 & Lord of Life Access	Minor Road Stop	EB	-	-	-	-	-	-	3.1	A
		WB	-	-	-	-	3.1	A		
		NB	-	-	0.4	A	-	-		
		SB	-	-	0.7	A	-	-		
CSAH 5 & Iodine Street	Minor Road Stop	EB	25.0	C	-	-	9.5	A	25.0	C
		WB	-	-	-	-	-	-		
		NB	6.0	A	0.7	A	0.2	A		
		SB	1.7	A	1.5	A	0.3	A		
CSAH 5 & Dysprosium Street	Minor Road Stop	EB	-	-	2.6	A	1.0	A	18.1	C
		WB	13.2	B	1.3	A	-	-		
		NB	18.1	C	-	-	7.4	A		
		SB	-	-	-	-	-	-		
MN-47 & CSAH 5	Signal	EB	36.9	D	34.9	C	4.0	A	17.7	B
		WB	50.4	D	32.5	C	5.9	A		
		NB	46.1	D	6.4	A	1.6	A		
		SB	47.3	D	19.1	B	6.2	A		

For Side Street Stop intersections, the worst individual movement was reported for the overall intersection LOS.

Table 6 – Horizon Year (2040) No-Build Intersection Analysis (Cont.)

Lord of Life SimTraffic Delay Summary - 2040 PM No Build Peak Traffic										
Intersection	Control	Approach	Operations by Movement						Overall Intersection	
			Left		Through		Right			
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
CSAH 5 & Sunwood Drive	Minor Road Stop	EB	11.4	B	15.8	C	3.8	A	15.8	C
		WB	14.3	B	13.4	B	3.5	A		
		NB	4.3	A	4.4	A	1.3	A		
		SB	2.7	A	1.3	A	0.2	A		
Sunwood Drive & Cobalt Street	Minor Road Stop	EB	0.0	A	1.2	A	1.1	A	4.1	A
		WB	3.0	A	1.2	A	0.0	A		
		NB	4.1	A	-	-	1.9	A		
		SB	-	-	-	-	-	-		
MN-47 & Sunwood Drive	Signal	EB	60.1	E	64.7	E	14.1	B	14.0	B
		WB	58.6	E	57.1	E	15.5	B		
		NB	60.0	E	13.7	B	8.5	A		
		SB	64.9	E	3.8	A	1.0	A		
CSAH 5 & 146th Avenue	Minor Road Stop	EB	3.9	A	0.0	A	10.7	B	10.7	B
		WB	2.1	A	-	-	-	-		
		NB	1.3	A	0.1	A	3.8	A		
		SB	1.0	A	0.5	A	1.3	A		
CSAH 5 & Lord of Life Access	Minor Road Stop	EB	-	-	-	-	-	-	14.1	B
		WB	14.1	B	-	-	5.4	A		
		NB	-	-	0.9	A	-	-		
		SB	-	-	0.6	A	-	-		
CSAH 5 & Iodine Street	Minor Road Stop	EB	12.5	B	-	-	3.5	A	15.4	C
		WB	15.4	C	-	-	10.6	B		
		NB	-	-	1.8	A	0.3	A		
		SB	5.5	A	0.8	A	0.2	A		
CSAH 5 & Dysprosium Street	Minor Road Stop	EB	-	-	1.8	A	0.2	A	17.0	C
		WB	7.0	A	3.0	A	-	-		
		NB	17.0	C	-	-	5.5	A		
		SB	-	-	-	-	-	-		
MN-47 & CSAH 5	Signal	EB	55.2	E	37.3	D	2.5	A	22.7	C
		WB	46.4	D	45.2	D	29.6	C		
		NB	50.9	D	11.9	B	2.3	A		
		SB	50.9	D	20.8	C	5.3	A		

For Side Street Stop intersections, the worst individual movement was reported for the overall intersection LOS.

Lord of Life SimTraffic Delay Summary - 2040 SUN No Build Peak Traffic										
Intersection	Control	Approach	Operations by Movement						Overall Intersection	
			Left		Through		Right			
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
CSAH 5 & Sunwood Drive	Minor Road Stop	EB	5.4	A	7.8	A	2.2	A	7.8	A
		WB	5.7	A	7.9	A	2.4	A		
		NB	1.2	A	1.2	A	0.2	A		
		SB	-	-	0.7	A	0.1	A		
Sunwood Drive & Cobalt Street	Minor Road Stop	EB	0.0	A	1.2	A	1.5	A	2.5	A
		WB	2.5	A	0.7	A	0.0	A		
		NB	2.1	A	-	-	1.6	A		
		SB	-	-	-	-	-	-		
MN-47 & Sunwood Drive	Signal	EB	37.4	D	29.8	C	6.3	A	6.5	A
		WB	39.7	D	31.1	C	2.0	A		
		NB	43.7	D	5.2	A	3.4	A		
		SB	39.3	D	3.2	A	0.5	A		
CSAH 5 & 146th Avenue	Minor Road Stop	EB	2.8	A	0.0	A	6.0	A	6.0	A
		WB	1.2	A	-	-	-	-		
		NB	0.6	A	0.1	A	0.5	A		
		SB	-	-	0.3	A	0.7	A		
CSAH 5 & Lord of Life Access	Minor Road Stop	EB	-	-	-	-	-	-	5.8	A
		WB	5.8	A	-	-	3.2	A		
		NB	-	-	0.4	A	-	-		
		SB	-	-	0.3	A	-	-		
CSAH 5 & Iodine Street	Minor Road Stop	EB	8.8	A	3.3	A	2.9	A	15.3	C
		WB	6.8	A	15.3	C	2.3	A		
		NB	2.1	A	0.7	A	0.1	A		
		SB	1.7	A	0.5	A	0.1	A		
CSAH 5 & Dysprosium Street	Minor Road Stop	EB	-	-	1.0	A	0.2	A	6.5	A
		WB	4.3	A	1.5	A	-	-		
		NB	6.5	A	-	-	2.2	A		
		SB	-	-	-	-	-	-		
MN-47 & CSAH 5	Signal	EB	46.8	D	42.2	D	2.0	A	17.6	B
		WB	55.5	E	45.7	D	11.9	B		
		NB	50.6	D	5.7	A	1.3	A		
		SB	62.0	E	13.1	B	4.9	A		

With additional background traffic growth, the study area intersections are projected to experience some change in delay, with some of movements and approaches projected to operate at a lower LOS as compared to the Opening Year (2027) No-Build Conditions. The network is expected to need new signal timings in order to operate at an acceptable level of service. Specifically, the stoplight at MN-47 & Sunwood Drive may need protected left turn phases in order for the left turn movements to operate at a LOS of D or better.

The SimTraffic reports are provided in **Appendix D**.

HORIZON YEAR (2040) BUILD CONDITIONS

The Horizon Year (2040) Build traffic volumes were developed from the addition of the Horizon Year (2040) No-Build volumes in Exhibit 5 and the Site Trips in Exhibit 7. **Exhibit 9** shows the Horizon Year (2040) Build turning movement volumes. The site accesses were modeled as side street stop control. The results of the analysis are provided in **Table 7**.

Table 7 – Horizon Year (2040) Build Intersection Analysis

Lord of Life SimTraffic Delay Summary - AM 2040 Build Peak Traffic											
Intersection	Control	Approach	Operations by Movement						Overall Intersection	
			Left		Through		Right			
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
CSAH 5 & Sunwood Drive	Minor Road Stop	EB	15.5	C	11.7	B	6.4	A	15.5	C
		WB	10.4	B	11.3	B	2.8	A		
		NB	4.2	A	1.1	A	0.2	A		
		SB	0.3	A	1.5	A	0.1	A		
Sunwood Drive & Cobalt Street	Minor Road Stop	EB	0.0	A	1.7	A	2.0	A	4.4	A
		WB	2.7	A	0.7	A	0.0	A		
		NB	4.4	A	-	-	2.4	A		
		SB	-	-	-	-	-	-		
MN-47 & Sunwood Drive	Signal	EB	49.0	D	40.7	D	4.5	A	8.3	A
		WB	39.9	D	37.0	D	2.3	A		
		NB	39.3	D	4.4	A	2.7	A		
		SB	65.7	E	5.3	A	0.9	A		
CSAH 5 & 146th Avenue	Minor Road Stop	EB	60.2	F	0.0	A	5.9	A	60.2	F
		WB	9.9	A	0.0	A	-	-		
		NB	6.2	A	1.2	A	0.0	A		
		SB	-	-	1.4	A	0.5	A		
CSAH 5 & Lord of Life Access	Minor Road Stop	EB	-	-	-	-	-	-	10.0	A
		WB	10.0	A	-	-	2.3	A		
		NB	-	-	0.4	A	0.0	A		
		SB	-	-	0.8	A	-	-		
CSAH 5 & Iodine Street	Minor Road Stop	EB	12.7	B	-	-	30.8	D	31.5	D
		WB	31.5	D	-	-	8.4	A		
		NB	6.8	A	0.8	A	0.3	A		
		SB	1.7	A	2.1	A	0.7	A		
CSAH 5 & Dysprosium Street	Minor Road Stop	EB	-	-	3.1	A	1.1	A	35.7	E
		WB	15.3	C	1.3	A	-	-		
		NB	35.7	E	-	-	16.2	C		
		SB	-	-	-	-	-	-		
MN-47 & CSAH 5	Signal	EB	36.4	D	32.3	C	4.7	A	19.6	B
		WB	41.4	D	35.4	D	14.2	B		
		NB	62.9	E	6.3	A	2.2	A		
		SB	53.1	D	21.1	C	8.1	A		

For Side Street Stop intersections, the worst individual movement was reported for the overall intersection LOS.

Table 7 – Design Year (2040) Build Intersection Analysis (Cont.)

Lord of Life SimTraffic Delay Summary - SUN 2040 Build Peak Traffic										
Intersection	Control	Approach	Operations by Movement						Overall Intersection	
			Left		Through		Right			
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
CSAH 5 & Sunwood Drive	Minor Road Stop	EB	4.7	A	9.2	A	2.7	A	7.5	A
		WB	7.5	A	6.1	A	1.8	A		
		NB	1.5	A	1.3	A	0.4	A		
		SB	-	-	0.7	A	0.1	A		
Sunwood Drive & Cobalt Street	Minor Road Stop	EB	0.0	A	1.3	A	0.9	A	2.3	A
		WB	2.1	A	0.7	A	0.0	A		
		NB	-	-	-	-	2.3	A		
		SB	-	-	-	-	-	-		
MN-47 & Sunwood Drive	Signal	EB	38.1	D	27.7	C	4.8	A	6.9	A
		WB	41.8	D	70.0	E	8.7	A		
		NB	38.3	D	5.9	A	3.8	A		
		SB	65.5	E	3.0	A	0.6	A		
CSAH 5 & 146th Avenue	Minor Road Stop	EB	2.9	A	0.0	A	6.9	A	6.9	A
		WB	1.1	A	-	-	-	-		
		NB	0.8	A	0.1	A	0.5	A		
		SB	-	-	0.2	A	0.7	A		
CSAH 5 & Lord of Life Access	Minor Road Stop	EB	-	-	-	-	-	-	5.7	A
		WB	5.7	A	-	-	3.2	A		
		NB	-	-	0.7	A	0.1	A		
		SB	2.6	A	0.4	A	-	-		
CSAH 5 & Iodine Street	Minor Road Stop	EB	-	-	11.1	B	3.6	A	11.1	B
		WB	7.9	A	6.0	A	3.3	A		
		NB	2.3	A	1.0	A	0.5	A		
		SB	1.3	A	0.8	A	1.7	A		
CSAH 5 & Dysprosium Street	Minor Road Stop	EB	-	-	1.4	A	0.3	A	7.0	A
		WB	5.3	A	1.3	A	-	-		
		NB	7.0	A	-	-	3.0	A		
		SB	-	-	-	-	-	-		
MN-47 & CSAH 5	Signal	EB	55.4	E	34.0	C	2.1	A	19.3	B
		WB	52.4	D	50.0	D	14.7	B		
		NB	47.2	D	6.8	A	1.2	A		
		SB	61.7	E	16.3	B	5.4	A		

For Side Street Stop intersections, the worst individual movement was reported for the overall intersection LOS.

Table 7 – Design Year (2040) Build Intersection Analysis (Cont.)

Lord of Life SimTraffic Delay Summary - PM 2040 Build Peak Traffic										
Intersection	Control	Approach	Operations by Movement						Overall Intersection	
			Left		Through		Right			
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
CSAH 5 & Sunwood Drive	Minor Road Stop	EB	18.4	C	14.1	B	3.1	A	19.3	C
		WB	19.3	C	17.1	C	3.9	A		
		NB	5.0	A	5.5	A	1.6	A		
		SB	1.0	A	1.1	A	0.2	A		
Sunwood Drive & Cobalt Street	Minor Road Stop	EB	0.0	A	1.4	A	0.5	A	2.9	A
		WB	2.6	A	1.2	A	0.0	A		
		NB	-	-	-	-	2.9	A		
		SB	-	-	-	-	-	-		
MN-47 & Sunwood Drive	Signal	EB	67.0	E	57.6	E	7.6	A	14.7	B
		WB	59.4	E	59.9	E	10.5	B		
		NB	76.1	E	13.0	B	7.1	A		
		SB	62.4	E	5.2	A	0.4	A		
CSAH 5 & 146th Avenue	Minor Road Stop	EB	17.5	C	0.0	A	3.0	A	17.5	C
		WB	11.3	B	0.0	A	-	-		
		NB	2.1	A	1.2	A	0.4	A		
		SB	1.5	A	0.8	A	0.1	A		
CSAH 5 & Lord of Life Access	Minor Road Stop	EB	-	-	-	-	-	-	14.1	B
		WB	14.1	B	-	-	3.6	A		
		NB	-	-	1.1	A	0.7	A		
		SB	3.8	A	0.7	A	-	-		
CSAH 5 & Iodine Street	Minor Road Stop	EB	13.5	B	-	-	5.1	A	18.5	C
		WB	18.5	C	-	-	6.5	A		
		NB	0.2	A	2.1	A	0.7	A		
		SB	6.9	A	1.1	A	0.0	A		
CSAH 5 & Dysprosium Street	Minor Road Stop	EB	-	-	2.1	A	0.6	A	20.4	C
		WB	8.2	A	3.1	A	-	-		
		NB	20.4	C	-	-	5.3	A		
		SB	-	-	-	-	-	-		
MN-47 & CSAH 5	Signal	EB	70.1	E	38.3	D	2.7	A	25.0	C
		WB	51.2	D	48.0	D	29.7	C		
		NB	50.7	D	11.8	B	2.5	A		
		SB	51.6	D	26.6	C	6.6	A		

With additional site traffic and background traffic growth, the study area intersections are projected to experience some change in delay, with some of movements and approaches projected to operate at a lower LOS as compared to Opening Year (2027) Build Conditions. The network is not expected to need significant mitigations along the corridor in order to operate at acceptable levels. Some minor changes at

the two signal-controlled intersections might be necessary, especially regarding timing. The signal timings were optimized when the 2040 builds were run but the phasing and cycle length were unchanged.

The LOS of the intersections is the same as in the 2040 no build scenario and the delays saw only a slight increase at most intersections as a result of the build. The LOS of the EBL and WBL turning movements worsened as a result of the project, both from LOS D to LOS E. The stoplight may need a protected left phase at the PM peak hour for these movements similar to what the NBL and SBL movements already have.

The project could also exacerbate the aforementioned issue with the left turns at the MN-47 & Sunwood Dr intersection, since these movements show higher delays and in some cases LOS when compared to the 2040 No Build Scenario.

The SimTraffic reports are provided in **Appendix D**.

TURN LANE WARRANTS AT NORTH SITE ACCESS

While the operations at the north site access are acceptable in all analysis scenarios, turn lane warrants were analyzed for the intersection in the build condition as the access is proposed to be converted from an exit only to full access. The necessity of southbound left turn lane and northbound right turn lane at CSAH 5 and the north site access was analyzed using NCHRP Report 457 – Evaluating Intersection Improvements: An Engineering Study Guide. CSAH 5 has a posted speed limit of 50 mph

The guidelines from NCHRP Report 457 recommend that if the plotted volumes are to the right of the curves for the speed of the major road listed, a right turn lane be considered. The PM Peak hour is the highest of the three peak hours in terms of volumes at the intersection. **Table 8** summarizes the results from Figure 2-6 from NCHRP Report 457. A northbound right turn lane is not warranted in 2027 or 2040.

Table 8 – Right-Turn Lane Warrants

Condition	Major Road Volume (veh/h)	Right Turn Volume (veh/h)	Limiting Right Turn Volume (veh/h)	Right Turn Warranted yes/no?
2027 – PM Peak Hour	442	5	28	No
2040 – PM Peak Hour	496	5	25	No

The guidelines from NCHRP Report 457 recommend that if the plotted volumes are to the right of the curves for the speed of the major road listed, a left turn lane be considered. The PM Peak hour is the highest of the three peak hours in terms of volumes at the intersection **Table 9** summarizes the results from Figure 2-5 from NCHRP Report 457. A southbound left turn lane is not warranted in 2027 or 2040.

Table 9 – Left-Turn Lane Warrants

Year of Build Condition	85th Percentile Speed (mph)	Percent Left in Advancing Volume	Advancing Volume (veh/h)	Opposing Volume (veh/h)	Left Turn Warranted yes/no?
2027	50	1	464	442	No
2040	50	1	520	496	No

CONCLUSIONS AND RECOMMENDATIONS

Presbyterian Homes is proposing a residential development consisting of 303 total Multifamily Housing Units, 173 units of Senior Adult Multifamily Housing building, and 22 Senior Single-family housing units. For a total of 498 housing units on site. The development is located on the block northwest of MN-47 (St Francis Blvd) & CSAH 5 (Nowthen Blvd) which is the area around the Lord of Life Church. The church will remain on site. The site is anticipated to generate 153 new trips during the AM peak hour (40 entering, 113 exiting), 168 new trips during the PM peak hour (100 entering, 68 exiting), and 161 new trips in the Sunday peak hour (86 entering, 75 exiting).

The site will include three (3) accesses. The northern access will be via Cobalt St to the north. The north access along CSAH 5 which leads to the north of the parking lot for the residential and church. The third access is across from Iodine St on CSAH 5, this access is expected to be the busiest of the three. The two accesses on CSAH 5 are in the same locations as the existing accesses and the Cobalt St access would be an extension of the current dead-end road.

A capacity analysis was performed for Existing Year (2023), Opening Year (2027) No-Build, Opening Year (2027) Build, Horizon Year (2040) No-Build, and Horizon Year (2040) Build. In all scenarios, the study intersections are anticipated to operate at LOS D or better in the weekday AM and PM peak hours as well as the Sunday peak hours. Analysis showed that the build conditions have minimal impacts on the LOS at the study area intersections. It is anticipated that all intersections will operate at acceptable LOS in the build conditions. There are some longer delays (LOS E/F) for minor side street movements at intersections along CSAH 5, however there is minimal queuing and anticipated delays are not uncommon on a higher volume corridor like CSAH 5.

No changes to the road geometry are necessary based on the operational analysis results with the addition of development traffic. Side-street stop control is adequate at the site accesses.

APPENDIX

A. Exhibits

B. Turning Movement Counts

C. Site Layout Exhibit

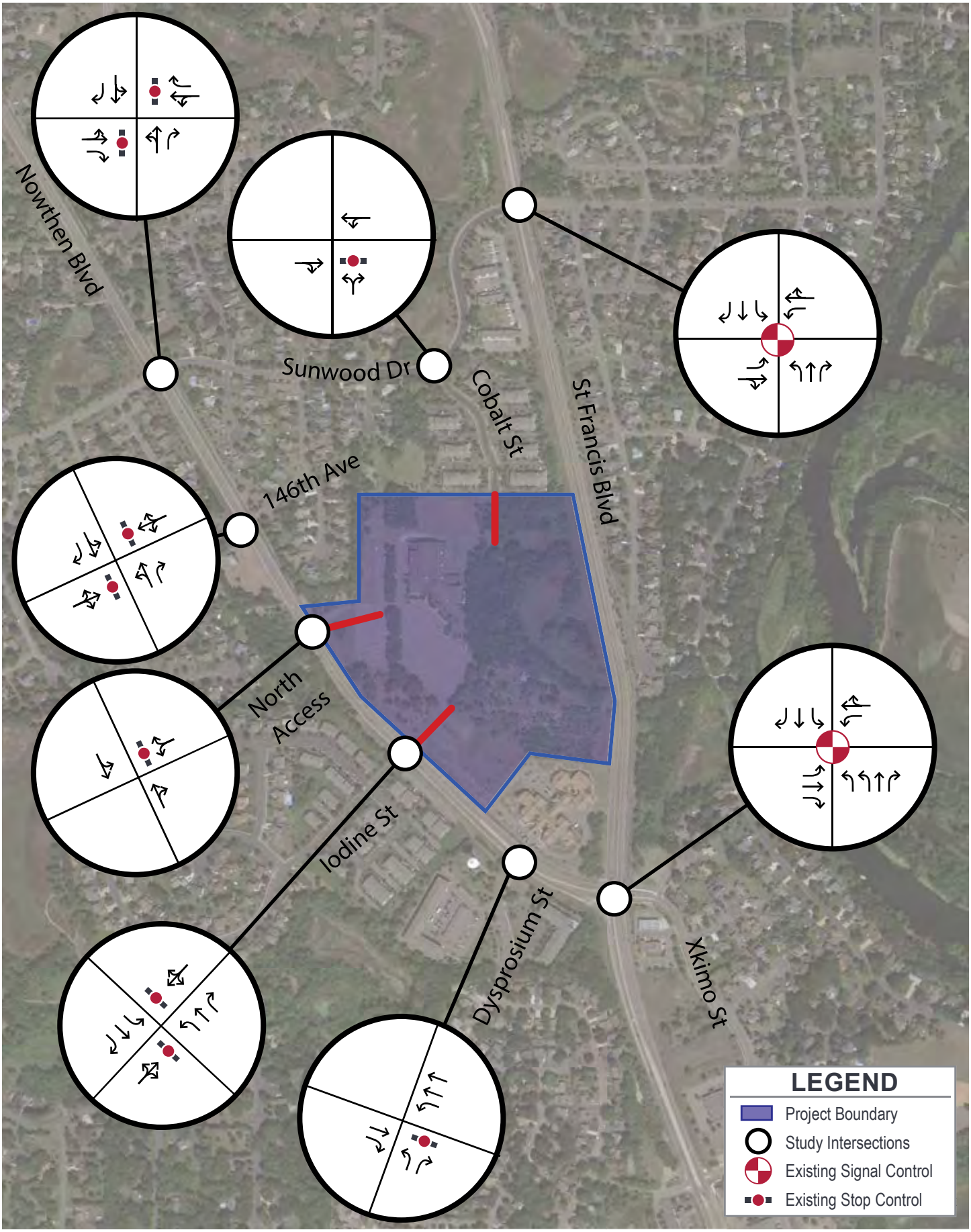
D. SimTraffic Analysis Results

A. Exhibits

Kimley»Horn

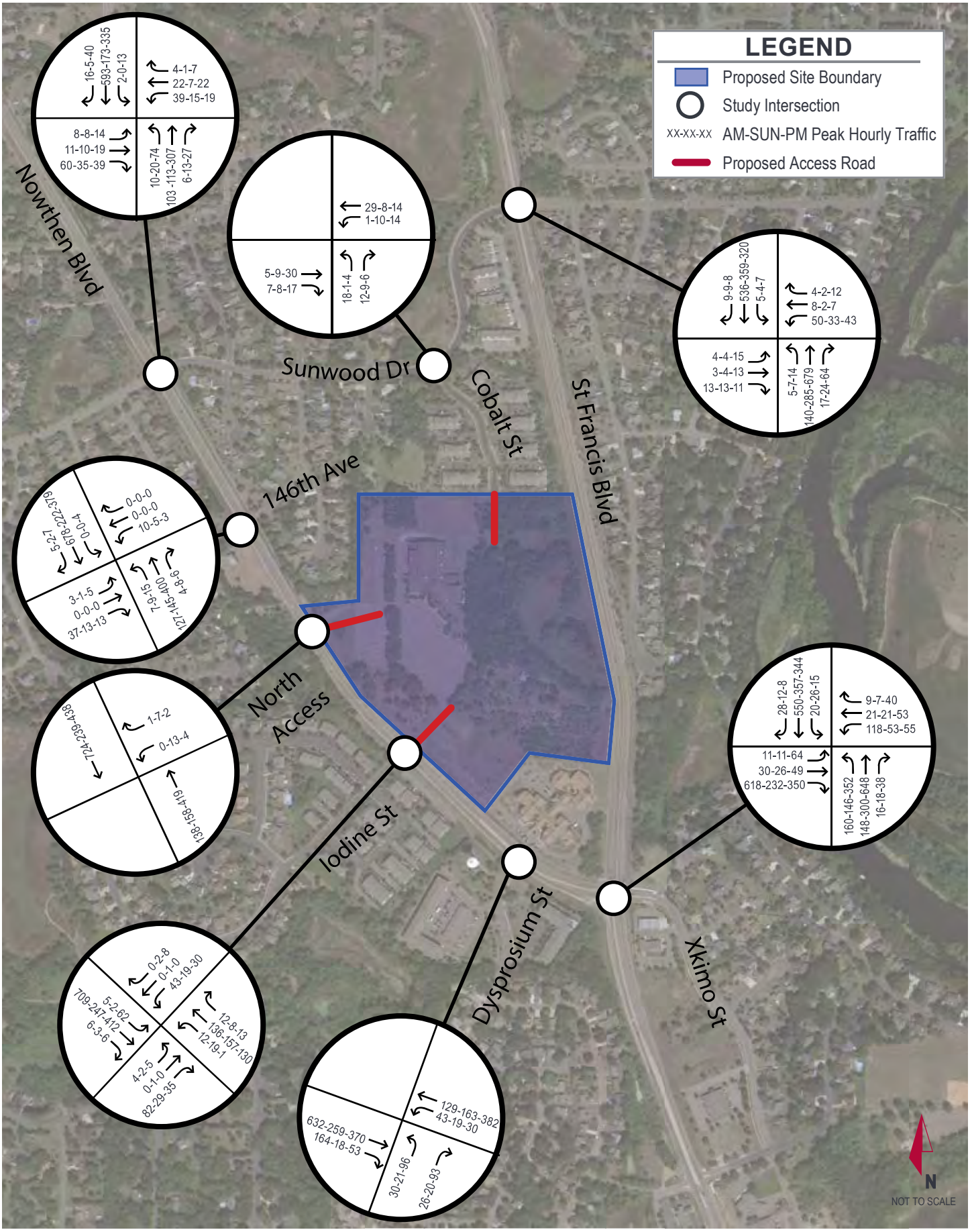
EXHIBIT 1

PROJECT LOCATION MAP



Kimley»Horn

EXHIBIT 2
EXISTING GEOMETRY AND INTERSECTION CONTROL



Kimley»Horn

EXHIBIT 3
EXISTING TRAFFIC VOLUMES

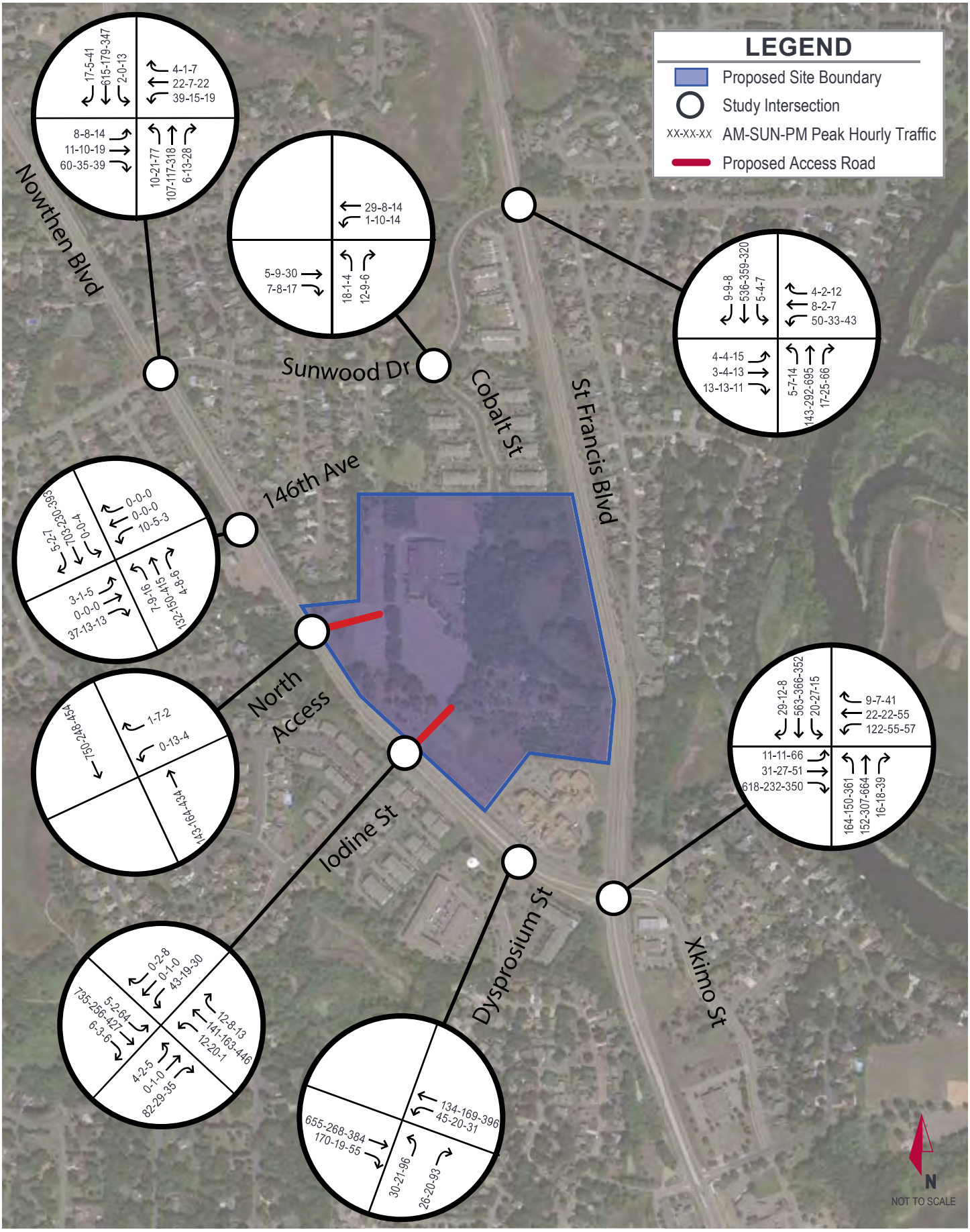


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EXHIBIT 4
NO BUILD SCENARIO 2027
TRAFFIC VOLUMES

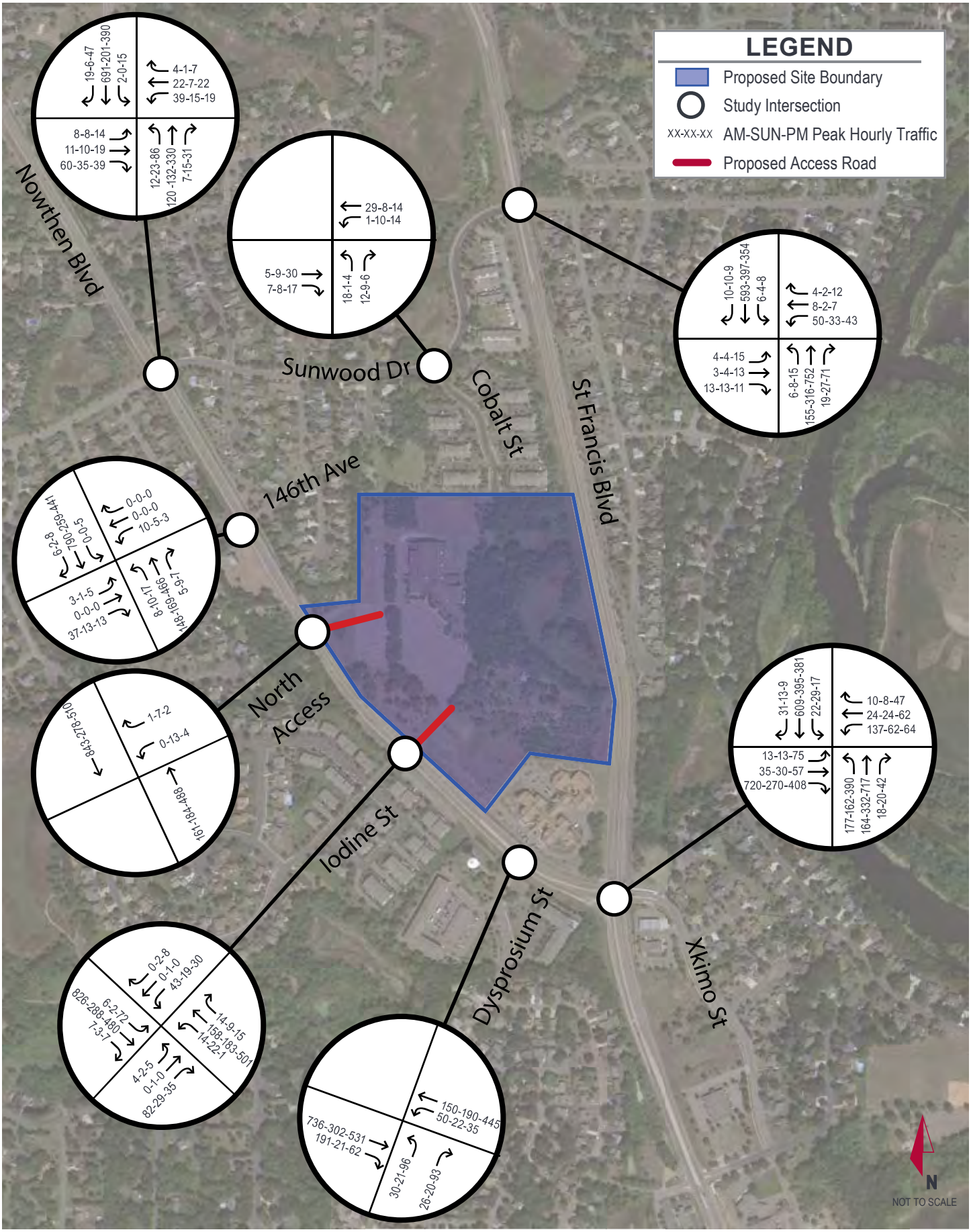

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EXHIBIT 5

NO BUILD SCENARIO 2040

TRAFFIC VOLUMES

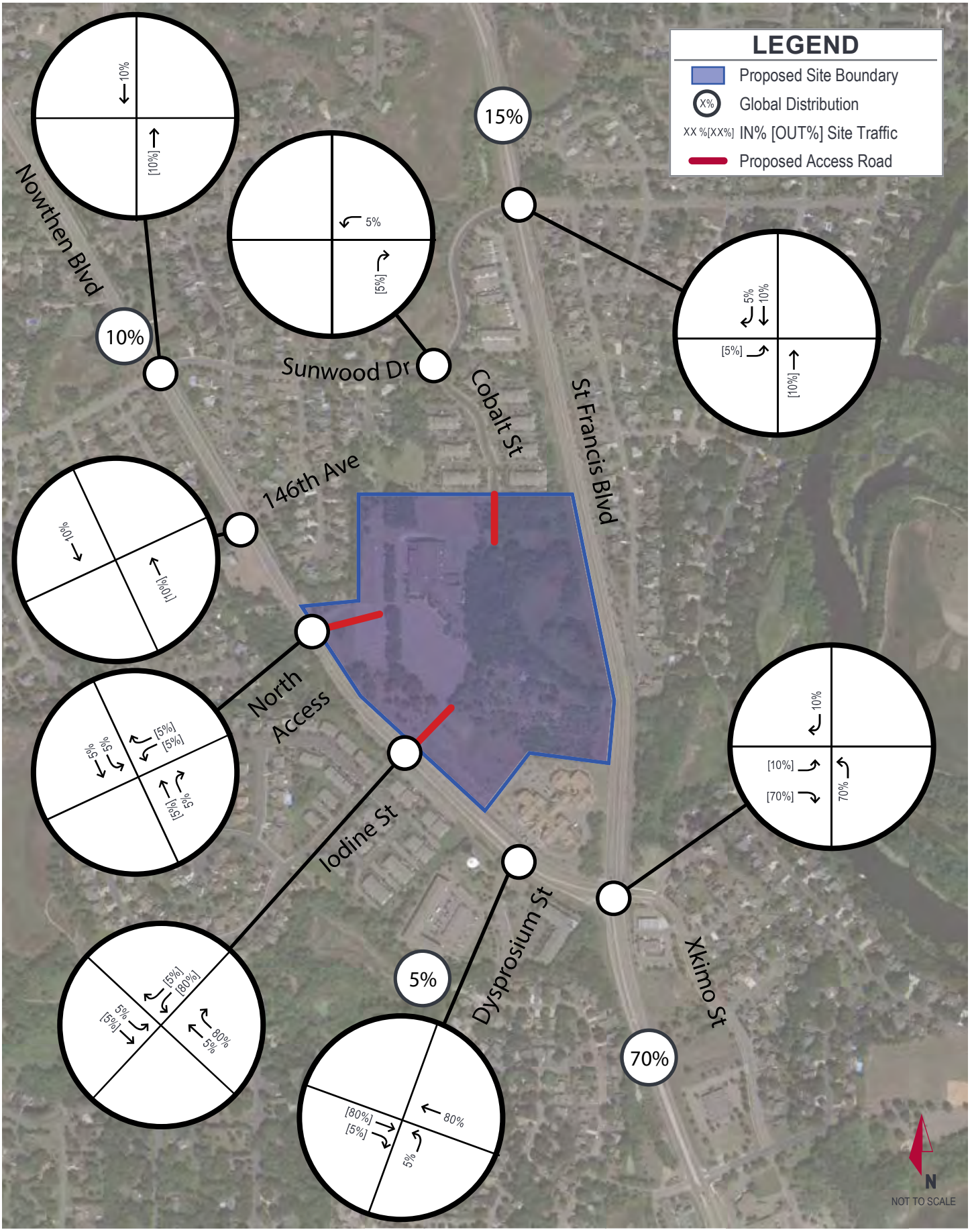

EXHIBIT 6

PROJECT TRIP DISTRIBUTION

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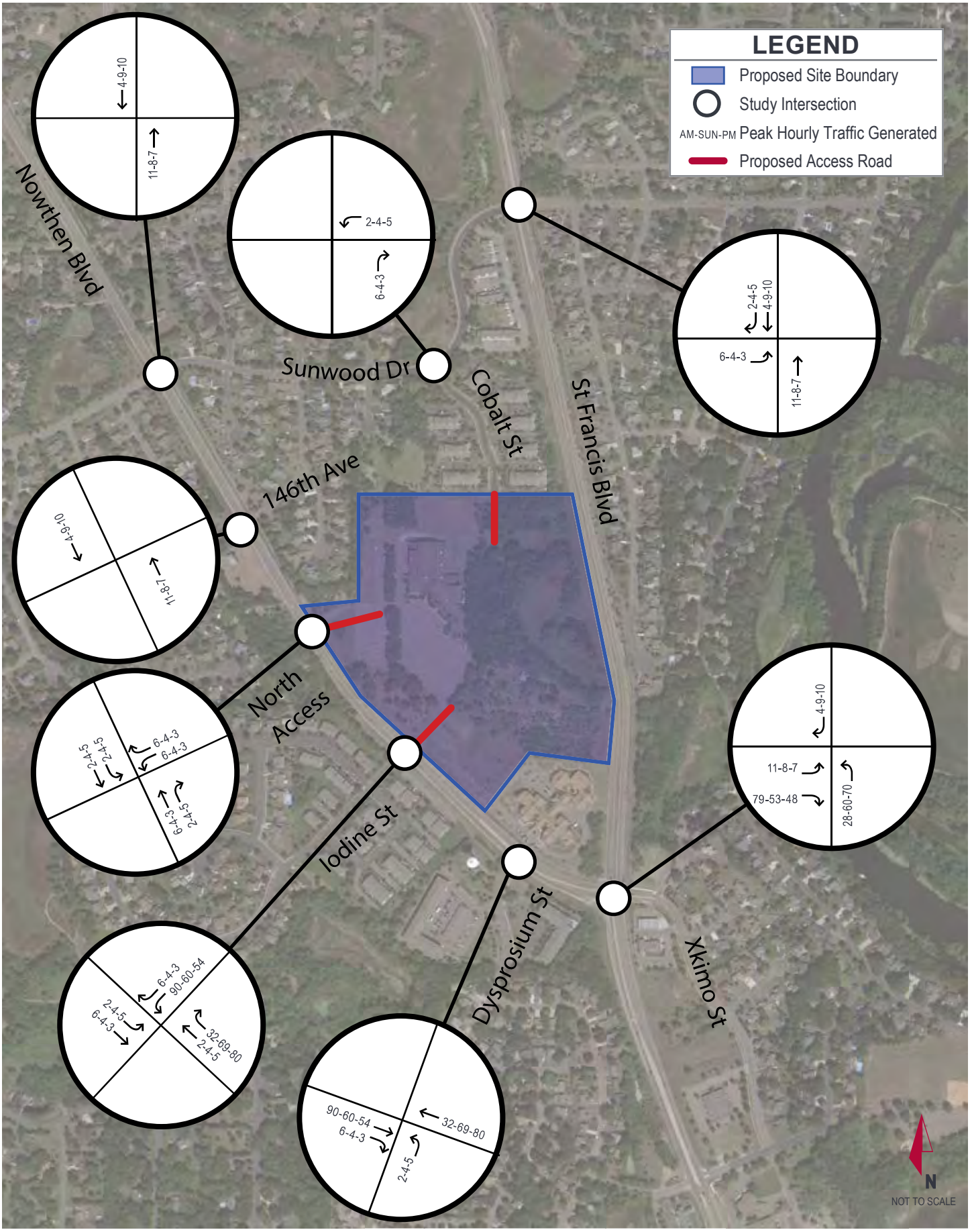

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EXHIBIT 7

TOTAL SITE GENERATED TRIPS

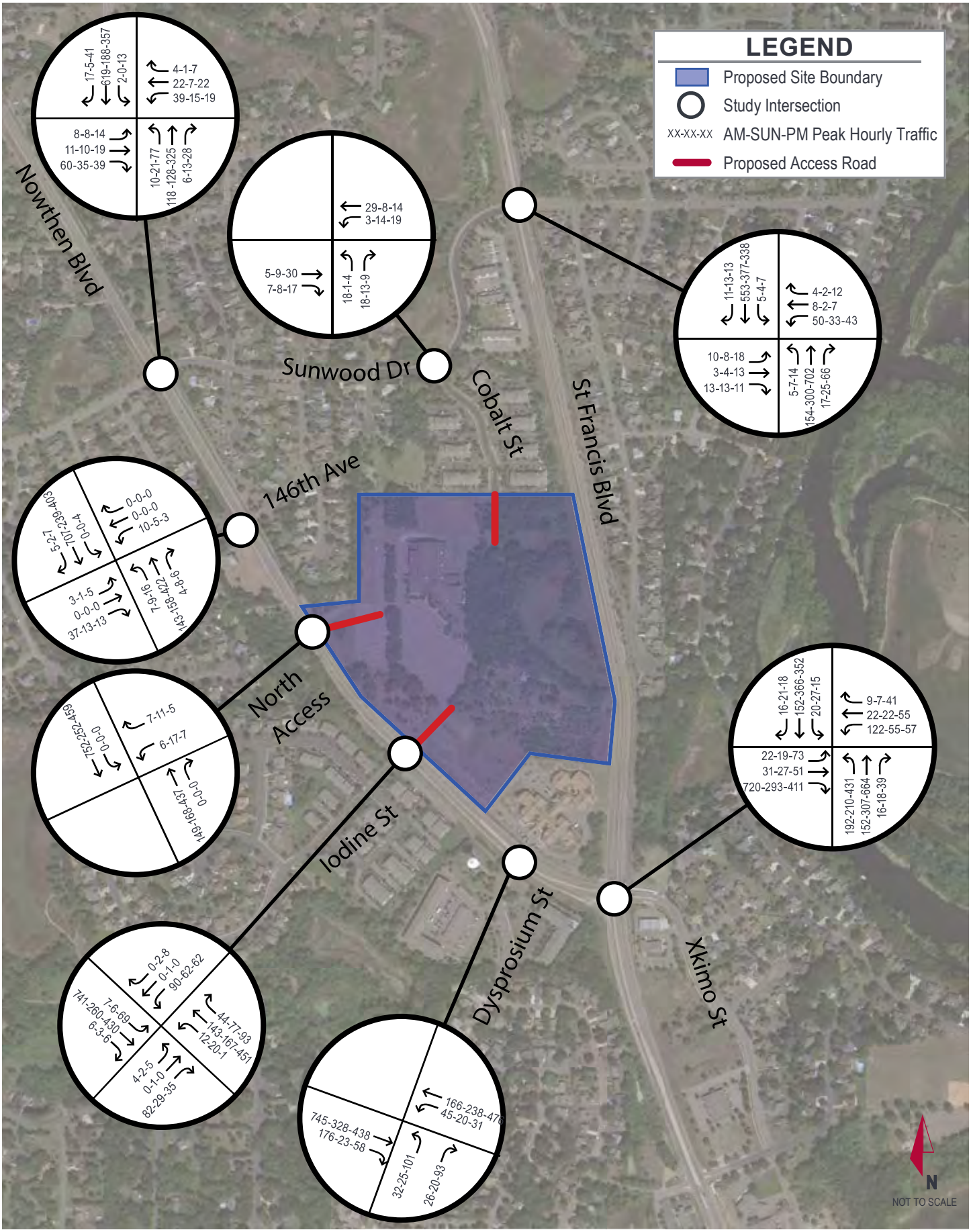

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EXHIBIT 8
BUILD SCENARIO 2027
TRAFFIC VOLUMES

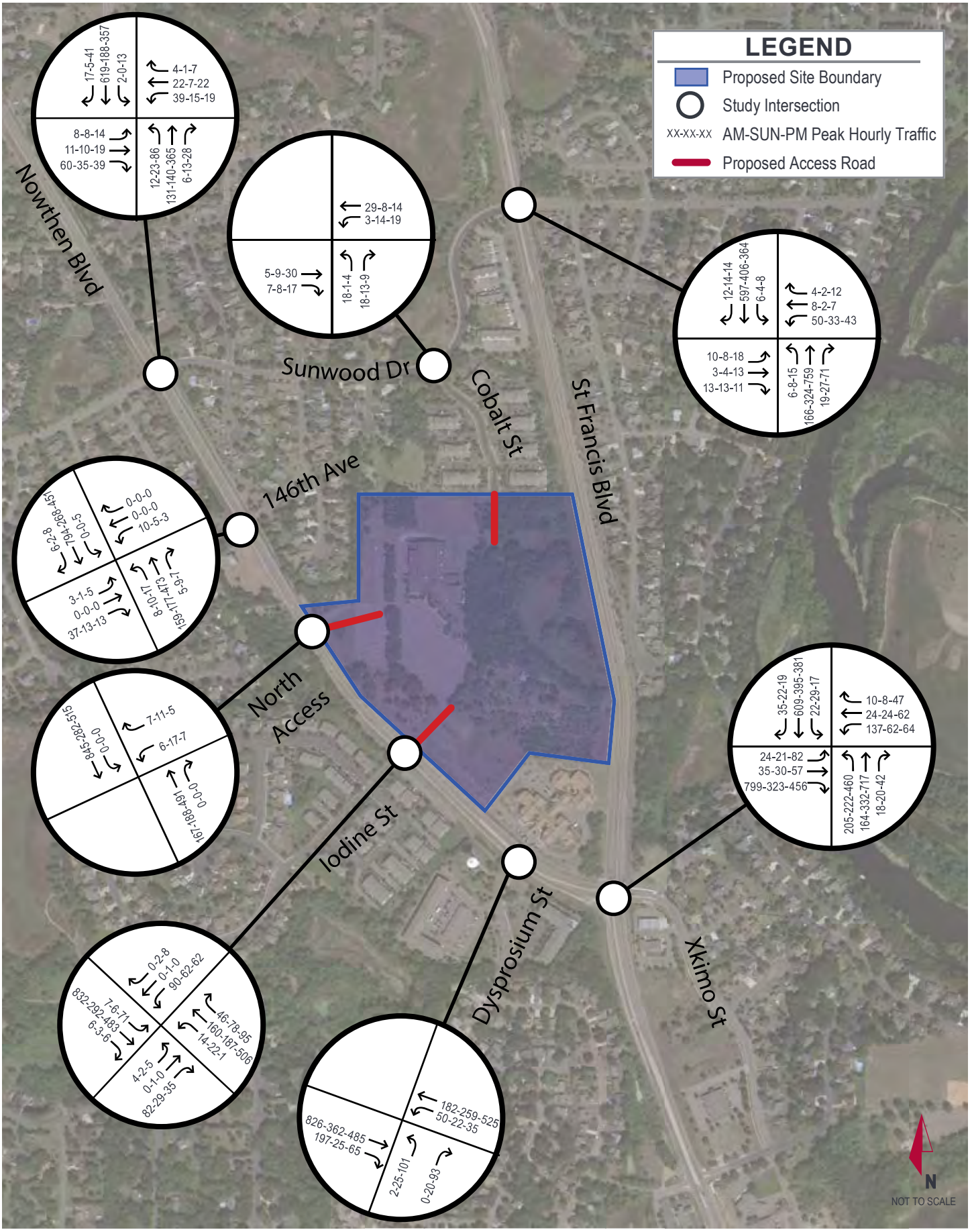

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EXHIBIT 9
BUILD SCENARIO 2040 TRAFFIC VOLUMES

B. Turning Movement Counts

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & 146th Ave
Site Code:
Start Date: 01/26/2023

Turning Movement Data

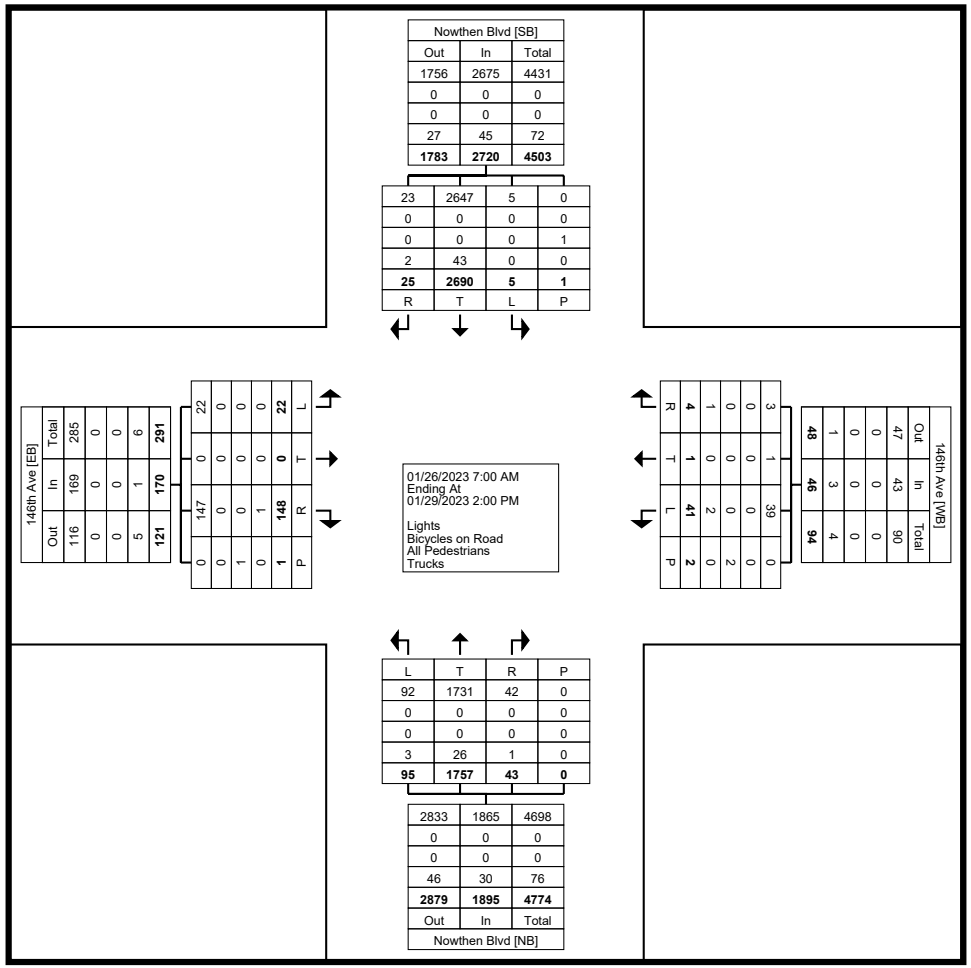
Start Time	146th Ave Eastbound					146th Ave Westbound					Nowthen Blvd Northbound					Nowthen Blvd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
7:00 AM	1	0	9	0	10	4	0	0	0	4	1	14	0	0	15	0	212	2	0	214	243
7:15 AM	1	0	15	0	16	3	0	0	0	3	1	32	1	0	34	0	190	1	0	191	244
7:30 AM	1	0	6	0	7	2	0	0	0	2	4	45	2	0	51	0	142	2	0	144	204
7:45 AM	0	0	7	0	7	1	0	0	0	1	1	36	1	0	38	0	134	0	0	134	180
Hourly Total	3	0	37	0	40	10	0	0	0	10	7	127	4	0	138	0	678	5	0	683	871
8:00 AM	0	0	8	0	8	2	0	0	0	2	0	55	0	0	55	0	103	0	0	103	168
8:15 AM	2	0	4	0	6	2	0	0	0	2	0	49	2	0	51	0	97	1	0	98	157
8:30 AM	2	0	2	0	4	2	0	0	0	2	2	34	1	0	37	0	87	0	0	87	130
8:45 AM	0	0	3	0	3	2	0	0	1	2	1	38	0	0	39	0	91	1	0	92	136
Hourly Total	4	0	17	0	21	8	0	0	1	8	3	176	3	0	182	0	378	2	0	380	591
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
4:00 PM	1	0	7	0	8	1	0	0	0	1	1	82	1	0	84	3	119	4	0	126	219
4:15 PM	2	0	2	0	4	0	0	0	0	0	7	101	3	0	111	0	88	2	0	90	205
4:30 PM	2	0	3	0	5	1	0	0	1	1	1	121	2	0	124	1	74	1	0	76	206
4:45 PM	0	0	1	0	1	1	0	0	0	1	6	96	0	0	102	0	98	0	0	98	202
Hourly Total	5	0	13	0	18	3	0	0	1	3	15	400	6	0	421	4	379	7	0	390	832
5:00 PM	1	0	4	1	5	1	0	0	0	1	6	115	2	0	123	0	87	2	1	89	218
5:15 PM	0	0	5	0	5	1	0	2	0	3	7	87	1	0	95	0	93	1	0	94	197
5:30 PM	0	0	4	0	4	2	0	0	0	2	4	81	3	0	88	0	78	1	0	79	173
5:45 PM	2	0	4	0	6	1	0	0	0	1	9	113	0	0	122	0	64	0	0	64	193
Hourly Total	3	0	17	1	20	5	0	2	0	7	26	396	6	0	428	0	322	4	1	326	781
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	7	0	7	2	0	0	0	2	2	27	1	0	30	0	53	0	0	53	92
10:15 AM	1	0	4	0	5	3	0	0	0	3	1	32	0	0	33	0	76	1	0	77	118
10:30 AM	0	0	5	0	5	0	0	0	0	0	1	28	0	0	29	0	64	0	0	64	98
10:45 AM	1	0	4	0	5	0	0	0	0	0	1	28	1	0	30	0	70	0	0	70	105
Hourly Total	2	0	20	0	22	5	0	0	0	5	5	115	2	0	122	0	263	1	0	264	413
11:00 AM	0	0	1	0	1	2	0	0	0	2	3	26	1	0	30	0	39	0	0	39	72
11:15 AM	0	0	5	0	5	0	0	0	0	0	3	37	2	0	42	0	49	1	0	50	97
11:30 AM	1	0	4	0	5	0	0	0	0	0	0	42	4	0	46	0	55	1	0	56	107
11:45 AM	0	0	3	0	3	3	0	0	0	3	3	40	1	0	44	0	79	0	0	79	129
Hourly Total	1	0	13	0	14	5	0	0	0	5	9	145	8	0	162	0	222	2	0	224	405

12:00 PM	1	0	4	0	5	0	0	0	0	0	5	44	0	0	49	0	53	0	0	53	107
12:15 PM	0	0	4	0	4	0	0	0	0	0	4	45	1	0	50	0	74	1	0	75	129
12:30 PM	1	0	4	0	5	0	0	0	0	0	6	53	2	0	61	0	60	1	0	61	127
12:45 PM	0	0	2	0	2	2	0	0	0	2	3	54	1	0	58	0	46	0	0	46	108
Hourly Total	2	0	14	0	16	2	0	0	0	2	18	196	4	0	218	0	233	2	0	235	471
1:00 PM	0	0	7	0	7	0	0	0	0	0	3	31	1	0	35	0	48	0	0	48	90
1:15 PM	0	0	3	0	3	1	0	1	0	2	3	60	3	0	66	0	71	1	0	72	143
1:30 PM	2	0	3	0	5	1	0	1	0	2	1	61	6	0	68	1	47	1	0	49	124
1:45 PM	0	0	4	0	4	1	1	0	0	2	5	49	0	0	54	0	49	0	0	49	109
Hourly Total	2	0	17	0	19	3	1	2	0	6	12	201	10	0	223	1	215	2	0	218	466
Grand Total	22	0	148	1	170	41	1	4	2	46	95	1757	43	0	1895	5	2690	25	1	2720	4831
Approach %	12.9	0.0	87.1	-	-	89.1	2.2	8.7	-	-	5.0	92.7	2.3	-	-	0.2	98.9	0.9	-	-	-
Total %	0.5	0.0	3.1	-	3.5	0.8	0.0	0.1	-	1.0	2.0	36.4	0.9	-	39.2	0.1	55.7	0.5	-	56.3	-
Lights	22	0	147	-	169	39	1	3	-	43	92	1731	42	-	1865	5	2647	23	-	2675	4752
% Lights	100.0	-	99.3	-	99.4	95.1	100.0	75.0	-	93.5	96.8	98.5	97.7	-	98.4	100.0	98.4	92.0	-	98.3	98.4
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	-	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	-	1	-	-	-	-	2	-	-	-	-	0	-	-	-	-	1	-	-
% All Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-
Trucks	0	0	1	-	1	2	0	1	-	3	3	26	1	-	30	0	43	2	-	45	79
% Trucks	0.0	-	0.7	-	0.6	4.9	0.0	25.0	-	6.5	3.2	1.5	2.3	-	1.6	0.0	1.6	8.0	-	1.7	1.6

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & 146th Ave
Site Code:
Start Date: 01/26/2023



Turning Movement Data Plot

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & 146th Ave
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (7:00 AM)

Start Time	146th Ave Eastbound					146th Ave Westbound					Nowthen Blvd Northbound					Nowthen Blvd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
7:00 AM	1	0	9	0	10	4	0	0	0	4	1	14	0	0	15	0	212	2	0	214	243
7:15 AM	1	0	15	0	16	3	0	0	0	3	1	32	1	0	34	0	190	1	0	191	244
7:30 AM	1	0	6	0	7	2	0	0	0	2	4	45	2	0	51	0	142	2	0	144	204
7:45 AM	0	0	7	0	7	1	0	0	0	1	1	36	1	0	38	0	134	0	0	134	180
Total	3	0	37	0	40	10	0	0	0	10	7	127	4	0	138	0	678	5	0	683	871
Approach %	7.5	0.0	92.5	-	-	100.0	0.0	0.0	-	-	5.1	92.0	2.9	-	-	0.0	99.3	0.7	-	-	-
Total %	0.3	0.0	4.2	-	4.6	1.1	0.0	0.0	-	1.1	0.8	14.6	0.5	-	15.8	0.0	77.8	0.6	-	78.4	-
PHF	0.750	0.000	0.617	-	0.625	0.625	0.000	0.000	-	0.625	0.438	0.706	0.500	-	0.676	0.000	0.800	0.625	-	0.798	0.892
Lights	3	0	37	-	40	10	0	0	-	10	4	118	4	-	126	0	664	4	-	668	844
% Lights	100.0	-	100.0	-	100.0	100.0	-	-	-	100.0	57.1	92.9	100.0	-	91.3	-	97.9	80.0	-	97.8	96.9
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	-	0.0	-	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	0	0	0	-	0	0	0	0	-	0	3	9	0	-	12	0	14	1	-	15	27
% Trucks	0.0	-	0.0	-	0.0	0.0	-	-	-	0.0	42.9	7.1	0.0	-	8.7	-	2.1	20.0	-	2.2	3.1

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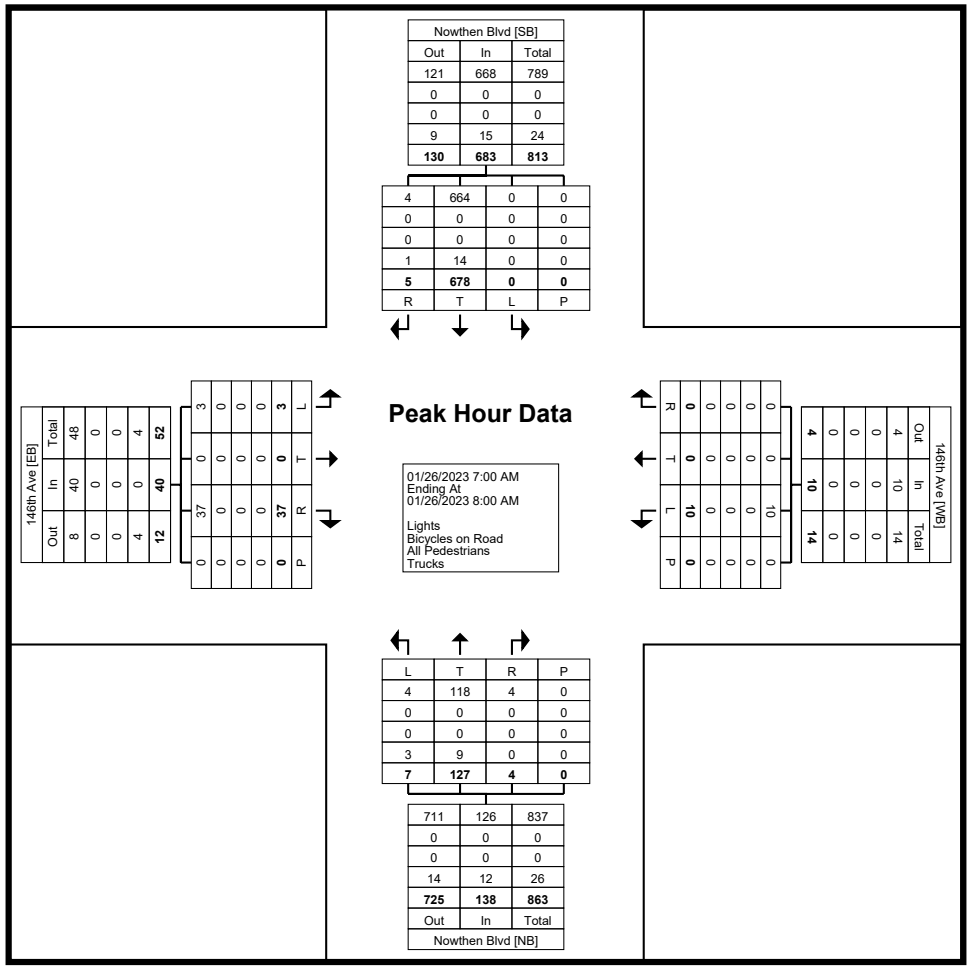
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (7:00 AM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & 146th Ave
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (4:00 PM)

Start Time	146th Ave Eastbound					146th Ave Westbound					Nowthen Blvd Northbound					Nowthen Blvd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
4:00 PM	1	0	7	0	8	1	0	0	0	1	1	82	1	0	84	3	119	4	0	126	219
4:15 PM	2	0	2	0	4	0	0	0	0	0	7	101	3	0	111	0	88	2	0	90	205
4:30 PM	2	0	3	0	5	1	0	0	1	1	1	121	2	0	124	1	74	1	0	76	206
4:45 PM	0	0	1	0	1	1	0	0	0	1	6	96	0	0	102	0	98	0	0	98	202
Total	5	0	13	0	18	3	0	0	1	3	15	400	6	0	421	4	379	7	0	390	832
Approach %	27.8	0.0	72.2	-	-	100.0	0.0	0.0	-	-	3.6	95.0	1.4	-	-	1.0	97.2	1.8	-	-	-
Total %	0.6	0.0	1.6	-	2.2	0.4	0.0	0.0	-	0.4	1.8	48.1	0.7	-	50.6	0.5	45.6	0.8	-	46.9	-
PHF	0.625	0.000	0.464	-	0.563	0.750	0.000	0.000	-	0.750	0.536	0.826	0.500	-	0.849	0.333	0.796	0.438	-	0.774	0.950
Lights	5	0	13	-	18	2	0	0	-	2	15	395	6	-	416	4	366	7	-	377	813
% Lights	100.0	-	100.0	-	100.0	66.7	-	-	-	66.7	100.0	98.8	100.0	-	98.8	100.0	96.6	100.0	-	96.7	97.7
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	-	0.0	-	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	0	0	0	-	0	1	0	0	-	1	0	5	0	-	5	0	13	0	-	13	19
% Trucks	0.0	-	0.0	-	0.0	33.3	-	-	-	33.3	0.0	1.3	0.0	-	1.2	0.0	3.4	0.0	-	3.3	2.3

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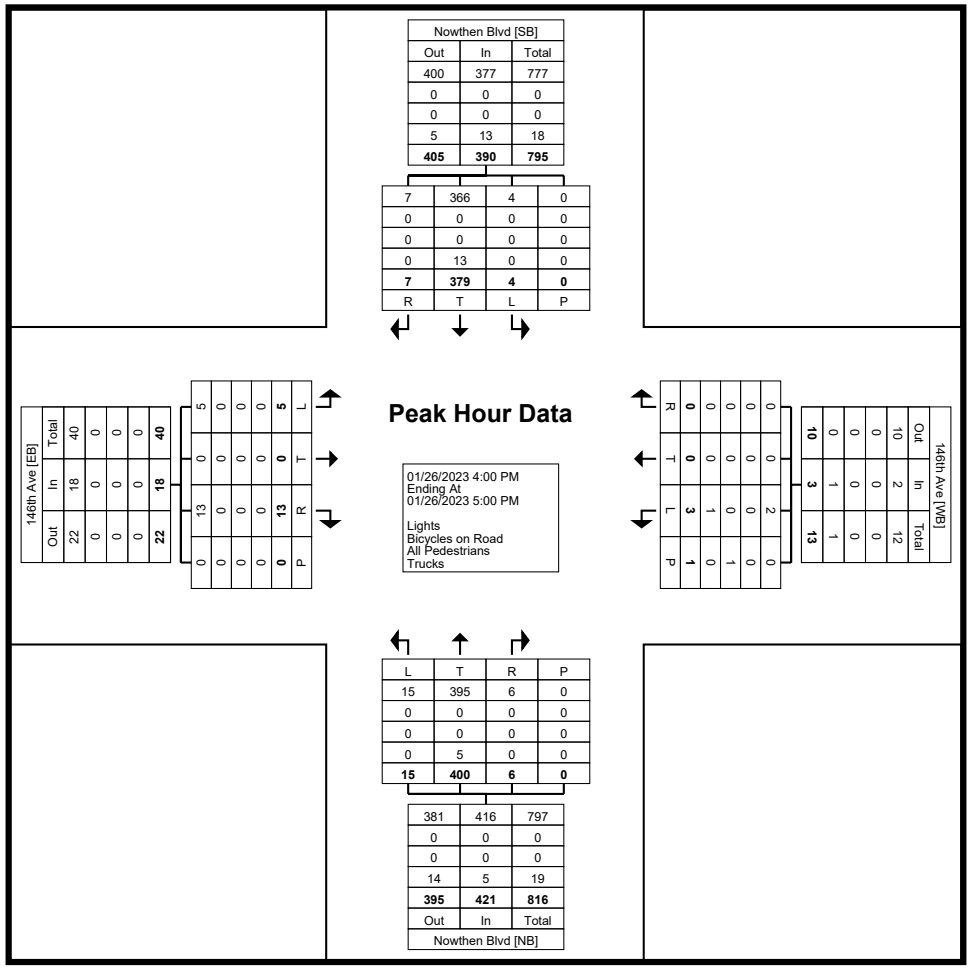
Count Name: Nowthen Blvd & 146th Ave
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (4:00 PM)

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(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & 146th Ave
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (10:00 AM)

Start Time	146th Ave Eastbound					146th Ave Westbound					Nowthen Blvd Northbound					Nowthen Blvd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
10:00 AM	0	0	7	0	7	2	0	0	0	2	2	27	1	0	30	0	53	0	0	53	92
10:15 AM	1	0	4	0	5	3	0	0	0	3	1	32	0	0	33	0	76	1	0	77	118
10:30 AM	0	0	5	0	5	0	0	0	0	0	1	28	0	0	29	0	64	0	0	64	98
10:45 AM	1	0	4	0	5	0	0	0	0	0	1	28	1	0	30	0	70	0	0	70	105
Total	2	0	20	0	22	5	0	0	0	5	5	115	2	0	122	0	263	1	0	264	413
Approach %	9.1	0.0	90.9	-	-	100.0	0.0	0.0	-	-	4.1	94.3	1.6	-	-	0.0	99.6	0.4	-	-	-
Total %	0.5	0.0	4.8	-	5.3	1.2	0.0	0.0	-	1.2	1.2	27.8	0.5	-	29.5	0.0	63.7	0.2	-	63.9	-
PHF	0.500	0.000	0.714	-	0.786	0.417	0.000	0.000	-	0.417	0.625	0.898	0.500	-	0.924	0.000	0.865	0.250	-	0.857	0.875
Lights	2	0	20	-	22	5	0	0	-	5	5	114	2	-	121	0	262	1	-	263	411
% Lights	100.0	-	100.0	-	100.0	100.0	-	-	-	100.0	100.0	99.1	100.0	-	99.2	-	99.6	100.0	-	99.6	99.5
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	-	0.0	-	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	0	1	0	-	1	2
% Trucks	0.0	-	0.0	-	0.0	0.0	-	-	-	0.0	0.0	0.9	0.0	-	0.8	-	0.4	0.0	-	0.4	0.5

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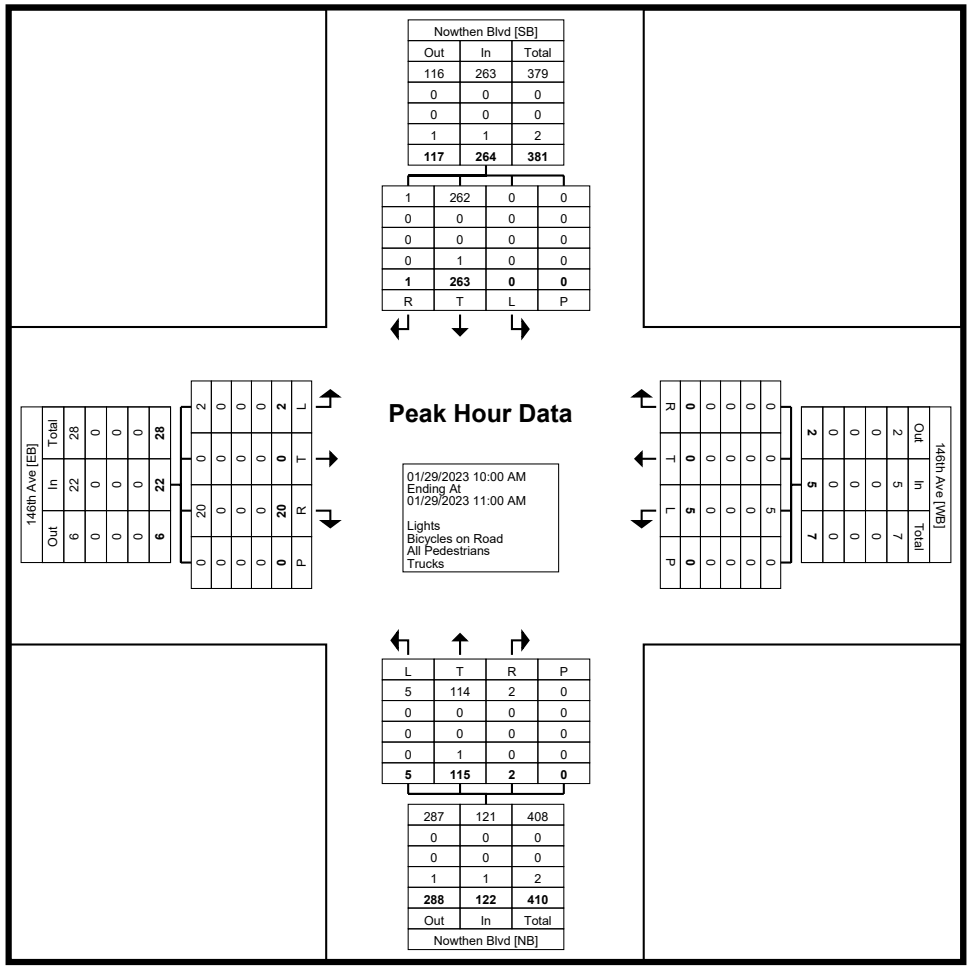
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (10:00 AM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & 146th Ave
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (12:00 PM)

Start Time	146th Ave Eastbound					146th Ave Westbound					Nowthen Blvd Northbound					Nowthen Blvd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
12:00 PM	1	0	4	0	5	0	0	0	0	0	5	44	0	0	49	0	53	0	0	53	107
12:15 PM	0	0	4	0	4	0	0	0	0	0	4	45	1	0	50	0	74	1	0	75	129
12:30 PM	1	0	4	0	5	0	0	0	0	0	6	53	2	0	61	0	60	1	0	61	127
12:45 PM	0	0	2	0	2	2	0	0	0	2	3	54	1	0	58	0	46	0	0	46	108
Total	2	0	14	0	16	2	0	0	0	2	18	196	4	0	218	0	233	2	0	235	471
Approach %	12.5	0.0	87.5	-	-	100.0	0.0	0.0	-	-	8.3	89.9	1.8	-	-	0.0	99.1	0.9	-	-	-
Total %	0.4	0.0	3.0	-	3.4	0.4	0.0	0.0	-	0.4	3.8	41.6	0.8	-	46.3	0.0	49.5	0.4	-	49.9	-
PHF	0.500	0.000	0.875	-	0.800	0.250	0.000	0.000	-	0.250	0.750	0.907	0.500	-	0.893	0.000	0.787	0.500	-	0.783	0.913
Lights	2	0	13	-	15	2	0	0	-	2	18	195	4	-	217	0	231	2	-	233	467
% Lights	100.0	-	92.9	-	93.8	100.0	-	-	-	100.0	100.0	99.5	100.0	-	99.5	-	99.1	100.0	-	99.1	99.2
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	-	0.0	-	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	0	0	1	-	1	0	0	0	-	0	0	1	0	-	1	0	2	0	-	2	4
% Trucks	0.0	-	7.1	-	6.3	0.0	-	-	-	0.0	0.0	0.5	0.0	-	0.5	-	0.9	0.0	-	0.9	0.8

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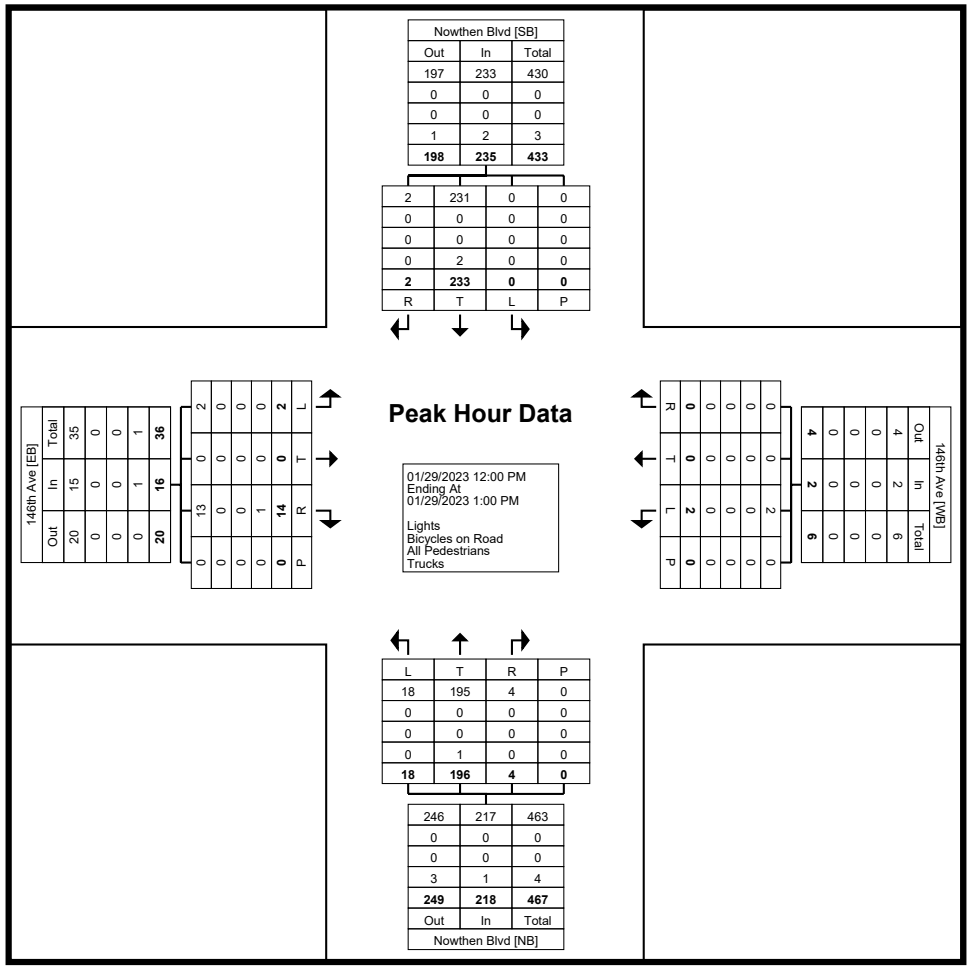
Count Name: Nowthen Blvd & 146th Ave
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (12:00 PM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & Dysprosium St
Site Code:
Start Date: 01/26/2023

Turning Movement Data

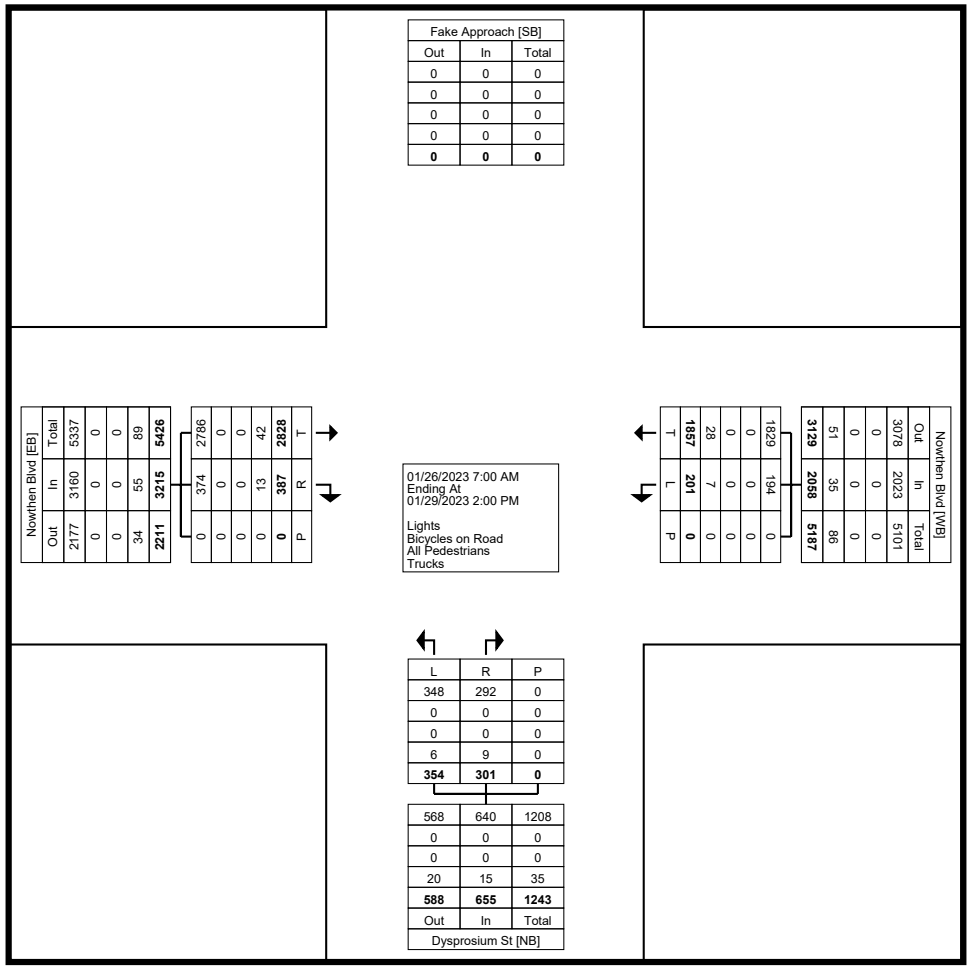
Start Time	Nowthen Blvd Eastbound				Nowthen Blvd Westbound				Dysprosium St Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
7:00 AM	188	52	0	240	1	15	0	16	3	6	0	9	265
7:15 AM	190	48	0	238	12	30	0	42	11	6	0	17	297
7:30 AM	123	35	0	158	16	52	0	68	7	6	0	13	239
7:45 AM	131	29	0	160	14	32	0	46	9	8	0	17	223
Hourly Total	632	164	0	796	43	129	0	172	30	26	0	56	1024
8:00 AM	101	15	0	116	9	53	0	62	9	8	0	17	195
8:15 AM	95	12	0	107	8	48	0	56	11	11	0	22	185
8:30 AM	84	17	0	101	3	36	0	39	8	4	0	12	152
8:45 AM	87	8	0	95	7	44	0	51	8	4	0	12	158
Hourly Total	367	52	0	419	27	181	0	208	36	27	0	63	690
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	114	19	0	133	10	84	0	94	19	21	0	40	267
4:15 PM	79	13	0	92	2	104	0	106	21	18	0	39	237
4:30 PM	83	7	0	90	9	103	0	112	37	37	0	74	276
4:45 PM	94	14	0	108	9	91	0	100	19	17	0	36	244
Hourly Total	370	53	0	423	30	382	0	412	96	93	0	189	1024
5:00 PM	84	8	0	92	7	128	0	135	26	20	0	46	273
5:15 PM	108	7	0	115	6	99	0	105	17	10	0	27	247
5:30 PM	106	8	0	114	11	88	0	99	19	11	0	30	243
5:45 PM	73	11	0	84	3	109	0	112	15	12	0	27	223
Hourly Total	371	34	0	405	27	424	0	451	77	53	0	130	986
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	68	3	0	71	1	26	0	27	4	6	0	10	108
10:15 AM	77	10	0	87	4	38	0	42	13	8	0	21	150
10:30 AM	70	5	0	75	4	42	0	46	5	4	0	9	130
10:45 AM	72	10	0	82	6	38	0	44	5	6	0	11	137
Hourly Total	287	28	0	315	15	144	0	159	27	24	0	51	525
11:00 AM	49	0	0	49	5	29	0	34	2	4	0	6	89
11:15 AM	59	6	0	65	5	51	0	56	4	4	0	8	129
11:30 AM	58	3	0	61	5	39	0	44	10	8	0	18	123
11:45 AM	93	9	0	102	4	44	0	48	5	4	0	9	159
Hourly Total	259	18	0	277	19	163	0	182	21	20	0	41	500

12:00 PM	62	10	0	72	4	40	0	44	13	5	0	18	134
12:15 PM	83	1	0	84	5	54	0	59	9	5	0	14	157
12:30 PM	62	7	0	69	4	57	0	61	8	11	0	19	149
12:45 PM	59	3	0	62	9	63	0	72	8	7	0	15	149
Hourly Total	266	21	0	287	22	214	0	236	38	28	0	66	589
1:00 PM	63	3	0	66	2	35	0	37	8	7	0	15	118
1:15 PM	86	7	0	93	3	60	0	63	8	5	0	13	169
1:30 PM	66	3	0	69	5	61	0	66	6	7	0	13	148
1:45 PM	61	4	0	65	8	64	0	72	7	11	0	18	155
Hourly Total	276	17	0	293	18	220	0	238	29	30	0	59	590
Grand Total	2828	387	0	3215	201	1857	0	2058	354	301	0	655	5928
Approach %	88.0	12.0	-	-	9.8	90.2	-	-	54.0	46.0	-	-	-
Total %	47.7	6.5	-	54.2	3.4	31.3	-	34.7	6.0	5.1	-	11.0	-
Lights	2786	374	-	3160	194	1829	-	2023	348	292	-	640	5823
% Lights	98.5	96.6	-	98.3	96.5	98.5	-	98.3	98.3	97.0	-	97.7	98.2
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	0	-	-	-	0	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	42	13	-	55	7	28	-	35	6	9	-	15	105
% Trucks	1.5	3.4	-	1.7	3.5	1.5	-	1.7	1.7	3.0	-	2.3	1.8

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & Dysprosium St
Site Code:
Start Date: 01/26/2023



Turning Movement Data Plot

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Count Name: Nowthen Blvd & Dysprosium St
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Nowthen Blvd Eastbound				Nowthen Blvd Westbound				Dysprosium St Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
7:00 AM	188	52	0	240	1	15	0	16	3	6	0	9	265
7:15 AM	190	48	0	238	12	30	0	42	11	6	0	17	297
7:30 AM	123	35	0	158	16	52	0	68	7	6	0	13	239
7:45 AM	131	29	0	160	14	32	0	46	9	8	0	17	223
Total	632	164	0	796	43	129	0	172	30	26	0	56	1024
Approach %	79.4	20.6	-	-	25.0	75.0	-	-	53.6	46.4	-	-	-
Total %	61.7	16.0	-	77.7	4.2	12.6	-	16.8	2.9	2.5	-	5.5	-
PHF	0.832	0.788	-	0.829	0.672	0.620	-	0.632	0.682	0.813	-	0.824	0.862
Lights	616	160	-	776	41	117	-	158	29	25	-	54	988
% Lights	97.5	97.6	-	97.5	95.3	90.7	-	91.9	96.7	96.2	-	96.4	96.5
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	0	-	-	-	0	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	16	4	-	20	2	12	-	14	1	1	-	2	36
% Trucks	2.5	2.4	-	2.5	4.7	9.3	-	8.1	3.3	3.8	-	3.6	3.5

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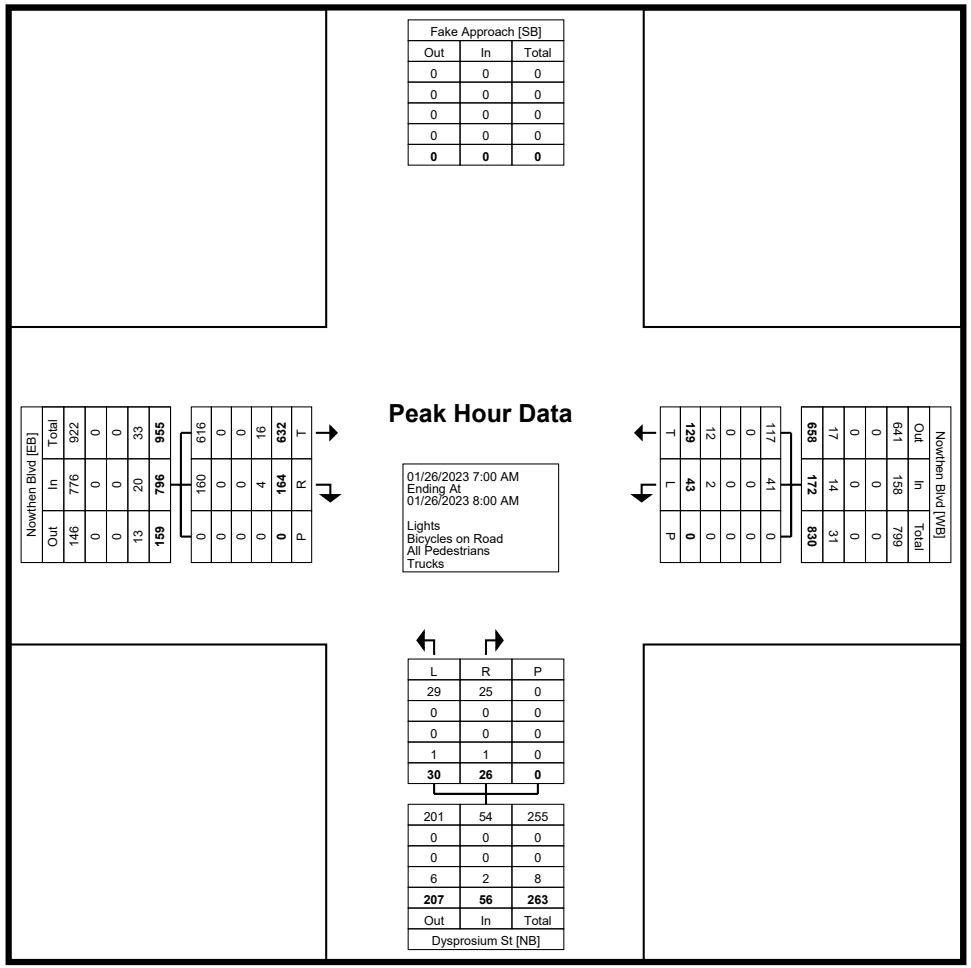
Count Name: Nowthen Blvd & Dysprosium St
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (7:00 AM)

Kimley-Horn and Associates, Inc.
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Count Name: Nowthen Blvd & Dysprosium St
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (4:30 PM)

Start Time	Nowthen Blvd Eastbound				Nowthen Blvd Westbound				Dysprosium St Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
4:30 PM	83	7	0	90	9	103	0	112	37	37	0	74	276
4:45 PM	94	14	0	108	9	91	0	100	19	17	0	36	244
5:00 PM	84	8	0	92	7	128	0	135	26	20	0	46	273
5:15 PM	108	7	0	115	6	99	0	105	17	10	0	27	247
Total	369	36	0	405	31	421	0	452	99	84	0	183	1040
Approach %	91.1	8.9	-	-	6.9	93.1	-	-	54.1	45.9	-	-	-
Total %	35.5	3.5	-	38.9	3.0	40.5	-	43.5	9.5	8.1	-	17.6	-
PHF	0.854	0.643	-	0.880	0.861	0.822	-	0.837	0.669	0.568	-	0.618	0.942
Lights	358	33	-	391	30	418	-	448	97	83	-	180	1019
% Lights	97.0	91.7	-	96.5	96.8	99.3	-	99.1	98.0	98.8	-	98.4	98.0
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	0	-	-	-	0	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	11	3	-	14	1	3	-	4	2	1	-	3	21
% Trucks	3.0	8.3	-	3.5	3.2	0.7	-	0.9	2.0	1.2	-	1.6	2.0

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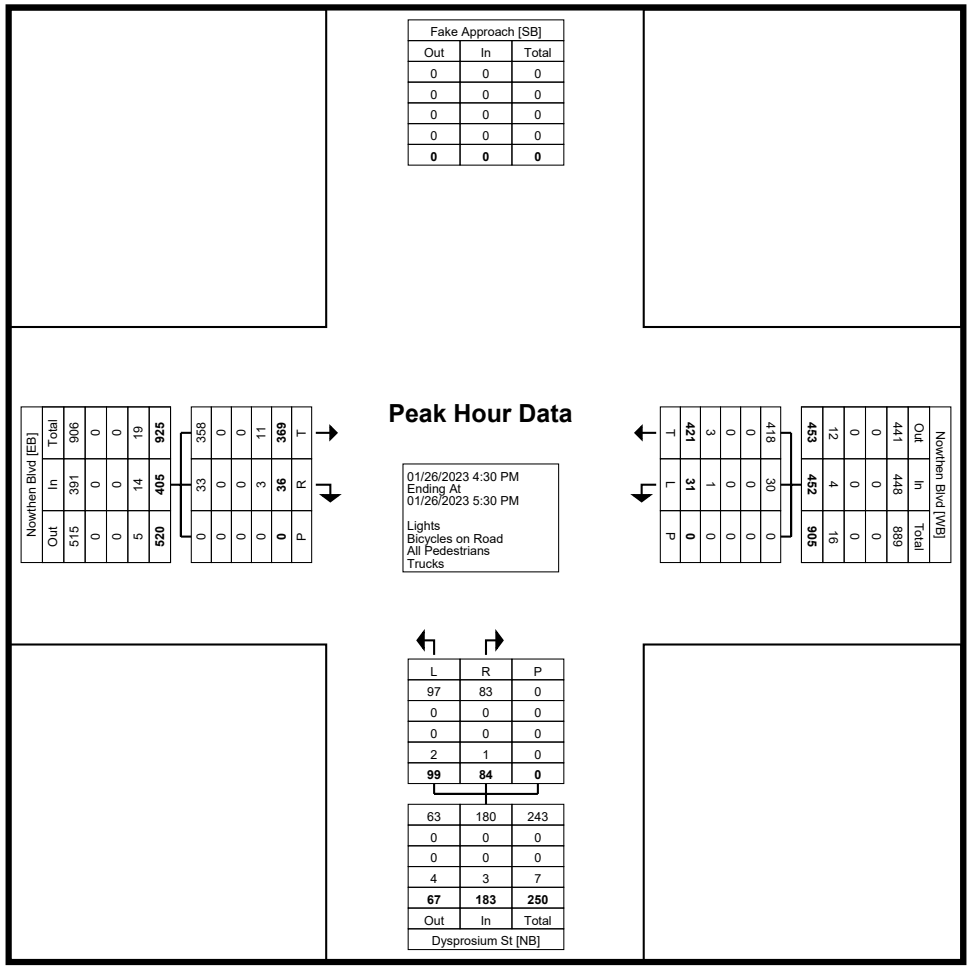
Count Name: Nowthen Blvd & Dysprosium St
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (4:30 PM)

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Count Name: Nowthen Blvd & Dysprosium St
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (10:00 AM)

Start Time	Nowthen Blvd Eastbound				Nowthen Blvd Westbound				Dysprosium St Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
10:00 AM	68	3	0	71	1	26	0	27	4	6	0	10	108
10:15 AM	77	10	0	87	4	38	0	42	13	8	0	21	150
10:30 AM	70	5	0	75	4	42	0	46	5	4	0	9	130
10:45 AM	72	10	0	82	6	38	0	44	5	6	0	11	137
Total	287	28	0	315	15	144	0	159	27	24	0	51	525
Approach %	91.1	8.9	-	-	9.4	90.6	-	-	52.9	47.1	-	-	-
Total %	54.7	5.3	-	60.0	2.9	27.4	-	30.3	5.1	4.6	-	9.7	-
PHF	0.932	0.700	-	0.905	0.625	0.857	-	0.864	0.519	0.750	-	0.607	0.875
Lights	287	28	-	315	15	144	-	159	27	24	-	51	525
% Lights	100.0	100.0	-	100.0	100.0	100.0	-	100.0	100.0	100.0	-	100.0	100.0
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	0	-	-	-	0	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	0	0	-	0	0	0	-	0	0	0	-	0	0
% Trucks	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0

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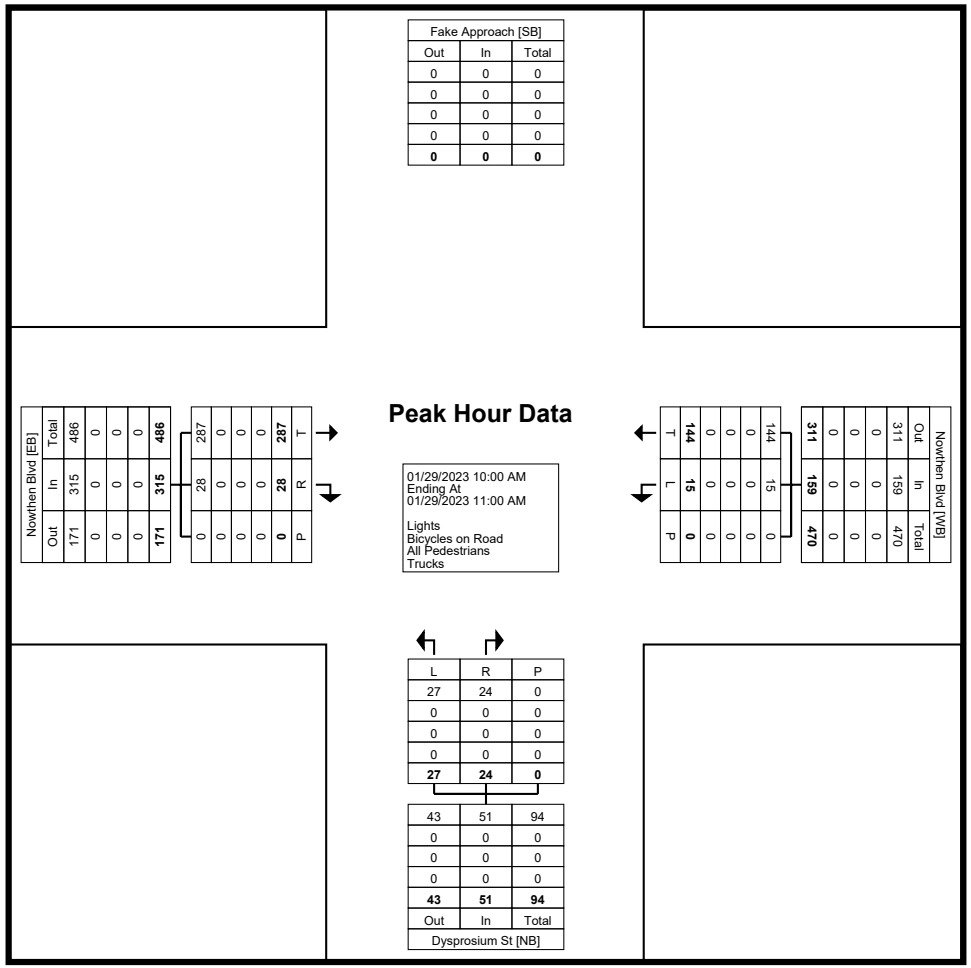
Count Name: Nowthen Blvd & Dysprosium St
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (10:00 AM)

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(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & Dysprosium St
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (1:00 PM)

Start Time	Nowthen Blvd Eastbound				Nowthen Blvd Westbound				Dysprosium St Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
1:00 PM	63	3	0	66	2	35	0	37	8	7	0	15	118
1:15 PM	86	7	0	93	3	60	0	63	8	5	0	13	169
1:30 PM	66	3	0	69	5	61	0	66	6	7	0	13	148
1:45 PM	61	4	0	65	8	64	0	72	7	11	0	18	155
Total	276	17	0	293	18	220	0	238	29	30	0	59	590
Approach %	94.2	5.8	-	-	7.6	92.4	-	-	49.2	50.8	-	-	-
Total %	46.8	2.9	-	49.7	3.1	37.3	-	40.3	4.9	5.1	-	10.0	-
PHF	0.802	0.607	-	0.788	0.563	0.859	-	0.826	0.906	0.682	-	0.819	0.873
Lights	275	17	-	292	18	220	-	238	29	30	-	59	589
% Lights	99.6	100.0	-	99.7	100.0	100.0	-	100.0	100.0	100.0	-	100.0	99.8
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	0	-	-	-	0	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	1	0	-	1	0	0	-	0	0	0	-	0	1
% Trucks	0.4	0.0	-	0.3	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.2

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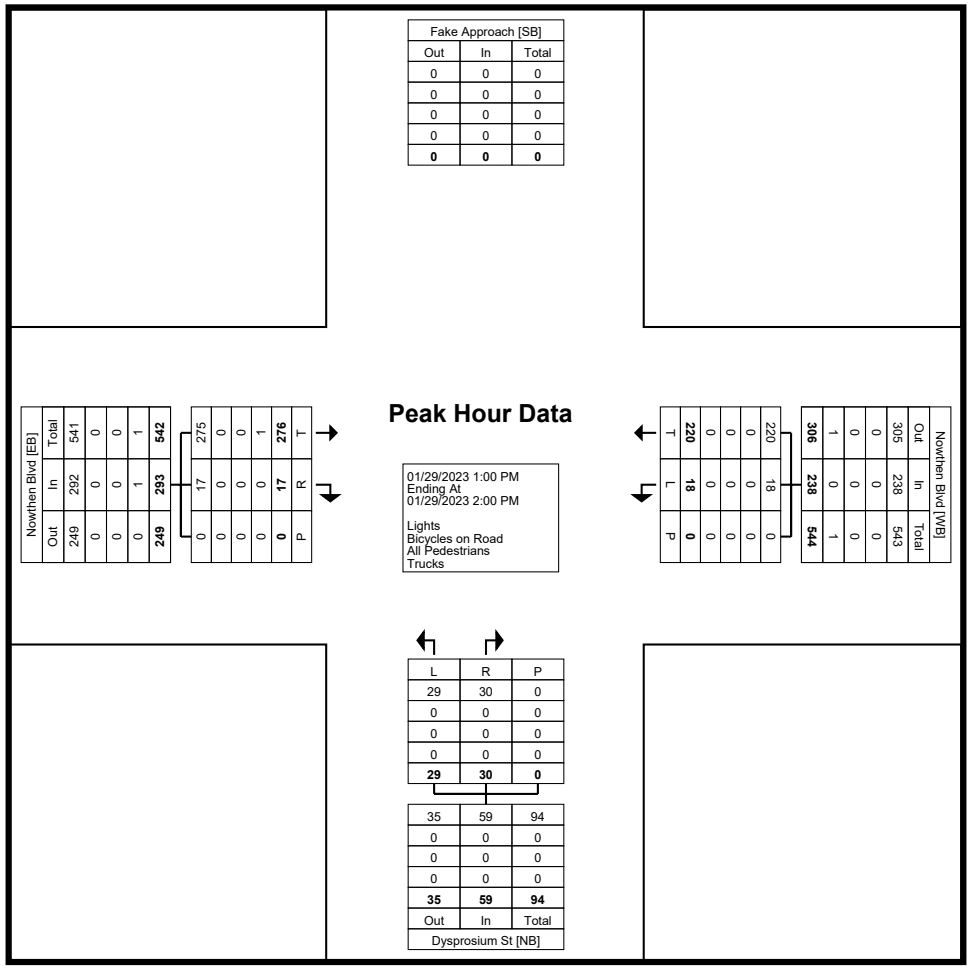
Count Name: Nowthen Blvd & Dysprosium St
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (1:00 PM)

Kimley-Horn and Associates, Inc.
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Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & Iodine St
Site Code:
Start Date: 01/26/2023

Turning Movement Data

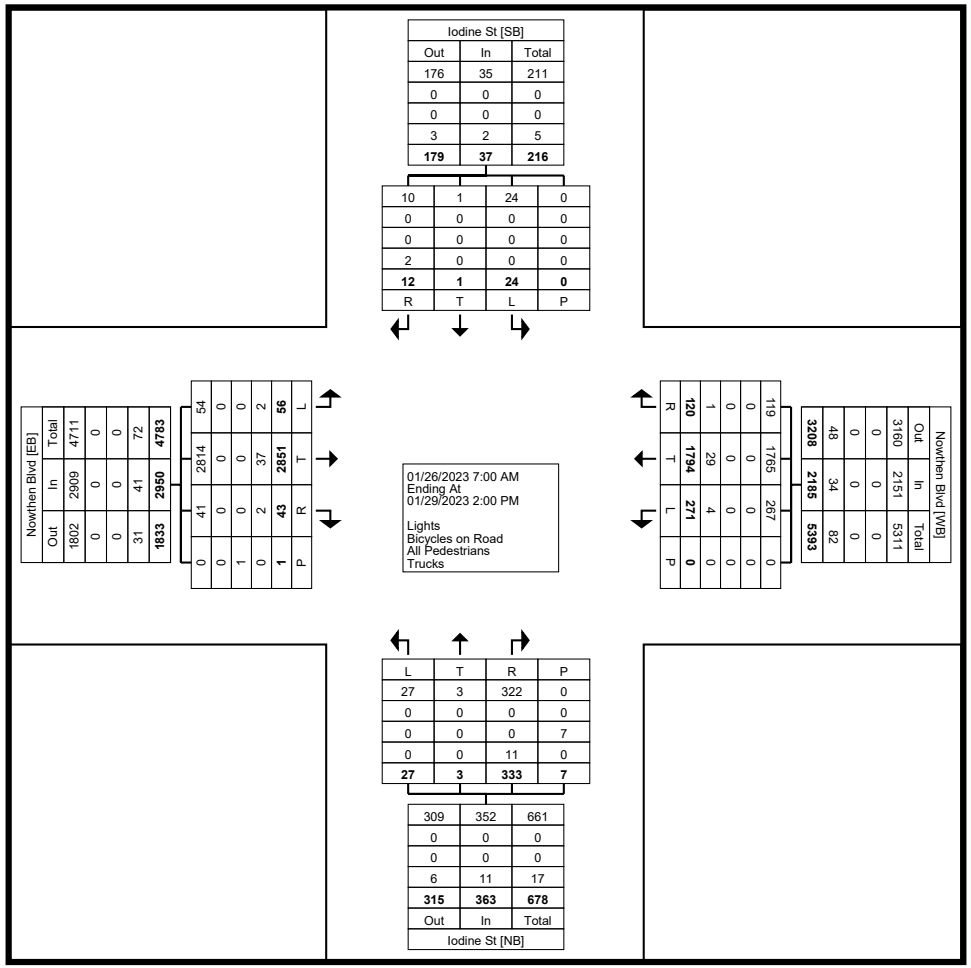
Start Time	Nowthen Blvd Eastbound					Nowthen Blvd Westbound					Iodine St Northbound					Iodine St Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
7:00 AM	0	216	0	0	216	3	15	1	0	19	2	0	23	0	25	0	0	0	0	0	260
7:15 AM	1	210	1	0	212	3	32	6	0	41	1	0	27	0	28	0	0	0	0	0	281
7:30 AM	2	140	2	0	144	5	52	1	0	58	0	0	17	0	17	0	0	0	0	0	219
7:45 AM	2	143	3	0	148	1	37	4	0	42	1	0	15	0	16	0	0	0	0	0	206
Hourly Total	5	709	6	0	720	12	136	12	0	160	4	0	82	0	86	0	0	0	0	0	966
8:00 AM	4	109	0	0	113	3	53	7	0	63	0	0	7	0	7	0	0	0	0	0	183
8:15 AM	2	98	2	0	102	4	49	6	0	59	3	0	8	0	11	0	0	0	0	0	172
8:30 AM	2	86	0	1	88	6	33	2	0	41	1	0	13	1	14	0	0	0	0	0	143
8:45 AM	9	86	1	0	96	3	39	11	0	53	0	0	9	0	9	0	0	0	0	0	158
Hourly Total	17	379	3	1	399	16	174	26	0	216	4	0	37	1	41	0	0	0	0	0	656
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	0	128	3	0	131	12	85	3	0	100	1	0	3	0	4	1	0	0	0	1	236
4:15 PM	0	80	6	0	86	11	117	1	0	129	2	0	8	0	10	2	0	0	0	2	227
4:30 PM	1	78	0	0	79	25	114	1	0	140	2	0	13	0	15	4	0	2	0	6	240
4:45 PM	0	94	4	0	98	14	96	1	0	111	0	0	11	0	11	1	0	0	0	1	221
Hourly Total	1	380	13	0	394	62	412	6	0	480	5	0	35	0	40	8	0	2	0	10	924
5:00 PM	7	81	3	0	91	21	125	2	0	148	0	0	11	1	11	1	0	0	0	1	251
5:15 PM	8	102	0	0	110	13	77	16	0	106	0	0	10	2	10	0	0	1	0	1	227
5:30 PM	2	95	4	0	101	17	81	11	0	109	1	0	17	0	18	2	0	1	0	3	231
5:45 PM	0	68	1	0	69	15	108	4	0	127	1	0	12	1	13	4	0	2	0	6	215
Hourly Total	17	346	8	0	371	66	391	33	0	490	2	0	50	4	52	7	0	4	0	11	924
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	64	0	0	64	0	24	3	0	27	0	0	6	0	6	0	0	0	0	0	97
10:15 AM	4	84	0	0	88	7	29	5	0	41	0	0	5	0	5	0	0	0	0	0	134
10:30 AM	4	64	0	0	68	5	24	13	0	42	4	1	8	0	13	1	0	1	0	2	125
10:45 AM	2	75	2	0	79	7	27	4	0	38	2	1	8	0	11	0	0	0	0	0	128
Hourly Total	10	287	2	0	299	19	104	25	0	148	6	2	27	0	35	1	0	1	0	2	484
11:00 AM	0	40	2	0	42	1	30	0	0	31	0	0	9	0	9	0	0	0	0	0	82
11:15 AM	0	59	0	0	59	7	44	4	0	55	1	1	6	0	8	0	1	0	0	1	123
11:30 AM	2	56	0	0	58	5	41	4	0	50	0	0	4	1	4	1	0	1	0	2	114
11:45 AM	0	92	1	0	93	6	42	0	0	48	1	0	10	0	11	1	0	0	0	1	153
Hourly Total	2	247	3	0	252	19	157	8	0	184	2	1	29	1	32	2	1	1	0	4	472
12:00 PM	0	65	0	0	65	9	44	2	0	55	0	0	4	0	4	1	0	0	0	1	125
12:15 PM	1	76	3	0	80	10	53	0	0	63	0	0	10	0	10	0	0	0	0	0	153

12:30 PM	0	64	0	0	64	9	54	0	0	63	0	0	8	0	8	1	0	1	0	2	137
12:45 PM	0	49	2	0	51	9	60	4	0	73	1	0	9	1	10	2	0	0	0	2	136
Hourly Total	1	254	5	0	260	37	211	6	0	254	1	0	31	1	32	4	0	1	0	5	551
1:00 PM	1	54	1	0	56	6	36	1	0	43	0	0	14	0	14	0	0	0	0	0	113
1:15 PM	1	84	1	0	86	10	55	3	0	68	2	0	8	0	10	1	0	1	0	2	166
1:30 PM	1	59	0	0	60	11	59	0	0	70	1	0	9	0	10	0	0	2	0	2	142
1:45 PM	0	52	1	0	53	13	59	0	0	72	0	0	11	0	11	1	0	0	0	1	137
Hourly Total	3	249	3	0	255	40	209	4	0	253	3	0	42	0	45	2	0	3	0	5	558
Grand Total	56	2851	43	1	2950	271	1794	120	0	2185	27	3	333	7	363	24	1	12	0	37	5535
Approach %	1.9	96.6	1.5	-	-	12.4	82.1	5.5	-	-	7.4	0.8	91.7	-	-	64.9	2.7	32.4	-	-	-
Total %	1.0	51.5	0.8	-	53.3	4.9	32.4	2.2	-	39.5	0.5	0.1	6.0	-	6.6	0.4	0.0	0.2	-	0.7	-
Lights	54	2814	41	-	2909	267	1765	119	-	2151	27	3	322	-	352	24	1	10	-	35	5447
% Lights	96.4	98.7	95.3	-	98.6	98.5	98.4	99.2	-	98.4	100.0	100.0	96.7	-	97.0	100.0	100.0	83.3	-	94.6	98.4
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	-	1	-	-	-	-	0	-	-	-	-	7	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-
Trucks	2	37	2	-	41	4	29	1	-	34	0	0	11	-	11	0	0	2	-	2	88
% Trucks	3.6	1.3	4.7	-	1.4	1.5	1.6	0.8	-	1.6	0.0	0.0	3.3	-	3.0	0.0	0.0	16.7	-	5.4	1.6

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & Iodine St
Site Code:
Start Date: 01/26/2023



Turning Movement Data Plot

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & Iodine St
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Nowthen Blvd Eastbound					Nowthen Blvd Westbound					Iodine St Northbound					Iodine St Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
7:00 AM	0	216	0	0	216	3	15	1	0	19	2	0	23	0	25	0	0	0	0	0	260
7:15 AM	1	210	1	0	212	3	32	6	0	41	1	0	27	0	28	0	0	0	0	0	281
7:30 AM	2	140	2	0	144	5	52	1	0	58	0	0	17	0	17	0	0	0	0	0	219
7:45 AM	2	143	3	0	148	1	37	4	0	42	1	0	15	0	16	0	0	0	0	0	206
Total	5	709	6	0	720	12	136	12	0	160	4	0	82	0	86	0	0	0	0	0	966
Approach %	0.7	98.5	0.8	-	-	7.5	85.0	7.5	-	-	4.7	0.0	95.3	-	-	0.0	0.0	0.0	-	-	-
Total %	0.5	73.4	0.6	-	74.5	1.2	14.1	1.2	-	16.6	0.4	0.0	8.5	-	8.9	0.0	0.0	0.0	-	0.0	-
PHF	0.625	0.821	0.500	-	0.833	0.600	0.654	0.500	-	0.690	0.500	0.000	0.759	-	0.768	0.000	0.000	0.000	-	0.000	0.859
Lights	5	697	6	-	708	11	125	11	-	147	4	0	78	-	82	0	0	0	-	0	937
% Lights	100.0	98.3	100.0	-	98.3	91.7	91.9	91.7	-	91.9	100.0	-	95.1	-	95.3	-	-	-	-	-	97.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	-	0.0	-	0.0	-	-	-	-	-	0.0
All Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	0	12	0	-	12	1	11	1	-	13	0	0	4	-	4	0	0	0	-	0	29
% Trucks	0.0	1.7	0.0	-	1.7	8.3	8.1	8.3	-	8.1	0.0	-	4.9	-	4.7	-	-	-	-	-	3.0

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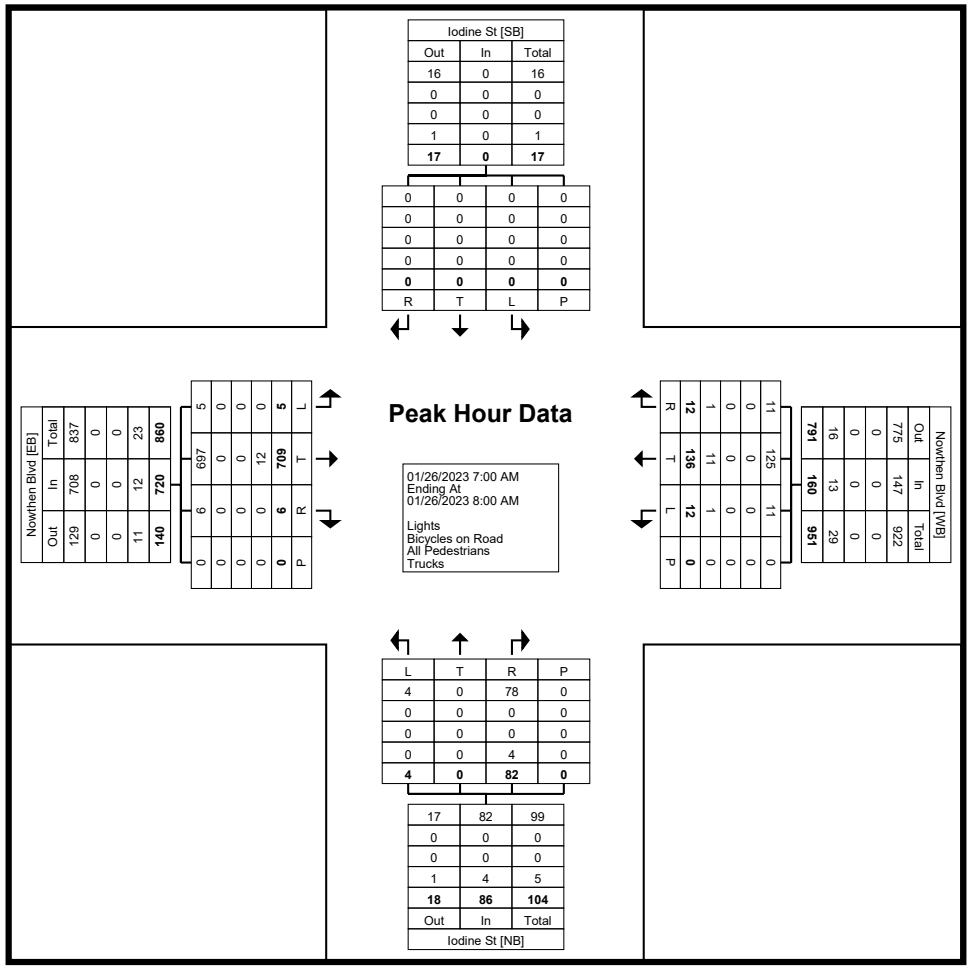
Count Name: Nowthen Blvd & Iodine St
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (7:00 AM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & Iodine St
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (4:15 PM)

Start Time	Nowthen Blvd Eastbound					Nowthen Blvd Westbound					Iodine St Northbound					Iodine St Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
4:15 PM	0	80	6	0	86	11	117	1	0	129	2	0	8	0	10	2	0	0	0	2	227
4:30 PM	1	78	0	0	79	25	114	1	0	140	2	0	13	0	15	4	0	2	0	6	240
4:45 PM	0	94	4	0	98	14	96	1	0	111	0	0	11	0	11	1	0	0	0	1	221
5:00 PM	7	81	3	0	91	21	125	2	0	148	0	0	11	1	11	1	0	0	0	1	251
Total	8	333	13	0	354	71	452	5	0	528	4	0	43	1	47	8	0	2	0	10	939
Approach %	2.3	94.1	3.7	-	-	13.4	85.6	0.9	-	-	8.5	0.0	91.5	-	-	80.0	0.0	20.0	-	-	-
Total %	0.9	35.5	1.4	-	37.7	7.6	48.1	0.5	-	56.2	0.4	0.0	4.6	-	5.0	0.9	0.0	0.2	-	1.1	-
PHF	0.286	0.886	0.542	-	0.903	0.710	0.904	0.625	-	0.892	0.500	0.000	0.827	-	0.783	0.500	0.000	0.250	-	0.417	0.935
Lights	8	322	12	-	342	70	446	5	-	521	4	0	38	-	42	8	0	2	-	10	915
% Lights	100.0	96.7	92.3	-	96.6	98.6	98.7	100.0	-	98.7	100.0	-	88.4	-	89.4	100.0	-	100.0	-	100.0	97.4
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0
All Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-
Trucks	0	11	1	-	12	1	6	0	-	7	0	0	5	-	5	0	0	0	-	0	24
% Trucks	0.0	3.3	7.7	-	3.4	1.4	1.3	0.0	-	1.3	0.0	-	11.6	-	10.6	0.0	-	0.0	-	0.0	2.6

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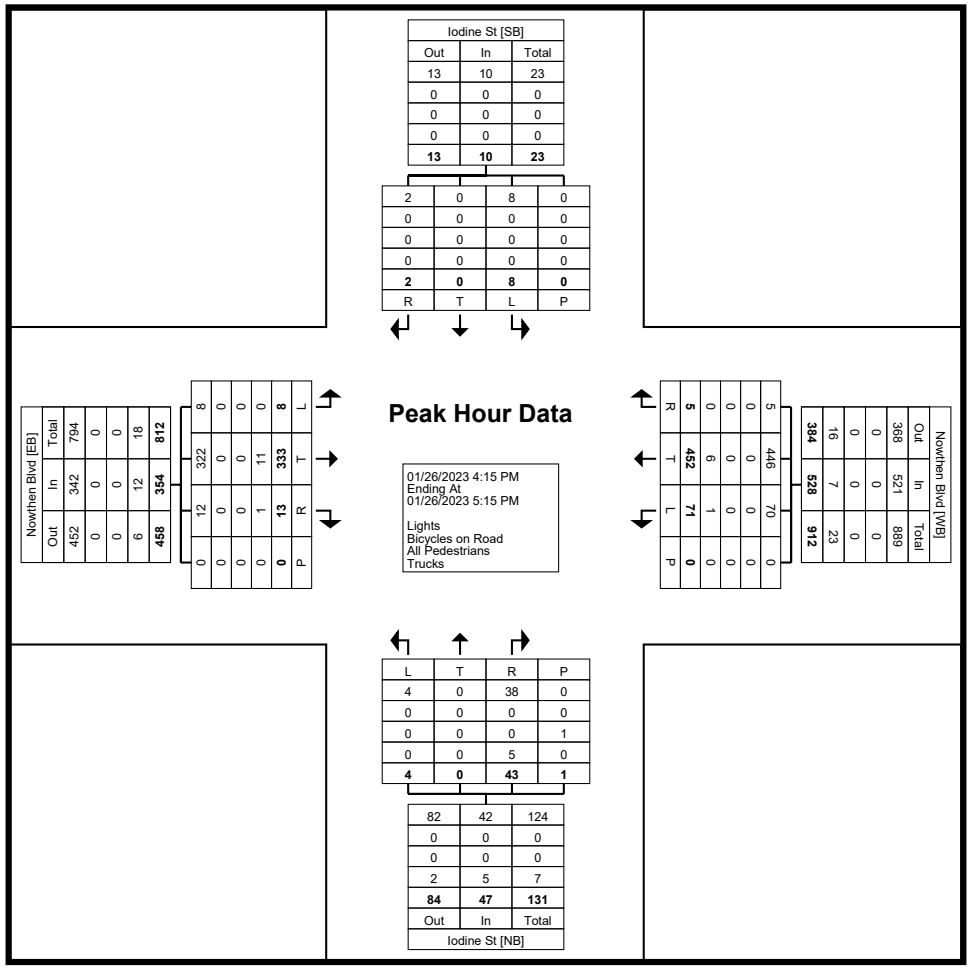
Count Name: Nowthen Blvd & Iodine St
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (4:15 PM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & Iodine St
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (10:00 AM)

Start Time	Nowthen Blvd Eastbound					Nowthen Blvd Westbound					Iodine St Northbound					Iodine St Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
10:00 AM	0	64	0	0	64	0	24	3	0	27	0	0	6	0	6	0	0	0	0	0	97
10:15 AM	4	84	0	0	88	7	29	5	0	41	0	0	5	0	5	0	0	0	0	0	134
10:30 AM	4	64	0	0	68	5	24	13	0	42	4	1	8	0	13	1	0	1	0	2	125
10:45 AM	2	75	2	0	79	7	27	4	0	38	2	1	8	0	11	0	0	0	0	0	128
Total	10	287	2	0	299	19	104	25	0	148	6	2	27	0	35	1	0	1	0	2	484
Approach %	3.3	96.0	0.7	-	-	12.8	70.3	16.9	-	-	17.1	5.7	77.1	-	-	50.0	0.0	50.0	-	-	-
Total %	2.1	59.3	0.4	-	61.8	3.9	21.5	5.2	-	30.6	1.2	0.4	5.6	-	7.2	0.2	0.0	0.2	-	0.4	-
PHF	0.625	0.854	0.250	-	0.849	0.679	0.897	0.481	-	0.881	0.375	0.500	0.844	-	0.673	0.250	0.000	0.250	-	0.250	0.903
Lights	9	287	2	-	298	19	104	25	-	148	6	2	27	-	35	1	0	0	-	1	482
% Lights	90.0	100.0	100.0	-	99.7	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0	-	100.0	100.0	-	0.0	-	50.0	99.6
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0
All Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	1	0	0	-	1	0	0	0	-	0	0	0	0	-	0	0	0	1	-	1	2
% Trucks	10.0	0.0	0.0	-	0.3	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	-	100.0	-	50.0	0.4

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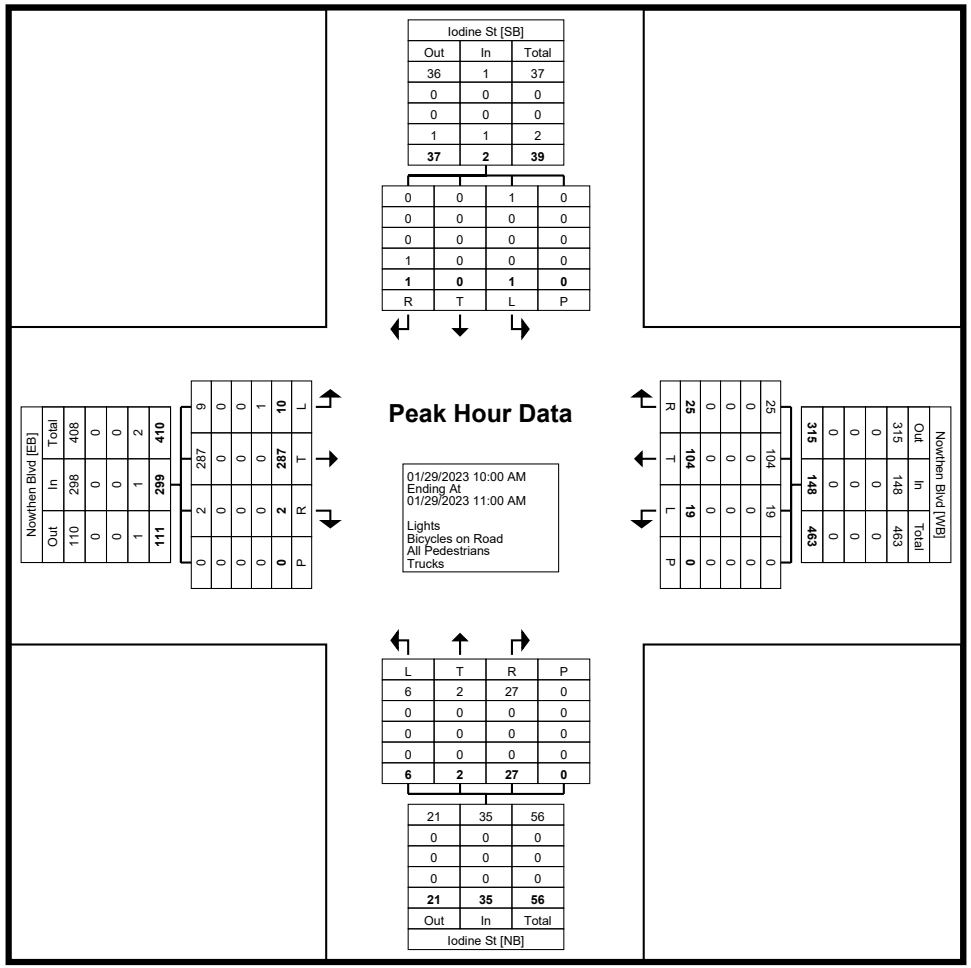
Count Name: Nowthen Blvd & Iodine St
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (10:00 AM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & Iodine St
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (1:00 PM)

Start Time	Nowthen Blvd Eastbound					Nowthen Blvd Westbound					Iodine St Northbound					Iodine St Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
1:00 PM	1	54	1	0	56	6	36	1	0	43	0	0	14	0	14	0	0	0	0	0	113
1:15 PM	1	84	1	0	86	10	55	3	0	68	2	0	8	0	10	1	0	1	0	2	166
1:30 PM	1	59	0	0	60	11	59	0	0	70	1	0	9	0	10	0	0	2	0	2	142
1:45 PM	0	52	1	0	53	13	59	0	0	72	0	0	11	0	11	1	0	0	0	1	137
Total	3	249	3	0	255	40	209	4	0	253	3	0	42	0	45	2	0	3	0	5	558
Approach %	1.2	97.6	1.2	-	-	15.8	82.6	1.6	-	-	6.7	0.0	93.3	-	-	40.0	0.0	60.0	-	-	-
Total %	0.5	44.6	0.5	-	45.7	7.2	37.5	0.7	-	45.3	0.5	0.0	7.5	-	8.1	0.4	0.0	0.5	-	0.9	-
PHF	0.750	0.741	0.750	-	0.741	0.769	0.886	0.333	-	0.878	0.375	0.000	0.750	-	0.804	0.500	0.000	0.375	-	0.625	0.840
Lights	3	248	3	-	254	40	209	4	-	253	3	0	42	-	45	2	0	3	-	5	557
% Lights	100.0	99.6	100.0	-	99.6	100.0	100.0	100.0	-	100.0	100.0	-	100.0	-	100.0	100.0	-	100.0	-	100.0	99.8
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0
All Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	1
% Trucks	0.0	0.4	0.0	-	0.4	0.0	0.0	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	-	0.0	0.2

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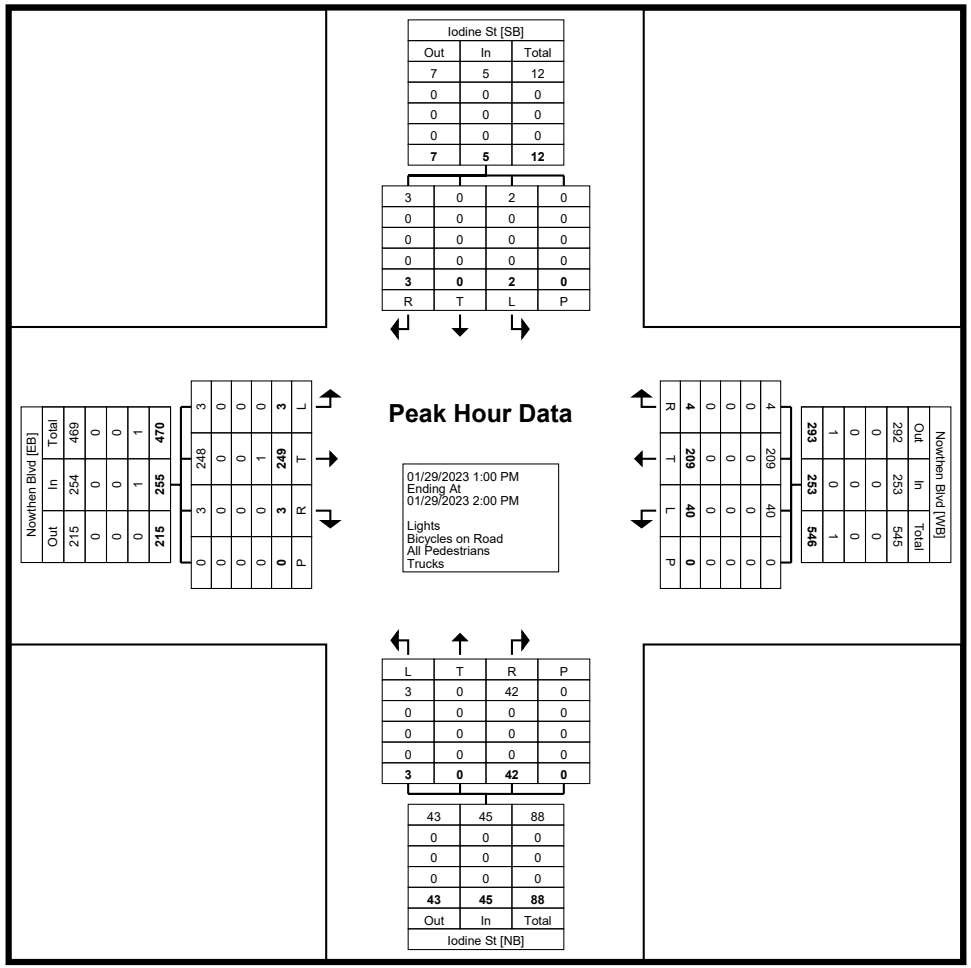
Count Name: Nowthen Blvd & Iodine St
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (1:00 PM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & Sunwood Dr
Site Code:
Start Date: 01/29/2023

Turning Movement Data

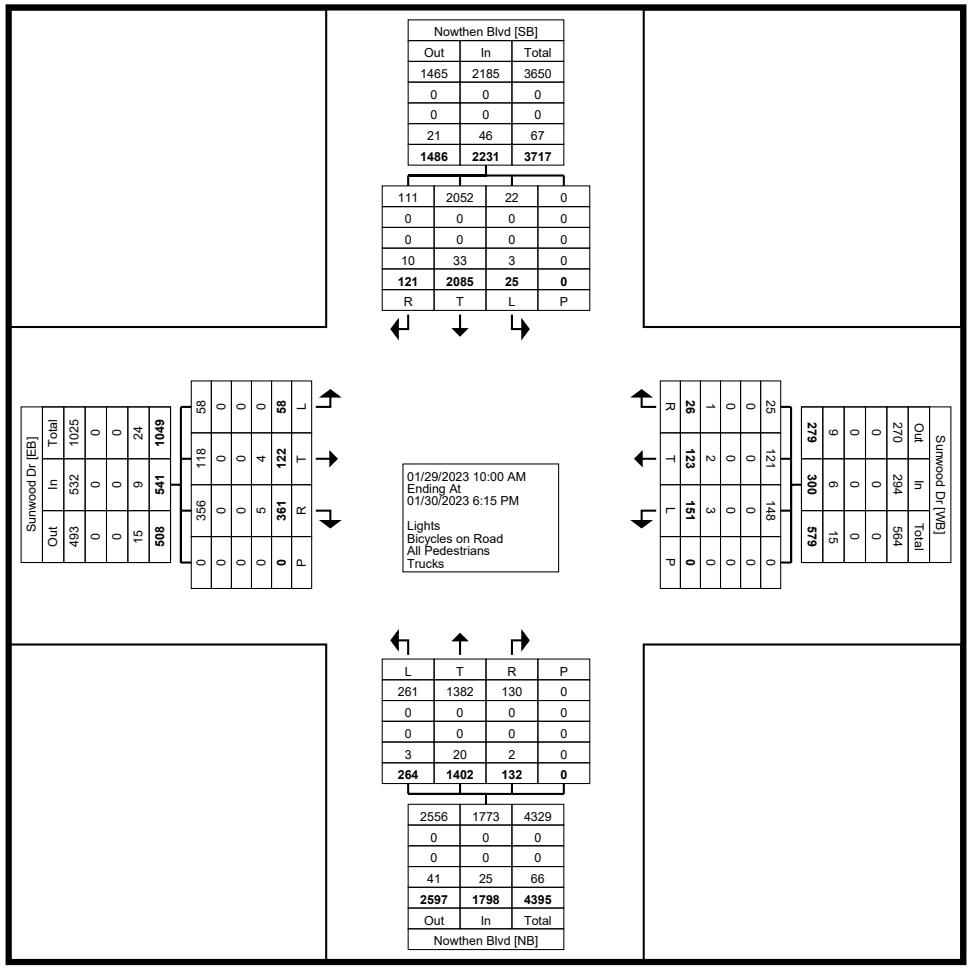
Start Time	Sunwood Dr Eastbound					Sunwood Dr Westbound					Nowthen Blvd Northbound					Nowthen Blvd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
10:00 AM	1	2	11	0	14	2	1	0	0	3	2	21	4	0	27	0	41	0	0	41	85
10:15 AM	0	4	14	0	18	6	3	0	0	9	4	26	3	0	33	0	58	0	0	58	118
10:30 AM	1	2	7	0	10	5	1	2	0	8	5	22	1	0	28	0	52	0	0	52	98
10:45 AM	1	2	14	0	17	5	7	0	0	12	2	24	3	0	29	0	50	0	0	50	108
Hourly Total	3	10	46	0	59	18	12	2	0	32	13	93	11	0	117	0	201	0	0	201	409
11:00 AM	2	3	6	0	11	1	1	0	0	2	6	15	3	0	24	0	33	2	0	35	72
11:15 AM	4	1	6	0	11	2	1	1	0	4	5	30	4	0	39	0	41	0	0	41	95
11:30 AM	1	3	6	0	10	4	3	0	0	7	6	32	5	0	43	0	46	1	0	47	107
11:45 AM	1	3	17	0	21	8	2	0	0	10	3	36	1	0	40	0	53	2	0	55	126
Hourly Total	8	10	35	0	53	15	7	1	0	23	20	113	13	0	146	0	173	5	0	178	400
12:00 PM	1	3	10	0	14	4	6	1	0	11	11	30	5	0	46	0	41	3	0	44	115
12:15 PM	0	7	10	0	17	1	4	1	0	6	5	35	4	0	44	0	63	2	0	65	132
12:30 PM	1	7	7	0	15	4	1	2	0	7	7	44	4	0	55	0	50	1	0	51	128
12:45 PM	1	7	7	0	15	1	5	1	0	7	9	40	7	0	56	1	39	1	0	41	119
Hourly Total	3	24	34	0	61	10	16	5	0	31	32	149	20	0	201	1	193	7	0	201	494
1:00 PM	1	3	10	0	14	0	1	0	0	1	7	24	1	0	32	0	38	2	0	40	87
1:15 PM	2	4	15	0	21	8	3	0	0	11	16	39	5	0	60	1	50	2	0	53	145
1:30 PM	0	1	12	0	13	4	7	1	0	12	7	51	7	0	65	0	34	2	0	36	126
1:45 PM	0	3	10	0	13	4	2	0	0	6	8	32	8	0	48	0	33	4	0	37	104
Hourly Total	3	11	47	0	61	16	13	1	0	30	38	146	21	0	205	1	155	10	0	166	462
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	4	12	0	16	12	9	2	0	23	3	15	2	0	20	0	127	5	0	132	191
7:15 AM	2	3	17	0	22	10	1	0	0	11	2	29	2	0	33	0	105	1	0	106	172
7:30 AM	3	1	6	0	10	12	6	0	0	18	3	31	3	0	37	2	108	6	0	116	181
7:45 AM	3	6	17	0	26	6	6	3	0	15	3	34	0	0	37	0	126	5	0	131	209
Hourly Total	8	14	52	0	74	40	22	5	0	67	11	109	7	0	127	2	466	17	0	485	753
8:00 AM	6	2	21	0	29	9	3	1	0	13	4	46	5	0	55	3	140	3	0	146	243
8:15 AM	4	3	14	0	21	7	6	1	0	14	3	56	2	0	61	2	100	4	0	106	202
8:30 AM	3	4	5	0	12	6	4	0	0	10	7	37	5	0	49	0	53	1	0	54	125
8:45 AM	1	2	15	0	18	4	4	0	0	8	6	25	3	0	34	0	57	3	0	60	120
Hourly Total	14	11	55	0	80	26	17	2	0	45	20	164	15	0	199	5	350	11	0	366	690
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

4:00 PM	6	5	6	0	17	2	5	4	0	11	21	84	12	0	117	11	120	37	0	168	313
4:15 PM	2	1	14	0	17	3	4	0	0	7	15	60	5	0	80	2	71	5	0	78	182
4:30 PM	4	7	15	0	26	8	6	1	0	15	24	82	6	0	112	3	77	3	0	83	236
4:45 PM	2	11	6	0	19	8	7	2	0	17	14	84	4	0	102	0	62	3	0	65	203
Hourly Total	14	24	41	0	79	21	22	7	0	50	74	310	27	0	411	16	330	48	0	394	934
5:00 PM	3	6	12	0	21	0	2	2	0	4	21	82	3	0	106	0	69	5	0	74	205
5:15 PM	0	5	14	0	19	2	6	0	0	8	11	96	4	0	111	0	55	8	0	63	201
5:30 PM	1	3	14	0	18	1	3	1	0	5	10	77	7	0	94	0	48	5	0	53	170
5:45 PM	1	4	11	0	16	2	3	0	0	5	14	63	3	0	80	0	45	5	0	50	151
Hourly Total	5	18	51	0	74	5	14	3	0	22	56	318	17	0	391	0	217	23	0	240	727
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
Grand Total	58	122	361	0	541	151	123	26	0	300	264	1402	132	0	1798	25	2085	121	0	2231	4870
Approach %	10.7	22.6	66.7	-	-	50.3	41.0	8.7	-	-	14.7	78.0	7.3	-	-	1.1	93.5	5.4	-	-	-
Total %	1.2	2.5	7.4	-	11.1	3.1	2.5	0.5	-	6.2	5.4	28.8	2.7	-	36.9	0.5	42.8	2.5	-	45.8	-
Lights	58	118	356	-	532	148	121	25	-	294	261	1382	130	-	1773	22	2052	111	-	2185	4784
% Lights	100.0	96.7	98.6	-	98.3	98.0	98.4	96.2	-	98.0	98.9	98.6	98.5	-	98.6	88.0	98.4	91.7	-	97.9	98.2
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	0	4	5	-	9	3	2	1	-	6	3	20	2	-	25	3	33	10	-	46	86
% Trucks	0.0	3.3	1.4	-	1.7	2.0	1.6	3.8	-	2.0	1.1	1.4	1.5	-	1.4	12.0	1.6	8.3	-	2.1	1.8

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & Sunwood Dr
Site Code:
Start Date: 01/29/2023



Turning Movement Data Plot

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & Sunwood Dr
Site Code:
Start Date: 01/29/2023

Turning Movement Peak Hour Data (10:00 AM)

Start Time	Sunwood Dr Eastbound					Sunwood Dr Westbound					Nowthen Blvd Northbound					Nowthen Blvd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
10:00 AM	1	2	11	0	14	2	1	0	0	3	2	21	4	0	27	0	41	0	0	41	85
10:15 AM	0	4	14	0	18	6	3	0	0	9	4	26	3	0	33	0	58	0	0	58	118
10:30 AM	1	2	7	0	10	5	1	2	0	8	5	22	1	0	28	0	52	0	0	52	98
10:45 AM	1	2	14	0	17	5	7	0	0	12	2	24	3	0	29	0	50	0	0	50	108
Total	3	10	46	0	59	18	12	2	0	32	13	93	11	0	117	0	201	0	0	201	409
Approach %	5.1	16.9	78.0	-	-	56.3	37.5	6.3	-	-	11.1	79.5	9.4	-	-	0.0	100.0	0.0	-	-	-
Total %	0.7	2.4	11.2	-	14.4	4.4	2.9	0.5	-	7.8	3.2	22.7	2.7	-	28.6	0.0	49.1	0.0	-	49.1	-
PHF	0.750	0.625	0.821	-	0.819	0.750	0.429	0.250	-	0.667	0.650	0.894	0.688	-	0.886	0.000	0.866	0.000	-	0.866	0.867
Lights	3	10	46	-	59	18	12	2	-	32	13	92	11	-	116	0	200	0	-	200	407
% Lights	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0	-	100.0	100.0	98.9	100.0	-	99.1	-	99.5	-	-	99.5	99.5
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	-	0.0	-	-	0.0	0.0
All Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	0	1	0	-	1	2
% Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	1.1	0.0	-	0.9	-	0.5	-	-	0.5	0.5

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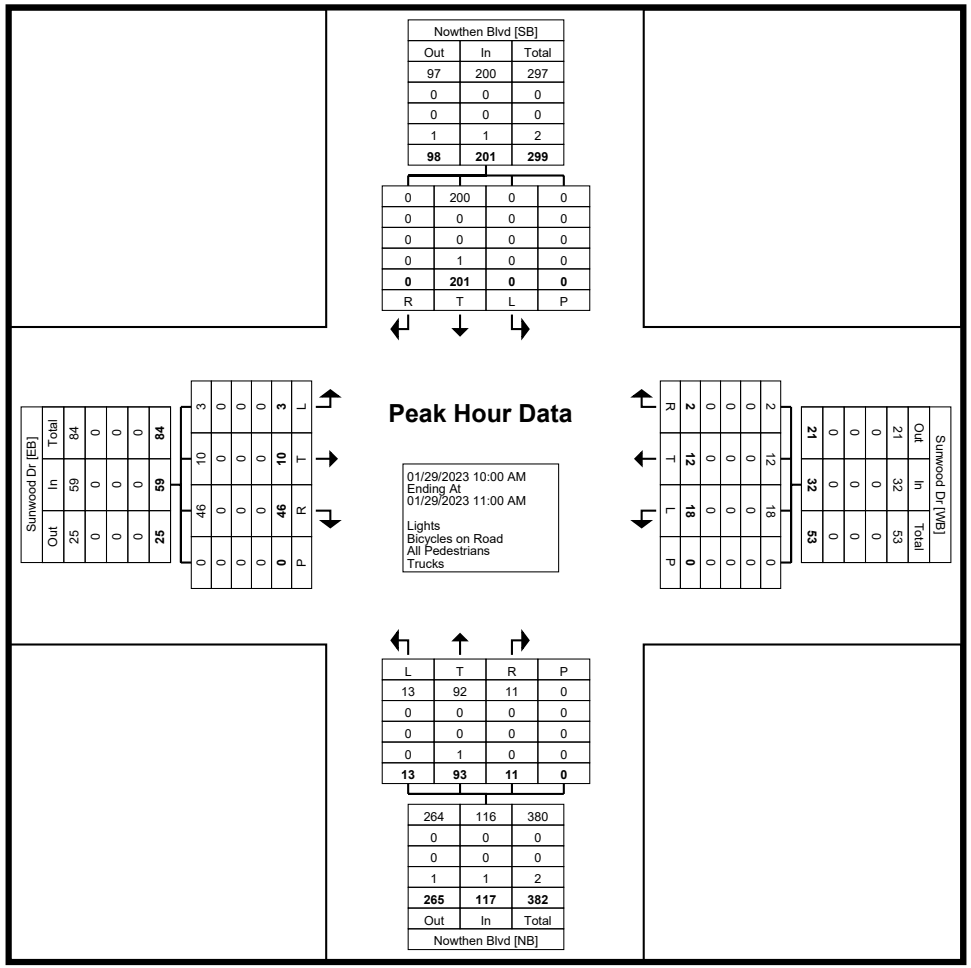
Count Name: Nowthen Blvd & Sunwood Dr
Site Code:
Start Date: 01/29/2023



Turning Movement Peak Hour Data Plot (10:00 AM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & Sunwood Dr
Site Code:
Start Date: 01/29/2023

Turning Movement Peak Hour Data (12:00 PM)

Start Time	Sunwood Dr Eastbound					Sunwood Dr Westbound					Nowthen Blvd Northbound					Nowthen Blvd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
12:00 PM	1	3	10	0	14	4	6	1	0	11	11	30	5	0	46	0	41	3	0	44	115
12:15 PM	0	7	10	0	17	1	4	1	0	6	5	35	4	0	44	0	63	2	0	65	132
12:30 PM	1	7	7	0	15	4	1	2	0	7	7	44	4	0	55	0	50	1	0	51	128
12:45 PM	1	7	7	0	15	1	5	1	0	7	9	40	7	0	56	1	39	1	0	41	119
Total	3	24	34	0	61	10	16	5	0	31	32	149	20	0	201	1	193	7	0	201	494
Approach %	4.9	39.3	55.7	-	-	32.3	51.6	16.1	-	-	15.9	74.1	10.0	-	-	0.5	96.0	3.5	-	-	-
Total %	0.6	4.9	6.9	-	12.3	2.0	3.2	1.0	-	6.3	6.5	30.2	4.0	-	40.7	0.2	39.1	1.4	-	40.7	-
PHF	0.750	0.857	0.850	-	0.897	0.625	0.667	0.625	-	0.705	0.727	0.847	0.714	-	0.897	0.250	0.766	0.583	-	0.773	0.936
Lights	3	24	34	-	61	10	16	5	-	31	32	148	20	-	200	1	191	7	-	199	491
% Lights	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0	-	100.0	100.0	99.3	100.0	-	99.5	100.0	99.0	100.0	-	99.0	99.4
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	0	2	0	-	2	3
% Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.7	0.0	-	0.5	0.0	1.0	0.0	-	1.0	0.6

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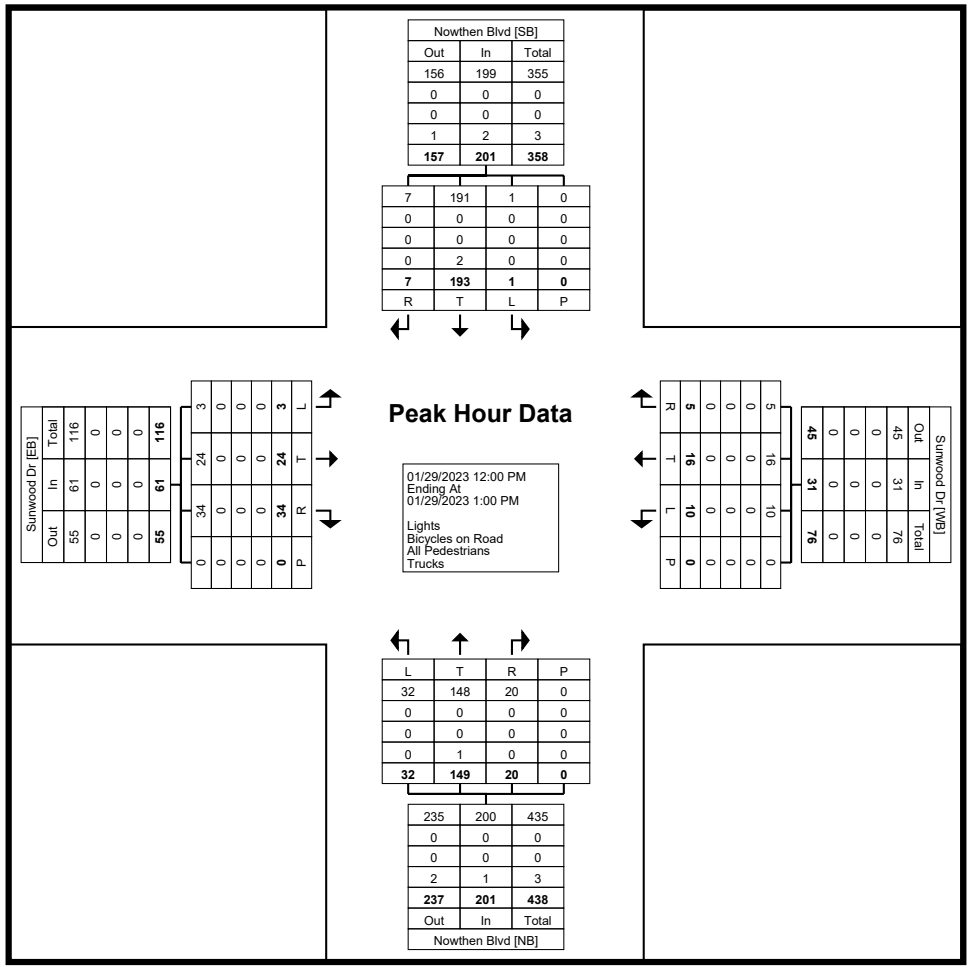
Count Name: Nowthen Blvd & Sunwood Dr
Site Code:
Start Date: 01/29/2023



Turning Movement Peak Hour Data Plot (12:00 PM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & Sunwood Dr
Site Code:
Start Date: 01/29/2023

Turning Movement Peak Hour Data (7:30 AM)

Start Time	Sunwood Dr Eastbound					Sunwood Dr Westbound					Nowthen Blvd Northbound					Nowthen Blvd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
7:30 AM	3	1	6	0	10	12	6	0	0	18	3	31	3	0	37	2	108	6	0	116	181
7:45 AM	3	6	17	0	26	6	6	3	0	15	3	34	0	0	37	0	126	5	0	131	209
8:00 AM	6	2	21	0	29	9	3	1	0	13	4	46	5	0	55	3	140	3	0	146	243
8:15 AM	4	3	14	0	21	7	6	1	0	14	3	56	2	0	61	2	100	4	0	106	202
Total	16	12	58	0	86	34	21	5	0	60	13	167	10	0	190	7	474	18	0	499	835
Approach %	18.6	14.0	67.4	-	-	56.7	35.0	8.3	-	-	6.8	87.9	5.3	-	-	1.4	95.0	3.6	-	-	-
Total %	1.9	1.4	6.9	-	10.3	4.1	2.5	0.6	-	7.2	1.6	20.0	1.2	-	22.8	0.8	56.8	2.2	-	59.8	-
PHF	0.667	0.500	0.690	-	0.741	0.708	0.875	0.417	-	0.833	0.813	0.746	0.500	-	0.779	0.583	0.846	0.750	-	0.854	0.859
Lights	16	9	56	-	81	34	19	4	-	57	12	164	9	-	185	7	466	17	-	490	813
% Lights	100.0	75.0	96.6	-	94.2	100.0	90.5	80.0	-	95.0	92.3	98.2	90.0	-	97.4	100.0	98.3	94.4	-	98.2	97.4
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	0	3	2	-	5	0	2	1	-	3	1	3	1	-	5	0	8	1	-	9	22
% Trucks	0.0	25.0	3.4	-	5.8	0.0	9.5	20.0	-	5.0	7.7	1.8	10.0	-	2.6	0.0	1.7	5.6	-	1.8	2.6

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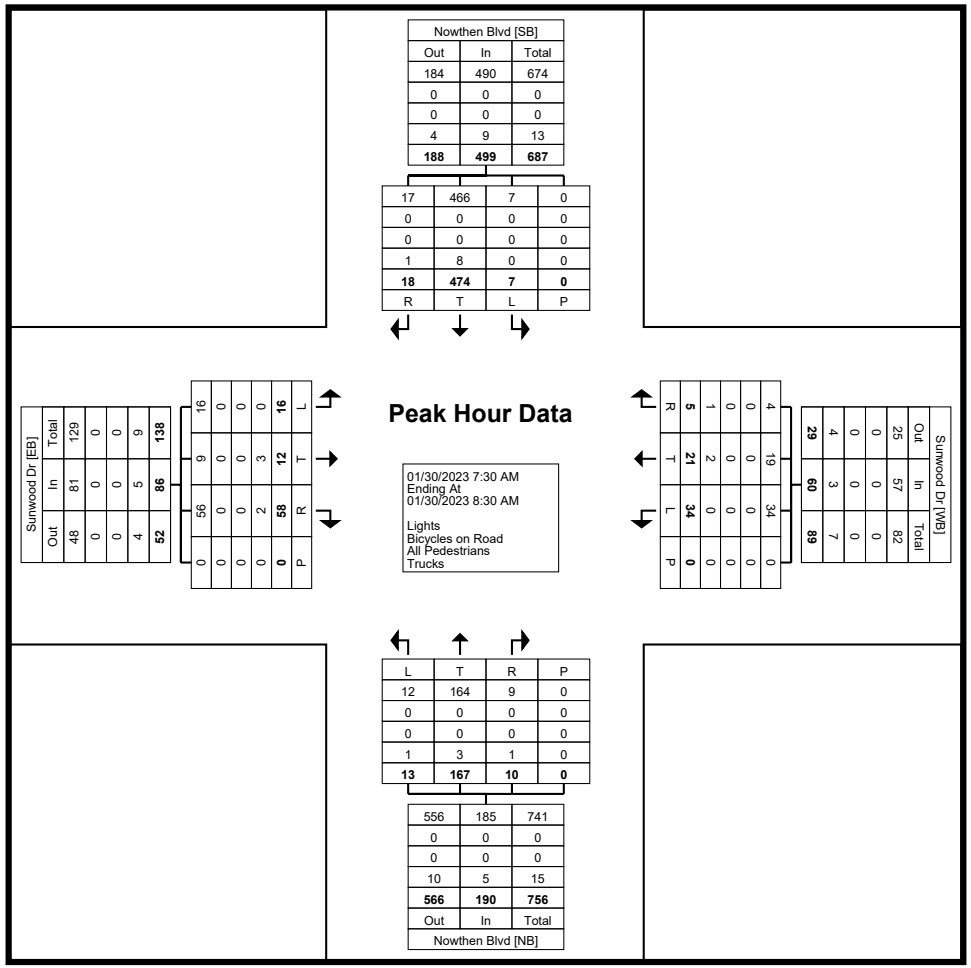
Count Name: Nowthen Blvd & Sunwood Dr
Site Code:
Start Date: 01/29/2023



Turning Movement Peak Hour Data Plot (7:30 AM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & Sunwood Dr
Site Code:
Start Date: 01/29/2023

Turning Movement Peak Hour Data (4:00 PM)

Start Time	Sunwood Dr Eastbound					Sunwood Dr Westbound					Nowthen Blvd Northbound					Nowthen Blvd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
4:00 PM	6	5	6	0	17	2	5	4	0	11	21	84	12	0	117	11	120	37	0	168	313
4:15 PM	2	1	14	0	17	3	4	0	0	7	15	60	5	0	80	2	71	5	0	78	182
4:30 PM	4	7	15	0	26	8	6	1	0	15	24	82	6	0	112	3	77	3	0	83	236
4:45 PM	2	11	6	0	19	8	7	2	0	17	14	84	4	0	102	0	62	3	0	65	203
Total	14	24	41	0	79	21	22	7	0	50	74	310	27	0	411	16	330	48	0	394	934
Approach %	17.7	30.4	51.9	-	-	42.0	44.0	14.0	-	-	18.0	75.4	6.6	-	-	4.1	83.8	12.2	-	-	-
Total %	1.5	2.6	4.4	-	8.5	2.2	2.4	0.7	-	5.4	7.9	33.2	2.9	-	44.0	1.7	35.3	5.1	-	42.2	-
PHF	0.583	0.545	0.683	-	0.760	0.656	0.786	0.438	-	0.735	0.771	0.923	0.563	-	0.878	0.364	0.688	0.324	-	0.586	0.746
Lights	14	24	39	-	77	19	22	7	-	48	74	307	27	-	408	13	320	40	-	373	906
% Lights	100.0	100.0	95.1	-	97.5	90.5	100.0	100.0	-	96.0	100.0	99.0	100.0	-	99.3	81.3	97.0	83.3	-	94.7	97.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	0	0	2	-	2	2	0	0	-	2	0	3	0	-	3	3	10	8	-	21	28
% Trucks	0.0	0.0	4.9	-	2.5	9.5	0.0	0.0	-	4.0	0.0	1.0	0.0	-	0.7	18.8	3.0	16.7	-	5.3	3.0

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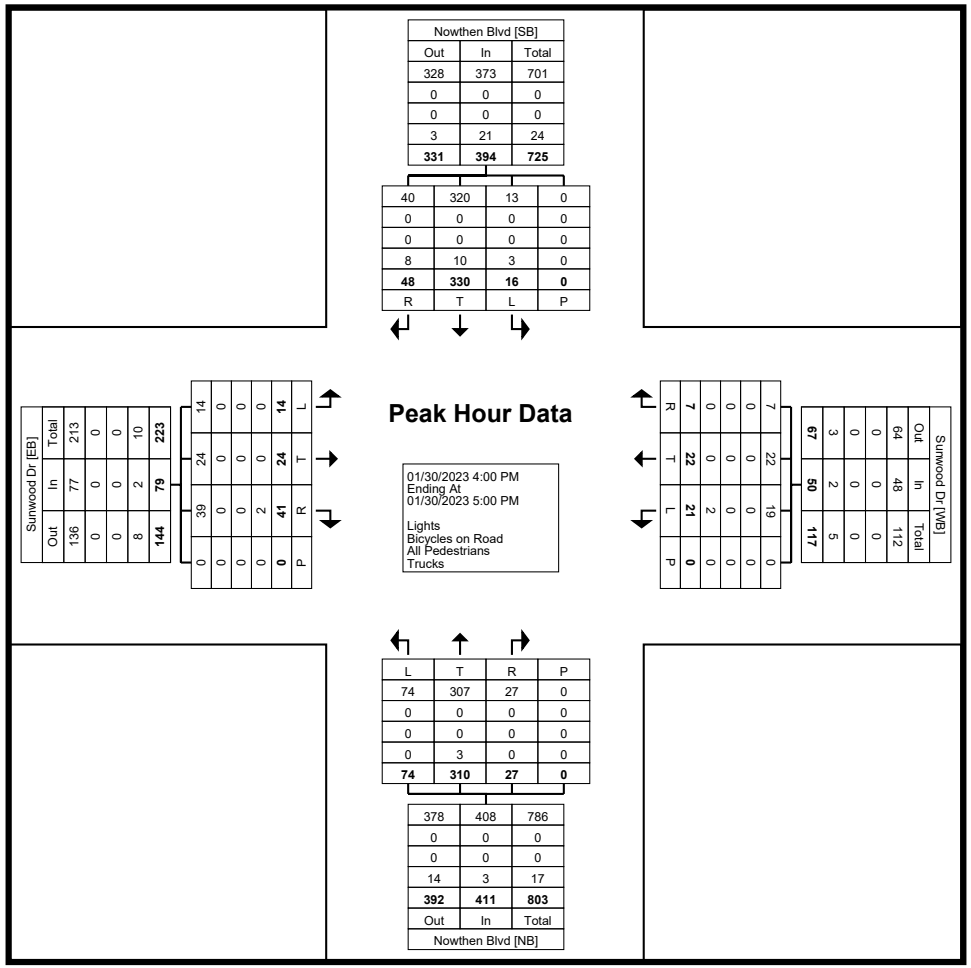
Count Name: Nowthen Blvd & Sunwood Dr
Site Code:
Start Date: 01/29/2023



Turning Movement Peak Hour Data Plot (4:00 PM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & the North Site Access
Site Code:
Start Date: 01/26/2023

Turning Movement Data

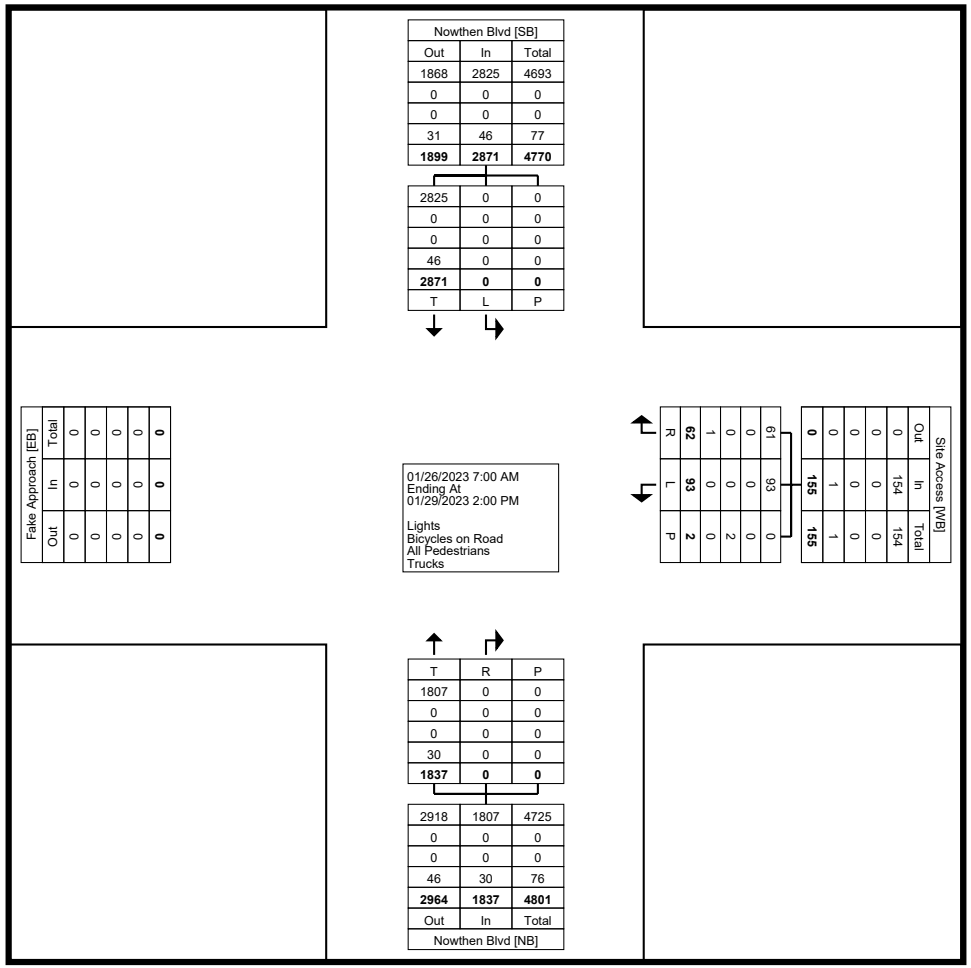
Start Time	Site Access Westbound				Nowthen Blvd Northbound				Nowthen Blvd Southbound				
	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Int. Total
7:00 AM	0	0	0	0	15	0	0	15	0	222	0	222	237
7:15 AM	0	0	0	0	34	0	0	34	0	209	0	209	243
7:30 AM	0	1	0	1	51	0	0	51	0	145	0	145	197
7:45 AM	0	0	0	0	38	0	0	38	0	148	0	148	186
Hourly Total	0	1	0	1	138	0	0	138	0	724	0	724	863
8:00 AM	3	0	0	3	53	0	0	53	0	111	0	111	167
8:15 AM	1	0	0	1	52	0	0	52	0	102	0	102	155
8:30 AM	0	2	1	2	33	0	0	33	0	87	0	87	122
8:45 AM	2	1	0	3	39	0	0	39	0	94	0	94	136
Hourly Total	6	3	1	9	177	0	0	177	0	394	0	394	580
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	2	1	0	3	84	0	0	84	0	127	0	127	214
4:15 PM	0	0	0	0	113	0	0	113	0	88	0	88	201
4:30 PM	2	0	1	2	123	0	0	123	0	75	0	75	200
4:45 PM	0	1	0	1	99	0	0	99	0	98	0	98	198
Hourly Total	4	2	1	6	419	0	0	419	0	388	0	388	813
5:00 PM	1	2	0	3	124	0	0	124	0	94	0	94	221
5:15 PM	8	5	0	13	85	0	0	85	0	101	0	101	199
5:30 PM	15	11	0	26	80	0	0	80	0	83	0	83	189
5:45 PM	1	0	0	1	120	0	0	120	0	71	0	71	192
Hourly Total	25	18	0	43	409	0	0	409	0	349	0	349	801
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	4	6	0	10	24	0	0	24	0	59	0	59	93
10:15 AM	4	3	0	7	29	0	0	29	0	85	0	85	121
10:30 AM	1	0	0	1	28	0	0	28	0	68	0	68	97
10:45 AM	5	1	0	6	29	0	0	29	0	75	0	75	110
Hourly Total	14	10	0	24	110	0	0	110	0	287	0	287	421
11:00 AM	1	0	0	1	30	0	0	30	0	40	0	40	71
11:15 AM	3	1	0	4	41	0	0	41	0	56	0	56	101
11:30 AM	0	0	0	0	46	0	0	46	0	58	0	58	104
11:45 AM	9	6	0	15	41	0	0	41	0	85	0	85	141
Hourly Total	13	7	0	20	158	0	0	158	0	239	0	239	417

12:00 PM	6	1	0	7	47	0	0	47	0	60	0	60	114
12:15 PM	1	1	0	2	49	0	0	49	0	80	0	80	131
12:30 PM	1	2	0	3	58	0	0	58	0	64	0	64	125
12:45 PM	0	1	0	1	61	0	0	61	0	51	0	51	113
Hourly Total	8	5	0	13	215	0	0	215	0	255	0	255	483
1:00 PM	1	0	0	1	36	0	0	36	0	55	0	55	92
1:15 PM	14	10	0	24	57	0	0	57	0	75	0	75	156
1:30 PM	6	3	0	9	64	0	0	64	0	51	0	51	124
1:45 PM	2	3	0	5	54	0	0	54	0	54	0	54	113
Hourly Total	23	16	0	39	211	0	0	211	0	235	0	235	485
Grand Total	93	62	2	155	1837	0	0	1837	0	2871	0	2871	4863
Approach %	60.0	40.0	-	-	100.0	0.0	-	-	0.0	100.0	-	-	-
Total %	1.9	1.3	-	3.2	37.8	0.0	-	37.8	0.0	59.0	-	59.0	-
Lights	93	61	-	154	1807	0	-	1807	0	2825	-	2825	4786
% Lights	100.0	98.4	-	99.4	98.4	-	-	98.4	-	98.4	-	98.4	98.4
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	-	-	0.0	-	0.0	-	0.0	0.0
All Pedestrians	-	-	2	-	-	-	0	-	-	-	0	-	-
% All Pedestrians	-	-	100.0	-	-	-	-	-	-	-	-	-	-
Trucks	0	1	-	1	30	0	-	30	0	46	-	46	77
% Trucks	0.0	1.6	-	0.6	1.6	-	-	1.6	-	1.6	-	1.6	1.6

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & the North Site Access
Site Code:
Start Date: 01/26/2023



Turning Movement Data Plot

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(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & the North Site Access
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Site Access Westbound				Nowthen Blvd Northbound				Nowthen Blvd Southbound				
	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Int. Total
7:00 AM	0	0	0	0	15	0	0	15	0	222	0	222	237
7:15 AM	0	0	0	0	34	0	0	34	0	209	0	209	243
7:30 AM	0	1	0	1	51	0	0	51	0	145	0	145	197
7:45 AM	0	0	0	0	38	0	0	38	0	148	0	148	186
Total	0	1	0	1	138	0	0	138	0	724	0	724	863
Approach %	0.0	100.0	-	-	100.0	0.0	-	-	0.0	100.0	-	-	-
Total %	0.0	0.1	-	0.1	16.0	0.0	-	16.0	0.0	83.9	-	83.9	-
PHF	0.000	0.250	-	0.250	0.676	0.000	-	0.676	0.000	0.815	-	0.815	0.888
Lights	0	0	-	0	127	0	-	127	0	710	-	710	837
% Lights	-	0.0	-	0.0	92.0	-	-	92.0	-	98.1	-	98.1	97.0
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	-	0.0	-	0.0	0.0	-	-	0.0	-	0.0	-	0.0	0.0
All Pedestrians	-	-	0	-	-	-	0	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	0	1	-	1	11	0	-	11	0	14	-	14	26
% Trucks	-	100.0	-	100.0	8.0	-	-	8.0	-	1.9	-	1.9	3.0

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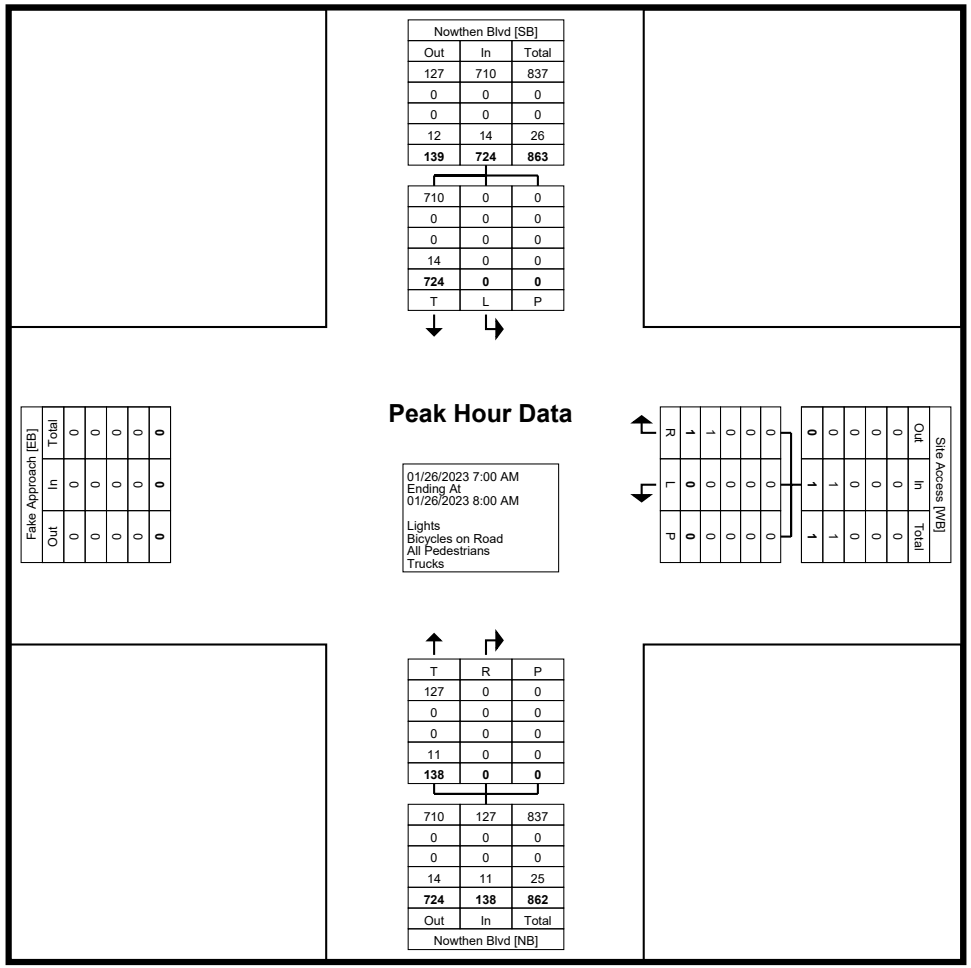
Count Name: Nowthen Blvd & the North Site Access
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (7:00 AM)

Kimley-Horn and Associates, Inc.
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Count Name: Nowthen Blvd & the North Site Access
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (4:15 PM)

Start Time	Site Access Westbound				Nowthen Blvd Northbound				Nowthen Blvd Southbound				
	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Int. Total
4:15 PM	0	0	0	0	113	0	0	113	0	88	0	88	201
4:30 PM	2	0	1	2	123	0	0	123	0	75	0	75	200
4:45 PM	0	1	0	1	99	0	0	99	0	98	0	98	198
5:00 PM	1	2	0	3	124	0	0	124	0	94	0	94	221
Total	3	3	1	6	459	0	0	459	0	355	0	355	820
Approach %	50.0	50.0	-	-	100.0	0.0	-	-	0.0	100.0	-	-	-
Total %	0.4	0.4	-	0.7	56.0	0.0	-	56.0	0.0	43.3	-	43.3	-
PHF	0.375	0.375	-	0.500	0.925	0.000	-	0.925	0.000	0.906	-	0.906	0.928
Lights	3	3	-	6	453	0	-	453	0	343	-	343	802
% Lights	100.0	100.0	-	100.0	98.7	-	-	98.7	-	96.6	-	96.6	97.8
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	-	-	0.0	-	0.0	-	0.0	0.0
All Pedestrians	-	-	1	-	-	-	0	-	-	-	0	-	-
% All Pedestrians	-	-	100.0	-	-	-	-	-	-	-	-	-	-
Trucks	0	0	-	0	6	0	-	6	0	12	-	12	18
% Trucks	0.0	0.0	-	0.0	1.3	-	-	1.3	-	3.4	-	3.4	2.2

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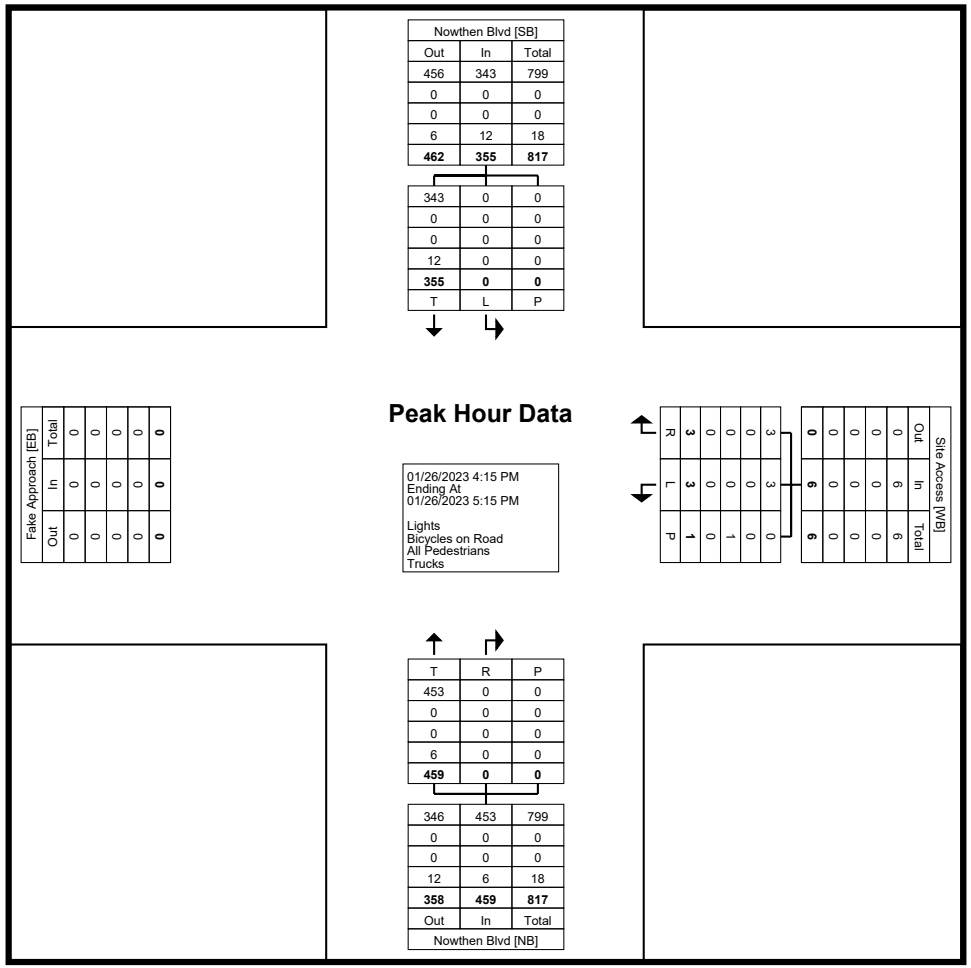
Count Name: Nowthen Blvd & the North Site Access
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (4:15 PM)

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(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & the North Site Access
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (10:00 AM)

Start Time	Site Access Westbound				Nowthen Blvd Northbound				Nowthen Blvd Southbound				
	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Int. Total
10:00 AM	4	6	0	10	24	0	0	24	0	59	0	59	93
10:15 AM	4	3	0	7	29	0	0	29	0	85	0	85	121
10:30 AM	1	0	0	1	28	0	0	28	0	68	0	68	97
10:45 AM	5	1	0	6	29	0	0	29	0	75	0	75	110
Total	14	10	0	24	110	0	0	110	0	287	0	287	421
Approach %	58.3	41.7	-	-	100.0	0.0	-	-	0.0	100.0	-	-	-
Total %	3.3	2.4	-	5.7	26.1	0.0	-	26.1	0.0	68.2	-	68.2	-
PHF	0.700	0.417	-	0.600	0.948	0.000	-	0.948	0.000	0.844	-	0.844	0.870
Lights	14	10	-	24	109	0	-	109	0	286	-	286	419
% Lights	100.0	100.0	-	100.0	99.1	-	-	99.1	-	99.7	-	99.7	99.5
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	-	-	0.0	-	0.0	-	0.0	0.0
All Pedestrians	-	-	0	-	-	-	0	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	0	0	-	0	1	0	-	1	0	1	-	1	2
% Trucks	0.0	0.0	-	0.0	0.9	-	-	0.9	-	0.3	-	0.3	0.5

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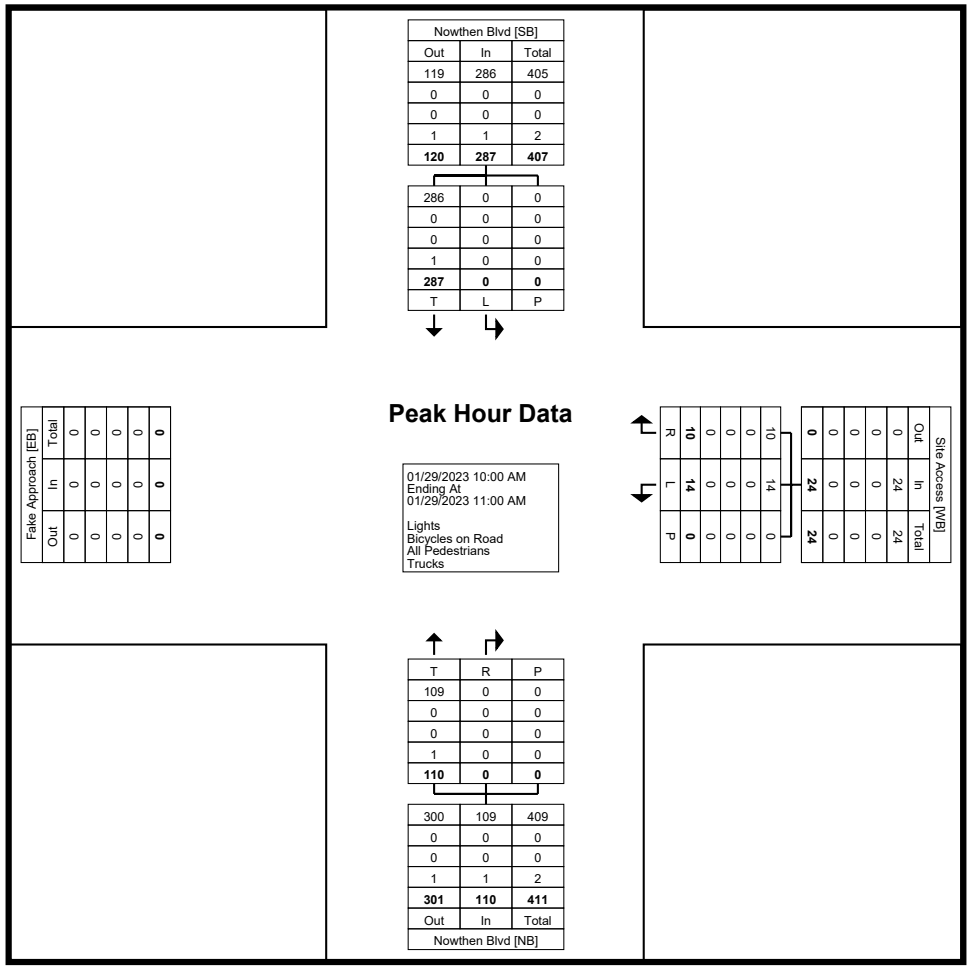
Count Name: Nowthen Blvd & the North Site Access
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (10:00 AM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Nowthen Blvd & the North Site Access
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (12:30 PM)

Start Time	Site Access Westbound				Nowthen Blvd Northbound				Nowthen Blvd Southbound				
	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Int. Total
12:30 PM	1	2	0	3	58	0	0	58	0	64	0	64	125
12:45 PM	0	1	0	1	61	0	0	61	0	51	0	51	113
1:00 PM	1	0	0	1	36	0	0	36	0	55	0	55	92
1:15 PM	14	10	0	24	57	0	0	57	0	75	0	75	156
Total	16	13	0	29	212	0	0	212	0	245	0	245	486
Approach %	55.2	44.8	-	-	100.0	0.0	-	-	0.0	100.0	-	-	-
Total %	3.3	2.7	-	6.0	43.6	0.0	-	43.6	0.0	50.4	-	50.4	-
PHF	0.286	0.325	-	0.302	0.869	0.000	-	0.869	0.000	0.817	-	0.817	0.779
Lights	16	13	-	29	211	0	-	211	0	243	-	243	483
% Lights	100.0	100.0	-	100.0	99.5	-	-	99.5	-	99.2	-	99.2	99.4
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	-	-	0.0	-	0.0	-	0.0	0.0
All Pedestrians	-	-	0	-	-	-	0	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	0	0	-	0	1	0	-	1	0	2	-	2	3
% Trucks	0.0	0.0	-	0.0	0.5	-	-	0.5	-	0.8	-	0.8	0.6

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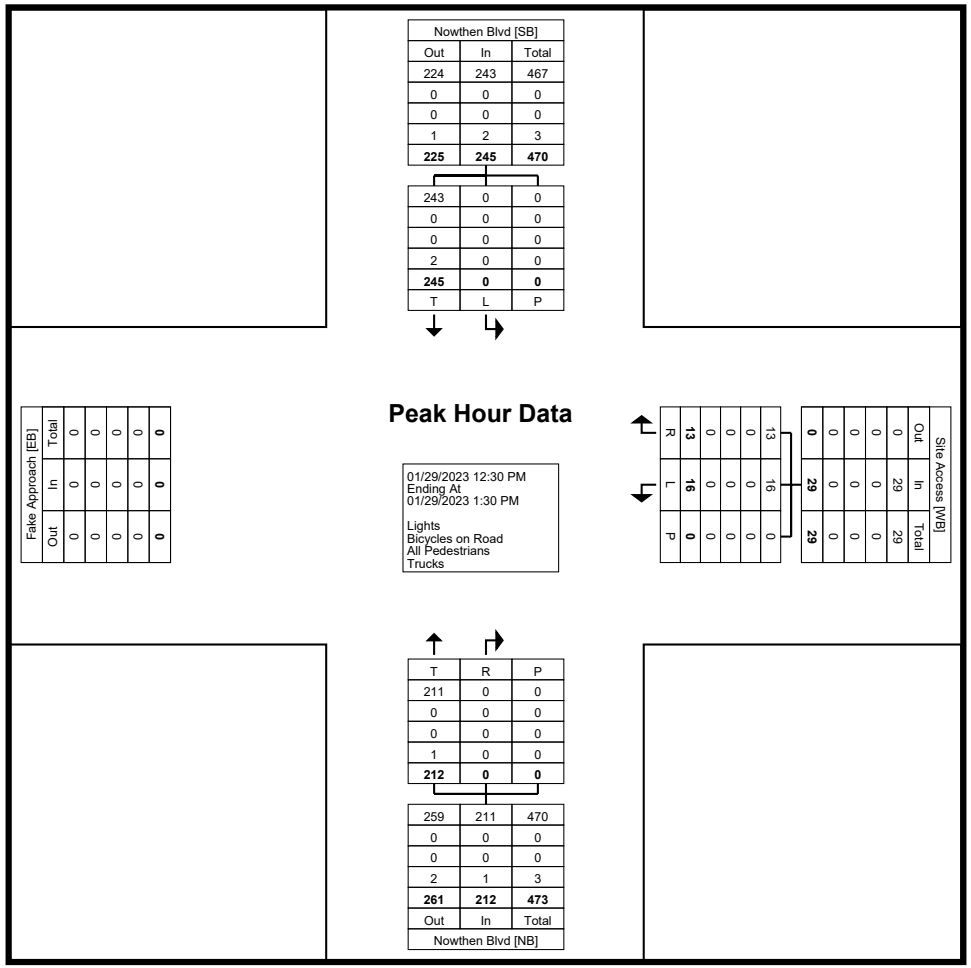
Count Name: Nowthen Blvd & the North Site Access
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (12:30 PM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: St Francis Blvd & Nowthen Blvd
Site Code:
Start Date: 01/26/2023

Turning Movement Data

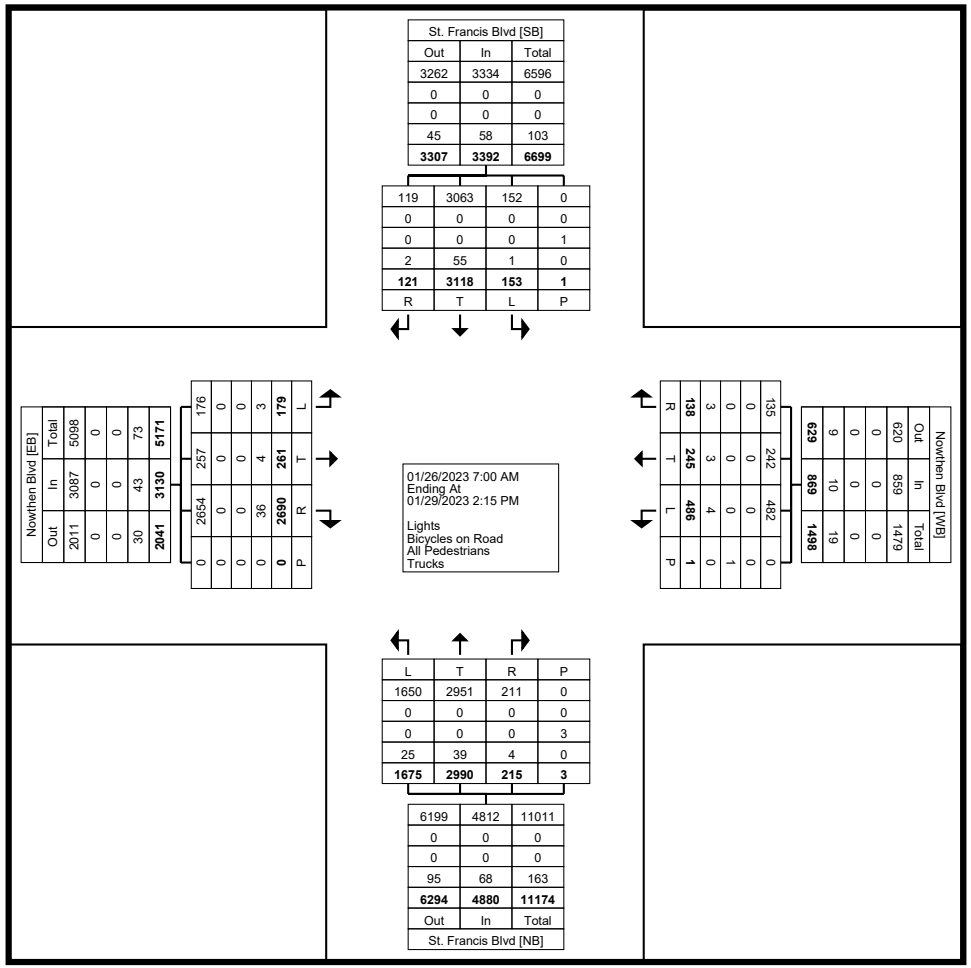
Start Time	Nowthen Blvd Eastbound					Nowthen Blvd Westbound					St. Francis Blvd Northbound					St. Francis Blvd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
7:00 AM	3	9	174	0	186	31	2	2	0	35	13	20	2	0	35	4	147	1	0	152	408
7:15 AM	2	9	194	0	205	40	6	3	0	49	32	53	6	0	91	3	116	10	0	129	474
7:30 AM	4	4	119	0	127	28	10	2	0	40	43	37	5	0	85	8	146	4	0	158	410
7:45 AM	2	8	131	0	141	19	3	2	0	24	28	38	3	0	69	5	141	13	0	159	393
Hourly Total	11	30	618	0	659	118	21	9	0	148	116	148	16	0	280	20	550	28	0	598	1685
8:00 AM	3	12	93	0	108	13	6	4	0	23	48	52	8	0	108	1	126	9	0	136	375
8:15 AM	2	10	92	0	104	10	6	1	0	17	42	53	8	0	103	4	104	8	0	116	340
8:30 AM	4	2	83	0	89	13	6	3	0	22	33	48	4	0	85	6	106	2	0	114	310
8:45 AM	2	7	83	0	92	14	5	0	0	19	37	42	3	0	82	8	86	7	0	101	294
Hourly Total	11	31	351	0	393	50	23	8	0	81	160	195	23	0	378	19	422	26	0	467	1319
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	15	12	107	0	134	11	16	8	0	35	83	188	13	2	284	4	80	1	0	85	538
4:15 PM	12	11	73	0	96	14	11	7	0	32	90	173	5	0	268	5	86	0	0	91	487
4:30 PM	25	14	82	0	121	18	13	10	0	41	94	132	10	0	236	6	90	6	0	102	500
4:45 PM	12	12	88	0	112	12	13	15	1	40	85	155	10	0	250	0	88	1	1	89	491
Hourly Total	64	49	350	0	463	55	53	40	1	148	352	648	38	2	1038	15	344	8	1	367	2016
5:00 PM	13	5	84	0	102	16	21	9	0	46	110	165	20	1	295	4	71	5	0	80	523
5:15 PM	4	8	105	0	117	8	14	11	0	33	87	193	9	0	289	1	102	4	0	107	546
5:30 PM	11	6	103	0	120	18	9	10	0	37	86	147	12	0	245	5	77	5	0	87	489
5:45 PM	8	9	67	0	84	14	9	6	0	29	104	151	5	0	260	5	90	3	0	98	471
Hourly Total	36	28	359	0	423	56	53	36	0	145	387	656	46	1	1089	15	340	17	0	372	2029
6:00 PM	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
10:00 AM	4	6	66	0	76	10	3	5	0	18	20	50	4	0	74	3	85	0	0	88	256
10:15 AM	8	6	70	0	84	14	5	0	0	19	24	47	2	0	73	3	100	4	0	107	283
10:30 AM	2	7	67	0	76	10	2	1	0	13	32	45	6	0	83	6	90	7	0	103	275
10:45 AM	2	6	71	0	79	18	6	5	0	29	31	68	6	0	105	7	97	2	0	106	319
Hourly Total	16	25	274	0	315	52	16	11	0	79	107	210	18	0	335	19	372	13	0	404	1133
11:00 AM	2	4	46	0	52	13	4	3	0	20	29	63	3	0	95	4	77	1	0	82	249
11:15 AM	3	5	47	0	55	16	9	3	0	28	40	68	5	0	113	5	74	4	0	83	279
11:30 AM	4	5	61	0	70	13	4	1	0	18	36	79	3	0	118	8	113	5	0	126	332
11:45 AM	2	12	78	0	92	11	4	0	0	15	41	90	7	0	138	9	93	2	0	104	349
Hourly Total	11	26	232	0	269	53	21	7	0	81	146	300	18	0	464	26	357	12	0	395	1209

12:00 PM	4	7	58	0	69	22	3	7	0	32	37	86	9	0	132	5	112	5	0	122	355
12:15 PM	4	11	76	0	91	15	9	1	0	25	49	84	3	0	136	5	113	3	0	121	373
12:30 PM	3	13	59	0	75	11	3	3	0	17	54	99	6	0	159	7	101	2	0	110	361
12:45 PM	2	4	57	0	63	12	14	5	0	31	60	96	6	0	162	3	75	3	0	81	337
Hourly Total	13	35	250	0	298	60	29	16	0	105	200	365	24	0	589	20	401	13	0	434	1426
1:00 PM	3	7	62	0	72	4	1	4	0	9	34	112	3	0	149	9	90	1	0	100	330
1:15 PM	5	16	71	0	92	12	7	1	0	20	56	106	8	0	170	2	75	0	0	77	359
1:30 PM	2	7	62	0	71	15	13	1	0	29	56	121	13	0	190	4	84	0	0	88	378
1:45 PM	7	7	60	0	74	11	8	5	0	24	61	128	8	0	197	4	83	3	0	90	385
Hourly Total	17	37	255	0	309	42	29	11	0	82	207	467	32	0	706	19	332	4	0	355	1452
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	179	261	2690	0	3130	486	245	138	1	869	1675	2990	215	3	4880	153	3118	121	1	3392	12271
Approach %	5.7	8.3	85.9	-	-	55.9	28.2	15.9	-	-	34.3	61.3	4.4	-	-	4.5	91.9	3.6	-	-	-
Total %	1.5	2.1	21.9	-	25.5	4.0	2.0	1.1	-	7.1	13.7	24.4	1.8	-	39.8	1.2	25.4	1.0	-	27.6	-
Lights	176	257	2654	-	3087	482	242	135	-	859	1650	2951	211	-	4812	152	3063	119	-	3334	12092
% Lights	98.3	98.5	98.7	-	98.6	99.2	98.8	97.8	-	98.8	98.5	98.7	98.1	-	98.6	99.3	98.2	98.3	-	98.3	98.5
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	3	-	-	-	-	1	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-
Trucks	3	4	36	-	43	4	3	3	-	10	25	39	4	-	68	1	55	2	-	58	179
% Trucks	1.7	1.5	1.3	-	1.4	0.8	1.2	2.2	-	1.2	1.5	1.3	1.9	-	1.4	0.7	1.8	1.7	-	1.7	1.5

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: St Francis Blvd & Nowthen Blvd
Site Code:
Start Date: 01/26/2023



Turning Movement Data Plot

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: St Francis Blvd & Nowthen Blvd
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Nowthen Blvd Eastbound					Nowthen Blvd Westbound					St. Francis Blvd Northbound					St. Francis Blvd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
7:00 AM	3	9	174	0	186	31	2	2	0	35	13	20	2	0	35	4	147	1	0	152	408
7:15 AM	2	9	194	0	205	40	6	3	0	49	32	53	6	0	91	3	116	10	0	129	474
7:30 AM	4	4	119	0	127	28	10	2	0	40	43	37	5	0	85	8	146	4	0	158	410
7:45 AM	2	8	131	0	141	19	3	2	0	24	28	38	3	0	69	5	141	13	0	159	393
Total	11	30	618	0	659	118	21	9	0	148	116	148	16	0	280	20	550	28	0	598	1685
Approach %	1.7	4.6	93.8	-	-	79.7	14.2	6.1	-	-	41.4	52.9	5.7	-	-	3.3	92.0	4.7	-	-	-
Total %	0.7	1.8	36.7	-	39.1	7.0	1.2	0.5	-	8.8	6.9	8.8	0.9	-	16.6	1.2	32.6	1.7	-	35.5	-
PHF	0.688	0.833	0.796	-	0.804	0.738	0.525	0.750	-	0.755	0.674	0.698	0.667	-	0.769	0.625	0.935	0.538	-	0.940	0.889
Lights	10	29	606	-	645	118	21	9	-	148	107	140	15	-	262	20	531	28	-	579	1634
% Lights	90.9	96.7	98.1	-	97.9	100.0	100.0	100.0	-	100.0	92.2	94.6	93.8	-	93.6	100.0	96.5	100.0	-	96.8	97.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	1	1	12	-	14	0	0	0	-	0	9	8	1	-	18	0	19	0	-	19	51
% Trucks	9.1	3.3	1.9	-	2.1	0.0	0.0	0.0	-	0.0	7.8	5.4	6.3	-	6.4	0.0	3.5	0.0	-	3.2	3.0

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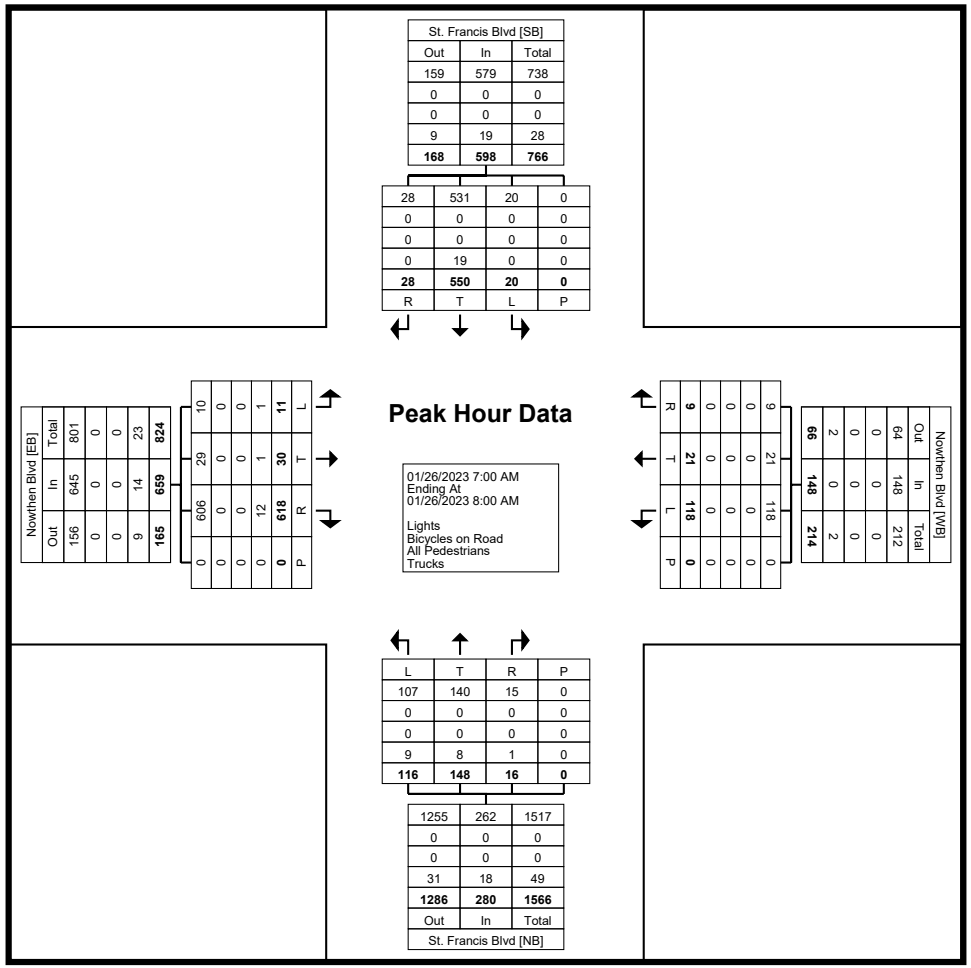
Count Name: St Francis Blvd & Nowthen Blvd
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (7:00 AM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: St Francis Blvd & Nowthen Blvd
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (4:30 PM)

Start Time	Nowthen Blvd Eastbound					Nowthen Blvd Westbound					St. Francis Blvd Northbound					St. Francis Blvd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
4:30 PM	25	14	82	0	121	18	13	10	0	41	94	132	10	0	236	6	90	6	0	102	500
4:45 PM	12	12	88	0	112	12	13	15	1	40	85	155	10	0	250	0	88	1	1	89	491
5:00 PM	13	5	84	0	102	16	21	9	0	46	110	165	20	1	295	4	71	5	0	80	523
5:15 PM	4	8	105	0	117	8	14	11	0	33	87	193	9	0	289	1	102	4	0	107	546
Total	54	39	359	0	452	54	61	45	1	160	376	645	49	1	1070	11	351	16	1	378	2060
Approach %	11.9	8.6	79.4	-	-	33.8	38.1	28.1	-	-	35.1	60.3	4.6	-	-	2.9	92.9	4.2	-	-	-
Total %	2.6	1.9	17.4	-	21.9	2.6	3.0	2.2	-	7.8	18.3	31.3	2.4	-	51.9	0.5	17.0	0.8	-	18.3	-
PHF	0.540	0.696	0.855	-	0.934	0.750	0.726	0.750	-	0.870	0.855	0.835	0.613	-	0.907	0.458	0.860	0.667	-	0.883	0.943
Lights	54	38	349	-	441	53	60	45	-	158	374	639	49	-	1062	10	343	15	-	368	2029
% Lights	100.0	97.4	97.2	-	97.6	98.1	98.4	100.0	-	98.8	99.5	99.1	100.0	-	99.3	90.9	97.7	93.8	-	97.4	98.5
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	1	-	-	-	-	1	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-
Trucks	0	1	10	-	11	1	1	0	-	2	2	6	0	-	8	1	8	1	-	10	31
% Trucks	0.0	2.6	2.8	-	2.4	1.9	1.6	0.0	-	1.3	0.5	0.9	0.0	-	0.7	9.1	2.3	6.3	-	2.6	1.5

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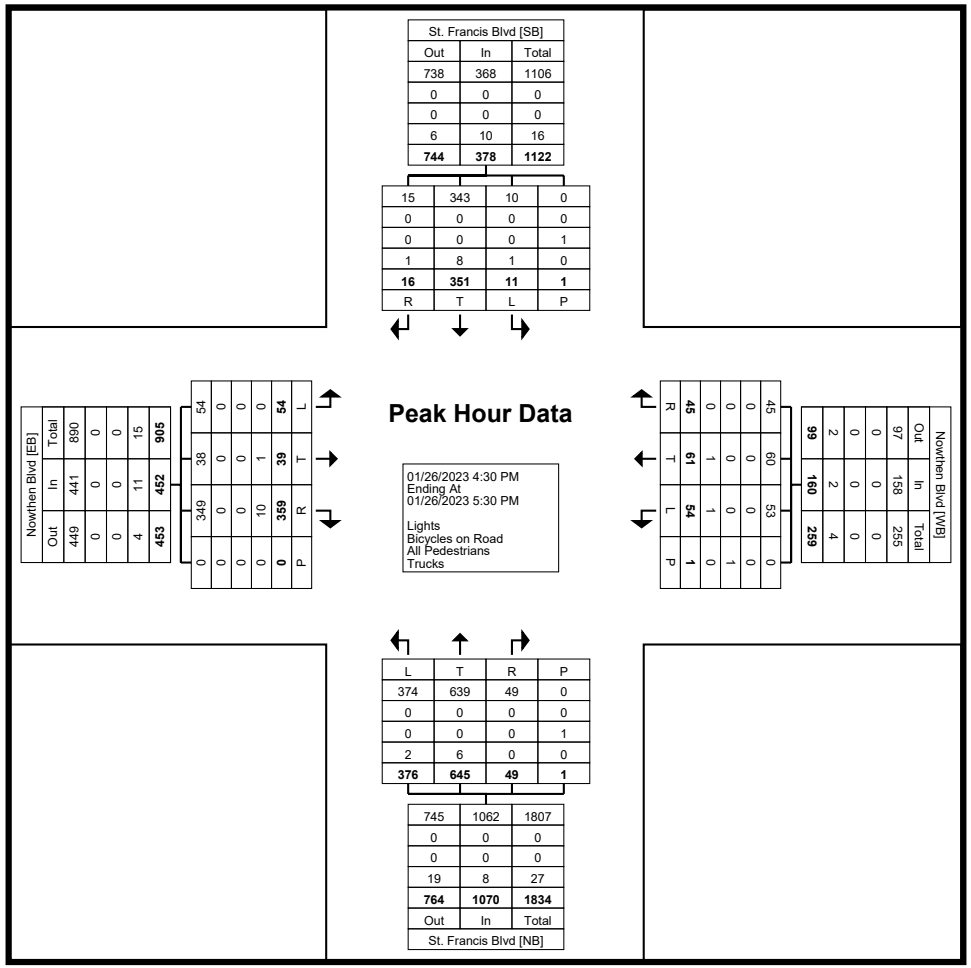
Count Name: St Francis Blvd & Nowthen Blvd
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (4:30 PM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: St Francis Blvd & Nowthen Blvd
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (11:00 AM)

Start Time	Nowthen Blvd Eastbound					Nowthen Blvd Westbound					St. Francis Blvd Northbound					St. Francis Blvd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
11:00 AM	2	4	46	0	52	13	4	3	0	20	29	63	3	0	95	4	77	1	0	82	249
11:15 AM	3	5	47	0	55	16	9	3	0	28	40	68	5	0	113	5	74	4	0	83	279
11:30 AM	4	5	61	0	70	13	4	1	0	18	36	79	3	0	118	8	113	5	0	126	332
11:45 AM	2	12	78	0	92	11	4	0	0	15	41	90	7	0	138	9	93	2	0	104	349
Total	11	26	232	0	269	53	21	7	0	81	146	300	18	0	464	26	357	12	0	395	1209
Approach %	4.1	9.7	86.2	-	-	65.4	25.9	8.6	-	-	31.5	64.7	3.9	-	-	6.6	90.4	3.0	-	-	-
Total %	0.9	2.2	19.2	-	22.2	4.4	1.7	0.6	-	6.7	12.1	24.8	1.5	-	38.4	2.2	29.5	1.0	-	32.7	-
PHF	0.688	0.542	0.744	-	0.731	0.828	0.583	0.583	-	0.723	0.890	0.833	0.643	-	0.841	0.722	0.790	0.600	-	0.784	0.866
Lights	11	26	232	-	269	53	21	7	-	81	146	300	18	-	464	26	357	12	-	395	1209
% Lights	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0	-	100.0	100.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0

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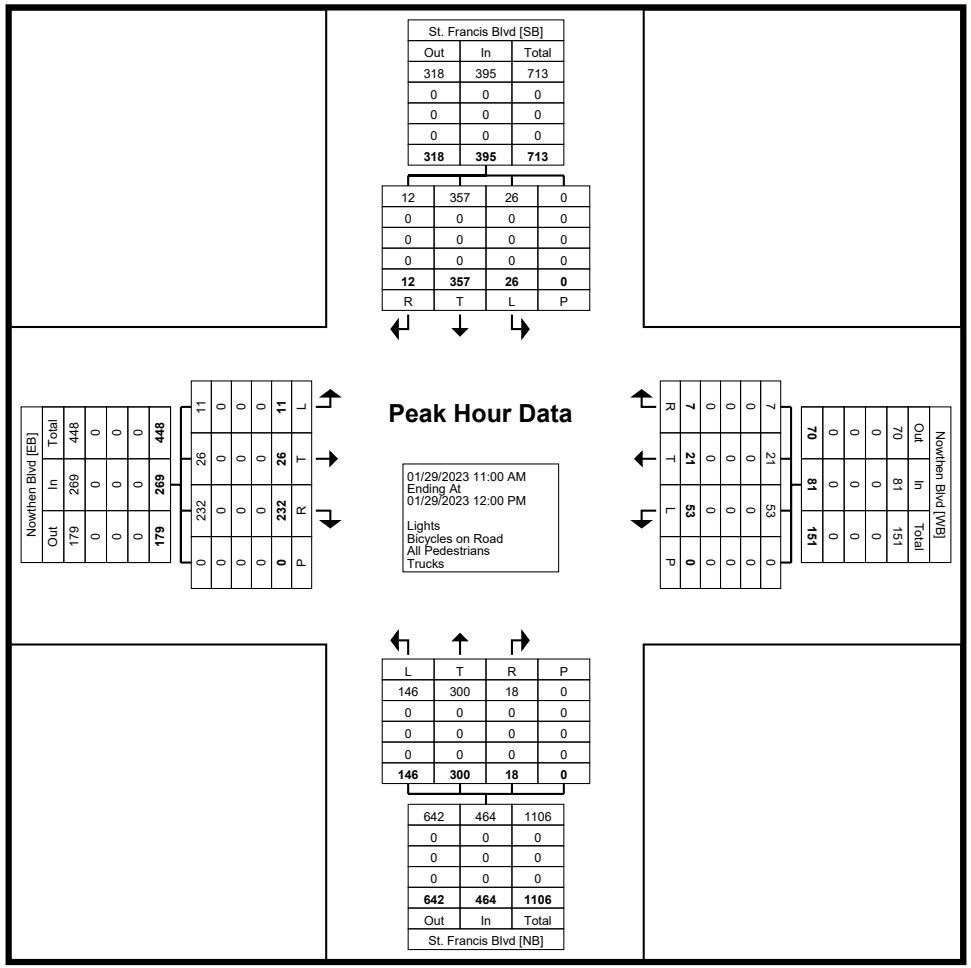
Count Name: St Francis Blvd & Nowthen Blvd
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (11:00 AM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: St Francis Blvd & Nowthen Blvd
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (1:00 PM)

Start Time	Nowthen Blvd Eastbound					Nowthen Blvd Westbound					St. Francis Blvd Northbound					St. Francis Blvd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
1:00 PM	3	7	62	0	72	4	1	4	0	9	34	112	3	0	149	9	90	1	0	100	330
1:15 PM	5	16	71	0	92	12	7	1	0	20	56	106	8	0	170	2	75	0	0	77	359
1:30 PM	2	7	62	0	71	15	13	1	0	29	56	121	13	0	190	4	84	0	0	88	378
1:45 PM	7	7	60	0	74	11	8	5	0	24	61	128	8	0	197	4	83	3	0	90	385
Total	17	37	255	0	309	42	29	11	0	82	207	467	32	0	706	19	332	4	0	355	1452
Approach %	5.5	12.0	82.5	-	-	51.2	35.4	13.4	-	-	29.3	66.1	4.5	-	-	5.4	93.5	1.1	-	-	-
Total %	1.2	2.5	17.6	-	21.3	2.9	2.0	0.8	-	5.6	14.3	32.2	2.2	-	48.6	1.3	22.9	0.3	-	24.4	-
PHF	0.607	0.578	0.898	-	0.840	0.700	0.558	0.550	-	0.707	0.848	0.912	0.615	-	0.896	0.528	0.922	0.333	-	0.888	0.943
Lights	17	37	255	-	309	42	29	11	-	82	207	465	32	-	704	19	332	4	-	355	1450
% Lights	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0	-	100.0	100.0	99.6	100.0	-	99.7	100.0	100.0	100.0	-	100.0	99.9
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	0	0	0	-	0	0	0	0	-	0	0	2	0	-	2	0	0	0	-	0	2
% Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.4	0.0	-	0.3	0.0	0.0	0.0	-	0.0	0.1

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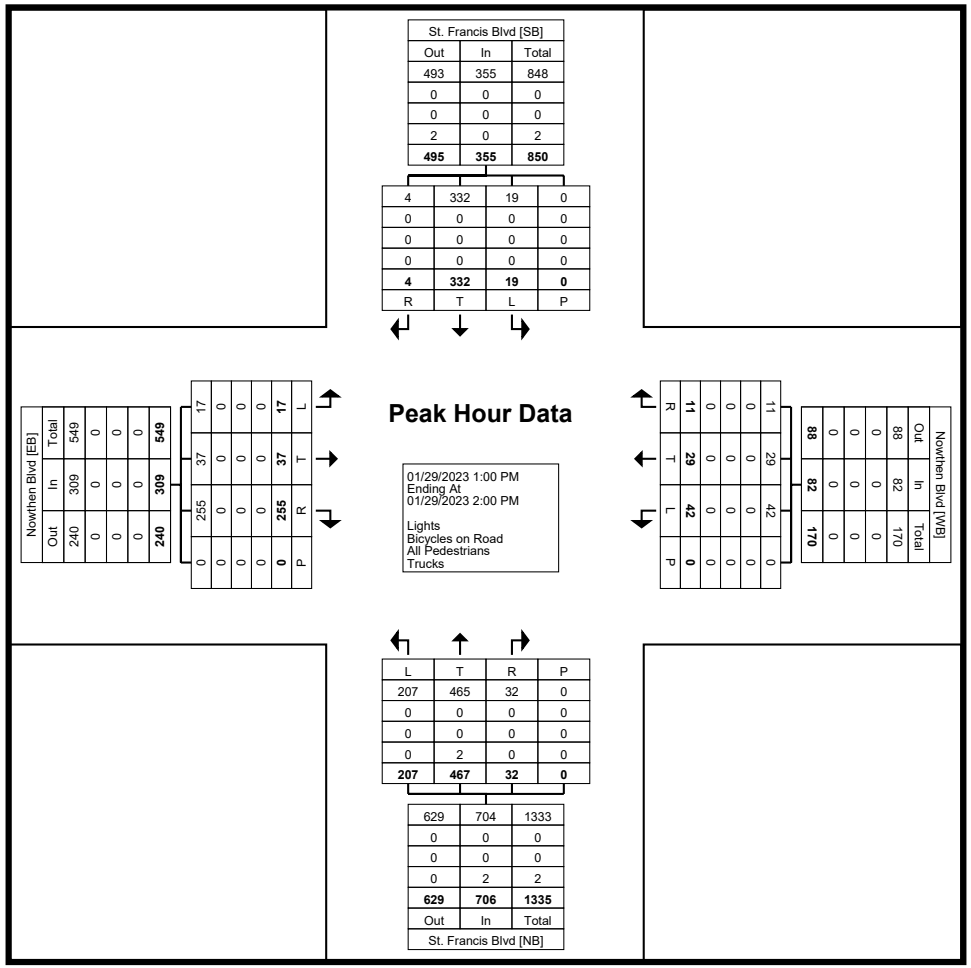
Count Name: St Francis Blvd & Nowthen Blvd
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (1:00 PM)

Kimley-Horn and Associates, Inc.
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Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: St Francis Blvd & Sunwood Dr
Site Code:
Start Date: 01/26/2023

Turning Movement Data

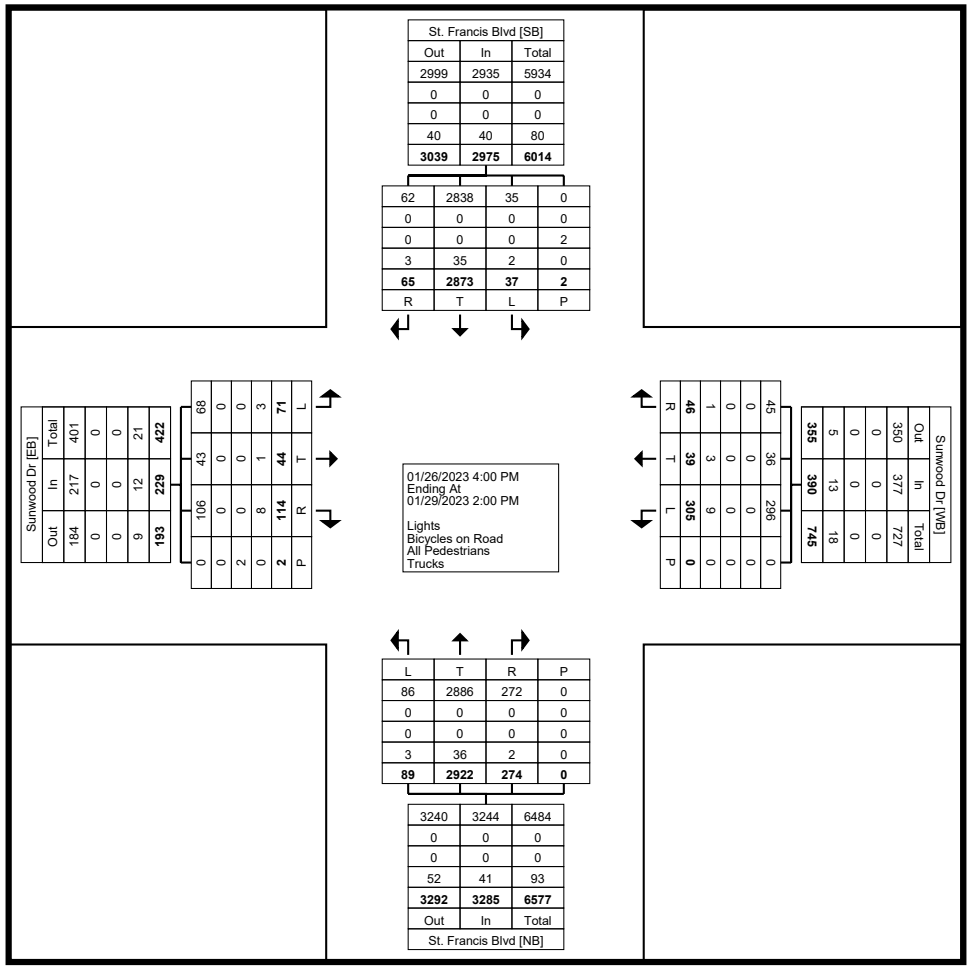
Start Time	Sunwood Dr Eastbound					Sunwood Dr Westbound					St. Francis Blvd Northbound					St. Francis Blvd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
4:00 PM	7	5	3	0	15	6	2	3	0	11	5	184	19	0	208	1	77	1	0	79	313
4:15 PM	3	1	1	0	5	14	2	4	0	20	1	181	24	0	206	3	86	1	0	90	321
4:30 PM	1	2	4	0	7	11	2	1	0	14	4	145	13	0	162	2	81	4	0	87	270
4:45 PM	4	5	3	0	12	12	1	4	0	17	4	169	8	0	181	1	76	2	0	79	289
Hourly Total	15	13	11	0	39	43	7	12	0	62	14	679	64	0	757	7	320	8	0	335	1193
5:00 PM	5	3	0	0	8	4	4	0	0	8	7	166	15	0	188	1	86	3	0	90	294
5:15 PM	8	2	5	0	15	6	0	2	0	8	6	185	18	0	209	1	88	3	0	92	324
5:30 PM	3	2	6	0	11	12	3	1	0	16	2	157	13	0	172	1	74	2	0	77	276
5:45 PM	2	1	4	0	7	10	0	3	0	13	9	139	14	0	162	4	85	2	0	91	273
Hourly Total	18	8	15	0	41	32	7	6	0	45	24	647	60	0	731	7	333	10	0	350	1167
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	3	0	2	0	5	13	0	1	0	14	0	25	1	0	26	2	150	3	0	155	200
7:15 AM	0	1	2	2	3	13	1	0	0	14	2	31	3	0	36	1	110	3	2	114	167
7:30 AM	1	0	3	0	4	8	3	2	0	13	1	43	10	0	54	1	104	0	0	105	176
7:45 AM	0	2	6	0	8	9	4	1	0	14	2	41	3	0	46	1	112	3	0	116	184
Hourly Total	4	3	13	2	20	43	8	4	0	55	5	140	17	0	162	5	476	9	2	490	727
8:00 AM	1	1	7	0	9	13	2	1	0	16	1	46	8	0	55	1	102	3	0	106	186
8:15 AM	1	0	6	0	7	12	0	3	0	15	1	52	3	0	56	0	102	2	0	104	182
8:30 AM	0	1	2	0	3	14	2	0	0	16	1	44	3	0	48	2	85	0	0	87	154
8:45 AM	1	0	6	0	7	12	1	0	0	13	2	40	3	0	45	0	71	0	0	71	136
Hourly Total	3	2	21	0	26	51	5	4	0	60	5	182	17	0	204	3	360	5	0	368	658
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	2	1	1	0	4	9	1	2	0	12	3	53	4	0	60	0	81	1	0	82	158
10:15 AM	3	1	9	0	13	12	1	0	0	13	2	52	3	0	57	0	86	2	0	88	171
10:30 AM	0	2	4	0	6	7	1	3	0	11	3	37	4	0	44	0	93	0	0	93	154
10:45 AM	1	0	3	0	4	9	2	1	0	12	1	69	6	0	76	1	87	5	0	93	185
Hourly Total	6	4	17	0	27	37	5	6	0	48	9	211	17	0	237	1	347	8	0	356	668
11:00 AM	2	0	4	0	6	6	1	0	0	7	2	62	5	0	69	0	73	0	0	73	155
11:15 AM	0	1	3	0	4	8	0	0	0	8	1	70	3	0	74	1	78	3	0	82	168
11:30 AM	1	1	3	0	5	14	1	2	0	17	2	71	10	0	83	1	114	3	0	118	223
11:45 AM	1	2	3	0	6	5	0	0	0	5	2	82	6	0	90	2	94	3	0	99	200
Hourly Total	4	4	13	0	21	33	2	2	0	37	7	285	24	0	316	4	359	9	0	372	746

12:00 PM	0	1	3	0	4	5	0	1	0	6	4	95	2	0	101	2	85	4	0	91	202
12:15 PM	2	2	5	0	9	11	0	2	0	13	4	84	4	0	92	1	111	1	0	113	227
12:30 PM	4	1	1	0	6	6	0	2	0	8	0	97	12	0	109	2	98	1	0	101	224
12:45 PM	3	3	3	0	9	5	1	3	0	9	2	91	13	0	106	0	78	1	0	79	203
Hourly Total	9	7	12	0	28	27	1	8	0	36	10	367	31	0	408	5	372	7	0	384	856
1:00 PM	4	0	4	0	8	6	0	0	0	6	5	101	6	0	112	2	85	1	0	88	214
1:15 PM	3	0	3	0	6	11	2	2	0	15	2	100	9	0	111	1	68	3	0	72	204
1:30 PM	3	3	5	0	11	8	2	1	0	11	5	95	11	0	111	1	73	3	0	77	210
1:45 PM	2	0	0	0	2	14	0	1	0	15	3	115	18	0	136	1	80	2	0	83	236
Hourly Total	12	3	12	0	27	39	4	4	0	47	15	411	44	0	470	5	306	9	0	320	864
Grand Total	71	44	114	2	229	305	39	46	0	390	89	2922	274	0	3285	37	2873	65	2	2975	6879
Approach %	31.0	19.2	49.8	-	-	78.2	10.0	11.8	-	-	2.7	88.9	8.3	-	-	1.2	96.6	2.2	-	-	-
Total %	1.0	0.6	1.7	-	3.3	4.4	0.6	0.7	-	5.7	1.3	42.5	4.0	-	47.8	0.5	41.8	0.9	-	43.2	-
Lights	68	43	106	-	217	296	36	45	-	377	86	2886	272	-	3244	35	2838	62	-	2935	6773
% Lights	95.8	97.7	93.0	-	94.8	97.0	92.3	97.8	-	96.7	96.6	98.8	99.3	-	98.8	94.6	98.8	95.4	-	98.7	98.5
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	-	2	-	-	-	-	0	-	-	-	-	0	-	-	-	-	2	-	-
% All Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-
Trucks	3	1	8	-	12	9	3	1	-	13	3	36	2	-	41	2	35	3	-	40	106
% Trucks	4.2	2.3	7.0	-	5.2	3.0	7.7	2.2	-	3.3	3.4	1.2	0.7	-	1.2	5.4	1.2	4.6	-	1.3	1.5

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: St Francis Blvd & Sunwood Dr
Site Code:
Start Date: 01/26/2023



Turning Movement Data Plot

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: St Francis Blvd & Sunwood Dr
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (4:00 PM)

Start Time	Sunwood Dr Eastbound					Sunwood Dr Westbound					St. Francis Blvd Northbound					St. Francis Blvd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
4:00 PM	7	5	3	0	15	6	2	3	0	11	5	184	19	0	208	1	77	1	0	79	313
4:15 PM	3	1	1	0	5	14	2	4	0	20	1	181	24	0	206	3	86	1	0	90	321
4:30 PM	1	2	4	0	7	11	2	1	0	14	4	145	13	0	162	2	81	4	0	87	270
4:45 PM	4	5	3	0	12	12	1	4	0	17	4	169	8	0	181	1	76	2	0	79	289
Total	15	13	11	0	39	43	7	12	0	62	14	679	64	0	757	7	320	8	0	335	1193
Approach %	38.5	33.3	28.2	-	-	69.4	11.3	19.4	-	-	1.8	89.7	8.5	-	-	2.1	95.5	2.4	-	-	-
Total %	1.3	1.1	0.9	-	3.3	3.6	0.6	1.0	-	5.2	1.2	56.9	5.4	-	63.5	0.6	26.8	0.7	-	28.1	-
PHF	0.536	0.650	0.688	-	0.650	0.768	0.875	0.750	-	0.775	0.700	0.923	0.667	-	0.910	0.583	0.930	0.500	-	0.931	0.929
Lights	13	13	10	-	36	38	6	12	-	56	14	668	64	-	746	7	312	8	-	327	1165
% Lights	86.7	100.0	90.9	-	92.3	88.4	85.7	100.0	-	90.3	100.0	98.4	100.0	-	98.5	100.0	97.5	100.0	-	97.6	97.7
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	2	0	1	-	3	5	1	0	-	6	0	11	0	-	11	0	8	0	-	8	28
% Trucks	13.3	0.0	9.1	-	7.7	11.6	14.3	0.0	-	9.7	0.0	1.6	0.0	-	1.5	0.0	2.5	0.0	-	2.4	2.3

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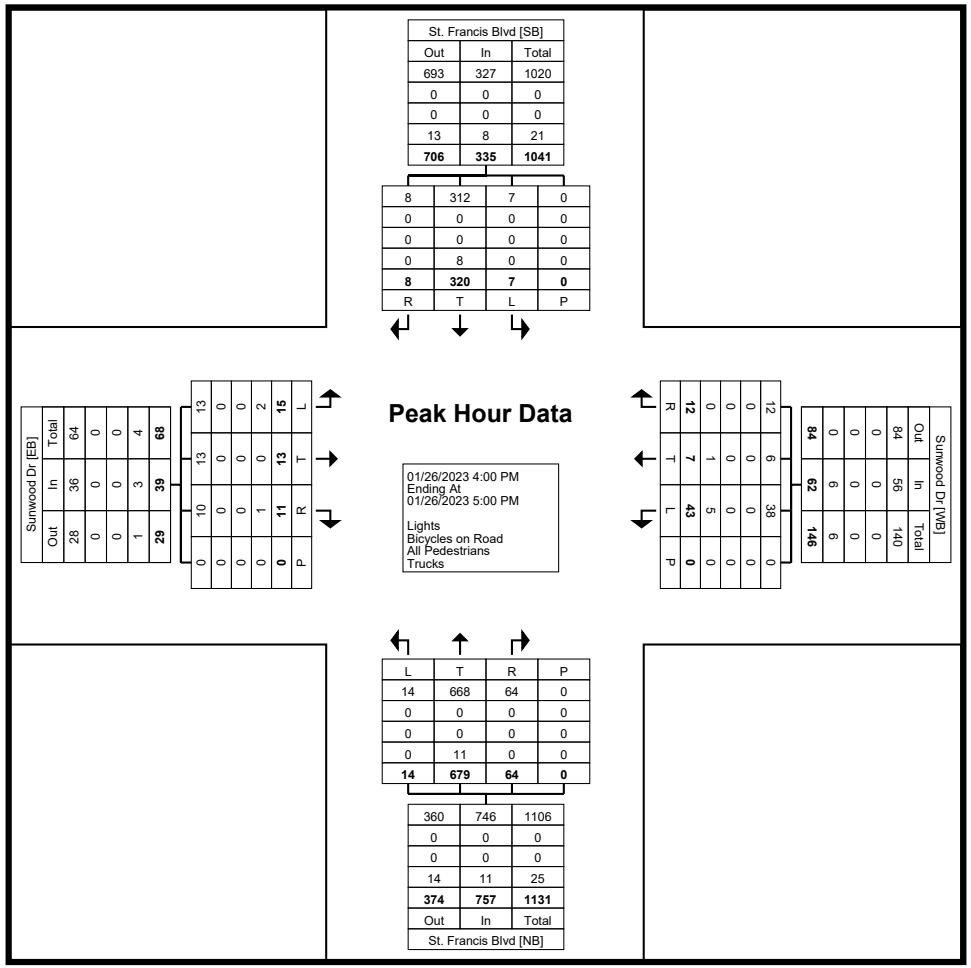
Count Name: St Francis Blvd & Sunwood Dr
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (4:00 PM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: St Francis Blvd & Sunwood Dr
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (7:30 AM)

Start Time	Sunwood Dr Eastbound					Sunwood Dr Westbound					St. Francis Blvd Northbound					St. Francis Blvd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
7:30 AM	1	0	3	0	4	8	3	2	0	13	1	43	10	0	54	1	104	0	0	105	176
7:45 AM	0	2	6	0	8	9	4	1	0	14	2	41	3	0	46	1	112	3	0	116	184
8:00 AM	1	1	7	0	9	13	2	1	0	16	1	46	8	0	55	1	102	3	0	106	186
8:15 AM	1	0	6	0	7	12	0	3	0	15	1	52	3	0	56	0	102	2	0	104	182
Total	3	3	22	0	28	42	9	7	0	58	5	182	24	0	211	3	420	8	0	431	728
Approach %	10.7	10.7	78.6	-	-	72.4	15.5	12.1	-	-	2.4	86.3	11.4	-	-	0.7	97.4	1.9	-	-	-
Total %	0.4	0.4	3.0	-	3.8	5.8	1.2	1.0	-	8.0	0.7	25.0	3.3	-	29.0	0.4	57.7	1.1	-	59.2	-
PHF	0.750	0.375	0.786	-	0.778	0.808	0.563	0.583	-	0.906	0.625	0.875	0.600	-	0.942	0.750	0.938	0.667	-	0.929	0.978
Lights	3	3	16	-	22	41	8	6	-	55	3	173	23	-	199	3	410	5	-	418	694
% Lights	100.0	100.0	72.7	-	78.6	97.6	88.9	85.7	-	94.8	60.0	95.1	95.8	-	94.3	100.0	97.6	62.5	-	97.0	95.3
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	0	0	6	-	6	1	1	1	-	3	2	9	1	-	12	0	10	3	-	13	34
% Trucks	0.0	0.0	27.3	-	21.4	2.4	11.1	14.3	-	5.2	40.0	4.9	4.2	-	5.7	0.0	2.4	37.5	-	3.0	4.7

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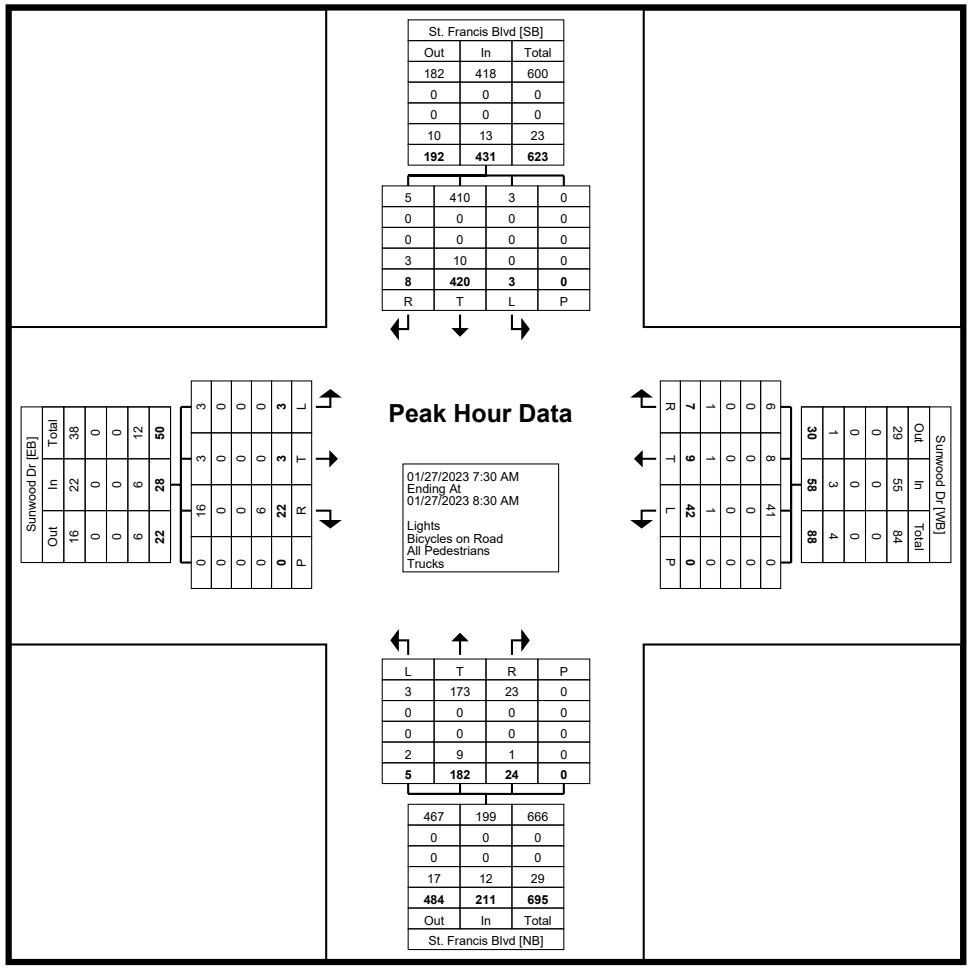
Count Name: St Francis Blvd & Sunwood Dr
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (7:30 AM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: St Francis Blvd & Sunwood Dr
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (11:00 AM)

Start Time	Sunwood Dr Eastbound					Sunwood Dr Westbound					St. Francis Blvd Northbound					St. Francis Blvd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
11:00 AM	2	0	4	0	6	6	1	0	0	7	2	62	5	0	69	0	73	0	0	73	155
11:15 AM	0	1	3	0	4	8	0	0	0	8	1	70	3	0	74	1	78	3	0	82	168
11:30 AM	1	1	3	0	5	14	1	2	0	17	2	71	10	0	83	1	114	3	0	118	223
11:45 AM	1	2	3	0	6	5	0	0	0	5	2	82	6	0	90	2	94	3	0	99	200
Total	4	4	13	0	21	33	2	2	0	37	7	285	24	0	316	4	359	9	0	372	746
Approach %	19.0	19.0	61.9	-	-	89.2	5.4	5.4	-	-	2.2	90.2	7.6	-	-	1.1	96.5	2.4	-	-	-
Total %	0.5	0.5	1.7	-	2.8	4.4	0.3	0.3	-	5.0	0.9	38.2	3.2	-	42.4	0.5	48.1	1.2	-	49.9	-
PHF	0.500	0.500	0.813	-	0.875	0.589	0.500	0.250	-	0.544	0.875	0.869	0.600	-	0.878	0.500	0.787	0.750	-	0.788	0.836
Lights	4	4	13	-	21	33	2	2	-	37	7	285	24	-	316	4	359	9	-	372	746
% Lights	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0	-	100.0	100.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0

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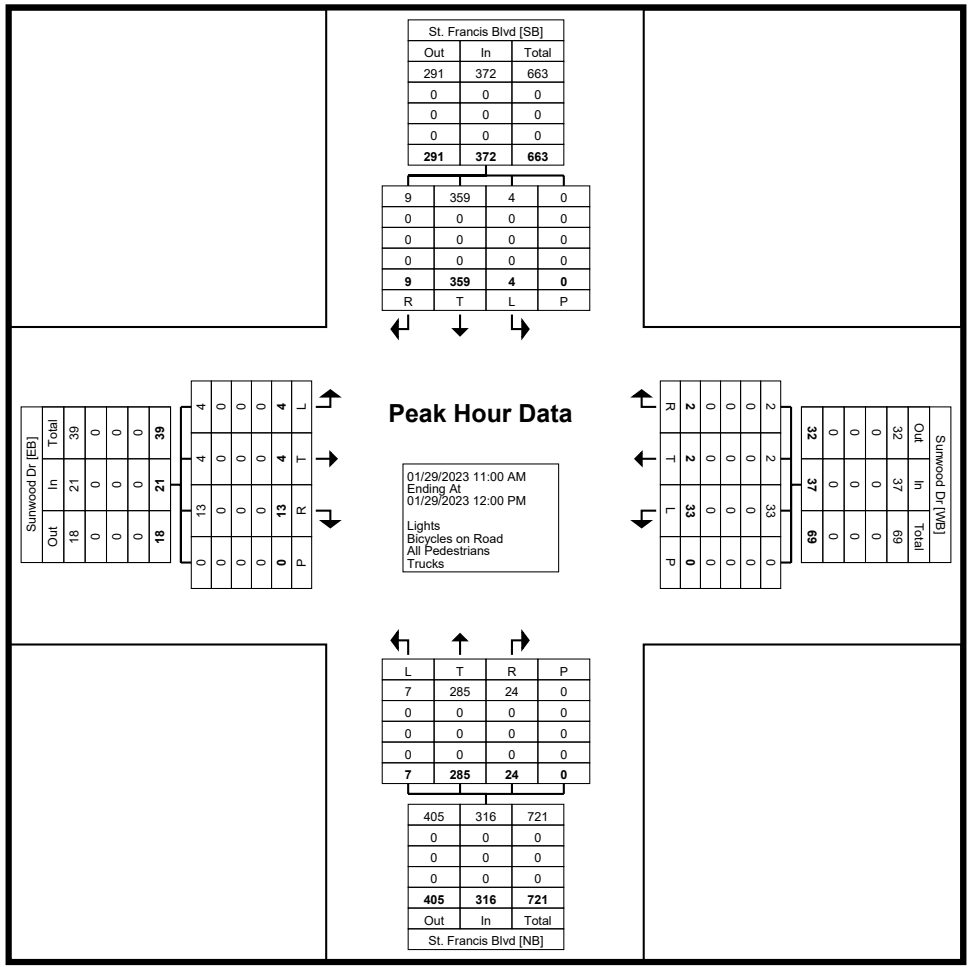
Count Name: St Francis Blvd & Sunwood Dr
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (11:00 AM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: St Francis Blvd & Sunwood Dr
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (12:15 PM)

Start Time	Sunwood Dr Eastbound					Sunwood Dr Westbound					St. Francis Blvd Northbound					St. Francis Blvd Southbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
12:15 PM	2	2	5	0	9	11	0	2	0	13	4	84	4	0	92	1	111	1	0	113	227
12:30 PM	4	1	1	0	6	6	0	2	0	8	0	97	12	0	109	2	98	1	0	101	224
12:45 PM	3	3	3	0	9	5	1	3	0	9	2	91	13	0	106	0	78	1	0	79	203
1:00 PM	4	0	4	0	8	6	0	0	0	6	5	101	6	0	112	2	85	1	0	88	214
Total	13	6	13	0	32	28	1	7	0	36	11	373	35	0	419	5	372	4	0	381	868
Approach %	40.6	18.8	40.6	-	-	77.8	2.8	19.4	-	-	2.6	89.0	8.4	-	-	1.3	97.6	1.0	-	-	-
Total %	1.5	0.7	1.5	-	3.7	3.2	0.1	0.8	-	4.1	1.3	43.0	4.0	-	48.3	0.6	42.9	0.5	-	43.9	-
PHF	0.813	0.500	0.650	-	0.889	0.636	0.250	0.583	-	0.692	0.550	0.923	0.673	-	0.935	0.625	0.838	1.000	-	0.843	0.956
Lights	13	6	13	-	32	28	1	7	-	36	11	373	35	-	419	5	371	4	-	380	867
% Lights	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0	-	100.0	100.0	99.7	100.0	-	99.7	99.9
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	1
% Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.3	0.0	-	0.3	0.1

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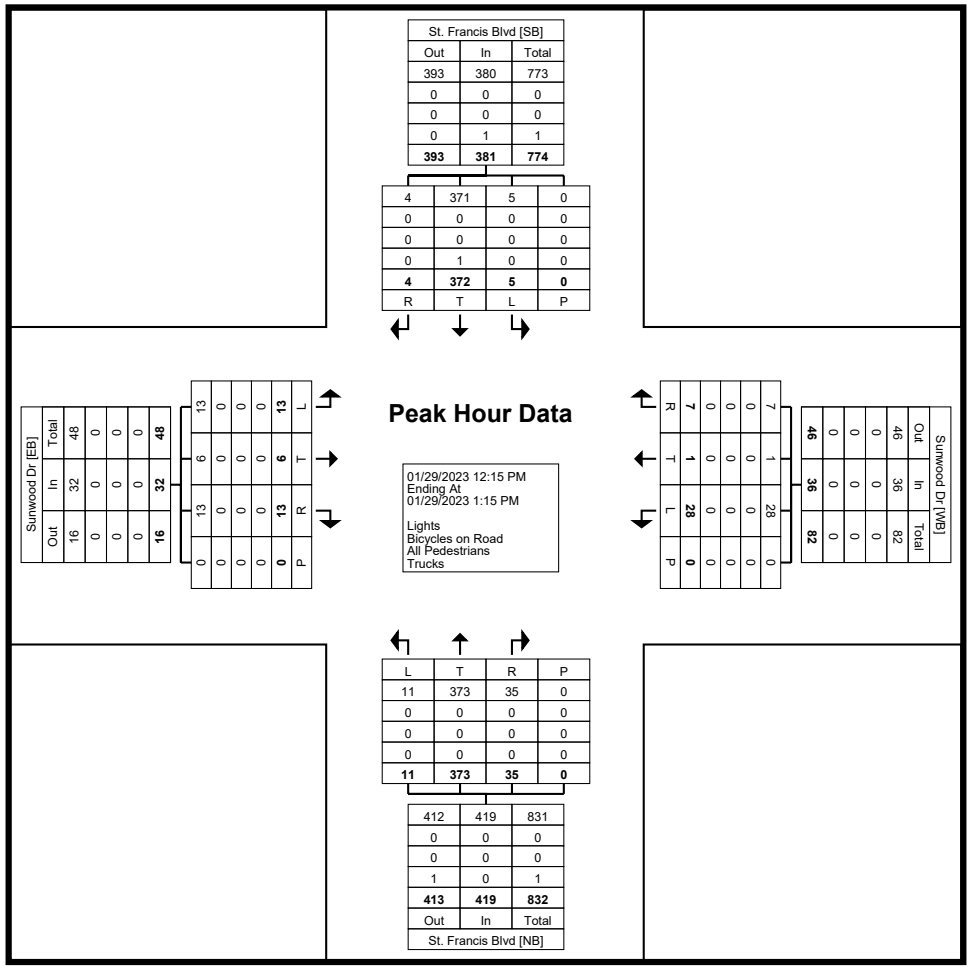
Count Name: St Francis Blvd & Sunwood Dr
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (12:15 PM)

Kimley-Horn and Associates, Inc.
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Sunwood Dr & Cobalt St
Site Code:
Start Date: 01/26/2023

Turning Movement Data

Start Time	Sunwood Dr Eastbound				Sunwood Dr Westbound				Cobalt St Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
7:00 AM	3	1	0	4	0	5	0	5	6	4	0	10	19
7:15 AM	1	3	0	4	1	8	0	9	7	2	0	9	22
7:30 AM	2	2	0	4	0	10	2	10	4	4	0	8	22
7:45 AM	1	1	0	2	0	9	0	9	1	2	0	3	14
Hourly Total	7	7	0	14	1	32	2	33	18	12	0	30	77
8:00 AM	3	0	0	3	1	2	0	3	0	4	0	4	10
8:15 AM	2	1	0	3	0	3	0	3	0	2	0	2	8
8:30 AM	6	0	0	6	0	3	0	3	0	1	0	1	10
8:45 AM	2	2	0	4	0	6	0	6	2	4	4	6	16
Hourly Total	13	3	0	16	1	14	0	15	2	11	4	13	44
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	10	7	0	17	5	4	0	9	1	4	1	5	31
4:15 PM	3	4	0	7	0	3	0	3	2	2	12	4	14
4:30 PM	5	3	0	8	4	6	0	10	0	2	1	2	20
4:45 PM	13	5	1	18	5	2	0	7	1	0	0	1	26
Hourly Total	31	19	1	50	14	15	0	29	4	8	14	12	91
5:00 PM	8	4	1	12	5	4	0	9	0	1	0	1	22
5:15 PM	10	3	0	13	2	4	0	6	1	2	0	3	22
5:30 PM	9	2	0	11	2	5	0	7	1	2	1	3	21
5:45 PM	2	2	0	4	1	3	0	4	1	1	0	2	10
Hourly Total	29	11	1	40	10	16	0	26	3	6	1	9	75
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	3	1	0	4	3	1	0	4	1	1	1	2	10
10:15 AM	6	1	0	7	1	2	0	3	2	7	0	9	19
10:30 AM	1	0	0	1	2	1	0	3	1	3	0	4	8
10:45 AM	1	0	0	1	2	6	0	8	1	2	0	3	12
Hourly Total	11	2	0	13	8	10	0	18	5	13	1	18	49
11:00 AM	4	1	0	5	1	1	0	2	0	1	0	1	8
11:15 AM	1	4	0	5	2	3	0	5	0	2	0	2	12
11:30 AM	1	3	0	4	3	3	0	6	0	3	0	3	13
11:45 AM	3	0	0	3	4	1	0	5	1	3	0	4	12
Hourly Total	9	8	0	17	10	8	0	18	1	9	0	10	45

12:00 PM	2	1	0	3	2	6	0	8	2	3	0	5	16
12:15 PM	4	1	0	5	1	3	0	4	1	3	0	4	13
12:30 PM	5	1	0	6	0	1	0	1	1	1	0	2	9
12:45 PM	5	5	0	10	1	2	0	3	3	1	0	4	17
Hourly Total	16	8	0	24	4	12	0	16	7	8	0	15	55
1:00 PM	3	0	0	3	2	1	0	3	0	2	0	2	8
1:15 PM	4	3	0	7	2	3	0	5	2	1	0	3	15
1:30 PM	5	2	0	7	5	5	0	10	2	3	1	5	22
1:45 PM	2	3	0	5	0	3	0	3	2	0	0	2	10
Hourly Total	14	8	0	22	9	12	0	21	6	6	1	12	55
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	130	66	2	196	57	119	2	176	46	73	21	119	491
Approach %	66.3	33.7	-	-	32.4	67.6	-	-	38.7	61.3	-	-	-
Total %	26.5	13.4	-	39.9	11.6	24.2	-	35.8	9.4	14.9	-	24.2	-
Lights	124	64	-	188	56	113	-	169	45	71	-	116	473
% Lights	95.4	97.0	-	95.9	98.2	95.0	-	96.0	97.8	97.3	-	97.5	96.3
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	2	-	-	-	2	-	-	-	21	-	-
% All Pedestrians	-	-	100.0	-	-	-	100.0	-	-	-	100.0	-	-
Trucks	6	2	-	8	1	6	-	7	1	2	-	3	18
% Trucks	4.6	3.0	-	4.1	1.8	5.0	-	4.0	2.2	2.7	-	2.5	3.7

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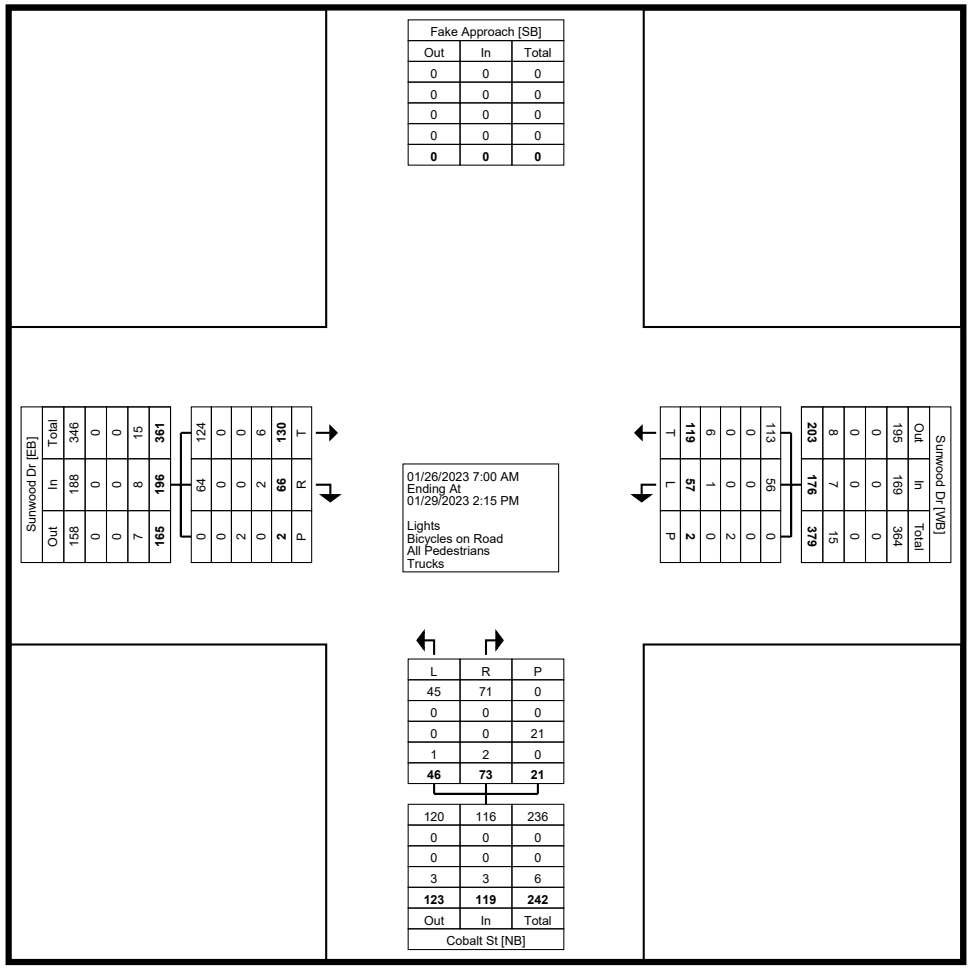
Count Name: Sunwood Dr & Cobalt St
Site Code:
Start Date: 01/26/2023



Turning Movement Data Plot

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Count Name: Sunwood Dr & Cobalt St
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Sunwood Dr Eastbound				Sunwood Dr Westbound				Cobalt St Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
7:00 AM	3	1	0	4	0	5	0	5	6	4	0	10	19
7:15 AM	1	3	0	4	1	8	0	9	7	2	0	9	22
7:30 AM	2	2	0	4	0	10	2	10	4	4	0	8	22
7:45 AM	1	1	0	2	0	9	0	9	1	2	0	3	14
Total	7	7	0	14	1	32	2	33	18	12	0	30	77
Approach %	50.0	50.0	-	-	3.0	97.0	-	-	60.0	40.0	-	-	-
Total %	9.1	9.1	-	18.2	1.3	41.6	-	42.9	23.4	15.6	-	39.0	-
PHF	0.583	0.583	-	0.875	0.250	0.800	-	0.825	0.643	0.750	-	0.750	0.875
Lights	5	7	-	12	1	29	-	30	18	12	-	30	72
% Lights	71.4	100.0	-	85.7	100.0	90.6	-	90.9	100.0	100.0	-	100.0	93.5
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	0	-	-	-	2	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	100.0	-	-	-	-	-	-
Trucks	2	0	-	2	0	3	-	3	0	0	-	0	5
% Trucks	28.6	0.0	-	14.3	0.0	9.4	-	9.1	0.0	0.0	-	0.0	6.5

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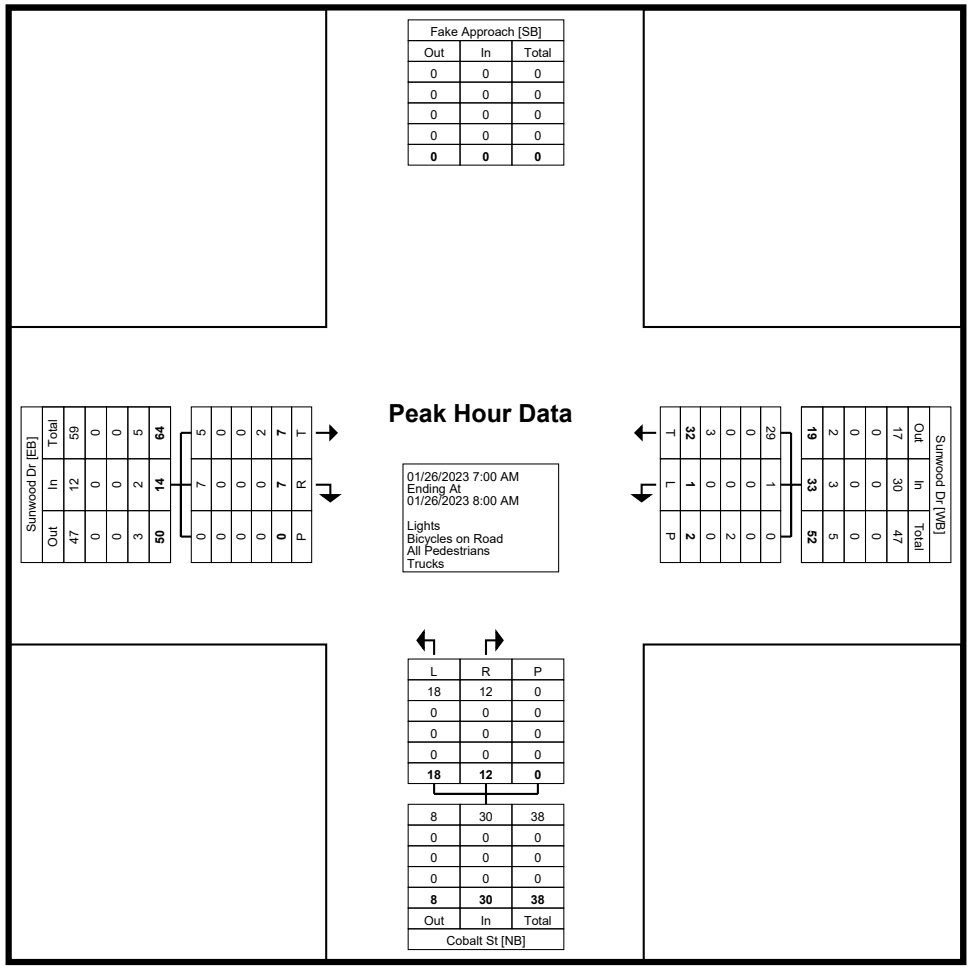
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (7:00 AM)

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Warrenville, Illinois, United States 60555
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Count Name: Sunwood Dr & Cobalt St
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (4:00 PM)

Start Time	Sunwood Dr Eastbound				Sunwood Dr Westbound				Cobalt St Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
4:00 PM	10	7	0	17	5	4	0	9	1	4	1	5	31
4:15 PM	3	4	0	7	0	3	0	3	2	2	12	4	14
4:30 PM	5	3	0	8	4	6	0	10	0	2	1	2	20
4:45 PM	13	5	1	18	5	2	0	7	1	0	0	1	26
Total	31	19	1	50	14	15	0	29	4	8	14	12	91
Approach %	62.0	38.0	-	-	48.3	51.7	-	-	33.3	66.7	-	-	-
Total %	34.1	20.9	-	54.9	15.4	16.5	-	31.9	4.4	8.8	-	13.2	-
PHF	0.596	0.679	-	0.694	0.700	0.625	-	0.725	0.500	0.500	-	0.600	0.734
Lights	30	17	-	47	14	14	-	28	4	6	-	10	85
% Lights	96.8	89.5	-	94.0	100.0	93.3	-	96.6	100.0	75.0	-	83.3	93.4
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	1	-	-	-	0	-	-	-	14	-	-
% All Pedestrians	-	-	100.0	-	-	-	-	-	-	-	100.0	-	-
Trucks	1	2	-	3	0	1	-	1	0	2	-	2	6
% Trucks	3.2	10.5	-	6.0	0.0	6.7	-	3.4	0.0	25.0	-	16.7	6.6

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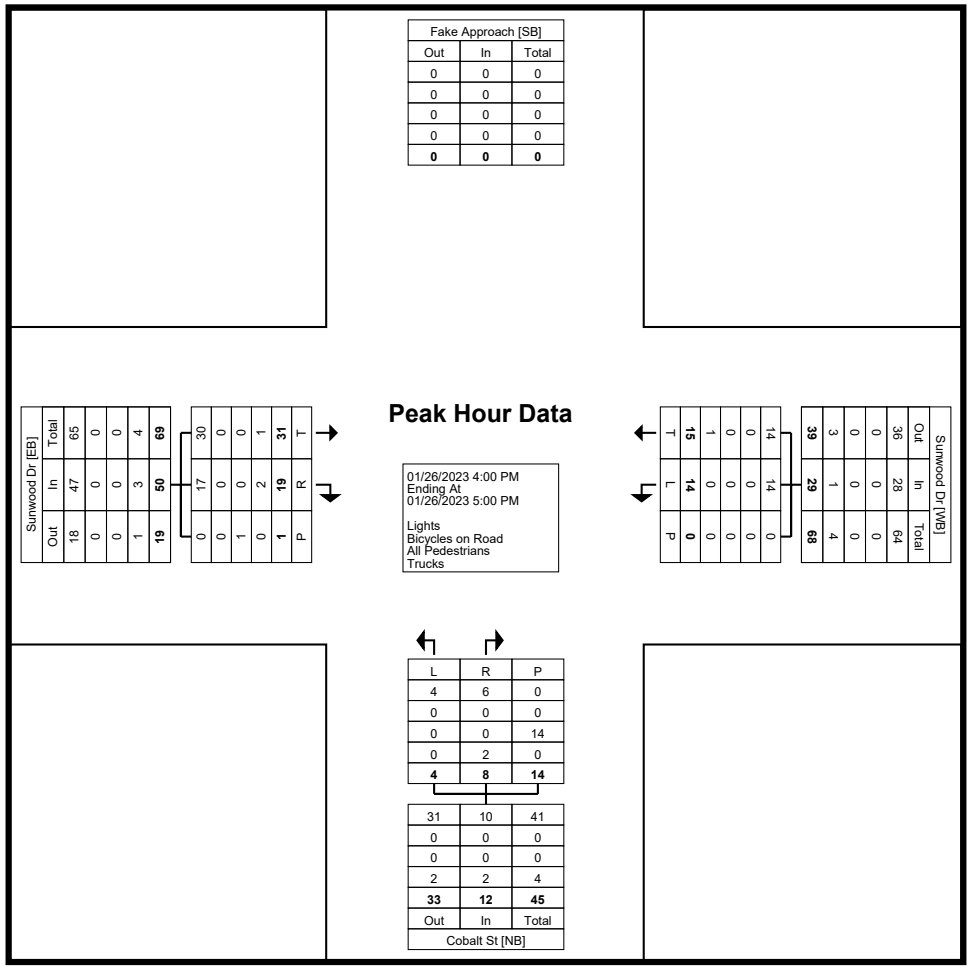
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (4:00 PM)

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Count Name: Sunwood Dr & Cobalt St
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (10:00 AM)

Start Time	Sunwood Dr Eastbound				Sunwood Dr Westbound				Cobalt St Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
10:00 AM	3	1	0	4	3	1	0	4	1	1	1	2	10
10:15 AM	6	1	0	7	1	2	0	3	2	7	0	9	19
10:30 AM	1	0	0	1	2	1	0	3	1	3	0	4	8
10:45 AM	1	0	0	1	2	6	0	8	1	2	0	3	12
Total	11	2	0	13	8	10	0	18	5	13	1	18	49
Approach %	84.6	15.4	-	-	44.4	55.6	-	-	27.8	72.2	-	-	-
Total %	22.4	4.1	-	26.5	16.3	20.4	-	36.7	10.2	26.5	-	36.7	-
PHF	0.458	0.500	-	0.464	0.667	0.417	-	0.563	0.625	0.464	-	0.500	0.645
Lights	11	2	-	13	8	10	-	18	5	13	-	18	49
% Lights	100.0	100.0	-	100.0	100.0	100.0	-	100.0	100.0	100.0	-	100.0	100.0
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	0	-	-	-	0	-	-	-	1	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-
Trucks	0	0	-	0	0	0	-	0	0	0	-	0	0
% Trucks	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0

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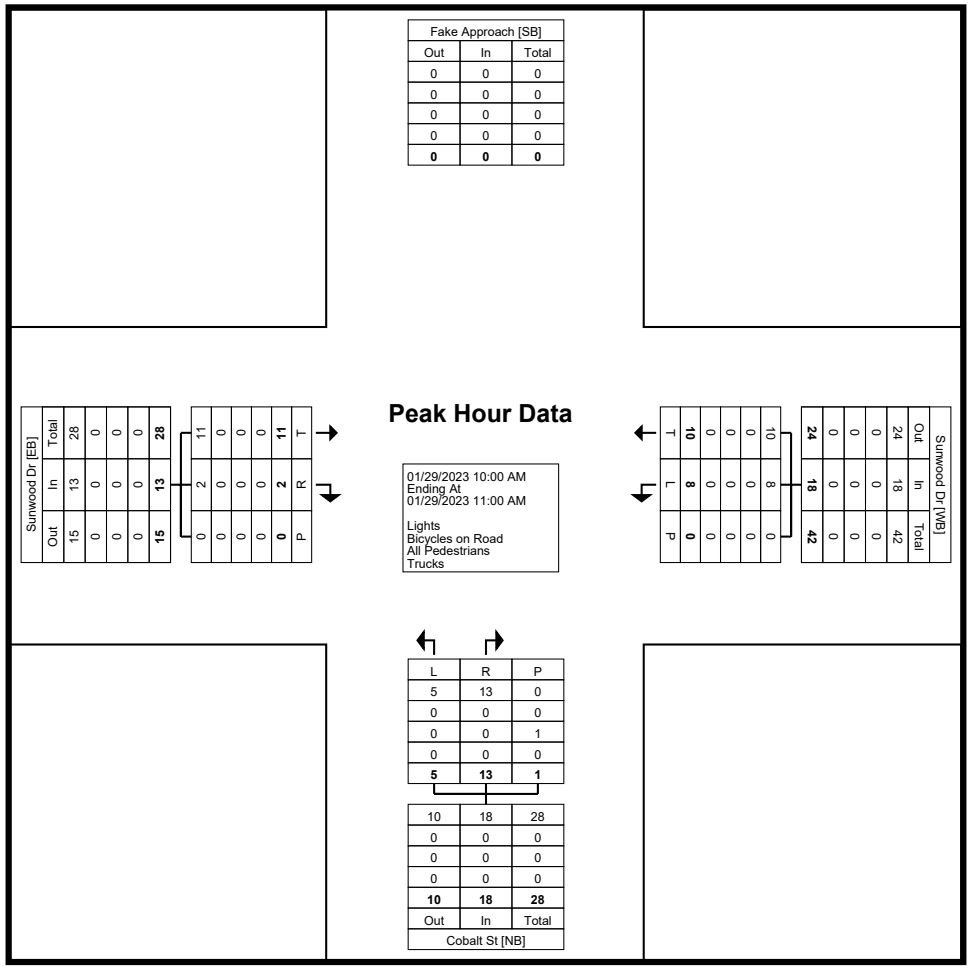
Count Name: Sunwood Dr & Cobalt St
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (10:00 AM)

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Count Name: Sunwood Dr & Cobalt St
Site Code:
Start Date: 01/26/2023

Turning Movement Peak Hour Data (12:45 PM)

Start Time	Sunwood Dr Eastbound				Sunwood Dr Westbound				Cobalt St Northbound				
	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
12:45 PM	5	5	0	10	1	2	0	3	3	1	0	4	17
1:00 PM	3	0	0	3	2	1	0	3	0	2	0	2	8
1:15 PM	4	3	0	7	2	3	0	5	2	1	0	3	15
1:30 PM	5	2	0	7	5	5	0	10	2	3	1	5	22
Total	17	10	0	27	10	11	0	21	7	7	1	14	62
Approach %	63.0	37.0	-	-	47.6	52.4	-	-	50.0	50.0	-	-	-
Total %	27.4	16.1	-	43.5	16.1	17.7	-	33.9	11.3	11.3	-	22.6	-
PHF	0.850	0.500	-	0.675	0.500	0.550	-	0.525	0.583	0.583	-	0.700	0.705
Lights	16	10	-	26	9	11	-	20	6	7	-	13	59
% Lights	94.1	100.0	-	96.3	90.0	100.0	-	95.2	85.7	100.0	-	92.9	95.2
Bicycles on Road	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	0	-	-	-	0	-	-	-	1	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-
Trucks	1	0	-	1	1	0	-	1	1	0	-	1	3
% Trucks	5.9	0.0	-	3.7	10.0	0.0	-	4.8	14.3	0.0	-	7.1	4.8

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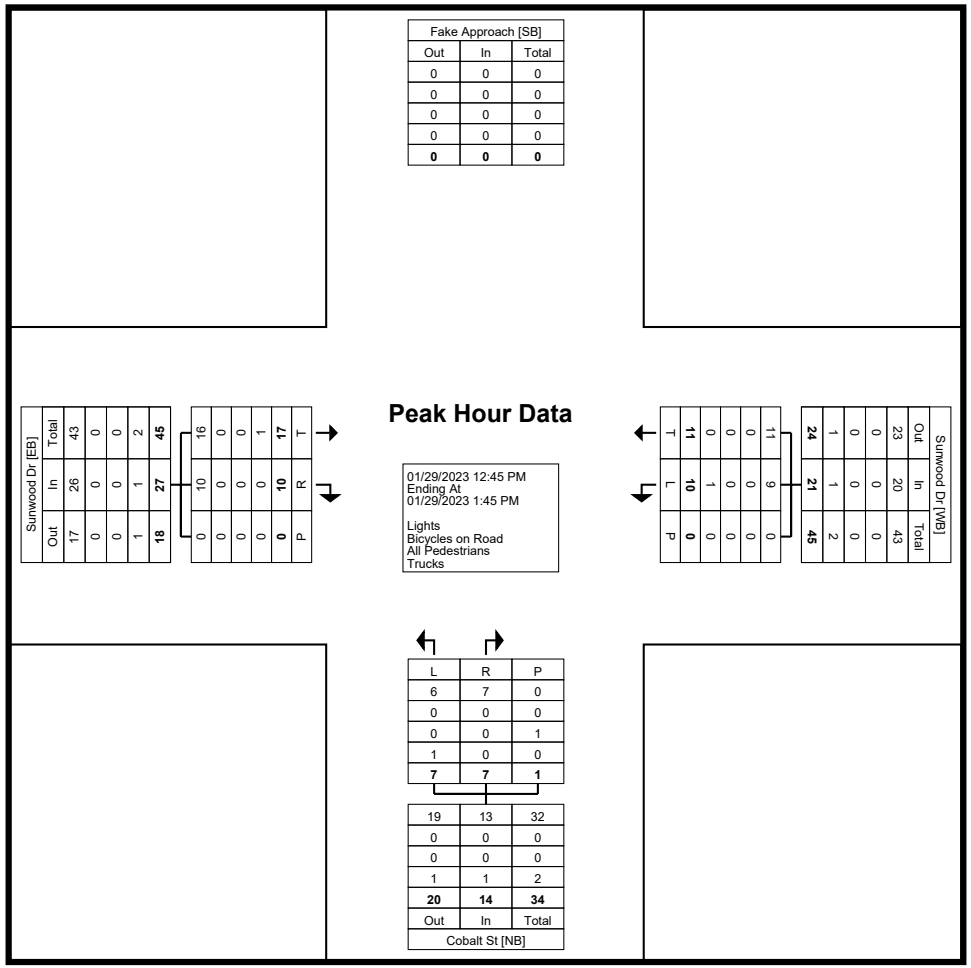
Count Name: Sunwood Dr & Cobalt St
Site Code:
Start Date: 01/26/2023



Turning Movement Peak Hour Data Plot (12:45 PM)

C. Site Layout Exhibit

GROUND LEVEL

OPTION D2-A

BKV GROUP

D. SimTraffic Analysis Results

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.2	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.5	0.7
Total Del/Veh (s)	13.7	11.0	6.9	13.9	11.1	1.5	2.0	0.8	0.2	1.3	0.1	2.5

2: Cobalt St NW & Sunwood Dr NW Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.2	0.1
Total Del/Veh (s)	2.1	2.4	1.7	0.6	4.5	2.3	1.9

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	1.8	0.0	0.0	4.1	0.9	0.1	0.0	0.0	0.0	3.1	0.5	3.9
Total Del/Veh (s)	44.8	45.0	6.3	40.1	41.8	5.8	51.8	5.8	3.5	63.6	3.5	1.6

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.6
Total Del/Veh (s)	7.2

4: Nowthen Blvd NW & 146th Ave NW Performance by movement

Movement	EBL	EBR	WBL	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	5.6	5.1	10.0	2.2	0.4	0.1	1.3	0.4	1.4

5: Nowthen Blvd NW & Lord of Life Access Performance by movement

Movement	WBR	NBT	SBT	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0
Total Del/Veh (s)	2.3	0.4	0.7	0.6

6: Nowthen Blvd NW & Iodine St NW Performance by movement

Movement	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	10.1	6.3	6.1	0.7	0.2	0.7	1.3	0.2	1.7

7: Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	2.2	0.8	11.3	1.3	15.2	5.1	2.7

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	3.9	0.3	0.4	3.7	0.6	3.0	0.0	0.0	0.2
Total Del/Veh (s)	23.2	34.5	3.5	42.1	32.8	6.6	46.3	6.6	1.4	45.7	18.5	6.8

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	16.8

Total Network Performance

Denied Del/Veh (s)	1.2
Total Del/Veh (s)	23.2

Intersection: 1: Nowthen Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB
Directions Served	LT	R	LT	R	LT
Maximum Queue (ft)	48	62	74	21	22
Average Queue (ft)	12	19	30	1	4
95th Queue (ft)	32	44	68	7	17
Link Distance (ft)	414		1298		784
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		270		270	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Cobalt St NW & Sunwood Dr NW

Movement	NB
Directions Served	LR
Maximum Queue (ft)	46
Average Queue (ft)	15
95th Queue (ft)	40
Link Distance (ft)	511
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: St Francis Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	24	42	86	118	26	98	26	46	122	26
Average Queue (ft)	6	10	31	8	4	18	5	6	42	5
95th Queue (ft)	23	29	61	46	17	57	22	25	104	21
Link Distance (ft)		1064		520		3458			761	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		240		240	240		240
Storage Blk Time (%)			0	0						
Queuing Penalty (veh)			0	0						

Intersection: 4: Nowthen Blvd NW & 146th Ave NW

Movement	EB	WB	NB
Directions Served	LTR	LTR	LT
Maximum Queue (ft)	47	25	50
Average Queue (ft)	15	5	3
95th Queue (ft)	37	20	19
Link Distance (ft)	303	354	585
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Nowthen Blvd NW & Lord of Life Access

Movement	WB
Directions Served	LR
Maximum Queue (ft)	27
Average Queue (ft)	3
95th Queue (ft)	17
Link Distance (ft)	225
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Nowthen Blvd NW & Iodine St NW

Movement	EB	EB	NB
Directions Served	LT	R	L
Maximum Queue (ft)	24	65	43
Average Queue (ft)	3	25	6
95th Queue (ft)	17	52	24
Link Distance (ft)	278	278	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			290
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7:

Movement	EB	EB	WB	NB	NB
Directions Served	T	R	L	L	R
Maximum Queue (ft)	22	22	90	53	46
Average Queue (ft)	1	1	27	23	21
95th Queue (ft)	7	8	68	54	41
Link Distance (ft)	659			345	345
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		300	120		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: St Francis Blvd NW & Nowthen Blvd NW

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	L	TR	L	L	T	R	L	T	R
Maximum Queue (ft)	24	43	146	121	189	128	99	23	26	359	60
Average Queue (ft)	7	20	72	19	83	31	34	2	8	153	4
95th Queue (ft)	23	47	129	58	149	87	83	14	24	273	21
Link Distance (ft)		384		243			607			3458	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	200		80		500	500		290	210		210
Storage Blk Time (%)			9	0						2	
Queuing Penalty (veh)			3	0						1	

Network Summary

Network wide Queuing Penalty: 4

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.1	4.2	0.1	0.1	4.2	0.0	0.0	0.0	0.1	0.3	3.7
Total Del/Veh (s)	21.0	9.0	2.2	28.6	15.8	1.4	1.8	2.8	1.7	1.2	1.1	0.3

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.6
Total Del/Veh (s)	3.6

2: Cobalt St NW & Sunwood Dr NW Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	3.0	0.4	3.4	1.3	3.6	2.0	2.2

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	4.2	0.1	0.0	0.1	0.0	2.0	0.4	2.8	0.4
Total Del/Veh (s)	49.3	0.2	3.4	59.1	72.1	31.3	13.4	7.7	20.1	2.9	0.0	13.1

4: Nowthen Blvd NW & 146th Ave NW Performance by movement

Movement	EBL	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	4.6	0.3	0.5	0.0	0.5	0.1	0.6

5: Nowthen Blvd NW & Lord of Life Access Performance by movement

Movement	WBR	NBT	SBT	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0
Total Del/Veh (s)	2.4	0.4	0.4	0.4

6: Nowthen Blvd NW & Iodine St NW Performance by movement

Movement	EBL	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.7	0.0	0.0
Total Del/Veh (s)	40.2	2.8	1.3	0.0	7.9	0.5	1.5

7: Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.2	0.0
Total Del/Veh (s)	1.4	0.3	3.4	1.9	8.4	3.6	2.5

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	4.2	0.1	0.1	2.7	1.7	3.5	0.0	0.0	0.0
Total Del/Veh (s)	58.1	26.8	1.6	58.3	55.6	39.3	40.2	9.6	2.2	34.3	13.7	12.9

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	All
Denied Del/Veh (s)	1.2
Total Del/Veh (s)	20.4

Total Network Performance

Denied Del/Veh (s)	1.4
Total Del/Veh (s)	24.9

Intersection: 1: Nowthen Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	LT	R	LT	R	LT	LT	R
Maximum Queue (ft)	25	21	92	25	47	21	13
Average Queue (ft)	19	11	50	5	19	4	3
95th Queue (ft)	35	26	88	21	57	18	11
Link Distance (ft)	414		1298		784	478	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		270		270			270
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 2: Cobalt St NW & Sunwood Dr NW

Movement	NB
Directions Served	LR
Maximum Queue (ft)	27
Average Queue (ft)	5
95th Queue (ft)	23
Link Distance (ft)	511
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: St Francis Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T
Maximum Queue (ft)	24	20	66	37	51	306	30	22	52
Average Queue (ft)	10	5	44	11	10	133	11	8	26
95th Queue (ft)	29	18	77	35	44	345	35	25	63
Link Distance (ft)		1064		520		3458			761
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	100		100		240		240	240	
Storage Blk Time (%)						5			
Queuing Penalty (veh)						4			

Intersection: 4: Nowthen Blvd NW & 146th Ave NW

Movement	EB
Directions Served	LTR
Maximum Queue (ft)	23
Average Queue (ft)	9
95th Queue (ft)	27
Link Distance (ft)	303
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Nowthen Blvd NW & Lord of Life Access

Movement	WB
Directions Served	LR
Maximum Queue (ft)	28
Average Queue (ft)	11
95th Queue (ft)	34
Link Distance (ft)	225
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Nowthen Blvd NW & Iodine St NW

Movement	EB	EB	SB
Directions Served	LT	R	L
Maximum Queue (ft)	24	40	50
Average Queue (ft)	5	15	26
95th Queue (ft)	21	39	53
Link Distance (ft)	278	278	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			300
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7:

Movement	WB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	31	72	75
Average Queue (ft)	12	45	41
95th Queue (ft)	37	79	73
Link Distance (ft)		345	345
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	120		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 8: St Francis Blvd NW & Nowthen Blvd NW

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	L	TR	L	L	T	R	L	T	R
Maximum Queue (ft)	66	62	50	125	185	149	164	24	22	131	17
Average Queue (ft)	28	18	22	84	154	99	115	14	4	78	3
95th Queue (ft)	68	55	48	136	194	161	199	33	19	137	15
Link Distance (ft)		384		244			607			3458	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	200		80		500	500		290	210		210
Storage Blk Time (%)				24							
Queuing Penalty (veh)				13							

Network Summary

Network wide Queuing Penalty: 17

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.3	0.2	4.0	0.1	0.0	2.1	0.0	0.0	0.0	0.2	3.4	0.5
Total Del/Veh (s)	5.2	7.2	2.5	5.5	8.5	1.5	1.4	1.2	0.1	0.8	0.1	1.5

2: Cobalt St NW & Sunwood Dr NW Performance by movement

Movement	EBT	EBR	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.4	1.6	1.9	1.1	2.1	1.6

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	1.4	0.0	0.0	4.1	0.1	0.1	0.0	0.0	0.0	3.2	0.3	3.1
Total Del/Veh (s)	36.6	16.1	5.6	44.1	36.8	5.7	30.1	5.7	3.2	31.5	2.9	0.1

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.4
Total Del/Veh (s)	7.1

4: Nowthen Blvd NW & 146th Ave NW Performance by movement

Movement	EBL	EBR	WBL	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	4.3	2.5	4.2	0.4	0.6	0.1	0.4	0.6	0.6

5: Nowthen Blvd NW & Lord of Life Access Performance by movement

Movement	WBL	WBR	NBT	SBT	All
Denied Del/Veh (s)	0.2	0.1	0.0	0.0	0.0
Total Del/Veh (s)	6.3	2.6	0.5	0.3	0.7

6: Nowthen Blvd NW & Iodine St NW Performance by movement

Movement	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	6.1	2.8	4.8	5.7	2.5	1.7	0.7	0.1	3.2	0.6	0.1	0.8

7: Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	1.0	0.1	4.4	1.4	8.4	2.6	1.5

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	4.0	0.1	0.3	3.3	0.7	3.1	0.0	0.0	0.0
Total Del/Veh (s)	64.2	41.1	2.0	51.4	37.6	21.7	46.7	5.2	1.4	68.5	14.6	3.3

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	17.3

Total Network Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	23.3

Intersection: 1: Nowthen Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB
Directions Served	LT	R	LT	R	LT
Maximum Queue (ft)	49	60	29	25	22
Average Queue (ft)	12	15	11	2	3
95th Queue (ft)	34	38	34	12	15
Link Distance (ft)	414		1298		784
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		270		270	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Cobalt St NW & Sunwood Dr NW

Movement	NB
Directions Served	LR
Maximum Queue (ft)	27
Average Queue (ft)	6
95th Queue (ft)	25
Link Distance (ft)	511
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: St Francis Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T
Maximum Queue (ft)	24	20	110	18	50	72	27	22	73
Average Queue (ft)	2	8	36	2	7	17	3	2	29
95th Queue (ft)	12	23	82	11	29	53	15	12	66
Link Distance (ft)		1064		520		3458			761
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	100		100		240		240	240	
Storage Blk Time (%)			2						
Queuing Penalty (veh)			0						

Intersection: 4: Nowthen Blvd NW & 146th Ave NW

Movement	EB	WB
Directions Served	LTR	LTR
Maximum Queue (ft)	25	25
Average Queue (ft)	8	3
95th Queue (ft)	26	17
Link Distance (ft)	303	354
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Nowthen Blvd NW & Lord of Life Access

Movement	WB
Directions Served	LR
Maximum Queue (ft)	51
Average Queue (ft)	17
95th Queue (ft)	40
Link Distance (ft)	225
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Nowthen Blvd NW & Iodine St NW

Movement	EB	EB	WB	NB	SB
Directions Served	LT	R	LTR	L	L
Maximum Queue (ft)	23	44	20	24	23
Average Queue (ft)	2	13	2	1	1
95th Queue (ft)	11	34	12	8	8
Link Distance (ft)	278	278	203		
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				290	300
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7:

Movement	WB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	53	49	46
Average Queue (ft)	5	14	18
95th Queue (ft)	29	40	40
Link Distance (ft)		345	345
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	120		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 8: St Francis Blvd NW & Nowthen Blvd NW

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	L	TR	L	L	T	R	L	T	R
Maximum Queue (ft)	44	46	108	56	185	146	152	42	69	307	16
Average Queue (ft)	11	21	38	13	77	17	52	5	23	109	1
95th Queue (ft)	35	45	83	37	154	81	121	22	60	203	8
Link Distance (ft)		384		243			607			3458	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	200		80		500	500		290	210		210
Storage Blk Time (%)			2							1	
Queuing Penalty (veh)			1							0	

Network Summary

Network wide Queuing Penalty: 1

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.3	0.2	4.1	0.1	0.0	0.7	0.0	0.0	0.0	0.6	0.5	3.2
Total Del/Veh (s)	8.5	11.6	6.2	11.3	11.8	2.6	4.4	0.8	0.2	0.7	1.3	0.2

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	2.4

2: Cobalt St NW & Sunwood Dr NW Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0		0.0	0.1	0.1	0.1
Total Del/Veh (s)	2.3	1.5		1.0	4.4	2.2	2.3

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.8	0.0	0.0	4.1	0.2	0.3	0.0	0.0	0.0	3.3	0.5	3.6
Total Del/Veh (s)	46.6	50.1	7.6	44.2	48.4	5.4	39.1	5.4	3.1	50.9	4.3	1.1

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.6
Total Del/Veh (s)	8.7

4: Nowthen Blvd NW & 146th Ave NW Performance by movement

Movement	EBL	EBR	WBL	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.2	0.1	0.1	0.0	0.0	0.2	0.0	0.0	0.0
Total Del/Veh (s)	11.8	5.1	9.8	3.2	0.6	0.0	1.3	0.4	1.5

5: Nowthen Blvd NW & Lord of Life Access Performance by movement

Movement	WBR	NBT	SBT	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0
Total Del/Veh (s)	1.4	0.3	0.7	0.6

6: Nowthen Blvd NW & Iodine St NW Performance by movement

Movement	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.0	0.0	0.2	0.0	0.0	0.0
Total Del/Veh (s)	8.9	7.6	6.0	0.6	0.2	1.8	1.3	0.2	1.8

7: Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	2.2	0.8	8.8	1.2	14.1	6.0	2.5

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	3.9	0.3	0.4	3.6	0.6	3.5	0.4	0.0	0.2
Total Del/Veh (s)	39.0	37.0	3.6	48.3	34.9	12.1	47.3	6.0	1.6	43.9	18.1	6.4

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	17.1

Total Network Performance

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

Intersection: 1: Nowthen Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	R	LT	R	LT	R
Maximum Queue (ft)	47	79	73	25	48	3
Average Queue (ft)	12	23	30	4	4	0
95th Queue (ft)	34	53	57	19	24	2
Link Distance (ft)	414		1298		784	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		270		270		270
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Cobalt St NW & Sunwood Dr NW

Movement	NB
Directions Served	LR
Maximum Queue (ft)	52
Average Queue (ft)	19
95th Queue (ft)	44
Link Distance (ft)	511
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: St Francis Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	24	54	99	30	26	108	37	29	146	20
Average Queue (ft)	3	11	40	6	5	19	4	5	48	1
95th Queue (ft)	14	38	82	21	20	63	21	21	115	9
Link Distance (ft)		1064		520		3458			761	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		240		240	240		240
Storage Blk Time (%)		0	1							
Queuing Penalty (veh)		0	0							

Intersection: 4: Nowthen Blvd NW & 146th Ave NW

Movement	EB	WB	NB
Directions Served	LTR	LTR	LT
Maximum Queue (ft)	55	28	59
Average Queue (ft)	18	9	3
95th Queue (ft)	40	28	25
Link Distance (ft)	303	354	585
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Nowthen Blvd NW & Lord of Life Access

Movement	WB
Directions Served	LR
Maximum Queue (ft)	6
Average Queue (ft)	0
95th Queue (ft)	6
Link Distance (ft)	225
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Nowthen Blvd NW & Iodine St NW

Movement	EB	EB	NB	SB
Directions Served	LT	R	L	L
Maximum Queue (ft)	19	86	48	14
Average Queue (ft)	2	26	5	0
95th Queue (ft)	14	51	26	5
Link Distance (ft)	278	278		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			290	300
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7:

Movement	EB	WB	NB	NB
Directions Served	R	L	L	R
Maximum Queue (ft)	9	81	75	54
Average Queue (ft)	1	25	23	17
95th Queue (ft)	7	62	55	44
Link Distance (ft)			345	345
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	300	120		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: St Francis Blvd NW & Nowthen Blvd NW

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	L	TR	L	L	T	R	L	T	R
Maximum Queue (ft)	32	77	160	134	172	134	106	27	67	339	37
Average Queue (ft)	8	21	73	19	76	29	28	4	15	147	6
95th Queue (ft)	27	55	134	69	150	87	73	19	46	279	23
Link Distance (ft)		384		243			607			3458	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	200		80		500	500		290	210		210
Storage Blk Time (%)			15	0						3	
Queuing Penalty (veh)			5	1						1	

Network Summary

Network wide Queuing Penalty: 7

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.1	4.1	0.1	0.1	1.8	0.0	0.0	0.0	0.3	0.4	3.6
Total Del/Veh (s)	10.3	9.8	2.6	15.0	8.2	3.4	2.9	3.2	0.6	2.5	1.1	0.2

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.5
Total Del/Veh (s)	2.6

2: Cobalt St NW & Sunwood Dr NW Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	1.3	2.1	2.7	1.9	4.5	2.1	1.7

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	4.2	0.3	0.2	0.0	0.0	0.0	3.3	0.4	4.2
Total Del/Veh (s)	53.0	44.0	10.0	55.9	75.6	14.5	79.0	13.0	8.1	84.1	4.5	0.0

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.3
Total Del/Veh (s)	14.2

4: Nowthen Blvd NW & 146th Ave NW Performance by movement

Movement	EBL	EBR	WBL	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.8	0.0
Total Del/Veh (s)	6.7	2.8	11.9	1.4	1.3	0.2	1.9	0.6	0.0	1.0

5: Nowthen Blvd NW & Lord of Life Access Performance by movement

Movement	WBL	WBR	NBT	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0
Total Del/Veh (s)	4.3	5.8	0.7	0.4	0.6

6: Nowthen Blvd NW & Iodine St NW Performance by movement

Movement	EBL	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.1	0.0	0.0	0.5	0.0	0.0	0.0
Total Del/Veh (s)	9.5	3.9	8.1	1.7	1.5	0.4	5.0	0.7	0.1	1.6

7: Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.1	0.0	0.0	0.2	0.1	0.0
Total Del/Veh (s)	1.6	0.5	9.4	2.4	12.6	3.8	3.3

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.1	4.1	0.3	0.1	2.9	1.6	3.2	0.0	0.0	0.0
Total Del/Veh (s)	48.0	44.1	2.2	56.9	47.1	25.6	42.1	12.2	1.7	58.2	25.6	7.6

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	All
Denied Del/Veh (s)	1.2
Total Del/Veh (s)	22.9

Total Network Performance

Denied Del/Veh (s)	1.4
Total Del/Veh (s)	30.5

Intersection: 1: Nowthen Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	R	LT	R	LT	LT
Maximum Queue (ft)	65	54	53	25	70	21
Average Queue (ft)	17	15	21	6	18	3
95th Queue (ft)	42	37	44	22	48	15
Link Distance (ft)	414		1298		784	478
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		270		270		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Cobalt St NW & Sunwood Dr NW

Movement	NB
Directions Served	LR
Maximum Queue (ft)	27
Average Queue (ft)	8
95th Queue (ft)	29
Link Distance (ft)	511
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: St Francis Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T
Maximum Queue (ft)	46	82	65	54	52	330	28	27	168
Average Queue (ft)	16	21	27	14	14	110	6	7	46
95th Queue (ft)	42	51	59	38	39	251	23	23	111
Link Distance (ft)		1064		520		3458			761
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	100		100		240		240	240	
Storage Blk Time (%)		0				1			
Queuing Penalty (veh)		0				1			

Intersection: 4: Nowthen Blvd NW & 146th Ave NW

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LT	LT
Maximum Queue (ft)	49	24	50	22
Average Queue (ft)	9	1	6	1
95th Queue (ft)	32	8	27	8
Link Distance (ft)	303	354	585	784
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Nowthen Blvd NW & Lord of Life Access

Movement	WB
Directions Served	LR
Maximum Queue (ft)	28
Average Queue (ft)	3
95th Queue (ft)	17
Link Distance (ft)	225
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Nowthen Blvd NW & Iodine St NW

Movement	EB	EB	WB	SB
Directions Served	LT	R	LTR	L
Maximum Queue (ft)	24	66	20	49
Average Queue (ft)	4	17	6	15
95th Queue (ft)	18	40	20	42
Link Distance (ft)	278	278	203	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				300
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7:

Movement	WB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	94	91	54
Average Queue (ft)	18	41	30
95th Queue (ft)	61	76	46
Link Distance (ft)		345	345
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	120		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 8: St Francis Blvd NW & Nowthen Blvd NW

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	L	TR	R	L	L	T	R	L	T	R
Maximum Queue (ft)	88	105	85	125	8	229	193	445	29	48	376	20
Average Queue (ft)	41	37	45	40	1	152	99	160	6	13	145	1
95th Queue (ft)	79	76	80	92	4	214	177	331	24	37	264	7
Link Distance (ft)		384		244	244			607			3458	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200		80			500	500		290	210		210
Storage Blk Time (%)		0	1	4				2			3	
Queuing Penalty (veh)		0	1	2				8			1	

Network Summary

Network wide Queuing Penalty: 13

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.2	4.2	0.0	0.1	4.2	0.0	0.0	0.0	0.2	3.0	0.4
Total Del/Veh (s)	4.5	7.8	1.6	6.4	6.5	1.4	1.7	1.3	0.5	0.6	0.2	1.6

2: Cobalt St NW & Sunwood Dr NW Performance by movement

Movement	EBT	EBR	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.3	1.3	2.0	0.9	2.0	1.4

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	4.1	0.1	0.1	0.0	0.0	0.1	1.5	0.3	2.9
Total Del/Veh (s)	76.4	48.8	4.0	36.0	57.2	3.1	45.6	5.4	2.6	29.3	3.7	0.8

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.4
Total Del/Veh (s)	7.0

4: Nowthen Blvd NW & 146th Ave NW Performance by movement

Movement	EBR	WBL	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0	0.0	4.2	0.0
Total Del/Veh (s)	2.7	4.2	0.5	0.8	0.1	0.4	0.1	0.7

5: Nowthen Blvd NW & Lord of Life Access Performance by movement

Movement	WBL	WBR	NBT	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0
Total Del/Veh (s)	5.5	3.5	0.6	0.2	0.5

6: Nowthen Blvd NW & Iodine St NW Performance by movement

Movement	EBT	EBR	WBL	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	9.8	2.5	4.4	1.6	0.9	0.0	2.7	0.4	0.0	0.8

7: Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.2	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	1.0	0.2	4.1	1.9	4.6	1.6	1.6

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	4.0	0.2	0.3	3.4	0.6	3.7	0.0	0.0	0.0
Total Del/Veh (s)	58.6	32.2	1.7	55.0	43.2	11.1	55.5	7.5	1.4	56.4	15.1	6.0

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.8
Total Del/Veh (s)	20.0

Total Network Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	24.9

Intersection: 1: Nowthen Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB
Directions Served	LT	R	LT	R	LT
Maximum Queue (ft)	48	44	29	25	22
Average Queue (ft)	12	10	17	1	2
95th Queue (ft)	35	30	39	8	10
Link Distance (ft)	414		1298		784
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		270		270	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Cobalt St NW & Sunwood Dr NW

Movement	NB
Directions Served	LR
Maximum Queue (ft)	46
Average Queue (ft)	9
95th Queue (ft)	32
Link Distance (ft)	511
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: St Francis Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	24	37	88	18	52	95	27	23	92	26
Average Queue (ft)	2	7	29	4	9	20	1	1	31	3
95th Queue (ft)	13	24	69	16	32	61	9	8	74	15
Link Distance (ft)		1064		520		3458			761	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		240		240	240		240
Storage Blk Time (%)			0							
Queuing Penalty (veh)			0							

Intersection: 4: Nowthen Blvd NW & 146th Ave NW

Movement	EB	WB	NB
Directions Served	LTR	LTR	LT
Maximum Queue (ft)	25	25	23
Average Queue (ft)	8	3	1
95th Queue (ft)	27	18	8
Link Distance (ft)	303	354	585
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Nowthen Blvd NW & Lord of Life Access

Movement	WB
Directions Served	LR
Maximum Queue (ft)	29
Average Queue (ft)	12
95th Queue (ft)	35
Link Distance (ft)	225
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Nowthen Blvd NW & Iodine St NW

Movement	EB	EB	WB	NB	SB
Directions Served	LT	R	LTR	L	L
Maximum Queue (ft)	23	19	20	28	24
Average Queue (ft)	0	12	1	4	1
95th Queue (ft)	0	26	7	19	8
Link Distance (ft)	278	278	203		
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				290	300
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7:

Movement	WB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	31	29	27
Average Queue (ft)	11	11	13
95th Queue (ft)	35	33	34
Link Distance (ft)		345	345
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	120		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 8: St Francis Blvd NW & Nowthen Blvd NW

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	L	TR	L	L	T	R	L	T	R
Maximum Queue (ft)	24	65	138	92	165	129	150	24	90	236	22
Average Queue (ft)	4	18	57	19	91	31	61	3	27	91	3
95th Queue (ft)	17	47	116	58	152	98	137	16	63	196	14
Link Distance (ft)		384		243			607			3458	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	200		80		500	500		290	210		210
Storage Blk Time (%)			7	2						0	
Queuing Penalty (veh)			2	1						0	

Network Summary

Network wide Queuing Penalty: 3

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.2	0.1	4.1	0.0	0.0	1.3	0.0	0.0	0.0	0.1	0.6	3.0
Total Del/Veh (s)	13.6	12.3	7.6	13.6	15.4	2.1	5.0	1.2	0.2	0.5	1.4	0.2

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	2.8

2: Cobalt St NW & Sunwood Dr NW Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0		0.0	0.1	0.2	0.1
Total Del/Veh (s)	1.8	1.9		1.1	4.2	2.4	2.2

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.8	0.0	0.0	4.1	0.2	0.4	0.0	0.0	0.0	3.4	0.5	2.9
Total Del/Veh (s)	44.9	38.0	7.3	48.9	39.6	5.2	59.5	5.7	3.2	53.5	4.2	0.9

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	8.2

4: Nowthen Blvd NW & 146th Ave NW Performance by movement

Movement	EBL	EBR	WBL	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.2	0.1	0.1	0.0	0.0	0.2	0.0	0.4	0.0
Total Del/Veh (s)	11.6	7.8	10.6	4.2	0.6	0.0	1.5	0.4	1.7

5: Nowthen Blvd NW & Lord of Life Access Performance by movement

Movement	WBR	NBT	SBT	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0
Total Del/Veh (s)	3.1	0.4	0.7	0.7

6: Nowthen Blvd NW & Iodine St NW Performance by movement

Movement	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.2	0.1	0.0	0.0	0.4	0.0	0.0	0.0
Total Del/Veh (s)	25.0	9.5	6.0	0.7	0.2	1.7	1.5	0.3	2.1

7: Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.1	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	2.6	1.0	13.2	1.3	18.1	7.4	3.0

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	3.9	0.5	0.4	3.5	0.7	3.6	0.1	0.0	0.2
Total Del/Veh (s)	36.9	34.9	4.0	50.4	32.5	5.9	46.1	6.4	1.6	47.3	19.1	6.2

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	17.7

Total Network Performance

Denied Del/Veh (s)	1.2
Total Del/Veh (s)	24.9

Intersection: 1: Nowthen Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB
Directions Served	LT	R	LT	R	LT
Maximum Queue (ft)	42	62	104	25	71
Average Queue (ft)	11	23	32	4	6
95th Queue (ft)	33	49	70	20	34
Link Distance (ft)	414		1298		784
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		270		270	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Cobalt St NW & Sunwood Dr NW

Movement	NB
Directions Served	LR
Maximum Queue (ft)	52
Average Queue (ft)	18
95th Queue (ft)	42
Link Distance (ft)	511
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: St Francis Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	24	40	88	36	37	95	31	32	183	13
Average Queue (ft)	3	8	36	7	6	20	3	4	52	1
95th Queue (ft)	16	29	75	25	23	66	18	18	131	11
Link Distance (ft)		1064		520		3458			761	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		240		240	240		240
Storage Blk Time (%)			0						0	
Queuing Penalty (veh)			0						0	

Intersection: 4: Nowthen Blvd NW & 146th Ave NW

Movement	EB	WB	NB
Directions Served	LTR	LTR	LT
Maximum Queue (ft)	60	25	52
Average Queue (ft)	20	7	4
95th Queue (ft)	46	26	25
Link Distance (ft)	303	354	585
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Nowthen Blvd NW & Lord of Life Access

Movement	WB
Directions Served	LR
Maximum Queue (ft)	17
Average Queue (ft)	1
95th Queue (ft)	7
Link Distance (ft)	225
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Nowthen Blvd NW & Iodine St NW

Movement	EB	EB	NB	SB
Directions Served	LT	R	L	L
Maximum Queue (ft)	28	86	39	15
Average Queue (ft)	2	28	7	1
95th Queue (ft)	12	59	27	8
Link Distance (ft)	278	278		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			290	300
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7:

Movement	EB	WB	NB	NB
Directions Served	R	L	L	R
Maximum Queue (ft)	34	86	52	51
Average Queue (ft)	2	33	21	18
95th Queue (ft)	16	73	48	45
Link Distance (ft)			345	345
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	300	120		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: St Francis Blvd NW & Nowthen Blvd NW

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	L	TR	L	L	T	R	L	T	R
Maximum Queue (ft)	36	81	175	99	176	140	95	33	59	339	29
Average Queue (ft)	8	20	91	16	82	32	28	3	20	164	7
95th Queue (ft)	28	54	156	56	155	95	67	16	49	277	24
Link Distance (ft)		384		243			607			3458	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	200		80		500	500		290	210		210
Storage Blk Time (%)		0	21	0						3	
Queuing Penalty (veh)		2	7	0						2	

Network Summary

Network wide Queuing Penalty: 11

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.2	0.2	4.0	0.1	0.1	2.4	0.0	0.0	0.0	0.5	0.5	3.4
Total Del/Veh (s)	11.4	15.8	3.8	14.3	13.4	3.5	4.3	4.4	1.3	2.7	1.3	0.2

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.5
Total Del/Veh (s)	3.6

2: Cobalt St NW & Sunwood Dr NW Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	1.2	1.1	3.0	1.2	4.1	1.9	1.6

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.0	0.0	4.1	0.1	0.2	0.0	0.0	0.1	3.4	0.4	3.5
Total Del/Veh (s)	60.1	64.7	14.1	58.6	57.1	15.5	60.0	13.7	8.5	64.9	3.8	1.0

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.3
Total Del/Veh (s)	14.0

4: Nowthen Blvd NW & 146th Ave NW Performance by movement

Movement	EBL	EBR	WBL	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.0
Total Del/Veh (s)	10.0	3.9	10.7	2.1	1.3	0.1	3.8	1.0	0.5	1.3

5: Nowthen Blvd NW & Lord of Life Access Performance by movement

Movement	WBL	WBR	NBT	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0
Total Del/Veh (s)	14.1	5.4	0.9	0.6	0.8

6: Nowthen Blvd NW & Iodine St NW Performance by movement

Movement	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.2		0.0	0.0	0.4	0.0	0.3	0.1
Total Del/Veh (s)	12.5	3.5	15.4	10.6		1.8	0.3	5.5	0.8	0.2	1.8

7: Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.1	0.3	0.0	0.2	0.2	0.0
Total Del/Veh (s)	1.8	0.2	7.0	3.0	17.0	5.5	3.9

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.2	3.9	0.3	0.3	3.1	1.8	3.2	0.1	0.0	0.0
Total Del/Veh (s)	55.2	37.3	2.5	46.4	45.2	29.6	50.9	11.9	2.3	50.9	20.8	5.3

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	All
Denied Del/Veh (s)	1.3
Total Del/Veh (s)	22.7

Total Network Performance

Denied Del/Veh (s)	1.4
Total Del/Veh (s)	31.0

Intersection: 1: Nowthen Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	LT	R	LT	R	LT	LT	R
Maximum Queue (ft)	57	45	50	25	114	42	4
Average Queue (ft)	20	16	24	6	30	5	0
95th Queue (ft)	46	36	47	22	80	26	2
Link Distance (ft)	414		1298		784	478	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		270		270			270
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 2: Cobalt St NW & Sunwood Dr NW

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	27	32
Average Queue (ft)	1	7
95th Queue (ft)	12	26
Link Distance (ft)	1064	511
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: St Francis Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	49	64	87	65	56	367	126	45	143	24
Average Queue (ft)	10	15	33	11	16	107	14	8	37	1
95th Queue (ft)	33	46	71	38	44	284	77	27	95	10
Link Distance (ft)		1064		520		3458			761	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		240		240	240		240
Storage Blk Time (%)			0	0		1				
Queuing Penalty (veh)			0	0		1				

Intersection: 4: Nowthen Blvd NW & 146th Ave NW

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LT	LT
Maximum Queue (ft)	30	24	51	55
Average Queue (ft)	11	2	6	3
95th Queue (ft)	32	13	28	25
Link Distance (ft)	303	354	585	784
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Nowthen Blvd NW & Lord of Life Access

Movement	WB
Directions Served	LR
Maximum Queue (ft)	29
Average Queue (ft)	5
95th Queue (ft)	23
Link Distance (ft)	225
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Nowthen Blvd NW & Iodine St NW

Movement	EB	EB	WB	SB
Directions Served	LT	R	LTR	L
Maximum Queue (ft)	23	36	33	68
Average Queue (ft)	2	13	6	20
95th Queue (ft)	13	29	23	51
Link Distance (ft)	278	278	203	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				300
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7:

Movement	WB	WB	WB	NB	NB
Directions Served	L	T	T	L	R
Maximum Queue (ft)	57	82	84	109	89
Average Queue (ft)	14	3	3	48	36
95th Queue (ft)	42	60	61	88	67
Link Distance (ft)		384	384	345	345
Upstream Blk Time (%)		0			
Queuing Penalty (veh)		0			
Storage Bay Dist (ft)	120				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: St Francis Blvd NW & Nowthen Blvd NW

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	L	TR	L	L	T	R	L	T	R
Maximum Queue (ft)	142	133	113	130	297	211	347	32	65	287	20
Average Queue (ft)	60	34	45	58	176	118	156	8	16	125	3
95th Queue (ft)	118	85	93	116	268	216	288	27	49	218	13
Link Distance (ft)		384		243			607			3458	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	200		80		500	500		290	210		210
Storage Blk Time (%)		0	5	9			1			1	
Queuing Penalty (veh)		2	5	6			4			0	

Network Summary

Network wide Queuing Penalty: 18

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.2	4.1	0.1	0.1	2.1	0.0	0.0	0.1	0.2	3.9	0.5
Total Del/Veh (s)	5.4	7.8	2.2	5.7	7.9	2.4	1.2	1.2	0.2	0.7	0.1	1.5

2: Cobalt St NW & Sunwood Dr NW Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0		0.1	0.0
Total Del/Veh (s)	1.2	1.5	2.5	0.7		2.1	1.6

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.3	0.0	0.0	4.1	0.1	0.1	0.0	0.0	0.0	2.9	0.4	3.2
Total Del/Veh (s)	37.4	29.8	6.3	39.7	31.1	2.0	43.7	5.2	3.4	39.3	3.2	0.5

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.4
Total Del/Veh (s)	6.5

4: Nowthen Blvd NW & 146th Ave NW Performance by movement

Movement	EBL	EBR	WBL	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)		0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)		2.8	6.0	1.2	0.6	0.1	0.5	0.3	0.7

5: Nowthen Blvd NW & Lord of Life Access Performance by movement

Movement	WBL	WBR	NBT	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0
Total Del/Veh (s)	5.8	3.2	0.4	0.3	0.5

6: Nowthen Blvd NW & Iodine St NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	8.8	3.3	2.9	6.8	15.3	2.3	2.1	0.7	0.1	1.7	0.5	0.1

6: Nowthen Blvd NW & Iodine St NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	0.8

7: Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.5	0.0	0.1	0.1	0.0
Total Del/Veh (s)	1.0	0.2	4.3	1.5	6.5	2.2	1.5

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	4.1	0.3	0.2	3.2	0.7	3.4	0.1	0.0	0.5
Total Del/Veh (s)	46.8	42.2	2.0	55.5	45.7	11.9	50.6	5.7	1.3	62.0	13.1	4.9

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.8
Total Del/Veh (s)	17.6

Total Network Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	22.7

Intersection: 1: Nowthen Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB
Directions Served	LT	R	LT	R	LT
Maximum Queue (ft)	40	57	46	19	39
Average Queue (ft)	13	15	18	2	4
95th Queue (ft)	34	37	44	12	20
Link Distance (ft)	414		1298		784
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		270		270	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Cobalt St NW & Sunwood Dr NW

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	18	39
Average Queue (ft)	1	8
95th Queue (ft)	8	29
Link Distance (ft)	1064	511
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: St Francis Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	32	42	75	17	55	93	32	26	118	15
Average Queue (ft)	2	10	24	2	11	17	2	3	30	1
95th Queue (ft)	15	32	56	10	38	61	12	16	82	10
Link Distance (ft)		1064		520		3458			761	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		240		240	240		240
Storage Blk Time (%)			0							
Queuing Penalty (veh)			0							

Intersection: 4: Nowthen Blvd NW & 146th Ave NW

Movement	EB	WB	NB
Directions Served	LTR	LTR	LT
Maximum Queue (ft)	25	25	19
Average Queue (ft)	11	4	1
95th Queue (ft)	30	20	10
Link Distance (ft)	303	354	585
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Nowthen Blvd NW & Lord of Life Access

Movement	WB
Directions Served	LR
Maximum Queue (ft)	37
Average Queue (ft)	15
95th Queue (ft)	39
Link Distance (ft)	225
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Nowthen Blvd NW & Iodine St NW

Movement	EB	EB	WB	NB	SB
Directions Served	LT	R	LTR	L	L
Maximum Queue (ft)	23	36	20	27	10
Average Queue (ft)	2	11	3	4	0
95th Queue (ft)	12	29	15	20	5
Link Distance (ft)	278	278	203		
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				290	300
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7:

Movement	EB	WB	NB	NB
Directions Served	R	L	L	R
Maximum Queue (ft)	4	39	46	48
Average Queue (ft)	0	9	16	16
95th Queue (ft)	3	33	41	41
Link Distance (ft)			345	345
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	300	120		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: St Francis Blvd NW & Nowthen Blvd NW

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	L	TR	L	L	T	R	L	T	R
Maximum Queue (ft)	40	60	117	90	186	148	155	29	73	212	20
Average Queue (ft)	8	20	48	16	93	27	54	3	26	95	3
95th Queue (ft)	26	50	98	53	164	102	120	18	62	173	14
Link Distance (ft)		384		243			607			3458	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	200		80		500	500		290	210		210
Storage Blk Time (%)			4	1						0	
Queuing Penalty (veh)			1	0						0	

Network Summary

Network wide Queuing Penalty: 2

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.3	0.3	4.0	0.0	0.0	1.0	0.0	0.0	0.0	0.6	0.6	3.2
Total Del/Veh (s)	7.3	10.9	6.3	12.6	13.0	2.9	3.1	0.8	0.1	0.5	1.3	0.1

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	2.6

2: Cobalt St NW & Sunwood Dr NW Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Total Del/Veh (s)	2.2	2.0	1.9	1.1	4.6	2.6	2.3

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.4	0.0	0.0	4.1	0.2	0.4	0.0	0.0	0.0	2.9	0.5	3.1
Total Del/Veh (s)	31.2	43.4	6.5	44.3	44.9	8.6	48.3	5.3	2.9	44.1	4.5	1.4

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	8.8

4: Nowthen Blvd NW & 146th Ave NW Performance by movement

Movement	EBL	EBR	WBL	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.0	0.0	0.2	0.0	0.0	0.0
Total Del/Veh (s)	9.8	6.4	8.1	2.7	0.5	0.0	1.4	0.8	1.5

5: Nowthen Blvd NW & Lord of Life Access Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.2	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	10.0	3.0	0.4	0.0	1.0	0.8	0.8

6: Nowthen Blvd NW & Iodine St NW Performance by movement

Movement	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	11.6	15.5	24.5	18.2	9.6	0.7	0.4	1.7	2.1	0.4	4.8

7: Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	2.7	1.1	12.6	1.2	25.2	10.7	3.3

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	3.9	0.5	0.1	3.6	0.7	3.6	0.0	0.0	0.3
Total Del/Veh (s)	36.8	37.7	4.0	46.7	34.5	9.1	45.8	5.9	1.2	46.8	18.9	7.1

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	17.6

Total Network Performance

Denied Del/Veh (s)	1.2
Total Del/Veh (s)	26.3

Intersection: 1: Nowthen Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	R	LT	R	LT	LT
Maximum Queue (ft)	39	61	87	24	42	3
Average Queue (ft)	11	23	38	3	4	0
95th Queue (ft)	32	48	72	17	23	2
Link Distance (ft)	414		1298		784	478
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		270		270		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Cobalt St NW & Sunwood Dr NW

Movement	NB
Directions Served	LR
Maximum Queue (ft)	60
Average Queue (ft)	21
95th Queue (ft)	47
Link Distance (ft)	511
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: St Francis Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	42	47	108	45	46	91	27	29	184	33
Average Queue (ft)	7	10	38	9	6	18	2	5	52	2
95th Queue (ft)	28	34	80	31	27	60	13	19	131	17
Link Distance (ft)		1064		520		3458			761	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		240		240	240		240
Storage Blk Time (%)			1						0	
Queuing Penalty (veh)			0						0	

Intersection: 4: Nowthen Blvd NW & 146th Ave NW

Movement	EB	WB	NB
Directions Served	LTR	LTR	LT
Maximum Queue (ft)	48	24	39
Average Queue (ft)	21	4	4
95th Queue (ft)	42	20	20
Link Distance (ft)	303	354	585
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Nowthen Blvd NW & Lord of Life Access

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	37	6
Average Queue (ft)	10	0
95th Queue (ft)	33	4
Link Distance (ft)	225	585
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Nowthen Blvd NW & Iodine St NW

Movement	EB	EB	WB	NB	SB
Directions Served	LT	R	LTR	L	L
Maximum Queue (ft)	24	89	111	51	20
Average Queue (ft)	3	30	43	7	1
95th Queue (ft)	16	63	88	31	9
Link Distance (ft)	278	278	203		
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				290	300
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7:

Movement	EB	EB	WB	NB	NB
Directions Served	T	R	L	L	R
Maximum Queue (ft)	4	25	80	77	68
Average Queue (ft)	0	1	30	25	23
95th Queue (ft)	3	11	66	59	60
Link Distance (ft)	659			345	345
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		300	120		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: St Francis Blvd NW & Nowthen Blvd NW

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	L	TR	R	L	L	T	R	L	T	R
Maximum Queue (ft)	69	55	154	96	6	175	134	100	29	52	341	37
Average Queue (ft)	16	19	79	16	0	83	44	25	4	16	157	7
95th Queue (ft)	47	47	135	52	2	149	102	69	20	41	277	25
Link Distance (ft)		384		244	244			607			3458	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200		80			500	500		290	210		210
Storage Blk Time (%)			15	0							3	
Queuing Penalty (veh)			4	0							1	

Network Summary

Network wide Queuing Penalty: 6

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.3	0.6	3.9	0.1	0.0	0.0	0.0	0.0	1.1	0.5	0.6	2.2
Total Del/Veh (s)	13.0	12.9	7.1	20.6	12.8	2.7	3.9	0.9	0.2	1.3	1.8	0.2

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	3.4

2: Cobalt St NW & Sunwood Dr NW Performance by movement

Movement	EBT	EBR	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.1	0.0
Total Del/Veh (s)	0.9	1.3	1.0	4.6	2.1	1.6

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	1.4	0.0	0.0	4.1	0.4	0.1	0.0	0.0	0.0	4.2	0.6	3.1
Total Del/Veh (s)	48.1	2.3	13.3	49.1	63.2	10.2	70.3	7.3	2.8	109.5	4.1	0.6

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.6
Total Del/Veh (s)	8.5

4: Nowthen Blvd NW & 146th Ave NW Performance by movement

Movement	EBL	EBR	WBL	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	19.2	5.0	8.4	2.3	0.3	0.0	1.5	1.0	1.5

5: Nowthen Blvd NW & Lord of Life Access Performance by movement

Movement	NBT	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.3	0.3	0.7	0.7

6: Nowthen Blvd NW & Iodine St NW Performance by movement

Movement	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.2	0.2	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	26.8	18.5	23.8	14.6	5.2	0.6	0.3	2.8	1.9	0.4	4.2

7: Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.1	0.2	0.0
Total Del/Veh (s)	2.6	1.1	7.6	1.0	18.5	8.2	2.9

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	3.9	0.7	0.1	3.5	0.6	3.6	0.0	0.0	0.0
Total Del/Veh (s)	51.2	41.5	3.5	52.8	46.0	21.1	45.6	7.6	1.3	64.2	30.0	7.6

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.6
Total Del/Veh (s)	21.7

Total Network Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	27.6

Intersection: 1: Nowthen Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	R	LT	R	LT	LT
Maximum Queue (ft)	48	82	72	23	48	21
Average Queue (ft)	24	25	34	2	5	1
95th Queue (ft)	47	54	57	14	23	7
Link Distance (ft)	414		1298		784	478
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		270		270		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Cobalt St NW & Sunwood Dr NW

Movement	NB
Directions Served	LR
Maximum Queue (ft)	49
Average Queue (ft)	14
95th Queue (ft)	39
Link Distance (ft)	511
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: St Francis Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	40	20	83	47	24	306	26	21	147	23
Average Queue (ft)	8	3	44	9	3	25	2	1	48	1
95th Queue (ft)	27	13	80	27	17	120	12	9	104	8
Link Distance (ft)		1064		520		3458			761	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		240		240	240		240
Storage Blk Time (%)			0			1				
Queuing Penalty (veh)			0			0				

Intersection: 4: Nowthen Blvd NW & 146th Ave NW

Movement	EB	WB	NB
Directions Served	LTR	LTR	LT
Maximum Queue (ft)	47	25	23
Average Queue (ft)	21	5	2
95th Queue (ft)	42	21	13
Link Distance (ft)	303	354	585
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Nowthen Blvd NW & Lord of Life Access

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

Intersection: 6: Nowthen Blvd NW & Iodine St NW

Movement	EB	EB	WB	NB	SB
Directions Served	LT	R	LTR	L	L
Maximum Queue (ft)	22	146	128	47	25
Average Queue (ft)	2	32	35	3	3
95th Queue (ft)	11	90	75	17	15
Link Distance (ft)	278	278	203		
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				290	300
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7:

Movement	WB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	55	50	58
Average Queue (ft)	21	23	12
95th Queue (ft)	47	44	39
Link Distance (ft)		345	345
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	120		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 8: St Francis Blvd NW & Nowthen Blvd NW

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	L	TR	R	L	L	T	R	L	T	R
Maximum Queue (ft)	66	95	207	56	9	99	60	108	28	88	440	400
Average Queue (ft)	27	22	86	13	1	58	16	39	3	27	258	22
95th Queue (ft)	53	56	140	38	5	105	44	93	18	69	416	143
Link Distance (ft)		384		244	244			607			3458	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200		80			500	500		290	210		210
Storage Blk Time (%)			15								16	
Queuing Penalty (veh)			4								11	

Network Summary

Network wide Queuing Penalty: 15

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.3	0.1	3.9	0.1	0.0	0.0	0.0	0.0	0.5	0.6	0.7	3.2
Total Del/Veh (s)	15.5	17.0	5.8	19.2	13.6	1.7	4.3	1.1	0.2	1.3	1.8	0.2

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	3.5

2: Cobalt St NW & Sunwood Dr NW Performance by movement

Movement	EBT	EBR	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	1.1	0.3	0.8	4.1	2.3	1.7

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.8	0.0	0.0	4.1	0.1	0.1	0.6	0.1	1.7	3.9	0.5	2.7
Total Del/Veh (s)	43.6	33.6	4.8	40.3	41.0	10.0	28.4	4.1	1.1	77.1	5.6	0.6

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	8.4

4: Nowthen Blvd NW & 146th Ave NW Performance by movement

Movement	EBL	EBR	WBL	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	8.1	6.2	15.3	4.7	0.6	0.0	1.6	0.0	1.9

5: Nowthen Blvd NW & Lord of Life Access Performance by movement

Movement	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	2.5	0.3	0.0	0.3	0.8	0.7

6: Nowthen Blvd NW & Iodine St NW Performance by movement

Movement	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.8	0.0	0.0	0.0
Total Del/Veh (s)	5.5	17.7	19.5	7.6	8.1	0.6	0.4	2.1	2.1	0.4	4.4

7: Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.0	0.1	0.1	0.0
Total Del/Veh (s)	2.8	1.2	15.8	1.1	25.1	6.5	3.6

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	3.9	0.2	0.1	3.6	0.6	3.8	0.0	0.0	0.0
Total Del/Veh (s)	65.5	47.9	4.2	45.6	39.2	4.2	52.4	7.2	1.0	58.1	16.1	6.4

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.6
Total Del/Veh (s)	17.3

Total Network Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	25.1

Intersection: 1: Nowthen Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	R	LT	R	LT	LT
Maximum Queue (ft)	66	67	70	25	66	22
Average Queue (ft)	30	21	35	1	5	1
95th Queue (ft)	56	48	62	8	27	6
Link Distance (ft)	414		1298		784	478
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		270		270		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Cobalt St NW & Sunwood Dr NW

Movement	NB
Directions Served	LR
Maximum Queue (ft)	51
Average Queue (ft)	22
95th Queue (ft)	47
Link Distance (ft)	511
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: St Francis Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T
Maximum Queue (ft)	24	36	102	39	28	93	27	27	224
Average Queue (ft)	8	10	40	7	7	19	1	3	72
95th Queue (ft)	25	27	83	24	24	66	9	16	142
Link Distance (ft)		1064		520		3458			761
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	100		100		240		240	240	
Storage Blk Time (%)			0						0
Queuing Penalty (veh)			0						0

Intersection: 4: Nowthen Blvd NW & 146th Ave NW

Movement	EB	WB	NB
Directions Served	LTR	LTR	LT
Maximum Queue (ft)	47	25	29
Average Queue (ft)	20	5	3
95th Queue (ft)	44	20	17
Link Distance (ft)	303	354	585
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Nowthen Blvd NW & Lord of Life Access

Movement	WB
Directions Served	LR
Maximum Queue (ft)	29
Average Queue (ft)	1
95th Queue (ft)	10
Link Distance (ft)	225
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Nowthen Blvd NW & Iodine St NW

Movement	EB	EB	WB	NB	SB
Directions Served	LT	R	LTR	L	L
Maximum Queue (ft)	23	84	63	64	28
Average Queue (ft)	2	29	33	7	1
95th Queue (ft)	11	58	63	30	10
Link Distance (ft)	278	278	203		
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				290	300
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7:

Movement	EB	WB	NB	NB
Directions Served	R	L	L	R
Maximum Queue (ft)	55	74	72	46
Average Queue (ft)	4	33	23	12
95th Queue (ft)	24	70	56	36
Link Distance (ft)			345	345
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	300	120		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: St Francis Blvd NW & Nowthen Blvd NW

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	L	TR	R	L	L	T	R	L	T	R
Maximum Queue (ft)	46	108	186	102	9	198	164	66	23	114	309	23
Average Queue (ft)	16	28	97	20	0	68	25	27	2	21	144	5
95th Queue (ft)	42	69	169	55	3	140	85	67	11	63	272	19
Link Distance (ft)		384		244	244			607			3458	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200		80			500	500		290	210		210
Storage Blk Time (%)		0	18	0							3	
Queuing Penalty (veh)		0	5	0							2	

Network Summary

Network wide Queuing Penalty: 7

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.2	4.1	0.0	0.1	2.7	0.0	0.0	0.0	0.1	0.6	3.3
Total Del/Veh (s)	15.5	11.7	6.4	10.4	11.3	2.8	4.2	1.1	0.2	0.3	1.5	0.1

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	2.5

2: Cobalt St NW & Sunwood Dr NW Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	1.7	2.0	2.7	0.7	4.4	2.4	2.1

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.7	0.0	0.0	3.9	0.1	0.1	0.0	0.0	0.0	3.5	0.5	2.9
Total Del/Veh (s)	49.0	40.7	4.5	39.9	37.0	2.3	39.3	4.4	2.7	65.7	5.3	0.9

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.6
Total Del/Veh (s)	8.3

4: Nowthen Blvd NW & 146th Ave NW Performance by movement

Movement	EBL	EBR	WBL	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	60.2	5.9	9.9	6.2	1.2	0.0	1.4	0.5	1.7

5: Nowthen Blvd NW & Lord of Life Access Performance by movement

Movement	WBL	WBR	NBT	NBR	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	10.0	2.3	0.4	0.0	0.8	0.8

6: Nowthen Blvd NW & Iodine St NW Performance by movement

Movement	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	12.7	30.8	31.5	8.4	6.8	0.8	0.3	1.7	2.1	0.7	5.8

7: Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.1	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	3.1	1.1	15.3	1.3	35.7	16.2	4.0

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	3.8	0.7	0.3	3.5	0.6	3.4	0.2	0.0	0.0
Total Del/Veh (s)	36.4	32.3	4.7	41.4	35.4	14.2	62.9	6.3	2.2	53.1	21.1	8.1

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	19.6

Total Network Performance

Denied Del/Veh (s)	1.2
Total Del/Veh (s)	28.9

Intersection: 1: Nowthen Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB
Directions Served	LT	R	LT	R	LT
Maximum Queue (ft)	25	43	51	25	49
Average Queue (ft)	11	21	29	3	4
95th Queue (ft)	31	40	51	15	26
Link Distance (ft)	414		1298		784
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		270		270	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Cobalt St NW & Sunwood Dr NW

Movement	NB
Directions Served	LR
Maximum Queue (ft)	50
Average Queue (ft)	17
95th Queue (ft)	42
Link Distance (ft)	511
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: St Francis Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	24	20	80	38	49	53	27	45	203	27
Average Queue (ft)	4	6	30	4	7	17	4	4	69	1
95th Queue (ft)	18	20	65	20	28	50	18	21	146	9
Link Distance (ft)		1064		520		3458			761	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		240		240	240		240
Storage Blk Time (%)			0							
Queuing Penalty (veh)			0							

Intersection: 4: Nowthen Blvd NW & 146th Ave NW

Movement	EB	WB	NB
Directions Served	LTR	LTR	LT
Maximum Queue (ft)	49	25	114
Average Queue (ft)	20	7	12
95th Queue (ft)	40	25	58
Link Distance (ft)	303	354	585
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Nowthen Blvd NW & Lord of Life Access

Movement	WB
Directions Served	LR
Maximum Queue (ft)	29
Average Queue (ft)	6
95th Queue (ft)	25
Link Distance (ft)	225
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Nowthen Blvd NW & Iodine St NW

Movement	EB	EB	WB	NB	SB
Directions Served	LT	R	LTR	L	L
Maximum Queue (ft)	23	153	110	28	25
Average Queue (ft)	2	39	46	9	2
95th Queue (ft)	14	102	91	28	12
Link Distance (ft)	278	278	203		
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				290	300
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7:

Movement	WB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	74	74	53
Average Queue (ft)	35	28	20
95th Queue (ft)	68	58	51
Link Distance (ft)		345	345
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	120		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 8: St Francis Blvd NW & Nowthen Blvd NW

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	L	TR	L	L	T	R	L	T	R
Maximum Queue (ft)	44	43	148	92	208	170	85	28	47	459	21
Average Queue (ft)	10	14	66	20	107	66	31	7	17	169	9
95th Queue (ft)	31	37	113	58	181	138	69	24	43	307	25
Link Distance (ft)		384		243			607			3458	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	200		80		500	500		290	210		210
Storage Blk Time (%)			11	1						4	
Queuing Penalty (veh)			4	2						2	

Network Summary

Network wide Queuing Penalty: 8

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.4	4.1	0.1	0.2	3.1	0.0	0.0	0.0	0.5	0.4	3.1
Total Del/Veh (s)	18.4	14.1	3.1	19.3	17.1	3.9	5.0	5.5	1.6	1.0	1.1	0.2

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.5
Total Del/Veh (s)	4.2

2: Cobalt St NW & Sunwood Dr NW Performance by movement

Movement	EBT	EBR	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.0	0.1	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.4	0.5	2.6	1.2	2.9	1.7

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.2	0.1	0.0	4.1	0.1	0.2	0.0	0.0	0.1	3.6	0.4	4.1
Total Del/Veh (s)	67.0	57.6	7.6	59.4	59.9	10.5	76.1	13.0	7.1	62.4	5.2	0.4

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.3
Total Del/Veh (s)	14.7

4: Nowthen Blvd NW & 146th Ave NW Performance by movement

Movement	EBL	EBR	WBL	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Total Del/Veh (s)	17.5	3.0	11.3	2.1	1.2	0.4	1.5	0.8	0.1	1.1

5: Nowthen Blvd NW & Lord of Life Access Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	14.1	3.6	1.1	0.7	3.8	0.7	1.0

6: Nowthen Blvd NW & Iodine St NW Performance by movement

Movement	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.4	0.0	0.0	0.1
Total Del/Veh (s)	13.5	5.1	18.5	6.5	0.2	2.1	0.7	6.9	1.1	0.0	2.7

7: Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.1	0.0	0.0	0.2	0.1	0.0
Total Del/Veh (s)	2.1	0.6	8.2	3.1	20.4	5.3	4.0

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.1	4.0	0.3	0.5	3.1	2.0	3.3	0.0	0.0	0.0
Total Del/Veh (s)	70.1	38.3	2.7	51.2	48.0	29.7	50.7	11.8	2.5	51.6	26.6	6.6

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	All
Denied Del/Veh (s)	1.4
Total Del/Veh (s)	25.0

Total Network Performance

Denied Del/Veh (s)	1.5
Total Del/Veh (s)	33.7

Intersection: 1: Nowthen Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	R	LT	R	LT	LT
Maximum Queue (ft)	50	62	94	25	92	20
Average Queue (ft)	15	16	29	10	35	1
95th Queue (ft)	40	35	61	29	75	10
Link Distance (ft)	414		1298		784	478
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		270		270		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Cobalt St NW & Sunwood Dr NW

Movement	NB
Directions Served	LR
Maximum Queue (ft)	51
Average Queue (ft)	8
95th Queue (ft)	32
Link Distance (ft)	511
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: St Francis Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	44	44	89	80	92	395	412	49	138	21
Average Queue (ft)	15	14	47	9	24	118	29	7	54	1
95th Queue (ft)	36	38	87	25	63	263	152	31	118	7
Link Distance (ft)		1064		520		3458			761	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		240		240	240		240
Storage Blk Time (%)			1			1				
Queuing Penalty (veh)			0			1				

Intersection: 4: Nowthen Blvd NW & 146th Ave NW

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LT	LT
Maximum Queue (ft)	25	24	51	21
Average Queue (ft)	12	1	4	1
95th Queue (ft)	31	8	24	7
Link Distance (ft)	303	354	585	784
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Nowthen Blvd NW & Lord of Life Access

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	29	53
Average Queue (ft)	11	2
95th Queue (ft)	32	18
Link Distance (ft)	225	585
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Nowthen Blvd NW & Iodine St NW

Movement	EB	EB	WB	SB
Directions Served	LT	R	LTR	L
Maximum Queue (ft)	46	44	86	71
Average Queue (ft)	6	16	27	24
95th Queue (ft)	25	37	55	56
Link Distance (ft)	278	278	203	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				300
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7:

Movement	EB	WB	WB	NB	NB
Directions Served	R	L	T	L	R
Maximum Queue (ft)	22	54	429	97	75
Average Queue (ft)	1	20	0	43	33
95th Queue (ft)	7	50	0	76	55
Link Distance (ft)			384	345	345
Upstream Blk Time (%)			0		
Queuing Penalty (veh)			0		
Storage Bay Dist (ft)	300	120			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: St Francis Blvd NW & Nowthen Blvd NW

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	L	TR	L	L	T	R	L	T	R
Maximum Queue (ft)	171	110	108	171	274	231	394	48	68	325	21
Average Queue (ft)	74	40	40	54	193	149	152	9	17	154	3
95th Queue (ft)	143	90	84	122	270	225	258	31	50	258	14
Link Distance (ft)		384		243			607			3458	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	200		80		500	500		290	210		210
Storage Blk Time (%)		0	3	9			1			4	
Queuing Penalty (veh)		0	3	6			5			1	

Network Summary

Network wide Queuing Penalty: 17

1: Nowthen Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.2	4.1	0.1	0.0	2.5	0.0	0.0	0.0	0.2	3.5	0.4
Total Del/Veh (s)	4.7	9.2	2.7	7.5	6.1	1.8	1.5	1.3	0.4	0.7	0.1	1.5

2: Cobalt St NW & Sunwood Dr NW Performance by movement

Movement	EBT	EBR	WBL	WBT	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.3	0.9	2.1	0.7	2.3	1.4

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.6	0.0	0.0	4.1	0.1	0.2	0.0	0.0	0.0	2.9	0.4	3.2
Total Del/Veh (s)	38.1	27.7	4.8	41.8	70.0	8.7	38.3	5.9	3.8	65.5	3.0	0.6

3: St Francis Blvd NW & Sunwood Dr NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.4
Total Del/Veh (s)	6.9

4: Nowthen Blvd NW & 146th Ave NW Performance by movement

Movement	EBL	EBR	WBL	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)		0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)		2.9	6.9	1.1	0.8	0.1	0.5	0.2	0.7

5: Nowthen Blvd NW & Lord of Life Access Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	5.7	3.2	0.7	0.1	2.6	0.4	0.7

6: Nowthen Blvd NW & Iodine St NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)		0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.0	0.0
Total Del/Veh (s)		11.1	3.6	7.9	6.0	3.3	2.3	1.0	0.5	1.3	0.8	0.3

6: Nowthen Blvd NW & Iodine St NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	1.7

7: Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Del/Veh (s)	0.0	0.1	0.2	0.0	0.1	0.1	0.0
Total Del/Veh (s)	1.4	0.3	5.3	1.3	7.0	3.0	1.7

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	4.1	0.3	0.2	3.3	0.9	3.4	0.2	0.0	0.0
Total Del/Veh (s)	55.4	34.0	2.1	52.4	50.0	14.7	47.2	6.8	1.2	61.7	16.3	5.4

8: St Francis Blvd NW & Nowthen Blvd NW Performance by movement

Movement	All
Denied Del/Veh (s)	0.9
Total Del/Veh (s)	19.3

Total Network Performance

Denied Del/Veh (s)	1.2
Total Del/Veh (s)	24.0

Intersection: 1: Nowthen Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB
Directions Served	LT	R	LT	R	LT
Maximum Queue (ft)	25	34	33	24	33
Average Queue (ft)	9	13	13	2	4
95th Queue (ft)	28	28	36	11	20
Link Distance (ft)	414		1298		784
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		270		270	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Cobalt St NW & Sunwood Dr NW

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	6	55
Average Queue (ft)	0	10
95th Queue (ft)	0	34
Link Distance (ft)	1064	511
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: St Francis Blvd NW & Sunwood Dr NW

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	R
Maximum Queue (ft)	32	39	84	20	36	106	32	28	96	20
Average Queue (ft)	5	8	25	2	7	25	2	3	29	1
95th Queue (ft)	21	26	64	11	26	77	16	16	76	9
Link Distance (ft)		1064		520		3458			761	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		240		240	240		240
Storage Blk Time (%)			0							
Queuing Penalty (veh)			0							

Intersection: 4: Nowthen Blvd NW & 146th Ave NW

Movement	EB	WB	NB
Directions Served	LTR	LTR	LT
Maximum Queue (ft)	25	25	20
Average Queue (ft)	8	4	1
95th Queue (ft)	26	18	12
Link Distance (ft)	303	354	585
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Nowthen Blvd NW & Lord of Life Access

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	29	14
Average Queue (ft)	17	1
95th Queue (ft)	40	14
Link Distance (ft)	225	585
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Nowthen Blvd NW & Iodine St NW

Movement	EB	EB	WB	NB	SB
Directions Served	LT	R	LTR	L	L
Maximum Queue (ft)	18	53	63	27	15
Average Queue (ft)	1	13	24	5	1
95th Queue (ft)	10	33	46	20	6
Link Distance (ft)	278	278	203		
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				290	300
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7:

Movement	WB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	45	47	30
Average Queue (ft)	8	16	15
95th Queue (ft)	32	41	36
Link Distance (ft)		345	345
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	120		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 8: St Francis Blvd NW & Nowthen Blvd NW

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	L	TR	L	L	T	R	L	T	R
Maximum Queue (ft)	61	64	125	64	188	131	162	24	76	242	20
Average Queue (ft)	16	22	47	17	94	51	55	3	26	103	5
95th Queue (ft)	44	52	101	47	162	110	123	17	62	197	17
Link Distance (ft)		384		243			607			3458	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	200		80		500	500		290	210		210
Storage Blk Time (%)			4	0						1	
Queuing Penalty (veh)			1	0						0	

Network Summary

Network wide Queuing Penalty: 2