City of Chaska

# Big Woods Business Park

# FINAL ALTERNATIVE URBAN AREAWIDE REVIEW (AUAR)

**MARCH 2026**

PREPARED FOR:

City of Chaska

PREPARED BY:

Kimley»Horn

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# Final Alternative Urban Areawide Review

This Alternative Urban Areawide Review (AUAR) follows the format of an Environmental Assessment Worksheet (EAW) (December 2022 version). Where the AUAR guidance provided by the Minnesota Environmental Quality Board (EQB) indicates that an AUAR response should differ notably from what is required for an EAW, the guidance is noted in *italics.*

## 1. PROJECT TITLE

Big Woods Business Park AUAR

## 2. PROPOSER

**Proposer**: Scannell Properties #771, LLC
**Contact Person:** Jake Kurth
**Address:** 8801 River Crossing Blvd, Suite 300
**City, State, ZIP:** Indianapolis, IN 46240
**Phone:** 612-280-4088
**Email:** jakek@scannellproperties.com

## 3. RGU

**RGU:** City of Chaska
**Contact Person:** Elizabeth Hanson, AICP
**Title:** City Planner
**Address:** One City Hall Plaza
**City, State, ZIP:** Chaska, MN 55318
**Phone:** 952-448-9200
**Email:** EHanson@chaskamn.gov

## 4. REASON FOR PREPARATION

*AUAR Guidance: Not applicable to an AUAR.*

## 5. PROJECT LOCATION

**County:** Carver
**City/Township:** Chaska
**PLS Location (¼, ¼, Section, Township, Range):** Township 115N, Range 23W, Sections 6 and 7
**Watershed (81 major watershed scale):** Minnesota River - Shakopee
**Tax Parcel Numbers:** 040010610, 040010600, 306920020, 306920020, 300061130, 040010610, 300061600, 300060520, 300061500, 300061700, 300061300, 300061200, 300070901, 300070500, 300070810, 300070210, 300070200 (note: the study area contains only whole parcels)
**At a minimum, attach each of the following to the AUAR:**

- **US Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries** (See Figure 1)
- **Map depicting the boundaries of the AUAR and any subdistricts used in the AUAR analysis** (see Figure 2)
- List of data sources, models, and other resources (from the Item-by-Item Guidance: Climate Adaptation and Resilience or other) used for information about current Minnesota climate trends and how climate change is anticipated to affect the general location of the project during the life of the project (as detailed below in Item 7)
- **Cover type map as required for Item 8** (See Figure 6)
- **Land use and planning and zoning maps as required in conjunction with Item 10** (See Figure 8, Figure 9, and Figure 10)

**Figure 1: USGS Map**

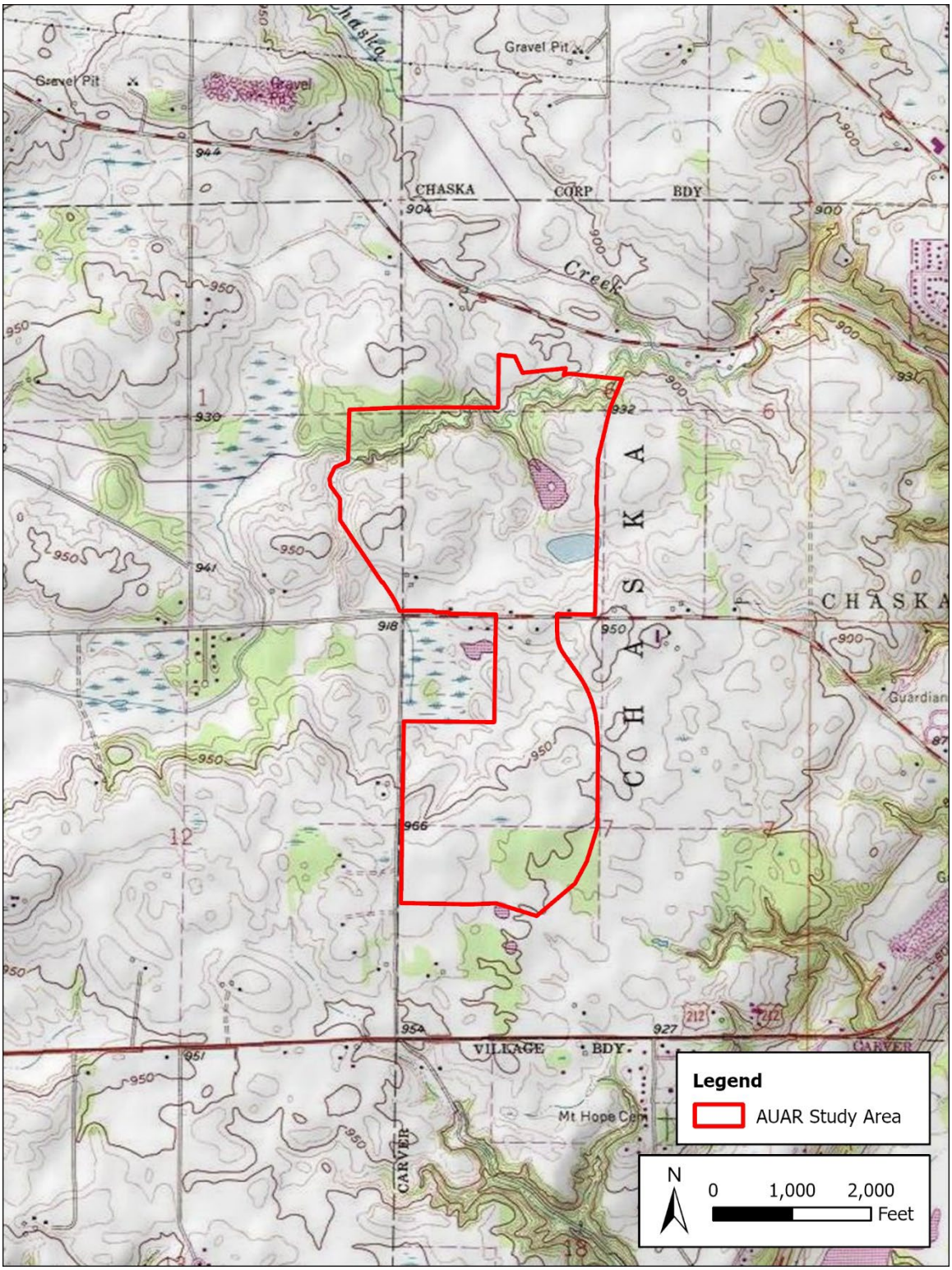
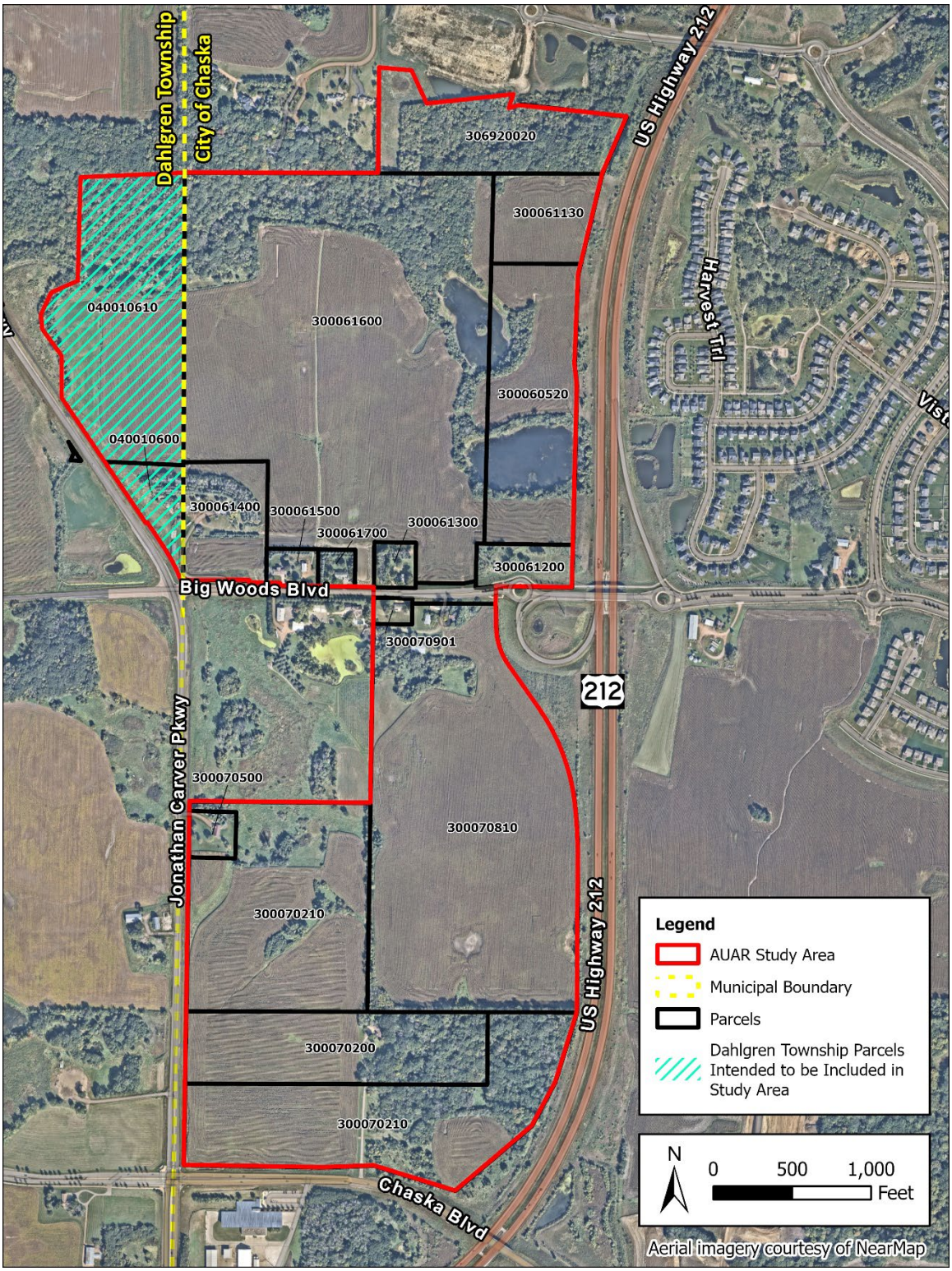


**Figure 2: Study Area**



## 6. PROJECT DESCRIPTION

*AUAR Guidance: Instead of the information called for on the EAW form, the description section of an AUAR should include the following elements for each major development scenario included:*

- *Anticipated types and intensity (density) of residential and commercial/warehouse/light industrial development throughout the AUAR area.*
- *Infrastructure planned to serve development (roads, sewers, water, stormwater system, etc.). Roadways intended primarily to serve as adjoining land uses within an AUAR area are normally expected to be reviewed as part of an AUAR. More "arterial" types of roadways that would cross an AUAR area are an optional inclusion in the AUAR analysis; if they are included, a more intensive level of review, generally including an analysis of alternative routes, is necessary.*
- *Information about the anticipated staging of various developments, to the extent known, and of the infrastructure, and how the infrastructure staging will influence the development schedule.*

The AUAR study area encompasses an area totaling approximately 359 acres on 17 parcels in the City of Chaska and Dahlgren Township, Carver County, Minnesota (shown in Figure 2). The study area is generally bounded to the north by Creek Road, to the west by Jonathan Carver Parkway, to the south by Chaska Boulevard, and to the east by U.S. Highway 212 (US 212). Two parcels within the AUAR study area are located within Dahlgren Township (shown in Figure 2). These parcels are intended to be annexed into the City of Chaska. Dahlgren Township and the City of Chaska adopted an Orderly Annexation Agreement for these parcels on September 8, 2025. The agreement outlines the terms and conditions under which an annexation would take place. It is expected that the annexation will occur when development on those parcels occur.

The study area excludes Parcel 300070400, located southeast of Big Woods Boulevard and Jonathan Carver Parkway. This parcel will remain undeveloped during the initial development of the site and is therefore not studied in the AUAR. The parcel will likely remain undeveloped due to the presence of high-quality wetlands.

Two scenarios are evaluated in the AUAR as outlined in Table 1. Scenario 1 includes multiple buildings for a total of 1.8 million square feet of proposed business park (office/warehouse/distribution center type uses) development and 200,000 square feet of proposed commercial development (see Figure 3). Scenario 2 includes multiple buildings for a total of 2.7 million square feet of proposed business park (office/warehouse/distribution center type uses) development and 300,000 square feet of proposed commercial development (see Figure 4). Both scenarios are consistent with the Chaska 2040 Comprehensive Plan.

Both scenarios would include a natural buffer area bisecting the study area from north to south. This aligns with the City's desire to see a natural buffer between land uses and is part of Chaska's Greenbelt, an edge of open space or low-density rural residential use along the edge of the City (as

described in Chapter 4 of the Chaska 2040 Comprehensive Plan).[1] Although there are areas within the Chaska Greenbelt guided for Rural Residential, neither scenario intends to incorporate residential use in these areas. The greenbelt areas are intended to serve as a natural buffer, which is consistent with the City's Comprehensive Plan; furthermore, the greenbelt is distinct from planned "open space", which designates an area for potential recreation or public use.

Both scenarios would also include an approximately 4-acre area for a city substation to support future development. New supporting infrastructure associated with the project will include new roadways, water service, sewer service, a substation, and stormwater infrastructure. There is also potential for a new water tower and lift station. Potential locations of future roadway access to the site are shown in Figure 3 and Figure 4 (see "Future Site Access Points").

The intent of the AUAR is to recognize the worst-case potential impacts and identify mitigation measures that may be taken to compensate for those impacts. Preliminary construction work is anticipated to begin as early as summer 2026. The study area will be constructed in phases with the full build out anticipated to occur over 5-15 years.

**Table 1: Development Scenario**

| Component | Scenario 1 | Scenario 2 |
|---|---|---|
| Business Park Building Area (square feet) | 1,800,000 square feet | 2,700,000 square feet |
| Commercial Building Area (square feet) | 200,000 square feet | 300,000 square feet |
| Rural Residential / Greenbelt | 76 acres | 76 acres |
| Open Space (Acres) | 39 acres | 39 acres |
| **Total (square feet)** | 2,000,000 square feet | 3,000,000 square feet |
| **Total Project Area** | 359 acres | 359 acres |

[1] City of Chaska. *2040 Comprehensive Plan*. Available at https://www.chaskamn.gov/DocumentCenter/View/2618/Ch-4-Land-Use-PDF

**Figure 3: Development Scenario 1**

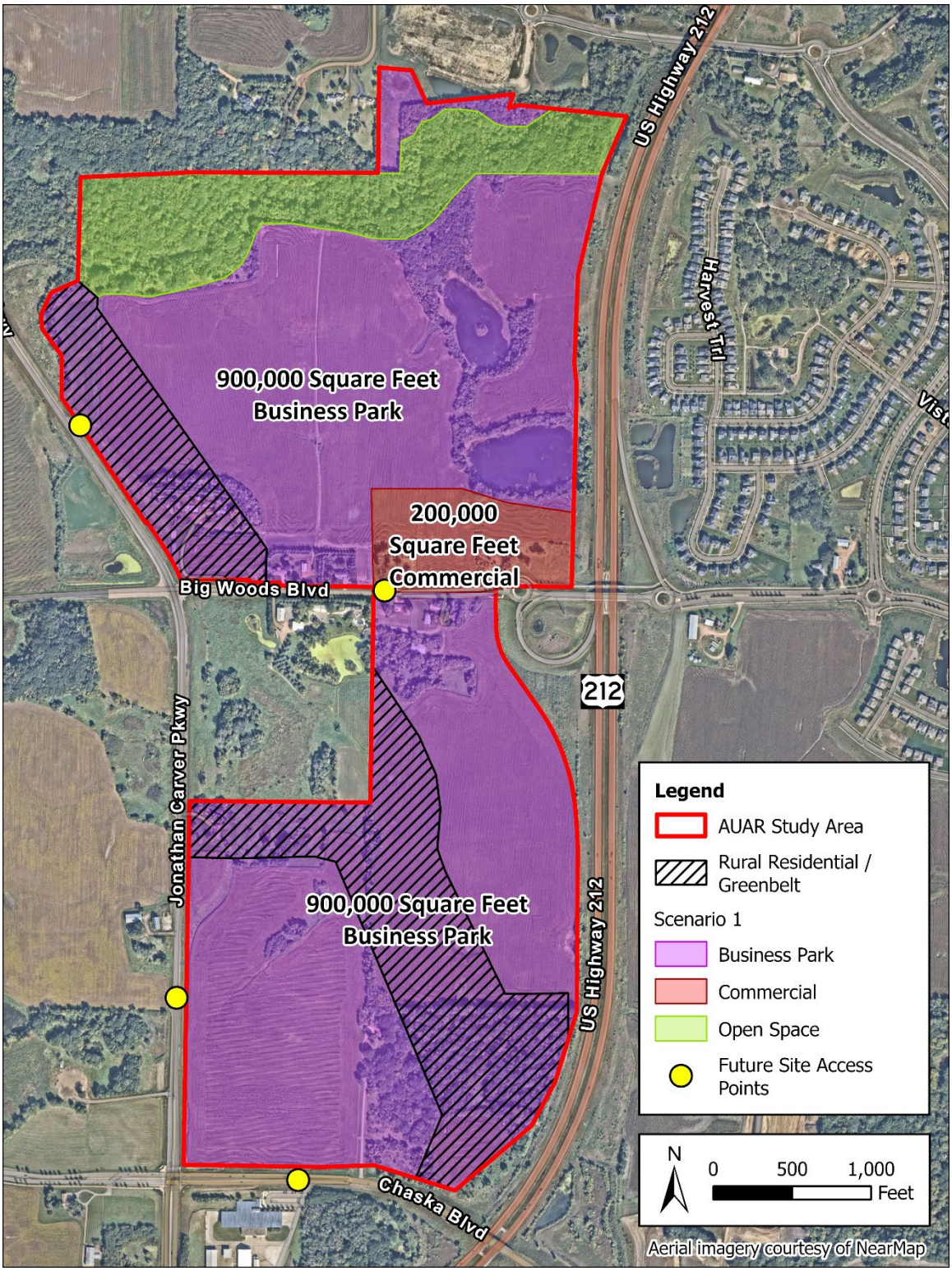
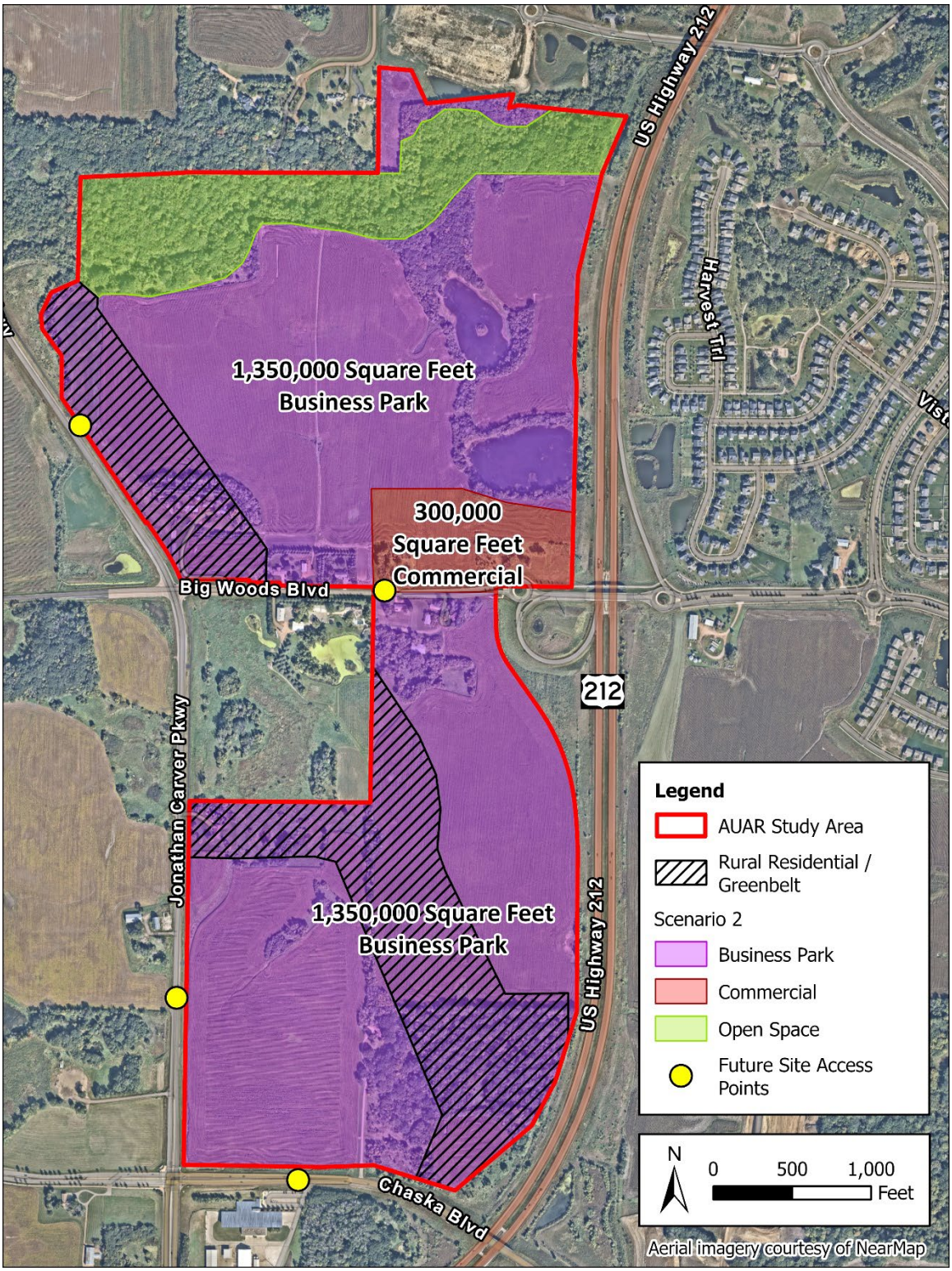


**Figure 4: Development Scenario 2**



## 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 shared socioeconomic pathways (SSPs), which are greenhouse gas concentration scenarios used by the Intergovernmental Panel on Climate Change. The SSPs reflect assumptions about how industrialization, fossil fuel dependence, land use, and population density evolve in the future. The assumptions are based on population growth, urbanization, economic growth, technological advances, greenhouse gas and aerosol emissions, energy supply and demand, land-use changes, and more.[2] SSP 245 is an intermediate scenario in which emissions decline after peaking around 2040, and SSP 370 is a high-emission scenario in which emissions continue to rise through the 21st Century.

### Temperature

According to the Minnesota Climate Mapping and Analysis Tool (CliMAT), the annual daily average temperature in the study area from 1995 to 2014 was 45.6°F.[3] The annual daily average temperature in the study area is projected to increase to 49.4°F from 2040 to 2059 under an intermediate emissions pathway (SSP 245). In 2080-2099, annual daily average temperature is projected to further increase to 52.4°F and 54.6°F under an intermediate (SSP 245) and high emissions pathway (SSP 370), 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 the urban heat island effect. According to the University of Minnesota's Heat Vulnerability Map Tool, the AUAR study area is in an area of high heat vulnerability.[4]

### Precipitation

According to the EPA Climate Resilience Evaluation and Awareness Tool (CREAT) Climate Change Scenarios Projection Map, there is a projected 3.0% to 13.9% increase in 100-year storm

[2] University of Minnesota Climate Adaptation Partnership. *Climate modeling: an introductory primer for practitioners*. May 2023. Available at https://climate.umn.edu/sites/climate.umn.edu/files/2023-06/ClimateProjectionPrimer_Compiled_CoverPage.pdf

[3] University of Minnesota. *Minnesota CliMAT*. Available at https://app.climate.umn.edu/?output_type=modelVal&scenario=ssp370_2080-2099&model=ensemble&variable=tmax-degF&time_frame=yearly&aoi=none#intro_pane

[4] University of Minnesota. *Heat Vulnerability in Minnesota*. Available at https://maps.umn.edu/climatehealthtool/heat_app/

intensity by 2035 and a projected 5.8% to 27.0% increase in 100-year storm intensity by 2060 for the AUAR study area.[5]

### Localized Flood Risk

In many places, climate change is exacerbating the frequency and intensity of the extreme rainfall events and associated flooding. According to the Metropolitan Council Localized Flood Map Screening Tool,[6] a tool that identifies potential surface flooding locations, the study area is located within Primary, Secondary, Tertiary, and Shallow Flood Impact Zones (FIZ) as shown in Figure 5. Primary, Secondary, and Tertiary FIZ describe the first areas to fill with water during a flood event, with Primary filling first, followed by Secondary and Tertiary. Shallow FIZ are separate low areas generally considered low risk, but this depth may still be a concern for certain types of infrastructure.

### Cooling Degree Days

As defined by the National Weather Service, cooling degree days, which are often used as a proxy to estimate cooling needs for buildings, can be examined as a baseline and projected exposure indicator under the RCP 4.5 and RCP 8.5 scenarios (lower emissions and higher emissions, respectively). Cooling degree days are indexed units, not actual days, which roughly describe the demand to heat or cool a building. Cooling degree days accumulate on days warmer than 65°F when cooling is required. For example, if a weather station recorded an average daily temperature of 78°F, cooling degree days for that station would be 13.

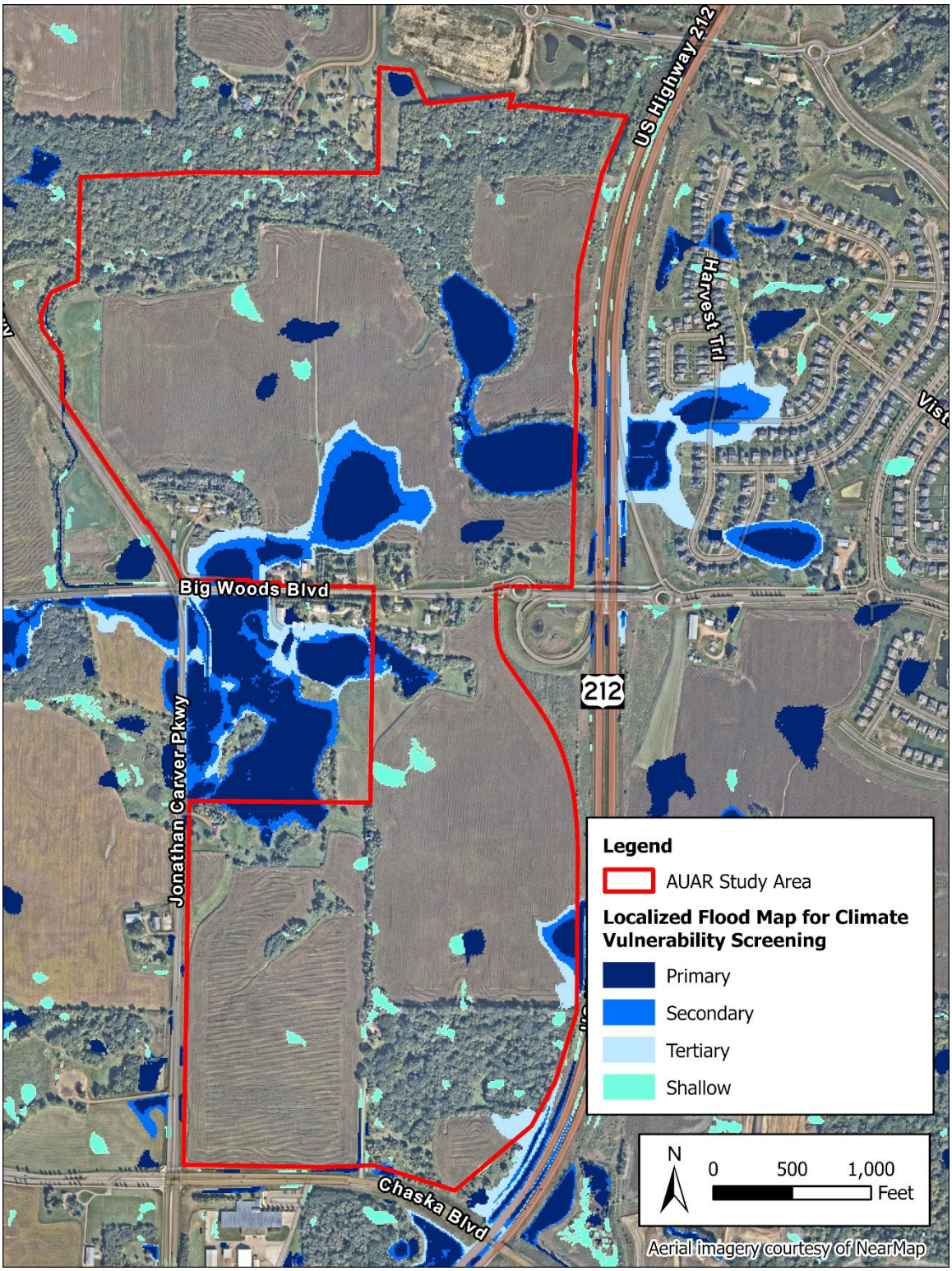
According to Heat Vulnerability in Minnesota,[7] the number of cooling degree days in 2019 for Carver County was 427. The number of cooling days in 2050 for Carver County is projected to be 496 and 650 for RCP 4.5 and 8.5, respectively.

[5] US EPA. *CREAT Climate Change Scenarios Projection Map*. September 2022. Available at https://www.arcgis.com/home/item.html?id=3805293158d54846a29f750d63c6890e

[6] Metropolitan Council. *Localized Flood Map Screening Tool*. Available at https://metrocouncil.org/Communities/Planning/Local-Planning-Assistance/CVA/Tools-Resources.aspx

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

**Figure 5: Metropolitan Council Localized Flood Map**



**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: Interaction of Proposed Activities with Each Climate Trend and Projection Listed in 7a**

| Resource Category | Climate Trends and Climate Projections | Project Components | Potential Environmental Effects | Adaptation Strategies (Scenario 1 and 2) |
|---|---|---|---|---|
| **Project Design** | In the coming decades, the location of the study area is anticipated to experience:<br>• Increased annual temperatures<br>• Increased annual precipitation and more frequent heavy rainfall events | Development of the study area will increase impervious surfaces. | Aspects of building architecture/materials choices and site design may impact urban heat island conditions in the surrounding area, including changing climate zones, temperature trends, and potential for extended heat waves. | • Proposed trees and landscaping will reduce runoff and mitigate heat island effect.<br>• Water-efficient design will be incorporated for landscape vegetation choices, landscape irrigation, appliances, and equipment. |

| Resource Category | Climate Trends and Climate Projections | Project Components | Potential Environmental Effects | Adaptation Strategies (Scenario 1 and 2) |
|---|---|---|---|---|
| **Land Use** | Reduction of tree cover may lead to more intense stormwater runoff, increased urban heat island effect, loss of shade for protection during extreme heat, and potential reduction in air quality. | Development of the study area will convert land use from residential/ agricultural use to business park and commercial uses. | Land use change will increase impervious surfaces within the study area. | • Energy end-use efficient appliances and equipment and energy efficient lighting will be incorporated into building design.<br>• Building shells will be energy efficient and developer will consider the use of solar panels.<br>• Design of the site and stormwater management facilities will be completed to reduce the risk of flooding in the AUAR study area. Bioretention benches, which are paired with ponding areas (discussed further in Item 12), filter stormwater water during rainfall events and will be used to improve water quality and reduce stormwater runoff in the project vicinity. |

| Resource Category | Climate Trends and Climate Projections | Project Components | Potential Environmental Effects | Adaptation Strategies (Scenario 1 and 2) |
|---|---|---|---|---|
| **Water Resources** | Current Minnesota climate trends and anticipated climate change in the general location of the project may influence water resources such as extreme storm events, drought, and groundwater depletion. | Development of the study area may impact nearby water resources. Existing water resources are described further in Item 12. | Water resources in the general project area may become warmer, and increase in volume due to increased temperatures, runoff, and impervious surfaces. There may be more evaporation and water available when it rains, leading to an increase in the flood potential. It is projected that there will be more severe storm events with high, intense rain amounts, which will require drainage systems to be adequately designed and maintained to accommodate for the increase in water volume and rate. | • Developer will use native plants and perennials for landscaping and place adjacent to stormwater features to absorb water therefore reducing the water demand for irrigation and to provide water resource buffers.<br>• Stormwater best management practices (BMPs) shall be designed to meet City of Chaska criteria for rate control and runoff volume reduction and criteria for Minnesota Pollution Control Agency (MPCA) and Carver County Water Management Organization (CCWMO) water quality requirements. |

| Resource Category | Climate Trends and Climate Projections | Project Components | Potential Environmental Effects | Adaptation Strategies (Scenario 1 and 2) |
|---|---|---|---|---|
| **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 the generation/use/storage of hazardous waste and materials. | The proposed development is not anticipated to generate hazardous waste or materials. | Any potential business park uses may require storage of hazardous materials and wastes. | The placement of any potential storage of hazardous materials and wastes would not be in floodplain areas. |
| **Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources (Rare Features)** | Current Minnesota climate trends and anticipated climate change in the general location of the project may influence the local species and suitable habitat. | Development of the study area will change land use and cover. | Suitable habitat for species may become unsuitable due to land use changes, increased temperature, and increased runoff. | Climate-appropriate native plantings and stormwater BMPs will provide suitable habitat for small mammals, insects, and bird species. Wooded steep slopes and high quality wetlands are protected through city ordinance and policy. The greenbelt policy prioritizes preservation of high value natural resources. |

## 8. COVER TYPES

*AUAR Guidance: The following information should be provided:*

- *A cover type map, at least at the scale of a USGS topographic map, depicting:*
  - *Wetlands (identified by Circular 39 type)*
  - *Watercourses (rivers, streams, creeks, ditches)*
  - *Lakes (identify public waters status and shoreland management classification)*
  - *Woodlands (break down by classes where possible)*
  - *Grassland (identify native and old field)*
  - *Cropland*
  - *Current development*
- *An overlay map showing anticipated development in relation to the cover types. This map should also depict any "protection areas," existing or proposed, that will preserve sensitive cover types. Separate maps for each major development scenario should be generally provided.*

The AUAR study area has approximately 359 acres of woodland, wetlands/watercourses, grassland, agricultural land, and impervious surface. There are several structures, mainly single-family homes and farmstead buildings, within the study area. Existing cover types within the study area are shown in Figure 6. These cover types were determined by reviewing recent aerial photography and wetland delineation data for wetland boundaries. Existing and proposed cover types for each proposed scenario are described in Table 3.

Green infrastructure systems could include bioretention areas without underdrains, vegetated swales with impermeable check dams, and enhanced stormwater ponds. Infiltration is likely not possible within the study area, however, green stormwater infrastructure with bioretention benches (enhanced ponds) are proposed (see Item 12 for further discussion of infiltration feasibility). The project proposer will use native plants in landscape designs and will maintain existing significant floodplain and wetland complexes as feasible.

**Table 3: Existing and Proposed Cover Types**

| Cover Type | Existing (acres) | Scenario 1 (acres) | Scenario 2 (acres) |
|---|---|---|---|
| Woodland | 79.2 | 64.2 | 64.2 |
| Grassland | 18.4 | 0 | 0 |
| Agricultural Land | 230.8 | 0 | 0 |
| Wetlands | 27 | 20 | 15 |
| Impervious Surface | 3.9 | 130 | 200 |
| Lawn/Landscaping | 0 | 125.1 | 55.1 |
| Green Infrastructure | 0 | 20 | 25 |
| **Total** | **359.3** | **359.3** | **359.3** |

**Table 4: Green Infrastructure**

| Green Infrastructure | Before (acres) | Scenario 1 (acres) | Scenario 2 (acres) |
|---|---|---|---|
| Green stormwater infrastructure with bioretention benches (enhanced ponds)[8] | 0 | 20 | 25 |
| **Total** | **0** | **20** | **25** |

**Table 5: Trees**

| Trees | Area (acres) |
|---|---|
| Area of Mature Trees Removed During Development[9] | 19 |
| Area of Trees Proposed to be Planted | 4 |

[8] Based on preliminary stormwater requirement calculations based on estimated impervious surface area.

[9] Tree clearing will be limited as much as feasible to support the proposed development scenarios. Tree clearing will be restricted to the winter months when the northern long-eared bat, tricolored bat, and migratory birds are not likely to be present (November 1 – March 31). If winter tree clearing is not feasible, technical assistance from the U.S. Fish and Wildlife Service will be obtained before any trees or shrubs are removed.

**Figure 6: Existing Cover Types**

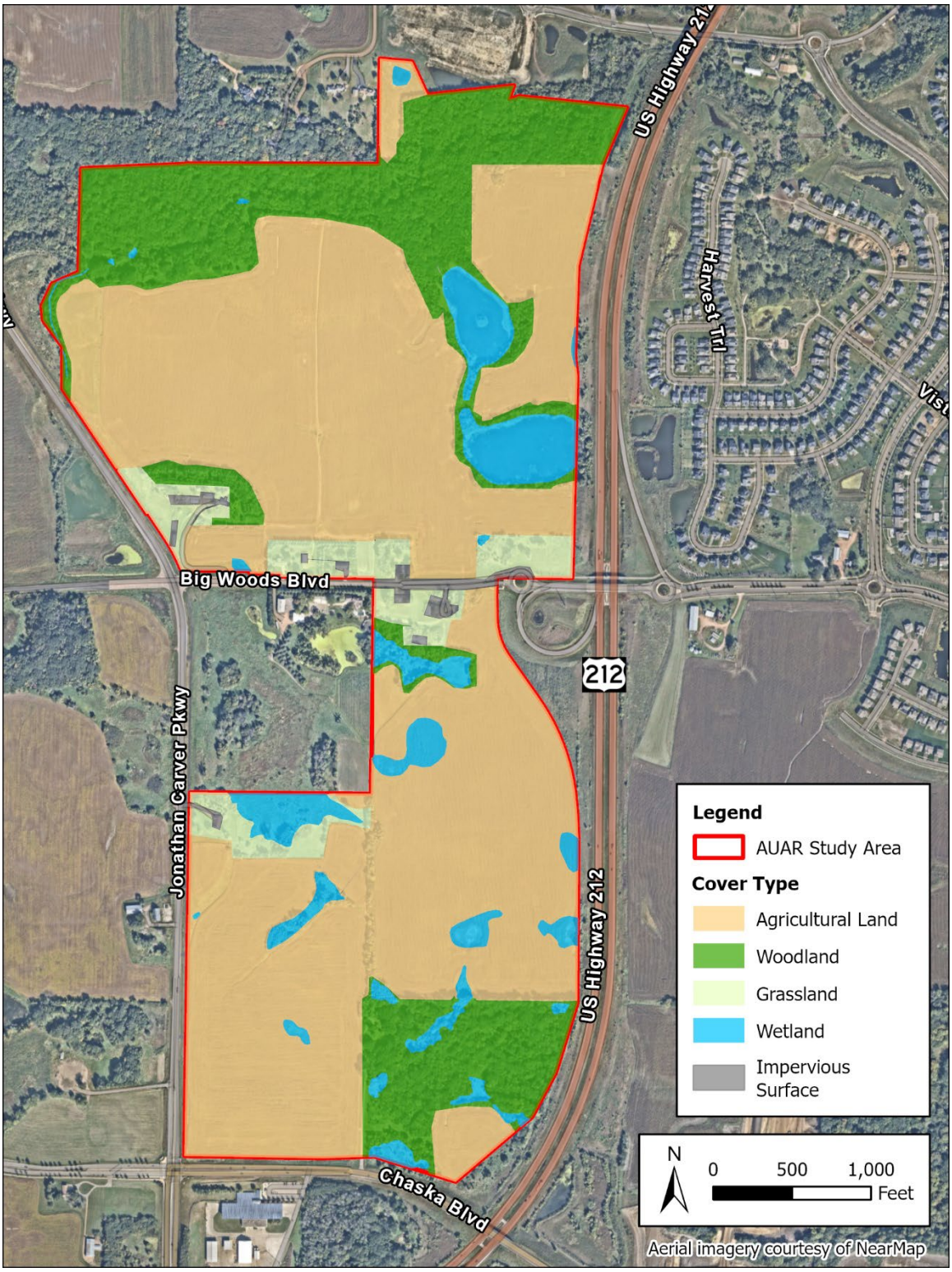
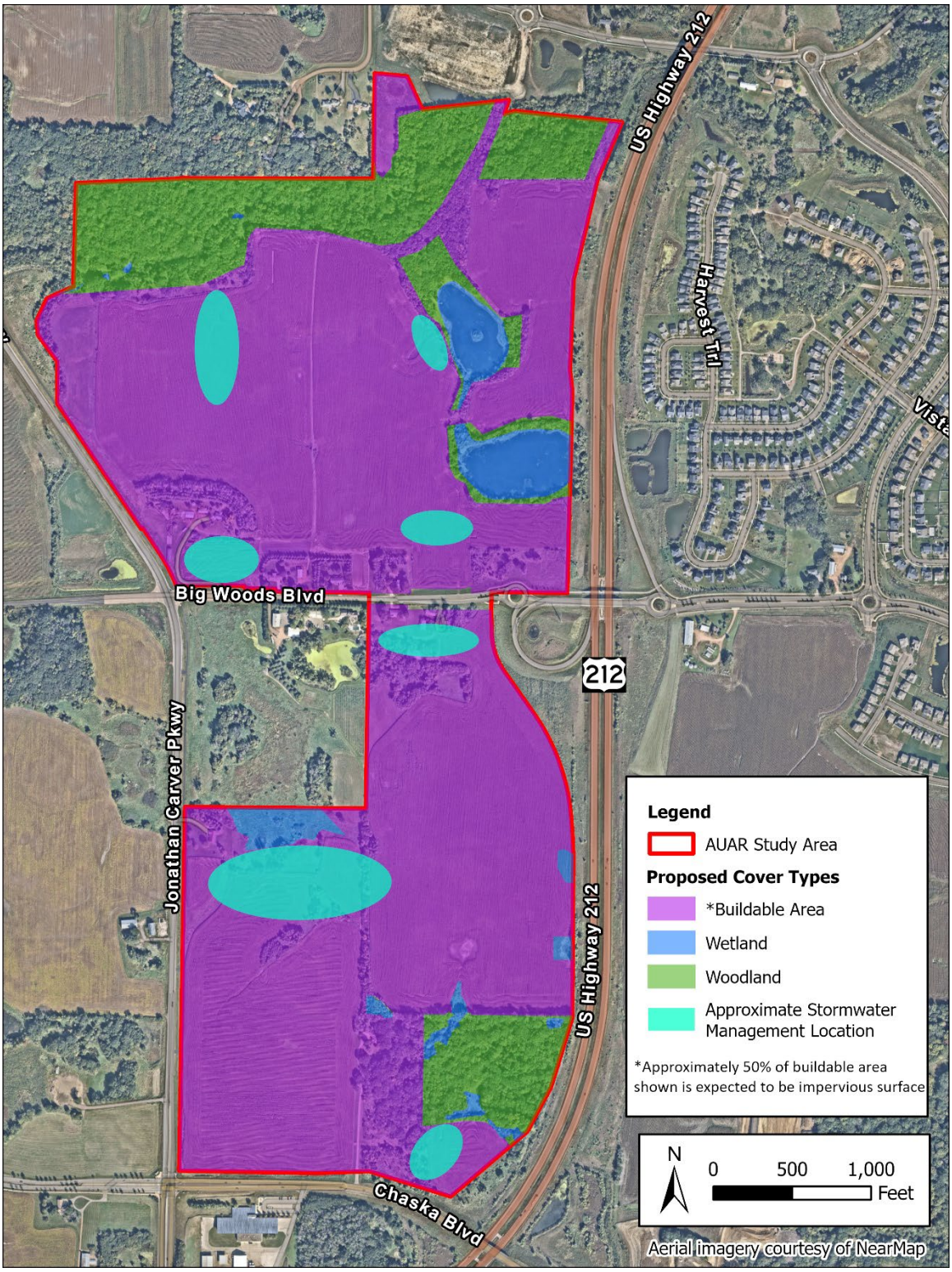


**Figure 7: Proposed Cover Types**



## 9. PERMITS AND APPROVALS REQUIRED

*AUAR Guidance: A listing of major approvals (including any comprehensive plan amendments and zoning amendments) and public financial assistance and infrastructure likely to be required by the anticipated types of development projects should be given for each major development scenario. This list will help orient reviewers to the framework that will protect environmental resources. The list can also serve as a starting point for the development of the implementation aspects of the mitigation plan to be developed as part of the AUAR.*

**Table 6: Anticipated Permits and Approvals**

| Unit of Government | Type of Application | Status |
|---|---|---|
| **Federal** | | |
| US Army Corps of Engineers | Section 404 Permit | To be applied for, if applicable |
| **State** | | |
| Minnesota Pollution Control Agency | Section 401 Water Quality Certification | To be applied for, if applicable |
| | National Pollutant Discharge Elimination System (NPDES) Stormwater Permit for Construction Activities | To be applied for, if applicable |
| | Sanitary Sewer Extension Permit | To be applied for, if applicable |
| | Construction Contingency Plan and Response Action Plan approval | To be applied for, if applicable |
| Minnesota Department of Natural Resources | Temporary Groundwater Appropriation Permit for Construction Dewatering | To be applied for, if applicable |
| | Utility Crossing License | To be applied for, if applicable |
| | Public Waters Permit | To be applied for, if applicable |
| Minnesota Department of Health | Water Main Installation Permit | To be applied for, if applicable |
| Minnesota Department of Transportation | Miscellaneous Work on Trunk Highway Right of Way | To be applied for, if applicable |
| | Drainage Permit | To be applied for, if applicable |
| **Regional** | | |
| Metropolitan Council | Sewer Connection/Extension Permit | To be applied for, if applicable |
| | Comprehensive Plan Amendment | To be applied for, if applicable |
| | Establish Metropolitan Urban Service Area (MUSA) staging | To be applied for, if applicable |

| Unit of Government | Type of Application | Status |
|---|---|---|
| **County** | | |
| Carver County | Application for Water Management Rules Conformance and Approval | To be applied for, if applicable |
| | County Right of Way Permit | To be applied for, if applicable |
| **City** | | |
| City of Chaska | Concept/Preliminary/Final Plat | To be applied for, if applicable |
| | Zoning | To be applied for, if applicable |
| | Comprehensive Plan Amendment | To be applied for, if applicable |
| | Road, Sewer, and Water Feasibility Study | To be applied for, if applicable |
| | Grading Permit | To be applied for, if applicable |
| | Development Agreement | To be applied for, if applicable |
| | Completion of the Orderly Annexation Process with Dahlgren Township | To be completed |
| | Land Use/Development Application | To be applied for, if applicable |
| | Building Permit | To be applied for, if applicable |
| | Demolition Permit | To be applied for, if applicable |
| | AUAR Approval | In process |

*Note: Coordination with Minnesota Valley Electric Cooperative (MVEC) will continue as design advances, and future permitting/approvals may be required.

## 10. LAND USE

### a. Describe:

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

The AUAR study area is located in a rural area in the southwest corner of Chaska, Minnesota. It includes two parcels within Dahlgren Township (west of Chaska) and 15 existing parcels within Chaska. The parcels within Dahlgren Township are under an Orderly Annexation Agreement between the City of Chaska and Dahlgren Township.

According to data from the City of Chaska, the Metropolitan Council[10] and aerial imagery, the majority of the study area is currently used as agricultural land, with some areas of undeveloped land and single family residential (see Figure 8). Land uses adjacent to the study area include agricultural land and single-family residential use.

There is one recreational feature, the Southwest Regional Trail, in the vicinity of the AUAR study area. An existing segment of the Southwest Regional Trail is approximately 500 feet north of the AUAR study area, at the intersection of Creek Road/County Road 10 and Chaska Creek Boulevard.

According to the Natural Resources Conservation Service (NRCS) data, 24.1% of the study area is considered farmland of statewide importance (see Table 9 for more information).

### 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.

*Chaska 2040 Comprehensive Plan*

The *Chaska 2040 Comprehensive Plan*[11] acts as a framework and guiding tool for development for the next 20 years in Chaska. According to this plan, the study area is designated mostly as Business Park, with some Rural Residential and Open Space uses (see Figure 10). See Table 7 for a description of this land use designation and allowed uses.

**Table 7: Chaska 2040 Comprehensive Plan designations within the AUAR Study Area**

| Future Land Use Designation | Purpose |
|---|---|
| Business Park | Areas guided for the integration of office and light industrial uses in order to create employment centers on large sites that provide a greater diversity of jobs, higher development densities and jobs per acre, higher quality site and architectural design, and increased tax revenues. Office, office-showroom-warehousing, research and development services, high-tech electronic manufacturing, medical, and lodging are typical business uses appropriate for this land use category. Supporting retail and services, such as healthcare, fitness, child daycare, dry cleaning, bank, coffee shop, restaurant, and convenience store, should only be allowed as secondary uses, provided no more than 10 percent of the overall business park area is used for these purposes. |

[10] Metropolitan Council. *Regional Planned Land Use - Twin Cities Metropolitan Area*. April 2023. Available at https://metrocouncil.org/Data-and-Maps/Research-and-Data/Metadata/Landuse-Planned-Research.aspx

[11] City of Chaska, MN. *2040 Comprehensive Plan*. Available at https://www.chaskamn.gov/605/2040-Comprehensive-Plan

| Future Land Use Designation | Purpose |
|---|---|
| Rural Residential | Lots or parcels of five (5) acres or more guided for rural single-family detached dwellings at four dwelling units per 1/4 1/4 section (40 acres). This land use category is intended to ensure preservation of land identified as part of Chaska's Greenbelt. The objective of the Greenbelt is to physically separate Chaska from adjacent communities to preserve and strengthen Chaska's sense of community and identity. The buffer areas proposed in the development scenarios are consistent with this greenbelt concept and would create a natural open space separating the business park from other land uses. |
| Open Space Preservation | Land guided for open space preservation, including environmental protection, historic preservation, homeowners' association recreation (e.g. Jonathan), public/semi-public use or other public purposes, and for which development is prohibited through ownership, ordinances or other legal means. |

### *Carver County 2040 Comprehensive Plan*

A small portion of the AUAR study area includes land in Dahlgren Township (under Carver County's land use authority). This area is identified in the Carver County 2040 Comprehensive Plan[12] as a future growth area for the City of Chaska. It is also designated as a Transition Overlay District under the Carver County Land Use Map and Zoning Code.

### *Southwest Chaska Growth and Development Plan*

The Southwest Chaska Growth and Development Plan,[13] adopted in January 2013, provides the City with a guide for future land use decision-making, public infrastructure investments, and review of proposed development projects in the southwest growth area. This plan was developed with substantial public involvement from many stakeholders. The AUAR study area occupies the western portion of the area studied by this plan. The plan identifies the majority of the study area as Business Park use, with some areas of open space. These open space areas include portions of the Chaska Greenbelt.

### *Carver County WMO 2020-2029 Watershed Management Plan*

The Carver County Water Management Organization (CCWMO) 2020-2029 Watershed Management Plan is used to fulfill the County's water management responsibilities and provide a framework for water resource management.[14] This plan identifies several water resource features within the AUAR study area including a Priority 1 Stream within

[12] Carver County. 2040 Comprehensive Plan. Available at https://www.carvercountymn.gov/departments/public-services/planning-water-management/planning/plans/2040-comprehensive-plan
[13] City of Chaska, MN. *Southwest Chaska Plan*. Available at https://chaskamn.gov/182/Southwest-Chaska-Plan
[14] Carver County Water Management Organization. *2020-2029 Watershed Management Plan*. Available at: https://www.carvercountymn.gov/home/showpublisheddocument/27334/638762654895100000

the AUAR study area, which is a tributary of the Chaska Creek. Priority 1 waterbodies are considered current priority for implementation of projects.

*Carver County Southwest Regional Trail Plan*

The Carver County Southwest Regional Trail Plan[15] shows a trail segment from Engler Blvd to an existing segment along Creek Road. This segment of the trail was constructed in 2023.

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

*AUAR Guidance: Water-related land use management districts should be delineated on appropriate maps, and the land use restrictions applicable in those districts should be described. If any variances or deviations from these restrictions within the AUAR area are envisioned, this should be discussed.*

*Existing Zoning*

The parcels within the study area within the current city limits are mostly zoned as rural residential (RR), as shown in Figure 9. According to Chaska's City Code, the RR zoning regulation permits uses of agriculture, forestry, single family dwellings, parks, and state-licensed residential facilities. Additionally, there are two location-based distinctions in the RR districts: RR1 and RR2. RR1 applies to land located within the west and north central portion of Chaska which in the future may gradually be required for expansion for residential uses as residential facilities and services become available. RR2 is intended for application to land located at the edge of Chaska's corporate limits where a "green belt" separation from adjacent communities is desired. The district is intended to help preserve Chaska's identity as a separate free-standing community as urban expansion of the Twin Cities metropolitan area occurs around Chaska.

The parcels currently within Dahlgren Township are zoned as Transition Area Overlay District according to Carver County Zoning.

*FEMA National Flood Hazard*

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (panel number 27019C0217D, effective 12/21/2018), the majority of the AUAR study area is located in an area of minimal flood hazard. The northern portion of the study area contains a 100-year floodplain (Zone A) along the tributary of the Chaska Creek (see Figure 13).

*Other Special Districts and Zoning Overlays*

The unnamed DNR Public Watercourse (M-055-020-001), a tributary of the Chaska Creek, is identified in the City of Chaska's Shoreland Management ordinance and therefore, future development in this area will need to comply with the shoreland

[15] Carver County, MN. *Carver County Southwest Regional Trail Plan*. Available at: https://www.carvercountymn.gov/departments/public-works/parks-recreation/parks-trails/regional-trails

overlay district requirements. According to the City's zoning code, permitted uses within a Shoreland Overlay District include "all permitted uses allowed and regulated by the applicable zoning district underlying this shoreland overlay district as indicated on the Official Zoning Map of the City."[16] Development standards applicable to the study area (effective 2/27/2023) are described in Table 8.

**Table 8: Standards Applicable to Shorelands of Tributary Watercourses**

| Unsewered Areas | |
|---|---|
| Lot Area (in square feet) | None |
| Water frontage and lot width at building line (in feet) | 100 |
| Structure setback from Ordinary High Water Mark (in feet) | 100 |
| Structure setback from roads and highways | 50: Federal State, or county<br>30: Municipal or Private |
| Structure height limitation (in feet) | None |
| Maximum lot area covered by impervious surface (in %) | None |
| Sewage system setback from Ordinary High Water Mark (in feet) | 75 |
| **Sewered Areas** | |
| Lot Area (in square feet)<br>Water front lots<br>Other lots | None |
| Water frontage and lot width at building line (in feet) | 75 |
| Structure setback from Ordinary High Water Mark (in feet) | 50 |

**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 development scenarios. No hazardous materials are proposed to be stored in floodplain areas.

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

[16] City of Chaska. *Zoning Code*. Available at https://chaska.municipalcodeonline.com/book?type=zoning#name=15.24_Shoreland_Management

*AUAR Guidance: The extent of conversion of existing farmlands anticipated in the AUAR should be described. If any farmland will be preserved by special protection programs, this should be discussed.*

*If development of the AUAR will interfere or change the use of any existing designated parks, recreation areas, or trails, this should be described in the AUAR. The RGU may also want to discuss under this item any proposed parks, recreation areas, or trails to be developed in conjunction with development of the AUAR area.*

*The AUAR must include a statement of certification from the RGU that its comprehensive plan complies with the requirements set out at Minnesota Rules, part 4410.3610, subpart 1. The AUAR document should discuss the proposed AUAR area development in the context of the comprehensive plan. If this has not been done as part of the responses to Items 6, 9, 11, 18, and others, it must be addressed here; a brief synopsis should be presented here if the material has been presented in detail under other items. Necessary amendments to comprehensive plan elements to allow for the development scenario should be noted. If there are any management plans of any other local, state, or federal agencies applicable to the AUAR area, the document must discuss the compatibility of the plan with the development scenario studied, with emphasis on any incompatible elements.*

The existing land within the City of Chaska is expected to transition to different land uses as the city develops. Any new development, redevelopment, change in land use, or change in zoning is required to be consistent with the Comprehensive Plan. The scenarios are generally consistent with the proposed land uses allowed under the City of Chaska 2040 Comprehensive Plan, with the exception of the areas of the Chaska Green Belt that will be developed in accordance with the greenbelt policies within the Comprehensive Plan. Additionally, the two Dahlgren Township parcels within the study area will need to be annexed into the City. The City has certified that the updated Comprehensive Plan complies with the requirements set forth in Minnesota Rules, part 4410.3610, subpart 1. For these parcels, both scenarios will require annexation, preliminary and final plats, and rezoning.

As discussed in item 10.a. above, an existing segment of the Southwest Regional Trail is approximately 500 feet north of the AUAR study area, at the intersection of Creek Road/County Road 10 and Chaska Creek Boulevard. The City intends to promote connections to nearby trails (including the Southwest Regional Trail) and foster pedestrian connections within the overall business park area.

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

An amendment to the 2040 Comprehensive Plan would be needed for both scenarios to accommodate development within the Chaska Green Belt and to incorporate the Dahlgren Township parcels that will be annexed. The City would advance a comprehensive plan amendment to also establish MUSA staging for this area prior to development occurring. Additionally, both scenarios would require a zoning change to Business Park use.

**Figure 8: Existing Land Use**

**Figure 9: Existing Zoning**

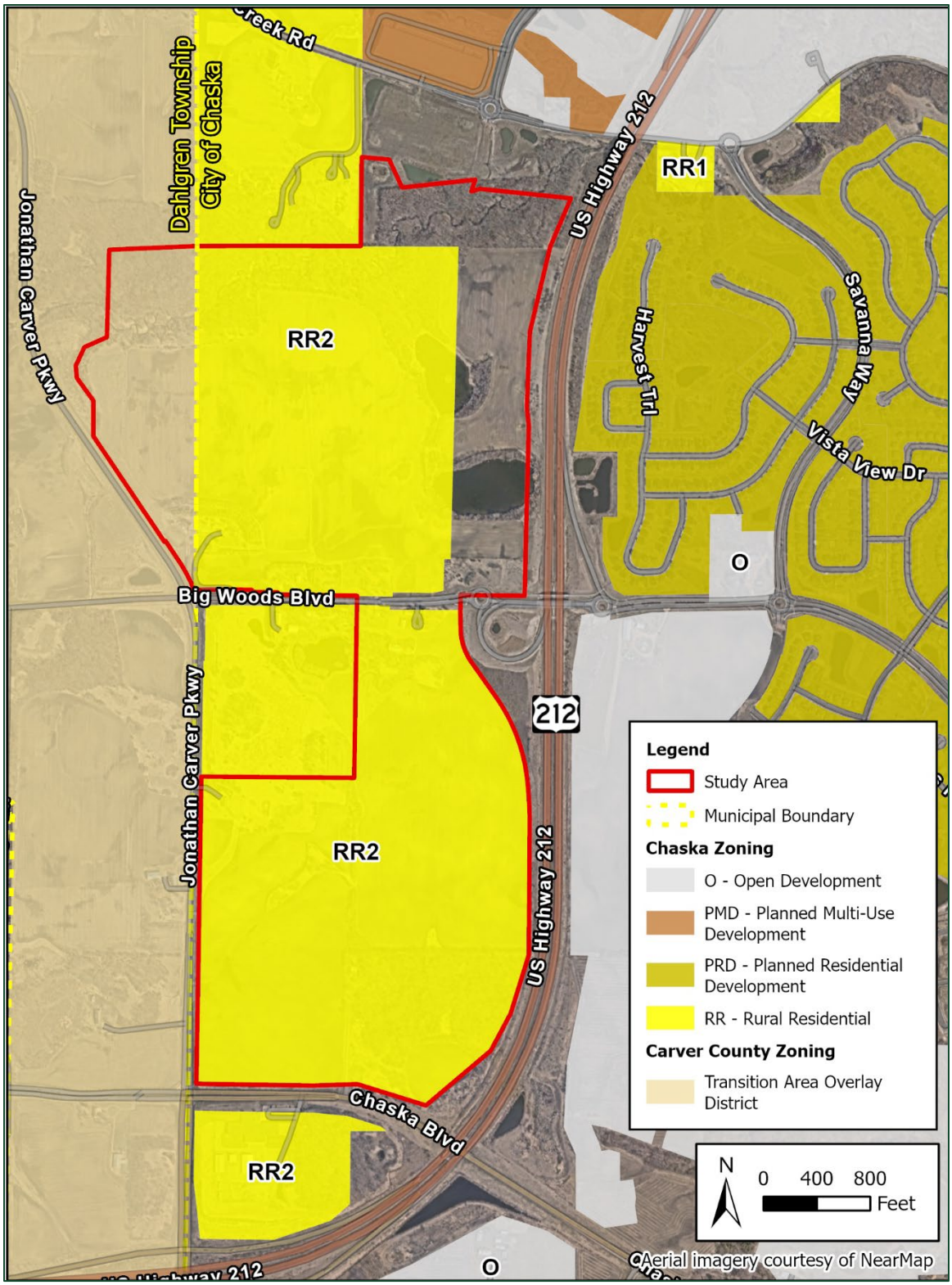
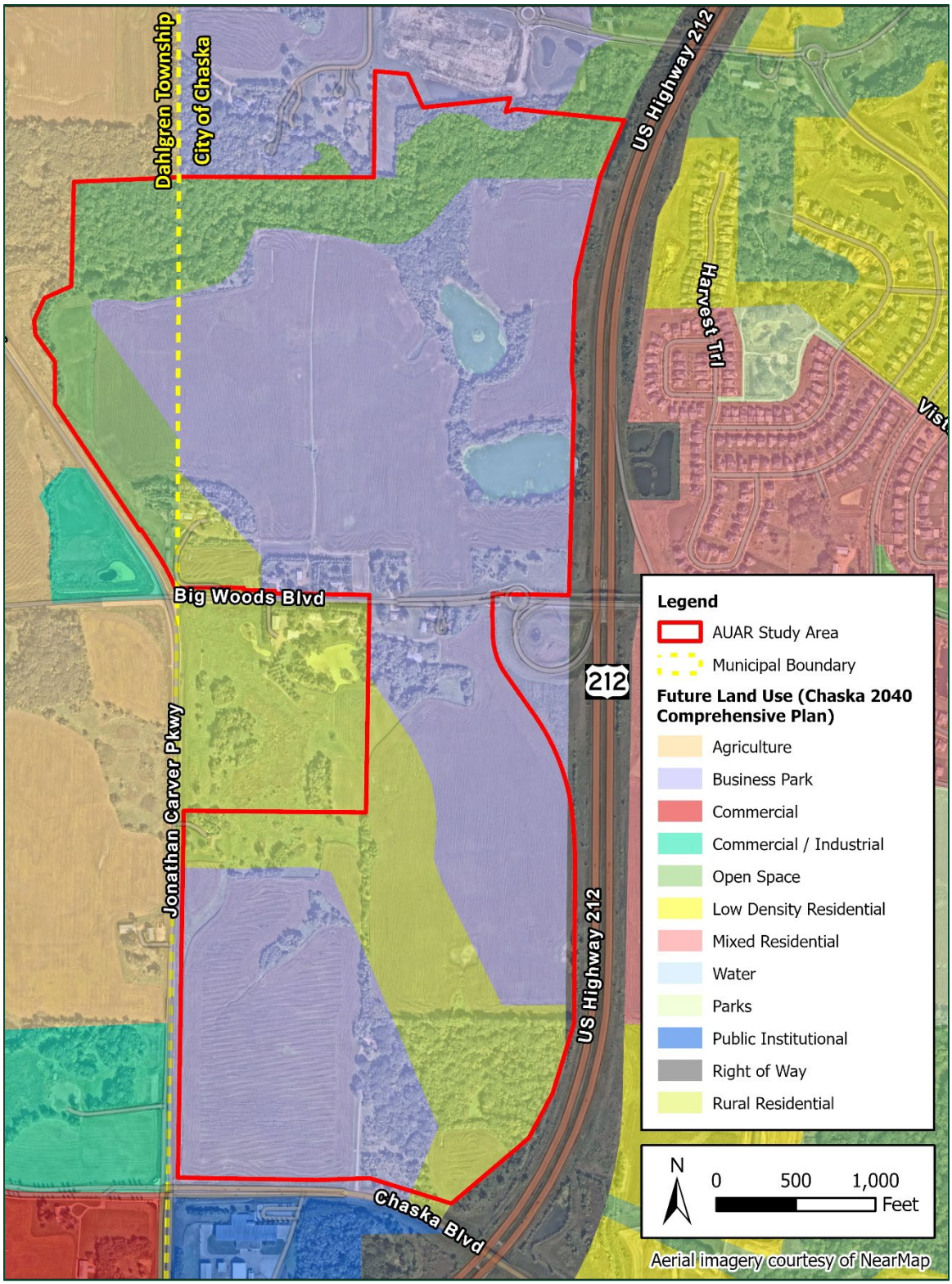


**Figure 10: Future Land Use**



## 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.**

*AUAR Guidance: A map should be included to show any groundwater hazards identified.*

According to the Geologic Atlas of Carver County[17] (Minnesota Geological Survey, 2020), the AUAR study area is underlain by sand, gravel, and glacial till. The mean depth to bedrock is approximately 300-400 feet below ground surface. Bedrock is predominantly sandstone. In descending order, the upper formations are the Jordan Sandstone, and the St. Lawrence and Lone Rock formations.

There are no known sinkholes, shallow limestone formations, or unconfined/shallow aquifers located within the AUAR study area. There are no known karst conditions located within the study area or within 500 feet from the study area.

**b. Soils and Topography – Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability, or other 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 11.b.ii.**

*AUAR Guidance: The number of acres to be graded and number of cubic yards of soil to be moved need not be given; instead, a general discussion of the likely earthmoving needs for development of the area should be given, with an emphasis on unusual or problem areas. In discussing mitigation measures, both the standard requirements of the local ordinances and any special measures that would be added for AUAR purposes should be included. A standard soils map for the area should be included.*

According to the Natural Resources Conservation Service (NRCS) Web Soil Survey, the area is comprised of 19 different soil types. Soil information is included in Table 9 and Figure 11. The erosion hazard rating included in Table 9 indicates the hazard of soil loss from off-road areas after the soil surface is exposed from disturbance activities. Within the study area,

[17] University of Minnesota Twin Cities University Digital Conservancy. *Geologic atlas of Carver County, Minnesota*. Available at: https://conservancy.umn.edu/items/f656ce2c-f888-41ab-94fc-2f70cf00e066

approximately 33% of the soil surface is mapped with a “moderate” or “severe” erosion rating, indicating that some erosion is likely in these areas and that erosion control measures may be needed. The remaining 67% of the study area was not rated or was mapped with a “slight” rating, meaning that erosion is unlikely under ordinary climatic conditions.

The topography within the northern portion of the study area varies from 942 feet in elevation at the north center of the study area to 894 feet in elevation along the stream that runs along the northern side. The northern portion of the study area features various lowland areas as well as multiple bodies of water. All drainage generally flows towards these bodies of water or lowland areas. The topography within the southern portion of the study area varies from 970 feet in elevation at the south center of the site to 914 feet at the northwest area. The southern portion of the study area contains various lowland and wetland areas within its boundary. All drainage generally flows towards these lowland or wetland areas.

Desktop review and planning efforts for mass grading have been completed for the northern portion of the AUAR study area to prepare for the development of buildings, roadways, stormwater, public improvements, and landscaping. This grading is anticipated to require approximately 600,000 cubic yards of cut and 700,000 cubic yards of fill. Similar activities will take place within the southern portion of the study area. This will require standard earthmoving equipment. Where appropriate, slope stabilization will be provided by means of vegetation establishment, erosion control blankets, or other standard methods of erosion and sediment control.

A National Pollutant Discharge Elimination System (NPDES) and Stormwater Pollution Prevention Program Construction Stormwater Permit (SWPPP) will be obtained prior to any earthwork or grading activities within the AUAR study area.

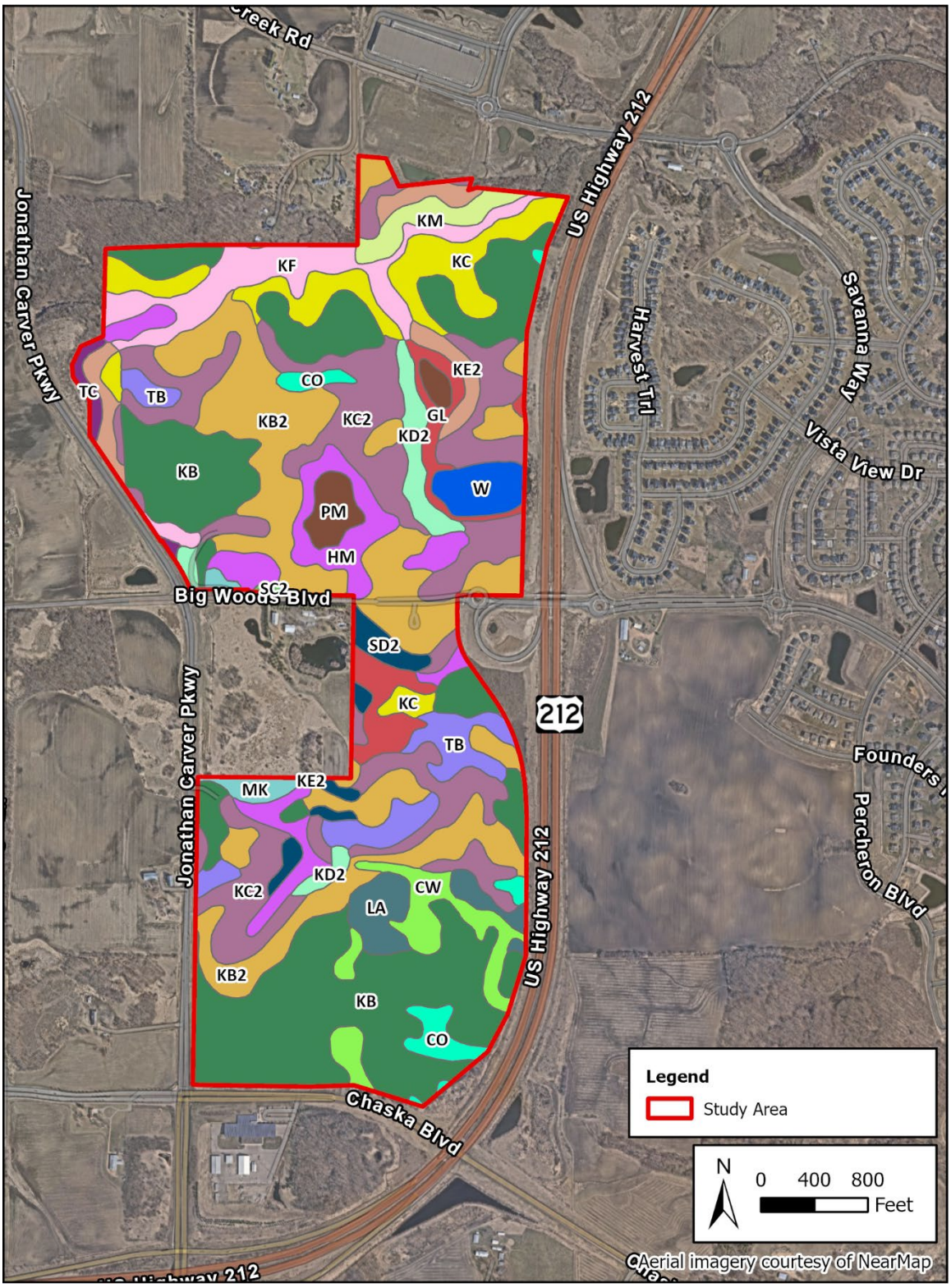
Operational activities from future development are not expected to have an impact on soils within the study area.

**Table 9: Soil Types**

| Map unit symbol | Map unit name | Acres in Study Area | Percent of Study Area | Farmland Rating | Erosion Hazard Rating |
|---|---|---|---|---|---|
| CO | Cordova clay loam, 0 to 2 percent slopes | 5.9 | 1.6% | Prime farmland if drained | Slight |
| CW | Cordova-Webster complex | 10.9 | 3.0% | Prime farmland if drained | Slight |
| GL | Glencoe clay loam, 0 to 1 percent slopes | 10.4 | 2.9% | Prime farmland if drained | Slight |
| HM | Hamel loam, 0 to 2 percent slopes | 19.5 | 5.4% | Prime farmland if drained | Slight |
| KB | Kilkenny-Lester loams, 2 to 6 percent slopes | 91.6 | 25.5% | All areas are prime farmland | Slight |

| Map unit symbol | Map unit name | Acres in Study Area | Percent of Study Area | Farmland Rating | Erosion Hazard Rating |
|---|---|---|---|---|---|
| KB2 | Lester-Kilkenny loams, 2 to 6 percent slopes, eroded | 62.9 | 17.5% | All areas are prime farmland | Slight |
| KC | Lester-Kilkenny loams, 6 to 12 percent slopes | 20.6 | 5.7% | Farmland of statewide importance | Moderate |
| KC2 | Lester-Kilkenny complex, 6 to 10 percent slopes, moderately eroded | 58.5 | 16.3% | Farmland of statewide importance | Moderate |
| KD2 | Lester-Kilkenny complex, 10 to 16 percent slopes, moderately eroded | 7.4 | 2.1% | Not prime farmland | Moderate |
| KE2 | Lester-Kilkenny complex, 16 to 22 percent slopes | 8.3 | 2.3% | Not prime farmland | Moderate |
| KF | Lester-Kilkenny complex, 22 to 40 percent slopes | 17.3 | 4.8% | Not prime farmland | Severe |
| KM | Minneiska-Kalmarville complex, frequently flooded | 5 | 1.4% | Not prime farmland | Slight |
| LA | Le Sueur-Lester complex, 1 to 6 percent slopes | 7.3 | 2.0% | All areas are prime farmland | Slight |
| MK | Muskego and Houghton soils, 0 to 1 percent slopes | 2.9 | 0.8% | Not prime farmland | Slight |
| PM | Klossner muck, 0 to 1 percent slopes | 5.2 | 1.4% | Farmland of statewide importance | Slight |
| SC2 | Lester-Storden complex, 6 to 10 percent slopes, moderately eroded | 0.4 | 0.1% | Farmland of statewide importance | Moderate |
| SD2 | Lester-Storden complex, 10 to 16 percent slopes, moderately eroded | 5.5 | 1.5% | Not prime farmland | Moderate |
| TB | Terril loam, 2 to 6 percent slopes | 12.5 | 3.5% | All areas are prime farmland | Slight |
| TC | Terril loam, 6 to 12 percent slopes | 1.8 | 0.5% | Farmland of statewide importance | Moderate |
| W | Water | 5.4 | 1.5% | Not prime farmland | Not rated |
| Total | | **359.3** | **100%** | | |

**Figure 11: Soil Types**



## 12. WATER RESOURCES

*AUAR Guidance: The information called for on the EAW form should be supplied for any of the infrastructure associated with the AUAR development scenario, and for any development expected to physically impact any water resources. Where it is uncertain whether water resources will be impacted depending on the exact design of future development, the AUAR should cover the possible impacts through a "worst case scenario" or else prevent impacts through the provisions of the mitigation plan.*

**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, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include water quality impairments or special designations listed on the current MPCA 303d Impaired Waters List that are within one mile of the project. Include DNR Public Waters Inventory number(s), if any.**

Kimley-Horn completed a level 2 wetland delineation for the southern portion of the AUAR study area in September 2024 and received a Notice of Decision (NOD) from the city approving these boundaries in June 2025. The city also supplied two 2022 NODs for parcels in the northern portion of the study area which were delineated by other professionals. Kimley-Horn delineated wetland boundaries for the remaining parcels in the AUAR study area; however, these boundaries have not been approved by a regulatory agency. There are 27 wetlands mapped within the AUAR study area, see Table 10:  and Figure 12.

Kimley-Horn used the Minnesota Routine Assessment Method Version (MnRAM) 2.0 to classify these wetlands based on the city's Local Surface Water Management Plan (LSWMP).[18] The study area is also within the Carver County WMO. Since the city's wetland buffer rules are more restrictive than the WMO's, and the study area is within the city's LGU jurisdiction, the city's LSWMP rules would be followed. Wetlands were categorized as Unique, Manage 1, Manage 2, or Manage 3. The four classes are based on the wetland floral diversity and integrity combined with wildlife habitat ranks determined from MnRAM. The LSWMP provides permanent buffer zone average width for each of the buffer classifications, see Table 11 and Figure 12. These buffers will consist of natural vegetative ground cover. The developer will need to incorporate these buffers into future site design.

[18] City of Chaska. *Local Surface Water Management Plan*. Available at https://www.chaskamn.gov/DocumentCenter/View/4063/Appendix-GLocal-Surface-Water-Management-Plan-PDF.

**Table 10: Wetland Summary**

| Name | Plant Community | Size (acres) | Classification |
|---|---|---|---|
| Wetland 1 | Wet meadow/shallow marsh | 0.82 | Manage 1 |
| Wetland 2 | Floodplain forest | 0.26 | Unique |
| Wetland 3 | Wet meadow | 0.45 | Unique |
| Wetland 4 | Wet meadow | 0.28 | Manage 3 |
| Wetland 5 | Seasonally flooded basin | 0.31 | Manage 3 |
| Wetland 6 | Floodplain forest | 0.14 | Manage 1 |
| Wetland 7 | Floodplain forest | 0.33 | Manage 1 |
| Wetland 8-1 | Floodplain forest | 0.89 | Manage 1 |
| Wetland 8-2 | Wet meadow | 0.28 | Manage 3 |
| Wetland 9 | Seasonally flooded basin | 0.78 | Manage 3 |
| Wetland 10 | Wet meadow | 0.03 | Manage 3 |
| Wetland 11 | Seasonally flooded basin | 1.07 | Manage 3 |
| Wetland 12 | Wet meadow/floodplain forest | 1.39 | Manage 2 |
| Wetland 13 | Seasonally flooded basin | 0.54 | Manage 3 |
| Wetland 14 | Wet meadow/sedge meadow/shallow marsh | 3.55 | Unique |
| Wetland 15 | Seasonally flooded basin | 2.01 | Manage 3 |
| Wetland 16 | Wet meadow/floodplain forest | 2.1 | Manage 1 |
| Wetland 17 | Shallow marsh | 0.17 | Manage 3 |
| Wetland 18 | Wet meadow | 0.03 | Manage 3 |
| Wetland 19 | Wet meadow | 0.12 | Manage 3 |
| Wetland 20 | Wet meadow | 0.08 | Manage 3 |
| Wetland 21 | Shallow, open water/floodplain forest | 6.35 | Manage 1 |
| Wetland 22 | Shallow, open water/floodplain forest | 4.54 | Manage 1 |
| Wetland 23 | Shrub-carr | 0.11 | Manage 1 |
| Wetland 24 | Floodplain forest | 0.03 | Unique |
| Wetland 25 | Floodplain forest | 0.06 | Unique |
| Wetland 26 | Floodplain forest | 0.05 | Unique |
| Wetland 27 | Shallow marsh | 0.27 | Manage 3 |

**Table 11: Wetland Buffer Standards**

| Classification | Permanent Buffer Zone Average Width (feet) |
|---|---|
| Unique | 75 |

| Classification | Permanent Buffer Zone Average Width (feet) |
|---|---|
| Manage 1 | 50 |
| Manage 2 | 25 |
| Manage 3 | 16 |

One surface water resource was identified within the AUAR study area. An unnamed DNR Public Watercourse (M-055-020-001), a tributary of Chaska Creek, flows east through the northern portion of the study area. As discussed in Item 10: Land Use, this stream is classified as a tributary and requires a 100-foot building setback from its Ordinary High Water Mark (OHWM) according to city zoning code. Figure 12 shows this as a 110-foot buffer as the provided NOD only depicted the stream centerline. The extra 10 feet serves as a conservative estimate of the true 100-foot buffer from the OHWM.

There are two MPCA Section 303(d) Impaired Streams within one mile of the AUAR study area identified using the 2024 Impaired Waters List (as shown in Figure 13). An unnamed stream south of the AUAR study area is impaired due to fecal coliform and a total maximum daily load (TMDL) study for this waterbody has been approved by the US Environmental Protection Agency (EPA). Chaska Creek, located northeast of the study area, is impaired for fish bioassessment and invertebrate bioassessment and there are no TMDLs for those impairments. There are several other streams and flowlines identified within one mile of the study area; most of these features are connected to the stream that flows through the study area. There are no trout streams within one mile of the AUAR study area.

The northern portion of the study area contains a 100-year floodplain (Zone A) along the tributary of the Chaska Creek (Figure 13).

**Figure 12: Aquatic Resources and Buffers**

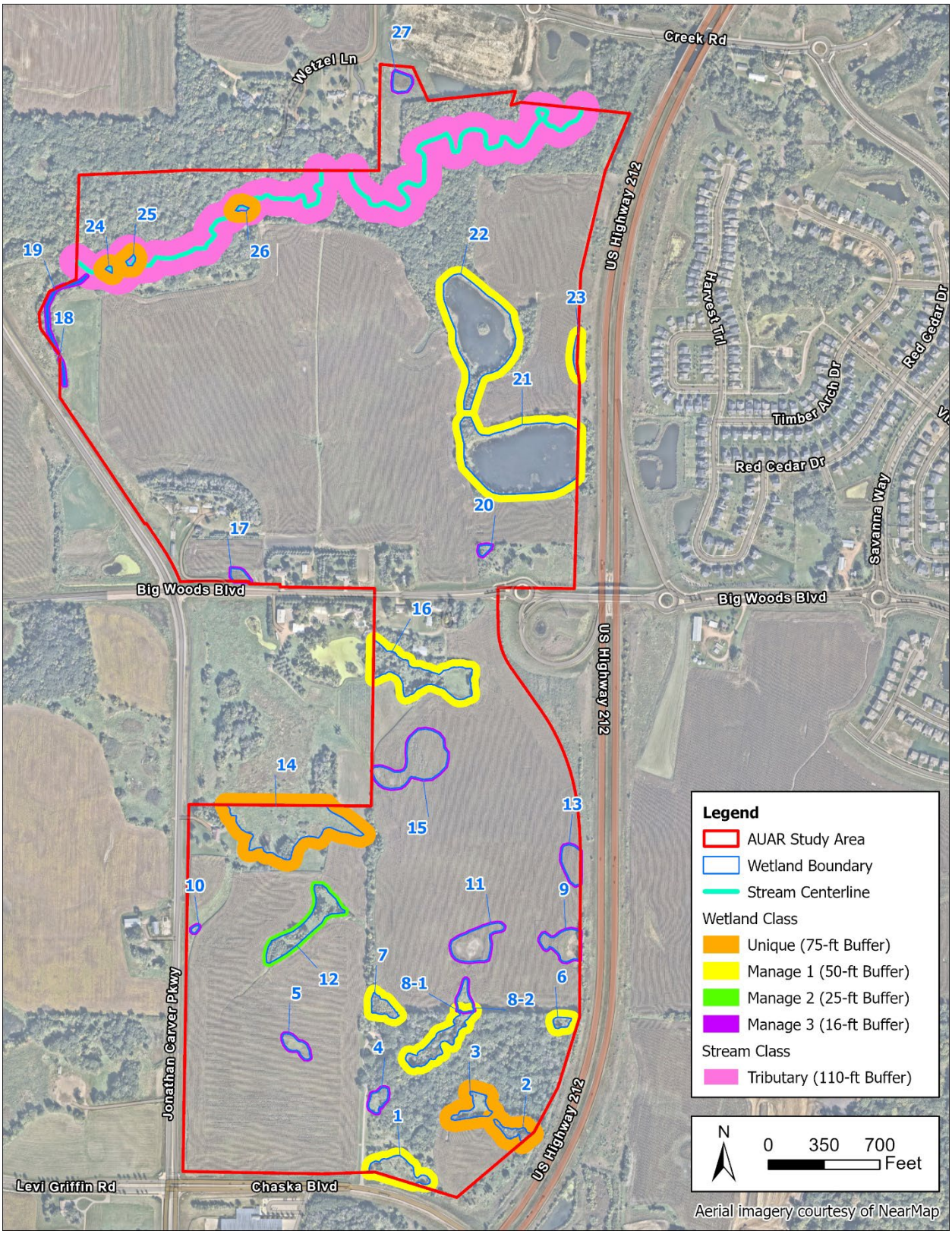
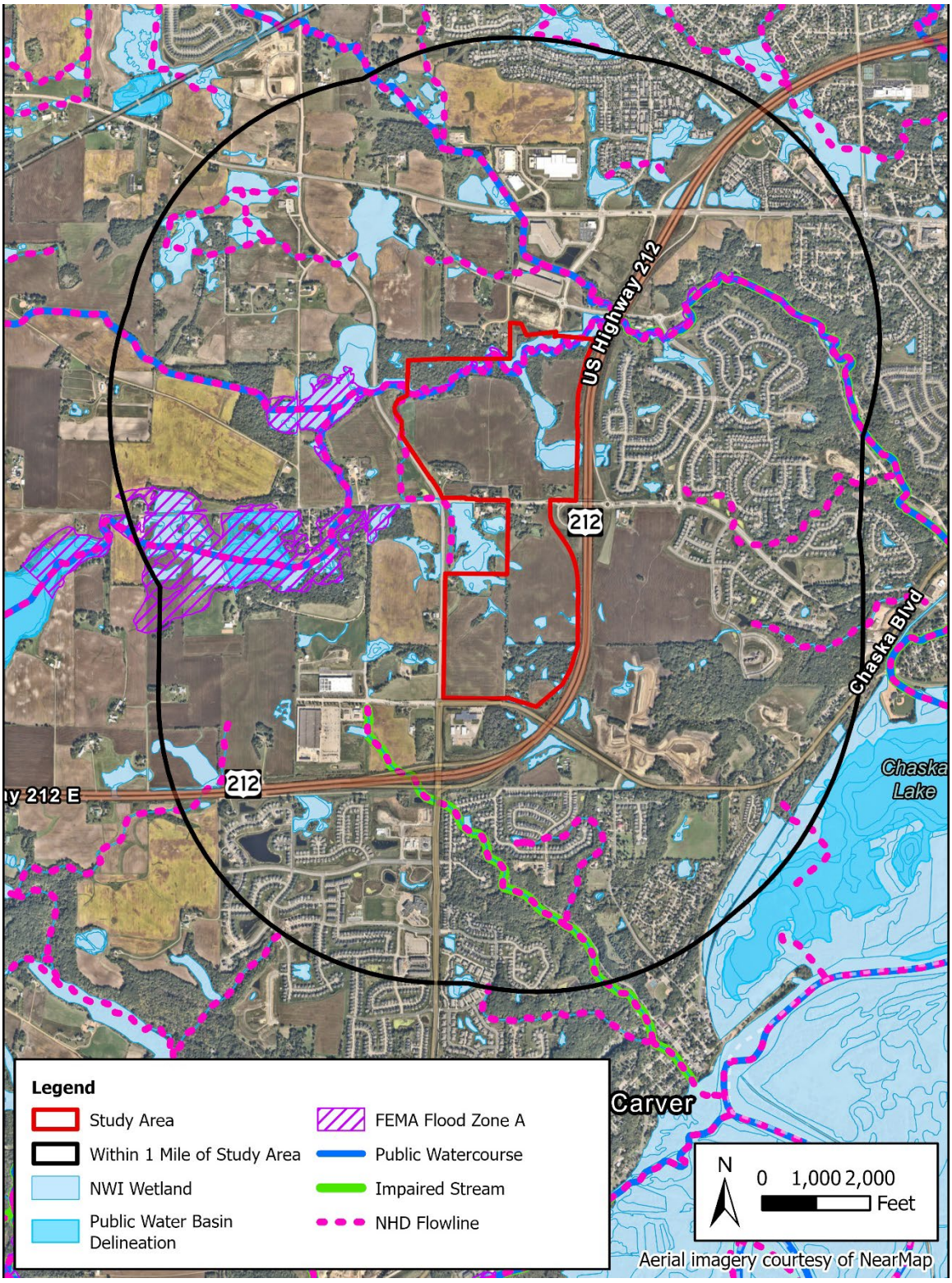


**Figure 13: Surface Water Resources**



**ii. Groundwater – aquifers, springs, and seeps. Include 1) depth to groundwater; 2) if project is within a MDH well 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 Spring Inventory there are no known springs or seeps within the study area.

The Minnesota Hydrogeology Atlas indicates that groundwater is likely present between 10-20 feet below grade, excluding the wetland areas.[19]

Based on the Minnesota Department of Health Minnesota Well Index (MWI), there are 5 wells located within the AUAR study area and five wells within 250 feet of the AUAR study area (see Table 12 and Figure 14).[20] Wells located within the study area would be properly sealed by a licensed well contractor prior to development within the study area per MPCA and MDH well sealing requirements.

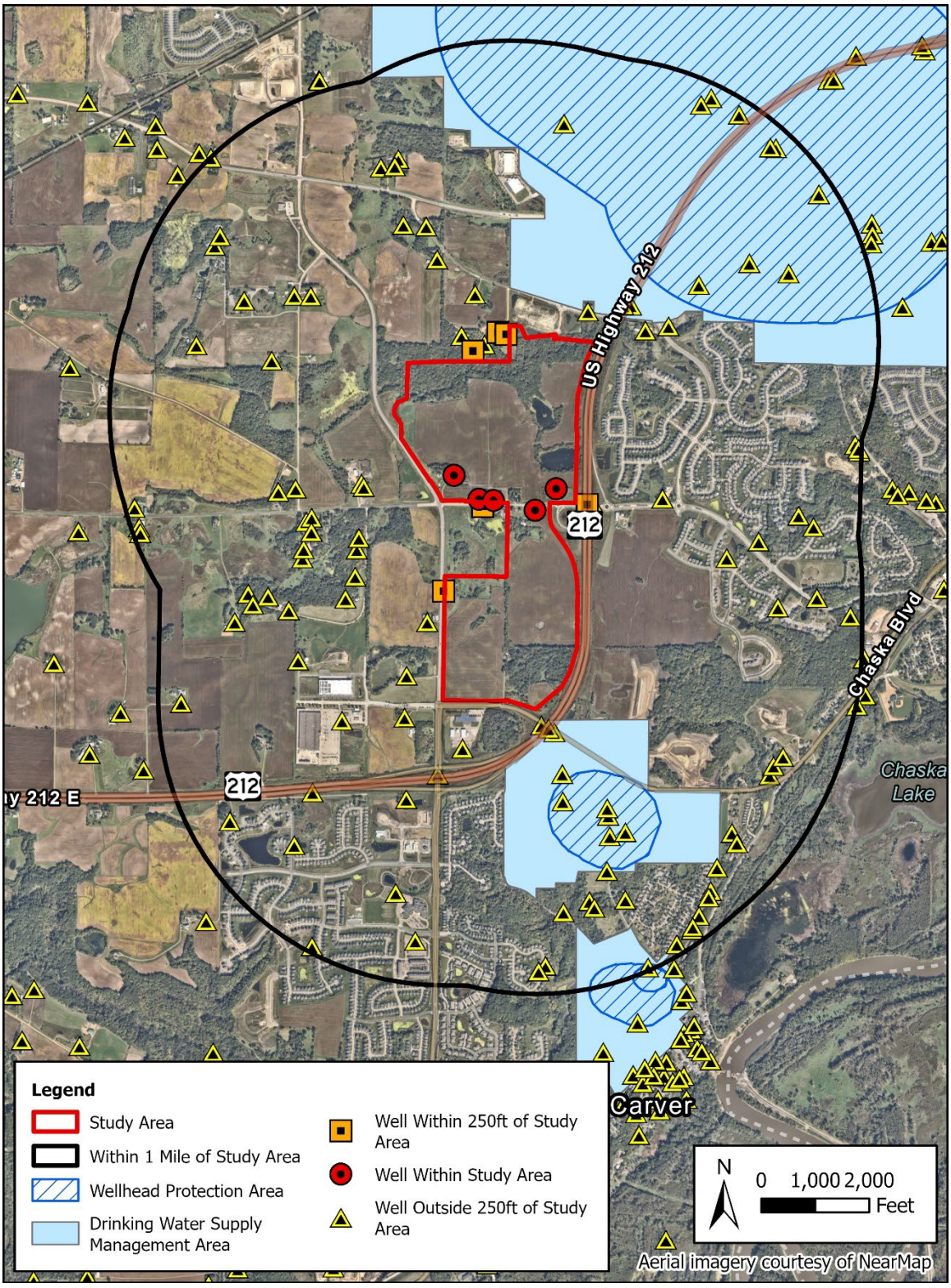
The study area is not located within a wellhead protection area or Drinking Water Supply Management Area (DWSMA). Wellhead protection areas with associated DWSMAs are located approximately 0.1 to 0.3 miles northeast and southeast of the study area.

**Table 12: MWI Wells within the AUAR Study Area**

| Well ID Number | Index Status | Well Use | Well Depth (feet) |
|---|---|---|---|
| 221492 | Active | Domestic | 215 |
| 424015 | Active | Domestic | 211 |
| 481235 | Active | Domestic | 218 |
| 546818 | Active | Domestic | 227 |
| 142819 | Sealed | Domestic | 300 |

[19] Minnesota DNR. *Water-Table Elevation and Depth to Water Table, Minnesota Hydrogeology Atlas series HG-03*. 2016. Available at https://gisdata.mn.gov/dataset/geos-hydrogeology-atlas-hg03.
[20] Minnesota Department of Health. *Minnesota Well Index*. Accessed October 2025. Available at https://mnwellindex.web.health.state.mn.us/.

**Figure 14: Groundwater Resources**



**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.**

*AUAR Guidance: Observe the following points of guidance in an AUAR:*

- *Only domestic wastewater should be considered in an AUAR—industrial wastewater would be coming from industrial uses that are excluded from review through an AUAR process*
- *Wastewater flows should be estimated by land use subareas of the AUAR area; the basis of flow estimates should be explained*
- *The major sewer system features should be shown on a map and the expected flows should be identified*
- *If not explained under Item 6, the expected staging of the sewer system construction should be described*
- *The relationship of the sewer system extension to the RGU's comprehensive sewer plan and (for metro area AUARs) to Metropolitan Council regional systems plans, including MUSA expansions, should be discussed. For non-metro area AUARs, the AUAR must discuss the capacity of the RGU's wastewater treatment system compared to the flows from the AUAR area; any necessary improvements should be described.*
- *If on-site systems will serve part of the AUAR, the guidance in the February 2000 edition of the EAW Guidelines on page 16 regarding item 18b under Residential development should be followed.*

**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.**

Wastewater from the proposed development scenarios will be discharged into the City of Chaska collection system. This will require extending the existing infrastructure from Creek Boulevard to the study area. The extension will need to cross an unnamed creek to provide service. A lift station will need to be constructed to complete this extension. A figure of the City's existing trunk sewer system is included in Appendix E.

The City of Chaska pumps their wastewater to the Blue Lake Water Resource Recovery Facility (WRRF) in Shakopee owned by the Metropolitan Council of Environmental Services (MCES). The Blue Lake WRRF currently treats 27 million gallons per day and has

the capacity to treat the permitted average wet weather design flow of 42 million gallons per day (MGD).

The existing average daily flow of wastewater is 2.67 MGD per the Chaska 2040 Comprehensive Sewer Plan (for 2020). The added wastewater flow from the proposed development was estimated from the proposed acreage of business park land and Table 3.1 of the Chaska 2040 Comprehensive Sewer Plan. Table 3.1 states that business park land use type equates to approximately 1,500 gallons per acre per day. Table 13 below summarizes the proposed approximate added flows from Scenarios 1 and 2.

**Table 13: Wastewater Discharges**

| | Average Daily Flow - MGD |
|---|---|
| Scenario 1 | 0.07 |
| Scenario 2 | 0.11 |

Scenarios 1 and 2 are projected to add 0.07 and 0.11 MGD of wastewater flow (domestic and light industrial) to the system respectively. Thus the Blue Lake WRRF has the capacity to treat the added flow from this development.

**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.**

No subsurface sewage treatment systems (SSTS) are anticipated within the AUAR study area for the proposed development scenario.

**3) If the wastewater discharge is to surface water, identify the wastewater treatment methods, discharge points, and proposed effluent limitations to mitigation impacts. Discuss any effects to surface or groundwater from wastewater discharges.**

No wastewater discharge to surface waters is anticipated for the proposed development scenario.

**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.**

*AUAR Guidance: For an AUAR the following additional guidance should be followed in addition to that in EAW Guidelines:*

- *It is expected that an AUAR will have a detailed analysis of stormwater issues*
- *A map of the proposed stormwater management system and of the water bodies that will receive stormwater should be provided*
- *The description of the stormwater systems would identify on-site and "regional" detention ponding and also indicate whether the various ponds will be new water bodies or converted existing ponds or wetlands. Where on-site ponds will be used but have not yet been designed, the discussion should indicate the design standards that will be followed.*
- *If present in or adjoining the AUAR area, the following types of water bodies must be given special analyses:*
    - *Lakes: Within the Twin Cities metro area, a nutrient budget analysis must be prepared for any "priority lake" identified by the Metropolitan Council. Outside of the metro area, lakes needing a nutrient budget analysis must be determined by consultation with the MPCA and DNR staffs.*
    - *Trout streams: If stormwater discharges will enter or affect a trout stream, an evaluation of the impacts on the chemical composition and temperature regime of the stream and the consequent impacts on the trout population (and other species of concern) must be included.*

### *Environmental Effects*

Stormwater runoff can cause a number of environmental problems. When untreated stormwater drains from manmade locations such as agricultural fields, impervious surfaces, and construction sites, it can carry sediments and/or pollutants that harm aquatic ecosystems and wildlife.

### *Existing Conditions*

There are two primary stormwater discharge points from the study area. Approximately 85% of the study area flows north to an unnamed tributary of Chaska Creek. Much of this area flows through multiple wetland complexes and manmade channels before discharging to the tributary. The remaining 15% of the site flows south through

wetlands and channels to an unnamed tributary of Chaska Lake. Additionally, there are three culverts under US 212 that range in size from 24-42" that water from the study area drains to.

The study area contains a minimal amount of impervious surfaces, which are primarily limited to existing roads and farmsteads. The predominant land use within the area is agricultural, characterized primarily as straight row crops.

### *During Construction*

Prior to construction, a comprehensive Stormwater Pollution Prevention Plan (SWPPP) will be completed before submitting the NPDES permit application and commencing construction. It will detail all planned temporary and permanent BMPs, maintenance schedules, responsible parties, and phasing. During construction, erosion and sediment control best management practices (BMPs) will be implemented to prevent impacts to aquatic ecosystems per the City of Chaska and MPCA MS4 and NPDES Standards. The following design/construction standards are to be adhered to during construction:

- Provide necessary precautions to prevent soil erosion, damage to adjacent property, and control runoff to surface water.
- The erosion and sediment control measures shall be maintained and repaired throughout construction and until such time as the property has been either sodded or a seeded vegetative cover has taken hold.
- Preserve topsoil on the site following the guidelines in CCWMO to preserve the structure of undisturbed soils on site and/or maintain comparable to existing quality and permeability of disturbed soils once mass grading is completed and infrastructure is installed.
- Minimize the need for disturbance of portions of the project with steep slopes. When steep slopes must be disturbed, techniques such as slope draining and terracing should be implemented.
- Exposed soil, including stockpiles, shall be stabilized immediately where activity has permanently or temporarily ceased on any portion of this site and will not resume for a period of time exceeding 7 days.
- The last two hundred (200) linear feet of any drainage ditch or swale must be stabilized within 24 hours after connecting to surface water.
- Temporary rock entrances are required on every construction site and are required after backfilling of foundation.
- Perimeter sediment controls (e.g., silt fence, bio-logs, sediment traps) must be installed down-gradient of all land disturbance before construction begins. Storm

drain inlet protection must be in place for all inlets that could receive runoff from disturbed areas.

- Temporary sedimentation basins must be provided for common drainage areas of 5 or more acres that are to be disturbed at any one time.
- If dewatering is to take place, adequate treatment must be provided so that nuisance conditions will not result from the discharge.

*Post Construction*

Overall impervious surface area is proposed to increase to 130 acres in Scenario 1 and 200 acres in Scenario 2, increasing the runoff rate from existing conditions. To mitigate this, the stormwater basins on-site are proposed to be sized to accommodate runoff from these impervious areas and the outlet control structures designed to discharge at a rate less 0.2 Cubic Feet per Second (cfs) per acre, as required by the City of Chaska. If site constraints inhibit the feasibility of this requirement, these constraints will be well documented in the future Stormwater Management Plan. Under the proposed development, runoff from the impervious areas of the site is proposed to be directed to stormwater management BMPs on-site where the runoff is proposed to be treated according to City of Chaska and CCWMO requirements. Stormwater rates, water quality volume (WQv), and abstraction volumes are all required to follow these standards.

The soils across the AUAR study area primarily consist of hydrologic group C/D and are not suited for infiltration. The size, type, and location of stormwater BMP's will vary throughout the site. Permanent above-ground stormwater management basins are currently proposed for the site. To meet water quality requirements, National Urban Runoff Program (NURP) basins combined with bioretention benches are anticipated to be the most effective and feasible solution. All NURP Basins and bioretention benches will be designed in accordance with the National Urban Runoff Program and CCWMO guidelines. These NURP basins are expected to provide sufficient permanent pool volume, which will facilitate the reuse of stormwater for irrigation of landscaped areas within the property. See Figure 15 for potential stormwater management locations.

Utilizing stormwater reuse is likely the preferred approach to satisfy the volume abstraction requirements set forth by the CCWMO. All stormwater reuse and treatment practices will be designed in accordance with CCWMO guidelines. A more comprehensive and detailed stormwater analysis will be conducted and submitted during subsequent stages of the project design phase.

The CCWMO reviews for potential stormwater-related impacts to upstream and downstream properties. The following requirements will be adhered to:

a. Upstream:

    i. Drainage flowing onto the site from upstream areas must be managed and accommodated. Alterations to flow paths which impound or slow down water

will not be allowed unless it can be shown that the upstream system can accommodate the change.

b. Downstream:

   i. To the greatest extent possible, existing drainage areas and discharge points from the site should be maintained post-development and concentrated flows onto neighboring properties should be avoided or mitigated. The downstream conveyance system (natural or structural) must be able to accommodate, to the nearest major receiving waterbody, increased volumes caused by development.

   ii. If diversions from existing drainage areas and alterations to discharge points are proposed, the responsible party shall provide additional documentation (rates, volumes, velocities, duration of flow, etc.) to demonstrate that the downstream conveyance system can accommodate the change. The party responsible shall provide evidence of easements or other agreements concerning water flow if a plan involves increased impervious or directing concentrated runoff onto a neighboring property.

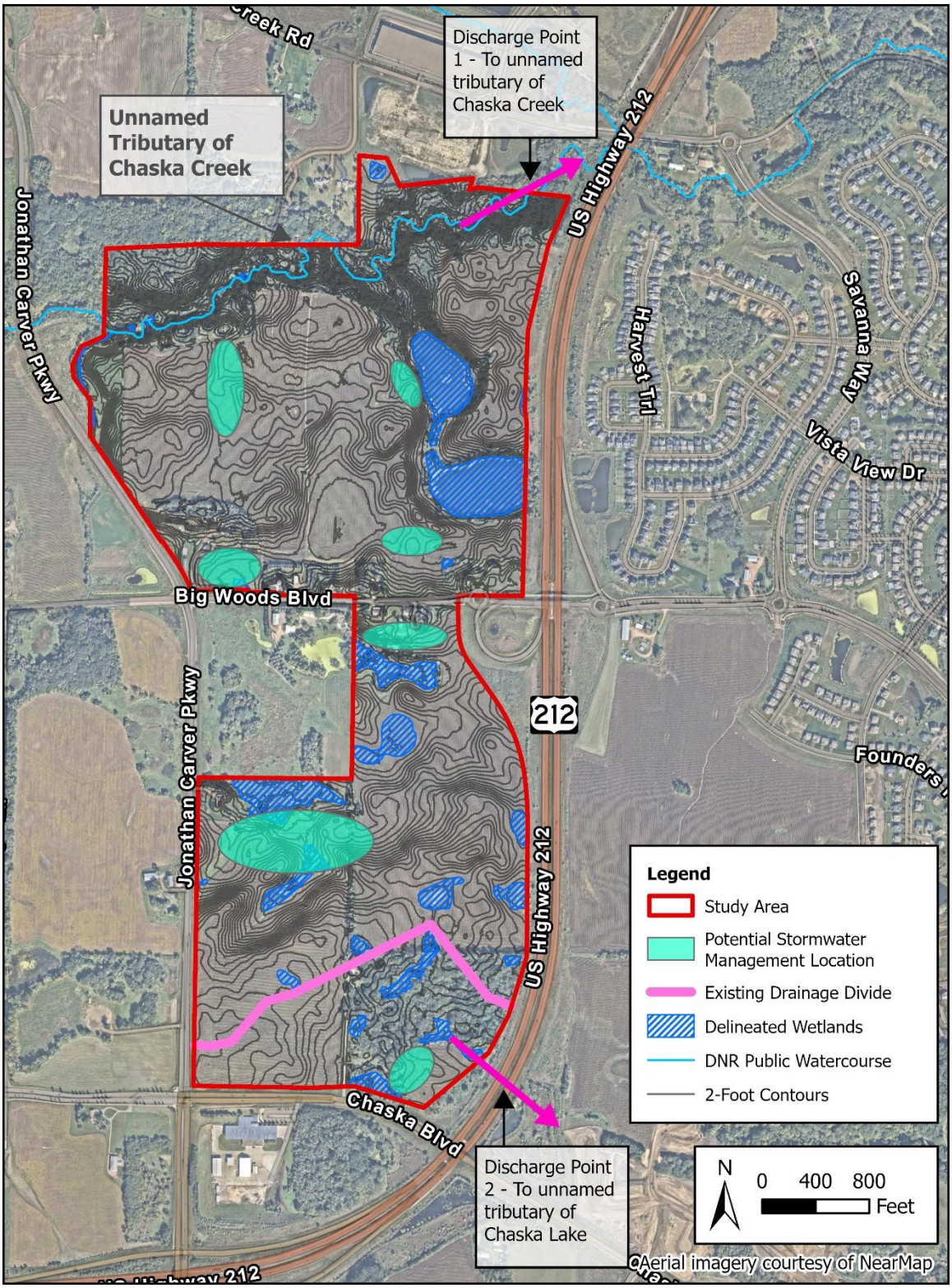
Additionally, the developer will need a MnDOT drainage permit for future development and flow rates to each existing culvert under US 212 must be maintained.

### *Chloride Management*

Both development scenarios would significantly increase the amount of impervious surface within the project area, and consequently the amount of chloride (road salt) used for winter maintenance. Chloride released into local lakes, streams, and groundwater does not break down, and instead accumulates in the environment, potentially reaching levels that are toxic to aquatic wildlife and plants.

The City of Chaska has implemented several policies and measures to reduce overuse of chloride. The City has a 'Winter Road Maintenance Policy' which highlights the impact of chloride on the environment and operators responsibility to properly/responsibly apply chlorides. City plow operators maintain Smart Salting Certification in addition to attending annual internal trainings focusing on proper selection and application of material based on road conditions. The City has also outfitted all plows with sectioned cutting edges on all plow blades to increase snow and ice removal efficiency and decrease reliance on chloride along with routine equipment calibration to ensure accurate application. Additionally, educational information highlighting chloride impacts to the environment and best practices for responsible salt use is distributed to both residents and businesses throughout the winter. As design advances, the project proposer will also use the Minnesota Stormwater Manual for low salt design strategies.

**Figure 15: Potential Stormwater Management Locations**



**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.**

*AUAR Guidance: If the area requires new water supply wells, specific information about that appropriation and its potential impacts on groundwater levels should be given; if groundwater levels would be affected, any impacts resulting on other resources should be addressed.*

A Water Use Appropriations Permit would be required if permanent dewatering is determined to be necessary for construction of development in Scenario 1 and 2. A Water Use Appropriation permit is required for permanent water dewatering and applies to users withdrawing more than 10,000 gallons of water per day or one million gallons per year.

The existing Victoria Drive Water Treatment Plant (WTP) has a capacity of 12.6 million gallons per day (MGD) and the projected 2025 maximum day demand of 9.4 MGD per the Local Water Supply Plan in the Chaska 2040 Comprehensive Plan.

The added water demand from the proposed development was estimated from the wastewater flow as described in Item 12.b.i and the estimated irrigation demand for the lawn and landscaping cover type. Table 14 below summarizes the proposed approximate water demand from Scenarios 1 and 2.

**Table 14: Water Demand**

| | Average Daily Demand - MGD |
|---|---|
| Scenario 1 | 0.08 |
| Scenario 2 | 0.12 |

Scenarios 1 and 2 are projected to add 0.08 and 0.12 MGD of water demand to the system respectively. Thus, the Victoria Drive WTP has the capacity to treat the added demand to this development. The current water system is estimated to be

approximately 75% utilized per the Chaska 2040 Comprehensive plan. The proposed added water demand for each scenario is estimated to increase the percent utilized by less than 1%.

Water supply to the proposed development scenarios will be provided by the City of Chaska water distribution system. This will require extending the existing infrastructure from Creek Boulevard to the study area. The extension will need to cross an unnamed creek (DNR Public Watercourse M-055-020-001) to provide service. Additionally, a water tower or other infrastructure improvements are necessary to ensure adequate flow and pressure for the development.

### 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 wetland impacts listed in Table 3 are based on anticipated worst case development impact; however, these impacts are dependent on final design for either development scenario. Once specific projects are identified, the developer will be required to comply with all federal, state, and local wetland requirements. These requirements include avoiding and minimizing impacts to the extent practicable as well as mitigating any wetland impacts that are unavoidable. If the end user cannot maintain natural surface flow between wetlands, they may need to install pipe connections to maintain hydraulic connectivity.

**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.**

*AUAR Guidance: Water surface use need only be addressed if the AUAR area would include or adjoin recreational water bodies.*

A Minnesota DNR public watercourse is mapped in the northern portion of the study area. If impacts to a public watercourse are anticipated, a Public Waters Work permit will be obtained prior to construction activities. Regulatory coordination with the MnDNR Hydrologist and Fisheries specialists is recommended to implement appropriate avoidance and mitigation measures, if required.

No alterations to other surface waters are anticipated as part of the development scenario. The study area does not contain and is not adjacent to any recreational waterbodies.

## 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.**

The Minnesota Pollution Control Agency's (MPCA) What's In My Neighborhood database and the Minnesota Department of Agriculture's (MDA) Chemical Incidents and Agricultural Spills inventory were reviewed to determine if any known contaminated properties or potential environmental hazards are located within and adjacent to the AUAR study area (within a 250-foot buffer). This review identified four MPCA WIMN properties near the study area, listed below in Table 15 and shown in Figure 16. The nearest MDA site is located over 1,000 feet from the study area and is not anticipated to be a concern.

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).

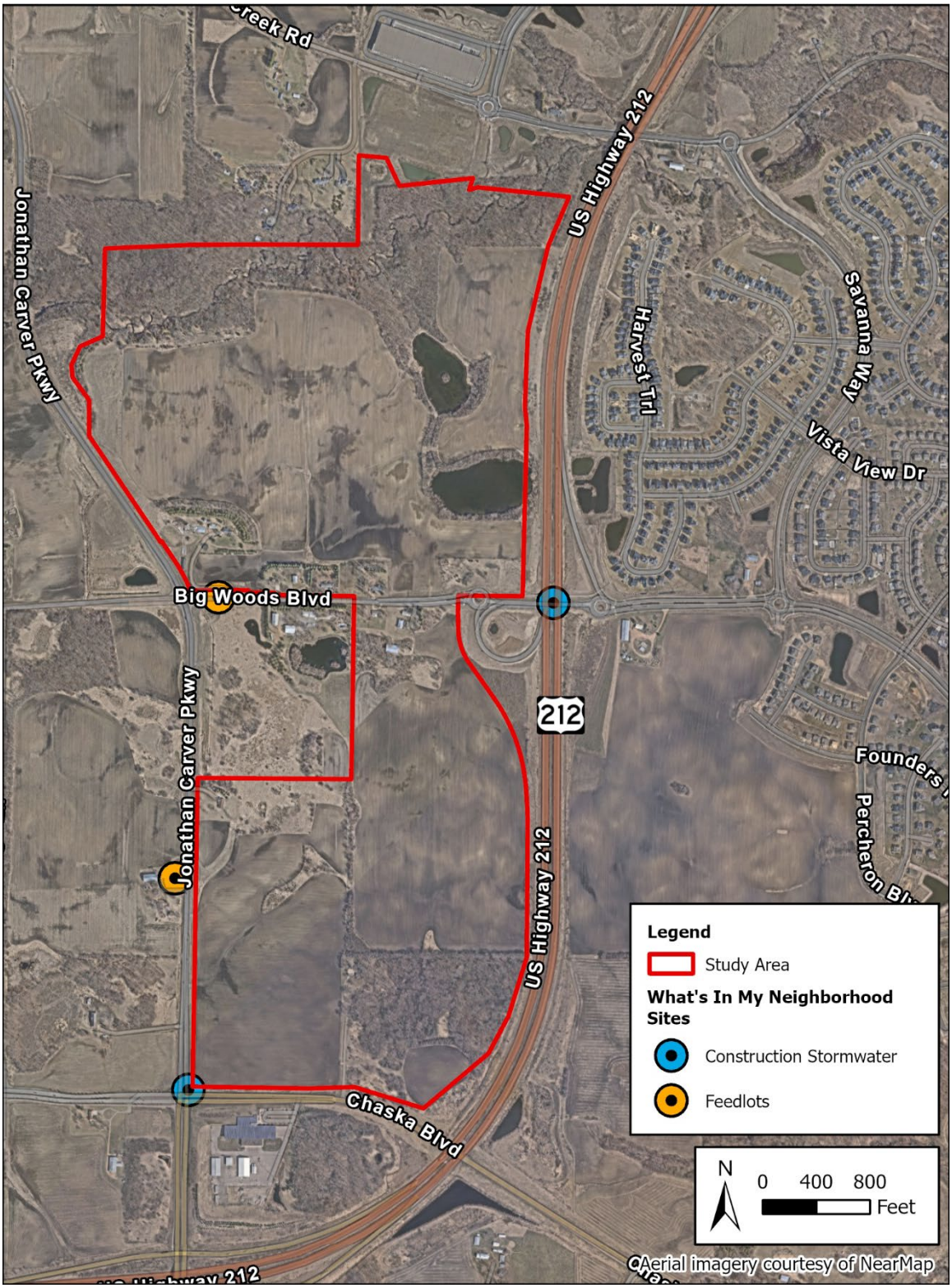
Based on these criteria, these properties are considered low risk for contamination concerns.

**Table 15: MPCA What's in my Neighborhood Sites**

| Site ID | Name | Status | Activity | Risk |
|---|---|---|---|---|
| 228821 | TH 212 Interchange and CSAH 44 Improvements | Active | Construction Stormwater | Low |
| 64266 | Joe Wickenhauser Farm | Active | Feedlots | Low |
| 95728 | Tim Raser Farm | Active | Feedlots | Low |
| 129263 | Freeway Commercial District Improvements | Active | Construction Stormwater | Low |

A Phase I/II Environmental Site Assessment (ESA) should be completed prior to construction under either Scenario and coordinate with the MPCA on safe handling and disposal of any contamination and hazardous materials found on the site prior to and during construction. An asbestos and regulated materials (ARM) assessment would need to be completed prior to the demolition of any structures, and a demolition notification will be made to the MPCA/Minnesota Department of Health (MDH) if asbestos containing material (ACM) is identified during the ARM assessment. If ACM and/or other regulated solid waste is identified during the ARM assessment requiring removal, generated solid waste will be disposed of at an MPCA permitted landfill.

**Figure 16: MPCA What's in my Neighborhood Sites**



**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.**

*AUAR Guidance: Generally, only the estimated total quantity of municipal solid waste generated and information about any recycling or source separation programs of the RGU need to be included.*

Future development will adhere to applicable laws, rules, and ordinances related to the management of solid and hazardous waste as required by Minnesota Statutes, section 473.811 and Chaska's municipal code.

*Construction Generated Solid Waste*

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

*Operation Generated Solid Waste*

Recycling for industrial buildings in the AUAR study area will be conducted in accordance with the 2016 Recycling Law (Minnesota Statutes Chapter 115A, Section 115A.151 and Section 115A.552).

The proposed development would generate new demands on solid waste management and sanitation services provided in the project area. During operation, it is estimated that the non-residential (commercial/industrial) waste stream be approximately 1,531 tons per year for Scenario 1 and 2,297 tons per year for Scenario 2.[21]

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

*AUAR Guidance: Not required for an AUAR. Potential locations of storage tanks associated with commercial uses in the AUAR should be identified (e.g., gasoline tanks at service stations).*

Any demolition activities must comply with state and federal regulations that require inspection of the structure for hazardous materials such as asbestos, lead based paint, light ballasts,

[21] Estimated based on the Minnesota Environmental Quality Board's Climate Calculator Tool

thermostats, stored chemicals, and ozone depleting chemicals. Both scenarios could potentially require an aboveground storage tank. The necessity of the storage tank and specifications will be determined in later design phases.

**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.**

*AUAR Guidance: Not required for an AUAR.*

Not applicable.

## 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.**

*AUAR Guidance: The description of fish and wildlife resources should be related to the habitat types depicted on the cover types map. Any differences in impacts between development scenario should be highlighted in the discussion.*

The majority of the land within the AUAR study area has been previously disturbed through farming. Based on a review of data from MnDNR,[22] there is one Regionally Significant Ecological Area (RSEA) located within the study area along the tributary of the Chaska Creek that flows through the northern portion of the site. There is one Native Plant Community (NPC), two Sites of Biodiversity Significance (SBS), and one RSEA within one mile of the study area. Most of the study area is agricultural land, with some areas of forest, grassland, and wetland. Forest, grassland, and wetlands may provide habitat for wildlife. Wildlife that can be found within the study area include birds, mammals, and insects. There are several residences located in the center portion of the study area.

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

*AUAR Guidance: For an AUAR, prior consultation with the DNR Division of Ecological Resources for information about reports of rare plant and animal species in the vicinity is required. Include*

[22] Minnesota Department of Natural Resources. Data available at MN Geospatial Commons: https://gisdata.mn.gov/dataset?organization=us-mn-state-dnr&q=DNR

*the reference numbers called for on the EAW form in the AUAR and include the DNR's response letter. If such consultation indicates the need, an on-site habitat survey for rare species in the appropriate portions of the AUAR area is required. Areas of on-site surveys should be depicted on a map, as should any "protection zones" established as a result.*

### *State-Listed Species*

Kimley-Horn reviewed the Natural Heritage Information System (NHIS) data per license agreement LA-2024-006 for state listed species within one mile of the study area. The database includes known occurrences of any state endangered, threatened, or special concern listed species. One species record, sessile-flowered yellow cress (*Rorippa sessiliflora*), was identified within one mile of the study area. The identification of this species is consistent with the Natural Heritage Review received from the MnDNR on July 17, 2025 (MCE #2025-00616, see

Appendix B).

**Sessile-flowered Yellow Cress**

Sessile-flowered yellow cress, an annual plant, occurs on exposed river sediments along the Mississippi River, and possibly the lower Minnesota River. This habitat type is ephemeral or seasonal in nature and usually appears as a narrow ecotonal zone between the normal low water line and the normal high-water line. This zone is typically underwater for a period of weeks following spring snowmelt and occasionally during the summer after periods of heavy rain. There are no extant populations of this species in Minnesota, and nearby records of this species are historic (>100 years old).

### *Federally-Listed Species*

The U.S. Fish and Wildlife (USFWS) Service Information for Planning and Conservation (IPaC) tool was used to identify federally-listed species that may be present in the study area. An IPaC Official Species List was generated on October 23, 2025 (see Appendix B). This review identified two federally-listed threatened species, the northern long-eared bat (*Myotis septentrionalis*) and rusty-patched bumble bee (*Bombus affinis*). This review also identified the proposed threatened monarch butterfly (*Danus Plexippus*) and proposed endangered tricolored bat (*Perimyotis subflavus*). This review identified one non-essential experimental species, the whooping crane (*Grus americana*). Non-essential experimental populations are treated as threatened species on National Wildlife Refuge and National Park land (require consultation under 7(a)(2) of the ESA) and as a proposed species on private land (no section 7(a)(2) requirements, but Federal agencies must not jeopardize their existence (section 7(a)(4))). There is currently no federal nexus for the proposed development.

**Northern Long-Eared Bat**

The northern long-eared bat (NLEB) was identified by the IPaC species list. The NLEB was designated a federally endangered species by USFWS in April 2023. According to the Minnesota DNR, in the southern part of the state, NLEB may use attics, bridges, and buildings for hibernating. In summer, the species is often found within forested habitats, especially around

wetlands. Summer roosts may include under loose tree bark, in buildings, behind signs or shutters, caves, mines, and quarry tunnels. Given that a portion of the study area is forested, there is potential for the northern long-eared bat to utilize the site. Future development may include the removal of trees.

**Tricolored Bat**

The tricolored bat was proposed to be designated as a federally endangered species by USFWS in September 2022. According to the USFWS, during the winter, tricolored bats are often found in caves and abandoned mines. During the spring, summer, and fall, tricolored bats are found in forested habitats where they roost in trees, primarily among leaves of live or recently dead deciduous hardwood trees, but may also be found in Spanish moss, pine trees, and occasionally human structures. Like the NLEB, the spread of white-nose syndrome across the eastern portion of the United States has become the major threat to the Tricolored Bat, with an estimated decline of more than 90% in affected colonies. According to the DNR's Rare Species Guide, there are no known maternity colonies within the state of Minnesota. Only three live hibernating individuals have been observed in Minnesota. Given that a portion of the study area is forested, there is potential for the tricolored bat to utilize the site. Future development may include the removal of trees.

**Rusty Patched Bumble Bee**

The rusty patched bumble bee is listed as a federally threatened species by USFWS. From April through October this species uses underground nests in upland grasslands, shrublands, and forest edges, and forages where nectar and pollen are available. From October through April the species overwinters under tree litter in upland forests and woodlands. The rusty patched bumble bee may be impacted by a variety of land management activities including, but not limited to, prescribed fire, tree-removal, haying, grazing, herbicide use, pesticide use, land-clearing, soil disturbance or compaction, or use of non-native bees. The AUAR study area was identified within the High Potential Zone[23] for the rusty patched bumble bee. The rusty patched bumblebee High Potential Zones are subject to updates.

**Monarch Butterfly**

The monarch butterfly was identified by the IPaC species list and is classified as a proposed threatened species by the USFWS. The preferred habitat for this species is prairie where milkweed and flowers are present. According to the USFWS, there are many potential reasons for the butterfly's decline, including habitat loss at breeding and overwintering sites, disease, pesticides, logging at overwintering sites, and climate change. The project may include disturbance to grassland ecosystems.

### *Ecologically Significant Areas*

[23] U.S. Fish and Wildlife Service. *Rusty Patched Bumble Bee Map (Updated 6/9/2025).* Available at: https://www.arcgis.com/apps/mapviewer/index.html?webmap=2716d871f88042a2a56b8001a1f1acae

As noted in the Natural Heritage Review letter, a calcareous fen has been documented in the vicinity of the proposed project (see Appendix B). A calcareous fen is a rare and distinctive peat-accumulating wetland that is legally protected in Minnesota. Many of the unique characteristics of calcareous fens result from the upwelling of groundwater through calcareous substrates.

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

*State-Listed Species*

**Sessile-flowered Yellow Cress**

There are no extant populations of this species in Minnesota, and the study area does not contain suitable habitat for the sessile-flowered yellow cress. Impacts to this species are not anticipated.

*Federally-listed Species*

**Northern Long-Eared Bat**

The development scenarios will likely require tree clearing. According to the USFWS, 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. Given that the majority of study area has been cultivated for agricultural use and does not contain caves or large expanses of forested habitat, the potential for the northern long-eared bat to utilize the study area is likely low.

**Tricolored Bat**

The development scenarios will require tree clearing. According to the USFWS, 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. Given that the majority of study area has been cultivated for agricultural use and does not contain caves or large expanses of forested habitat, the potential for the northern long-eared bat to utilize the study area is considered low.

**Rusty Patched Bumble Bee**

Suitable habitat for the rusty patched bumble bee may be present within the study area. The proposed project may affect vegetation that could harbor rusty patched bumble bee and/or suitable bee habitat; however, ground and vegetation disturbing activities are not expected to appreciably diminish the quality or extent of available suitable habitat within the study area. Reseeding disturbed grasslands with native seed mix is recommended by the DNR to avoid potential impacts to the rusty patched bumble bee.

**Monarch Butterfly**

Suitable habitat for the monarch butterfly may be present within the study area. The proposed development may affect vegetation that could harbor monarch butterflies and/or suitable monarch habitat; however, ground and vegetation disturbing activities are not expected to appreciably diminish the quality or extent of available suitable habitat within the study area.

*Ecologically Significant Areas*

The proposed development will likely not have surface water impacts to the calcareous fen given it is over two miles away from the study area and does not have a clear surface connection. Groundwater impacts to the calcareous fen are possible (see Calcareous Fen Fact Sheet in Appendix B).

If future development in the area proposes impacts near or within the mapped RSEA in the northern portion of the study area, a survey may be required. If impacts are proposed to the field surveyed resource, avoidance and minimization measures would be discussed with the DNR to identify next steps.

*Invasive Species*

Invasive species are a major cause of biodiversity loss and are considered biological pollutants by the DNR. Invasive species can be moved on construction equipment, landscaping equipment, and other debris.

*Stormwater*

Stormwater run-off can cause a number of environmental problems. When stormwater drains off a construction site, it can carry sediment and pollutants that harm lakes, rivers, streams, and wetlands which in turn may harm wildlife. Strategies for stormwater management and treatment of stormwater run-off within the study area are discussed in Item 12 of the AUAR.

*Tree Removal*

The study area contains approximately 79.2 acres of wooded land. Forests and forested areas provide an important natural resource in Minnesota. Forest clearing and tree removal creates a variety of environmental impacts including habitat destruction, biodiversity impairment, soil erosion, and loss of carbon sinks. Although some tree removal will be necessary, the scope of removal will be limited as much as feasible to support the proposed development.

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

*State-Listed Species*

**Sessile-flowered Yellow Cress**

There are no extant populations of this species in Minnesota, and the study area does not contain suitable habitat for the sessile-flowered yellow cress. Impacts to this species are not anticipated.

*Federally-listed Species*

**Northern Long-Eared Bat**

Tree clearing activities should be restricted to when northern long-eared bats are not likely to be present, between November 1 to March 31. Coordination with USFWS before tree clearing is recommended.

**Tricolored Bat**

Tree clearing activities should be restricted to when tricolored bats are not likely to be present, between November 1 to March 31. Coordination with USFWS before tree clearing is recommended.

**Rusty Patched Bumble Bee**

The use of native plant species in seed mixes is recommended to promote pollinator friendly habitat within the study area.

**Monarch Butterfly**

The use of native plant species in seed mixes is recommended to promote pollinator friendly habitat within the study area.

### *Ecologically Significant Areas*

Coordination should occur with the DNR to ensure compliance under the Wetland Conservation Act (WCA).

### *Invasive Species*

State requirements necessitate the control and spread of state listed noxious weeds and/or invasive weeds if encountered prior to construction. Disturbed areas would be reestablished using appropriate native and stabilization seed mixes. Methods to avoid spreading noxious weeds and/or invasive species will be incorporated into project specifications (and/or SWPPP when developed). According to the DNR, some methods that can prevent the spread of invasive species during construction include:

- Inspecting construction equipment and removing any visible plant, seeds, mud, dirt clods, and animals when arriving and leaving a site.
- Using certified weed-free products such as weed-free seed or hay whenever possible.
- Using mulch, soil, gravel, etc., that is free of invasive species whenever possible.
- Inspecting soil and plant material during planting for signs of invasive species and removing or destroying the invasive species or the plant and associated soil if the invasive species cannot be separated out.

### *Tree Removal*

Although tree removal will be required for development, some existing trees may be preserved in areas outside construction limits. The City of Chaska has a tree preservation ordinance that pertains to wooded steep slopes. The ordinance currently states wooded land with an eighteen (18) percent slope or greater shall be preserved in its natural state for environmental value, particularly to deter soil erosion on the steep slopes/ravines and protect natural wildlife habitat

areas. In addition, buildings (except for residential decks as regulated in CZO 15.12.200 paragraph J) and parking shall be set back at least fifty (50) feet from the edge of the eighteen (18) percent slope and a thirty (30) foot "no-grade/mow" zone provided for adjacent to the edge of the eighteen (18) percent slope for purposes of erosion control. The point of measurement shall be where slopes of eighteen (18) percent or greater exist. No building or structures shall be constructed on wooded slopes of eighteen (18) percent or more in grade. Additional tree preservation outside of wooded steep slope areas will be reviewed and identified during the development review process.

*Stormwater*

The proposed development scenarios include stormwater management and treatment of all stormwater run-off within the AUAR study area.

## 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 Minnesota 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.**

*AUAR Guidance: For an AUAR, contact with the State Historic Preservation Office and State Archeologist is required to determine whether there are areas of potential impacts to these resources. If any exist, an appropriate site survey of high probability areas is needed to address the issue in more detail. The mitigation plan must include mitigation for any impacts identified.*

During the Scoping step of this AUAR, the State Historic Preservation Office (SHPO) recommended that an archaeological survey be conducted within the proposed development area with the goals of 1) identifying archaeological sites within the project boundary that have not been previously documented and 2) evaluating any sites that are identified to determine their historical significance and eligibility for listing in the National Register of Historic Places (NRHP). A Cultural Desktop Review was completed by Chronicle Heritage in 2026 and the summary of the findings are described below.

According to the Minnesota Statewide Historic Inventory Portal, five historical sites were identified within 500 feet of the AUAR study area (see Table 16). The Ortlip Farmstead, previously listed as eligible, was demolished in 2005. None of the previously surveyed above-ground structures within the study area are structures recommended eligible for the NRHP.

**Table 16: Historic Properties within 500 Feet**

| Minnesota Historic Property Record # | Type | Demolished | NRHP Evaluation | Intersects with Study Area |
|---|---|---|---|---|
| CR-CKC-00634 | Farmstead | No | Not Eligible | Yes |

| Minnesota Historic Property Record # | Type | Demolished | NRHP Evaluation | Intersects with Study Area |
|---|---|---|---|---|
| CR-CKC-00635 | House | No | Not Eligible | Yes |
| CR-CKC-00636 | House | No | Not Eligible | Yes |
| CR-CKC-00637 | House | No | Not Eligible | Yes |
| CR-CKC-00638 | Farmstead | Yes | Not Eligible | No |

A review of the Minnesota Office of the State Archaeologist (OSA) Portal was conducted to identify previously reported archaeological or cemetery burial sites and previous cultural resource surveys within one mile of the study area. This review resulted in the identification of one cemetery lead, one archaeological site lead, and seven archaeological sites within one mile of the study area (see Table 17). The cemetery lead is the only one of these sites that intersects the study area.

**Table 17: Archaeological and Burial Sites Within One Mile**

| Site # | Name | Type | Affiliation | Intersects with Study Area |
|---|---|---|---|---|
| | Griffin Cemetery, McBride Cemetery | Site Lead, Cemetery/burial – Inactive/lost | Historic Euro-American | Yes |
| 21CRau | | Mound Site - Unverified | Unknown Prehistoric | No |
| 21CR0070 | | Isolated Find | Unknown Prehistoric | No |
| 21CR0101 | Hutchinson | Lithic Scatter | Unknown Prehistoric | No |
| 21CR0135 | Engler Boulevard West | Isolated Find | Unknown Prehistoric | No |
| 21CR0138 | Chaska Heights | Lithic Scatter | Unknown Prehistoric | No |
| 21CR0139 | Chaska Heights II | Lithic Scatter | Unknown Prehistoric | No |
| 21CR0142 | | Artifact Scatter | Unknown Prehistoric | No |
| 21CR0151 | | Lithic Scatter | Unknown Prehistoric | No |

The results of these findings will be submitted to SHPO and OSA to obtain concurrence on location and type of field survey needed as a next step to be completed prior to development occurring.

If future development requires applying for a Section 404 permit, the project proposer must also consider potential impacts on historic properties under Section 106, which requires consultation with the SHPO and other relevant parties to identify any potential mitigation needed.

## 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.**

*AUAR Guidance: Any impacts on scenic views and vistas present in the AUAR should be addressed. This would include both direct physical impacts and impacts on visual quality or integrity. EAW Guidelines contains a list of possible scenic resources.*

*If any non-routine visual impacts would occur from the anticipated development, this should be discussed here along with appropriate mitigation.*

There are no scenic views or vistas in or near the AUAR study area. The AUAR study area includes existing agricultural land that is not near any unique designated scenic views or vistas. Any development of agricultural land will have an impact on the visual look of a property. Future development would conform with the city ordinances for building height, building form, landscape screening, and lighting to avoid impacts to neighboring properties and species. No significant visual impacts are 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, criteria pollutants, and any greenhouse gases. Discuss effects to air quality including any sensitive receptors, human health, or applicable regulatory criteria. Include a discussion of any methods used 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.**

   *AUAR Guidance: This item is not applicable to an AUAR. Any stationary air emissions source large enough to merit environmental review requires individual review.*

   Not applicable to an AUAR.

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.**

   *AUAR Guidance: Although the MPCA no longer issues Indirect Source Permits, traffic-related air quality may still be an issue if the analysis in Item 18 indicates that development would cause or worsen traffic congestion. The general guidance from the EAW form should still be followed. Questions about the details of air quality analysis should be directed to MPCA staff.*

   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.[24] 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 in the study area 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 16a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors.**

*AUAR Guidance: Dust and odors need not be addressed in an AUAR, unless there is some unusual reason to do so. The RGU might want to discuss as part of the mitigation plan, however, any dust control ordinances in effect.*

The proposed development may generate temporary fugitive dust emissions during construction. The City of Chaska does not regulate dust emissions. Dust emissions can be controlled by sweeping, watering, sprinkling, as appropriate or as prevailing weather and soil conditions dictate. Dust emissions are not anticipated during operations as all ground surfaces will either be impervious or vegetated.

## 18. GREENHOUSE GAS (GHG) EMISSIONS/CARBON FOOTPRINT

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

*About Greenhouse Gases (GHGs)*

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

[24] Minnesota Department of Transportation. *MnDOT CO Hot Spot Screening Method.* Available at: https://www.dot.state.mn.us/project-development/subject-guidance/air-quality/process.html#:~:text=The%20Twin%20Cities%20area%20has,carbon%20monoxide%20(CO)%20violations.

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.[25]

### *Project Related GHG Emissions*

This section estimates emissions of the following GHGs for each scenario:

- Carbon dioxide ($CO_2$)
- Nitrous oxide ($N_2O$)
- Methane ($CH_4$)

Note that an analysis of existing conditions was not completed. The study area currently contains several single-family homes and farmstead buildings; however, the existing greenhouse gas emissions from the study area is considered negligible. 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 future development. The estimates also include emissions from the construction and operating phases of the scenario. Emissions were estimated using the Minnesota Environmental Quality Board's Climate Calculator Tool[26] and are summarized in Table 18, Table 19, and Appendix C by project phase (i.e., construction and operations) and source type (e.g., material inputs, building energy consumption).

Construction emissions for the two proposed scenarios are based on length of construction and are from material inputs, transport of those material inputs, employee commuting, construction equipment, land use change, and construction waste.

**Table 18: Construction Emissions**

| Emissions Source | Scenario 1 Project-Related $CO_{2e}$ Emissions (total) | Scenario 2 Project-Related $CO_{2e}$ Emissions (total) |
|---|---|---|
| Material inputs | 85,554.92 | 128,332.38 |

[25] U.S. EPA. *Overview of Greenhouse Gases*. January 2025. Available at https://www.epa.gov/ghgemissions/overview-greenhouse-gases

[26] Minnesota Environmental Quality Board. *Climate assessments*. Available at https://www.eqb.state.mn.us/environmental-review/climate-assessments.

| Emissions Source | Scenario 1 Project-Related $CO_{2e}$ Emissions (total) | Scenario 2 Project-Related $CO_{2e}$ Emissions (total) |
|---|---|---|
| Transportation of material inputs | 2,199.26 | 3,298.89 |
| Employee commuting | 18,291.17 | 27,581.35 |
| Construction equipment | 13,110.44 | 13,110.44 |
| Land use change | 39.70 | 48.49 |
| Construction waste | 135.58 | 203.38 |
| **Total** | **119,331.07** | **172,574.92** |

**Table 19: Annual Operational Emissions**

| Emissions Source | Scenario 1 Proposed $CO_{2e}$ Emissions (tons/year)[27] | Scenario 2 Proposed $CO_{2e}$ Emissions (tons/year) |
|---|---|---|
| Building energy consumption | 71,400.38 | 107,100.58 |
| HFC leakage | 231.17 | 346.75 |
| On-road vehicles | 2,162.13 | 3,243.19 |
| Treatment of waste off-site | 869.33 | 1,304.00 |
| **Total** | **74,663.01** | **111,994.51** |

### b. GHG Assessment

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

The following are potential design strategies and sustainability measures that are under consideration for both scenarios proposed development to reduce emissions for both scenarios:

- Create new open space with native vegetation and habitat
- Expand urban tree planting
- Require energy efficient appliances
- On-site EV charging

Implementation of the above strategies will be evaluated on a case-by-case basis based on code requirements, feasibility, availability of materials, schedule, and tenant considerations.

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

[27] Note: Scenario 1 and 2 estimated annual emissions are based on the EQB's recommended Climate Calculator Tool and is based on a typical office/warehouse end user.

The following are potential reduction strategies that could be implemented as part of future development within the study area. Note: these are high level strategies and quantification of reduction is not known at this phase.

- By creating new vegetated areas from previously cropped land, the project would sequester carbon dioxide that would not have been captured without the land conversion. Trees and other vegetation also incorporate carbon into their biomass when growing.
- Tree planting can provide shade, which reduces building cooling demands. When this demand is reduced, it also reduces energy consumption and corresponding GHG emissions.
- Selecting energy-efficient appliances reduces energy consumption and corresponding GHG emissions.

The potential mitigation listed in Item 18.b.i. was selected to comply with best management practices for new construction and reduce GHG emissions where practicable during operations.

**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 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; this equates to a total estimated 5,121,670.58 $CO2_e$ metric tons over the lifetime of the development under Scenario 1 and 7,676,084.18 $CO2_e$ metric tons over the lifetime of the development under Scenario 2 (including both construction and operations phases). The proposer will evaluate implementing the sustainability measures listed in Item 18.b.i to reduce operational emissions to the extent practicable. The proposed development will be built in compliance with state regulations and city building codes.

## 19. NOISE

**Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area; 2) nearby sensitive receptors; 3)**

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

*AUAR Guidance: Construction noise need not be addressed in an AUAR, unless there is some unusual reason to do so. The RGU might want to discuss as part of the mitigation plan, however, any construction noise ordinances in effect.*

*If the area will include or adjoin major noise sources, a noise analysis is needed to determine if any noise levels in excess of standards would occur, and if so, to identify appropriate mitigation measures. With respect to traffic-generated noise, the noise analysis should be based on the traffic analysis of Item 18.*

### *Existing Noise*

The AUAR study area is currently single family residential, agricultural, and undeveloped land. Surrounding nearby receptors are single family residential homes surrounding the study area.

The existing ambient noise sources in the study area consist mainly of the surrounding roadways.

### *Construction Noise*

As stated in the AUAR guidelines, construction noise need not be addressed unless there is some unusual reason to do so. No unusual circumstances have been identified that would necessitate a detailed construction noise analysis. The City of Chaska regulates the hours of operation for construction equipment.[28]

### *Traffic Generated Noise*

A sound increase of 3 dBA is barely noticeable by the human ear, a 5 dBA increase is clearly noticeable, and a 10 dBA increase is heard as twice as loud. For example, if the sound energy is doubled (i.e., the amount of traffic doubles), there is a 3 dBA increase in noise, which is just barely noticeable to most people. On the other hand, if traffic increases by a factor of 10, the resulting sound level will increase by about 10 dBA and be heard approximately twice as loud.

Traffic volumes in the project area are either on roadways that do not have receivers that are sensitive to noise, or the traffic levels attributable to the project are well below the amount that would generate a sound increase that could be noticeable.

The change in traffic noise levels is not anticipated to be readily perceptible.

### *Operational Noise*

The MPCA regulates mechanical noise associated with building operation. As site development progresses, developers would be responsible for assessing whether operational noise exceeds established noise standards which may require studies of ambient and proposed noise conditions and then mitigation for compliance. All future development will be required to comply with these requirements. There are no operational noise concerns for the proposed development under either scenario.

[28] City of Chaska. *Municipal Code*. Available at https://chaska.municipalcodeonline.com/book?type=ordinances#name=6.12_Noise_And_Odors

## 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.**

The information listed below summarizes the findings of the Big Woods Business Park Traffic Impact Analysis (TIA). A brief description of the roadways that make up the adjacent network is provided below.

**US 212** is a primarily east-west freeway which locally runs in the north-south direction, forming the eastern boundary of the AUAR area. It is a four-lane divided freeway and is classified by the Metropolitan Council as a Principal Arterial. According to the MnDOT Traffic Mapping Application, the roadway has an Annual Average Daily Traffic (AADT) of 22,650 vehicles per day (vpd) south of CSAH 10, as of 2024. The posted speed limit is 65 miles per hour (mph).

**CSAH 44 (Big Woods Boulevard)** is a two-lane undivided roadway that runs east-west. This roadway bisects the AUAR area, providing primary access to the study area parcels. The roadway is classified by the Met Council as an A-Minor Expander east of CSAH 11 (Jonathan Carver Parkway) and a Major Collector west of CSAH 11. According to the MnDOT Traffic Mapping Application, the roadway has an AADT of 3,350 vpd west of CSAH 61 (2018) and 1,060 vpd west of CSAH 11 (2025). Directly to the east of the site, Big Woods Boulevard includes a partial interchange with a northbound entrance ramp and southbound exit ramp from US 212. Big Woods Boulevard also connects directly to downtown Chaska east of the AUAR area. There is no posted speed limit along CSAH 44 near the study area.

**CSAH 11 (Johnathan Carver Parkway)** is a north-south roadway that is primarily two-lanes undivided but widens to four-lanes divided south of CSAH 61. The roadway is classified by the Met Council as an A-Minor Connector. Approximately 1500’ to the south of the AUAR area, Johnathan Carver Parkway includes a full access interchange with US 212. According to the MnDOT Traffic Mapping Application, the AADT of CSAH 11 ranges from 5,100 vpd north of CSAH 61 to 18,100 south of US 212, as of 2025. The posted speed limit is 55 mph.

**CSAH 61 (Chaska Boulevard**) is a four-lane undivided east-west roadway in the study area. CSAH 61 terminates at CSAH 11 (Jonathan Carver Parkway), but the roadway continues west of CSAH 11 as Levi Griffin Road. CSAH 61 is classified by the Met Council as an A-Minor Reliever while Levi Griffin Road is classified as a local road. According to the MnDOT Traffic Mapping Application, CSAH 61 has an AADT of 5,700 vpd, as of 2022. Chaska Boulevard connects directly to downtown Chaska to the east. The posted speed limit is 50 mph.

**CSAH 10 (Engler Boulevard)** is a primarily two-lane east-west undivided roadway which widens to four lanes near the US 212 interchange. The roadway is classified by the Met Council as an A-Minor Connector west of CSAH 11 and an A-Minor Expander east of CSAH 11. According to the

MnDOT Traffic Mapping Application, the roadway has an AADT of 14,500 vpd west of US 212, as of 2025. The posted speed limit is 55 mph.

**Chaska Creek Boulevard** is a four-lane divided north-south roadway that provides access to planned industrial/mixed-use developments north of the AUAR area. At the approach of Creek Road, the roadway narrows to two-lanes undivided. The roadway is classified by the MnDOT Functional Classifications as a local road. AADT data is unavailable. There is no posted speed limit. The roadway becomes Clover Ridge Drive north of CSAH 10.

**Creek Road** is a two-lane primarily east-west undivided roadway. The roadway is classified by the Met Council Functional Classifications as a Major Collector. According to the MnDOT Traffic Mapping Application, the roadway has an AADT of 2,450 as of 2021. The posted speed limit is 40 mph.

*Parking*

The development will adhere to the off-street parking standards listed in section 15.27.030 of the City of Chaska's municipal code.

*Trip Generation*

The amount of traffic generated by the proposed development was calculated using data from the Institute of Transportation Engineer's *Trip Generation Manual, 12th Edition*. The trip generation for both scenarios was calculated using Land Use Code (LUC) 130 – Industrial Park for the business park area, and LUC 820 – Shopping Center for the commercial areas. Trip generation totals for each scenario at buildout are shown below in Table 20.

**Table 20: Estimated Buildout Trip Generation**

| Scenario | AM Peak Hour | | | PM Peak Hour | | | Daily |
|---|---|---|---|---|---|---|---|
| | Total | In | Out | Total | In | Out | |
| **Scenario 1** | 572 | 414 | 158 | 1,066 | 435 | 631 | 12,102 |
| **Scenario 2** | 858 | 622 | 238 | 1,599 | 653 | 947 | 18,153 |

*Transit*

Currently, there is a Southwest Transit Station approximately 1 mile south of AUAR site. It is not anticipated that there will be significant change in transit usage.

*Bike and Pedestrian Infrastructure*

There are currently multi-use paths on most roadways in the study area. The City's bike and trail network plan identifies future off-street trails along CSAH 61 and along the major internal roadway connections throughout the development site. Public roadways throughout the site will be designed to improve pedestrian connectivity.

**b. Discuss the effect on traffic congestion on affected roads and describe any traffic improvements necessary. The analysis must discuss the project's impact on the regional transportation system. If the peak hour traffic generated exceeds 250 vehicles or the total**

**daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW. Use the format and procedures described in the Minnesota Department of Transportation's Access Management Manual, Chapter 5 (available at: http://www.dot.state.mn.us/accessmanagement/resources.html) or a similar local guidance.**

*AUAR Guidance: For AUAR reviews, a detailed traffic analysis will be needed, conforming to the MnDOT guidance as listed on the EAW form. The results of the traffic analysis must be used in the response to Items 16 and 17.*

A Traffic Impact Analysis was completed as part of the AUAR because the trip generation is anticipated to exceed the 250-trip peak hour vehicle threshold. The detailed Big Woods Business Park TIA is included in Appendix D. Based on the findings of the TIA, the area's transportation network is expected to support development within the AUAR study area with mitigation. The TIA identified improvements that could be constructed to mitigate potential future traffic impacts associated with the development within the AUAR study area. Metrics for traffic analysis include intersection delay as measured by Level of Service (LOS) and queue lengths.

The intersections analyzed in the TIA are shown in Figure 17. In addition, operational analysis was conducted at four (4) potential site access points:

- Proposed right-in/right-out (side street stop) along CSAH 11 north of CSAH 44 ("Access A")
- Proposed full-movement access (roundabout) along CSAH 44 ("Access B")
- Proposed full-movement access (side street stop) along CSAH 11 north of CSAH 61 ("Access C")
- Proposed full-movement access (side street stop) along CSAH 61 ("Access D")

Based on the results of the TIA, the roadway network is anticipated to experience significant increases in delay in the long term due to background growth and development. The CSAH 11 interchange with US 212 is anticipated to be near capacity due to development south of US 212 and construction of a new interchange or improvements to the existing interchange may be required. Additionally, significant increases in delay are anticipated along CSAH 10.

Under Scenario 1 conditions, delays are generally anticipated to see a minor increase as a result of the proposed development. Turn lanes are expected to be required at some of the access points, but other intersections are generally not anticipated to experience major impacts. The proposed access configuration is sufficient for this scenario.

Under Scenario 2 conditions, delays are anticipated to see slightly higher increases but are still not anticipated to cause significant operational issues in the network. The proposed access configuration is sufficient for this scenario.

**Table 21: Existing and Projected Intersection LOS**

| Intersection | Existing LOS | No-Build LOS | | Scenario 1 LOS | | Scenario 2 LOS | |
|---|---|---|---|---|---|---|---|
| | 2025 | 2030 | 2045 | 2030 | 2045 | 2030 | 2045 |
| **AM Peak Hour** | | | | | | | |
| **CSAH 10 & US 212 Eastbound Ramps** | B | B | C | B | C | B | C |
| **CSAH 10 & US 212 Westbound Ramps** | B | B | C | B | C | B | C |
| **CSAH 10 & Chaska Creek Boulevard** | C | C | D | B | D | B | D |
| **CSAH 10 & CSAH 11** | C | B | C | B | C | B | C |
| **Chaska Creek Boulevard & Creek Road** | A | A | A | A | A | A | A |
| **CSAH 44 & US 212 Eastbound Entrance Ramp** | A | A | A | A | A | A | B |
| **CSAH 44 & US 212 Westbound Exit Ramp** | A | A | A | A | A | A | A |
| **CSAH 44 & CSAH 11** | A | A | A | A | B | A | B |
| **CSAH 11 & CSAH 61** | B | B | B | B | B | B | B |
| **CSAH 11 & US 212 Westbound Ramps** | B | B | B | B | B | B | B |
| **CSAH 11 & US 212 Eastbound Ramps** | B | D | **F** / A | C | C | C | C |
| **CSAH 11 & Access A** | - | - | - | A | A | A | A |
| **CSAH 44 & Access B** | - | - | - | A | A | A | A |
| **CSAH 11 & Access C** | - | - | - | - | A | - | A |
| **CSAH 61 & Access D** | - | - | - | - | A | - | A |
| **PM Peak Hour** | | | | | | | |
| **CSAH 10 & US 212 Eastbound Ramps** | B | B | B | B | B | B | B |

| Intersection | Existing LOS | No-Build LOS | | Scenario 1 LOS | | Scenario 2 LOS | |
|---|---|---|---|---|---|---|---|
| | 2025 | 2030 | 2045 | 2030 | 2045 | 2030 | 2045 |
| **CSAH 10 & US 212 Westbound Ramps** | B | B | C | B | C | B | C |
| **CSAH 10 & Chaska Creek Boulevard** | B | B | C | B | C | B | C |
| **CSAH 10 & CSAH 11** | C | B | C | C | C | C | C |
| **Chaska Creek Boulevard & Creek Road** | A | A | A | A | A | A | A |
| **CSAH 44 & US 212 Eastbound Entrance Ramp** | A | A | A | A | A | A | **B** |
| **CSAH 44 & US 212 Westbound Exit Ramp** | A | A | A | A | A | A | C |
| **CSAH 44 & CSAH 11** | A | A | B | A | B | A | C |
| **CSAH 11 & CSAH 61** | B | B | C | B | C | B | C |
| **CSAH 11 & US 212 Westbound Ramps** | C | C | C | C | D | C | D |
| **CSAH 11 & US 212 Eastbound Ramps** | A | A | A | A | B | A | B |
| **CSAH 11 & Access A** | - | - | - | A | A | A | A |
| **CSAH 44 & Access B** | - | - | - | A | A | B | C |
| **CSAH 11 & Access C** | - | - | - | - | A | - | A |
| **CSAH 61 & Access D** | - | - | - | - | A | - | A |

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

The following provides a summary of the mitigation improvements that were identified as part of the traffic analysis for the Big Woods Business Park development.

**Existing (2025) Conditions**

- No Mitigation Necessary

**Opening Year (2030) No-Build Conditions**

- No Mitigation Necessary

**Opening Year (2030) Build Scenario 1 Conditions**

- Install a dedicated northbound right turn lane and provide side street stop control at CSAH 11 & Access A.
- Install a single lane roundabout at CSAH 44 & Access B.
- As parcels begin to develop on the AUAR area, install sidewalk and trail connections to connect to existing pedestrian and bicycle infrastructure.
- Extend the southbound right turn lane at CSAH 11 & US Highway 212 Westbound Ramps to 250’ in length

**Opening Year (2030) Build Scenario 2 Conditions**

- Install a dedicated northbound right turn lane and provide side street stop control at CSAH 11 & Access A.
- Install a single lane roundabout at CSAH 44 & Access B.
- As parcels begin to develop on the AUAR area, install sidewalk and trail connections to connect to existing pedestrian and bicycle infrastructure.
- Extend the southbound right turn lane at CSAH 11 & US Highway 212 Westbound Ramps to 250’ in length.

**Design Year (2045) No-Build Conditions**

- Install dual northbound right turn lanes at CSAH 11 & US 212 Eastbound Ramps.
- Extend the southbound right turn lane at CSAH 10 & US 212 Westbound Ramps to 450’.
- Extend the dedicated southbound left turn lane at CSAH 10 & Chaska Creek Boulevard to 400’.
- Extend the westbound left turn lane at CSAH 11 & US 212 Westbound Ramps to 550’.

**Design Year (2045) Build Scenario 1 Conditions**

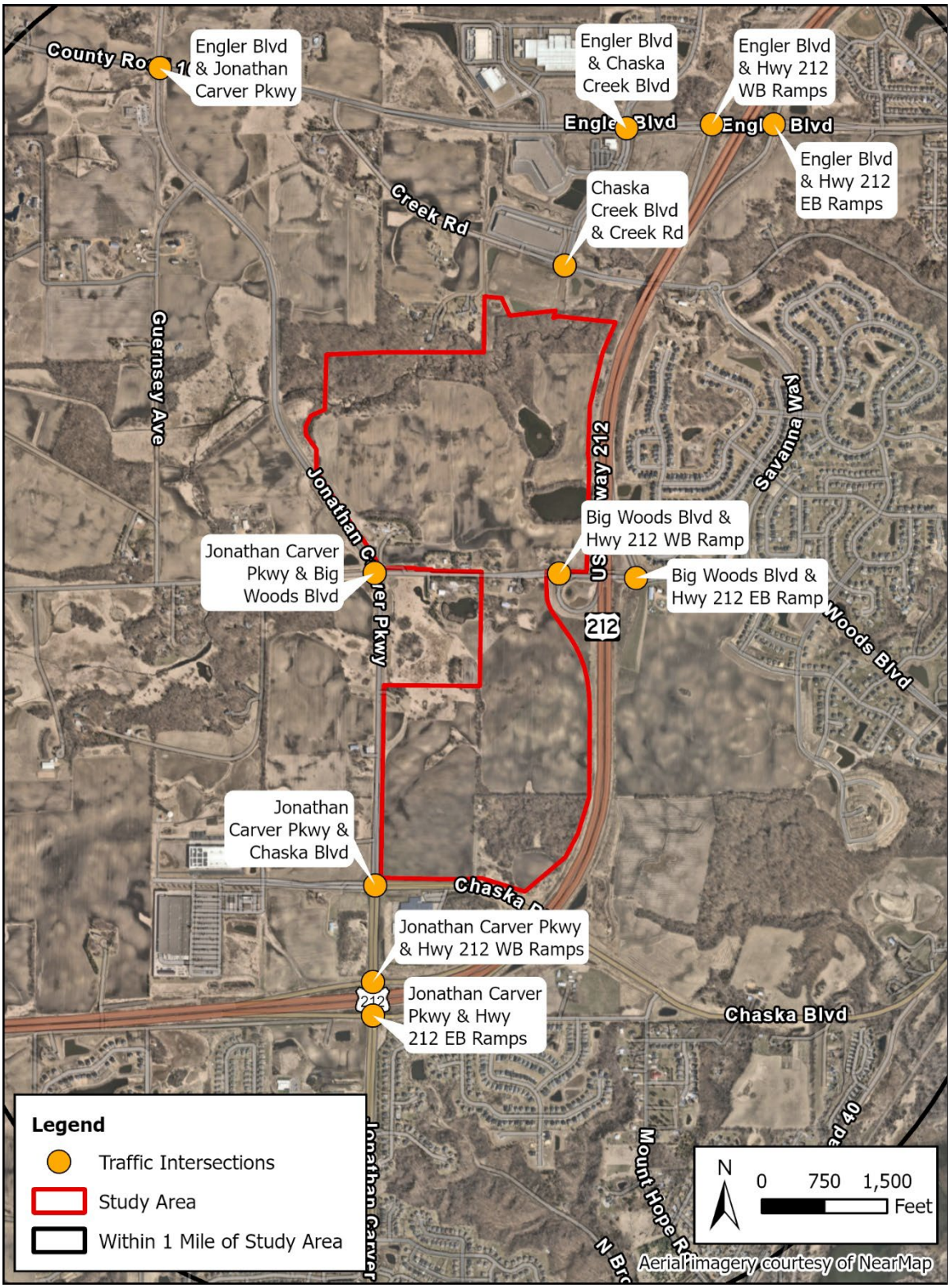
- All modifications from Deign Year (2045) No-Build & Opening Year (2030) Scenario 1 Conditions.
- Install a dedicated eastbound left turn lane at CSAH 61 & Access D.
- Side-street stop control is adequate at accesses A, C, & D.
- Extend the southbound right turn lane at CSAH 11 & US Highway 212 Westbound Ramps to 250’ in length.

**Design Year (2045) Build Scenario 2 Conditions**

- All modifications from Deign Year (2045) No-Build & Opening Year (2030) Scenario 2 Conditions.
- Install a dedicated eastbound left-turn lane at CSAH 61 & Access D.
- Install a dedicated southbound left-turn lane at CSAH 11 & Access C.
- Side-street stop control is adequate at accesses A, C, & D.
- Extend the southbound right turn lane at CSAH 11 & US Highway 212 Westbound Ramps to 250’ in length.

Note that the overall roadway network in the area has capacity to accommodate the AUAR development in Scenarios 1 and 2. Analysis of the potential creek crossing which would connect to the Creek Road & Chaska Creek Boulevard roundabout indicated that such a connection is not anticipated to significantly improve traffic operations. As the area develops further, additional traffic analysis should be completed to determine if such a connection and/or completion of the CSAH 44 interchange are appropriate.

**Figure 17: Traffic Study Intersections**



## 21. CUMULATIVE POTENTIAL EFFECTS

*AUAR Guidance: Because the AUAR process by its nature is intended to deal with cumulative potential effects from all future developments within the AUAR area, it is presumed that the responses to all items on the EAW form automatically encompass the impacts from all anticipated developments within the AUAR area.*

*However, the total impact on the environment with respect to any of the items on the EAW form may also be influenced by past, present, and reasonably foreseeable future projects outside of the AUAR area. The cumulative potential effect descriptions may be provided as part of the responses to other appropriate EAW items, or in response to this item.*

**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 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."[29]

Development of the AUAR area is anticipated to potentially start in 2026 and would occur over several years. Full buildout is assumed to occur over 5-15 years and would be dependent on market conditions. The geographic areas considered for cumulative effects are those areas adjacent to the study area and generally a combination of the study areas defined in the sections above, and the timeframe considered includes projects that would be constructed in the reasonably foreseeable future (by 2035) by other private and public entities that have made future project plans and timelines publicly available.

**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.**

There is one reasonably foreseeable project that may interact with the environmental effects of the development scenarios. The Southwest Growth Area Housing Development in Dahlgren Township is located approximately 1.5 miles southwest of the AUAR study area.

An AUAR is currently in progress for the Southwest Growth Area Housing development. Two scenarios are proposed for evaluation within the AUAR. Scenario 1 is based on the current Carver Comprehensive Plan housing units per acre requirements. This Scenario currently includes an estimated 5,076 housing units built on approximately 492 acres. Scenario 2 contains an overall denser housing units per acre with an estimated 6,078 housing units built on 978

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

acres. Both scenarios contain approximately 296 acres of preserved open space and 65 acres of parks.

**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.**

Based on the information obtained for the Southwest Growth Area Housing Development and summarized in Item 21.b., potential cumulative effects may include stormwater, wastewater/water appropriation, traffic, and land conversion. The potential for adverse cumulative effects is described for each of these items in the following paragraphs.

*Stormwater*

Stormwater travels along the ground surface in a different manner once lawn/grass is replaced by impervious surfaces including building rooftops and paved parking areas. Future business park and commercial development projects within the AUAR would increase impervious surface area with the development of buildings, parking lots, and roadways. These projects along with the additional nearby development would be required to meet stormwater management requirements, including installation of BMPs, falling under the authority of the MPCA, City of Chaska and CCWMO. Therefore, adverse cumulative water quality impacts are not anticipated.

*Wastewater and Water Appropriation*

Item 12.b.i and iii outlines the wastewater generation and water demand estimates that would be associated with the development scenarios described in this AUAR. It is anticipated that the City's current water supply and sewer system has sufficient capacity to accommodate the proposed development scenarios for this AUAR. Other proposed future developments, such as the Southwest Growth Area Housing Development Project, would increase the overall demand on the respective city's water supply and sewer system. Any future development would need to provide a detailed projection of wastewater generation, and water demands to the city to determine if any additional infrastructure or water appropriations would be required and individually mitigated for.

*Traffic*

A traffic analysis for the development scenarios studied in this AUAR was completed and identifies mitigation strategies to improve traffic movement as described in Item 20 (Transportation) and Appendix D. Future developments in the surrounding areas that are anticipated to increase traffic congestion would be required to compete a traffic impact study and identify mitigation measures to address the impacts. Therefore, adverse cumulative impacts related to traffic congestion are not anticipated.

*Land Conversion*

The proposed development scenarios in this AUAR would convert agricultural land to business park land use. Other proposed future developments such as the Southwest Growth Area Housing Development project would also convert agricultural land to other land uses. The City of Chaska, through their land use policies and zoning requirements, regulates future

development and can protect agricultural land from future development as appropriate. Adverse cumulative impacts on agricultural land are not anticipated.

## 22. OTHER POTENTIAL ENVIRONMENTAL EFFECTS

*AUAR Guidance: If the project may cause any additional environmental effects not addressed by Items 1 to 19, describe the effects here, discuss the how the environment will be affected, and identify measures that will be taken to minimize and mitigate these effects.*

### *Additional Environmental Effects*

There are no other potential environmental effects that have not been addressed in preceding sections.

## MITIGATION PLAN

This Mitigation Plan is submitted as part of the AUAR to provide reviewers and regulators with an understanding of the actions that are advisable, recommended, or necessary to protect the environment and minimize potential impacts by the proposed development scenarios. This Mitigation Plan will be revised and updated based on comments received during the AUAR comment period.

This Mitigation Plan is intended to satisfy the AUAR rules that require the preparation of a mitigation plan that specifies measures or procedures that will be used to avoid, minimize, or mitigate the potential impacts of development within the AUAR study area. Although mitigation strategies are discussed throughout the AUAR document, this plan will be formally adopted by the RGU as their action plan to prevent potentially significant environmental impacts.

The primary mechanism for mitigation of environmental impacts is the effective use of ordinances, rules, and regulations. The plan does not modify the regulatory agencies' responsibilities for implementing their respective regulatory programs nor create additional regulatory requirements. The plan specifies the legal and institutional arrangements that will assure that the adopted mitigation measures are implemented.

In addition to the anticipated permits and approvals listed in Table 6, the mitigation measures developed in the AUAR process are outlined in Table 22. The mitigation items identified are regulatory requirements and/or mitigation measures that reduce the level of potential impact of development within the study area. The plan is formatted consistently with the sections of the AUAR for ease of reference.

**Table 22: Mitigation Plan for Scenario 1 and 2**

| Resource Area | Mitigation |
|---|---|
| **Climate Adaption and Resilience** | Water efficient irrigation design will be considered for any landscape irrigation systems. |

| Resource Area | Mitigation |
|---|---|
| | Energy efficient building shells, appliances, equipment and lighting will be incorporated into the building design. |
| | Proposed trees and landscaping will reduce runoff and mitigate heat island effect. |
| | Enhanced stormwater ponds, which serve as green infrastructure, will be implemented for both scenarios. |
| **Land Use** | The city will annex the current Dahlgren Township parcels prior to development and incorporate them into an applicable zoning district and overlay districts, subject to land use permit review. |
| | An amendment to the 2040 Comprehensive Plan would be needed for both scenarios to accommodate development within the Chaska Green Belt. The comprehensive plan amendment will also establish Metropolitan Urban Service Area (MUSA) staging for this area. |
| | Both scenarios would require a zoning change to Business Park use. |
| | Future development within the study area will need to comply with the shoreland overlay district requirements for shorelands of tributary watercourses. |
| **Geology, Soils, and Topography** | A National Pollutant Discharge Elimination System (NPDES) and Stormwater Pollution Prevention Program Construction Stormwater Permit (SWPPP) will need to be obtained prior to any earthwork or grading activities within the AUAR study area. |
| | Where required, slope stabilization will be provided by means of vegetation establishment, erosion control blankets, or other standard methods of erosion and sediment control. The proposed development within the AUAR study area will require compliance with the City of Chaska's erosion and sediment control standards as well as stormwater management requirements. |
| **Water Resources - Stormwater** | Infrastructure will be built within the AUAR study area to convey stormwater to stormwater management areas (BMPs) to help achieve the appropriate water quality treatment. Design of the site and stormwater management facilities will be used to reduce the risk of flooding in the AUAR study area. Bioretention benches will be used to improve water quality and reduce stormwater runoff in the project vicinity. |
| | Maintenance and monitoring of the stormwater management areas will be performed to ensure long term effectiveness of the facilities. |
| | Best management practices pertaining to stormwater management will be adhered to during construction. |
| | Stormwater Best Management Practices (BMP) shall meet criteria for Minnesota Pollution Control Agency (MPCA) water quality requirements. |
| | Stormwater BMPs shall be designed to meet the City's criteria for rate control as well as runoff volume reduction and will be designed to maintain stormwater runoff rates at or below the level of existing conditions. |

| Resource Area | Mitigation |
|---|---|
| | The use of native plants will be considered for landscaping and stormwater features to absorb water, reduce water demand for irrigation, and protect water resources from pollution. |
| | The impact of more severe precipitation events on offsite flows will be evaluated with conveyance and/or storage of offsite flow. |
| | CCWMO requirements will be adhered to regarding stormwater-related impacts upstream and downstream of the site. |
| **Water Resources - Surface Water** | Avoidance measures will be taken to avoid impacts to the wetlands within the AUAR study area to the extent practicable. As design plans advance and if impacts to wetlands are found necessary, the project proposer will obtain appropriate permits and purchase wetland banking credits. Buffers will also be installed around wetlands to protect water quality from adjacent development. |
| | Future development would need to comply with the shoreland overlay district requirements which applies to the unnamed watercourse in the northern portion of the site. |
| | If any potential impacts are proposed to FEMA 100-Year Floodplains as part of development within the AUAR study area, the applicable City of Chaska and CCWMO approvals will be obtained. |
| | Utility crossings of the unnamed stream within the AUAR study area may require additional permitting, to be determined in future design stages. |
| **Water Resources – Water Appropriation** | Extend water infrastructure to reach the proposed development. |
| | The presence or absence of unverified wells will be confirmed and any existing wells will be sealed according to MDH requirements. |
| **Water Resources - Wastewater** | Extend wastewater infrastructure to reach the proposed development. |
| **Contamination/ Hazardous Waste** | Ensure compliance with applicable laws, rules, and ordinances related to the management of solid and hazardous waste as required by Minnesota Statutes 2020, section 473.811, subdivision 5c. |
| | Coordinate with the MPCA regarding the required plans, material handling, and disposal. |
| | Development would both generate construction-related waste materials such as wood, packaging, excess materials, and other wastes, which would be either recycled or disposed in the proper facilities. |
| | A Phase I/II Environmental Site Assessment (ESA) should be completed prior to construction and coordinate with the MPCA on safe handling and disposal of any contamination and hazardous materials found on the site prior to and during construction. |
| | The placement of any potential storage of hazardous materials and wastes would not be in floodplain areas. |
| **Fish, Wildlife, Plant Communities, and** | Invasive species will be controlled during site construction. Additionally, appropriate measures will be taken to control the spread of invasive species during construction and landscaping: |

| Resource Area | Mitigation |
|---|---|
| **Sensitive Ecological Resources** | • Inspecting construction equipment and removing any visible plant, seeds, mud, dirt clods, and animals when arriving and leaving a site.<br>• Using certified weed-free products such as weed-free seed or hay whenever possible.<br>• Using mulch, soil, gravel, etc., that is free of invasive species whenever possible.<br>• Inspecting soil and plant material during planting for signs of invasive species and removing or destroying the invasive species or the plant and associated soil if the invasive species cannot be separated out.<br>• Native and drought-tolerant species will be utilized in landscaped areas. |
| | Tree clearing activities should be restricted to when tricolored and northern long-eared bats are not likely to be present, between November 1 to March 31. |
| | Wildlife friendly erosion control methods will be utilized within the study area to minimize impacts to wildlife using the site during construction. |
| | The use of native plant species, including flowering plants, in seed mixes may be used to promote pollinator friendly habitat within the study area. |
| | Climate-appropriate native plantings and stormwater BMPs will provide suitable habitat for small mammals, insects, and bird species. |
| | Regarding the calcareous fen in the vicinity of the study area, coordination should occur with the DNR to ensure compliance under the Wetland Conservation Act (WCA). |
| | If future development in the area proposes impacts near or within the mapped RESA in the northern portion of the study area, a survey may be required. If impacts are proposed to the field surveyed resource, avoidance and minimization measures would be discussed with the DNR to identify next steps. |
| **Historic Properties** | An archeological survey is currently in process and will be completed prior to construction. |
| | If future development requires applying for a Section 404 permit, the project proposer must also consider potential impacts on historic properties under Section 106, which requires consultation with the SHPO and other relevant parties to identify any potential mitigation needed. |
| **Visual** | Lighting practices will be selected to address known ecological concerns and prevent avoidable impacts to insects, wildlife, rare plants, and adjacent natural areas. Guidance from the USFWS that recommends a lighting system that minimizes uplight and backlight would be adhered to the extent practicable. |
| **Air** | Fugitive dust emissions from construction will be controlled by sweeping, watering, sprinkling, as appropriate or as prevailing weather and soil conditions dictate. |

| Resource Area | Mitigation |
|---|---|
| **GHG Emissions/Carbon Footprint** | The following are potential design strategies and sustainability measures that are under consideration for the proposed development to reduce emissions for both scenarios:<br>• Create new open space with native vegetation and habitat<br>• Expand urban tree planting<br>• Require energy efficient appliances |
| | The developer will also consider implementation of items such as energy efficient building shells, solar ready design, EV charging infrastructure, and incorporating solar as an accessory use to allow for in-boundary energy generation. |
| **Noise** | Construction activities may result in temporarily elevated noise levels. To the extent possible, construction activities will be conducted to minimize noise levels and nighttime construction activities. The City regulates the hours of operation for construction equipment. |
| **Transportation** | Install a dedicated northbound right turn lane and provide side street stop control at CSAH 11 & Access A. |
| | Install a single lane roundabout at CSAH 44 & Access B. |
| | As parcels begin to develop on the AUAR area, install sidewalk and trail connections to connect to existing pedestrian and bicycle infrastructure. |
| | Install dual northbound right turn lanes at CSAH 11 & US 212 Eastbound Ramps. |
| | Extend the southbound right turn lane at CSAH 10 & US 212 Westbound Ramps to 450'. |
| | Extend the dedicated southbound left turn lane at CSAH 10 & Chaska Creek Boulevard to 400'. |
| | Extend the westbound left turn lane at CSAH 11 & US 212 Westbound Ramps to 550'. |
| | Install a dedicated eastbound left turn lane at CSAH 61 & Access D. |
| | Extend the southbound right turn lane at CSAH 11 & US Highway 212 Westbound Ramps to 250' in length. |
| | **Scenario 2 ONLY:** Install a dedicated southbound left-turn lane at CSAH 11 & Access C. |
| | **Scenario 1 and 2:** Overall roadway network in the area has capacity to accommodate the AUAR development in Scenarios 1 & 2. Analysis of the potential creek crossing which would connect to the Creek Road & Chaska Creek Boulevard roundabout indicated that such a connection is not anticipated to significantly improve traffic operations. As the area develops further, additional traffic analysis should be completed to determine if such a connection and/or completion of the CSAH 44 interchange are appropriate. |

# Appendix A: Wetland Information

- Minnesota WCA NOD – Big Woods Blvd (6/6/2025)
- Minnesota WCA NOD – Chaska Club West (5/17/2022)
- Minnesota WCA NOD – Raser Properties (7/27/2022)

BOARD OF WATER AND SOIL RESOURCES

# Minnesota Wetland Conservation Act
# Notice of Decision

| | |
|---|---|
| **Local Government Unit:** City of Chaska | **County:** Carver |
| **Applicant Name:** Scannell Properties | **Applicant Representative:** Jake Kurth |
| **Project Name:** Big Woods Blvd | **LGU Project No. (if any):** 193807390 |
| **Date Complete Application Received by LGU:** 4/25/25 | |
| **Date of LGU Decision:** 6/6/25 | |
| **Date this Notice was Sent:** 6/6/25 | |

**WCA Decision Type -** check all that apply

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

**Replacement Plan Impacts** (replacement plan decisions only)

Total WCA Wetland Impact Area:

Wetland Replacement Type: ☐ Project Specific Credits:
☐ Bank Credits:

Bank Account Number(s):

**Technical Evaluation Panel Findings and Recommendations (attach if any)**

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

**LGU Decision**

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

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

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

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

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

☒ Attachment(s) (specify): Figure 1. Project Location; Figure 3. Delineated Resource Map
☒ Summary: The wetland delineation was reviewed in the field by the Wetland Conservation Act Technical Evaluation Panel on May 29, 2025. The boundaries as they appeared in the field and provided on Figure 3 of the Wetland Delineation Report are approved.

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

**Attached Project Documents**

☒ Site Location Map ☒ Project Plan(s)/Descriptions/Reports (specify): Figure 1. Project Location; Figure 3. Delineated Resource Map

**Appeals of LGU Decisions**

If you wish to appeal this decision, you must provide a written request within 30 calendar days of the date you received the notice. All appeals must be submitted to the Board of Water and Soil Resources Executive Directoralong with a check payable to BWSR for $500 *unless* the LGU has adopted a local appeal process as identified below. The check must be sent by mail and the written request to appeal can be submitted by mail or e-mail.

The appeal should include a copy of this notice, name and contact information of appellant(s) and their representatives (if applicable), a statement clarifying the intent to appeal and supporting information as to whythe decision is in error. Send to:

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

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

☐ Yes[1] ☒ No

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

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

| |
|---|
| |

**Notice Distribution (include name)**

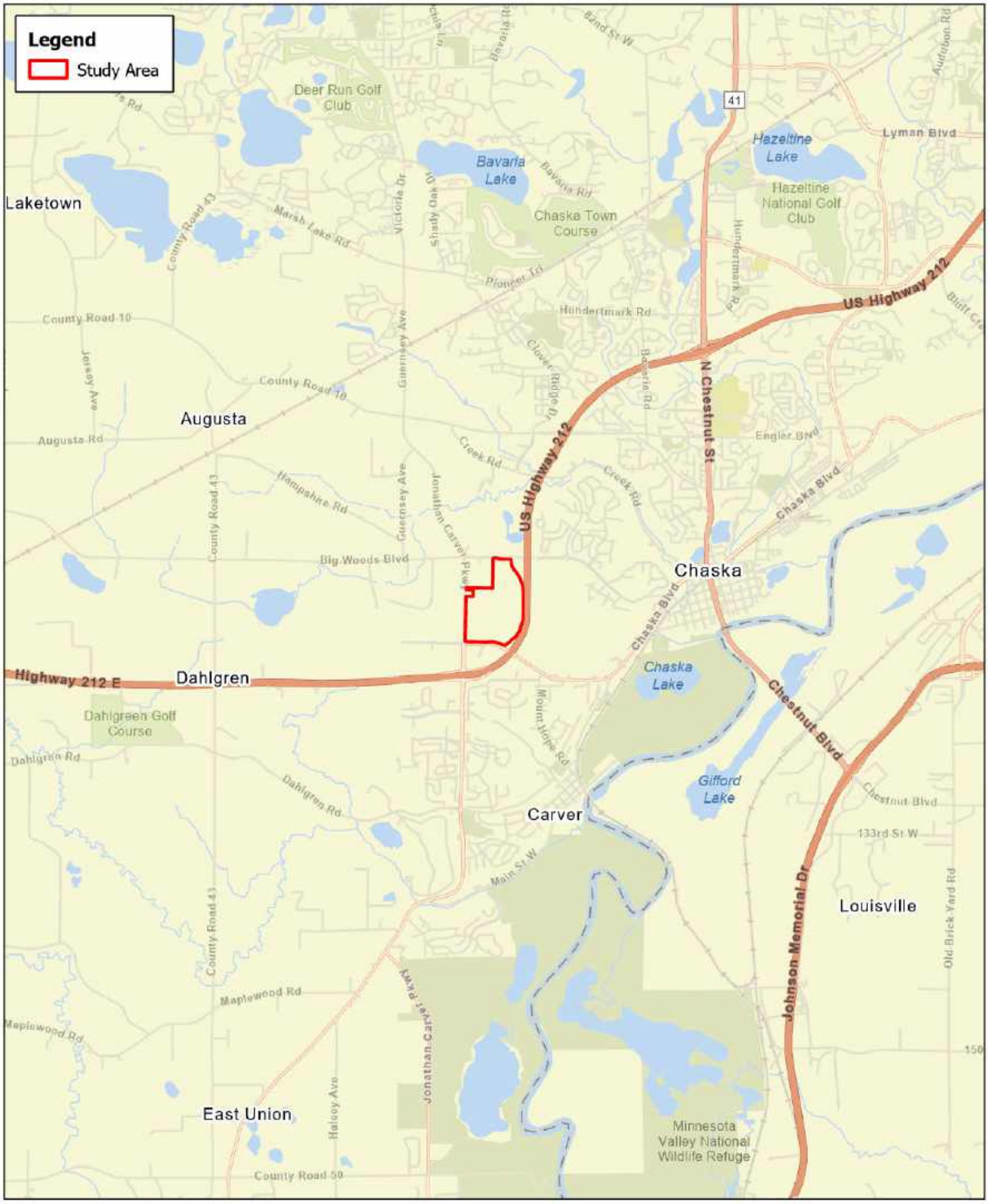
*Required on all notices:*

| |
|---|
| ☒ SWCD TEP Member: Tyler Polster (tpolster@co.carver.mn.us) ☒ BWSR TEP Member: Alyssa Core (Alyssa.core@state.mn.us) |
| ☐ LGU TEP Member (if different than LGU contact): |
| ☒ DNR Representative: Taylor Huinker (DNR) Taylor.Huinker@state.mn.us |
| ☒ Watershed District or Watershed Mgmt. Org.: Carver County WMO - Kristen Larson |
| ☒ Applicant: See Above ☒ Agent/Consultant: Susan Mayer, Kimley Horn and Associates – susan.mayer@kimley-horn.com |

*Optional or As Applicable:*

| |
|---|
| ☐ Corps of Engineers: |
| ☐ BWSR Wetland Mitigation Coordinator (required for bank plan applications only): |
| ☒ Members of the Public (notice only): Eric Trelstad – eric@wetlandcreditagency.com<br>☐ Other: |

| | |
|---|---|
| **Signature:** | **Date:** **6/6/25** |

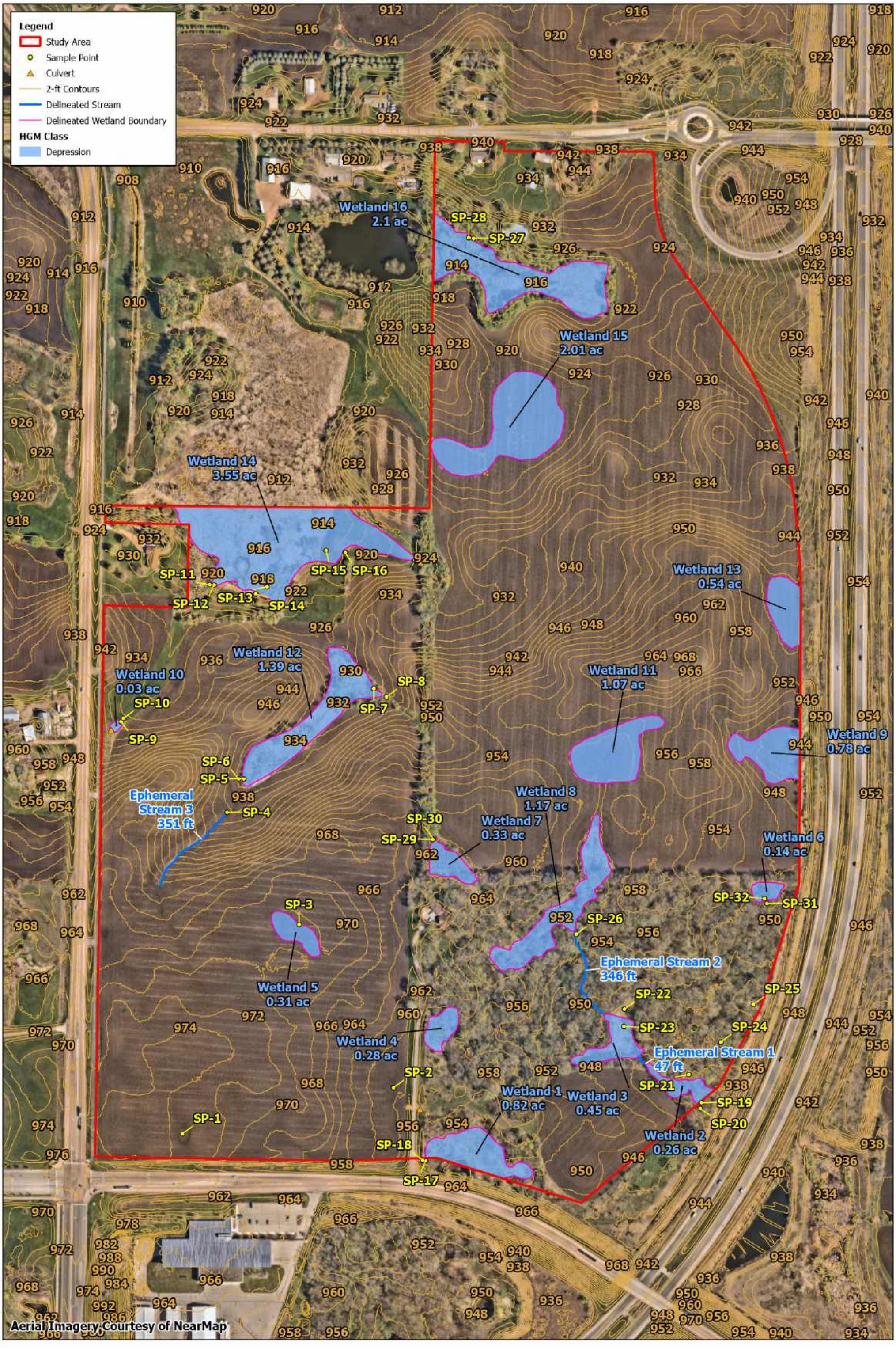



Kimley»Horn

N

0 0.5 1 Miles

**Figure 1. Project Location**
Scannell - Chaska
Chaska, MN




Kimley»Horn

N

0 150 300 Feet

**Figure 3. Delineated Resources Map**
Scannell - Chaska
Chaska, MN

BOARD OF WATER AND SOIL RESOURCES

# Minnesota Wetland Conservation Act
# Notice of Decision

| | |
|---|---|
| **Local Government Unit:** City of Chaska | **County:** Carver |
| **Applicant Name:** Oppidan | **Applicant Representative:** Jay Moore, jay@oppidan.com |
| **Project Name:** Chaska Club West | **LGU Project No. (if any):** 193805200 |
| **Date Complete Application Received by LGU:** Outside Growing Season 2021 (Complete 4/22/22) | |
| **Date of LGU Decision:** 5/17/22 | |
| **Date this Notice was Sent:** 5/17/22 | |

**WCA Decision Type -** check all that apply

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

**Replacement Plan Impacts** (replacement plan decisions only)

Total WCA Wetland Impact Area:

Wetland Replacement Type: ☐ Project Specific Credits:
☐ Bank Credits:

Bank Account Number(s):

**Technical Evaluation Panel Findings and Recommendations (attach if any)**

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

**LGU Decision**

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

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

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

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

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

☒ Attachment(s) (specify): Approved Boundary
☒ Summary: Wetland delineation was reviewed in the field on May 10, 2022 with the applicant's agent. The wetland boundary has been approved as presented in the report and reviewed in the field. No changes were made.

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

**Attached Project Documents**

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

**Appeals of LGU Decisions**

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

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

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

☐ Yes[1] ☒ No

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

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

**Notice Distribution (include name)**

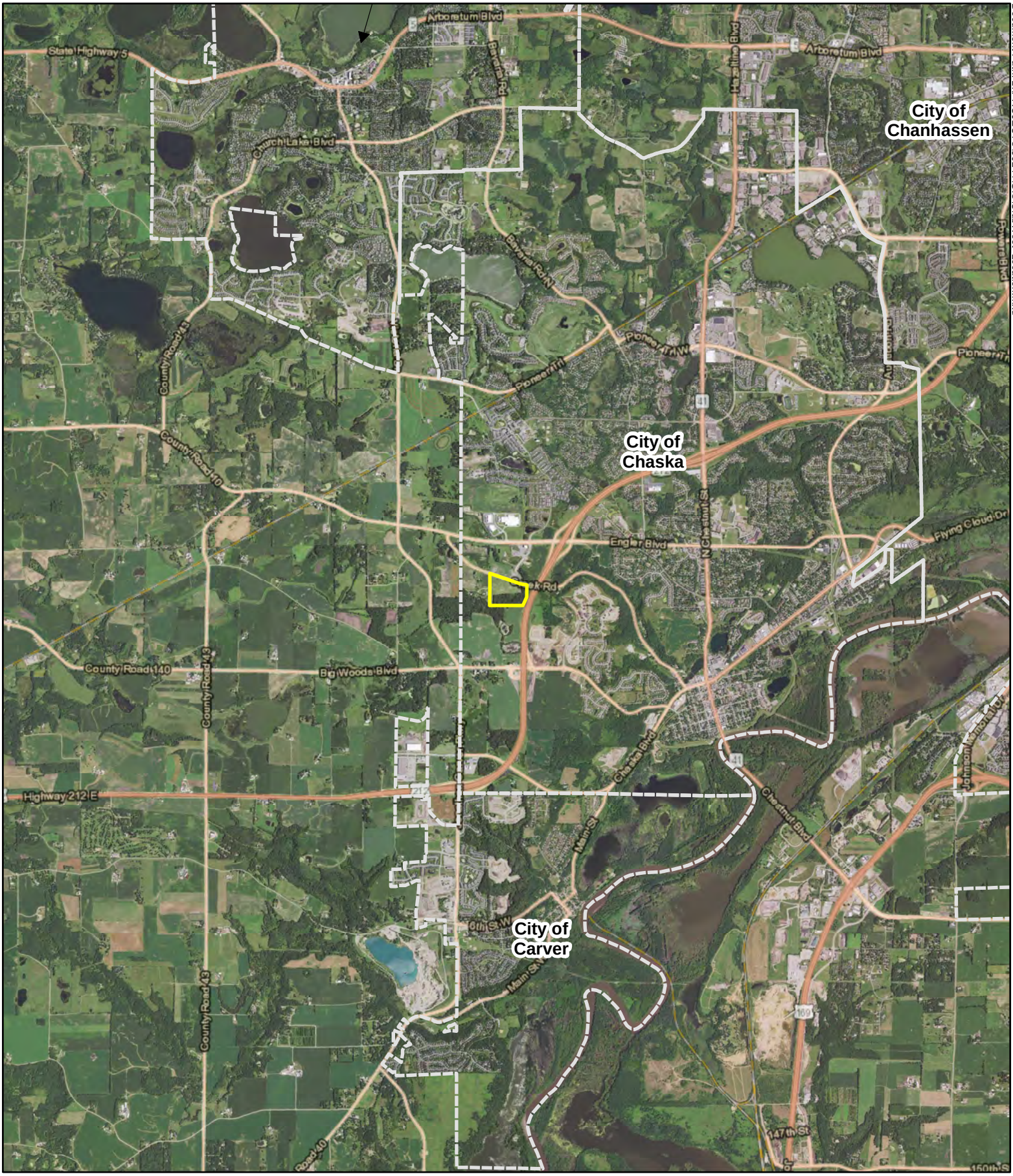
*Required on all notices:*

| | |
|---|---|
| ☒ SWCD TEP Member: Tom Genelin | ☐ BWSR TEP Member: Ben Meyer |
| ☐ LGU TEP Member (if different than LGU contact): | |
| ☒ DNR Representative: Taylor Huinker (DNR) Taylor.Huinker@state.mn.us | |
| ☒ Watershed District or Watershed Mgmt. Org.: Carver County WMO - Kristen Larson | |
| ☒ Applicant: See Above | ☒ Agent/Consultant: Todd Ullom – Sambatek, tullom@sambateck.com |

*Optional or As Applicable:*

| | |
|---|---|
| ☐ Corps of Engineers: | |
| ☐ BWSR Wetland Mitigation Coordinator (required for bank plan applications only): | |
| ☒ Members of the Public (notice only): Eric Trelstad – eric@wetlandcreditagency.com | ☐ Other: |

| | |
|---|---|
| **Signature:** | **Date:** 5/17/22 |




# Location Map

Chaska Club West Industrial

Chaska, Minnesota

**Legend**

- Property Boundaries
- City Boundaries

N W E S

0 1 Miles

Date: 10/18/2021

Project Number: 50241

Notes:

Sambatek

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

Document Path: L:\PROJECTS\50241\GIS\ClubWest_Location.mxd

Document Path: L:\PROJECTS\50241\GIS\ClubWest_Wetland.mxd

# Wetland Delineation Map

Chaska Club West Industrial

Chaska, Minnesota

**Legend**

- Project Area
- Wetland Boundary
- Upland Sample Transect
- Wetland Sample Transect

N
W E
S

0 100 200

Scale in Feet

Date: 10/29/2021

Project Number: 50241

Notes:

Sambatek

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

BOARD OF WATER AND SOIL RESOURCES

# Minnesota Wetland Conservation Act
# Notice of Decision

| | |
|---|---|
| **Local Government Unit:** City of Chaska | **County:** Carver |
| **Applicant Name:** Timothy and Ann Raser, Walter and Rosette Raser, LP | **Applicant Representative:** Sambatek |
| **Project Name:** Raser Properties | **LGU Project No. (if any):** 193805200 |
| **Date Complete Application Received by LGU:** 4/22/22 | |
| **Date of LGU Decision:** **7/17/22** | |
| **Date this Notice was Sent:** **7/27/22** | |

**WCA Decision Type -** check all that apply

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

**Replacement Plan Impacts** (replacement plan decisions only)

| |
|---|
| Total WCA Wetland Impact Area: |
| Wetland Replacement Type: ☐ Project Specific Credits:<br>☐ Bank Credits: |
| Bank Account Number(s): |

**Technical Evaluation Panel Findings and Recommendations (attach if any)**

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

**LGU Decision**

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

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

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

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

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

☐ Attachment(s) (specify):
☒ Summary: The Raser Wetland Delineation was reviewed in the field by the Wetland Conservation Act Technical Evaluation Panel with the applicants agent. There were several low areas that were being affectively drained by tiles within this site. The approved wetland delineation boundary is provided with this NOD as an attachment.

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

**Attached Project Documents**

☒ Site Location Map ☒ Approved Wetland Delineation

**Appeals of LGU Decisions**

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

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

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

☐ Yes[1] ☒ No

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

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

**Notice Distribution (include name)**

*Required on all notices:*

| |
|---|
| ☒ SWCD TEP Member: Tom Genelin- tgenelin@co.carver.mn.us<br>☒ BWSR TEP Member: Ben Carlson |
| ☐ LGU TEP Member (if different than LGU contact): |
| ☒ DNR Representative: Taylor Huinker (DNR) Taylor.Huinker@state.mn.us |
| ☒ Watershed District or Watershed Mgmt. Org.: Carver County WMO - Kristen Larson |
| ☒ Applicant: Timoth and Ann Raser and Walter and Rosette Raser, LP<br>☒ Agent/Consultant: Todd Ullom, Samatek |

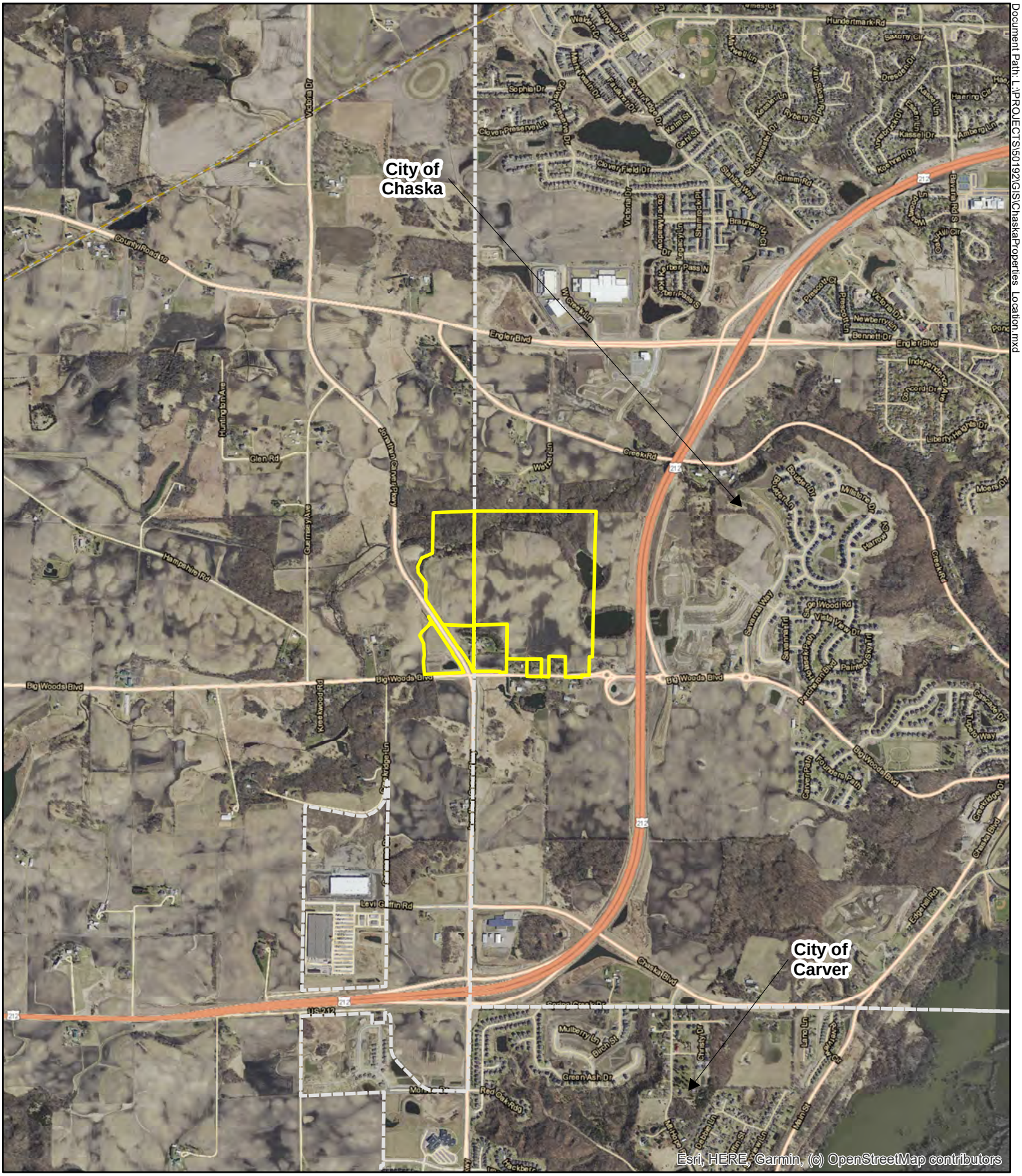
*Optional or As Applicable:*

| |
|---|
| ☒ Corps of Engineers: |
| ☐ BWSR Wetland Mitigation Coordinator (required for bank plan applications only): |

| | |
|---|---|
| ☐ Members of the Public (notice only): | ☐ Other: |

| | |
|---|---|
| **Signature:** | **Date:** 7/27/22 |

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




Document Path: L:\PROJECTS\50192\GIS\ChaskaProperties_Location.mxd

# Location Map

Raser Properties

Chaska, Minnesota

**Legend**

- Property Boundaries
- City Boundaries

N W E S

0 1,000 2,000

Scale in Feet

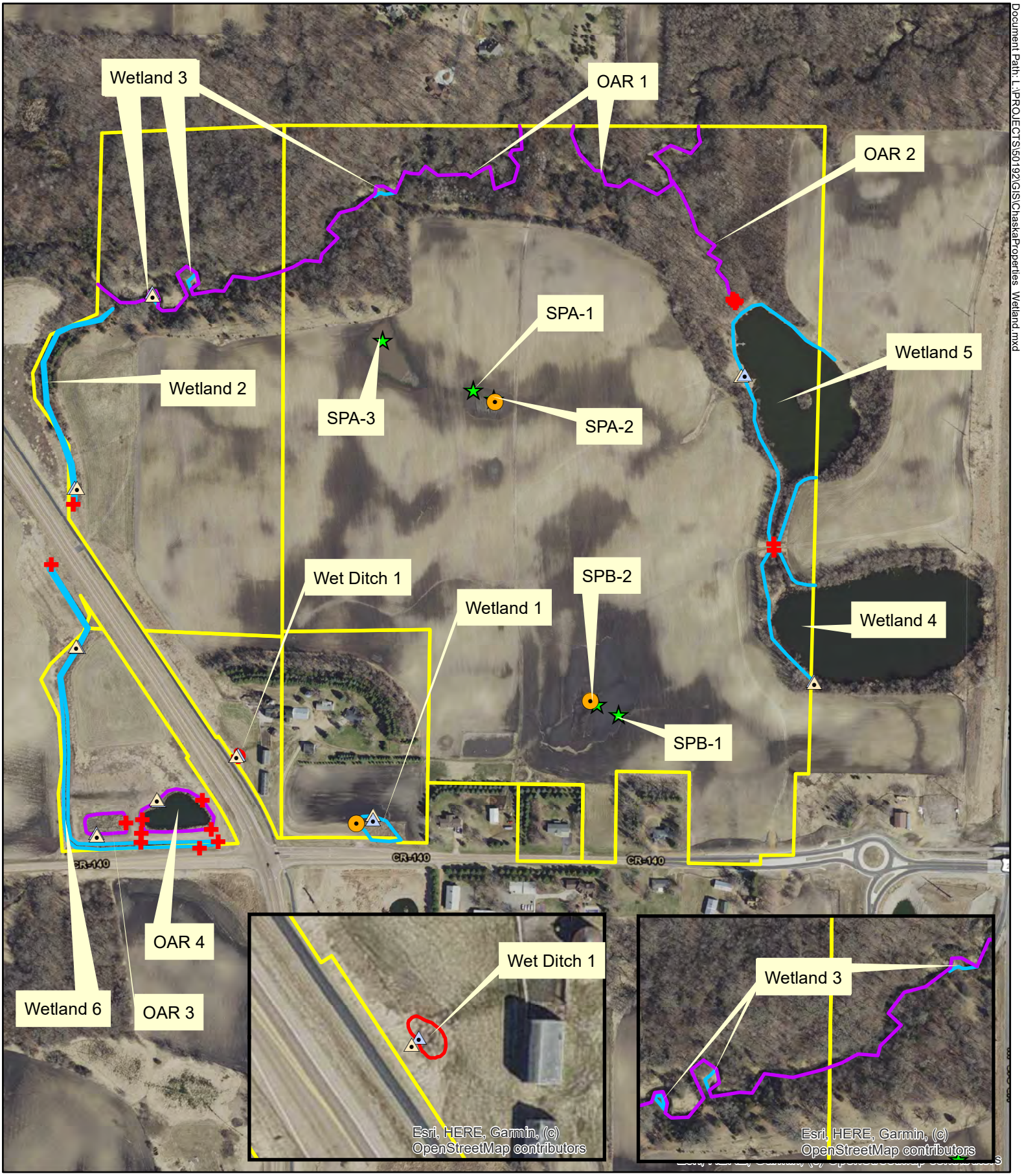
Date: 11/10/2021

Project Number: 50192

Notes:

Sambatek

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




# Wetland Delineation Map

Raser Properties

Chaska, Minnesota

**Legend**

- Property Boundaries
- Wetland Boundaries
- OAR Boundaries
- Wet Ditch Boundaries
- Upland Sample
- Wet Sample
- Non-wetland area
- Culvert
- Drain Tile Inlet

N W E S

0 225 450

Scale in Feet

Date: 11/30/2021

Project Number: 50192

Notes:

Sambatek

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

Document Path: L:\PROJECTS\50192\GIS\ChaskaProperties_Wetland.mxd

# APPENDIX B: AGENCY PROJECT CORRESPONDENCE

- USFWS IPaC Species List
- MnDNR Natural Heritage Review Letter
- Calcareous Fen Fact Sheet

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
Phone: (952) 858-0793

In Reply Refer To: 10/23/2025 22:09:52 UTC
Project Code: 2026-0008185
Project Name: Big Woods Business Park

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

To Whom It May Concern:

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

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

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

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

We recommend running the project (if it qualifies) through our **Minnesota-Wisconsin Federal Endangered Species Determination Key (Minnesota-Wisconsin ("D-key"))**. A demonstration video showing how-to access and use the determination key is available. Please note that the Minnesota-Wisconsin D-key is the third option of 3 available d-keys. D-keys are tools to help Federal agencies and other project proponents determine if their proposed action has the potential to adversely affect federally listed species and designated critical habitat. The Minnesota-Wisconsin D-key includes a structured set of questions that assists a project proponent in determining whether a proposed project qualifies for a certain predetermined consultation outcome for all federally listed species found in Minnesota and Wisconsin (except for the northern long-eared bat- see below), which includes determinations of “no effect” or “may affect, not likely to adversely affect." In each case, the Service has compiled and analyzed the best available information on the species’ biology and the impacts of certain activities to support these determinations.

If your completed d-key output letter shows a "No Effect" (NE) determination for all listed species, print your IPaC output letter for your files to document your compliance with the Endangered Species Act.

For Federal projects with a “Not Likely to Adversely Affect” (NLAA) determination, our concurrence becomes valid if you do not hear otherwise from us after a 30-day review period, as indicated in your letter.

If your d-key output letter indicates additional coordination with the Minnesota-Wisconsin Ecological Services Field Office is necessary (i.e., you get a “May Affect” determination), you will be provided additional guidance on contacting the Service to continue ESA coordination outside of the key; ESA compliance cannot be concluded using the key for “May Affect” determinations unless otherwise indicated in your output letter.

**Note: Once you obtain your official species list, you are not required to continue in IPaC with d-keys, although in most cases these tools should expedite your review.** If you choose to make an effects determination on your own, you may do so. If the project is a Federal Action, you may want to review our section 7 step-by-step instructions before making your determinations.

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

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

3. Should you determine that project activities **may affect** any federally listed, please contact our office for further coordination. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

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

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

Examples of unsuitable habitat include:

- Individual trees that are greater than 1,000 feet from forested or wooded areas,
- Trees found in highly developed urban areas (e.g., street trees, downtown areas),
- A pure stand of less than 3-inch dbh trees that are not mixed with larger trees, and
- A monoculture stand of shrubby vegetation with no potential roost trees.

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

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

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

species list report for your records.

*If any of the above activities are proposed*, and the northern long-eared bat appears on the user's species list, the federal project user will be directed to either the northern long-eared bat and tricolored bat range-wide D-key or the Federal Highways Administration, Federal Railways Administration, and Federal Transit Administration Indiana bat/Northern long-eared bat D-key, depending on the type of project and federal agency involvement. Similar to the Minnesota-Wisconsin D-key, these d-keys helps to determine if prohibited take might occur and, if not, will generate an automated verification letter. Additional information about available tools can be found on the Service's northern long-eared bat website.

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

**Other Trust Resources and Activities**
*Bald and Golden Eagles* - Although the bald eagle has been removed from the endangered species list, this species and the golden eagle are protected by the Bald and Golden Eagle Act and the Migratory Bird Treaty Act. It is the responsibility of the project proponent to survey the area for any migratory bird nests. If there is an eagle nest on-site while work is on-going, eagles may be disturbed. We recommend avoiding and minimizing disturbance to eagles whenever practicable. If you cannot avoid eagle disturbance, you may seek a permit. A nest take permit is always required for removal, relocation, or obstruction of an eagle nest. For communication and wind energy projects, please refer to additional guidelines below.

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

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

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

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

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

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

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

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

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

# OFFICIAL SPECIES LIST

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

This species list is provided by:

**Minnesota-Wisconsin Ecological Services Field Office**
3815 American Blvd East
Bloomington, MN 55425-1659
(952) 858-0793

# PROJECT SUMMARY

Project Code: 2026-0008185
Project Name: Big Woods Business Park
Project Type: Commercial Development
Project Description: Business Park development in Chaska, Dakota County, Minnesota
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@44.79071135,-93.6360226572547,14z

Counties: Carver County, Minnesota

# ENDANGERED SPECIES ACT SPECIES

There is a total of 5 threatened, endangered, or candidate species on this species list.

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

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

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

---

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

## MAMMALS

| NAME | STATUS |
|---|---|
| Northern Long-eared Bat *Myotis septentrionalis*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/9045 | Endangered |
| Tricolored Bat *Perimyotis subflavus*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/10515 | Proposed Endangered |

## BIRDS

| NAME | STATUS |
|---|---|
| Whooping Crane *Grus americana*<br>Population: U.S.A. (AL, AR, CO, FL, GA, ID, IL, IN, IA, KY, LA, MI, MN, MS, MO, NC, NM, OH, SC, TN, UT, VA, WI, WV, western half of WY)<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/758 | Experimental Population, Non-Essential |

## INSECTS

| NAME | STATUS |
|---|---|
| Monarch Butterfly *Danaus plexippus*<br>There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/9743 | Proposed Threatened |
| Rusty Patched Bumble Bee *Bombus affinis*<br>There is **proposed** critical habitat for this species. Your location overlaps the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/9383<br>General project design guidelines:<br>https://ipac.ecosphere.fws.gov/project/HZCF6JNZVJFJ5L4SFWR7L2J7TY/documents/generated/9225.pdf | Endangered |

# CRITICAL HABITATS

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

| NAME | STATUS |
|---|---|
| Rusty Patched Bumble Bee *Bombus affinis*<br>https://ecos.fws.gov/ecp/species/9383#crithab | Proposed |

# USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

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

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

# BALD & GOLDEN EAGLES

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

---

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

There are Bald Eagles and/or Golden Eagles in your project area.

**Measures for Proactively Minimizing Eagle Impacts**
For information on how to best avoid and minimize disturbance to nesting bald eagles, please review the National Bald Eagle Management Guidelines. You may employ the timing and activity-specific distance recommendations in this document when designing your project/ activity to avoid and minimize eagle impacts. For bald eagle information specific to Alaska, please refer to Bald Eagle Nesting and Sensitivity to Human Activity.

The FWS does not currently have guidelines for avoiding and minimizing disturbance to nesting Golden Eagles. For site-specific recommendations regarding nesting Golden Eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

If disturbance or take of eagles cannot be avoided, an incidental take permit may be available to authorize any take that results from, but is not the purpose of, an otherwise lawful activity. For assistance making this determination for Bald Eagles, visit the Do I Need A Permit Tool. For assistance making this determination for golden eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

**Ensure Your Eagle List is Accurate and Complete**
If your project area is in a poorly surveyed area in IPaC, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information

on Migratory Birds and Eagles, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to bald or golden eagles on your list, see the "Probability of Presence Summary" below to see when these bald or golden eagles are most likely to be present and breeding in your project area.

| NAME | BREEDING SEASON |
|---|---|
| Bald Eagle *Haliaeetus leucocephalus*<br>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.<br>https://ecos.fws.gov/ecp/species/1626 | Breeds Dec 1 to Aug 31 |
| Golden Eagle *Aquila chrysaetos*<br>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.<br>https://ecos.fws.gov/ecp/species/1680 | Breeds elsewhere |

# 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 "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

**Probability of Presence** (■)

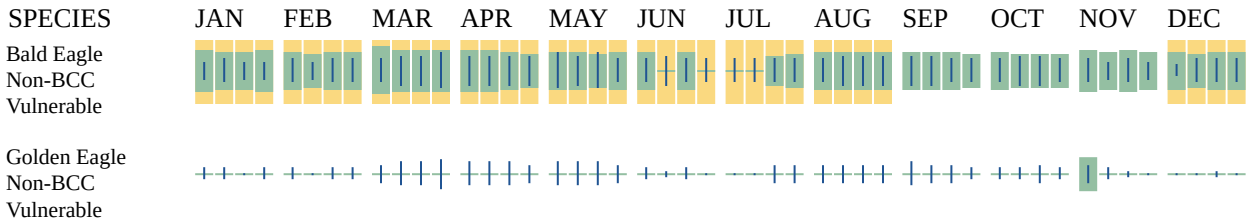
Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

**Breeding Season** (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

**Survey Effort** (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

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

■ probability of presence ■ breeding season | survey effort – no data




Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

# MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service).

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

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

| NAME | BREEDING SEASON |
|---|---|
| American Golden-plover *Pluvialis dominica*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/10561 | Breeds elsewhere |

| NAME | BREEDING SEASON |
|---|---|
| Bald Eagle *Haliaeetus leucocephalus*<br>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.<br>https://ecos.fws.gov/ecp/species/1626 | Breeds Dec 1 to Aug 31 |
| Black Tern *Chlidonias niger surinamenisis*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/3093 | Breeds May 15 to Aug 20 |
| Black-billed Cuckoo *Coccyzus erythropthalmus*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9399 | Breeds May 15 to Oct 10 |
| Bobolink *Dolichonyx oryzivorus*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9454 | Breeds May 20 to Jul 31 |
| Canada Warbler *Cardellina canadensis*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9643 | Breeds May 20 to Aug 10 |
| Cerulean Warbler *Setophaga cerulea*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/2974 | Breeds Apr 22 to Jul 20 |
| Chimney Swift *Chaetura pelagica*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9406 | Breeds Mar 15 to Aug 25 |
| Eastern Whip-poor-will *Antrostomus vociferus*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/10678 | Breeds May 1 to Aug 20 |
| Golden Eagle *Aquila chrysaetos*<br>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.<br>https://ecos.fws.gov/ecp/species/1680 | Breeds elsewhere |
| Golden-winged Warbler *Vermivora chrysoptera*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/8745 | Breeds May 1 to Jul 20 |

| NAME | BREEDING SEASON |
|---|---|
| Grasshopper Sparrow *Ammodramus savannarum perpallidus*<br>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA<br>https://ecos.fws.gov/ecp/species/8329 | Breeds Jun 1 to Aug 20 |
| Henslow's Sparrow *Centronyx henslowii*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/3941 | Breeds May 1 to Aug 31 |
| Le Conte's Sparrow *Ammospiza leconteii*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9469 | Breeds Jun 1 to Aug 15 |
| Lesser Yellowlegs *Tringa flavipes*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9679 | Breeds elsewhere |
| Long-eared Owl *asio otus*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/3631 | Breeds Mar 1 to Jul 15 |
| Marbled Godwit *Limosa fedoa*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9481 | Breeds May 1 to Jul 31 |
| Pectoral Sandpiper *Calidris melanotos*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9561 | Breeds elsewhere |
| Red-headed Woodpecker *Melanerpes erythrocephalus*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9398 | Breeds May 10 to Sep 10 |
| Rusty Blackbird *Euphagus carolinus*<br>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA<br>https://ecos.fws.gov/ecp/species/9478 | Breeds elsewhere |
| Semipalmated Sandpiper *Calidris pusilla*<br>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA<br>https://ecos.fws.gov/ecp/species/9603 | Breeds elsewhere |

| NAME | BREEDING SEASON |
|---|---|
| Short-billed Dowitcher *Limnodromus griseus*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9480 | Breeds elsewhere |
| Wood Thrush *Hylocichla mustelina*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9431 | Breeds May 10 to Aug 31 |

# PROBABILITY OF PRESENCE SUMMARY

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

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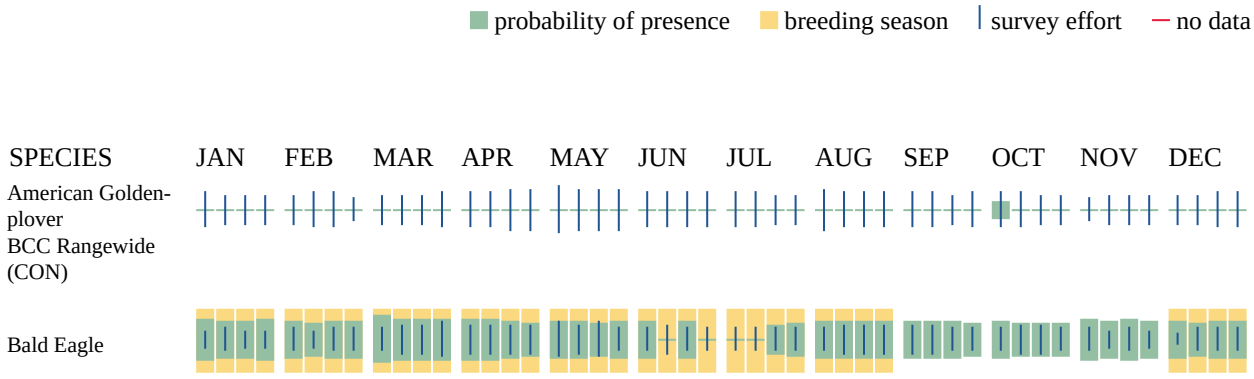
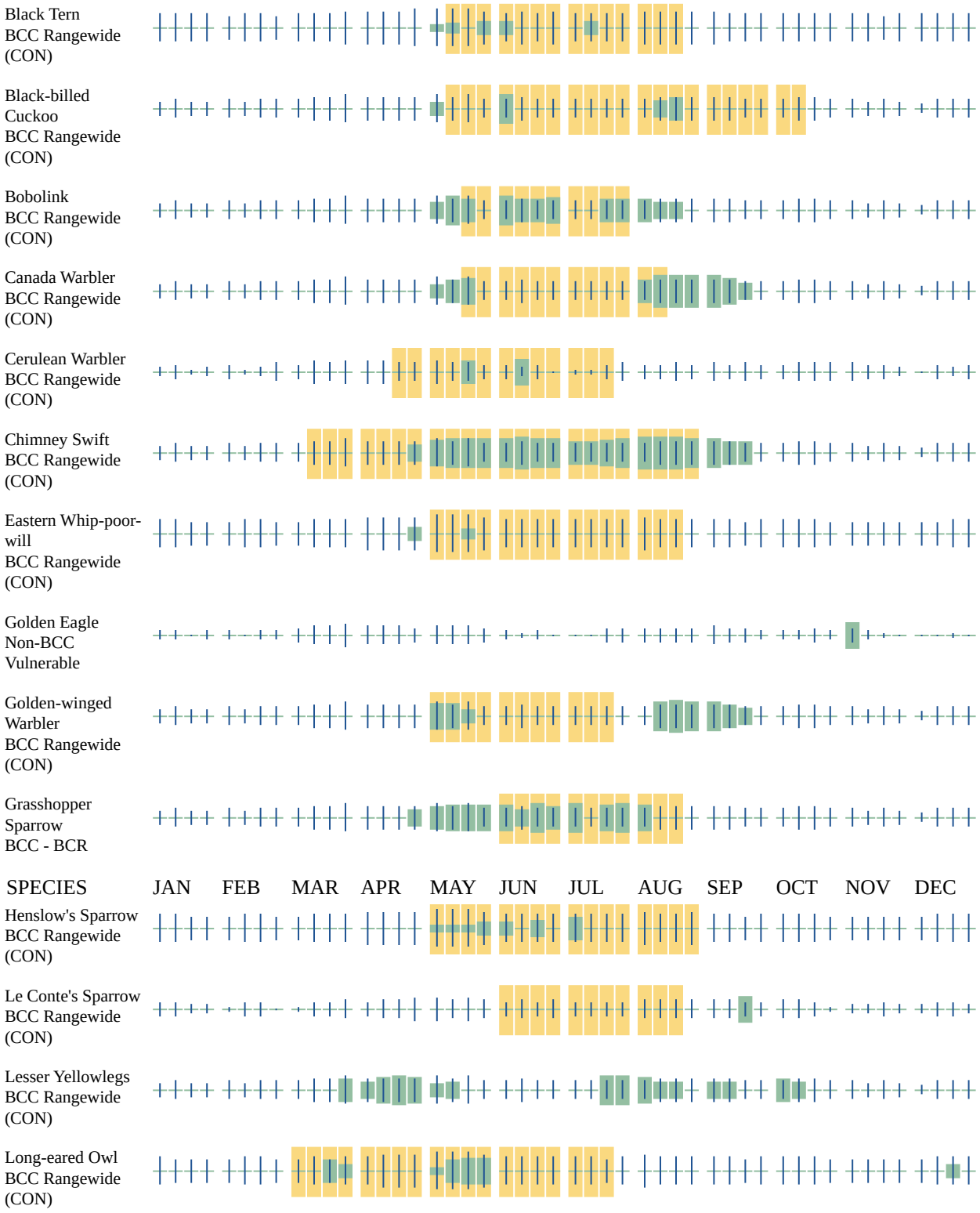
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

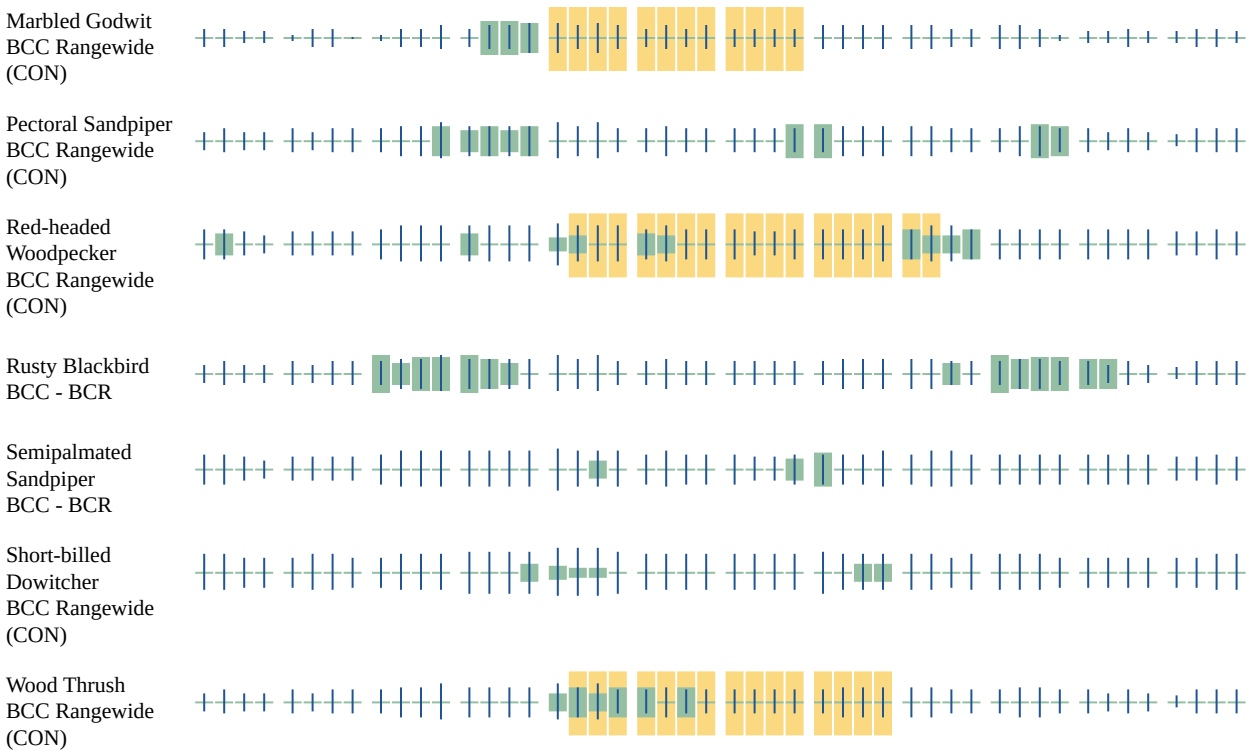
**Survey Effort** (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

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



Non-BCC Vulnerable



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- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

# WETLANDS

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

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

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

FRESHWATER FORESTED/SHRUB WETLAND

- PFO1A

- PFO1Ad

RIVERINE

- R4SBC
- R2UBH

FRESHWATER EMERGENT WETLAND

- PEM1C
- PEM1Ad
- PEM1F
- PEM1Cd
- PEM1Af
- PEM1A

FRESHWATER POND

- PABHx
- PUBH

# IPAC USER CONTACT INFORMATION


| | |
|---|---|
| Agency: | Private Entity |
| Name: | Madeline Roess |
| Address: | 767 Eustis Street |
| Address Line 2: | #100 |
| City: | St. Paul |
| State: | MN |
| Zip: | 55114 |
| Email | madeline.roess@kimley-horn.com |
| Phone: | 6128456789 |

# Formal Natural Heritage Review - Cover Page

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

**Project Name:** Big Woods Business Park - 160846040.1

**Project Proposer:** Scannell

**Project Type:** Development, Commercial/Institutional/Industrial

**Project Type Activities:** Wetland impacts (e.g., dewatering, tiling, drainage, discharge, excavation, fill, runoff, sedimentation, changes in hydrology);Tree Removal

**TRS:** T115 R23 S6, T115 R23 S7

**County(s):** Carver

**DNR Admin Region(s):** Central

**Reason Requested:** State EAW

**Project Description:** The project is proposing a business park development.

**Existing Land Uses:** Agricultural land, undeveloped land, farmsteads

**Landcover / Habitat Impacted:** Agricultural land, forest, grassland, wetland

**Waterbodies Affected:** Potential wetland impacts

**Groundwater Resources Affected:** N/A

**Previous Natural Heritage Review:** No

**Previous Habitat Assessments / Surveys:** No

## SUMMARY OF AUTOMATED RESULTS

| Category | Results | Response By Category |
|---|---|---|
| **Project Details** | Comments | Tree Removal - Recommendations |
| **Ecologically Significant Area** | Comments | Protected Wetlands: Calcareous Fens |
| **State-Listed Endangered or Threatened Species** | No Comments | No Further Review Required |
| **State-Listed Species of Special Concern** | Comments | Recommendations |
| **Federally Listed Species** | Comments | Visit IPaC for Federal Review<br>RPBB High Potential Zone |

DEPARTMENT OF NATURAL RESOURCES

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

July 17, 2025

Project ID: MCE #2025-00616

Twin Cities - Environmental (Kimley-Horn)
Kimley-Horn and Associates, Inc.
767 North Eustis Street, Suite 100
St. Paul, MN 55114

RE: Automated Natural Heritage Review of the proposed Big Woods Business Park - 160846040.1
See Cover Page for location and project details.

Dear Twin Cities - Environmental (Kimley-Horn),

As requested, the above project has been reviewed for potential effects to rare features. Based on this review, the following rare features may be adversely affected by the proposed project:

*Project Type and/or Project Type Activity Comments*

- The Natural Heritage Information System (NHIS) tracks bat roost trees and hibernacula plus some acoustic data, but this information is not exhaustive. Even if there are no bat records listed below, all 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.

*Ecologically Significant Area*

- One or more calcareous fens have been documented in the vicinity of the proposed project. A calcareous fen is a rare and distinctive peat-accumulating wetland that is legally protected in Minnesota. Many of the unique characteristics of calcareous fens result from the upwelling of groundwater through calcareous substrates. Because of this dependence on groundwater hydrology, calcareous fens can be affected by nearby activities or even those several miles away. Calcareous fens are fragile and may be impacted by activities within the fen, activities that affect surface water flows (e.g., stormwater flow/runoff, erosion), or activities that affect groundwater hydrology (e.g., groundwater pumping, contamination, or discharge). For more information regarding calcareous fens, please see the Calcareous Fen Fact Sheet. To minimize stormwater impacts, please refer to the Minnesota Pollution Control Agency's General Principles for Erosion Prevention and Sediment Control in the Minnesota Stormwater Manual. Please note that calcareous fens are "Special Waters"

and a buffer zone may be required.

Depending on the distance to the calcareous fen(s), additional guidance may be provided below if you indicated that potential project activities include wetland impacts or groundwater impacts. **If you did not correctly identify wetland or groundwater impacts as part of your project, this impact analysis may be incorrect.**

*State-Listed Endangered or Threatened Species*

No state-listed endangered or threatened species have been documented in the vicinity of the project.

*State-Listed Species of Special Concern*

| Taxonomic Group | Common Name | Scientific Name | Water Regime | Habitat | Federal Status |
|---|---|---|---|---|---|
| Vascular Plant | Sessile-flowered Yellow Cress | Rorippa sessiliflora | wetland | Floodplain Forest, River Shore | |

- The above table identifies state-listed species of special concern that have been documented in the vicinity of your project. If suitable habitat for any of these species occurs within your project footprint or activity impact area, the project may negatively impact those species. To avoid impacting state-listed species of special concern, the DNR recommends modifying the location of project activities to avoid suitable habitat or modifying the timing of project activities to avoid the presence of the species. 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. Species-specific comments, if any, appear below.

*Federally Listed Species*

- One or more federally listed species may be impacted by the proposed project. To ensure compliance with federal law, conduct a federal regulatory review using the U.S. Fish & Wildlife Service online IPaC tool.
- The area of interest overlaps with a U.S Fish and Wildlife Service (USFWS) Rusty Patched Bumble Bee High Potential Zone. The rusty patched bumble bee *(Bombus affinis)* is federally listed as endangered and is likely to be present in suitable habitat within High Potential Zones. From April through October this species uses underground nests in upland grasslands, shrublands, and forest edges, and forages where nectar and pollen are available. From October through April the species overwinters under tree litter in upland forests and woodlands. The rusty patched bumble bee may be impacted by a variety of land management activities including, but not limited to, prescribed fire, tree-removal, haying, grazing, herbicide use, pesticide use, land-clearing, soil disturbance or compaction, or use of non-native bees. If applicable, the DNR recommends reseeding disturbed soils with native species of grasses and forbs using BWSR Seed Mixes or MnDOT Seed Mixes. To ensure compliance with federal law, please conduct a federal regulatory review using the U.S. Fish and Wildlife Service's online Information for Planning and Consultation (IPaC) tool. Please note that all projects, regardless of whether there is a federal nexus, are subject to federal take prohibitions. The IPaC review will determine if prohibited take is likely to occur and, if not, will generate an automated letter. The USFWS RPBB guidance provides guidance on avoiding impacts to rusty patched bumble bee and a key for determining if actions are likely to affect the species; the determination key can be found in the appendix.

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

For environmental review purposes, the results of this Natural Heritage Review are valid for one year; the results are only valid for the project location and the project description provided on the cover page. If project details change or construction has not occurred within one year, please resubmit the project for review before 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. 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, *The Natural Heritage Review Team* Natural Heritage Review Program
Review.NHIS@state.mn.us

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

# Big Woods Business Park - 160846040.1

## Aerial Imagery With Locator Map

N
W E
S

0 0.2 0.4 0.8 1.2 1.6 Miles

Project Boundary

Project Type: Development, Commercial/Institutional/Industrial

Project Size (acres): 324.72

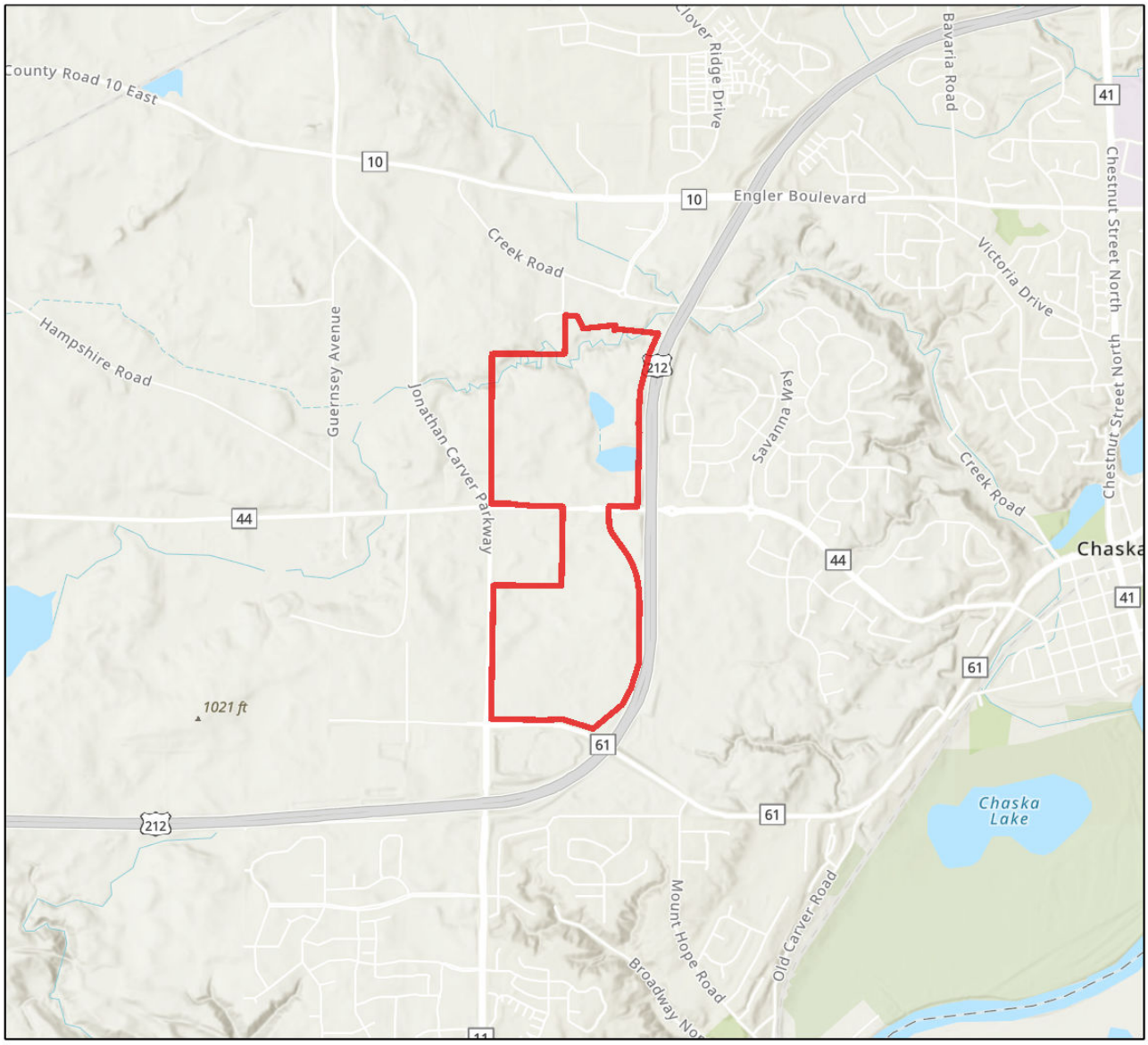
County(s): Carver

TRS: T115 R23 S6, T115 R23 S7

Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, USFWS
Earthstar Geographics
Metropolitan Council, MetroGIS, Three Rivers Park District, Esri, TomTom,

# Big Woods Business Park - 160846040.1

USA Topo Basemap With Locator Map




N
W E
S

0 0.2 0.4 0.8 1.2 1.6 Miles

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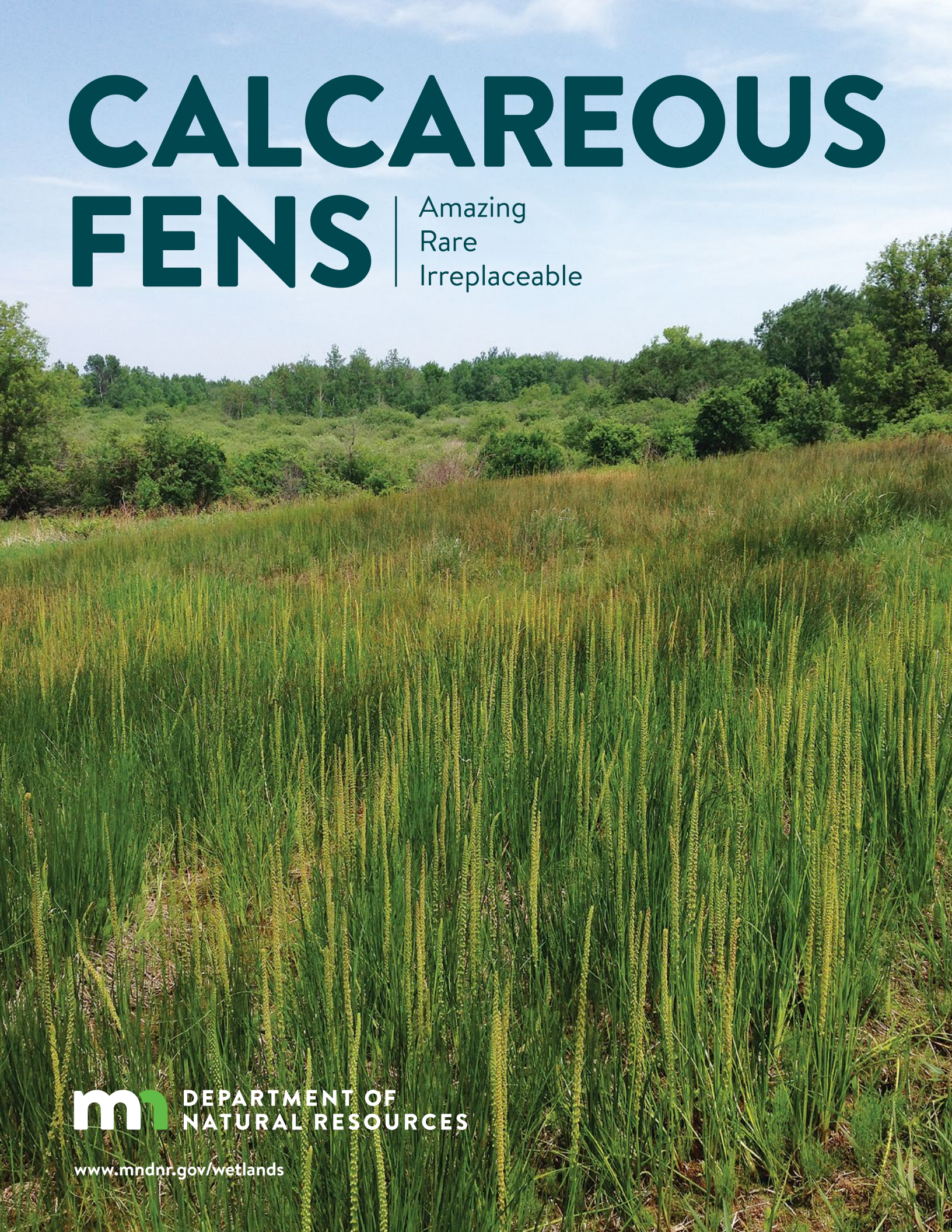
Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, USFWS
Esri, NASA, NGA, USGS, FEMA
Metropolitan Council, MetroGIS, Three Rivers Park District, Esri, TomTom,

# CALCAREOUS FENS

Amazing
Rare
Irreplaceable



DEPARTMENT OF NATURAL RESOURCES

www.mndnr.gov/wetlands

American grass of parnassus
*Parnassia glauca*

## What are calcareous fens?

Calcareous fens are rare and distinctive peat-accumulating wetlands. They depend on a constant supply of upwelling groundwater rich in calcium and other minerals. This calcium-rich environment supports highly diverse and unique rare plants that tolerate low oxygen conditions, calcium carbonate deposits, low nutrient availability, and relatively cold organic soils (peat)—the calcareous fen ecosystem.

*Iron-stained, marly pools are one sign of a healthy calcareous fen like this one at Sioux Nation Wildlife Management Area.*

## Where can you find calcareous fens?

In Minnesota, calcareous fens are mostly found in the western part of the state associated with remnant glacial features, along the Minnesota River Valley, and in the limestone-dominated (karst) geologic regions of the southeast. Calcareous fens have been in western Minnesota for at least 4,000 years and in the Minnesota River Valley for more than 10,000 years. They typically occur on slopes where groundwater rises to the surface and saturates the peat before draining away, causing the area to be spongy and wet. The upwelling groundwater can either create a "peat dome," rising a few feet above the ground or an "apron" where the peat spreads out along a hillside. You might also notice shallow pools of water that can be surrounded by sedges growing in small raised clumps, called hummocks. The shallow pools contain white calcium carbonate deposits that look like snow or salt. Water levels in calcareous fens remain at or very near the soil surface, even during summer because groundwater input balances evaporation and the use of water by plants (transpiration). They are rarely, if ever, flooded by surface water because of their position on the landscape.

## Calcareous fens are fragile

Fens are highly susceptible to disturbance. The soft peat makes almost any activity within them, by humans or livestock, highly disruptive. A loss of groundwater supply to the fen can break down the peat and release nutrients that can alter the plant community. Flooding can drown fen species and deposit sediment and excess nutrients. Most of these disturbances result in an invasion of shrubs, upland plants, and invasive species such as reed canary grass, which eventually outcompete and crowd out fen species, ultimately leading to the loss of the calcareous fen community.

**www.mndnr.gov/wetlands**

*Cover photo: The Nature Conservancy's Regal Meadow calcareous fen.*

## State-listed rare plant species found in calcareous fens

| | | |
|---|---|---|
| Hairy fimbry | *Fimbristylis puberula* | State endangered |
| Sterile sedge | *Carex sterilis* | State threatened |
| Hair-like beak rush | *Rhynchospora capillacea* | State threatened |
| Beaked spikerush | *Eleocharis rostellata* | State threatened |
| Whorled nutrush | *Scleria verticillata* | State threatened |
| Cut-leaf water parsnip | *Berula erecta* | State threatened |
| Edible valerian | *Valeriana edulis* | State threatened |
| Twig rush | *Cladium mariscoides* | State special concern |
| Small white lady's-slipper | *Cypripedium candidum* | State special concern |
| Wild sweet William | *Phlox maculata* | State special concern |

Sterile sedge, *Carex sterilis*

## Why are calcareous fens protected?

Fens are connected to a larger groundwater system. They are good indicators of groundwater sustainability, contribute to improved water quality and ecological diversity, and are an invaluable part of Minnesota's rich natural heritage. Calcareous fens formed after the glaciers receded, which makes them an old and constant feature in the landscape. Because of this they are irreplaceable and have special protection in Minnesota to prevent them from being lost forever. (Minn. Statutes 103G.223). In addition, any state-threatened or endangered plants occurring in a calcareous fen are protected under Minnesota's endangered species law (Minn. Statutes 84.0895).

Calcareous fens are one of the rarest natural communities and are threatened throughout much of their range by land use conversion, changes in groundwater supply, and development. There are approximately 200 known calcareous fens in Minnesota. They range in size from a tenth of an acre to dozens of acres, but most are less than 4 acres. Calcareous fens support a large number of uncommon and rare plant species. Four of these species are found almost exclusively in calcareous fens.

*DNR scientist, Jennie Leete, stands on an ice dome formed by upwelling groundwater freezing as it hits the cold winter air.*

## How can you help calcareous fens?

If you are interested in the conservation of calcareous fens or suspect you have one on your property, the DNR can serve as a resource to help you manage the fen for its long-term health and survival. If you are considering an activity that may impact a calcareous fen, a permit may be required. For more information, contact the DNR, Ecological and Water Resources at 651-259-5100.

## CALL US

License, titling and registration: M-F 8 a.m.-4:30 p.m.

General information: M-F 8 a.m.-8 p.m., Sat. 9 a.m.-1 p.m.

888-646-6367 or 651-296-6157

888-MINNDNR

MinnesotaDNR

mndnr

DEPARTMENT OF NATURAL RESOURCES

**ECOLOGICAL AND WATER RESOURCES**
500 Lafayette Road
St. Paul, MN 55155-4040
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# Appendix C: Greenhouse Gas Information

- Minnesota Climate Calculator: Scenario 1
- Minnesota Climate Calculator: Scenario 2
- Adaptation Strategies
- Mitigation Measures

# Minnesota Climate Calculator: Project Summary Report

**Date Prepared:** 2/11/2026

*The results shown below were generated using the Minnesota Climate Calculator. The emissions quantified account for the full greenhouse gas impact of a potential project throughout the construction and operational phases of the project. This includes emissions from project activities that occur on-site as well as emissions that occur upstream and downstream of the project. The results are based on user inputs and assumptions; actual project emissions may vary.*

## Background Information

| | |
|---|---|
| Project Name | Big Woods Business Park AUAR - Scenario 1 |
| Project Category (primary) | Subp. 14, Industrial, commercial, institutional facilities |
| Project Category (secondary) | |
| Location (County) | Carver |
| Construction Start Date | 6/1/2026 |
| Operational Year | 2037 |
| Operational Lifetime (Years) | 50 |

| | |
|---|---|
| Electricity Provider | Grid Average |
| Portion of Building Electricity Consumption to be Generated On-Site via Renewables or Supplied through the Purchase of Renewable Energy Credits (RECs) | 0% |
| Portion of Building Natural Gas Consumption to be Supplied from Renewable Sources | 0% |

| | |
|---|---|
| Building Construction Project? | Yes |

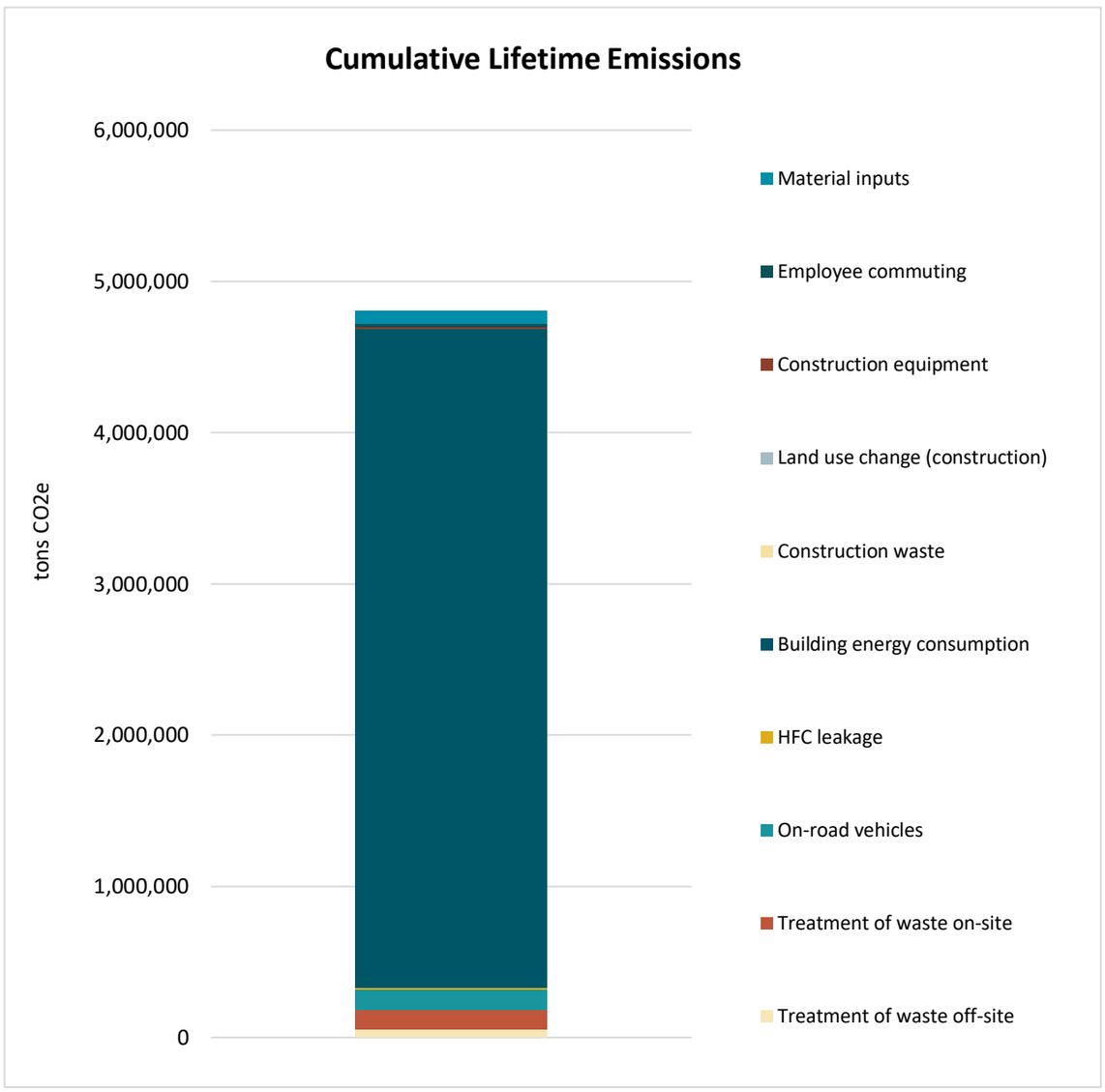
| Construction Stage | Duration (Days) |
|---|---|
| Demolition | 359 |
| Site Preparation | 215 |
| Grading | 556 |
| Building Construction | 5,565 |
| Architectural Coatings | 395 |
| Paving and Landscaping | 395 |

## Summary Results

| | |
|---|---|
| Project Lifetime | 61 |
| Unit | tons |

| Phase | $CO_2e$ Emissions | |
|---|---|---|
| | Cumulative | Annualized |
| **Construction** | | |
| Material inputs | 85,554.92 | 1,402.54 |
| Transportation of material inputs | 2,199.26 | 36.05 |
| Employee commuting | 18,291.17 | 299.86 |
| Construction equipment | 13,110.44 | 214.93 |
| Land use change (construction) | 39.70 | 0.65 |
| Construction waste | 135.58 | 2.22 |
| **Operation** | | |
| Building energy consumption | 4,355,423.43 | 71,400.38 |
| Coal production | NA | NA |
| Natural gas and oil products | NA | NA |
| Industrial processes | NA | NA |
| HFC leakage | 14,101.12 | 231.17 |
| Land use change (operations) | NA | NA |
| On-road vehicles | 131,889.76 | 2,162.13 |
| Treatment of waste on-site | NA | NA |
| Treatment of wastewater on-site | NA | NA |
| Treatment of waste off-site | 53,029.21 | 869.33 |
| Enteric fermentation | NA | NA |
| Manure management | NA | NA |
| **Total** | **4,673,774.59** | **76,619.26** |

Note: NA indicates that emissions were not quantified and/or are not applicable.



## User Inputs

Note: NA indicates that emissions were not quantified and/or activity is not applicable.

**Material Inputs**

| Material Type | Quantity | Unit | Geographical Sourcing |
|---|---|---|---|
| Aluminum | 5,000.00 | Tons | Unknown |
| Asphalt | 2,500.00 | Tons | Domestic |
| Brick | 7,000.00 | Tons | Unknown |
| Concrete | 150,000.00 | Tons | Domestic |
| Glass | 1,500.00 | Tons | Unknown |
| Insulation (residential) | 0.00 | Tons | Unknown |
| Insulation (commercial) | 500.00 | Tons | Unknown |
| Steel | 10,000.00 | Tons | Unknown |
| Wood Products | 3,000.00 | Tons | Unknown |

**Employee Commuting**

| Construction Stage | Daily Average Number of Employees Commuting |
|---|---|
| Demolition | 15 |
| Site Preparation | 25 |
| Grading | 15 |
| Building Construction | 300 |
| Architectural Coatings | 40 |
| Paving and Landscaping | 40 |

| Transportation Mode | Percent of Employees |
|---|---|
| Single Occupancy Vehicle | 90% |
| Carpool | 10% |
| Motorcycle | 0% |
| Bus | 0% |
| Transit Rail | 0% |
| Bike/Walk | 0% |

| | |
|---|---|
| **Average One-Way Commute Length (miles)** | 13.2 |

**Construction Equipment**

| Equipment Type | Fuel Type | Number of Hours per Day by Construction Stage | | | | | |
|---|---|---|---|---|---|---|---|
| | | Demolition | Site Preparation | Grading | Building Construction | Architectural Coatings | Paving and Landscaping |
| Air Compressors | Diesel | 0 | 0 | 0 | 0 | 6 | 0 |
| Cement and Mortar Mixers | Diesel | 0 | 0 | 0 | 0 | 0 | 0 |
| Concrete/Industrial Saws | Diesel | 8 | 0 | 0 | 0 | 0 | 0 |
| Cranes | Diesel | 0 | 0 | 0 | 7 | 0 | 0 |
| Excavators | Diesel | 24 | 0 | 16 | 0 | 0 | 0 |
| Forklifts | Diesel | 0 | 0 | 0 | 24 | 0 | 0 |
| Generator Sets | Diesel | 0 | 0 | 0 | 8 | 0 | 0 |
| Graders | Diesel | 0 | 0 | 8 | 0 | 0 | 0 |
| Pavers | Diesel | 0 | 0 | 0 | 0 | 0 | 16 |
| Paving Equipment | Diesel | 0 | 0 | 0 | 0 | 0 | 16 |
| Rollers | Diesel | 0 | 0 | 0 | 0 | 0 | 16 |
| Rubber Tired Dozers | Diesel | 16 | 24 | 8 | 0 | 0 | 0 |
| Scrapers | Diesel | 0 | 0 | 16 | 0 | 0 | 0 |
| Tractors/Loaders/Backhoes | Diesel | 0 | 32 | 16 | 21 | 0 | 0 |
| Welders | Diesel | 0 | 0 | 0 | 8 | 0 | 0 |

**Land Use Change**

| Land Use Type | Acres | | |
|---|---|---|---|
| | Pre-Construction | Post-Construction | Post-Operation |
| Wetlands, forested | 0.00 | 0.00 | NA |
| Wetlands, not forested | 40.30 | 20.00 | NA |
| Forest | 62.60 | 60.00 | NA |
| Rivers and streams | 0.00 | 0.00 | NA |
| Brush and grassland | 17.80 | 0.00 | NA |
| Cropland | 234.70 | 0.00 | NA |
| Livestock rangeland/pastureland | 0.00 | 0.00 | NA |
| Lawn/landscaping | 0.00 | 129.30 | NA |
| Green Infrastructure: Constructed wetlands, paved | 0.00 | 0.00 | NA |
| Green Infrastructure: Constructed wetlands, vegetated | 0.00 | 20.00 | NA |
| Green Infrastructure: Constructed green roofs | 0.00 | 0.00 | NA |
| Green Infrastructure: Constructed permeable pavements | 0.00 | 0.00 | NA |
| Impervious surface | 3.90 | 130.00 | NA |
| Stormwater pond (wet sedimentation basin) | 0.00 | 0.00 | NA |

| Trees | Number |
|---|---|
| Number of mature trees removed | 1000 |
| Number of new trees planted | 500 |

**Construction Waste**

| Material Type | Quantity (tons) |
|---|---|
| Aluminum | 0.00 |
| Asphalt | 0.00 |
| Brick | 280.00 |
| Concrete | 4500.00 |
| Glass | 45.00 |
| Insulation | 50.00 |
| Steel | 0.00 |
| Wood Products | 150.00 |
| Mixed Waste | 0.00 |

**Building Energy Consumption**

| Building Type | Energy Intensity (Btu/sq ft/year) | | | |
|---|---|---|---|---|
| | Electricity | Natural Gas | Propane | Kerosene or Fuel Oil |
| Residential | 18,096.91 | 24,460.01 | 3,619.38 | 233.51 |
| Commercial | 30,766.13 | 35,534.88 | 0.00 | 1,661.56 |
| Industrial | 229,952.20 | 656,392.90 | 0.00 | 8,191.66 |
| Institutional | 46,860.06 | 48,219.03 | 0.00 | 3,659.93 |
| Other | 0.00 | 0.00 | 0.00 | 0.00 |

**Emissions from Coal Production**

| Coal Type | Incremental Production (tons/year) |
|---|---|
| Mixed Coal | NA |
| Anthracite Coal | NA |
| Bituminous Coal | NA |
| Subbituminous Coal | NA |
| Lignite Coal | NA |
| Coal Coke | NA |

**Emissions from Natural Gas and Oil Products**

| Fuel Type | Incremental Throughput | Unit |
|---|---|---|
| Natural Gas | NA | Cubic Feet/year |
| Renewable Natural Gas | NA | Cubic Feet/year |
| Propane | NA | Gallons/year |
| Gasoline | NA | Gallons/year |
| Distillate Fuel Oil No. 1 | NA | Gallons/year |
| Distillate Fuel Oil No. 2 | NA | Gallons/year |
| Distillate Fuel Oil No. 4 | NA | Gallons/year |
| Residual Fuel Oil No. 5 | NA | Gallons/year |
| Residual Fuel Oil No. 6 | NA | Gallons/year |
| Liquified Petroleum Gas (LPG) | NA | Gallons/year |
| Kerosene | NA | Gallons/year |
| Kerosene Jet Fuel | NA | Gallons/year |
| Biodiesel 100 | NA | Gallons/year |
| Biodiesel 20 | NA | Gallons/year |
| Renewable Diesel | NA | Gallons/year |

**Natural Gas Assumptions**

| | |
|---|---|
| **Percent Reduction in Leakage and Venting Emissions** | NA |
| **Leakage and Venting Emissions ($kgCO_2e$/MMBtu)** | NA |

**Industrial Processes**

| Product Type | Quantity (tons/year) | Emission Factor ($kgCO_2e$/ton) |
|---|---|---|
| Cement | NA | NA |
| Lime | NA | NA |
| Limestone Use | NA | NA |
| Magnesium | NA | NA |
| Iron and Steel | NA | NA |
| Ammonia | NA | NA |
| Aluminum | NA | NA |
| Nitric Acid | NA | NA |

**HFC Leakage**

| Building Type | Percent of Building Area Utilized |
|---|---|
| Residential | 100% |
| Commercial | 100% |
| Industrial | 100% |
| Institutional | 100% |

**On-Road Vehicles**

| Speed Bin (miles/hr) | Additional VMT (miles/year) |
|---|---|
| Fleet Average | 10000000 |
| 0-30 | 0 |
| 31-55 | 0 |
| 56-75 | 0 |

**Treatment of Waste On-Site**

| Waste Treatment Practice | Quantity of Waste Treated (tons/year) |
|---|---|
| | NA |
| | NA |
| | NA |

**Treatment of Wastewater On-Site**

| | |
|---|---|
| **Population Served by Treatment Plant** | NA |

| Product Type | Production (MT/year) |
|---|---|
| | NA |

**Treatment of Waste Off-Site**

| Activity | Quantity | Waste Generation Rate | Unit |
|---|---|---|---|
| Number of single family households | 0 | 7.00 | lb/household/day |
| Number of employees (commercial) | 100 | 10.53 | lb/employee/day |
| Number of employees (industrial) | 900 | 8.93 | lb/employee/day |
| Number of employees (institutional) | 0 | 3.55 | lb/employee/day |
| Visitors per year (public venues) | 0 | 1.72 | lb/visitor |

| Waste Treatment Practice | Percent of Waste |
|---|---|
| Recycled | 0% |
| Composted | 0% |
| Landfilled | 100% |
| Combusted | 0% |

**Enteric Fermentation and Manure Management**

| Livestock Type | Population | Percentage of Manure Management System | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Anaerobic digester | Anaerobic lagoon - liquid | Cattle deep litter | Composting | Daily spread | Deep pit | Dry lot | Liquid/ slurry | Pasture, range, paddock | Poultry with litter | Poultry without litter | Solid storage |
| Bulls | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Beef cows | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Beef heifers | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Steer stockers | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Heifer stockers | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Feedlot beef | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Beef calves | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dairy heifers | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dairy cows | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dairy calves | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Swine, <55 lbs | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Swine 55-330 lbs | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Swine 330+ lbs | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Poultry, layers | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Poultry, pullets | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Poultry, chickens | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Poultry, broilers | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Turkeys | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

| | |
|---|---|
| **Percent of manure applied or sold for application to agricultural soils (pasture or cropland) as fertilizer** | 0% |

## Notes

| | |
|---|---|
| General Notes | |
| Material inputs | |
| Transportation of material inputs | |
| Employee commuting | |
| Construction equipment | |
| Land use change (construction) | |
| Construction waste | |
| Building energy consumption | |
| Coal production | |
| Natural gas and oil products | |
| Industrial processes | |
| HFC leakage | |
| Land use change (operations) | |
| On-road vehicles | |
| Treatment of waste on-site | |
| Treatment of wastewater on-site | |
| Treatment of waste off-site | |
| Enteric fermentation | |
| Manure management | |
| Mitigation Measures | |
| Adaptation Strategies | |

# Minnesota Climate Calculator: Project Summary Report

**Date Prepared:** 2/11/2026

*The results shown below were generated using the Minnesota Climate Calculator. The emissions quantified account for the full greenhouse gas impact of a potential project throughout the construction and operational phases of the project. This includes emissions from project activities that occur on-site as well as emissions that occur upstream and downstream of the project. The results are based on user inputs and assumptions; actual project emissions may vary.*

## Background Information

| | |
|---|---|
| Project Name | Big Woods Business Park - Scenario 2 |
| Project Category (primary) | Subp. 14, Industrial, commercial, institutional facilities |
| Project Category (secondary) | |
| Location (County) | Carver |
| Construction Start Date | 6/1/2026 |
| Operational Year | 2037 |
| Operational Lifetime (Years) | 50 |

| | |
|---|---|
| Electricity Provider | Grid Average |
| Portion of Building Electricity Consumption to be Generated On-Site via Renewables or Supplied through the Purchase of Renewable Energy Credits (RECs) | 0% |
| Portion of Building Natural Gas Consumption to be Supplied from Renewable Sources | 0% |

| | |
|---|---|
| Building Construction Project? | Yes |

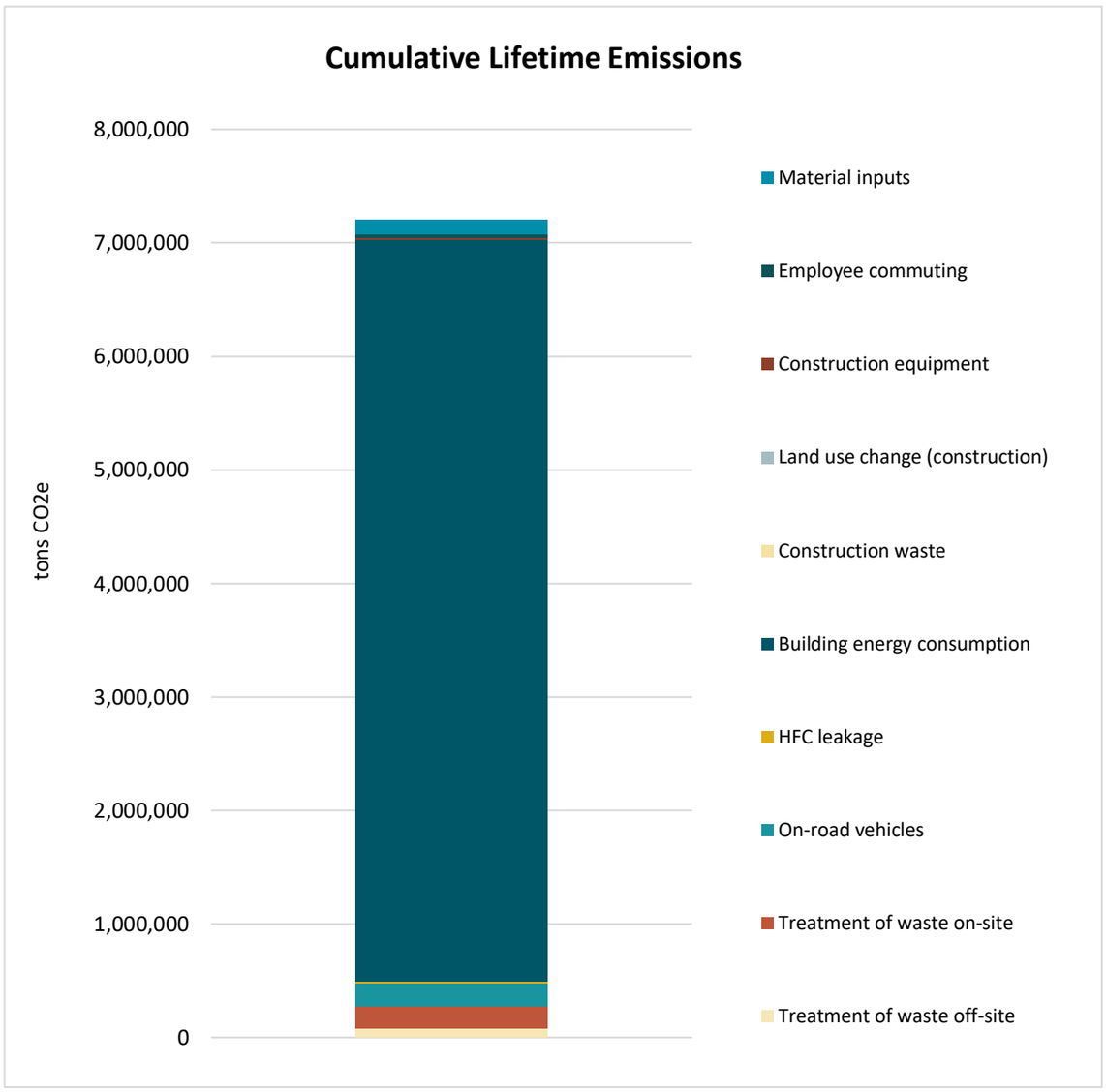
| Construction Stage | Duration (Days) |
|---|---|
| Demolition | 359 |
| Site Preparation | 215 |
| Grading | 556 |
| Building Construction | 5,565 |
| Architectural Coatings | 395 |
| Paving and Landscaping | 395 |

## Summary Results

| | |
|---|---|
| Project Lifetime | 61 |
| Unit | tons |

| Phase | $CO_2e$ Emissions | |
|---|---|---|
| | Cumulative | Annualized |
| **Construction** | | |
| Material inputs | 128,332.38 | 2,103.81 |
| Transportation of material inputs | 3,298.89 | 54.08 |
| Employee commuting | 27,581.35 | 452.15 |
| Construction equipment | 13,110.44 | 214.93 |
| Land use change (construction) | 48.49 | 0.79 |
| Construction waste | 203.38 | 3.33 |
| **Operation** | | |
| Building energy consumption | 6,533,135.15 | 107,100.58 |
| Coal production | NA | NA |
| Natural gas and oil products | NA | NA |
| Industrial processes | NA | NA |
| HFC leakage | 21,151.68 | 346.75 |
| Land use change (operations) | NA | NA |
| On-road vehicles | 197,834.64 | 3,243.19 |
| Treatment of waste on-site | NA | NA |
| Treatment of wastewater on-site | NA | NA |
| Treatment of waste off-site | 79,543.81 | 1,304.00 |
| Enteric fermentation | NA | NA |
| Manure management | NA | NA |
| **Total** | **7,004,240.20** | **114,823.61** |

Note: NA indicates that emissions were not quantified and/or are not applicable.



## User Inputs

Note: NA indicates that emissions were not quantified and/or activity is not applicable.

**Material Inputs**

| Material Type | Quantity | Unit | Geographical Sourcing |
|---|---|---|---|
| Aluminum | 7,500.00 | Tons | Unknown |
| Asphalt | 3,750.00 | Tons | Domestic |
| Brick | 10,500.00 | Tons | Unknown |
| Concrete | 225,000.00 | Tons | Domestic |
| Glass | 2,250.00 | Tons | Unknown |
| Insulation (residential) | 0.00 | Tons | Unknown |
| Insulation (commercial) | 750.00 | Tons | Unknown |
| Steel | 15,000.00 | Tons | Unknown |
| Wood Products | 4,500.00 | Tons | Unknown |

**Employee Commuting**

| Construction Stage | Daily Average Number of Employees Commuting |
|---|---|
| Demolition | 25 |
| Site Preparation | 35 |
| Grading | 25 |
| Building Construction | 450 |
| Architectural Coatings | 70 |
| Paving and Landscaping | 80 |

| Transportation Mode | Percent of Employees |
|---|---|
| Single Occupancy Vehicle | 90% |
| Carpool | 10% |
| Motorcycle | 0% |
| Bus | 0% |
| Transit Rail | 0% |
| Bike/Walk | 0% |

| | |
|---|---|
| **Average One-Way Commute Length (miles)** | 13.2 |

**Construction Equipment**

| Equipment Type | Fuel Type | Number of Hours per Day by Construction Stage | | | | | |
|---|---|---|---|---|---|---|---|
| | | Demolition | Site Preparation | Grading | Building Construction | Architectural Coatings | Paving and Landscaping |
| Air Compressors | Diesel | 0 | 0 | 0 | 0 | 6 | 0 |
| Cement and Mortar Mixers | Diesel | 0 | 0 | 0 | 0 | 0 | 0 |
| Concrete/Industrial Saws | Diesel | 8 | 0 | 0 | 0 | 0 | 0 |
| Cranes | Diesel | 0 | 0 | 0 | 7 | 0 | 0 |
| Excavators | Diesel | 24 | 0 | 16 | 0 | 0 | 0 |
| Forklifts | Diesel | 0 | 0 | 0 | 24 | 0 | 0 |
| Generator Sets | Diesel | 0 | 0 | 0 | 8 | 0 | 0 |
| Graders | Diesel | 0 | 0 | 8 | 0 | 0 | 0 |
| Pavers | Diesel | 0 | 0 | 0 | 0 | 0 | 16 |
| Paving Equipment | Diesel | 0 | 0 | 0 | 0 | 0 | 16 |
| Rollers | Diesel | 0 | 0 | 0 | 0 | 0 | 16 |
| Rubber Tired Dozers | Diesel | 16 | 24 | 8 | 0 | 0 | 0 |
| Scrapers | Diesel | 0 | 0 | 16 | 0 | 0 | 0 |
| Tractors/Loaders/Backhoes | Diesel | 0 | 32 | 16 | 21 | 0 | 0 |
| Welders | Diesel | 0 | 0 | 0 | 8 | 0 | 0 |

**Land Use Change**

| Land Use Type | Acres | | |
|---|---|---|---|
| | Pre-Construction | Post-Construction | Post-Operation |
| Wetlands, forested | 0.00 | 0.00 | NA |
| Wetlands, not forested | 40.30 | 15.00 | NA |
| Forest | 62.60 | 60.00 | NA |
| Rivers and streams | 0.00 | 0.00 | NA |
| Brush and grassland | 17.80 | 0.00 | NA |
| Cropland | 234.70 | 0.00 | NA |
| Livestock rangeland/pastureland | 0.00 | 0.00 | NA |
| Lawn/landscaping | 0.00 | 59.30 | NA |
| Green Infrastructure: Constructed wetlands, paved | 0.00 | 0.00 | NA |
| Green Infrastructure: Constructed wetlands, vegetated | 0.00 | 25.00 | NA |
| Green Infrastructure: Constructed green roofs | 0.00 | 0.00 | NA |
| Green Infrastructure: Constructed permeable pavements | 0.00 | 0.00 | NA |
| Impervious surface | 3.90 | 200.00 | NA |
| Stormwater pond (wet sedimentation basin) | 0.00 | 0.00 | NA |

| Trees | Number |
|---|---|
| Number of mature trees removed | 1000 |
| Number of new trees planted | 500 |

**Construction Waste**

| Material Type | Quantity (tons) |
|---|---|
| Aluminum | 0.00 |
| Asphalt | 0.00 |
| Brick | 420.00 |
| Concrete | 6750.00 |
| Glass | 67.50 |
| Insulation | 75.00 |
| Steel | 0.00 |
| Wood Products | 225.00 |
| Mixed Waste | 0.00 |

**Building Energy Consumption**

| Building Type | Energy Intensity (Btu/sq ft/year) | | | |
|---|---|---|---|---|
| | Electricity | Natural Gas | Propane | Kerosene or Fuel Oil |
| Residential | 18,096.91 | 24,460.01 | 3,619.38 | 233.51 |
| Commercial | 30,766.13 | 35,534.88 | 0.00 | 1,661.56 |
| Industrial | 229,952.20 | 656,392.90 | 0.00 | 8,191.66 |
| Institutional | 46,860.06 | 48,219.03 | 0.00 | 3,659.93 |
| Other | 0.00 | 0.00 | 0.00 | 0.00 |

**Emissions from Coal Production**

| Coal Type | Incremental Production (tons/year) |
|---|---|
| Mixed Coal | NA |
| Anthracite Coal | NA |
| Bituminous Coal | NA |
| Subbituminous Coal | NA |
| Lignite Coal | NA |
| Coal Coke | NA |

**Emissions from Natural Gas and Oil Products**

| Fuel Type | Incremental Throughput | Unit |
|---|---|---|
| Natural Gas | NA | Cubic Feet/year |
| Renewable Natural Gas | NA | Cubic Feet/year |
| Propane | NA | Gallons/year |
| Gasoline | NA | Gallons/year |
| Distillate Fuel Oil No. 1 | NA | Gallons/year |
| Distillate Fuel Oil No. 2 | NA | Gallons/year |
| Distillate Fuel Oil No. 4 | NA | Gallons/year |
| Residual Fuel Oil No. 5 | NA | Gallons/year |
| Residual Fuel Oil No. 6 | NA | Gallons/year |
| Liquified Petroleum Gas (LPG) | NA | Gallons/year |
| Kerosene | NA | Gallons/year |
| Kerosene Jet Fuel | NA | Gallons/year |
| Biodiesel 100 | NA | Gallons/year |
| Biodiesel 20 | NA | Gallons/year |
| Renewable Diesel | NA | Gallons/year |

**Natural Gas Assumptions**

| | |
|---|---|
| **Percent Reduction in Leakage and Venting Emissions** | NA |
| **Leakage and Venting Emissions ($kgCO_2e$/MMBtu)** | NA |

**Industrial Processes**

| Product Type | Quantity (tons/year) | Emission Factor ($kgCO_2e$/ton) |
|---|---|---|
| Cement | NA | NA |
| Lime | NA | NA |
| Limestone Use | NA | NA |
| Magnesium | NA | NA |
| Iron and Steel | NA | NA |
| Ammonia | NA | NA |
| Aluminum | NA | NA |
| Nitric Acid | NA | NA |

**HFC Leakage**

| Building Type | Percent of Building Area Utilized |
|---|---|
| Residential | 100% |
| Commercial | 100% |
| Industrial | 100% |
| Institutional | 100% |

**On-Road Vehicles**

| Speed Bin (miles/hr) | Additional VMT (miles/year) |
|---|---|
| Fleet Average | 15000000 |
| 0-30 | 0 |
| 31-55 | 0 |
| 56-75 | 0 |

**Treatment of Waste On-Site**

| Waste Treatment Practice | Quantity of Waste Treated (tons/year) |
|---|---|
| | NA |
| | NA |
| | NA |

**Treatment of Wastewater On-Site**

| | |
|---|---|
| **Population Served by Treatment Plant** | NA |

| Product Type | Production (MT/year) |
|---|---|
| | NA |

**Treatment of Waste Off-Site**

| Activity | Quantity | Waste Generation Rate | Unit |
|---|---|---|---|
| Number of single family households | 0 | 7.00 | lb/household/day |
| Number of employees (commercial) | 150 | 10.53 | lb/employee/day |
| Number of employees (industrial) | 1350 | 8.93 | lb/employee/day |
| Number of employees (institutional) | 0 | 3.55 | lb/employee/day |
| Visitors per year (public venues) | 0 | 1.72 | lb/visitor |

| Waste Treatment Practice | Percent of Waste |
|---|---|
| Recycled | 0% |
| Composted | 0% |
| Landfilled | 100% |
| Combusted | 0% |

**Enteric Fermentation and Manure Management**

| Livestock Type | Population | Percentage of Manure Management System | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Anaerobic digester | Anaerobic lagoon - liquid | Cattle deep litter | Composting | Daily spread | Deep pit | Dry lot | Liquid/ slurry | Pasture, range, paddock | Poultry with litter | Poultry without litter | Solid storage |
| Bulls | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Beef cows | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Beef heifers | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Steer stockers | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Heifer stockers | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Feedlot beef | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Beef calves | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dairy heifers | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dairy cows | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dairy calves | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Swine, <55 lbs | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Swine 55-330 lbs | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Swine 330+ lbs | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Poultry, layers | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Poultry, pullets | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Poultry, chickens | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Poultry, broilers | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Turkeys | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

| | |
|---|---|
| **Percent of manure applied or sold for application to agricultural soils (pasture or cropland) as fertilizer** | 0% |

## Notes

| | |
|---|---|
| General Notes | |
| Material inputs | |
| Transportation of material inputs | |
| Employee commuting | |
| Construction equipment | |
| Land use change (construction) | |
| Construction waste | |
| Building energy consumption | |
| Coal production | |
| Natural gas and oil products | |
| Industrial processes | |
| HFC leakage | |
| Land use change (operations) | |
| On-road vehicles | |
| Treatment of waste on-site | |
| Treatment of wastewater on-site | |
| Treatment of waste off-site | |
| Enteric fermentation | |
| Manure management | |
| Mitigation Measures | |
| Adaptation Strategies | |

# Adaptation Strategies (Step 6)

*Use the checkboxes below to identify adaptation strategies relevant to selected climate trends and project characteristics. The list of adapation strategies will filter to show strategies that align with both the climate trends and project characteristics selected. Ensure Macros are enabled for filters to work (see the User Guide tab for instructions on enabling macros). Use the column on the far left to select strategies you plan to implement as part of your proposed project. Select Generate PDF button once you've made your desired selections.*

### Step 1: Select Climate Trends

- ☑ Heavier, more damaging rain
- ☑ Average annual precipitation increasing
- ☑ Average annual temperature increasing
- ☑ Increasing risk of extreme heat and heatwaves
- ☑ Early thawing (cold weather warming)
- ☑ Increasing risk of drought

### Step 2: Select Project Characteristics

- ☑ Hazardous waste
- ☑ Agriculture
- ☑ Livestock
- ☑ Critical infrastructure
- ☑ Waste management
- ☑ New or upgraded buildings
- ☑ Subsurface infrastructure
- ☑ Water management
- ☑ Construction
- ☑ Increased impervious surface
- ☑ New, expanded, or rebuilt transportation route

Reset Climate Trends | Reset Project Characteristics | Select All Unhidden Strategies | Reset all Selected Strategies | Generate PDF

| Selection | ID | Adaptation Strategies | Additional Information |
|---|---|---|---|
| | S-1A-01 | Clear floodplains and other areas subject to flooding of hazardous contaminants in advance of a flood event from extreme precipitation. | Develop a coordination plan to clear hazardous contaminants ahead of and/or after a flood event. |
| | S-1A-02 | Conduct ongoing and pre-event stormwater infrastructure maintenance. | Clean out the storm drains and culverts; Ensure that all maintenance equipment are readily available and working for extreme events (e.g., generators). |
| | S-1A-03 | Consider and adjust to changes in agricultural pests, due to increased precipitation, including the distribution and prevalence of flood-tolerant pests, and/or increased temperatures. | Monitor changes in distribution/prevalence of pests in the region; utilize plant selection / rotational strategies to address pests. |
| | S-1A-04 | Consider and adopt soil health best practices to address increased precipitation, including flood-affected cropping patterns, and/or increased temperatures. | Plant cover crops; Plant more deep-rooted plants; Adopt no tillage approach or alter tiling to reduce erosion. |
| | S-1A-05 | Enhance/develop adaptive stormwater management practices and technologies. | Implement natural buffers and green infrastructure (e.g., bioswales, tree trench; blue roof; vegetated roof; bioretention; green and blue roofs; preserve or build natural features/ecosystems; Use certified/qualified green infrastructure contractors and engineers; Maintain and/or expand the urban tree canopy); Ensure adequate culvert sizing and/or replace undersized culverts; Remove impervious surfaces and/or install permeable surfaces; Ensure sufficient water storage capacity for extreme flooding; Install underground storage systems to detain runoff in underground receptacles (e.g., culverts, engineered stormwater detention vaults, or perforated pipes); Build a retention pond to manage stormwater; Implement enhanced roof access to inspect and maintain roof and drainage system; Install oversized roof drains; use smart ponds. |
| | S-1A-06 | Incorporate flood-proofing measures into new or upgraded facilities/assets. | Dry or wet-proof facilities (e.g., apply a waterproof veneer); Waterproof key equipment; Install back-up power; Conduct pre-flood event sandbagging; Install hard flood protection structures (e.g., floodwall, levees, dikes); Install removable barriers; Have movable assets; Seal buildings; Place critical equipment in waterproof containers or foundation systems; Consider elevation when selecting the site (e.g., Elevate the facilities and/or assets to be above the flood level). |
| | S-1A-07 | Flood-proof facilities/assets using natural buffers and green infrastructure. | Maintain and/or expand the urban tree canopy; Use green roofs; Preserve or build natural features/ecosystems; Use certified/qualified green infrastructure contractors and engineers. |
| | S-1A-08 | Create redundancy for routes in case of a disruption from an extreme precipitation event. | Expand the active transportation network (e.g., pedestrian walkways, bike routes); Identify alternative routes and evacuation routes in the case of an emergency; Create a map of detours. |
| | S-1A-09 | Implement mechanisms to ensure roadways can withstand increased precipitation and extreme precipitation events. | Increase the capacity of the drainage system; elevate roadways; incorporate green infrastructure for stormwater management (e.g., revegetate with native/deep rooted plants, trees, swale, raingardens); Install permeable pavements; Install ribbin curbs or curb cuts; Conduct regular maintenance and inspections of drainage systems and culverts to make sure they are clear of debris. See climate adaptation materials from New York and Copenhagen for additional strategies to manage cloudburst. |
| | S-1A-10 | Ensure there is adequate redundancy and/or backup energy resources available to maintain necessary operations during extreme precipitation events. | Implement renewable energy and smart grid technology to optimize energy distribution and reduce outages; Develop off-grid sources for redundant power supply; Install easy hookups for temporary power; Install backup generators; Diversify energy sources such as by installing renewable energy; Install battery storage; Incorporate multiple power supplies; Implement a microgrid with integrated energy storage systems; Join a community energy project to pool resources; Utilize a combined heat and power (CHP) system; Ensure these systems are designed to be resilient during a projected extreme flood event. |
| | S-1A-11 | Harden the energy infrastructure systems to withstand extreme precipitation events. | Bury distribution lines; Elevate critical infrastructure above flood levels; Waterproof or seal equipment; Improve drainage systems around critical infrastructure. |
| | S-1A-12 | Improve farm drainage and management systems to address increased runoff and prevent any waterlogging or excessive build up of mud considering increases in average and extreme precipitation without contributing to increased erosion at outlets. | Install subsurface drainage systems; Install permeable surfaces such as for farm roads; Build retention ponds; Plant native and/or deep-rooted vegetation to buffer runoff; Ensure a slope of 3-5% for pastures and pens to facilitate water runoff; Add bedding (e.g., shavings, straw); Add rubber mats; Adjust regular maintenance as needed to remove excess mud and manure. |
| | S-1A-13 | Install additional shelter to protect livestock from prolonged wet conditions and extreme precipitation events. | Install run-in sheds; Maintain and/or plant trees; Use portable shelters; Install elevated flooring. |
| | S-1A-14 | Ensure waste management facilities are prepared for extreme precipitation events. | Waterproof waste storage (e.g., sealed containers; protective barriers); Improve drainage systems around the facility; Elevate the weigh station area to allow continued receipt of waste deliveries; Ensure access roads to the facility do not flood; When siting the facility, consider location (e.g., avoid floodplains; elevate the facility). |
| | S-1A-15 | Ensure water infrastructure can withstand projected increases in average and extreme precipitation. | Install stormwater outfall pumps/lift stations to drain water from the system if outfalls were to become submerged; Implement strong pumps for backflow prevention; Ensure adequate capacity for wastewater and stormwater collection or treatment; Increase water treatment capabilities; Incorporate backup generators and fuels sources, as applicable, in a location safe from flooding, for the water infrastructure system to provide a sustained minimal level of water services in the event of a power outage. |
| | S-1A-16 | Prepare for worst case scenarios regarding extreme precipitation. | Stockpile response materials and store them near areas that will likely need rapid repairs after an extreme rainfall event (e.g., pre-position emergency power generation capacity, portable pumps, and debris removal equipment); Implement early warning systems for extreme weather events. |
| | S-1A-17 | When siting and orienting a facility or asset, consider flood risk from increased precipitation and extreme precipitation events. | Avoid development in erosion zones and floodplains; Select a site at higher elevation. |
| | S-1A-18 | Maintain or improve ecosystem health to act as a natural barrier to increasing precipitation and extreme precipitation events. | Avoid or minimize development on key ecosystem areas (e.g., wetlands, trees) to maintain natural barriers; Revegetate with native and/or deep rooted plants to improve stormwater drainage and flooding; Develop a plan for future ecosystem health; If there is tree planting, plant tree species that are adapted to current and/or future climate conditions (see: https://extension.umn.edu/creating-climate-ready-woodlands/recommended-trees). |
| | S-1A-19 | Incorporate stormwater green infrastructure into site plans to mimic the water storage of natural systems. | Plan installation of bioswales, tree trenches, bioretention cells, raingardens, etc. sized to better address more frequent intense precipitation events. |
| | S-1A-20 | Develop post-storm plans for the construction site. | Develop a coordination plan to clear roads and drainage systems from debris after extreme precipitation events. |
| | S-1B-01 | Ensure hazardous materials are stored in temperature-controlled environments to accommodate for high temperatures and heatwaves. | Insulate storage areas; Install temperature monitoring systems with alarms to alert staff; Conduct regular inspections and maintenance of storage facilities. |
| | S-1B-02 | Consider alternative pavement surfaces and materials that are more heat-resistant to reduce heat impacts and surface temperatures. | Use light-colored asphalt pavement to reduce heat absorption and reflect radiation; Use materials for railway tracks and stations that are resistant to higher heat to prevent buckling and kinks; Install permeable surfaces especially for low-traffic areas such as roadside parking (along curbs) and parking lots. |
| | S-1B-03 | Incorporate flexible pavement design to accommodate thermal expansion and prevent buckling from high temperatures and heatwaves. | Design roads with additional thermal expansion joints; Incorporate polymer-modified asphalt in the pavement mix; Apply reflective coatings. |
| | S-1B-04 | Regularly monitor the condition of roadways and conduct maintenance to address wear and tear from high temperatures and heatwaves. | Implement regular maintenance schedules to address increased wear and tear; As needed, increase the use and frequency of preventative maintenance treatments (e.g., seal coats, crack seals); Install pavement sensors for extreme heat and road failure. |
| | S-1B-05 | Retain mature trees as part of design and during construction. | Inventory trees; mark boundaries around trees to avoid compaction and damage to trunks and roots. |
| | S-1B-06 | Use cooling technologies to reduce surface temperatures during periods of high temperatures and/or heatwaves. | Use reflective coating; Use high-reflectivity hardscape; Decrease impervious surfaces and/or install permeable surfaces; Incorporate green infrastructure (e.g., green roofs); Maintain and/or expand urban tree canopy. |
| | S-1B-07 | Consider and adjust to changes in the distribution and prevalence of heat-tolerant pests by incorporating changes into pest management for buildings and infrastructure. | Resist intrusion of termites as hardiness zones move north. |
| | S-1B-08 | Use building construction materials that maintain indoor temperatures and/or are resilient to increasing temperatures during high heat conditions and heatwaves. | Update building insulation for higher heat thresholds; Use reflective roofing materials; Install energy efficient windows (e.g., double-glazed windows); Install green roofs and/or green walls; Use light-colored building materials (e.g., cool roofing and sliding materials); Optimize natural ventilation. |
| | S-1B-09 | Consider and adjust to changes to agricultural systems because of increased temperatures, including the distribution and prevalence of heat-tolerant pests, heat-affected cropping patterns, and water management needs. | Monitor changes in distribution/prevalence of pests in the region; Plant cover crops; Install sensors to monitor soil moisture levels. |

| | | | |
|---|---|---|---|
| | S-1B-10 | Install cooling systems to protect livestock from heat stress during periods of high temperatures and/or heatwaves. | Install shade structures; Install fans or ventilation systems; Install misters or sprinklers; Install water troughs; Incorporate reflective materials for shelter roofing. |
| | S-1B-11 | Consider livestock breeds that are more tolerant to heat. | Introduce heat-tolerant cattle breeds. |
| | S-1B-12 | Consider how higher temperatures and heatwaves may increase decomposition rates and the need to improve waste management practices. | Install a temperature monitoring system to detect and manage heat build-up; Install waste infrastructure that can withstand higher temperatures such as landfill liners, odor control strategies for organics composting. |
| | S-1B-13 | Ensure subsurface infrastructure (e.g., pipes, SSTA installation) can withstand high temperatures and heatwaves. | Install sensors to monitor ground temperatures; Use thermal insulation; Implement cooling systems (e.g., ventilation shafts, cooling pipes); Install temperature sensors for monitoring. |
| | S-1B-14 | Ensure there is adequate redundancy and/or backup energy resources available to maintain necessary operations during increased cooling demand and/or an extreme heat event. | Implement renewable energy and smart grid technology to optimize energy distribution and reduce outages; Develop off-grid sources for redundant power supply; Install easy hookups for temporary power; Install backup generators; Diversify energy sources such as by installing renewable energy; Install battery storage; Incorporate multiple power supplies; Implement a microgrid with integrated energy storage systems; Join a community energy project to pool resources; Utilize a combined heat and power (CHP) system. |
| | S-1B-15 | Harden the energy infrastructure systems to withstand projected increasing temperatures and heatwaves. | Increase tension in transmission lines to reduce sag; Add external coolers to transformers; Use more heat-resistant materials (e.g., high-temperature conductors); Bury lines/cables. |
| | S-1B-16 | Upgrade the electrical systems to handle increased cooling demand especially from extreme heat events. | Consider renewable energy and smart grid technology to optimize energy distribution and reduce outages. |
| | S-1B-17 | Provide cooling systems for critical infrastructure or equipment sensitive to overheating during periods of high temperatures and/or heatwaves. | Install back up air conditioning units; Use battery-powered equipment which is less prone to overheating than gas-powered machinery. |
| | S-1B-18 | Implement cooling strategies for construction equipment vulnerable to high temperatures. | Provide cooling systems for equipment sensitive to overheating; Use battery-powered equipment which is less prone to overheating than gas-powered machinery. |
| | S-1B-19 | Increase the frequency of maintenance checks to ensure construction equipment is functioning optimally in high temperatures and during heatwaves. | Regularly check fluid levels, tire pressure, and hydraulic systems. |
| | S-1B-20 | Use cooling technologies to reduce heat impact on waste management systems during periods of high temperatures and/or heatwaves. | Implement cooling systems for waste facility; Install heat-resistant and sealed containers to store waste; Install green infrastructure on the facility (e.g., green roof; increased vegetation). |
| | S-1B-21 | Maintain or improve ecosystem health to mitigate heat from increasing temperatures and heatwaves. | Avoid or minimize development on key ecosystem areas (e.g., wetlands, trees) to maintain natural cooling systems; Develop a plan for future ecosystem health; If there is tree planting, plant tree species that are adapted to current and/or future climate conditions (see: https://extension.umn.edu/creating-climate-ready-woodlands/recommended-trees). |
| | S-1B-22 | Provide heat protective measures for construction staff who may be exposed to heat during work duties. | Consider different attire/uniforms, more breaks, more shade, more hydration stations, or telecommuting options. |
| | S-1C-01 | Consider impact of increased freeze/thaw cycles for design and construction of building and road foundations. | Use frost-resistant materials (e.g., frost-resistant concrete and asphalt) to minimize damage like cracking; Insulate foundations; Construct deeper foundations; Conduct regular maintenance and monitoring to inspect and repair damage. |
| | S-1C-02 | Consider changing thawing conditions when selecting or upgrading pipes. | Install PVC water pipes (rather than metal cast iron pipes) which are less expensive and easier to install than iron, to minimize breaks and ensure structural integrity. |
| | S-1C-03 | Regularly monitor the conditions of the construction site, roadway, etc. and conduct maintenance to reduce any degradation from increased temperatures and/or freeze/thaw cycles. | Implement regular monitoring and maintenance of potholes; Track thawing with sensors. |
| | S-1D-01 | For landscaping, use drought-tolerant plants or xeriscaping. | Plant more drought-tolerant options (e.g., succulents); Apply mulch around plants; Incorporate hardscaping (e.g., rocks). |
| | S-1D-02 | Consider more drought-tolerant plants for the farms and incorporate drought insights into water management practices. | Select more drought-tolerant plants like millet; Plant cover crops to maintain moisture; Implement efficient irrigation systems (e.g., drip irrigation); Install soil moisture sensors; Install rainwater harvesting infrastructure; Incorporate drought forecasts into farm planning to adjust planting schedules and irrigation accordingly. |
| | S-1D-03 | Reduce agricultural and irrigation water use/needs to account for drought conditions. | Adopt micro-irrigation technology (e.g., drip irrigation); Install soil moisture sensors; Plant more drought-resistant crops; Apply mulch; Implement rainwater harvesting systems; Plant cover crops to retain moisture. |
| | S-1D-04 | Install water storage to retain rainfall on the land for use to meet agricultural and irrigation needs. | Convert low spots that are currently in crop production but prone to flooding / washout into water storage areas. |
| | S-1D-05 | Incorporate water-efficient practices/technology into the waste management facility to account for drought conditions. | Use greywater for cleaning; Install rainwater harvesting systems; Use alternative water sources (e.g., reclaimed water). |
| | S-1D-06 | Ensure water infrastructure can withstand drought conditions. | Build infrastructure needed for aquifer storage and recovery; Diversify sources of water supply. |
| | S-1D-07 | Use technologies and strategies that recycle water for water management systems to account for drought conditions. | Establish systems to recycle water and use reclaimed water; Plumb buildings for greywater separation and reuse; Install wastewater treatment technology (e.g., a Living Machine) to recycle wastewater; Install greywater purification and reuse systems; Develop a closed-loop system. |
| | S-1D-08 | Install water-saving technologies indoors to account for drought conditions. | Use water-efficient household appliances (e.g., low-flow toilets, showerheads, and front-loading washers); Install water meters. |
| | S-1D-09 | Install water-saving technologies outdoors to account for drought conditions. | Install rainwater harvesting tanks; Plant native, deep-rooted, and/or drought-tolerant plants. |

# Mitigation Measures (Step 5)

*Use the filters in the table below to identify potential mitigation measures to reduce GHG emissions from the proposed project. Use the column on the far left to select measures you plan to implement. Select Generate PDF button once you've made your desired selections.*

Generate PDF

Select All Unhidden Measures

Reset all Selected Measures

| Select | Emissions Source | Phase | ID | Measure Title | Measure Description |
|---|---|---|---|---|---|
| | Material inputs | Construction | M-1A-01 | Use Sustainable Building Materials | Ensure sustainable building materials comprise at least 20% of total construction materials by volume weight. Sustainable building materials have a less carbon-intensive production process compared to their non-sustainable counterparts. This strategy could include the use of Environmental Product Declarations in bid decisions to ensure the most sustainable materials are procured. This strategy is general to any building material. See 1A-2 through 1A-6 for measures specific to wood, pavement, and cement. |
| | Material inputs | Construction | M-1A-02 | Source Wood Materials from Urban Wood Re-Use Program | Source wood materials from urban wood re-use programs. In areas where removed trees are sent to landfills, they decompose and contribute to methane emissions. Wood re-use programs extend a tree's lifetime by converting it into a range of products and prolonging the sequestration benefit. Re-uses range from logs, lumber, woodchips, mulch, compost, biochar, animal fuel, paper products, engineered wood, furniture, and cellulosic ethanol. |
| | Material inputs | Construction | M-1A-03 | Sustainable Pavements | Use lower-impact materials specially designed for roadway surfaces without compromising the pavement's ability to meet its engineering purposes. For example, warm-mix asphalt (WMA) production methods use temperatures that are 30 to 120 degrees Fahrenheit lower than those of traditional hot-mix asphalt. Because less energy is needed to heat the asphalt mix, less fuel is needed to produce WMA. Fuel consumption during WMA manufacturing is typically reduced by 20%. Sustainable pavements can also result in extended pavement life thereby reducing the need for energy-intensive maintenance. |
| | Material inputs | Construction | M-1A-04 | Purchase Cement from Manufacturers using Low-Carbon Mix Design for Calcination | Purchase cement from manufactures that use low-carbon mix design. Using a low-carbon mix design in addition to renewable power sources and carbon capture can significantly reduce emissions from calcination. The seven most impactful low-carbon mix alternatives, listed from smallest to largest carbon footprint, are 1) granulated blast furnace slag; 2) limestone calcined clay cement; 3) fly ash; 4) Portland limestone cement; 5) biochar; 6) early-stage carbon curing; and 7) recycled concrete aggregate. |
| | Material inputs | Construction | M-1A-05 | Purchase Cement from Efficient Cement Manufacturers | Purchase cement from manufacturers that have implemented measures to improve their production efficiency. Efficiency measures for cement manufacturing can reduce the demand for fuel by addressing the production process itself (such as switching from inefficient wet kilns to dry ones) or through technical and mechanical improvements (such as preventive maintenance to repair kiln leaks). |
| | Material inputs | Construction | M-1A-06 | Purchase Cement from Manufacturers Using Alternative Fuels | Purchase cement from manufacturers that use alternative fuels in their production method. Indirect emissions from burning fossil fuels to heat the kiln can be reduced by switching to alternative fuels, including natural gas, biomass, and waste-derived fuels such as tires, sewage sludge, and municipal solid wastes. |
| | Material inputs | Construction | M-1A-07 | Require Environmentally Responsible Purchasing | Implement an environmentally responsible purchasing plan. Examples of environmentally responsible purchases include but are not limited to: purchasing products made from recycled materials or with sustainable packaging; purchasing post-consumer recycled paper, paper towels, and stationery; purchasing and stocking communal kitchens with reusable dishes and utensils; choosing sustainable cleaning supplies; purchasing products from restaurants, farms, or ranches that source materials or goods from locations that use soil conservation practices; and leasing equipment from manufacturers who will recycle the components at their end of life. |
| | Material inputs | Construction | M-1A-08 | Use Recycled Asphalt Pavement | Use recycled concrete aggregate (RCA) or recycled asphalt pavement (RAP) in place of traditional asphalt. RCA and RAP help reduce energy consumption and thus GHGs of a project by displacing the volume of new asphalt. |
| | Transportation of material inputs | Construction | M-1B-01 | Use Local Building Materials | Ensure locally sourced or recycled construction materials comprise at least 20% of total construction materials by volume weight. Choosing locally made and distributed products reduces the distance required to transport the products from the distribution or manufacturing center to the project, thus reducing GHG emissions associated with transportation. |
| | Transportation of material inputs | Construction | M-1B-02 | Use SmartWay Certified Trucks | Use U.S. Environmental Protection Agency SmartWay certified trucks for deliveries and equipment transport. The SmartWay truck and trailer certification program sets voluntary standards for trucks and trailers that exhibit the highest fuel efficiency and emissions reductions. These tractors and trailers are outfitted at point of sale or retrofitted with equipment that significantly reduces fuel use and emissions including idle reduction technologies, improved aerodynamics, automatic tire inflation systems, advanced lubricants, advanced powertrain technologies, and low rolling resistance tires. |
| | Transportation of material inputs | Construction | M-1B-03 | Limit Delivery Windows | Limit deliveries of materials and equipment to the site to off-peak traffic congestion hours. This will avoid congested vehicle travel, which generates more emissions per mile than travel at free-flow speeds. |
| | Transportation of material inputs | Construction | M-1B-04 | Evaluate Efficient Delivery Options | Evaluate the feasibility of using freight locomotives and other more efficient modes of transportation to deliver construction equipment and vehicles instead of on-road haul trucks. More efficient modes of transportation will reduce delivery emissions and may reduce transportation costs. |
| | Employee commuting | Construction | M-1C-01 | Use Local Construction Contractors | Maximize use of local construction contractors. Contracting construction work with a local company reduces vehicle miles traveled associated with construction employee commute distances and, therefore, reduces emissions from vehicle fuel combustion. Local hire provisions may cover the entire workforce, or a percentage of the workforce based on the project size or employment type. |

| | | | | | |
|---|---|---|---|---|---|
| | Employee commuting | Construction | M-1C-02 | Develop a Ride Share Program for Construction Contractors | Develop a project specific ride share program to encourage carpools, shuttle vans, transit passes and/or secure bicycle parking for construction worker commutes. Ride share programs reduce employee commute vehicle miles traveled, which in turn reduces emissions from fuel combustion. |
| | Construction equipment | Construction | M-1D-01 | Use Renewable Diesel | Use renewable diesel in construction equipment and vehicles in lieu of similar vehicles powered by gasoline or diesel fuel. Tailpipe GHG emissions from renewable diesel are identical to tailpipe GHG emissions from conventional diesel; thus, the GHG benefits of renewable diesel come from the fact that it is produced from biomass. |
| | Construction equipment | Construction | M-1D-02 | Use Electric or Hybrid Powered Equipment | Use electric- or hybrid-powered construction equipment over conventional diesel-fueled counterparts. Replacing diesel-powered equipment with electric or hybrid-electric equipment reduces fossil fuel combustion and thus GHG emissions. However, all-electric equipment results in GHG emissions from the electricity used to charge the equipment. The indirect GHG emissions increase from electricity must be calculated in addition to the GHG emissions reduction from displaced fossil fuel combustion to estimate the total net GHG emissions reduction achieved by this measure if using all electric equipment. |
| | Construction equipment | Construction | M-1D-03 | Limit Heavy-Duty Diesel Vehicle Idling | Minimize idling time by requiring that equipment be shut down after five minutes when not in use. Provide clear signage that posts this requirement for workers at the entrances to the site and provide a plan for the enforcement of this requirement. Reducing idling time will reduce emissions from fuel combustion. |
| | Construction equipment | Construction | M-1D-04 | Maintain All Equipment in Proper Condition | Maintain all construction equipment in proper working condition and perform all preventative maintenance. Required maintenance includes compliance with all manufacturer's recommendations, proper upkeep and replacement of filters and mufflers, and maintenance of all engine and emissions systems in proper operating condition. Maintenance schedules should be detailed in an Air Quality Control Plan prior to commencement of construction. |
| | Construction equipment | Construction | M-1D-05 | Implement a Tire Inflation Program | Implement a tire inflation program on jobsites to confirm that equipment tires are correctly inflated. Check tire inflation when equipment arrives on site and every two weeks for equipment that remains on site. Check vehicles used for hauling materials off site weekly for correct tire inflation. Procedures for the tire inflation program should be documented in an Air Quality Management Plan prior to commencement of construction. |
| | Construction equipment | Construction | M-1D-06 | Use Conveyors Instead of Trucks | Move material onsite using electric conveyors instead of diesel trucks. While electric conveyors result in GHG emissions from the electricity used to charge the equipment, these indirect emissions are likely much less than emissions from diesel combustion. The indirect GHG emissions increase from electricity must be calculated in addition to the GHG emissions reduction from displaced fossil fuel combustion to estimate the total net GHG emissions reduction achieved by this measure. |
| | Construction equipment | Construction | M-1D-07 | Use Vehicles with Onroad Engines | Perform on-site material hauling during construction with trucks equipped with on-road engines. On-road certified engines often generate fewer GHG emissions per mile traveled when compared to off-road counterparts. |
| | Construction equipment | Construction | M-1D-08 | Evaluate Potential for On-Site Electrical Service | Confirm all feasible avenues have been explored for providing an electrical service drop to the construction site for temporary construction power. When generators must be used, use alternative fuels, such as propane, or solar power, to power generators to the maximum extent feasible. |
| | Construction equipment | Construction | M-1D-09 | Use High Efficiency Lighting | Reduce electricity use in temporary construction offices by using high efficiency lighting and requiring that heating and cooling units be Energy Star compliant. Require that all contractors develop and implement procedures for turning off computers, lights, air conditioners, heaters, and other equipment each day at close of business. |
| | Construction equipment | Construction | M-1D-10 | Develop a Water Efficiency Plan for Dust Control | Develop a plan to efficiently use water for adequate dust control since substantial amounts of energy can be consumed during the pumping or transporting of water. |
| | Land use change | Construction | M-1E-01 | Create New Open Space with Native Vegetation and Habitat | Convert previously developed areas to vegetated open spaces. By creating new vegetated areas from previously settled land, the project would sequester carbon dioxide that would not have been captured without the land conversion. Trees and other vegetation also incorporate carbon into their biomass during their growth phase (stored carbon). Prior to establishing new vegetation, conduct information gathering to assess the site history, soil type, hydrology, topography, and wildlife populations to determine appropriate native vegetation that will be well adapted to the local environment. Establish project goals, including GHG emission reduction and restoration native pollinator and/or native habitat. Other important goals may include expanding contiguous habitat and wildlife corridors for threatened or endangered species or increasing biodiversity. Create a detailed planting and management plan that describes actions for site preparation, planting, habitat enhancement, water management, and invasive species control. Maximize long-term establishment success by conducting regular monitoring. This may involve tracking plant growth, soil conditions, and wildlife movement. Utilize the monitoring data to perform regular maintenance. Adjust the management plan as needed to keep the site healthy and ensure attainment of project goal(s). |
| | Land use change | Construction | M-1E-02 | Expand Urban Tree Planting | Require tree planting in urban areas. Planting trees sequesters carbon dioxide while the trees are actively growing, thereby reducing GHGs. The amount of carbon dioxide sequestered depends on the type of tree and the duration of the active growing period. Urban trees may also provide shade, which can reduce the urban heat island effect and building cooling demands. Buildings that use less electricity for air conditioning reduce energy consumption and associated indirect GHG emission. The selection of tree type is critical to minimize the use of additional water. Trees that have high water demands that are met through GHG-intensive water (such as water transported over long distances) can impact the amount of GHG reductions achieved by this measure. |
| | Land use change | Construction | M-1E-03 | Clear Vegetation from Area to be Flooded | Reduce the amount of organic material flooded during construction. Flooded areas can result in organic decomposition, which can contribute to methane emissions. |

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| | Land use change | Construction | M-1E-04 | Land Agreements for Tree Removal | Engage landowners to develop a strategy for composting, chipping, processing, or reusing trees removed from their properties. The strategy should prioritize cost-effective options that minimize GHG emissions from stored tree carbon. If appropriate, consider retaining stumps or logs on the project site to improve soil health and support wildlife habitat. |
| | Land use change | Construction | M-1E-05 | Wetland Restoration | Restore wetlands to improve their function and ability to sequester GHG emissions. For example, rewet drained wetlands, remove non-native plans, exclude livestock, and plant native wetland species. Because wetlands can also represent a GHG source, ensure the restored wetland and selected restoration strategies will effectively reduce GHG emissions. |
| | Land use change | Construction | M-1E-06 | Afforestation | Plant trees on previously deforested land. |
| | Land use change | Construction | M-1E-07 | Establish a Carbon Sequestration Project | Establish a carbon sequestration project. Carbon emissions are sequestered by embedding the carbon in a structure that will hold the emissions and keep them out of the atmosphere. Sequestration can happen through biological, chemical, or physical processes. |
| | Construction waste | Construction | M-1F-01 | Maximize Deconstruction during Site Preparation | Minimize energy used during site preparation by deconstructing existing structures to the greatest extent feasible. This can also reduce transportation trips required to transport waste products, which in turn reduces vehicle fuel combustion and associated emissions. |
| | Construction waste | Construction | M-1F-02 | Recycle Waste Paint | Recycle waste paint during construction. Recycling waste paint reduces GHG emissions from raw material sourcing and paint production. If the process of recycling waste paint is less carbon-intensive than the processes required to harvest and produce new paint, recycling results in a net reduction in GHG emissions. |
| | Construction waste | Construction | M-1F-03 | Recycle Demolished Construction Material | Recycle general construction waste. Recycling demolished construction material reduces GHGs by displacing new construction materials, thereby reducing the need for new raw material acquisition and manufacturing. If the process of recycling construction materials is less carbon-intensive than the processes required to harvest and produce new construction materials, recycling results in a net reduction in GHG emissions. Using local recycled construction material would also reduce emissions associated with the transportation of new construction materials, which are typically manufactured farther away from a project site. Finally, recycling avoids sending materials to landfills. Wood-based materials decompose in landfills and contribute to methane emissions. |
| | Building energy consumption | Operation | M-2A-01 | Require Energy Efficient Appliances | Install ENERGY STAR-certified appliances that exceed the energy efficiency of conventional appliances. By committing to more efficient appliances, the building's energy use is reduced, thereby reducing GHG emissions. |
| | Building energy consumption | Operation | M-2A-02 | Install Alternative Type of Water Heater in Place of Gas Storage Tank Heater | Install water heaters that are less emissions intensive than a natural gas conventional storage tank water heater. Alternatives may include electric conventional storage tanks, solar water heaters with natural gas backup, or solar water heaters with electric backup. Each alternative reduces GHG emissions in a slightly different way. An electric storage tank heater displaces natural gas consumption with electricity use, replacing more emissions-intensive natural gas with less emissions-intensive electricity. A solar water heater with electric backup reduces GHG emissions by displacing natural gas with zero-emission solar energy when water is heated by the system's solar collectors and grid electricity when the back-up function is utilized. A solar water heater with natural gas backup reduces emissions by displacing natural gas with solar energy when water is heated by the solar collectors. |
| | Building energy consumption | Operation | M-2A-03 | Limit Wood Burning Devices and Natural Gas/Propane Fireplaces | Prohibit installation of any wood burning devices (i.e., woodstoves and fireplaces) or natural gas or propane fireplaces. This avoids the combustion of biomass, natural gas, and propane, thereby reducing associated biogenic and non-biogenic GHG emissions. The most efficient alternatives to wood burning devices or gas fireplaces are electric fireplace inserts and electric heat pumps. |
| | Building energy consumption | Operation | M-2A-04 | Install Electric Ranges in Place of Gas Ranges | Install electric ranges (i.e., cooktop plus oven) in place of gas ranges. An electric range displaces natural gas consumption with electricity use, replacing a more emissions-intensive fossil fuel-based source of energy with electricity from the grid that is increasingly transitioning to renewable sources. |
| | Building energy consumption | Operation | M-2A-05 | Install Electric Heat Pumps | Install electric heat pumps as alternatives to conventional furnaces or air conditioners. Electric heat pumps use electricity to transfer heat between cool and warm spaces to either provide cooling or heating. When cooling is needed during the summer months, the pumps move warmer inside air to outside. The pumps operate in reverse during the winter, moving warmer outdoor air into the building to provide heat. Because heat pumps move warm air instead of generating heat, they are more efficient than conventional heating and cooling systems. When electric heat pumps replace fossil-fuel heating or cooling sources, they achieve a dual efficiency and decarbonization benefit. The most common types of heat pumps collect heat from the air (are air-to-air), water (water-to-air), or ground (geothermal-to-air). The performance and emissions reductions achieved by electric heat pumps depend heavily on the system type, cooling and heating loads, climate zone, season, and other project-specific variables. |
| | Building energy consumption | Operation | M-2A-06 | Require Energy Efficient Boilers | Install boilers with higher energy efficiencies than what is required by regulation. Improving boiler efficiency decreases fuel consumption for the same amount of energy output, thereby reducing associated GHG emissions |
| | Building energy consumption | Operation | M-2A-07 | Install Whole-House Fans | Install whole-house fans in new construction. Whole-house fans draw cooler outdoor air through open windows, exhaust the warmer air into the attic, and then expel the air outside through attic vents. Whole-house cooling using a whole house fan can substitute for an air conditioner most of the year in most climates, resulting in a reduction in emissions associated with building energy use. Whole-house fans may be inappropriate in locations near sources that generate air pollutants during the evening hours, such as major roads and freeways. |

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| | Building energy consumption | Operation | M-2A-08 | Install Cool Roofs and/or Cool Walls | Install cool roofs and/or walls in place of dark roofs and/or conventional walls. Cool roofs have been designed to reflect more sunlight and absorb less heat than a standard roof, keeping buildings cooler in the summertime and thus reducing air-conditioning loads. Complementary to cool roofs, cool walls achieve a similar result through using more reflective paints or materials. This reduces the electricity needed to provide cooling but can potentially increase the energy needed to provide winter heating, thereby reducing associated GHG emissions depending on the project parameters (e.g., climate, level of implementation, carbon intensity of local electricity provider). However, the winter heating penalty may be small with lower levels of winter sunlight due to shorter daylight hours and more overcast skies. |
| | Building energy consumption | Operation | M-2A-09 | Install Green Roofs in Place of Dark Roofs | Install green roofs in place of dark roofs. Green roofs consist of a layer of vegetation on top of buildings, which provides natural insulation and climate control benefits. This reduces the electricity and natural gas needed to provide cooling and heating, thereby reducing associated GHG emissions. |
| | Building energy consumption | Operation | M-2A-10 | Install Cool Pavements | Install cool pavement in place of dark pavement. Cool pavement helps to lower ambient outdoor air temperatures when compared to dark-colored, heat-absorbent pavement such as asphalt. This reduces the electricity needed to provide cooling, thereby reducing associated GHG emissions, depending on the project parameters (e.g., climate, carbon intensity of local utility). |
| | Building energy consumption | Operation | M-2A-11 | Improve Insulation Standards | Use building insulation that exceeds minimum code standards. Improving insulation reduces energy demand for both heating and cooling and thus reduces GHG emissions from reduced energy consumption. Adequate insulation improves buildings' thermal regulation as it helps avoid extreme heat gains and losses. |
| | Building energy consumption | Operation | M-2A-12 | Limit Window-To-Wall Ratio | Limit the window-to-wall ratio (WWR) of new buildings. Buildings with fully glazed façades are dependent on heating, ventilation, and air conditioning and tend to be highly exposed to solar. The optimal WWR for energy efficiency depends on the climate and orientation of the building. |
| | Building energy consumption | Operation | M-2A-13 | Maximize Solar Shading | Maximize building shade during the summer months. Shading is a passive and inexpensive way to reduce summer heat loads, and thus the need for air conditioning. Examples include vegetation with seasonal variation and envelope elements that reflect natural light. |
| | Building energy consumption | Operation | M-2A-14 | Optimize Natural Ventilation | Maximize natural building ventilation in new construction. Façade design allows natural ventilation at night to cool the building and reduce peak daytime temperatures in summer. This in turn reduces the need for air conditioning, which reduces building electricity consumption and associated emissions. |
| | Building energy consumption | Operation | M-2A-15 | Obtain Third-party HVAC Commissioning and Verification of Energy Savings | Require third-party review of heating ventilation and air conditioning (HVAC) systems to ensure proper installation and construction of energy reduction features. HVAC commissioning and third-party verification of energy savings may be obtained for thermal efficiency components including HVAC systems, insulation, windows, and water heating. |
| | Building energy consumption | Operation | M-2A-16 | Require Higher Efficacy Public Street and Area Lighting | Install higher efficacy public street and area lighting in place of typical or existing lamps. Installing more efficacious lamps, such as light-emitting diodes, will use less electricity while producing the same amount of light, thereby reducing the associated indirect GHG emissions. |
| | Building energy consumption | Operation | M-2A-17 | Replace Incandescent Traffic Lights with LED Traffic Lights | Replace incandescent traffic lights with more energy-efficient light-emitting diode (LED) traffic lights. Installing LEDs reduces electricity demand and thus results in a reduction in indirect GHG emissions. |
| | Building energy consumption | Operation | M-2A-18 | Procure Electricity from Lower Carbon Intensity Power Supply | Procure electricity with a lower carbon intensity than the primary product offered by the local provider (often an investor-owned utility). This would displace the electricity demand that would ordinarily be supplied by the local electricity provider's energy mix. Electricity provided by local electricity providers has varying carbon intensities based on the portfolio of energy sources. Procurement of electricity of a lower carbon intensity would displace the emissions that would have been produced had the electricity been supplied by the default energy mix and thus results in a reduction in GHG emissions. Green power supply options include utility green power products, community choice aggregation, shared renewables (e.g., community solar), and power purchase agreements. |
| | Building energy consumption | Operation | M-2A-19 | Require All-Electric Development | Install all-electric appliances and end uses. Using electric instead of natural gas-powered appliances and end uses replaces a more emissions-intensive fossil fuel source of energy with a less emissions-intensive source of energy, electricity from the grid that is increasingly transitioning to renewable sources. |
| | Building energy consumption | Operation | M-2A-20 | Require Zero Net Energy Buildings | Design and construct zero net energy (ZNE) buildings. A ZNE building foremost reduces GHG emissions by reducing energy use through more efficient design. Further, the building avoids GHG emissions either by using no emissions-generating energy sources or offsetting the building energy emissions by exporting emission-free energy (typically from onsite renewables). |
| | Building energy consumption | Operation | M-2A-21 | Require Renewable-Surplus Buildings | Install onsite renewable energy in an amount that offsets more emissions than the amount generated from the development's electricity use and onsite fuel consumption. Installing zero-emission renewable energy displaces emissions from grid electricity that would otherwise be used, thereby reducing GHG emissions. Implementation of this measure would result in buildings that reduce more GHG emissions than they generate through surplus generation of energy from renewables, sometimes known as carbon-negative buildings. The amount of renewable energy required for a building to have net negative GHG emissions is largely determined by the number of emissions from onsite fuel consumption and the carbon intensity of the local electricity provider. |

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| | Building energy consumption | Operation | M-2A-22 | Establish Onsite Renewable Energy Systems | Generate electricity from an onsite renewable or zero-emission power system. This displaces the electricity demand that would ordinarily be supplied by the local electricity provider. Electricity generation provided by local electricity providers have varying carbon intensities based on the portfolio of energy sources. Some renewable energy systems, such as fuel cells, may not be completely GHG emissions-free, but may still have lower emissions than the electricity provided by the local electricity provider (unless the electricity provider has a relatively high renewable portfolio), thereby reducing GHG emissions. Zero-emissions power systems, such as solar panels, result in the greatest magnitude of emissions reductions. Onsite renewable systems can also provide back-up power as an alternative to diesel generators in the event of grid power outages or demand response events. |
| | Building energy consumption | Operation | M-2A-23 | Use Renewable Natural Gas or Green Hydrogen Fuel | Use renewable natural gas (RNG) in buildings instead of traditional natural gas. RNG has much lower carbon emissions and can be used in standard gas appliances like furnaces and water heaters. Alternatively, consider green hydrogen as a primary fuel source. Use of hydrogen would likely require some buildings retrofits or updates to appliances. |
| | Building energy consumption | Operation | M-2A-24 | Encourage Residential Participation in Existing Demand Response Program(s) | Market and promote the local utility's manual (i.e., behavioral) demand response program(s) to encourage participation from residents in the project area. During demand response events, program users shift or conserve electricity, thereby reducing the associated indirect GHG emissions. Methods of engaging customers in demand response efforts include offering time-based rates, such as time-of-use pricing, critical peak pricing, variable peak pricing, real-time pricing, and critical peak rebates. Users are encouraged to respond to time-based rates or other forms of financial incentives with smart phone app, email, phone call, and/or text notifications. |
| | Building energy consumption | Operation | M-2A-25 | Use Microgrids and Energy Storage | Design, install, and manage a microgrid. Microgrids offer the opportunity to deploy more zero-emission electricity sources, thereby reducing GHG emissions. The microgrid manager (e.g., local energy management system) can balance generation from non-controllable renewable power sources, such as solar, with distributed, controllable generation, such as natural gas-fueled combustion turbines. They can also use energy storage and batteries in electric vehicles to balance energy distribution and usage within the microgrid. |
| | Building energy consumption | Operation | M-2A-26 | Provide Battery Storage | Strategically deploy battery storage. While energy storage has no direct emissions effect, when deployed strategically, energy storage can make the grid more flexible, unlocking renewable energy and reducing GHG emissions. When deployed non-strategically, owners of energy storage assets are more likely to charge their facilities during off-peak periods when power prices are lower, in order to supply power during more expensive peak hours. Off-peak generation times such as nighttime hours are more likely to be dominated by conventional power sources, which, except for nuclear and hydropower, are likely to be more emissions intensive. |
| | Building energy consumption | Operation | M-2A-27 | Utilize a Combined Heat and Power System | Use combined heat and power (CHP) systems in place of separate heat and power (SHP) systems. For the same level of power output, CHP systems use less input energy than traditional SHP generation, resulting in lower GHG emissions. In traditional SHP systems, heat created as a by-product is wasted as it is released into the surrounding environment. CHP systems harvest thermal energy and use it to heat onsite uses or for processes in proximity, which reduces the amount of natural gas or other fuel that would otherwise be combusted for heating or for use in those processes. CHP systems also result in a reduced demand for electricity from the grid, which displaces the GHG emissions from the production of electricity from the grid. |
| | Building energy consumption | Operation | M-2A-28 | Utilize Biomass Energy | Install new biomass or biofuel electricity generation (or cogeneration). Although the direct combustion emissions for biofuels are generally on-par with other forms of fossil fuel energy, biofuels have a lower life-cycle carbon intensity due to the uptake of carbon from plants used to produce that fuel. A reasonable reference point for this carbon intensity would be the average carbon intensity of the electricity in the utility that would receive power from this new biomass plant. |
| | Natural gas and petroleum systems | Operation | M-2C-01 | Conduct Regular Maintenance | Implement a preventative maintenance schedule to replace worn-out components like gaskets, seals, and packing on valves and fittings. Regularly tighten all connections on pipelines, tanks, and equipment. Proper maintenance can avoid leaks, which in turn reduces fugitive emissions. |
| | Natural gas and petroleum systems | Operation | M-2C-02 | Ensure Proper Systemwide Management | Develop a plan to properly and efficiently maintain systemwide performance. For example, ensure proper pressure management, optimize maintenance schedules with preventative maintenance procedures, and implement procedures for proper valve operation and isolation. |
| | Natural gas and petroleum systems | Operation | M-2C-03 | Design New Pipelines to Minimize Leaks | Use advanced materials during pipeline construction, such as high-performance polymers. Consider using advanced materials for gaskets and seals with enhanced leak resistance. |
| | Natural gas and petroleum systems | Operation | M-2C-04 | Install Low-Bleed Pneumatic Controllers | Install low-bleed pneumatic controllers instead of high-bleed ones to reduce fugitive leaks. |
| | Natural gas and petroleum systems | Operation | M-2C-05 | Use Vapor Recovery Units | Use vapor recovery units to capture fugitive emissions during tank loading/unloading. |
| | Industrial processes | Operation | M-2D-01 | Implement Measures to Improve Industrial Electrification, Decarbonization, and Efficiency | While industrial processes vary significantly across types of industry, nearly all industrial processes have opportunities to enhance their thermal or electrical efficiency. Some industrial operations can be cost-effectively decarbonized through electrification tools from heat pumps for low to medium temperature ranges to thermal storage for high temperature processes, and by changing industrial processes that generate GHG emissions. Suitability for electrification might differ by use case, and such efforts are well complemented by further changes to chemical processes, production techniques to reduce process emissions, and/or carbon capture storage (see Measure 1E-4). Deploying industrial electrification, decarbonizing, and improving efficiency can take many forms including:<br>• Build more efficient plants and reduce the amount of electricity purchased.<br>• Use natural gas or waste-derived fuels.<br>• Replace coal burning production facilities with biomass or hydrogen powered facilities.<br>• Expand onsite renewable energy production to supply a portion of onsite electrical demand.<br>• Recover and use waste heat. |

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| | Industrial processes | Operation | M-2D-02 | Implement Measures to Reduce GHG Emissions from Cement Production | Implement Measure 2D-1 and consider the following actions specific to the cement industry to further reduce GHG emissions.<br>• Use less clinker in the cement mix.<br>• Use alternative materials to reduce the amount of high-emission clinker.<br>• Use carbonation by cement systems under appropriate conditions. |
| | Industrial processes | Operation | M-2D-03 | Implement Measures to Reduce GHG Emissions from Lime Production | Implement Measure 2D-1 and consider the following actions specific to the lime industry to further reduce GHG emissions.<br>• Use more efficient kilns with direct emission separation technologies.<br>• Increase the commercial use of lime kiln dust, a byproduct of lime manufacturing, as a soil stabilizing agent.<br>• Use alternative fuels, like hydrogen or oxyfuel, in new kiln technologies. |
| | Industrial processes | Operation | M-2D-04 | Implement Measures to Reduce GHG Emissions from Glass Production | Implement Measure 2D-1 and consider the following actions specific to the glass industry to further reduce GHG emissions.<br>• Improve furnace design and insulation to reduce energy consumption and associated emissions.<br>• Use oxyfuel burners, which can reduce energy consumption in glass melting furnaces by up to 20%.<br>• Recycle desulfurization waste as a raw material for glass production. |
| | Industrial processes | Operation | M-2D-05 | Implement Measures to Reduce GHG Emissions from Metals Production | Implement Measure 2D-1 and consider the following actions specific to the metals industry to further reduce GHG emissions.<br>• Reuse and recycle metals scraps.<br>• Improve energy efficiency through continuous casting and rolling, energy recovery, and advanced processes.<br>• Use hydrogen in steelmaking processes.<br>• Use Electric Arc Furnace to heat materials like pig iron, steel scraps, and direct reduced iron (DRI) product with electricity.<br>• Use DRI to directly reduce iron ore in solid-state. |
| | Industrial processes | Operation | M-2D-06 | Implement Measures to Reduce GHG Emissions from Chemicals Production | Implement Measure 2D-1 and consider the following actions specific to the chemicals industry to further reduce GHG emissions.<br>• Use solvent recyclers to reduce reliance on virgin solvent makeup, which eliminates transportation-related emissions and waste processing emissions.<br>• Use heat integration solutions like high-temperature heat pumps, steam mechanical vapor recompression, and heat separation to increase the utilization of primarily generated heat.<br>• Utilize improved platinum-based catalysts with higher selectivity towards nitric oxide (NO) production and reduced nitrous oxide (N2O) formation during the ammonia oxidation stage.<br>• Precisely control reaction temperature and pressure within the ammonia oxidation reactor to minimize N2O production.<br>• Install a dedicated catalyst system between the ammonia oxidation stage and the absorption tower to decompose N2O before it reaches the final tail gas. |
| | HFC leakage | Operation | M-2E-01 | Use Alternative Refrigerants Instead of High-GWP Refrigerants | Replace high-global warming potential (GWP) refrigerants with lower-GWP refrigerants (e.g., natural refrigerants such as carbon dioxide, ammonia, and hydrocarbons, or next generation low-GWP synthetic refrigerants like hydrofluoroolefin-1234yf) in refrigeration and air conditioning equipment. When emitted into the atmosphere, high-GWP refrigerants (e.g., hydrofluorocarbons) absorb significantly more heat than carbon dioxide on a mass basis, resulting in larger global warming effects. Shifting to lower-GWP refrigerants reduces the potency of refrigerant leaks, decreasing GHG emissions. |
| | HFC leakage | Operation | M-2E-02 | Install Secondary Loop and/or Cascade Supermarket Systems in Place of Direct Expansion Systems | Replace conventional direct expansion systems in supermarkets with indirect systems such as secondary loop and cascade systems. Indirect systems employ a primary and secondary refrigerant or heat transfer fluid. The primary refrigerant remains in the machine room and cools the secondary fluid, which is then pumped throughout the store to cool products. Another type of indirect system is a cascade system, which contains two refrigeration systems that share a common heat exchanger. By either confining hydrofluorocarbons to the machinery room as the primary refrigerant or removing hydrofluorocarbons entirely, these systems require significantly lower refrigerant charge and have lower leak rates than conventional direct expansion systems. Decreasing the refrigerant charge and leak rates results in a reduction of potential direct GHG emissions. |
| | HFC leakage | Operation | M-2E-03 | Install Transcritical CO2 Supermarket Systems in Place of High-GWP Systems | Replace conventional direct expansion systems in supermarkets with carbon dioxide (CO2) transcritical systems. CO2 transcritical systems use CO2, which has a global warming potential (GWP) of 1 and a lower leakage rate than typical conventional direct expansion systems. By reducing annual leak rates and replacing high-GWP refrigerants with CO2, these systems result in a reduction of potential direct GHG emissions. CO2 transcritical systems work most efficiently in cooler climates; but can also be used in warmer climates. |
| | HFC leakage | Operation | M-2E-04 | Install Microchannel Heat Exchangers in A/C Equipment in Place of Conventional Heat Exchanger | Replace conventional heat exchangers in air conditioning (A/C) equipment (e.g., unitary A/C) with microchannel heat exchangers (MCHX). A/C equipment using MCHX require 35 percent to 40 percent less refrigerant than those using conventional heat exchangers. The reduction in refrigerant charge in A/C equipment results in a reduction of potential GHG emissions. |
| | HFC leakage | Operation | M-2E-05 | Reduce Service Leak Emissions | Improve refrigerant servicing technologies and practices to reduce refrigerant emissions during equipment servicing. It is estimated that recovering refrigerants can reduce emissions in servicing by up to 95 percent. Equipment should only be serviced by qualified technicians certified under Section 608 of the Clean Air Act. Implementing more widespread and thorough refrigerant recovery practices while servicing refrigeration and A/C systems must go beyond regulatory requirements. |
| | HFC leakage | Operation | M-2E-06 | Reduce Operational Leak Emissions | Deploy leak detection technology and preventative maintenance measures to quickly identify and resolve operational leaks, which in turn will reduce GHG emissions. |
| | HFC leakage | Operation | M-2E-07 | Reduce Disposal Emissions | Properly recover refrigerants prior to the disposal of refrigeration and air conditioning equipment. U.S. Environmental Protection Agency-certified refrigerant recovery equipment must be used, meaning that a least 90 percent of the refrigerant must be recovered if the compressor is operating, and at least 80 percent must be recovered otherwise. |

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| | Land use change | Operation | M-2F-01 | Implement Management Practices to Improve the Health and Function of Natural and Working Lands | Implement management strategies aimed at improving the overall health and functionality of natural and working lands as a mechanism for increasing carbon sequestration and reducing GHG emissions. Management practices may include those that change ecosystem carbon exchange rates (e.g., cultivated land soil conservation, use of biochar) and those that involve land cover changes. If land conversion is deemed appropriate, refer to Measure M-1E-1 for recommended implementation and management strategies. |
| | Land use change | Operation | M-2F-02 | Wildfire Resilience and Management | Implement fuel treatments in forested areas to minimize the likelihood of severe or catastrophic wildfire behavior, thereby minimizing pyrogenic carbon emissions during a wildfire event. Fuel treatments have the short-term effect of releasing more carbon emissions as understory, ladder fuels, and forest fuel loads are burned. However, in the long term, treated stands produce fewer emissions compared to untreated stands because treated stands produce low to moderate fire severity that does not disturb the carbon stock in the overstory canopy. Untreated stands are far more likely to experience sever behavior that ignites the canopy and releases the stored carbon in the overstory. |
| | Land use change | Operation | M-2F-03 | Use Rotational Grazing | Regularly move cattle between different grazing areas to promote healthy pasture regrowth before resuming grazing. |
| | Land use change | Operation | M-2F-04 | Reduce Livestock Stocking Density | Decrease the amount of cattle stocked per pasture to reduce grazing pressure, which in turn reduces plant defoliation and soil disturbance, which can mitigate soil carbon loss. Reducing the stocking density also reduces methane emissions by decreasing the animal population. |
| | Land use change | Operation | M-2F-05 | Plant Cover Crops | Plant cover crops during fallow periods to enhance soil carbon storage. |
| | On-road vehicles | Operation | M-2G-01 | Increase Residential Density | Design projects with a higher density of dwelling units compared to the average residential density in the U.S. Increased densities affect the distance people travel and provide greater options for the mode of travel they choose. Increasing residential density results in shorter and fewer trips by single-occupancy vehicles and thus a reduction in GHG emissions. |
| | On-road vehicles | Operation | M-2G-02 | Increase Job Density | Design projects with a higher density of jobs compared to the average job density in the U.S. Increased densities affect the distance people travel and provide greater options for the mode of travel they choose. Increasing job density results in shorter and fewer trips by single-occupancy vehicles and thus a reduction in GHG emissions |
| | On-road vehicles | Operation | M-2G-03 | Infill Development | Support infill housing development programs that allow residents to live closer to downtown areas where there is greater access to jobs and activities. Residents living at infill development projects typically do not need to travel as far to access essential destinations. This leads to lower vehicle miles traveled and associated GHG emissions compared to similar projects located farther from a downtown area. |
| | On-road vehicles | Operation | M-2G-04 | Provide Transit-Oriented Development | Support transit-oriented development (TOD), which achieve lower vehicle miles traveled compared to developed sited in a TOD location. TOD refers to projects built in compact, walkable areas that have easy access to public transit, ideally in a location with a mix of uses, including housing, retail offices, and community facilities. Project site residents, employees, and visitors would have easy access to high-quality public transit, thereby encouraging transit ridership and reducing the number of single-occupancy vehicle trips and associated GHG emissions. |
| | On-road vehicles | Operation | M-2G-05 | Integrate Affordable and Below Market Rate Housing | Require below market rate (BMR) housing. BMR housing provides greater opportunity for lower income families to live closer to job centers and achieve a job/housing match near transit. It is also an important strategy to address the limited availability of affordable housing that might force residents to live far away from jobs or school, requiring longer commutes. |
| | On-road vehicles | Operation | M-2G-06 | Locate Project in Area with High Destination Accessibility | Site new development in an area with high accessibility to destinations. Destination accessibility is measured in terms of the number of jobs or other attractions (e.g., schools, supermarkets, and health care services) that are reachable within a given travel time or travel distance and tends to be highest at central locations and lowest at peripheral ones. When destinations are nearby, the travel time between them is less, thus increasing the potential for people to walk and bike to those destinations and, therefore, reducing the vehicle miles traveled and associated GHG emissions. |
| | On-road vehicles | Operation | M-2G-07 | Improve Destination Accessibility in Underserved Areas | Construct job centers or other attractions (e.g., schools, supermarkets, and health care services) for residents in underserved areas (e.g., food deserts). When destinations are nearby, the travel time between them is less, thus increasing the potential for people to walk and bike to those destinations, reducing vehicle miles traveled and associated GHG emissions. |
| | On-road vehicles | Operation | M-2G-08 | Limit Residential Parking Supply | Reduce the total parking supply available at a residential project or site. Limiting the amount of parking available creates scarcity and adds additional time and inconvenience to trips made by private auto, thus disincentivizing driving as a mode of travel. Reducing the convenience of driving results in a shift to other modes and decreased vehicle miles traveled and thus a reduction in GHG emissions. |
| | On-road vehicles | Operation | M-2G-09 | Unbundle Residential Parking Costs from Property Cost | Unbundle, or separate, a residential project's parking costs from property costs, requiring those who wish to purchase parking spaces to do so at an additional cost. On the assumption that parking costs are passed through to the vehicle owners/drivers utilizing the parking spaces, this measure results in decreased vehicle ownership and, therefore, a reduction in vehicle miles traveled and GHG emissions. |
| | On-road vehicles | Operation | M-2G-10 | Implement Preferential Parking Permit Program | Provide preferential parking in terms of free or reduced parking fees, priority parking, or reserved parking in convenient locations (such as near public transportation or building entrances) for commuters who carpool, vanpool, ride-share or use sustainably fueled vehicles. Projects should also provide wide parking spaces to accommodate vanpool vehicles. Commercial preferential parking can accommodate workers who work non-standard hours by providing opportunities to participate. Residential preferential parking can consider an equitable distribution of permits, giving priority to owners of sustainably fueled vehicles. |

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| | On-road vehicles | Operation | M-2G-11 | Provide Traffic Calming Measures | Include pedestrian/bicycle safety and traffic calming measures above jurisdictional requirements. Roadways should also be designed to reduce motor vehicle speeds and encourage pedestrian and bicycle trips with traffic calming features. Traffic calming features may include marked crosswalks, count-down signal timers, curb extensions, speed tables, raised crosswalks, raised intersections, median islands, tight corner radii, roundabouts or mini-circles, on-street parking, planter strips with street trees, chicanes/chokers, and others. Providing traffic calming measures encourages people to walk or bike instead of using a vehicle. This mode shift will result in a decrease in vehicle miles traveled. |
| | On-road vehicles | Operation | M-2G-12 | Required Project Contributions to Transportation Infrastructure Improvement | Contribute to traffic-flow improvements or other multi-modal infrastructure projects that reduce emissions and are not considered as substantially growth inducing. The local transportation agency should be consulted for specific needs. Contributions may consist of dedicated right-of-way, capital improvements, or easements. |
| | On-road vehicles | Operation | M-2G-13 | Locate Project near Bike Path/Bike Lane | Locate new development within 0.5-mile bicycling distance to an existing Class I or IV path or Class II bike lane. A project that is designed around an existing or planned bicycle facility encourages sustainable mode use. The project design should include a comparable network that connects the project uses to the existing off-site facilities that connect to work/retail destinations. |
| | On-road vehicles | Operation | M-2G-14 | Provide Bike Parking | Provide short-term and long-term bicycle parking facilities to meet peak season maximum demand. Parking can be provided in designated areas or added within rights-of-way, including by replacing parking spaces with bike parking corrals. Ensure that bike parking can be accessed by all, not just project employees or residents. |
| | On-road vehicles | Operation | M-2G-15 | Orient Project Toward Transit, Bicycle, or Pedestrian Facility | Minimize the setback distance between the project and planned or existing transit, bicycle, or pedestrian corridors. A project that is designed around an existing or planned transit, bicycle, or pedestrian corridor encourages sustainable mode use. |
| | On-road vehicles | Operation | M-2G-16 | Implement Commute Trip Reduction Marketing | Implement a marketing strategy to promote the project site employer's commute trip reduction (CTR) program. Information sharing and marketing promote and educate employees about their travel choices to the employment location beyond driving such as carpooling, taking transit, walking, and biking, thereby reducing vehicle miles traveled and GHG emissions. This measure can be used to support implementation of either a voluntary CTR program (see Measure 2G-17) or mandatory CTR program (see Measure 2G-18). |
| | On-road vehicles | Operation | M-2G-17 | Implement Commute Trip Reduction Program (Voluntary) | Implement a voluntary commute trip reduction (CTR) program with employers. CTR programs discourage single-occupancy vehicle trips and encourage alternative modes of transportation such as carpooling, taking transit, walking, and biking, thereby reducing vehicle miles traveled and GHG emissions. |
| | On-road vehicles | Operation | M-2G-18 | Implement Commute Trip Reduction Program (Mandatory Implementation and Monitoring) | Implement a mandatory commute trip reduction (CTR) program with employers. CTR programs discourage single-occupancy vehicle trips and encourage alternative modes of transportation such as carpooling, taking transit, walking, and biking, thereby reducing vehicle miles traveled and GHG emissions. |
| | On-road vehicles | Operation | M-2G-19 | Provide Ridesharing Program | Implement a ridesharing program and establish a permanent transportation management association with funding requirements for employers. Ridesharing encourages carpooled vehicle trips in place of single-occupied vehicle trips, thereby reducing the number of trips, vehicle miles traveled, and GHG emissions. |
| | On-road vehicles | Operation | M-2G-20 | Provide Employer-Sponsored Vanpool | Implement an employer-sponsored vanpool service. Vanpooling is a flexible form of public transportation that provides groups of 5 to 15 people with a cost-effective and convenient rideshare option for commuting. The mode shift from long-distance, single-occupied vehicles to shared vehicles reduces overall commute vehicle miles traveled, thereby reducing GHG emissions. |
| | On-road vehicles | Operation | M-2G-21 | Provide End-of-Trip Bicycle Facilities | Install and maintain end-of-trip facilities for employee use. End-of-trip facilities include bike parking, bike lockers, showers, and personal lockers. The provision and maintenance of secure bike parking and related facilities encourages commuting by bicycle, thereby reducing vehicle miles traveled and GHG emissions. |
| | On-road vehicles | Operation | M-2G-22 | Provide Shuttles (Gas or Electric) | Provide local shuttle service through coordination with the local transit operator or private contractor. The shuttles should provide service to and from commercial centers to nearby transit centers to help with first and last mile connectivity, thereby incentivizing a shift from private vehicles to transit, reducing associated GHG emissions. Electric shuttle vehicles provide a marginally more effective reduction to GHG emissions compared to gas- or diesel-fueled shuttles due to their use of less emissions-intensive electric power. |
| | On-road vehicles | Operation | M-2G-23 | Implement Subsidized or Discounted Transit Program | Provide subsidized or discounted, or free transit passes for employees and/or residents. Reducing the out-of-pocket cost for choosing transit improves the competitiveness of transit against driving, increasing the total number of transit trips and decreasing vehicle trips. This decrease in vehicle trips results in reduced vehicle miles traveled and thus a reduction in GHG emissions. |
| | On-road vehicles | Operation | M-2G-24 | Implement Telecommute and/or Alternative Work Schedule Program | Permit employee telecommuting and/or alternative work schedules and monitor employee involvement to ensure forecasted participation matches observed participation. While this measure certainly reduces commute-related vehicle miles traveled (VMT), recent research has shown that total VMT from telecommuters can exceed VMT from non-telecommuters. In addition, telecommuting affects commercial and residential electricity use, complicating the calculation of the net effect and attribution of emissions. More specifically, an office with fewer employees could result in a decrease in the project's energy used to operate equipment and provide space heating and air conditioning. Conversely, an increase in telecommuters using their private homes as workspaces could result in a residential increase in energy for those same end uses and appliances. It is recommended that users review the most recent literature at the time of their project initiation to see if new findings more conclusively support emissions reduction. |
| | On-road vehicles | Operation | M-2G-25 | Price Workplace Parking | Price onsite parking at workplaces. Because free employee parking is a common benefit, charging employees to park onsite increases the cost of choosing to drive to work. This is expected to reduce single-occupancy vehicle commute trips, resulting in decreased vehicle miles traveled, thereby reducing associated GHG emissions. |

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| | On-road vehicles | Operation | M-2G-26 | Implement Employee Parking Cash-Out | Offer employee parking cash-out. Cash-out is when employers provide employees with a choice of forgoing their current subsidized/free parking for a cash payment equivalent to or greater than the cost of the parking space. This encourages employees to use other modes of travel instead of single occupancy vehicles. This mode shift results in people driving less and thereby reduces vehicle miles traveled and GHG emissions. |
| | On-road vehicles | Operation | M-2G-27 | Provide On-Demand Microtransit | Provide small-scale, on-demand public transit services that can offer fixed routes and schedules or flexible routes and on-demand scheduling (e.g., Metro Micro) through coordination with the local transit operator or private contractor. Microtransit aims to offer shorter wait times and improved reliability compared to the bus and rail system to further incentivize alternative transportation modes that are less emissions-intensive than private vehicle trips. On-demand rides can be booked using smartphone applications or call centers. |
| | On-road vehicles | Operation | M-2G-28 | Improve Transit Access, Safety, and Comfort | Improve transit access and safety through sidewalk/crosswalk safety enhancements, bus shelter improvements, improved lighting, and other features. Work with the community to determine barriers to use, most desired improvements, and other access challenges. |
| | On-road vehicles | Operation | M-2G-29 | Provide Real-Time Transit Information | Provide real-time bus/train/ferry arrival time, travel time, alternative routings, or other transit information via electronic message signs, dedicated monitor or interactive electronic displays, websites, or mobile apps. This makes transit service more convenient and may result in a mode shift from auto to transit, which reduces vehicle miles traveled. |
| | On-road vehicles | Operation | M-2G-30 | Provide First and Last Mile TNC Incentives | Require a first-last mile partnership between a municipality/transit agency and a transportation network company (TNC) for subsidized, shared TNC rides to or from the local transit station within a specific geographic area. This measure encourages a shift to transit mode for longer trips. Consider providing inclusive mechanisms so people without bank accounts, credit cards, or smart phones can access the incentives. |
| | On-road vehicles | Operation | M-2G-31 | Implement a School Pool Program | Create a ridesharing program for school children. School pool helps match parents to transport students to private schools, or to schools where students cannot walk or bike but do not meet the requirements for bussing. A school pool program can help reduce onsite air pollutant emissions at the school by reducing private vehicle trips, especially if the pool vehicle is zero emissions. |
| | On-road vehicles | Operation | M-2G-32 | Establish a School Bus Program | Establish or expand a school bus program. Busing provides a practical way to transport students to school while also offering reductions in GHG emissions when there is high enough ridership. When districts establish busing programs, they directly replace automobile trips to take students to and from school. |
| | On-road vehicles | Operation | M-2G-33 | Active Modes of Transportation for Youth | Provide infrastructure to support any form of active transport among youth. Ensuring that children can use active transportation whenever possible can serve to reduce vehicle miles traveled (VMT) and allow them to get the necessary exercise to live healthy lives. Safe Routes to Schools provides federal funding for new sidewalks, bike lanes, off-street pathways, and street crossings to help children use active modes of transportation to get to school, bringing health benefits to children, in addition to reductions in VMT from mode-shifts away from private vehicle trips. |
| | On-road vehicles | Operation | M-2G-34 | Electrify Loading Docks | Plug in transport refrigeration units and auxiliary power units to the electric grid at the loading dock instead of running the units on diesel. The indirect GHG emission from electricity generation can partially offset the emissions reduction from fuel reductions. |
| | On-road vehicles | Operation | M-2G-35 | Provide Electric Vehicle Charging Infrastructure | Install onsite electric vehicle chargers at buildings with designated parking areas (e.g., commercial, educational, retail, multifamily). This will enable drivers of plug-in hybrid electric vehicles to drive a larger share of miles in electric mode, as opposed to gasoline-powered mode, thereby displacing GHG emissions from gasoline consumption with a lesser amount of indirect emissions from electricity. |
| | On-road vehicles | Operation | M-2G-36 | Use Cleaner-Fuel Vehicles | Use cleaner-fuel vehicles in lieu of similar vehicles powered by gasoline or diesel fuel. Cleaner-fuel vehicles may include electric vehicles, natural gas and propane vehicles, and vehicles powered by biofuels such as composite diesel (blend of renewable diesel, biodiesel, and conventional fossil diesel), ethanol, and renewable natural gas. The full GHG emissions impact of cleaner fuels depends on the emissions from the vehicle's tailpipe as well as the emissions associated with production of the fuel (sometimes termed "upstream" emissions). For example, tailpipe GHG emissions from renewable natural gas are identical to tailpipe GHG emissions from conventional natural gas; the GHG benefits of renewable natural gas come from the fact that it is produced from biomass. Similarly, battery electric vehicles have zero tailpipe emissions, but properly accounting for their GHG impacts requires quantifying the emissions associated with the electricity generation needed to charge the vehicle's batteries. |
| | On-road vehicles | Operation | M-2G-37 | Install Hydrogen Fueling Infrastructure | Implement accessible hydrogen fuel cell fueling infrastructure. Drivers of fuel cell electric vehicles (FCEV), from individual passenger vehicles to haul truck fleets, will be able to refuel using this infrastructure. The expansion of hydrogen fueling locations indirectly supports the uptake of FCEV in place of the typical internal combustion engine vehicle fueled by carbon-emitting gasoline and diesel. |
| | Treatment of waste on-site | Operation | M-2H-01 | Establish Methane Recovery in Landfills | Capture and either flare or combust landfill gas (LFG) emitted from decomposition of organic waste in landfills. Flaring LFG will reduce the amount of methane emitted into the atmosphere. Combusting LFG to generate electricity for onsite energy needs reduces GHG emissions in two ways: it reduces direct methane emissions, and it displaces electricity demand and the associated indirect GHG emissions from electricity production. |
| | Treatment of waste on-site | Operation | M-2H-02 | Implement Monitoring and Design Practices to Reduce Landfill Methane | Improve the design and operation of landfills to maximize control of methane emissions. Strategies may include:<br>1. Monitor to quickly detect and repair fugitive emissions.<br>2. Use effective cover practices to control surface methane.<br>3. Design and operate robust gas collection systems.<br>4. Efficiently destroy or use collected landfill gas. |
| | Treatment of waste on-site | Operation | M-2H-03 | Use Appropriate Additives to Accelerate Composting | Increase compositing additives. Appropriate use of additives can effectively accelerate the composting period. Studies have shown that microbial agents are more conducive to GHG reduction compared to chemical, mineral, and organic physical organic additives. Combined measures, such as biochar and electric field-assisted composting can also be very effective at reducing GHGs during compositing. |

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| | Treatment of waste on-site | Operation | M-2H-04 | Improve Digestion Efficiency | Improve the efficiency of methane digestion by using smaller sludge amounts at increased frequency. Homogenizing primary and excess sludge can also improve stabilit8y and efficiency of anaerobic digestion, thus reducing emissions. |
| | Treatment of wastewater on-site | Operation | M-2I-01 | Establish Methane Recovery in Wastewater Treatment Plants | Capture methane from a wastewater treatment plant and either (1) combust or flare it to prevent escape into the atmosphere or (2) combust or flare it and use the heat to generate electricity for onsite energy needs. Using the combusted methane as an energy source reduces GHG emissions by displacing electricity demand and the associated indirect GHG emissions from electricity production. This measure is most applicable to wastewater treatment plants that have anaerobic digestion infrastructure, which facilitates the biological decomposition of the wastewater and produces the methane that is either flared or harnessed for energy. |
| | Treatment of wastewater on-site | Operation | M-2I-02 | Improve Monitoring and Energy Management | Implement a system to improve the monitoring efficiency of each step in the wastewater treatment process. Use sensors to measure dissolved methane and nitrous oxide concentrations, and use this data to reduce the need for aeration. An intelligent system that controls the aeration quantity in biochemical pools with feedback controls and intelligent models could be deployed to maintain a balance of aeration. This system can also be used to improve oxygen management throughout the wastewater treatment process. |
| | Treatment of wastewater on-site | Operation | M-2I-03 | Optimize Treatment Processes to Reduce Energy | Monitor and adjust the parameters of treatment processes (e.g., membrane bioreactor treatment) to reduce energy consumption. Consider new processes and configurations to remove organic matter. For example, use microalgae or partial nitritation-Anammox processes instead of conventional nitrification-denitrification processes. Or, use biological techniques like aerobic granular sludge. |
| | Treatment of wastewater on-site | Operation | M-2I-04 | Recover and Separate Carbon | Recover carbon from waste sludge and separate it from nitrogen after fermentation. |
| | Treatment of wastewater on-site | Operation | M-2I-05 | Implement Energy Efficiency Improvements | Implement facility energy efficiency improvements, such as upgrading sewage-lifting pumps, improving the efficiency of heating ventilation and air conditioning and lighting through controls or replacement equipment, and improving efficiency of aeration equipment. Use of frequency conversion technology to transform old sewage lifting pumps and the direct application of new equipment or facilities (e.g., digital pumps) are two major pathways to reduce the energy consumption needed for the sewage lifting pumps. |
| | Treatment of wastewater on-site | Operation | M-2I-06 | Use Renewable and Heat Energy | Use renewable energy sources like solar, biogas, and heat throughout the wastewater process. Extract waste heat energy using wastewater source heat pump technology. |
| | Treatment of wastewater on-site | Operation | M-2I-07 | Prevent the Release of Untreated Wastewater | Treat wastewater prior to release. While treatment will generate emissions, untreated wastewater has a three-times higher carbon footprint compared to treated wastewater. Thus, treatment emissions will be more than offset by the benefits of wastewater treatment prior to discharge. |
| | Treatment of waste off-site | Operation | M-2J-01 | Institute or Extend Recycling Services | Institute or extend recycling services to reduce the volume of landfilled waste. Decomposition of certain types of landfilled waste produces methane. Increasing waste diversion from landfills therefore reduces GHG emissions. The recycling process generates some emissions, but also reduces upstream emissions from the manufacturing and production of new raw materials and goods. |
| | Treatment of waste off-site | Operation | M-2J-02 | Require Edible Food Recovery Program Partnerships with Food Generators | Require food service, wholesale, and retail sources of edible food to partner with food recovery programs. Food recovery programs collect edible foods from commercial production and distribution channels that would otherwise be transported to a landfill and redistribute them for consumption. This measure would avoid emissions from the decomposition of non-diverted organic material in landfills. |
| | Treatment of waste off-site | Operation | M-2J-03 | Implement Organics Diversion Program | Implement an organics diversion program to reduce the volume of organic waste sent to landfills. An organics diversion program lowers the landfill disposal rate of food waste (both edible and non-edible), food soiled paper, yard waste, and non-hazardous wood waste. Decomposition of organic waste in landfills produces methane. Increasing organic waste diversion from landfills thus reduces GHG emissions |
| | Enteric fermentation | Operation | M-2K-01 | Use Feed Additives | Incorporate feed supplements that can inhibit methane production in the rumen. Examples of methane-reducing feed additives include seaweed, oils, agolin, mootral, certain synthetics (e.g., 3-Nitrooxpropanol), and certain plant extracts |
| | Enteric fermentation | Operation | M-2K-02 | Manage and Balance Diets | Provide a balanced diet with high-quality forage to improve digestibility and reduce methane emissions. Also, balance feed rations to minimize excess nutrients that contribute to emissions. |
| | Enteric fermentation | Operation | M-2K-03 | Manage Herd Composition | Reduce the number of unproductive animals on a farm can potentially reduce GHG emissions while increasing profitability. For example, extending lactation in dairying cows (where cows calve every 18 months rather than annually) can reduce herd energy demand, thereby potentially reducing methane emissions by a similar amount. |
| | Manure management | Operation | M-2L-01 | Require Best Management Practices for Manure Management | Implement best management practices for the management of manure from livestock. Well-managed pasture systems and aerobic dry composting systems tend to have lower emissions, while anaerobic wet handling systems generate more methane. This measure is thus intended for manure collection systems that are currently managed by anaerobic decomposition of manure volatile solids stored in a lagoon or other predominantly liquid anaerobic environment. Utilizing alternative practices to manage manure results in reduced agriculture emissions from livestock by decreasing the amount of volatile manure solids that are stored in wet, anaerobic conditions. |
| | Manure management | Operation | M-2L-02 | Convert to Pasture-Based Management | Convert non-pasture operations to pasture-based management. To achieve emission reduction, the project must currently manage/store some manure in wet/anaerobic conditions and introduce new practices that reduce the quantity of manure managed under such conditions. |
| | Manure management | Operation | M-2L-03 | Install Compost Bedded Pack Barn | Install a compost bedded pack barn that composts manure in situ. |
| | Manure management | Operation | M-2L-04 | Install Slatted Floor Pit Storage Manure Collection | Install slated floor pit storage manure collection that must be cleaned out at least monthly. Pit storage cleaned out at a frequency less than twelve times per year may not reduce GHG emissions since this allows conditions to become anaerobic. |

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| | Manure management | Operation | M-2L-05 | Separate Manure Solids | Separate manure solids prior to entry into a wet/anaerobic environment (e.g., lagoon, settling pond, settling basin) in conjunction with one of the following practices (a) through (h):<br>a) Open solar drying of manure (manure is dried in a paved or unpaved open confinement area without any significant vegetative cover where accumulating manure may be removed periodically);<br>b) Closed solar drying (drying of manure in enclosed environment);<br>c) Forced evaporation with natural-gas fueled dryers;<br>d) Daily spread (manure is routinely removed from a confinement facility and is applied to cropland or pasture within 24 hours of excretion);<br>e) Solid storage (storage of manure, typically for a period of several months, in unconfined piles or stacks);<br>f) Composting in vessel (composting in an enclosed vessel, with forced aeration and continuous mixing) or in aerated static pile (composting in piles with forced aeration but no mixing);<br>g) Composting in intensive windrows (with regular – at least daily – turning for mixing and aeration) or passive windrows (with infrequent turning for mixing and aeration); or<br>h) Composting in aerated vermifiltration system (solids separated by vermifilter are also processed by worms within the vermifilter) |
| | Manure management | Operation | M-2L-06 | Convert from Flush to Scrape Manure Collection | Convert from a flush to scrape manure collection system in conjunction with one of the practices (a) through (h) listed in Measure 2L-5. |
| | Manure management | Operation | M-2L-07 | Install An Anaerobic Digester | Install an anaerobic digester to capture methane from manure and utilize it to generate energy. |

City of Chaska

# APPENDIX D: TRAFFIC IMPACT ANALYSIS

# Traffic Impact Analysis

## Big Woods Business Park AUAR

CHASKA, MINNESOTA

**FEBRUARY 2026**

Prepared By:

Kimley»Horn

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# 1. INTRODUCTION

Kimley-Horn and Associates, Inc., (Kimley-Horn) was hired to prepare a traffic impact study included in the Big Woods Business Park AUAR in Chaska, MN. An aerial view of the study location and surrounding roadway network is presented in **Exhibit 1**. All exhibits for this report are included in the appendix.

For purposes of this analysis, two (2) development scenarios were analyzed. Scenario 1 consists of a 2 million square foot Business Park while Scenario 2 consists of a 3 million square foot Business Park. For both scenarios, 90% of the total floor area is anticipated to become industrial land uses while the remaining 10% of the area is anticipated to become retail or similar commercial developments. In order to assess the potential impact of the development scenarios on the area roadway network, site-generated trips were estimated and added to the background traffic volumes. Future traffic conditions were evaluated for the approximate Opening Year of the near term developments (2030) and a long term "Design Year" (2045).

This report presents and documents data collection, summarizes the evaluation of existing and projected future traffic conditions on the surrounding roadways, and identifies recommendations to address the potential impact of site-generated traffic on the adjacent roadway network for Scenarios 1 and 2.

## 1.1 Report Purpose and Objectives

The purpose of this study is to address traffic and transportation impacts of the proposed development on surrounding streets and intersections. This traffic impact study was prepared based on criteria set forth by the AUAR guidelines. The following specific information, per AUAR recommended content, should be provided:

- A description and map of the existing and proposed roadway system, including state, regional, and local roads to be affected by the development of the AUAR area. This information should include existing and proposed roadway capacities and existing and projected background (i.e. without the AUAR development) traffic volumes;
- Trip generation data – trip generation rates and trip totals – for each major development scenario broken down by land use zones and/or other relevant subdivisions of the area. The projected distributions onto the roadway system must be included;
- Analysis of impacts of the traffic generated by the AUAR area on the roadway system, including: comparison of peak period total flows to capacities and analysis of Level of Service and delay times at critical points (if any);
- A discussion of structural and non-structural improvements and traffic management measures that are proposed to mitigate problems.

Note: in the above analyses the geographical scope must extend outward as far as the traffic to be generated would have a significant effect on the roadway system and traffic measurements and projections should include peak days and peak hours, or other appropriate measures related to identifying congestion problems, as well as ADTs (average daily traffic).

# 2. EXISTING CONDITIONS

Kimley-Horn conducted a review of the AUAR area including existing land uses in the surrounding area, the adjacent street system, current traffic volumes and operating conditions, lane configurations and traffic controls at nearby intersections, and other key roadway characteristics. This section of the report details information on the existing conditions. An aerial view of the existing conditions and lane movements are shown in **Exhibit 2**.

## 2.1 Area Land Uses & Connectivity

The site is directly west of US Highway 212 and would have direct access to multiple County State Aid Highways (CSAHs). US Highway 212 is the primary connecting route between Chaska/nearby communities and most of the Twin Cities metro area. There are three (3) interchanges to access US Highway 212 near the site, along CSAH 10 (Engler Boulevard), CSAH 44 (Big Woods Boulevard), and CSAH 10 (Jonathan Carver Parkway). The CSAH 10 and CSAH 11 interchanges are full-access diamond interchanges, while CSAH 44 is a partial interchange with access to/from the north along US Highway 212 with room to expand to a full interchange in the future.

The existing land use of the surrounding area is primarily classified as RR2, Rural Residential on the Chaska Zoning Map. Other nearby areas are classified as O, Open Development and north of the development area there are planned multi-use and industrial developments.

## 2.2 Existing Roadway Characteristics

The following provides a description of the public roadways within the AUAR area.

**U.S. Highway 212** is a primarily east-west freeway which locally runs in the north-south direction, forming the eastern boundary of the AUAR area. It is a four-lane divided freeway and is classified by the Met Council as a Principal Arterial. According to the MnDOT Traffic Mapping Application, the roadway has an Annual Average Daily Traffic (AADT) of 22,650 vehicles per day (vpd) south of CSAH 10, as of 2024. The posted speed limit is 65 miles per hour (mph). Three (3) freeway interchanges are included in the TIA study area. Approximately 1500’ to the south of the AUAR area, Johnathan Carver Parkway provides a full access interchange with U.S. Highway 212. Directly to the west of the site, Big Woods Boulevard provides a northbound entrance ramp and southbound exit ramp to U.S. Highway 212. Approximately 3000’ northwest of the site, Engler Boulevard provides a full access interchange with U.S. Highway 212.

**CSAH 44 (Big Woods Boulevard)** is a two-lane undivided roadway that runs east-west. This roadway bisects the AUAR area, providing primary access to the study area parcels. The roadway is classified by the Met Council as an A-Minor Expander east of CSAH 11 (Jonathan Carver Parkway) and a Major Collector west of CSAH 11. According to the MnDOT Traffic Mapping Application, the roadway has an AADT of 3,350 vpd west of CSAH 61 (2018) and 1,060 vpd west of CSAH 11 (2025). Directly to the east of the site, Big Woods Boulevard provides a northbound entrance ramp and southbound exit ramp to U.S. Highway 212. Big Woods Boulevard also connects directly to downtown Chaska.

**CSAH 11 (Johnathan Carver Parkway)** is a north-south roadway that is primarily two-lanes undivided but widens to four-lanes divided south of Chaska Boulevard. The roadway is classified by the Met Council as an A-Minor Connector. Approximately 1500’ to the south of the AUAR area, Johnathan Carver Parkway has a full access interchange with U.S. Highway 212. According to the MnDOT Traffic Mapping Application,

the AADT of CSAH 11 ranges from 5,100 vpd north of CSAH 61 to 18,100 south of US Highway 212, as of 2025. The posted speed limit is 55 mph.

**CSAH 61 (Chaska Boulevard**) is a four-lane undivided east-west roadway in the study area. CSAH 61 terminates at CSAH 11 (Jonathan Carver Parkway), but the roadway continues west of CSAH 11 as Levi Griffin Road. CSAH 61 is classified by the Met Council as an A-Minor Reliever while Levi Griffin Road is classified as a local road. According to the MnDOT Traffic Mapping Application, CSAH 61 has an AADT of 5,700 vpd, as of 2022. Chaska Boulevard connects directly to downtown Chaska to the east. The posted speed limit is 50 mph.

**CSAH 10 (Engler Boulevard)** is a primarily two-lane east-west undivided roadway which widens to four lanes near the US Highway 212 interchange. The roadway is classified by the Met Council as an A-Minor Connector west of CSAH 11 and an A-Minor Expander east of CSAH 11. According to the MnDOT Traffic Mapping Application, the roadway has an AADT of 14,500 vpd west of US Highway 212, as of 2025. The posted speed limit is 55 mph.

**Chaska Creek Boulevard** is a four-lane divided north-south roadway that provides access to planned industrial/mixed-use developments north of the AUAR area. At the approach of Creek Road, the roadway narrows to two-lanes undivided. The roadway is classified as a future major collector in the City of Chaska's 2040 Comprehensive Plan. AADT data is unavailable. There is no posted speed limit. The roadway becomes Clover Ridge Drive north of CSAH 10.

**Creek Road** is a two-lane primarily east-west undivided roadway. The roadway is classified by the Met Council Functional Classifications as a Major Collector between Chaska Creek Boulevard & Savannah Way, and a local road otherwise. According to the MnDOT Traffic Mapping Application, the roadway has an AADT of 2,450 as of 2021. The posted speed limit is 40 mph.

The existing geometry and intersection control for the intersections in the study area that will be included in this analysis are shown in **Exhibit 2**.

## 2.3 Traffic Count Data

Turning movement count data was collected during the AM peak period (7:00 AM to 9:00 AM) and the PM peak period (4:00 PM to 6:00 PM), with one 24-hour count collected at CSAH 11 & CSAH 44. Data was collected at the eleven (11) study intersections listed below.

- CSAH 10 (Engler Boulevard) & US Highway 212 Westbound Ramps
- CSAH 10 (Engler Boulevard) & US Highway 212 Eastbound Ramps
- CSAH 10 (Engler Boulevard) & Chaska Creek Boulevard
- CSAH 10 (Engler Boulevard) & CSAH 11 (Jonathan Carver Parkway)
- Chaska Creek Boulevard & Creek Road
- CSAH 44 (Big Woods Boulevard) & Westbound U.S. Highway 212
- CSAH 44 (Big Woods Boulevard) & Eastbound U.S. Highway 212
- CSAH 11 (Johnathan Carver Parkway) & CSAH 44 (Big Woods Boulevard) ***24-hour count***
- CSAH 11 (Johnathan Carver Parkway) & CSAH 61 (Chaska Boulevard)
- CSAH 11 (Johnathan Carver Parkway) & US Highway 212 Westbound Ramps
- CSAH 11 (Johnathan Carver Parkway) & US Highway 212 Eastbound Ramps

Turning movement data was collected on Tuesday, October 21, 2025, with the exception of the AM peak hour data at CSAH 11 & US Highway 212 Eastbound Ramps which were collected the following morning

of Wednesday, October 22 due to hardware issues. The traffic count data indicates that peak traffic volumes occur within the study area from 7:15 to 8:15 AM and 4:00 to 5:00 PM on a typical weekday. Existing peak hour traffic volumes are summarized in **Exhibit 3**. Detailed TMC data is provided in the appendix.

## 2.4 Pedestrian and Bicycle Infrastructure

There is a multi-use path along the east side of CSAH 11 (Jonathan Carver Parkway) within the development site. The CSAH 44 (Big Woods Boulevard) interchange with US Highway 212 includes a dedicated pedestrian bridge north of the interchange bridge but this trail does not connect west to CSAH 11. This trail connection will be completed during the planned reconstruction of CSAH 44 as driven by development west of US 212. Additionally, there is a planned Southwest Regional Trail connection across the ravine on the north end of the AUAR site.

## 2.5 Existing (2025) Capacity Analysis

Synchro 12/SimTraffic capacity software was used to evaluate existing operational conditions at the signalized and stop-controlled study intersections. The capacity of an intersection quantifies its ability to accommodate traffic volumes and is expressed in terms of level of service (LOS), measured in average delay per vehicle. LOS grades range 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 2-1**.

**Table 2-1: Level of Service Grading Descriptions**

| Level of Service | Description[1] |
|---|---|
| A | Minimal control delay; traffic operates at primarily free-flow conditions; unimpeded movement within traffic stream. |
| B | Minor control delay at signalized intersections; traffic operates at a fairly unimpeded level with slightly restricted movement within traffic stream. |
| C | Moderate control delay; movement within traffic stream more restricted than at LOS B; formation of queues contributes to lower average travel speeds. |
| D | Considerable control delay that may be substantially increased by small increases in flow; average travel speeds continue to decrease. |
| E | High control delay; average travel speed no more than 33 percent of free flow speed. |
| F | Extremely high control delay; extensive queuing and high volumes create exceedingly restricted traffic flow. |

[1]*Highway Capacity Manual, 7th Edition.*

The range of control delay for each rating (as detailed in the HCM) is shown in **Table 2-2**. HCM considers roundabouts to be unsignalized intersections when determining LOS grades.

**Table 2-2: Level of Service Grading Criteria**

| Level of Service[1] | Average Control Delay (s/veh) at: | |
|---|---|---|
| | Unsignalized Intersections | Signalized Intersections |
| A | 0 – 10 | 0 – 10 |
| B | > 10 – 15 | > 10 – 20 |
| C | > 15 – 25 | > 20 – 35 |
| D | > 25 – 35 | > 35 – 55 |
| E | > 35 – 50 | > 55 – 80 |
| F[2] | > 50 | > 80 |

[1]*Highway Capacity Manual, 7th Edition*

[2]*All movements with a Volume to Capacity (v/c) ratio greater than 1 receive a rating of LOS F.*

For the purposes of this study, the worst individual movement delay was reported as the overall intersection delay at side street stop control intersections. The results of capacity analysis for existing conditions are summarized in **Table 2-3**. The results are based on analysis conducted with Synchro 12/SimTraffic for signalized and stop controlled intersections. Roundabout analysis software Rodel was used to evaluate the operations at roundabouts. All Rodel analysis was carried out with the default 50% confidence level, representing mean capacity estimates. Copies of the SimTraffic and Rodel reports are provided in the appendix.

Based on the analysis, all study intersections operate at LOS C or better during the AM and PM peak hours. Some movements at signalized intersections operate at LOS E or F but all movements operate below their respective capacities, and no queueing issues are present at the study intersections, based on the 95th percentile queueing results. The network operations are acceptable overall, and no mitigation is required.

**Table 2-3: Existing Year (2025) Level of Service**

| Intersection | Control | Approach | Operations by Movement | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | | PM Peak Hour | | | |
| | | | Left | Through | Right | Overall | Left | Through | Right | Overall |
| CSAH 10 & US 212 Eastbound Ramps | Signal | EB | A (8) | A (3) | - | B (12) | C (26) | A (4) | - | B (14) |
| | | WB | - | D (38) | B (15) | | - | B (11) | A (4) | |
| | | NB | D (40) | D (44) | A (6) | | D (46) | B (18) | A (5) | |
| | | SB | - | - | - | | - | - | - | |
| CSAH 10 & US 212 Westbound Ramps | Signal | EB | - | B (12) | A (3) | B (12) | - | B (17) | A (3) | B (15) |
| | | WB | F (92) | A (7) | - | | B (14) | A (10) | - | |
| | | NB | - | - | - | | - | - | - | |
| | | SB | E (70) | - | A (7) | | C (23) | - | B (14) | |
| CSAH 10 & Chaska Creek Boulevard | Signal | EB | B (15) | C (24) | A (3) | C (20) | D (46) | A (9) | A (2) | B (14) |
| | | WB | D (41) | A (8) | A (2) | | D (43) | B (14) | A (4) | |
| | | NB | A (8) | E (64) | A (8) | | C (34) | E (56) | A (5) | |
| | | SB | C (29) | C (30) | A (5) | | C (31) | C (35) | A (8) | |
| CSAH 10 & CSAH 11 | Signal | EB | B (20) | C (25) | B (11) | C (22) | C (25) | B (12) | A (5) | C (27) |
| | | WB | C (21) | B (15) | A (6) | | C (35) | D (36) | C (22) | |
| | | NB | C (23) | C (31) | C (22) | | C (33) | C (29) | B (12) | |
| | | SB | C (29) | C (26) | A (6) | | C (26) | C (33) | B (18) | |

| Intersection | Control | Approach | Operations by Movement | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | | PM Peak Hour | | | |
| | | | Left | Through | Right | Overall | Left | Through | Right | Overall |
| Chaska Creek Boulevard & Creek Road | Round-about | EB | A (0) | | | A (3) | A (3) | | | A (3) |
| | | WB | A (3) | | | | A (3) | | | |
| | | NB | - | | | | - | | | |
| | | SB | A (3) | | | | A (4) | | | |
| CSAH 44 & US 212 Eastbound Ramp | Round-about | EB | A 3) | | | A (5) | A (4) | | | A (4) |
| | | WB | A (8) | | | | A (7) | | | |
| | | NB | - | | | | - | | | |
| | | SB | - | | | | - | | | |
| CSAH 44 & US 212 Westbound Ramp | Round-about | EB | A (5) | | | A (4) | A (5) | | | A (3) |
| | | WB | A (5) | | | | A (6) | | | |
| | | NB | A (0) | | | | A (2) | | | |
| | | SB | - | | | | - | | | |
| CSAH 44 & CSAH 11 | Side Street Stop | EB | B (12) | B (13) | A (3) | A (4) | A (4) | B (12) | A (3) | A (4) |
| | | WB | B (10) | A (10) | A (2) | | B (11) | B (13) | A (3) | |
| | | NB | A (2) | A (2) | A (1) | | A (3) | A (3) | A (1) | |
| | | SB | A (4) | A (1) | A (0) | | A (4) | A (2) | A (2) | |
| CSAH 11 & CSAH 61 | Signal | EB | C (33) | D (37) | A (5) | B (10) | C (25) | D (39) | A (6) | B (17) |
| | | WB | B (19) | B (17) | A (3) | | C (27) | C (32) | A (7) | |
| | | NB | B (10) | B (11) | A (8) | | B (17) | B (19) | A (6) | |
| | | SB | A (9) | A (7) | A (1) | | B (13) | B (16) | A (2) | |
| CSAH 11 & US 212 Westbound Ramps | Signal | EB | - | - | - | B (13) | - | - | - | C (24) |
| | | WB | C (29) | - | A (6) | | D (38) | - | A (9) | |
| | | NB | D (37) | A (7) | - | | D (44) | B (16) | - | |
| | | SB | - | A (10) | A (4) | | - | B (16) | A (6) | |
| CSAH 11 & US 212 Eastbound Ramps | Signal | EB | C (30) | - | A (6) | B (12) | D (43) | - | B (12) | A (7) |
| | | WB | - | - | - | | - | - | - | |
| | | NB | - | A (7) | B (14) | | - | A (4) | A (5) | |
| | | SB | A (5) | A (4) | - | | A (5) | A (4) | - | |

# 3. BACKGROUND CONDITIONS ANALYSIS

Analysis of the future background conditions was carried out to determine the baseline operating conditions for the Opening Year (2030) and Design Year (2045) of the proposed AUAR development. A review of future traffic growth and planned geometric changes for the study roadways was conducted for the analysis.

## 3.1 Planned Roadway Improvements

Carver County is currently planning to reconstruct CSAH 44 (Big Woods Boulevard) west of the US Highway 212 interchange as well as the intersection with CSAH 11 (Jonathan Carver Parkway). Plans include the installation of a roundabout at CSAH 44 & CSAH 11 and converting Big Woods Boulevard to a median divided roadway between the proposed roundabout and the existing roundabout at the US 212 interchange. coinciding with the site's development. The project is anticipated to be completed in the near future. Therefore, a single-lane roundabout is assumed to be in place at the intersection of CSAH 44 & CSAH 11 for all future conditions analysis.

Additionally, Carver County is planning to reconstruct CSAH 10 (Engler Boulevard) expanding the route to four lanes through the intersection with CSAH 11 (Jonathan Carver Parkway). A corridor study was completed for CSAH 10. Based on the recommendations of that report, CSAH 11 will also be expanded to include two through lanes in each direction at the intersection. Turn lanes will be provided for all turning movements at CSAH 10 & CSAH 11 and dual left turn lanes will be provided where necessary. Based on the projected traffic volumes at this intersection, it is assumed that dual northbound and southbound left turn lanes will likely be installed. CSAH 11 was assumed to remain a two-lane road south of the intersection.

There are also two potential roadway improvements in the area that have been reviewed as part of previous traffic studies for the area. They are the connection of the AUAR site roadway to the Chaska Creek Boulevard & Creek Road roundabout and the completion of the Big Woods Boulevard & US Highway 212 interchange to provide access to/from the south. The effects of the Creek Road connection/ravine crossing will be analyzed in the analysis, while completion of the Big Woods Boulevard interchange will not be analyzed in this report.

## 3.2 Future Background Growth

MnDOT's ESAL worksheet was used to model the historical AADT growth along the major study area roadways. Based on the historical AADT counts along US Highway 212, Engler Boulevard, and Jonathan Carver Parkway, the model gives demographically adjusted growth rates of 1.9%, 1.9%, and 3.7%, respectively, which averages to 2.5% annual growth. Therefore, a 2.5% annual growth rate was applied to the study area intersections. This level of growth aligns with the background growth assumed in recent traffic studies for the area.

To confirm that this level of growth is accurate, future AADT forecasts from the City of Chaska 2040 Comprehensive Plan were reviewed at U.S. Highway 212, Engler Boulevard, and Johnathan Carver Parkway. These roadways are predicted to grow at annual rates of 1.2%, 2.4%, and 2.8% respectively, based on the 2040 traffic projections in relation to the baseline (2018) traffic volumes. This represents an average annual growth rate of 2.1% and generally aligns with the high level of growth anticipated based on historical AADT trends.

Additional traffic growth is also expected to result from at least one planned development in the vicinity of the project, as described in the section below.

## 3.3 Background Development

A TIS was completed for the proposed Enclave at Carver Creek residential development. The site is approximately one mile southwest of the AUAR area and is anticipated to have an impact on the traffic patterns within the study area, particularly at the CSAH 11 & US Highway 212 interchange. The development is expected to consist of 509 residential lots, with a mix of single-family homes and attached town homes. Background site traffic estimates were taken directly from The Enclave at Carver Creek TIS. The background development traffic distribution is shown in **Exhibit 4** and background development site trips are shown in **Exhibit 5**.

## 3.4 Future Background Traffic Projections

The Opening Year (2030) No-Build traffic projections were determined by growing the Existing (2025) traffic volumes shown in Exhibit 3 with five years of growth at 2.5% annually and then adding the background trips in Exhibit 5. The Opening Year (2030) No-Build traffic volumes are presented in **Exhibit 6**.

The Design Year (2045) No-Build traffic projections were determined by growing the Existing (2025) traffic volumes shown in Exhibit 3 with 20 years of growth at 2.5% annually and then adding the background trips in Exhibit 5. The Design Year (2045) No-Build traffic volumes are presented in **Exhibit 7**.

## 3.6 Opening Year (2030) No-Build Capacity Analysis

An Opening Year (2030) No-Build conditions analysis was completed to develop an understanding of the baseline operating conditions for the study area in the opening year. As discussed in Section 3.2, a single-lane roundabout was assumed at the intersection of CSAH 11 & CSAH 44. Additionally, corridor improvements were assumed along CSAH 10 including upgrades to the intersection of CSAH 10 & CSAH 11. Capacity results for the Opening Year (2030) No-Build conditions are provided in

**Table** 3-1. SimTraffic and Rodel analysis reports are included in the appendix.

Under Opening Year (2030) No-Build conditions, all intersections are anticipated to continue operating at LOS D or better. Delays at most intersections see minimal increase compared to the Existing (2025) conditions. The northbound right turn movement at CSAH 11 (Jonathan Carver Parkway) & US 212 Eastbound Ramps is anticipated to be nearing capacity during the AM peak hour and experiences significant delays and queueing. However, all intersections operate with acceptable levels of overall delay.

Based on review of the 95$^{th}$ percentile queueing results, the westbound left turn movement at CSAH 11 & US 212 Westbound Ramps sees 95$^{th}$ percentile queues that exceed the storage of the left turn bay, however queues are not anticipated to extend near the freeway itself. All other queues are anticipated to remain within their provided storage bays. The operating conditions of the Opening Year (2030) No-Build conditions are acceptable, and no mitigation is required.

**Table 3-1: Opening Year (2030) No-Build Level of Service**

| Intersection | Control | Approach | Operations by Movement | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | | PM Peak Hour | | | |
| | | | Left | Through | Right | Overall | Left | Through | Right | Overall |
| CSAH 10 & US 212 Eastbound Ramps | Signal | EB | B (11) | A (3) | - | B (14) | C (24) | A (4) | - | B (14) |
| | | WB | - | D (40) | B (15) | | - | B (13) | A (5) | |
| | | NB | D (40) | D (47) | A (7) | | D (38) | B (15) | A (6) | |
| | | SB | - | - | - | | - | - | - | |
| CSAH 10 & US 212 Westbound Ramps | Signal | EB | - | B (14) | A (3) | B (14) | - | B (19) | A (4) | B (15) |
| | | WB | F (87) | A (6) | - | | B (14) | A (10) | - | |
| | | NB | - | - | - | | - | - | - | |
| | | SB | E (73) | - | A (8) | | C (21) | - | B (15) | |
| CSAH 10 & Chaska Creek Boulevard | Signal | EB | C (31) | C (28) | A (3) | C (23) | D (44) | A (10) | A (2) | B (13) |
| | | WB | D (44) | A (6) | A (2) | | D (47) | B (12) | A (5) | |
| | | NB | D (52) | E (59) | B (17) | | C (31) | D (49) | A (5) | |
| | | SB | C (33) | C (34) | A (7) | | C (31) | C (35) | A (8) | |
| CSAH 10 & CSAH 11 | Signal | EB | B (15) | B (13) | A (5) | B (14) | B (20) | B (11) | A (4) | B (15) |
| | | WB | B (18) | B (13) | A (5) | | B (13) | B (16) | B (11) | |
| | | NB | B (18) | C (25) | A (6) | | B (20) | B (19) | A (3) | |
| | | SB | C (21) | C (22) | A (4) | | B (20) | C (27) | A (8) | |
| Chaska Creek Boulevard & Creek Road | Round-about | EB | A (3) | | | A (3) | A (3) | | | A (3) |
| | | WB | A (3) | | | | A (3) | | | |
| | | NB | - | | | | - | | | |
| | | SB | A (3) | | | | A (3) | | | |
| CSAH 44 & US 212 Eastbound Ramp | Round-about | EB | A (4) | | | A (6) | A (4) | | | A (5) |
| | | WB | A (9) | | | | A (7) | | | |
| | | NB | - | | | | - | | | |
| | | SB | - | | | | - | | | |
| CSAH 44 & US 212 Westbound Ramp | Round-about | EB | A (6) | | | A (4) | A (5) | | | A (4) |
| | | WB | A (5) | | | | A (6) | | | |
| | | NB | A (0) | | | | A (2) | | | |
| | | SB | - | | | | - | | | |
| CSAH 44 & CSAH 11 | Round-about | EB | A (5) | | | A (7) | A (5) | | | A (7) |
| | | WB | A (5) | | | | A (5) | | | |
| | | NB | A (9) | | | | A (8) | | | |
| | | SB | A (8) | | | | A (8) | | | |
| CSAH 11 & CSAH 61 | Signal | EB | C (23) | C (33) | A (4) | B (11) | C (24) | D (37) | A (7) | B (19) |
| | | WB | C (21) | B (18) | A (2) | | C (27) | D (35) | B (10) | |
| | | NB | B (10) | B (12) | A (8) | | B (19) | C (22) | A (8) | |
| | | SB | B (10) | A (7) | A (1) | | B (16) | B (18) | A (2) | |

| Intersection | Control | Approach | Operations by Movement | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | | PM Peak Hour | | | |
| | | | Left | Through | Right | Overall | Left | Through | Right | Overall |
| CSAH 11 & US 212 Westbound Ramps | Signal | EB | - | - | - | B (15) | - | - | - | C (29) |
| | | WB | C (32) | - | A (7) | | D (43) | - | B (14) | |
| | | NB | D (39) | A (7) | - | | D (42) | B (18) | - | |
| | | SB | - | B (11) | A (4) | | - | C (22) | A (8) | |
| CSAH 11 & US 212 Eastbound Ramps | Signal | EB | C (30) | - | A (7) | D (38) | D (44) | - | B (15) | A (9) |
| | | WB | - | - | - | | - | - | - | |
| | | NB | - | C (26) | E (61) | | - | A (5) | A (7) | |
| | | SB | A (7) | A (4) | - | | A (6) | A (8) | - | |

## 3.7 Design Year (2045) No-Build Capacity Analysis

The Design Year (2045) No-Build Condition analysis was completed to develop an understanding of the baseline operating conditions for the study area in the long-term without the addition of the development traffic. Existing geometry and intersection control was assumed for this analysis. Signal timings and cycle lengths were optimized for the analysis. Capacity results for the Design Year (2045) No-Build conditions are provided in **Table 3-2**. SimTraffic analysis reports are included in the appendix.

Under Design Year (2045) No-Build conditions, multiple intersections are anticipated to experience significant operational issues, particularly at or near the CSAH 11 (Jonathan Carver Parkway) and CSAH 10 (Engler Boulevard) interchanges with US Highway 212. The southbound left turn movement at CSAH 10 & Chaska Creek Boulevard sees 95$^{th}$ percentile queues of 580' which could block through/right turn vehicles from entering the 400' storage bay. Although some movements see long delays (greater than 100 seconds per vehicle), the intersections along CSAH 11 operate at an overall LOS D or better during the AM and PM peak hours. However, queues along CSAH 10 are anticipated to lead to congestion along CSAH 10 at multiple intersections along the corridor where vehicles would be positioning in the respective lanes for the major turning movements. The US 212 Ramps and CSAH 10 intersections have multiple movements nearing their capacity and these intersections should be monitored for potential capacity improvements such as expansion of CSAH 10 to six-lanes or improvements to the US 212 interchange in the long term.

The intersection of CSAH 11 & US Highway 212 Eastbound Ramps operates at LOS F during the AM peak hour. The northbound right turn movement operates over its capacity with nearly 1,800 vehicles projected to make this turn in the AM peak hour. Improvements to the existing CSAH 11 interchange will likely be required in order to maintain acceptable operating conditions in the long-term due to the anticipated traffic growth from developments south of US Highway 212.

Growth south of US 212 will be heavily dependent on if an additional interchange along US Highway 212 is constructed. Furthermore, with the projected traffic volume of nearly 1,800 vehicles turning northbound right during the AM peak, improvements may be required along the CSAH 11 corridor south of US Highway 212. Dual channelized right-turn lanes (one merging into the left-turn/through lane and one free flowing) at the US Highway 212 Eastbound Ramps would be required within the study area. Traffic analysis of the developments south of US Highway 212 should be conducted to determine the precise traffic impacts of these developments and the need for an additional interchange or improvements to the CSAH 11 interchange.

Review of the 95th Percentile queueing results indicated the following potential queueing issues:

- CSAH 10 & Chaska Creek Boulevard – Southbound left turn lane exceeds capacity during the AM peak hour. Dual 400' left turn lanes are anticipated to be required.
- CSAH 10 & US 212 Westbound Ramps – Southbound right turn movement sees 445' queues during the PM peak hour. Extending the dedicated southbound right turn lane to 450' is anticipated to be required to prevent queues from blocking the southbound left turn lane.
- CSAH 11 & US 212 Westbound Ramps – Westbound left turn movement sees 531' queues during the PM peak hour. Extending the dedicated westbound left turn lane to 550' is anticipated to be required to prevent queues from blocking the right turn lane.

**Table 3-2: Design Year (2045) No-Build Level of Service**

| Intersection | Control | Approach | Operations by Movement | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | | PM Peak Hour | | | |
| | | | Left | Through | Right | Overall | Left | Through | Right | Overall |
| CSAH 10 & US 212 Eastbound Ramps | Signal | EB | C (21) | A (6) | - | C (22) | C (27) | A (5) | - | B (16) |
| | | WB | - | D (48) | C (33) | | - | B (16) | A (7) | |
| | | NB | E (59) | E (59) | A (8) | | C (35) | D (39) | A (7) | |
| | | SB | - | - | - | | - | - | - | |
| CSAH 10 & US 212 Westbound Ramps | Signal | EB | - | C (28) | B (11) | C (26) | - | C (30) | A (6) | C (30) |
| | | WB | F (100+) | A (7) | - | | C (24) | A (9) | - | |
| | | NB | - | - | - | | - | - | - | |
| | | SB | F (100+) | - | B (13) | | C (32) | - | D (37) | |
| CSAH 10 & Chaska Creek Boulevard | Signal | EB | D (35) | D (39) | B (17) | D (41) | D (47) | B (15) | A (2) | C (25) |
| | | WB | F (100+) | A (9) | A (3) | | D (48) | C (32) | B (15) | |
| | | NB | E (69) | F (99) | C (32) | | C (29) | D (51) | A (10) | |
| | | SB | F (86) | E (61) | C (28) | | C (27) | C (33) | B (15) | |
| CSAH 10 & CSAH 11 | Signal | EB | B (18) | B (19) | A (8) | C (20) | C (27) | B (14) | A (6) | C (23) |
| | | WB | C (29) | B (15) | A (8) | | C (23) | C (25) | B (18) | |
| | | NB | C (23) | C (32) | B (15) | | C (29) | C (25) | A (5) | |
| | | SB | D (36) | C (29) | A (6) | | C (28) | D (40) | B (13) | |
| Chaska Creek Boulevard & Creek Road | Round-about | EB | A (3) | | | A (3) | A (4) | | | A (4) |
| | | WB | A (3) | | | | A (4) | | | |
| | | NB | - | | | | - | | | |
| | | SB | A (3) | | | | A (4) | | | |
| CSAH 44 & US 212 Eastbound Ramp | Round-about | EB | A (4) | | | A (8) | A (5) | | | A (6) |
| | | WB | B (12) | | | | A (9) | | | |
| | | NB | - | | | | - | | | |
| | | SB | - | | | | - | | | |
| CSAH 44 & US 212 Westbound Ramp | Round-about | EB | A (7) | | | A (4) | A (6) | | | A (4) |
| | | WB | A (6) | | | | A (7) | | | |
| | | NB | A (1) | | | | A (2) | | | |
| | | SB | - | | | | - | | | |

| Intersection | Control | Approach | Operations by Movement | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | | PM Peak Hour | | | |
| | | | Left | Through | Right | Overall | Left | Through | Right | Overall |
| CSAH 44 & CSAH 11 | Round-about | EB | A (6) | | | A (9) | A (7) | | | B (10) |
| | | WB | A (7) | | | | A (10) | | | |
| | | NB | B (11) | | | | B (11) | | | |
| | | SB | B (10) | | | | B (13) | | | |
| CSAH 11 & CSAH 61 | Signal | EB | B (17) | D (40) | A (6) | B (15) | D (39) | D (50) | A (10) | C (23) |
| | | WB | C (24) | B (17) | A (3) | | D (40) | D (38) | B (14) | |
| | | NB | B (13) | B (18) | B (15) | | C (21) | B (10) | A (8) | |
| | | SB | B (12) | A (9) | A (1) | | D (38) | C (21) | A (2) | |
| CSAH 11 & US 212 Westbound Ramps | Signal | EB | - | - | - | B (17) | - | - | - | C (34) |
| | | WB | C (32) | - | A (9) | | D (40) | - | C (25) | |
| | | NB | D (51) | A (10) | - | | E (61) | C (23) | - | |
| | | SB | - | B (12) | A (6) | | - | D (41) | B (16) | |
| CSAH 11 & US 212 Eastbound Ramps | Signal | EB | D (37) | - | B (11) | F (100+) | D (44) | - | C (26) | A (9) |
| | | WB | - | - | - | | - | - | - | |
| | | NB | - | F (100+) | F (100+) | | - | A (6) | A (9) | |
| | | SB | A (9) | A (5) | - | | A (9) | A (6) | - | |

Analysis was conducted on the intersection of CSAH 11 & US 212 Eastbound Ramps with dual northbound right turn lanes in place to ensure this provides sufficient operating conditions. Results of the analysis are included below in **Table 3-3**. All movements at the intersection operate at LOS D or better during the AM and PM peak hour with the proposed mitigation change in place. The mitigation is sufficient and therefore an additional northbound right turn lane was assumed for the Design Year (2045) Scenario 1 and Design Year (2045) Scenario 2 conditions analysis. Note that the need for this improvement will greatly depend on the level of development that occurs south of US Highway 212 and whether or not an additional interchange is constructed for that development.

**Table 3-3: Design Year (2045) No-Build Mitigated Levels of Service**

| Intersection | Control | Approach | Operations by Movement | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | | PM Peak Hour | | | |
| | | | Left | Through | Right | Overall | Left | Through | Right | Overall |
| CSAH 11 & US 212 Eastbound Ramps | Signal | EB | D (44) | - | C (27) | A (9) | D (38) | - | B (11) | C (25) |
| | | WB | - | - | - | | - | - | - | |
| | | NB | - | A (6) | A (6) | | - | C (22) | C (32) | |
| | | SB | A (10) | A (6) | - | | A (10) | A (5) | - | |

# 4. FUTURE CONDITIONS ANALYSIS - SCENARIO 1

This section of the report outlines the proposed development scenario, summarizes site-specific traffic characteristics, and develops future traffic projections for Scenario 1. The project location and proposed access points are shown in **Exhibit 1**.

## 4.1 Scenario 1 Development Characteristics and Site Access

The Scenario 1 development consists of 2,000,000 total square feet of development, 90% of which is expected to be business park (industrial) and 10% is expected to be commercial (retail). The AUAR scoping document indicates that the retail/commercial space will generally be located along the north side of CSAH 44 (Big Woods Boulevard) in the eastern half of the site. The business park/industrial space is dispersed throughout the remainder of the AUAR area.

The development will generally be completed in two phases. Phase 1 consists of the portion of the development located north of CSAH 44 (i.e., all of the retail space and about half of the business park. For the purposes of the analysis, it was assumed that Phase 1 would be completed by 2030. Phase 2 includes the remaining half of the business park space that is located south of CSAH 44. This phase is anticipated to develop farther in the future than the Phase 1 portion of the development and is included in analysis year 2045.

There are four proposed access points. A potential fifth access point may be added by establishing a connection between the development's internal roadway network and the roundabout at CSAH 44 & US Highway 212 westbound ramp. For the purposes of this AUAR the accesses will be labeled as the following:

- Access A – Along CSAH 11 (Jonathan Carver Parkway) north of CSAH 44 (Big Woods Boulevard). Proposed right-in/right-out access based on county access spacing requirements.
- Access B – Along CSAH 44 (Big Woods Boulevard) west of the US Highway 212 interchange. Proposed full-movement access. While Access B does not meet Carver County access spacing requirements for full access, it is expected to be the primary access point due to its central location within the development and connectivity to US Highway 212.
- Access C – Along CSAH 11 (Jonathan Carver Parkway) north of CSAH 61 (Chaska Boulevard). Proposed full-movement access. This access should be provided at acceptable access spacing for full access on a Carver County roadway. Alignment to be coordinated with the City of Carver.
- Access D – Along CSAH 61 (Chaska Boulevard) east of CSAH 11 (Jonathan Carver Parkway). Proposed full-movement access.

All site access should be reviewed with Carver County as development plans are completed to determine a final access plan to the site.

## 4.2 Scenario 1 Trip Generation

Proposed development traffic was determined based on data from the Institute of Transportation Engineers' (ITE) *Trip Generation*, 12th Edition. The manual provides peak hour trips rates/equations, inbound-outbound percentages that can be attributed to the proposed site. Based on a review of ITE Land Use codes, LUC 130 (Industrial Park) was determined to be the most appropriate fit for the business park portions of the development, and LUC 820 (Shopping Center) was determined to be the most appropriate fit for the commercial portion of the development.

**Table 4-1** provides a summary of trip generation for development Scenario 1. Based on the trip generation calculation, the proposed Scenario 1 development is anticipated to generate 12,102 daily trips, including 572 total trips during the AM Peak Hour (414 entering, 158 exiting), and 1,066 total trips during the PM Peak Hour (435 entering, 631 exiting).

**Table 4-1: Trip Generation – Scenario 1**

| Land Use Description | Intensity / Units | Daily | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | In | Out | Total | In | Out | Total |
| Phase 1 (2030) | | | | | | | | |
| Industrial Park – ITE LUC 130 | 900 kSF | 2,412 | 153 | 46 | 198 | 58 | 149 | 207 |
| *Passenger Vehicles* | *900 kSF* | *1,980* | *139* | *33* | *171* | *43* | *137* | *180* |
| *Trucks* | *900 kSF* | *432* | *14* | *13* | *27* | *15* | *12* | *27* |
| Shopping Center – ITE LUC 820 | 200 kSF | 7,278 | 109 | 67 | 176 | 319 | 333 | 652 |
| *Passenger Vehicles* | *200 kSF* | *7,260* | *107* | *65* | *172* | *318* | *332* | *650* |
| *Trucks* | *200 kSF* | *18* | *2* | *2* | *4* | *1* | *1* | *2* |
| Phase 1 (2030) Totals | 1,100 kSF | 9,690 | 262 | 113 | 374 | 377 | 482 | 859 |
| *Passenger Vehicles* | *1,100 kSF* | *9,240* | *246* | *98* | *343* | *361* | *469* | *830* |
| *Trucks* | *1,100 kSF* | *450* | *16* | *15* | *31* | *16* | *13* | *29* |
| Phase 2 (2045) | | | | | | | | |
| Industrial Park – ITE LUC 130 | 900 kSF | 2,412 | 153 | 46 | 198 | 58 | 149 | 207 |
| *Passenger Vehicles* | *900 kSF* | *1,980* | *139* | *33* | *171* | *43* | *137* | *180* |
| *Trucks* | *900 kSF* | *432* | *14* | *13* | *27* | *15* | *12* | *27* |
| Buildout (2045) Totals | 2,000 kSF | 12,102 | 414 | 158 | 572 | 435 | 631 | 1,066 |
| *Passenger Vehicles* | *2,000 kSF* | *11,220* | *384* | *130* | *514* | *404* | *606* | *1,010* |
| *Trucks* | *2,000 kSF* | *882* | *30* | *28* | *58* | *31* | *25* | *56* |

## 4.3 Scenario 1 Directional Distribution

The estimated distribution of site-generated traffic on the surrounding roadway network was developed based on a review of the roadway network, area development pattern, and access to the proposed development. With a large portion of the development being industrial space, truck traffic is anticipated to account for a significant portion of the vehicle trips, and separate distributions were created for truck traffic. Separate distributions were developed for Phase 1 and Phase 2 of the proposed development since Phase 1 includes retail development while Phase 2 entirely consists of industrial development. The following global distribution was used for the Phase 1 development:

- 50% (vehicles) / 60% (trucks) to/from the east on U.S. Highway 212
- 15% (vehicles) / 25% (trucks) to/from the west on U.S. Highway 212
- 10% (vehicles) / 5% (trucks) to/from the south on CSAH 11 (Johnathan Carver Parkway)
- 10% (vehicles) / 5% (trucks) to/from the east on CSAH 44 (Big Woods Boulevard)
- 5% (vehicles) / 5% (trucks) to/from the west on CSAH 10 (Engler Boulevard)
- 5% (vehicles) to/from the north on CSAH 11
- 5% (vehicles) to/from the east on CSAH 10

The Phase 1 passenger vehicles site trip distribution is presented in **Exhibit 8**, and the distribution of trucks is presented in **Exhibit 9**. The Opening Year (2030) Scenario 1 site trips were calculated by applying these distributions to their respective trip generation totals shown in **Table 4-1.** Total site trips for Opening Year (2030) Scenario 1 are shown in **Exhibit 10**. The Opening Year (2030) Scenario 1 traffic volumes were then calculated by adding these site trips to the Opening Year (2030) No-Build traffic volumes in Exhibit 6. The Opening Year (2030) Build traffic volumes are shown in **Exhibit 11**.

The global distribution for the Phase 2 development is as follows:

- 40% (vehicles) / 55% (trucks) to/from the east on U.S. Highway 212
- 25% (vehicles) / 30% (trucks) to/from the west on U.S. Highway 212
- 10% (vehicles) / 5% (trucks) to/from the south on CSAH 11 (Johnathan Carver Parkway)
- 5% (vehicles) / 5% (trucks) to/from the west on CSAH 10 (Engler Boulevard)
- 5% (vehicles) / 5% (trucks) to/from the east on CSAH 61 (Chaska Boulevard)
- 5% (vehicles) to/from the east on CSAH 44 (Big Woods Boulevard)
- 5% (vehicles) to/from the north on CSAH 11
- 5% (vehicles) to/from the east on CSAH 10

The Phase 2 passenger vehicles site trip distribution is presented in **Exhibit 12**, and the distribution of trucks is presented in **Exhibit 13**. The Phase 2 (2045) site trips for Scenario were calculated by applying these distributions to their respective trip generation totals shown in **Table 4-1**. The total Phase 2 (2045) site trips for Scenario 1 are shown in **Exhibit 14**. The Design Year (2045) Scenario 1 traffic volumes were then calculated by adding these site trips to the Design Year (2045) No-Build traffic volumes in **Exhibit 7**. The Design Year (2045) Scenario 1 traffic volumes are shown in **Exhibit 15**.

## 4.4 Scenario 1 Future Pedestrian and Bicycle Infrastructure

During buildout of the site, trails/sidewalks should be provided along the major routes throughout the site with connections to the existing trail system to allow for multimodal site trips and improve the connectivity of the local trail system. This includes sidewalks along CSAH 11, CSAH 44, and a ravine crossing for the Southwest Regional Trail.

## 4.5 Opening Year (2030) Build Scenario 1 Capacity Analysis

An Opening Year (2030) Scenario 1 capacity analysis was conducted to determine the impacts of the short-term Scenario 1 development. The developments north of CSAH 44 (Big Woods Boulevard) are included in this analysis, which consists of 900,000 square feet of industrial space (half of the total for Scenario 1) and all 200,000 square feet of retail space. Access A is assumed to be side street stop controlled and restricted to right-in/right-out while Access B is assumed to be controlled by a single-lane roundabout. The results of the analysis for the Opening Year (2030) Build Scenario 1 are shown in **Table 4-2**. Copies of the capacity analysis reports are provided in the appendix.

All study intersections and site accesses are anticipated to operate at LOS C or better during the AM and PM peak hours. Overall, the study intersections are anticipated to see little change in delay as a result of the Scenario 1 Build conditions and all intersections continue to operate at acceptable levels. The 95$^{th}$ percentile queueing results were reviewed, and all queues are anticipated to remain within their respective storage bays except for the southbound right turn lane at CSAH 11 & US 212 Westbound ramps which sees 144’ queues, exceeding the 90’ of provided storage.

**Table 4-2: Opening Year (2030) Build Scenario 1 Level of Service**

| Intersection | Control | Approach | Operations by Movement | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | | PM Peak Hour | | | |
| | | | Left | Through | Right | Overall | Left | Through | Right | Overall |
| CSAH 10 & US 212 Eastbound Ramps | Signal | EB | B (11) | A (4) | - | B (14) | C (23) | A (4) | - | B (14) |
| | | WB | - | D (39) | B (16) | | - | B (13) | A (4) | |
| | | NB | D (43) | C (28) | A (7) | | D (41) | E (59) | A (6) | |
| | | SB | - | - | - | | - | - | - | |
| CSAH 10 & US 212 Westbound Ramps | Signal | EB | - | B (14) | A (5) | B (14) | - | B (20) | A (4) | B (16) |
| | | WB | E (78) | A (6) | - | | B (16) | A (10) | - | |
| | | NB | - | - | - | | - | - | - | |
| | | SB | E (71) | - | A (8) | | C (22) | - | B (16) | |
| CSAH 10 & Chaska Creek Boulevard | Signal | EB | B (18) | B (18) | A (4) | B (17) | D (46) | B (11) | A (2) | B (13) |
| | | WB | D (39) | A (5) | A (2) | | D (48) | B (11) | A (5) | |
| | | NB | D (49) | D (51) | A (9) | | D (40) | D (39) | A (5) | |
| | | SB | C (33) | D (36) | A (7) | | C (32) | C (33) | B (10) | |
| CSAH 10 & CSAH 11 | Signal | EB | B (16) | B (13) | A (5) | B (14) | D (52) | B (12) | A (4) | C (24) |
| | | WB | C (22) | B (13) | A (5) | | D (52) | B (20) | B (11) | |
| | | NB | B (17) | C (23) | A (7) | | D (44) | D (36) | A (4) | |
| | | SB | C (22) | C (23) | A (4) | | D (47) | D (49) | A (10) | |
| Chaska Creek Boulevard & Creek Road | Round-about | EB | A (3) | | | A (3) | A (3) | | | A (3) |
| | | WB | A (3) | | | | A (3) | | | |
| | | NB | - | | | | - | | | |
| | | SB | A (3) | | | | A (3) | | | |
| CSAH 44 & US 212 Eastbound Ramp | Round-about | EB | A (5) | | | A (6) | A (7) | | | A (7) |
| | | WB | A (9) | | | | A (9) | | | |
| | | NB | - | | | | - | | | |
| | | SB | - | | | | - | | | |
| CSAH 44 & US 212 Westbound Ramp | Round-about | EB | A (7) | | | A (5) | A (9) | | | A (6) |
| | | WB | A (6) | | | | A (7) | | | |
| | | NB | A (4) | | | | A (5) | | | |
| | | SB | - | | | | - | | | |
| CSAH 44 & CSAH 11 | Round-about | EB | A (5) | | | A (7) | A (6) | | | A (9) |
| | | WB | A (7) | | | | A (10) | | | |
| | | NB | A (9) | | | | A (10) | | | |
| | | SB | A (7) | | | | B (11) | | | |
| CSAH 11 & CSAH 61 | Signal | EB | C (20) | D (35) | A (5) | B (12) | C (33) | D (47) | A (8) | B (20) |
| | | WB | C (22) | A (10) | A (2) | | D (43) | D (39) | B (17) | |
| | | NB | B (11) | B (13) | A (10) | | B (17) | A (9) | A (5) | |
| | | SB | A (10) | A (7) | A (1) | | C (22) | B (14) | A (2) | |
| | Signal | EB | - | - | - | B (14) | - | - | - | C (24) |

| Intersection | Control | Approach | Operations by Movement | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | | PM Peak Hour | | | |
| | | | Left | Through | Right | Overall | Left | Through | Right | Overall |
| CSAH 11 & US 212 Westbound Ramps | | WB | C (30) | - | A (8) | | C (29) | - | B (11) | |
| | | NB | D (35) | A (8) | - | | E (59) | B (17) | - | |
| | | SB | - | B (11) | A (5) | | - | C (26) | A (10) | |
| CSAH 11 & US 212 Eastbound Ramps | Signal | EB | C (33) | - | A (8) | C (33) | D (42) | - | B (16) | A (8) |
| | | WB | - | - | - | | - | - | - | |
| | | NB | - | C (30) | D (48) | | - | A (5) | A (7) | |
| | | SB | A (8) | A (4) | - | | A (7) | A (5) | - | |
| CSAH 11 & Access A | Side Street Stop | EB | - | - | - | A (1) | - | - | - | A (2) |
| | | WB | - | - | A (3) | | - | - | A (4) | |
| | | NB | - | A (2) | A (1) | | - | A (2) | A (1) | |
| | | SB | - | A (1) | - | | - | A (1) | - | |
| CSAH 44 & Access B | Round-about | EB | A (7) | | | A (6) | A (7) | | | A (8) |
| | | WB | A (7) | | | | A (9) | | | |
| | | NB | - | | | | - | | | |
| | | SB | A (5) | | | | A (10) | | | |

## 4.6 Design Year (2045) Build Scenario 1 Capacity Analysis

Capacity analysis results for the Design Year (2045) Scenario 1 conditions are provided in **Table 4-3**. The analysis was carried out assuming dual northbound right turn lanes at CSAH 11 & US 212 Eastbound Ramps which was shown to be necessary under Design Year (2045) No-Build conditions if an additional interchange is not constructed for the developments south of US Highway 212.

Results of the Design Year (2045) Scenario 1 conditions show that all intersections are anticipated to operate at LOS D or better. Similar to the Design Year (2045) No-Build conditions, some individual movements at signalized are anticipated to operate at LOS E or F, particularly along CSAH 10 (Engler Boulevard). However, these intersections are relatively unaffected by the proposed development and the overall network operations are acceptable.

The 95$^{th}$ percentile queueing results were reviewed, and all queues are anticipated to remain within their respective storage bays except for the southbound right turn lane at CSAH 11 & US 212 Westbound ramps which sees 248' queues during the PM peak, exceeding the 90' of provided storage. A turn lane extension (at least 250') is required to maintain the anticipated queues. All other 95$^{th}$ percentile queues were acceptable, except those outlined in the Design Year (2045) No-Build section.

**Table 4-3: Design Year (2045) Build Scenario 1 Level of Service**

| Intersection | Control | Approach | Operations by Movement | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | | PM Peak Hour | | | |
| | | | Left | Through | Right | Overall | Left | Through | Right | Overall |
| CSAH 10 & US 212 Eastbound Ramps | Signal | EB | C (22) | A (6) | - | C (24) | C (27) | A (6) | - | B (16) |
| | | WB | - | D (46) | C (33) | | - | B (17) | A (6) | |
| | | NB | E (60) | E (76) | A (9) | | C (35) | E (70) | A (8) | |
| | | SB | - | - | - | | - | - | - | |
| CSAH 10 & US 212 Westbound Ramps | Signal | EB | - | C (32) | B (12) | C (30) | - | C (33) | A (5) | C (31) |
| | | WB | F (100+) | A (7) | - | | C (24) | A (9) | - | |
| | | NB | - | - | - | | - | - | - | |
| | | SB | F (100+) | - | B (14) | | C (35) | - | D (38) | |
| CSAH 10 & Chaska Creek Boulevard | Signal | EB | D (42) | D (38) | B (12) | D (37) | D (41) | B (14) | A (2) | C (25) |
| | | WB | F (95) | A (9) | A (3) | | D (46) | C (32) | B (14) | |
| | | NB | F (98) | F (83) | C (28) | | C (28) | D (45) | A (9) | |
| | | SB | E (72) | E (61) | B (20) | | C (27) | C (31) | B (19) | |
| CSAH 10 & CSAH 11 | Signal | EB | B (20) | B (19) | A (8) | C (21) | C (28) | B (13) | A (6) | C (23) |
| | | WB | C (34) | B (16) | A (8) | | C (24) | C (25) | B (18) | |
| | | NB | C (24) | C (32) | B (12) | | C (28) | C (27) | A (6) | |
| | | SB | D (36) | C (30) | A (6) | | C (28) | D (38) | B (16) | |
| Chaska Creek Boulevard & Creek Road | Round-about | EB | A (3) | | | A (3) | A (4) | | | A (4) |
| | | WB | A (3) | | | | A (4) | | | |
| | | NB | - | | | | - | | | |
| | | SB | A (3) | | | | A (4) | | | |
| CSAH 44 & US 212 Eastbound Ramp | Round-about | EB | A (6) | | | A (10) | A (9) | | | A (10) |
| | | WB | B (15) | | | | B (14) | | | |
| | | NB | - | | | | - | | | |
| | | SB | - | | | | - | | | |
| CSAH 44 & US 212 Westbound Ramp | Round-about | EB | A (8) | | | A (6) | B (11) | | | A (8) |
| | | WB | A (7) | | | | A (8) | | | |
| | | NB | A (5) | | | | A (6) | | | |
| | | SB | - | | | | - | | | |
| CSAH 44 & CSAH 11 | Round-about | EB | A (7) | | | B (10) | A (8) | | | B (15) |
| | | WB | A (8) | | | | C (15) | | | |
| | | NB | B (13) | | | | B (15) | | | |
| | | SB | B (11) | | | | C (18) | | | |
| CSAH 11 & CSAH 61 | Signal | EB | C (21) | D (37) | A (6) | B (16) | D (38) | D (50) | B (13) | C (26) |
| | | WB | C (26) | B (12) | A (4) | | D (43) | D (39) | B (17) | |
| | | NB | B (13) | B (18) | B (15) | | C (31) | B (15) | A (10) | |
| | | SB | B (15) | A (10) | A (1) | | D (45) | C (26) | A (3) | |

| Intersection | Control | Approach | Operations by Movement | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | | PM Peak Hour | | | |
| | | | Left | Through | Right | Overall | Left | Through | Right | Overall |
| CSAH 11 & US 212 Westbound Ramps | Signal | EB | - | - | - | B (15) | - | - | - | D (40) |
| | | WB | C (33) | - | B (12) | | D (44) | - | C (30) | |
| | | NB | D (38) | A (8) | - | | E (61) | C (26) | - | |
| | | SB | - | B (13) | A (6) | | - | E (57) | C (30) | |
| CSAH 11 & US 212 Eastbound Ramps | Signal | EB | D (49) | - | B (15) | C (28) | E (56) | - | C (34) | B (11) |
| | | WB | - | - | - | | - | - | - | |
| | | NB | - | B (20) | D (38) | | - | A (8) | A (6) | |
| | | SB | A (10) | A (5) | - | | A (10) | A (6) | - | |
| CSAH 11 & Access A | Side Street Stop | EB | - | - | - | A (2) | - | - | - | A (2) |
| | | WB | - | - | A (3) | | - | - | A (6) | |
| | | NB | - | A (2) | A (2) | | - | A (3) | A (2) | |
| | | SB | - | A (1) | - | | - | A (1) | - | |
| CSAH 44 & Access B | Round-about | EB | A (8) | | | A (7) | A (9) | | | A (10) |
| | | WB | A (8) | | | | B (12) | | | |
| | | NB | A (5) | | | | A (6) | | | |
| | | SB | A (6) | | | | B (11) | | | |
| CSAH 11 & Access C | Side Street Stop | EB | - | - | - | A (2) | - | - | - | A (3) |
| | | WB | B (11) | - | A (6) | | C (19) | - | A (10) | |
| | | NB | - | A (2) | A (1) | | - | A (1) | A (0) | |
| | | SB | A (6) | A (3) | - | | A (8) | A (4) | - | |
| CSAH 61 & Access D | Side Street Stop | EB | A (4) | A (2) | - | A (2) | A (4) | A (2) | - | A (2) |
| | | WB | - | A (1) | A (1) | | - | A (2) | A (0) | |
| | | NB | - | - | - | | - | - | - | |
| | | SB | B (13) | - | A (4) | | D (27) | - | A (6) | |

# 5. FUTURE CONDITIONS ANALYSIS - SCENARIO 2

This section of the report outlines the proposed development scenario, summarizes site-specific traffic characteristics, and develops future traffic projections for Scenario 2. The project location is shown in **Exhibit 1**.

## 5.1 Scenario 2 Development Characteristics and Site Access

The Scenario 2 development consists of 3,000,000 total square feet of development, 90% of which is expected to be business park (industrial) and 10% is expected to be commercial (retail). As was the case with Scenario 1, the retail/commercial space would generally be located along the north side of CSAH 44 (Big Woods Boulevard) in the eastern half of the site. The proposed business park/industrial space is dispersed throughout the remainder of the site.

As with Scenario 1, the development will generally be completed in two phases. Phase 1 consists of the portion of the development located north of CSAH 44 (i.e., all of the retail space and about half of the business park). Phase 1 is assumed to be completed by 2030. Phase 2 includes the remaining half of the total business park space that is located south of CSAH 44. This phase is anticipated to develop farther in the future than the Phase 1 portion of the development and is included in analysis year 2045.

The access plan for Scenario 2 is anticipated to be the same as what is outlined in Section 4.1 for Scenario 1. As previously mentioned, all site accesses should be reviewed with Carver County as development plans are completed to determine a final access plan to the site.

## 5.2 Scenario 2 Trip Generation

Proposed development traffic was determined based on data from the Institute of Transportation Engineers' (ITE) *Trip Generation*, 12$^{th}$ Edition. The manual provides peak hour trips rates/equations, inbound-outbound percentages that can be attributed to the proposed site. Based on a review of industrial land uses provided in the manual, LUC 130 (Industrial Park) was determined to be the most appropriate fit. LUC 820 (Shopping Center) was determined to be the most appropriate fit for the retail portion of the development.

**Table 5-1** provides a summary of trip generation for development Scenario 2. Based on the trip generation calculation, the proposed Scenario 2 development is anticipated to generate 18,153 daily trips, including 858 total trips during the AM Peak Hour (622 entering, 238 exiting), and 1,599 total trips during the PM Peak Hour (653 entering, 947 exiting).

**Table 5-1: Site-Generated Traffic Projections – Scenario 2**

| Land Use Description | Intensity / Units | Daily | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | | | In | Out | Total | In | Out | Total |
| Phase 1 (2030) | | | | | | | | |
| Industrial Park – ITE LUC 130 | 1,350 kSF | 3,618 | 229 | 68 | 297 | 87 | 224 | 311 |
| *Passenger Vehicles* | 1,350 kSF | *2,970* | *208* | *49* | *257* | *65* | *206* | *270* |
| *Trucks* | 1,350 kSF | *648* | *21* | *20* | *41* | *23* | *18* | *41* |
| Shopping Center – ITE LUC 820 | 300 kSF | 10,917 | 164 | 101 | 264 | 479 | 500 | 978 |
| *Passenger Vehicles* | *300 kSF* | *10,890* | *161* | *98* | *258* | *477* | *498* | *975* |
| *Trucks* | *300 kSF* | *27* | *3* | *3* | *6* | *2* | *2* | *3* |
| Phase 1 (2030) Totals | 1,650 kSF | 14,535 | 393 | 169 | 561 | 566 | 724 | 1,289 |
| *Passenger Vehicles* | *1,650 kSF* | *13,860* | *369* | *147* | *515* | *542* | *704* | *1,245* |
| *Trucks* | *1,650 kSF* | *675* | *24* | *23* | *47* | *25* | *20* | *44* |
| Phase 2 (2045) | | | | | | | | |
| Industrial Park – ITE LUC 130 | 1,350 kSF | 3,618 | 229 | 69 | 297 | 87 | 223 | 310 |
| *Passenger Vehicles* | 1,350 kSF | *2,970* | *208* | *49* | *256* | *64* | *205* | *270* |
| *Trucks* | 1,350 kSF | *648* | *21* | *19* | *40* | *22* | *18* | *40* |
| Buildout (2045) Totals | 3,000 kSF | 18,153 | 622 | 238 | 858 | 653 | 947 | 1,599 |
| *Passenger Vehicles* | *3,000 kSF* | *16,830* | *577* | *196* | *771* | *606* | *909* | *1,515* |
| *Trucks* | *3,000 kSF* | *1,323* | *45* | *42* | *87* | *47* | *38* | *84* |

## 5.3 Scenario 2 Directional Distribution

Because Scenario 2 differs from Scenario 1 only in intensity and not in land usage, the distribution of development trips to the Scenario 2 development is not expected to differ significantly from Scenario 1. The passenger vehicle distribution for the Phase 1 (2030) development is shown in Exhibit 8 and the truck distribution in Exhibit 9.

Opening Year (2030) Scenario 2 site trips were determined by combining passenger vehicle trips and truck trips. Passenger vehicle site trips were determined by applying passenger vehicle trip generation (Table 5-1) to the passenger vehicle distribution (Exhibit 8). Truck site trips were determined by applying truck trip generation (Table 5-1) to truck distribution (Exhibit 9). The total Opening Year (2030) Scenario 2 site trips are presented in **Exhibit 16**.

The Opening Year (2030) Scenario 2 Traffic Volumes were calculated by adding the Phase 1 site trips in Exhibit 16 to the Opening Year (2030) No-Build Traffic Volumes in Exhibit 6. The Opening Year (2030) Scenario 2 Traffic Volumes are shown in **Exhibit 17**.

The passenger vehicle and truck distributions for the Phase 2 developments of Scenario 2 are shown in Exhibit 12 and Exhibit 13, respectively. The Phase 2 Passenger Vehicle Site Trips for Scenario 2 were calculated by applying the passenger vehicle trip generation (Table 5-1) to the passenger vehicle distribution shown in Exhibit 12. The truck site trips were calculated by applying the truck trip generation shown in Table 5-1 to the truck distribution shown in Exhibit 13. The total Phase 2 site trips for Scenario 2 are shown in **Exhibit 18**.

The Design Year (2045) Scenario 2 Traffic Volumes were calculated by adding the Phase 1 and Phase 2 development trips in Exhibit 16 and Exhibit 18 to the Design Year (2045) No-Build Traffic Volumes in Exhibit 7. The Design Year (2045) Scenario 2 Traffic Volumes are shown in **Exhibit 19**.

## 5.4 Scenario 2 Future Pedestrian and Bicycle Infrastructure

During buildout of the site, trails/sidewalks should be provided along the major routes throughout the site with connections to the existing trail system to allow for multimodal site trips and improve the connectivity of the local trail system. This includes sidewalks along CSAH 11, CSAH 44, and a ravine crossing for the Southwest Regional Trail.

## 5.5 Opening Year (2030) Build Scenario 2 Capacity Analysis

An Opening Year (2030) Scenario 2 capacity analysis was conducted to determine the impacts of the short-term Scenario 2 development. The development north of CSAH 44 (Big Woods Boulevard) is included in this analysis, which consists of 1,350,000 square feet of industrial space (half of the total for Scenario 2) and all 300,000 square feet of retail space. Access A is assumed to be side street stop controlled and restricted to right-in/right-out while Access B is assumed to be controlled by a single-lane roundabout. The results of the analysis for the Opening Year (2030) Build Scenario 2 are shown in **Table 5-2**. Copies of the SimTraffic/Rodel analysis reports are provided in the appendix.

Based on the analysis in the Opening Year (2030) Build Scenario 2, the proposed short-tern Scenario 2 development is anticipated to result in slightly higher increases in delay than Scenario 1, but all intersections are anticipated to continue operating at LOS C or better. The 95$^{th}$ percentile queueing indicate the southbound right turn lane at CSAH 11 & US 212 Westbound sees 153' queues, exceeding the 90' of provided storage. All other 95$^{th}$ percentile queues are maintained within the provided storage bays.

**Table 5-2: Opening Year (2030) Build Scenario 2 Level of Service**

| Intersection | Control | Approach | Operations by Movement | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | | PM Peak Hour | | | |
| | | | Left | Through | Right | Overall | Left | Through | Right | Overall |
| CSAH 10 & US 212 Eastbound Ramps | Signal | EB | B (11) | A (4) | - | B (15) | C (26) | A (4) | - | B (15) |
| | | WB | - | D (39) | B (17) | | - | B (14) | A (5) | |
| | | NB | D (43) | C (32) | A (7) | | D (43) | D (41) | A (6) | |
| | | SB | - | - | - | | - | - | - | |
| CSAH 10 & US 212 Westbound Ramps | Signal | EB | - | B (17) | A (6) | B (16) | - | B (20) | A (4) | B (17) |
| | | WB | F (85) | A (7) | - | | B (19) | A (10) | - | |
| | | NB | - | - | - | | - | - | - | |
| | | SB | E (69) | - | A (8) | | C (23) | - | B (16) | |
| CSAH 10 & Chaska Creek Boulevard | Signal | EB | B (14) | C (21) | A (4) | B (19) | D (44) | B (10) | A (1) | B (13) |
| | | WB | D (39) | A (8) | A (3) | | D (50) | B (11) | A (5) | |
| | | NB | C (27) | E (61) | B (12) | | D (47) | D (48) | A (5) | |
| | | SB | C (29) | C (28) | A (5) | | C (34) | C (34) | B (14) | |
| CSAH 10 & CSAH 11 | Signal | EB | B (14) | B (13) | A (5) | B (15) | D (55) | B (12) | A (4) | C (24) |
| | | WB | C (21) | B (14) | A (5) | | E (71) | B (20) | B (11) | |
| | | NB | B (17) | C (24) | A (8) | | D (42) | C (34) | A (4) | |
| | | SB | C (22) | C (24) | A (3) | | D (50) | D (47) | A (10) | |

| Intersection | Control | Approach | Operations by Movement | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | | PM Peak Hour | | | |
| | | | Left | Through | Right | Overall | Left | Through | Right | Overall |
| Chaska Creek Boulevard & Creek Road | Round-about | EB | A (3) | | | A (3) | A (3) | | | A (3) |
| | | WB | A (3) | | | | A (3) | | | |
| | | NB | - | | | | - | | | |
| | | SB | A (3) | | | | A (3) | | | |
| CSAH 44 & US 212 Eastbound Ramp | Round-about | EB | A (5) | | | A (7) | A (9) | | | A (9) |
| | | WB | A (10) | | | | A (11) | | | |
| | | NB | - | | | | - | | | |
| | | SB | - | | | | - | | | |
| CSAH 44 & US 212 Westbound Ramp | Round-about | EB | A (7) | | | A (6) | B (11) | | | A (9) |
| | | WB | A (6) | | | | A (8) | | | |
| | | NB | A (6) | | | | A (9) | | | |
| | | SB | - | | | | - | | | |
| CSAH 44 & CSAH 11 | Round-about | EB | A (5) | | | A (7) | A (6) | | | A (9) |
| | | WB | A (7) | | | | A (10) | | | |
| | | NB | A (9) | | | | A (10) | | | |
| | | SB | A (8) | | | | B (11) | | | |
| CSAH 11 & CSAH 61 | Signal | EB | C (23) | D (36) | A (4) | B (11) | C (33) | E (55) | A (9) | B (20) |
| | | WB | C (22) | B (12) | A (3) | | D (47) | D (39) | B (13) | |
| | | NB | B (12) | B (13) | A (9) | | C (21) | A (10) | A (6) | |
| | | SB | B (11) | A (7) | A (1) | | C (21) | B (13) | A (2) | |
| CSAH 11 & US 212 Westbound Ramps | Signal | EB | - | - | - | B (13) | - | - | - | C (24) |
| | | WB | C (29) | - | A (7) | | C (29) | - | B (12) | |
| | | NB | D (37) | A (8) | - | | E (58) | B (19) | - | |
| | | SB | - | B (11) | A (5) | | - | C (27) | B (10) | |
| CSAH 11 & US 212 Eastbound Ramps | Signal | EB | C (32) | - | A (8) | C (35) | D (42) | - | B (16) | A (9) |
| | | WB | - | - | - | | - | - | - | |
| | | NB | - | D (41) | D (48) | | - | A (6) | A (7) | |
| | | SB | A (7) | A (5) | - | | A (10) | A (6) | - | |
| CSAH 11 & Access A | Side Street Stop | EB | - | - | - | A (1) | - | - | - | A (2) |
| | | WB | - | - | A (3) | | - | - | A (4) | |
| | | NB | - | A (2) | A (1) | | - | A (3) | A (2) | |
| | | SB | - | A (1) | - | | - | A (1) | - | |
| CSAH 44 & Access B | Round-about | EB | A (7) | | | A (6) | A (9) | | | B (12) |
| | | WB | A (8) | | | | B (12) | | | |
| | | NB | - | | | | - | | | |
| | | SB | A (6) | | | | C (15) | | | |

## 5.6 Design Year (2045) Build Scenario 2 Capacity Analysis

Capacity analysis results for the Design Year (2045) Scenario 1 conditions are provided in **Table 5-3**. The analysis was carried out assuming dual northbound right turn lanes at CSAH 11 & US 212 Eastbound Ramps which was shown to be necessary under Design Year (2045) No-Build conditions if an additional interchange is not constructed for the developments south of US Highway 212.

The results of the capacity analysis show the system has increased delay compared to Scenario 1, particularly the roundabouts along CSAH 44 (Big Woods Boulevard), but all intersections are anticipated to continue operating at LOS D or better. All roundabout approaches operate at LOS C or better. Some individual movements at signalized intersections are anticipated to operate at LOS E or LOS F, as with the Design Year (2045) No-Build scenario, but these intersections/movements are primarily along CSAH 10 (Engler Boulevard) and are relatively unaffected by the proposed development. The overall network operations are anticipated to be acceptable.

Based on review of the 95$^{th}$ percentile queueing results, the US Highway 212 westbound exit ramp at CSAH 44 sees significant queueing during the PM peak with 95$^{th}$ percentile queues of 475', but queues would need to extend more than 1,000 feet to reach the freeway itself and are not at risk of doing so. The 95$^{th}$ percentile queues at the southbound approach of the Access B roundabout are anticipated to be 225' during the PM peak and the site should be designed to accommodate queues of this length. The southbound right turn lane at CSAH 11 & US 212 Westbound ramps is anticipated to experience 244' queues during the PM peak, exceeding the 90' of provided storage. A turn lane extension (at least 250') is required to maintain the anticipated queues. All other 95$^{th}$ percentile queues were acceptable, except those outlined in the Design Year (2045) No-Build section.

**Table 5-3: Design Year (2045) Build Scenario 2 Level of Service**

| Intersection | Control | Approach | Operations by Movement | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | | PM Peak Hour | | | |
| | | | Left | Through | Right | Overall | Left | Through | Right | Overall |
| CSAH 10 & US 212 Eastbound Ramps | Signal | EB | C (23) | A (6) | - | C (24) | C (26) | A (6) | - | B (16) |
| | | WB | - | D (48) | C (31) | | - | B (17) | A (6) | |
| | | NB | E (60) | C (27) | A (10) | | D (37) | C (34) | A (8) | |
| | | SB | - | - | - | | - | - | - | |
| CSAH 10 & US 212 Westbound Ramps | Signal | EB | - | D (39) | B (15) | C (35) | - | D (40) | A (6) | C (33) |
| | | WB | F (100+) | A (7) | - | | C (25) | A (9) | - | |
| | | NB | - | - | - | | - | - | - | |
| | | SB | F (100+) | - | B (14) | | C (35) | - | D (36) | |
| CSAH 10 & Chaska Creek Boulevard | Signal | EB | D (50) | D (51) | B (18) | D (47) | D (41) | B (15) | A (2) | C (26) |
| | | WB | F (100+) | A (8) | A (3) | | D (49) | C (33) | B (17) | |
| | | NB | E (61) | F (85) | D (48) | | C (27) | D (44) | A (9) | |
| | | SB | F (87) | E (72) | C (31) | | C (27) | D (36) | B (18) | |
| CSAH 10 & CSAH 11 | Signal | EB | C (22) | C (20) | A (8) | C (22) | C (28) | B (14) | A (6) | C (23) |
| | | WB | C (34) | B (17) | A (8) | | C (24) | C (24) | B (18) | |
| | | NB | C (26) | C (32) | B (14) | | C (27) | C (25) | A (6) | |
| | | SB | D (38) | C (30) | A (7) | | C (28) | D (41) | B (16) | |
| Chaska Creek Boulevard & Creek Road | Round-about | EB | A (3) | | | A (3) | A (4) | | | A (4) |
| | | WB | A (3) | | | | A (4) | | | |
| | | NB | - | | | | - | | | |
| | | SB | A (3) | | | | A (4) | | | |
| CSAH 44 & US 212 Eastbound Ramp | Round-about | EB | A (6) | | | B (11) | B (11) | | | B (13) |
| | | WB | C (16) | | | | C (18) | | | |
| | | NB | - | | | | - | | | |
| | | SB | - | | | | - | | | |
| CSAH 44 & US 212 Westbound Ramp | Round-about | EB | A (8) | | | A (7) | C (15) | | | C (17) |
| | | WB | A (7) | | | | C (25) | | | |
| | | NB | A (7) | | | | A (10) | | | |
| | | SB | - | | | | - | | | |
| CSAH 44 & CSAH 11 | Round-about | EB | A (7) | | | B (11) | A (8) | | | C (19) |
| | | WB | A (9) | | | | C (21) | | | |
| | | NB | B (15) | | | | C (21) | | | |
| | | SB | B (12) | | | | C (18) | | | |
| CSAH 11 & CSAH 61 | Signal | EB | C (22) | D (38) | A (7) | B (18) | D (35) | D (48) | B (15) | C (28) |
| | | WB | C (29) | B (14) | A (4) | | D (42) | D (38) | B (16) | |
| | | NB | B (15) | C (20) | B (16) | | D (36) | B (16) | A (10) | |
| | | SB | B (14) | B (11) | A (2) | | D (51) | C (32) | A (4) | |

| Intersection | Control | Approach | Operations by Movement | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | | PM Peak Hour | | | |
| | | | Left | Through | Right | Overall | Left | Through | Right | Overall |
| CSAH 11 & US 212 Westbound Ramps | Signal | EB | - | - | - | B (15) | - | - | - | D (42) |
| | | WB | C (32) | - | B (13) | | D (44) | - | C (30) | |
| | | NB | D (37) | A (10) | - | | E (63) | C (28) | - | |
| | | SB | - | B (13) | A (7) | | - | E (59) | C (34) | |
| CSAH 11 & US 212 Eastbound Ramps | Signal | EB | C (33) | - | B (12) | C (24) | E (60) | - | C (35) | B (12) |
| | | WB | - | - | - | | - | - | - | |
| | | NB | - | C (20) | C (31) | | - | A (9) | A (6) | |
| | | SB | B (13) | A (6) | - | | B (12) | A (7) | - | |
| CSAH 11 & Access A | Side Street Stop | EB | - | - | - | A (2) | - | - | - | A (3) |
| | | WB | - | - | A (5) | | - | - | A (6) | |
| | | NB | - | A (3) | A (2) | | - | A (4) | A (3) | |
| | | SB | - | A (1) | - | | - | A (1) | - | |
| CSAH 44 & Access B | Round-about | EB | A (9) | | | A (8) | B (12) | | | C (16) |
| | | WB | B (10) | | | | C (18) | | | |
| | | NB | A (6) | | | | A (8) | | | |
| | | SB | A (7) | | | | C (20) | | | |
| CSAH 11 & Access C | Side Street Stop | EB | - | - | - | A (3) | - | - | - | A (6) |
| | | WB | C (17) | - | A (7) | | E (36) | - | C (21) | |
| | | NB | - | A (2) | A (1) | | - | A (2) | A (1) | |
| | | SB | A (5) | A (3) | - | | B (12) | A (6) | - | |
| CSAH 61 & Access D | Side Street Stop | EB | A (4) | A (2) | - | A (2) | A (8) | A (3) | - | A (3) |
| | | WB | - | A (1) | A (1) | | - | A (2) | A (1) | |
| | | NB | - | - | - | | - | - | - | |
| | | SB | C (21) | - | A (7) | | C (18) | - | A (6) | |

# 6. ANALYSIS OF POTENTIAL CREEK CROSSING

Establishing a connection from the internal “Spine Road” to the Creek Road & Chaska Creek Boulevard roundabout north of the AUAR area has been explored as a potential option for improving connectivity throughout the area. This improvement would have a significant impact on travel patterns to/from the proposed development site and would impact the required mitigation plan. Analysis of the impacts associated with a creek crossing was focused on the Design Year (2045), to capture the long term impacts of the crossing on the network traffic operations.

The global distribution of traffic would not be affected by the implementation of a creek crossing, but the new connection would create a more convenient route into the site from the north for many of the vehicles traveling to/from the north. In general, the impact of this connection would be felt significantly by the Phase 1 development traffic, but it is not anticipated that Phase 2 development traffic would be affected in a meaningful way. The distribution of passenger vehicle traffic for the Phase 1 development with the implementation of a creek crossing connection is shown in **Exhibit 20**. The distribution of heavy vehicle traffic to the Phase 1 development with the implementation of a creek crossing is shown in **Exhibit 21**.

## 6.1 Design Year (2045) Scenario 1 with Creek Crossing

Analysis was conducted on the Design Year (2045) Scenario 1 with Creek Crossing scenario to determine the traffic impacts of the proposed development with a creek crossing in place. The total trip assignment for Phase 1 of Scenario 1 with a creek crossing in place is shown in **Exhibit 22**. The Design Year (2045) Scenario 1 with Creek Crossing traffic volumes are shown in **Exhibit 23**. Results of the capacity analysis are shown below in **Table 6-1**.

The analysis indicates that implementation of a creek crossing will worsen traffic operations along CSAH 10 but will provide some reduction in delays along CSAH 44. Overall, it is not anticipated that establishing a creek crossing connection would significantly improve traffic operations throughout the study area. However, improved connectivity offered by the connection could benefit businesses throughout the area. Furthermore, this analysis did not include the potential completion of the CSAH 44 interchange.

**Table 6-1: Design Year (2045) Build Scenario 1 Level of Service**

| Intersection | Control | Approach | Operations by Movement | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | | PM Peak Hour | | | |
| | | | Left | Through | Right | Overall | Left | Through | Right | Overall |
| CSAH 10 & US 212 Eastbound Ramps | Signal | EB | B (20) | A (8) | - | C (23) | C (28) | A (6) | - | B (17) |
| | | WB | - | D (47) | C (35) | | - | B (17) | A (8) | |
| | | NB | E (62) | E (67) | A (9) | | D (36) | E (71) | A (8) | |
| | | SB | - | - | - | | - | - | - | |
| CSAH 10 & US 212 Westbound Ramps | Signal | EB | - | D (44) | B (16) | D (37) | - | E (62) | A (7) | D (41) |
| | | WB | F (100+) | A (6) | - | | C (25) | A (9) | - | |
| | | NB | - | - | - | | - | - | - | |
| | | SB | F (100+) | - | B (16) | | D (35) | - | D (39) | |
| CSAH 10 & Chaska Creek Boulevard | Signal | EB | D (41) | D (43) | B (17) | D (49) | D (44) | C (34) | A (7) | C (32) |
| | | WB | F (100+) | A (8) | A (3) | | D (44) | D (39) | B (16) | |
| | | NB | E (78) | F (95) | D (52) | | C (23) | C (28) | B (15) | |
| | | SB | F (100+) | F (83) | D (47) | | C (26) | D (36) | B (17) | |
| CSAH 10 & CSAH 11 | Signal | EB | B (20) | B (20) | A (8) | C (21) | C (26) | B (14) | A (6) | C (22) |
| | | WB | C (29) | B (15) | A (7) | | C (31) | C (24) | B (16) | |
| | | NB | C (24) | C (33) | B (15) | | C (27) | C (25) | A (5) | |
| | | SB | D (36) | C (29) | A (6) | | C (29) | D (39) | B (15) | |
| Chaska Creek Boulevard & Creek Road | Round-about | EB | A (4) | | | A (4) | A (4) | | | A (5) |
| | | WB | A (4) | | | | A (4) | | | |
| | | NB | A (4) | | | | A (5) | | | |
| | | SB | A (5) | | | | A (6) | | | |
| CSAH 44 & US 212 Eastbound Ramp | Round-about | EB | A (5) | | | A (10) | A (7) | | | A (8) |
| | | WB | B (14) | | | | B (12) | | | |
| | | NB | - | | | | - | | | |
| | | SB | - | | | | - | | | |
| CSAH 44 & US 212 Westbound Ramp | Round-about | EB | A (7) | | | A (5) | A (8) | | | A (6) |
| | | WB | A (6) | | | | A (8) | | | |
| | | NB | A (6) | | | | A (4) | | | |
| | | SB | - | | | | - | | | |
| CSAH 44 & CSAH 11 | Round-about | EB | A (7) | | | A (10) | A (7) | | | B (13) |
| | | WB | A (8) | | | | B (14) | | | |
| | | NB | B (13) | | | | B (14) | | | |
| | | SB | B (11) | | | | C (16) | | | |
| CSAH 11 & CSAH 61 | Signal | EB | C (22) | D (41) | A (7) | B (18) | D (40) | D (49) | B (14) | C (26) |
| | | WB | C (31) | B (14) | A (4) | | D (44) | D (39) | B (15) | |
| | | NB | B (15) | C (21) | B (16) | | C (28) | B (12) | A (9) | |
| | | SB | B (14) | A (10) | A (2) | | E (58) | C (26) | A (3) | |

| Intersection | Control | Approach | Operations by Movement | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | | PM Peak Hour | | | |
| | | | Left | Through | Right | Overall | Left | Through | Right | Overall |
| CSAH 11 & US 212 Westbound Ramps | Signal | EB | - | - | - | B (16) | - | - | - | D (38) |
| | | WB | C (32) | - | B (12) | | D (45) | - | C (31) | |
| | | NB | D (40) | B (10) | - | | E (60) | C (26) | - | |
| | | SB | - | B (13) | A (6) | | - | D (48) | C (21) | |
| CSAH 11 & US 212 Eastbound Ramps | Signal | EB | C (31) | - | B (11) | C (23) | D (53) | - | C (31) | B (10) |
| | | WB | - | - | - | | - | - | - | |
| | | NB | - | C (32) | C (27) | | - | A (7) | A (6) | |
| | | SB | B (12) | A (6) | - | | B (11) | A (6) | - | |
| CSAH 11 & Access A | Side Street Stop | EB | - | - | - | A (2) | - | - | - | A (2) |
| | | WB | - | - | A (4) | | - | - | A (5) | |
| | | NB | - | A (2) | A (2) | | - | A (3) | A (2) | |
| | | SB | - | A (1) | - | | - | A (1) | - | |
| CSAH 44 & Access B | Round-about | EB | A (8) | | | A (6) | A (8) | | | A (8) |
| | | WB | A (7) | | | | A (10) | | | |
| | | NB | A (5) | | | | A (5) | | | |
| | | SB | A (5) | | | | A (8) | | | |
| CSAH 11 & Access C | Side Street Stop | EB | - | - | - | A (3) | - | - | - | A (3) |
| | | WB | B (13) | - | A (6) | | C (18) | - | A (6) | |
| | | NB | - | A (2) | A (1) | | - | A (2) | A (0) | |
| | | SB | A (6) | A (3) | - | | A (8) | A (4) | - | |
| CSAH 61 & Access D | Side Street Stop | EB | A (4) | A (2) | - | A (2) | A (9) | A (2) | - | A (2) |
| | | WB | - | A (1) | A (0) | | - | A (1) | A (1) | |
| | | NB | - | - | - | | - | - | - | |
| | | SB | C (17) | - | A (4) | | C (20) | - | A (7) | |

## 6.2 Design Year (2045) Scenario 2 with Creek Crossing

Analysis was conducted on the Design Year (2045) Scenario 2 with Creek Crossing scenario to determine the traffic impacts of the proposed development with a creek crossing in place. The total trip assignment for Phase 1 of Scenario 2 with a creek crossing in place is shown in **Exhibit 24**. The Design Year (2045) Scenario 2 with Creek Crossing traffic volumes are shown in **Exhibit 25**. Results of the capacity analysis are shown below in .

The analysis indicates that, in line with the results for Scenario 1, implementation of a creek crossing will worsen traffic operations along CSAH 10 but will provide a minor reduction in delays along CSAH 44. While the improved connectivity offered by the connection could benefit businesses throughout the area, it is not anticipated that the establishment of a creek crossing would provide significant operational benefit. However, this analysis does not take into account the potential completion of the CSAH 44 interchange which could impact this.

**Table 6-2: Design Year (2045) Build Scenario 1 Level of Service**

| Intersection | Control | Approach | Operations by Movement | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | | PM Peak Hour | | | |
| | | | Left | Through | Right | Overall | Left | Through | Right | Overall |
| CSAH 10 & US 212 Eastbound Ramps | Signal | EB | C (21) | A (8) | - | C (23) | C (29) | A (6) | - | B (18) |
| | | WB | - | D (47) | C (35) | | - | B (17) | A (8) | |
| | | NB | E (62) | E (63) | A (9) | | D (35) | C (33) | A (8) | |
| | | SB | - | - | - | | - | - | - | |
| CSAH 10 & US 212 Westbound Ramps | Signal | EB | - | E (62) | C (29) | E (56) | - | F (94) | B (10) | D (53) |
| | | WB | F (100+) | B (11) | - | | C (26) | A (9) | - | |
| | | NB | - | - | - | | - | - | - | |
| | | SB | F (100+) | - | D (51) | | D (37) | - | D (39) | |
| CSAH 10 & Chaska Creek Boulevard | Signal | EB | E (73) | E (76) | D (39) | F (94) | F (88) | F (92) | D (36) | D (43) |
| | | WB | F (100+) | A (9) | A (3) | | D (45) | C (33) | B (13) | |
| | | NB | F (100+) | F (100+) | F (98) | | C (25) | D (38) | C (25) | |
| | | SB | F (100+) | F (100+) | D (51) | | C (27) | C (33) | B (15) | |
| CSAH 10 & CSAH 11 | Signal | EB | C (22) | C (21) | A (7) | C (22) | C (27) | B (14) | A (6) | C (22) |
| | | WB | C (34) | B (17) | A (8) | | C (25) | C (24) | B (16) | |
| | | NB | C (26) | C (33) | B (16) | | C (27) | C (25) | A (5) | |
| | | SB | D (39) | C (31) | A (6) | | C (28) | D (38) | B (15) | |
| Chaska Creek Boulevard & Creek Road | Round-about | EB | A (4) | | | A (5) | A (4) | | | A (5) |
| | | WB | A (4) | | | | A (4) | | | |
| | | NB | A (5) | | | | A (6) | | | |
| | | SB | A (6) | | | | A (6) | | | |
| CSAH 44 & US 212 Eastbound Ramp | Round-about | EB | A (5) | | | A (8) | A (8) | | | B (13) |
| | | WB | C (15) | | | | B (13) | | | |
| | | NB | - | | | | - | | | |
| | | SB | - | | | | - | | | |
| CSAH 44 & US 212 Westbound Ramp | Round-about | EB | A (8) | | | A (6) | B (10) | | | A (7) |
| | | WB | A (7) | | | | A (9) | | | |
| | | NB | A (7) | | | | A (9) | | | |
| | | SB | - | | | | - | | | |
| CSAH 44 & CSAH 11 | Round-about | EB | A (7) | | | C (18) | A (8) | | | C (16) |
| | | WB | C (22) | | | | C (19) | | | |
| | | NB | C (21) | | | | C (16) | | | |
| | | SB | C (16) | | | | C (18) | | | |
| CSAH 11 & CSAH 61 | Signal | EB | C (26) | D (38) | A (6) | B (18) | D (37) | D (47) | B (15) | C (28) |
| | | WB | C (28) | B (13) | A (4) | | D (42) | D (44) | B (18) | |
| | | NB | B (14) | C (22) | B (17) | | D (36) | B (14) | A (9) | |
| | | SB | B (16) | A (10) | A (1) | | D (46) | D (37) | A (4) | |

| Intersection | Control | Approach | Operations by Movement | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM Peak Hour | | | | PM Peak Hour | | | |
| | | | Left | Through | Right | Overall | Left | Through | Right | Overall |
| CSAH 11 & US 212 Westbound Ramps | Signal | EB | - | - | - | B (15) | - | - | - | D (44) |
| | | WB | C (32) | - | B (14) | | D (47) | - | C (33) | |
| | | NB | D (39) | B (10) | - | | E (64) | C (27) | - | |
| | | SB | - | B (13) | A (6) | | - | E (66) | D (37) | |
| CSAH 11 & US 212 Eastbound Ramps | Signal | EB | D (36) | - | B (13) | C (25) | E (57) | - | C (32) | B (11) |
| | | WB | - | - | - | | - | - | - | |
| | | NB | - | C (34) | C (28) | | - | A (8) | A (6) | |
| | | SB | B (13) | A (6) | - | | B (13) | A (6) | - | |
| CSAH 11 & Access A | Side Street Stop | EB | - | - | - | A (2) | - | - | - | A (3) |
| | | WB | - | - | A (5) | | - | - | A (6) | |
| | | NB | - | A (3) | A (2) | | - | A (4) | A (3) | |
| | | SB | - | A (1) | - | | - | A (1) | - | |
| CSAH 44 & Access B | Round-about | EB | A (8) | | | A (7) | A (9) | | | A (9) |
| | | WB | A (8) | | | | B (11) | | | |
| | | NB | A (5) | | | | A (6) | | | |
| | | SB | A (6) | | | | B (11) | | | |
| CSAH 11 & Access C | Side Street Stop | EB | - | - | - | A (3) | - | - | - | A (5) |
| | | WB | B (13) | - | A (7) | | D (32) | - | C (19) | |
| | | NB | - | A (3) | A (1) | | - | A (2) | A (1) | |
| | | SB | A (6) | A (4) | - | | A (10) | A (6) | - | |
| CSAH 61 & Access D | Side Street Stop | EB | A (4) | A (2) | - | A (2) | A (7) | A (2) | - | A (2) |
| | | WB | - | A (1) | A (0) | | - | A (2) | A (1) | |
| | | NB | - | - | - | | - | - | - | |
| | | SB | F (50) | - | A (3) | | D (25) | - | A (7) | |

# 7. TURN LANE WARRANT ANALYSIS

A turn lane warrant analysis was conducted at the proposed stop-controlled site access points for Opening Year (2030) and Design Year (2045) of Scenario 1 and Scenario 2 to determine the need for major-road left and right turn lanes at the site access points. The warrant analysis was carried out using the methodologies outlined in National Cooperative Highway Research Program (NCHRP) Report 457 on the need for major-road turn lanes at unsignalized intersections. Results of the analysis are summarized below in **Table 7-1**.

**Table 7-1: Turn Lane Warrant Analysis Summary**

| Intersection | Movement | Turn Lane Warrant Result by Scenario | | | |
|---|---|---|---|---|---|
| | | Scenario 1 | | Scenario 2 | |
| | | 2030 | 2045 | 2030 | 2045 |
| CSAH 11 & Access A | NBR | MET | MET | MET | MET |
| CSAH 11 & Access C | NBR | - | MET | - | MET |
| | SBL | - | Not Met | - | MET |
| CSAH 61 & Access D | WBR | - | Not Met | - | Not Met |
| | EBL | - | MET | - | MET |

Results of the turn lane warrant analysis indicate that Scenario 1 will require right turn lanes along CSAH 11 at Access A and Access C and a left turn lane along CSAH 61 at Access D. Scenario 2 will additionally require a southbound left turn lane along CSAH 11 at Access C.

# 8. CONCLUSION AND RECOMMENDATIONS

A traffic analysis was performed to quantify the impacts of the proposed Big Woods Industrial development located between CSAH 11 (Jonathan Carver Parkway) and US Highway 212 in Chaska, MN. Characteristics of the development and results of the analysis are summarized below.

## 7.1 Project Characteristics

The identified AUAR scenarios include a split of 90% industrial area and 10% retail area (by gross floor area). Two scenarios were identified, with Scenario 1 representing the current land use plan for the area (2,000,000 square feet of development area) and Scenario 2 representing the maximum development intensity for the site (3,000,000 square feet of development area).

The development would be completed in two phases, with the area north of CSAH 44 (Big Woods Boulevard) being included in phase 1. This area includes all of the retail development and half of the industrial development. This phase is assumed to be completed by the selected Opening Year of 2030. The remaining portion of the development is assumed to be built-out in the long term, by the studied Design Year of 2045.

The study area includes the following intersections along with the proposed site access points:

- CSAH 10 (Engler Boulevard) & US Highway 212 Westbound Ramps
- CSAH 10 (Engler Boulevard) & US Highway 212 Eastbound Ramps
- CSAH 10 (Engler Boulevard) & Chaska Creek Boulevard
- CSAH 10 (Engler Boulevard) & CSAH 11 (Jonathan Carver Parkway)
- Chaska Creek Boulevard & Creek Road
- CSAH 44 (Big Woods Boulevard) & Westbound U.S. Highway 212
- CSAH 44 (Big Woods Boulevard) & Eastbound U.S. Highway 212
- CSAH 11 (Johnathan Carver Parkway) & CSAH 44 (Big Woods Boulevard)
- CSAH 11 (Johnathan Carver Parkway) & CSAH 61 (Chaska Boulevard)
- CSAH 11 (Johnathan Carver Parkway) & US Highway 212 Westbound Ramps
- CSAH 11 (Johnathan Carver Parkway) & US Highway 212 Eastbound Ramps

The listed intersections were analyzed in the following scenarios:

- Existing Year (2025)
- Opening Year (2030) No-Build
- Opening Year (2030) Build Scenario 1
- Opening Year (2030) Build Scenario 2
- Design Year (2045) No-Build
- Design Year (2045) Build Scenario 1
- Design Year (2045) Build Scenario 2

The proposed development would include four (4) access points (A-D) at full buildout. Access A is a right-in/right-out access point along CSAH 11 (Jonathan Carver Parkway) north of CSAH 44 (Big Woods Boulevard). Access B is a proposed single-lane roundabout along CSAH 44. Access C is a proposed full-movement access along CSAH 11 south of CSAH 44. Access D is a full-movement access along CSAH 61 (Chaska Boulevard).

All site access should be reviewed with Carver County as development plans are completed to determine a final access plan to the site.

## 7.2 Existing Year (2025) Capacity Analysis Summary

A capacity analysis was conducted for Existing Year (2025) traffic conditions at the study intersections to determine baseline existing conditions. Based on the analysis, all intersections are anticipated to operate at acceptable LOS and there are no queuing issues at the study intersections.

## 7.3 Opening Year (2030) No-Build Capacity Analysis Summary

A capacity analysis was conducted for the Opening Year (2030) No-Build traffic conditions at the study intersections to determine baseline conditions for the 2030 analysis year. A single-lane roundabout was assumed at CSAH 11 & CSAH 44 as well as improvements to the CSAH 10 & CSAH 11 intersection. Based on the analysis, all intersections are anticipated to operate at acceptable LOS and there are no queuing issues at the study intersections.

## 7.4 Opening Year (2030) Build Scenario 1 Capacity Analysis Summary

The Opening Year (2030) Scenario 1 development would include 900,000 square feet of industrial space and 200,000 square feet of retail space north of CSAH 44 (Big Woods Boulevard). Access B was modeled as a single-lane roundabout and Access A as a right-in/right-out stop controlled access.

Opening Year (2030) Scenario 1 conditions analysis indicated that all intersections operate at acceptable LOS and there are no queueing issues at the study intersections.

## 7.5 Opening Year (2030) Build Scenario 2 Capacity Analysis Summary

The Opening Year (2030) Scenario 2 development would include 1,350,000 square feet of industrial space and 300,000 square feet of retail space north of CSAH 44 (Big Woods Boulevard). Access B was modeled as a single-lane roundabout and Access A as a right-in/right-out stop controlled access.

Opening Year (2030) Scenario 2 conditions analysis indicated that all intersections operate at acceptable LOS and there are no queueing issues at the study intersections.

## 7.6 Design Year (2045) No-Build Capacity Analysis Summary

A capacity analysis was conducted for the Design Year (2045) No-Build traffic conditions at the study intersections to determine baseline conditions for the 2045 analysis year. No further geometric changes were assumed besides the Opening Year (2030) No-Build changes. Based on the analysis, delays are anticipated to increase significantly due to background development. The intersection of CSAH 11 (Jonathan Carver Parkway) & US Highway 212 Eastbound Ramps is anticipated to experience significant operational issues and may require dual northbound right turn lanes if an additional interchange is not constructed to accommodate traffic from the developments south of US Highway 212. With an additional northbound right turn lane in place, the intersection to operate at acceptable LOS. Some individual movements at signalized intersections are anticipated to experience LOS E or LOS F but overall network operations are acceptable. A few movements are anticipated to require turn lane extensions under this scenario.

## 7.7 Design Year (2045) Build Scenario 1 Capacity Analysis Summary

Under Design Year (2045) Scenario 1 conditions, network operations are generally anticipated to be similar to the Design Year (2045) No-Build operations, with some minor increases in delay, particularly along CSAH 44 (Big Woods Boulevard). With the Design Year (2040) No-Build mitigations in place, the network is anticipated acceptably.

## 7.8 Design Year (2045) Build Scenario 2 Capacity Analysis Summary

The long-term analysis of Scenario 2 indicates that delays are likely to increase compared to the Design Year (2045) No-Build conditions, but all intersections are anticipated to operate acceptably with the No-Build mitigations in place. Delays are slightly higher than Scenario 1, particularly along CSAH 44 (Big Woods Boulevard) but all approaches at the analyzed roundabouts are anticipated to operate at LOS C or better with acceptable levels of queueing.

## 7.9 Mitigation Plan

The following provides a summary of mitigation improvements that were identified as part of the traffic analysis for the proposed development.

**Existing (2025) Conditions**

- No Mitigation Necessary

**Opening Year (2030) No-Build Conditions**

- No Mitigation Necessary

**Opening Year (2030) Build Scenario 1 Conditions**

- Install a dedicated northbound right turn lane and provide side street stop control at CSAH 11 & Access A.
- Install a single lane roundabout at CSAH 44 & Access B.
- As parcels begin to develop on the AUAR area, install sidewalk and trail connections to connect to existing pedestrian and bicycle infrastructure.
- Extend the southbound right turn lane at CSAH 11 & US Highway 212 Westbound Ramps to 250’ in length.

**Opening Year (2030) Build Scenario 2 Conditions**

- Install a dedicated northbound right turn lane and provide side street stop control at CSAH 11 & Access A.
- Install a single lane roundabout at CSAH 44 & Access B.
- As parcels begin to develop on the AUAR area, install sidewalk and trail connections to connect to existing pedestrian and bicycle infrastructure.
- Extend the southbound right turn lane at CSAH 11 & US Highway 212 Westbound Ramps to 250’ in length.

**Design Year (2045) No-Build Conditions**

- Install dual northbound right turn lanes at CSAH 11 & US Highway 212 Eastbound Ramps.

- Extend the southbound right turn lane at CSAH 10 & US Highway 212 Westbound Ramps to 450'.
- Extend the dedicated southbound left turn lane at CSAH 10 & Chaska Creek Boulevard to 400'.
- Extend the westbound left turn lane at CSAH 11 & US Highway 212 Westbound Ramps to 550'.

**Design Year (2045) Build Scenario 1 Conditions**

- All modifications from Deign Year (2045) No-Build & Opening Year (2030) Scenario 1 Conditions.
- Install a dedicated eastbound left turn lane at CSAH 61 & Access D.
- Side-street stop control is adequate at accesses A, C, & D.
- Extend the southbound right turn lane at CSAH 11 & US Highway 212 Westbound Ramps to 250' in length.

**Design Year (2045) Build Scenario 2 Conditions**

- All modifications from Deign Year (2045) No-Build & Opening Year (2030) Scenario 2 Conditions.
- Install a dedicated eastbound left-turn lane at CSAH 61 & Access D.
- Install a dedicated southbound left-turn lane at CSAH 11 & Access C.
- Side-street stop control is adequate at accesses A, C, & D.
- Extend the southbound right turn lane at CSAH 11 & US Highway 212 Westbound Ramps to 250' in length.

Note that the overall roadway network in the area has capacity to accommodate the AUAR development in Scenarios 1 & 2. It is not anticipated that roadway connection on the north side of the AUAR site to the Creek Road & Chaska Creek Boulevard roundabout or the addition of the southbound on/off ramps at Big Woods Boulevard & US Highway 212 would be required from a traffic capacity standpoint.

# 9. APPENDIX

Appendix A: Exhibits

Appendix B: Turning Movement Counts

Appendix C: Development Scenario Concepts

Appendix D: Existing Year (2025) Analysis Reports

Appendix E: Opening Year (2030) No-Build Analysis Reports

Appendix F: Opening Year (2030) Build Scenario 1 Analysis Reports

Appendix G: Design Year (2045) No-Build Analysis Reports

Appendix H: Design Year (2045) Build Scenario 1 Analysis Reports

Appendix I: Opening Year (2030) Build Scenario 2 Analysis Reports

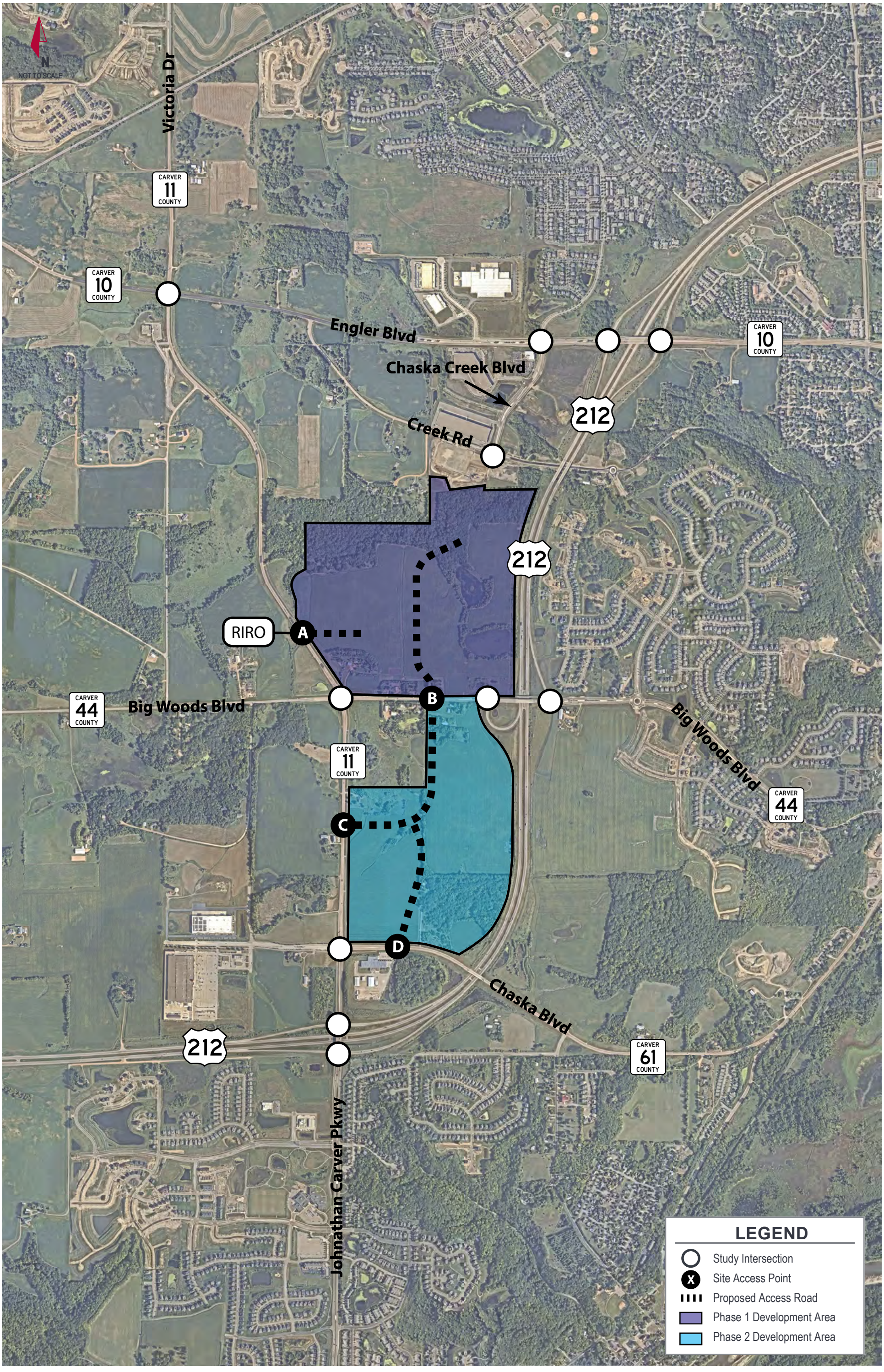
Appendix J: Design Year (2045) Build Scenario 2 Analysis Reports

Appendix K: Turn Lane Warrant Analysis

# Appendix A:

# Exhibits

Exhibit 1. Project Location Map
Exhibit 2. Existing Geometry and Intersection Control
Exhibit 3. Existing Year (2025) Traffic Volumes
Exhibit 4. Background Development Distribution
Exhibit 5. Background Development Site Trips
Exhibit 6. Opening Year (2030) No-Build Traffic Volumes
Exhibit 7. Design Year (2045) No-Build Traffic Volumes
Exhibit 8. Passenger Vehicle Distribution (Phase 1)
Exhibit 9. Truck Distribution (Phase 1)
Exhibit 10. Scenario 1 Peak Hour Site Trips (Phase 1)
Exhibit 11. Opening Year (2030) Scenario 1 Traffic Volumes
Exhibit 12. Passenger Vehicle Distribution (Phase 2)
Exhibit 13. Truck Distribution (Phase 2)
Exhibit 14. Scenario 1 Site Trips (Phase 2)
Exhibit 15. Design Year (2045) Scenario 1 Traffic Volumes
Exhibit 16. Scenario 2 Peak Hour Site Trips (Phase 1)
Exhibit 17. Opening Year (2030) Scenario 2 Traffic Volumes
Exhibit 18. Scenario 2 Passenger Vehicle Trips (Phase 2)
Exhibit 19. Design Year (2045) Scenario 2 Traffic Volumes
Exhibit 20. Passenger Vehicle Distribution (Phase 1 with Creek Crossing)
Exhibit 21. Heavy Vehicle Distribution (Phase 1 with Creek Crossing)
Exhibit 22. Scenario 1 Peak Hour Site Trips (Phase 1 with Creek Crossing)
Exhibit 23. Design Year (2045) Scenario 1 Traffic Volumes with Creek Crossing
Exhibit 24. Scenario 2 Peak Hour Site Trips (Phase 1 with Creek Crossing)
Exhibit 25. Design Year (2045) Scenario 2 Traffic Volumes with Creek Crossing

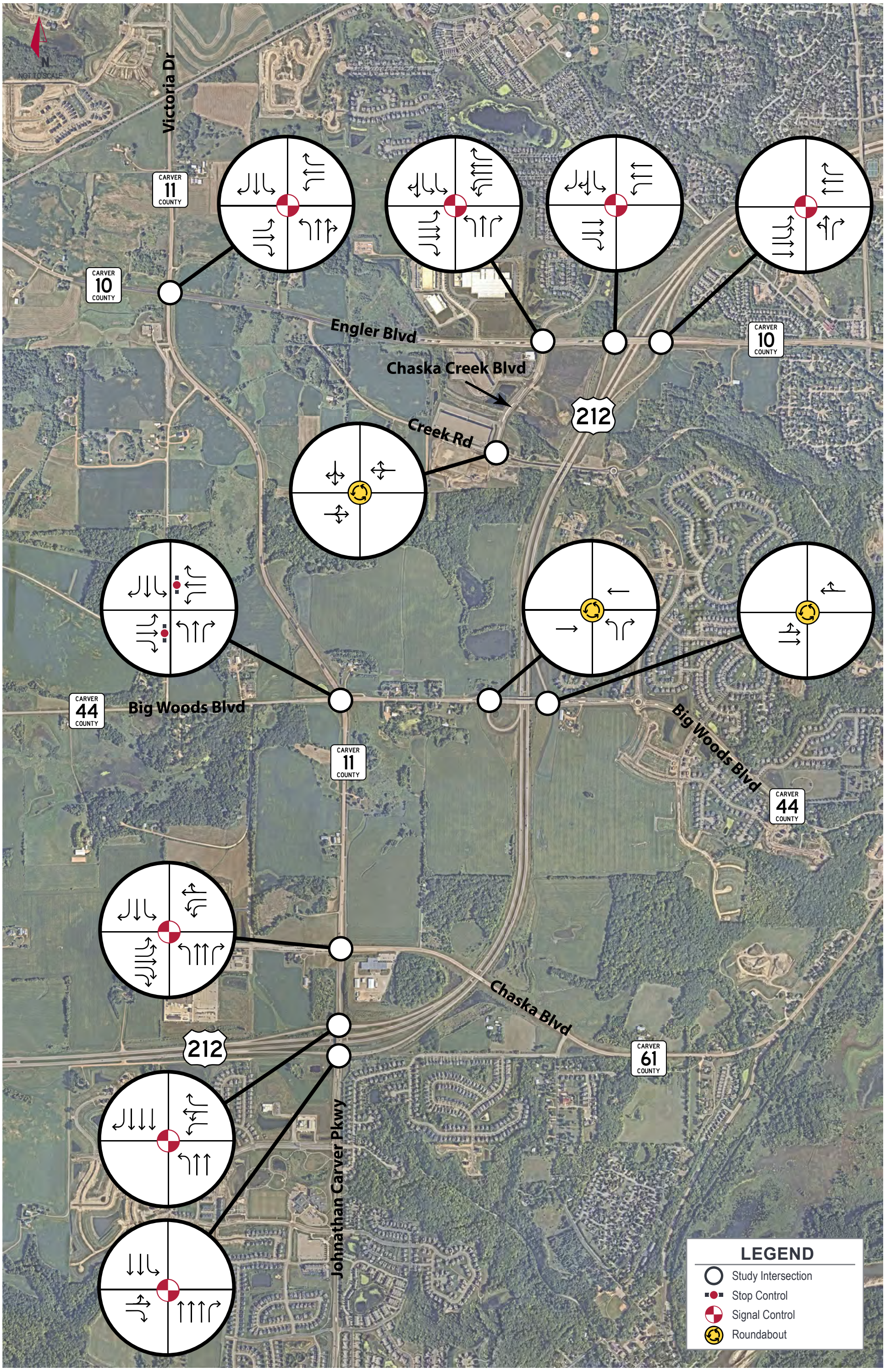



Kimley»Horn

EXHIBIT 1

**PROJECT LOCATION MAP**

**BIG WOODS BUSINESS PARK — CHASKA, MN**

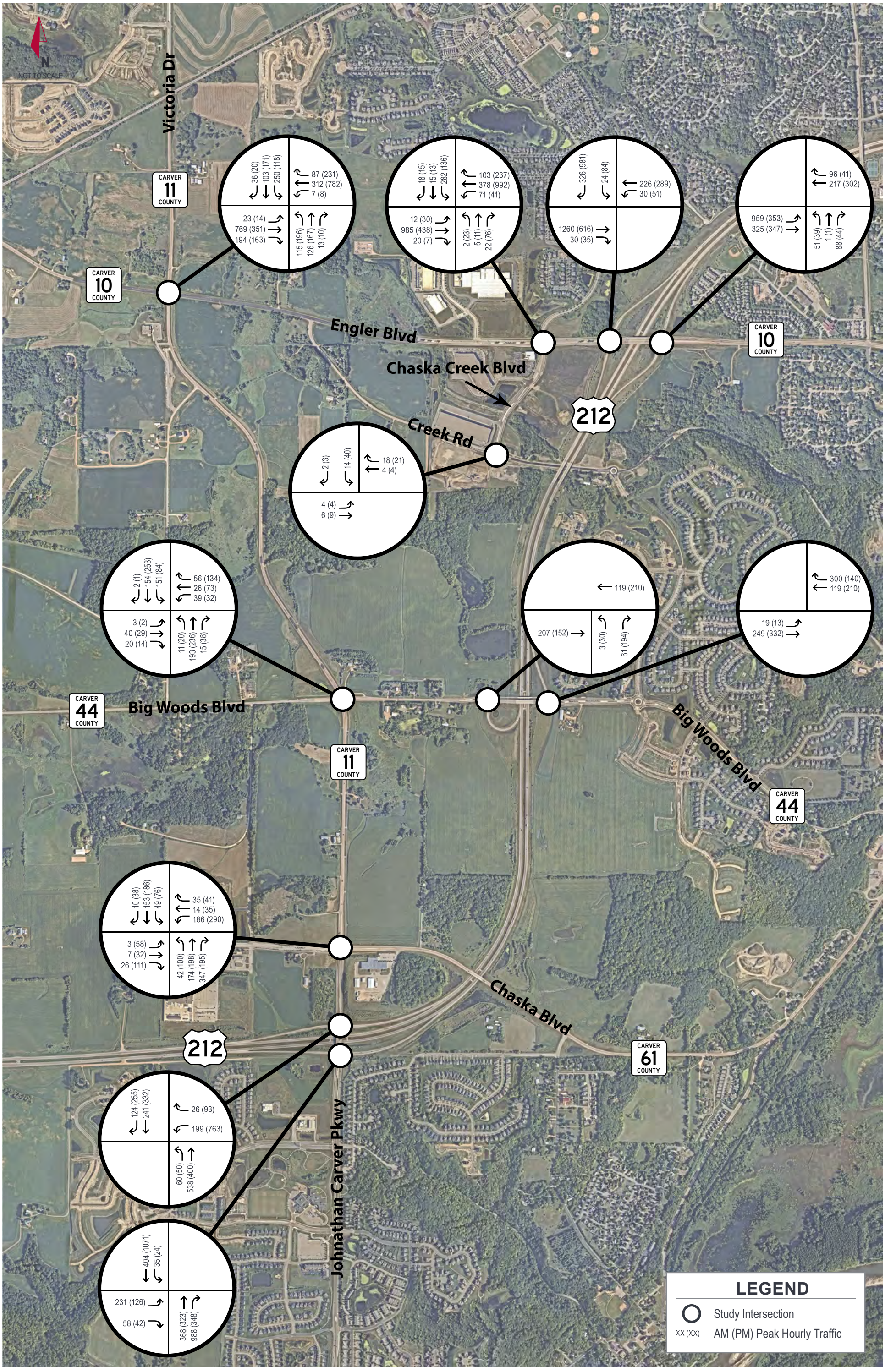



Kimley»Horn

EXHIBIT 2

**EXISTING GEOMETRY AND INTERSECTION CONTROL**

**BIG WOODS BUSINESS PARK — CHASKA, MN**




Kimley»Horn

EXHIBIT 3

**EXISTING YEAR (2025) TRAFFIC VOLUMES**

**BIG WOODS BUSINESS PARK — CHASKA, MN**

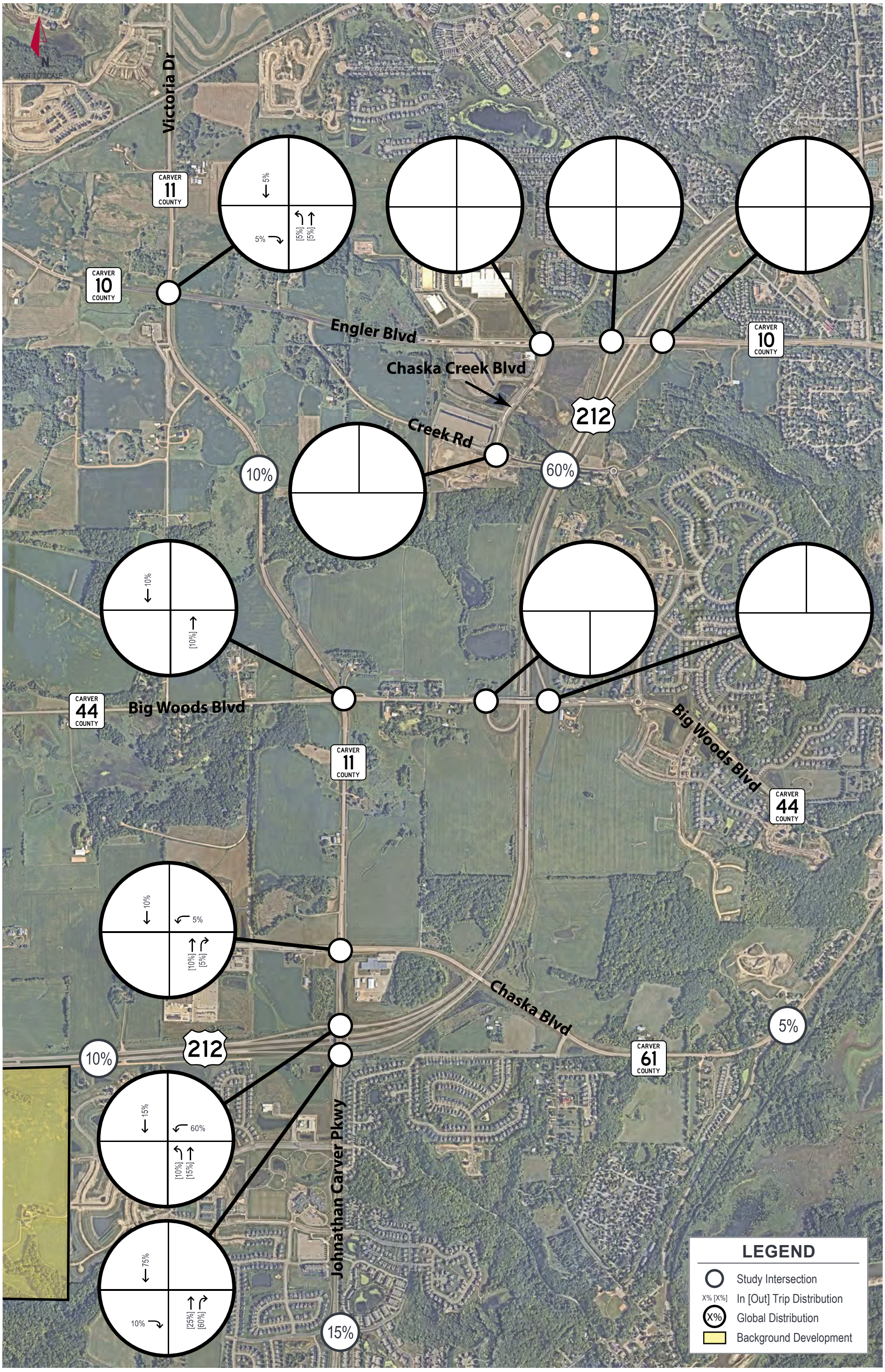



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EXHIBIT 4

**BACKGROUND DEVELOPMENT DISTRIBUTION**

**BIG WOODS BUSINESS PARK — CHASKA, MN**

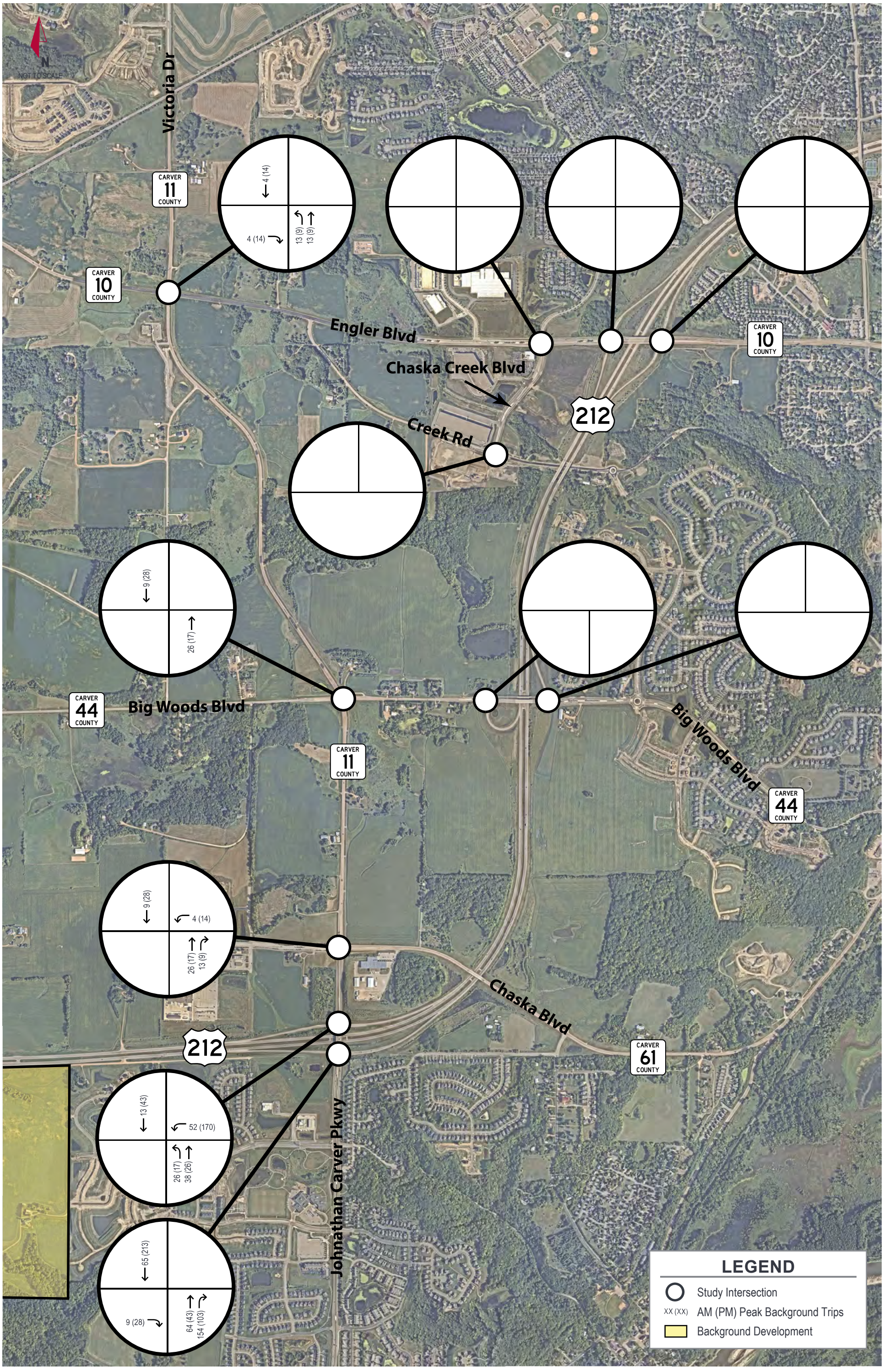


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EXHIBIT 5

**BACKGROUND DEVELOPMENT SITE TRIPS**

**BIG WOODS BUSINESS PARK — CHASKA, MN**

N
NOT TO SCALE

Victoria Dr

CARVER 11 COUNTY

CARVER 10 COUNTY

Engler Blvd

Chaska Creek Blvd

212

Creek Rd

CARVER 10 COUNTY

CARVER 44 COUNTY

Big Woods Blvd

CARVER 11 COUNTY

Big Woods Blvd

CARVER 44 COUNTY

212

Chaska Blvd

CARVER 61 COUNTY

Johnathan Carver Pkwy

| | | | |
|---|---|---|---|
| 41 (23) | 121 (207) | 283 (134) | 98 (261) |
| | | | 353 (885) |
| | | | 8 (9) |
| 26 (16) | | | |
| 870 (397) | | | |
| 223 (198) | | | |
| | 143 (231) | 156 (198) | 15 (11) |

| | | | |
|---|---|---|---|
| 20 (17) | 17 (15) | 319 (154) | 117 (268) |
| | | | 428 (1122) |
| | | | 80 (46) |
| 14 (34) | | | |
| 1114 (496) | | | |
| 23 (8) | | | |
| | 2 (26) | 6 (12) | 25 (86) |

| | | | |
|---|---|---|---|
| 369 (1110) | 27 (95) | | 256 (327) |
| | | | 34 (58) |
| 1426 (697) | | | |
| 34 (40) | | | |

| | | | |
|---|---|---|---|
| | | | 109 (46) |
| | | | 233 (342) |
| 1085 (399) | | | |
| 368 (393) | | | |
| | 58 (44) | 1 (1) | 100 (50) |

| | | | |
|---|---|---|---|
| 2 (3) | 16 (45) | | 20 (24) |
| | | | 5 (5) |
| 5 (5) | | | |
| 7 (10) | | | |

| | | | |
|---|---|---|---|
| 2 (1) | 183 (314) | 171 (95) | 63 (152) |
| | | | 29 (83) |
| | | | 44 (36) |
| 3 (2) | | | |
| 45 (33) | | | |
| 23 (16) | | | |
| | 12 (23) | 244 (284) | 17 (43) |

| | | | |
|---|---|---|---|
| | | | 138 (238) |
| 234 (172) | | 3 (34) | 69 (219) |

| | | | |
|---|---|---|---|
| | | | 339 (158) |
| | | | 135 (238) |
| 21 (15) | | | |
| 282 (376) | | | |

| | | | |
|---|---|---|---|
| 11 (43) | 182 (238) | 55 (86) | 40 (46) |
| | | | 16 (40) |
| | | | 214 (342) |
| 3 (66) | | | |
| 8 (36) | | | |
| 29 (126) | | | |
| | 48 (113) | 223 (241) | 406 (230) |

| | | | |
|---|---|---|---|
| 140 (289) | 286 (419) | | 29 (105) |
| | | | 277 (1033) |
| | 94 (74) | 648 (479) | |

| | | | |
|---|---|---|---|
| | 522 (1425) | 40 (27) | |
| 261 (143) | | | |
| 75 (76) | | | |
| | | 481 (408) | 1273 (497) |

**LEGEND**

| | |
|---|---|
| ○ | Study Intersection |
| XX (XX) | AM (PM) Peak Hour Volume |

Kimley»Horn

EXHIBIT 6

# OPENING YEAR (2030) NO-BUILD TRAFFIC VOLUMES

## BIG WOODS BUSINESS PARK — CHASKA, MN

N
NOT TO SCALE

Victoria Dr

CARVER 11 COUNTY

CARVER 10 COUNTY

Engler Blvd

Chaska Creek Blvd

212

Creek Rd

CARVER 44 COUNTY

Big Woods Blvd

CARVER 11 COUNTY

Big Woods Blvd

CARVER 44 COUNTY

CARVER 10 COUNTY

212

Chaska Blvd

CARVER 61 COUNTY

Johnathan Carver Pkwy

| | | | |
|---|---|---|---|
| 59 (33) | 173 (294) | 410 (193) | 143 (379) |
| | | | 511 (1281) |
| | | | 11 (13) |
| 38 (23) | | | |
| 1260 (575) | | | |
| 322 (281) | | | |
| | 201 (330) | 219 (283) | 21 (16) |

| | | | |
|---|---|---|---|
| 29 (25) | 25 (21) | 462 (223) | 169 (388) |
| | | | 619 (1626) |
| | | | 116 (67) |
| 20 (49) | | | |
| 1614 (718) | | | |
| 33 (11) | | | |
| | 3 (38) | 8 (18) | 36 (125) |

| | | | |
|---|---|---|---|
| 634 (1607) | 39 (138) | | 370 (474) |
| | | | 49 (84) |
| 2065 (1009) | | | |
| 49 (57) | | | |

| | | | |
|---|---|---|---|
| | | | 157 (67) |
| | | | 335 (495) |
| 1571 (578) | | | |
| 533 (539) | | | |
| | 84 (64) | 2 (2) | 144 (72) |

| | | | |
|---|---|---|---|
| 3 (5) | 23 (66) | | 29 (34) |
| | | | 7 (7) |
| 7 (7) | | | |
| 10 (15) | | | |

| | | | |
|---|---|---|---|
| 3 (2) | 261 (443) | 247 (138) | 92 (220) |
| | | | 43 (120) |
| | | | 64 (52) |
| 5 (3) | | | |
| 66 (48) | | | |
| 33 (23) | | | |
| | 18 (33) | 342 (404) | 25 (62) |

| | | | |
|---|---|---|---|
| | | | 195 (344) |
| 339 (249) | | 5 (49) | 100 (318) |

| | | | |
|---|---|---|---|
| | | | 492 (229) |
| | | | 195 (344) |
| 31 (21) | | | |
| 408 (544) | | | |

| | | | |
|---|---|---|---|
| 16 (62) | 260 (333) | 80 (125) | 57 (67) |
| | | | 23 (57) |
| | | | 309 (489) |
| 5 (95) | | | |
| 11 (52) | | | |
| 43 (182) | | | |
| | 69 (164) | 311 (341) | 582 (329) |

| | | | |
|---|---|---|---|
| 203 (418) | 408 (587) | | 43 (152) |
| | | | 378 (1420) |
| | | | |
| | 124 (99) | 921 (681) | |

| | | | |
|---|---|---|---|
| 727 (1968) | 57 (39) | | |
| 379 (206) | | | |
| 104 (97) | | | |
| | 668 (572) | 1774 (673) | |

**LEGEND**

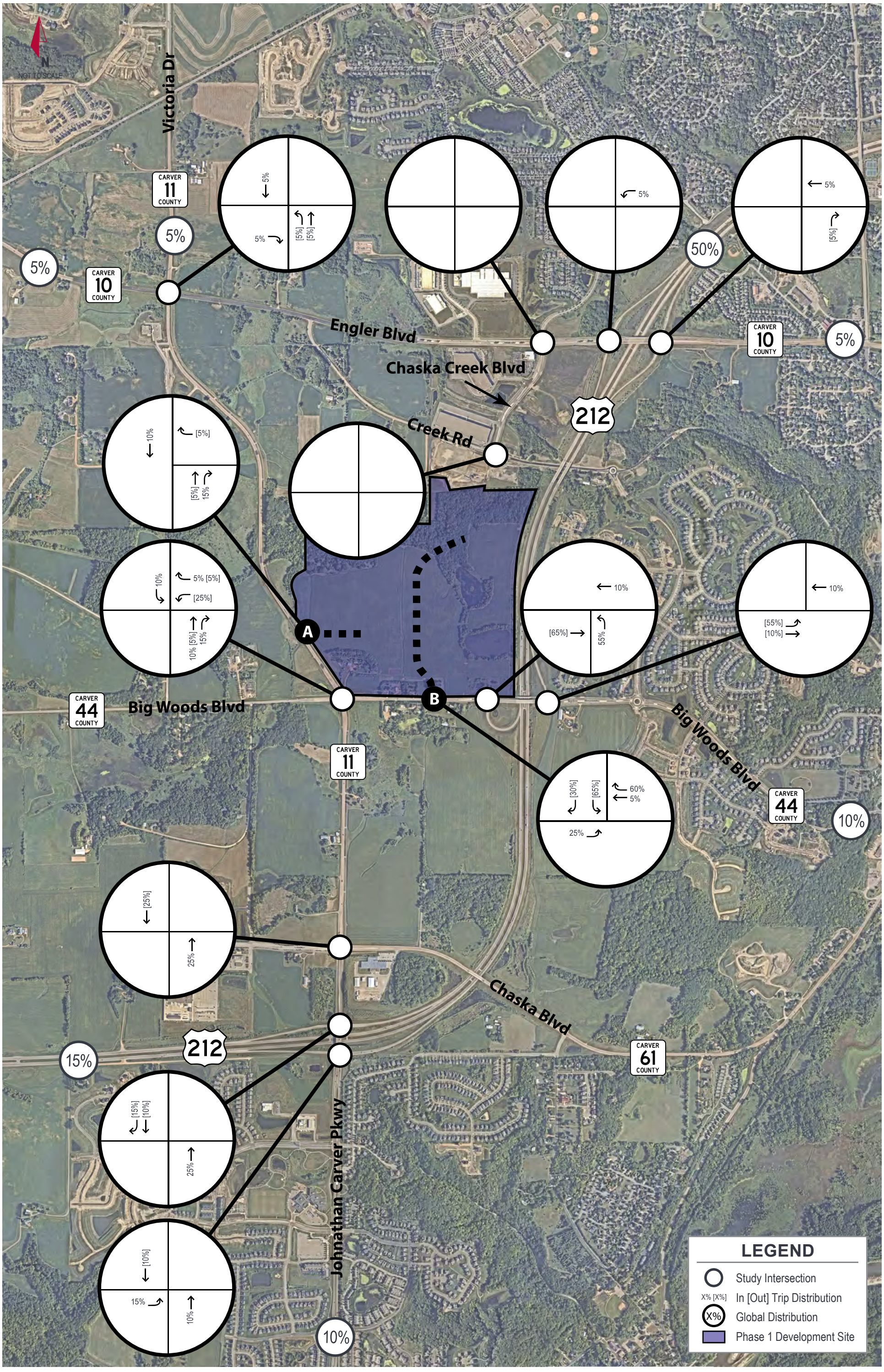
- Study Intersection
- XX (XX) AM (PM) Peak Hour Volume

Kimley»Horn

EXHIBIT 7

**DESIGN YEAR (2045) NO-BUILD TRAFFIC VOLUMES**

**BIG WOODS BUSINESS PARK — CHASKA, MN**

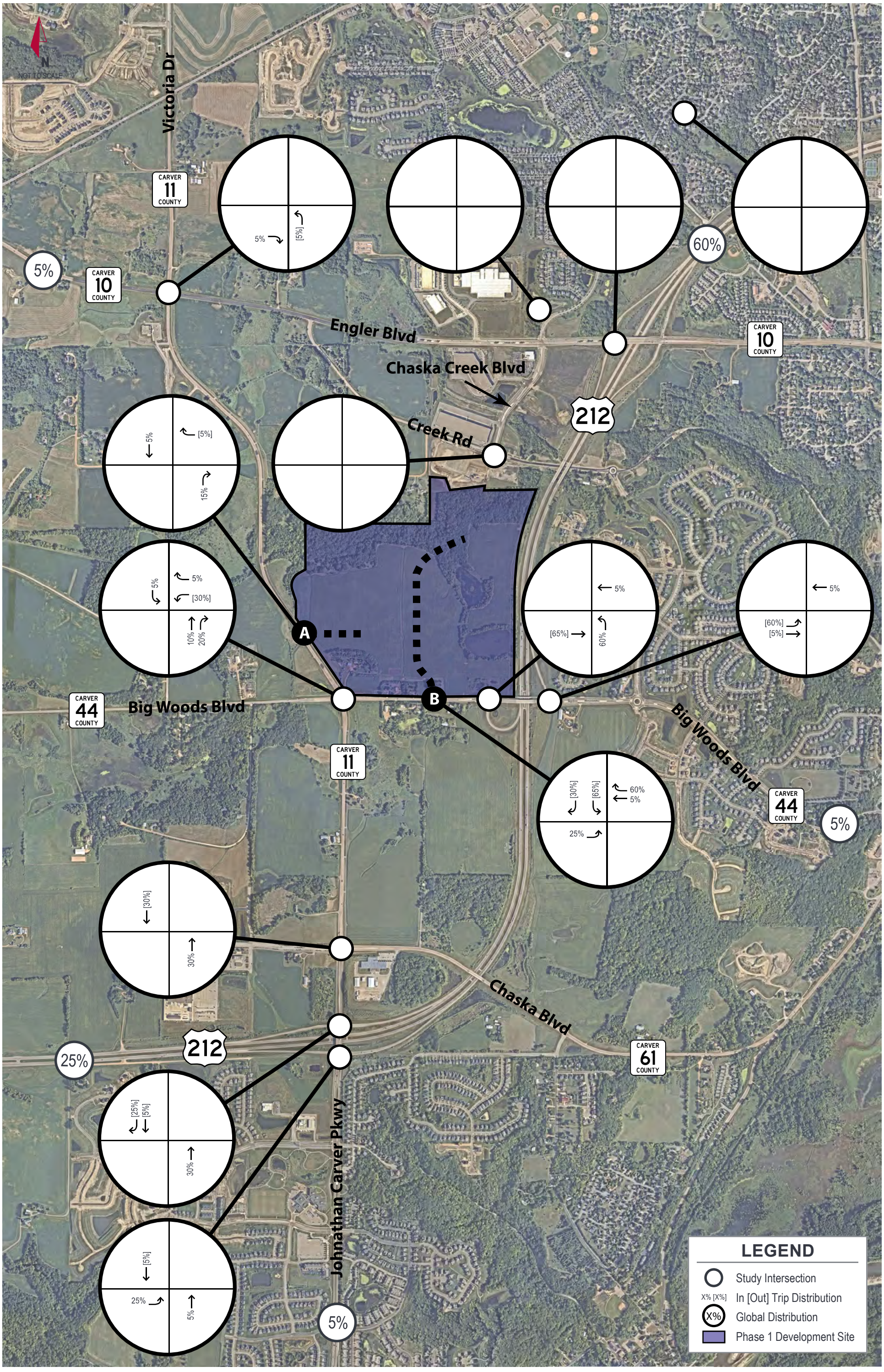



Kimley»Horn

EXHIBIT 8

**PASSENGER VEHICLE DISTRIBUTION (PHASE 1)**

**BIG WOODS BUSINESS PARK — CHASKA, MN**

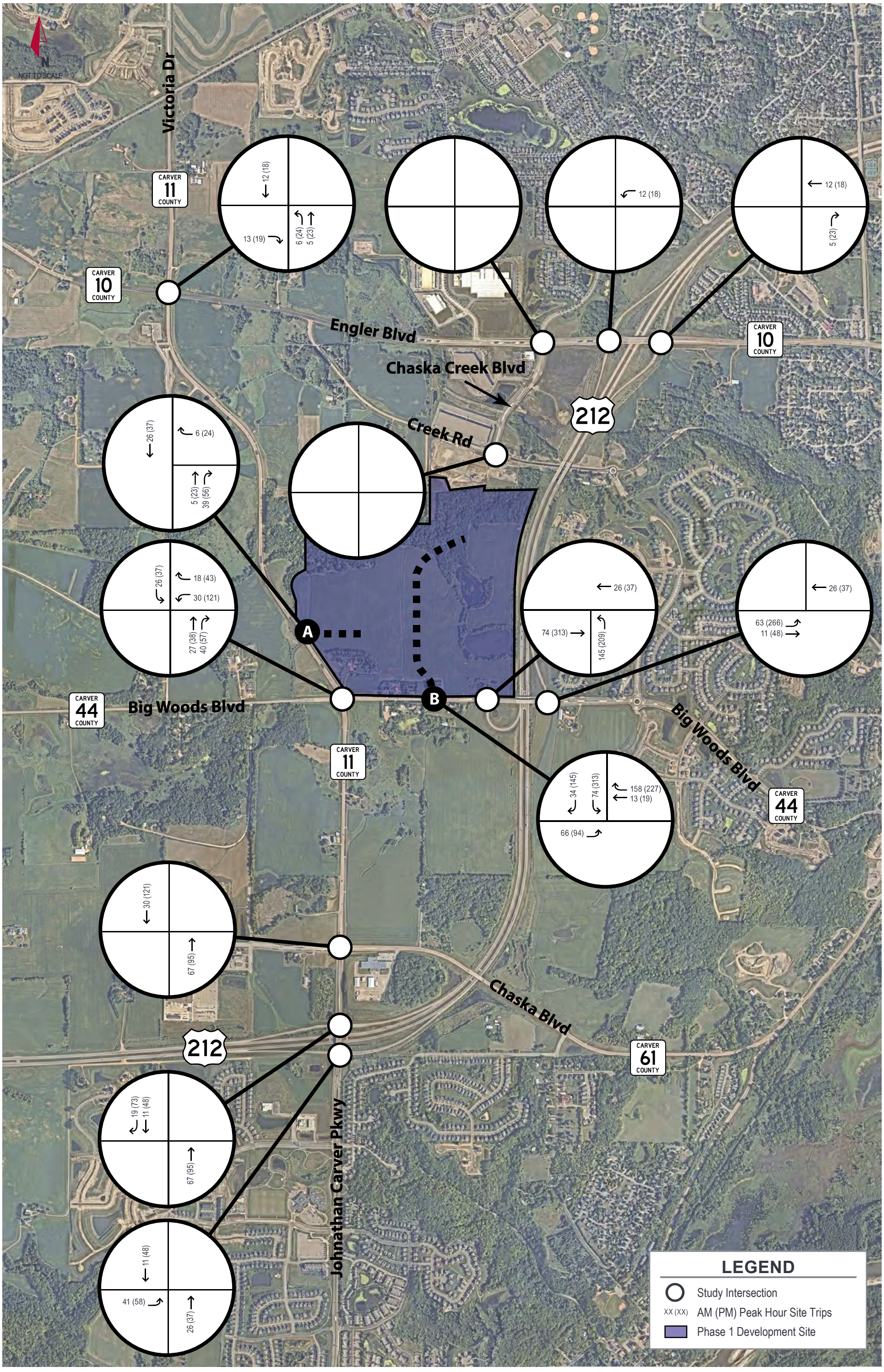



Kimley»Horn

EXHIBIT 9

**TRUCK DISTRIBUTION (PHASE 1)**

**BIG WOODS BUSINESS PARK — CHASKA, MN**




Kimley»Horn

EXHIBIT 10

**SCENARIO 1 PEAK HOUR SITE TRIPS (PHASE 1)**

**BIG WOODS BUSINESS PARK — CHASKA, MN**

N
NOT TO SCALE

Victoria Dr

CARVER 11 COUNTY

CARVER 10 COUNTY

Engler Blvd

Chaska Creek Blvd

212

Creek Rd

A

B

CARVER 44 COUNTY

Big Woods Blvd

CARVER 11 COUNTY

Big Woods Blvd

CARVER 10 COUNTY

CARVER 44 COUNTY

Chaska Blvd

212

CARVER 61 COUNTY

Johnathan Carver Pkwy

| | | | |
|---|---|---|---|
| 41 (23) ↲ 133 (225) ↓ 283 (134) ↘ | | 98 (261) ↰ 353 (885) ↑ 8 (9) ↱ | |
| 26 (16) ↰ 870 (397) → 236 (217) ↱ | | 149 (255) ↰ 161 (221) ↑ 15 (11) ↱ | |

| | | | |
|---|---|---|---|
| 20 (17) ↲ 17 (15) ↓ 319 (154) ↘ | | 117 (268) ↰ 428 (1122) ↑ 80 (46) ↱ | |
| 14 (34) ↰ 1114 (496) → 23 (8) ↱ | | 2 (26) ↰ 6 (12) ↑ 25 (86) ↱ | |

| | | | |
|---|---|---|---|
| 369 (1110) ↲ | 27 (95) ↘ | 256 (327) ↰ 46 (76) ← | |
| 1426 (697) → 34 (40) ↱ | | | |

| | | | |
|---|---|---|---|
| | | 109 (46) ↰ 245 (360) ← | |
| 1085 (399) ↰ 368 (393) → | | 58 (44) ↰ 1 (1) ↑ 105 (73) ↱ | |

| | | | |
|---|---|---|---|
| 382 (447) ↓ | | 6 (24) ↰ | |
| | | 317 (462) ↑ 39 (56) ↱ | |

| | | | |
|---|---|---|---|
| 2 (3) ↲ | 16 (45) ↘ | 20 (24) ↰ 5 (5) ← | |
| 5 (5) ↰ 7 (10) → | | | |

| | | | |
|---|---|---|---|
| 2 (1) ↲ | 183 (314) ↓ 197 (132) ↘ | 81 (195) ↰ 29 (83) ← 74 (157) ↖ | |
| 3 (2) ↰ 45 (33) → 23 (16) ↱ | | 12 (23) ↰ 271 (322) ↑ 57 (100) ↱ | |

| | | | |
|---|---|---|---|
| | | 161 (275) ← | |
| 308 (485) → | | 148 (243) ↰ | 69 (219) ↱ |

| | | | |
|---|---|---|---|
| | | 339 (158) ↰ 161 (275) ← | |
| 84 (281) ↱ 293 (424) → | | | |

| | | | |
|---|---|---|---|
| 34 (145) ↲ | 74 (313) ↘ | 158 (227) ↰ 151 (291) ← | |
| 66 (94) ↰ 234 (172) → | | | |

| | | | |
|---|---|---|---|
| 11 (43) ↲ | 212 (359) ↓ 55 (86) ↘ | 40 (46) ↰ 16 (40) ← 214 (342) ↖ | |
| 3 (66) ↰ 8 (36) → 29 (126) ↱ | | 48 (113) ↰ 290 (336) ↑ 406 (230) ↱ | |

| | | | |
|---|---|---|---|
| 159 (362) ↲ | 297 (467) ↓ | 29 (105) ↰ | |
| | | 277 (1033) ← | |
| | | 94 (74) ↰ 715 (574) ↑ | |

| | | | |
|---|---|---|---|
| 533 (1473) ↓ | 40 (27) ↘ | | |
| 302 (201) ↰ 75 (76) ↱ | | 507 (445) ↑ 1273 (497) ↱ | |

**LEGEND**

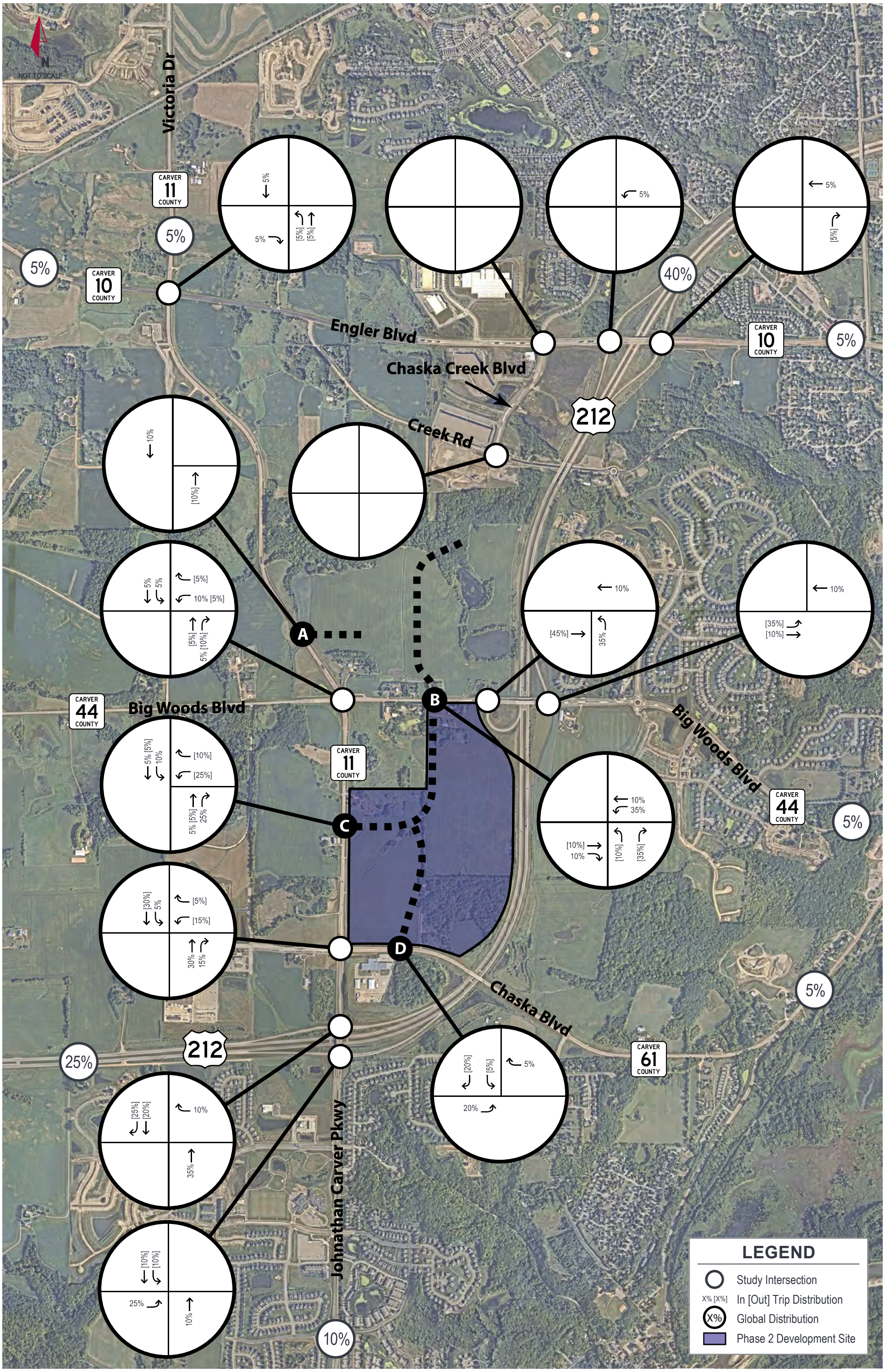
- Study Intersection
- XX (XX) AM (PM) Peak Hour Traffic Volumes
- Phase 1 Development Site

Kimley»Horn

EXHIBIT 11

**OPENING YEAR (2030) SCENARIO 1 TRAFFIC VOLUMES**

**BIG WOODS BUSINESS PARK — CHASKA, MN**

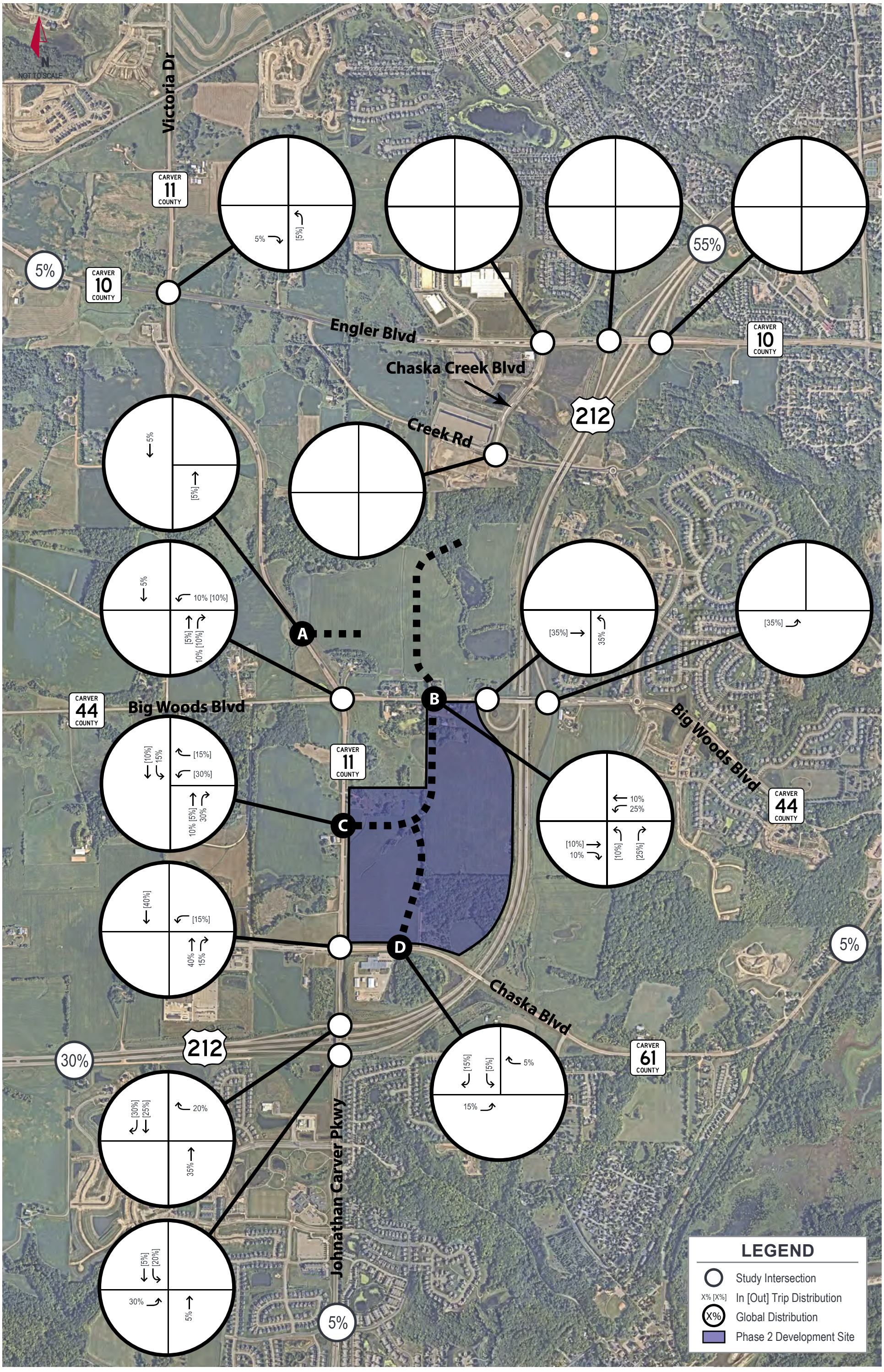



Kimley»Horn

EXHIBIT 12

**PASSENGER VEHICLE DISTRIBUTION (PHASE 2)**

**BIG WOODS BUSINESS PARK — CHASKA, MN**

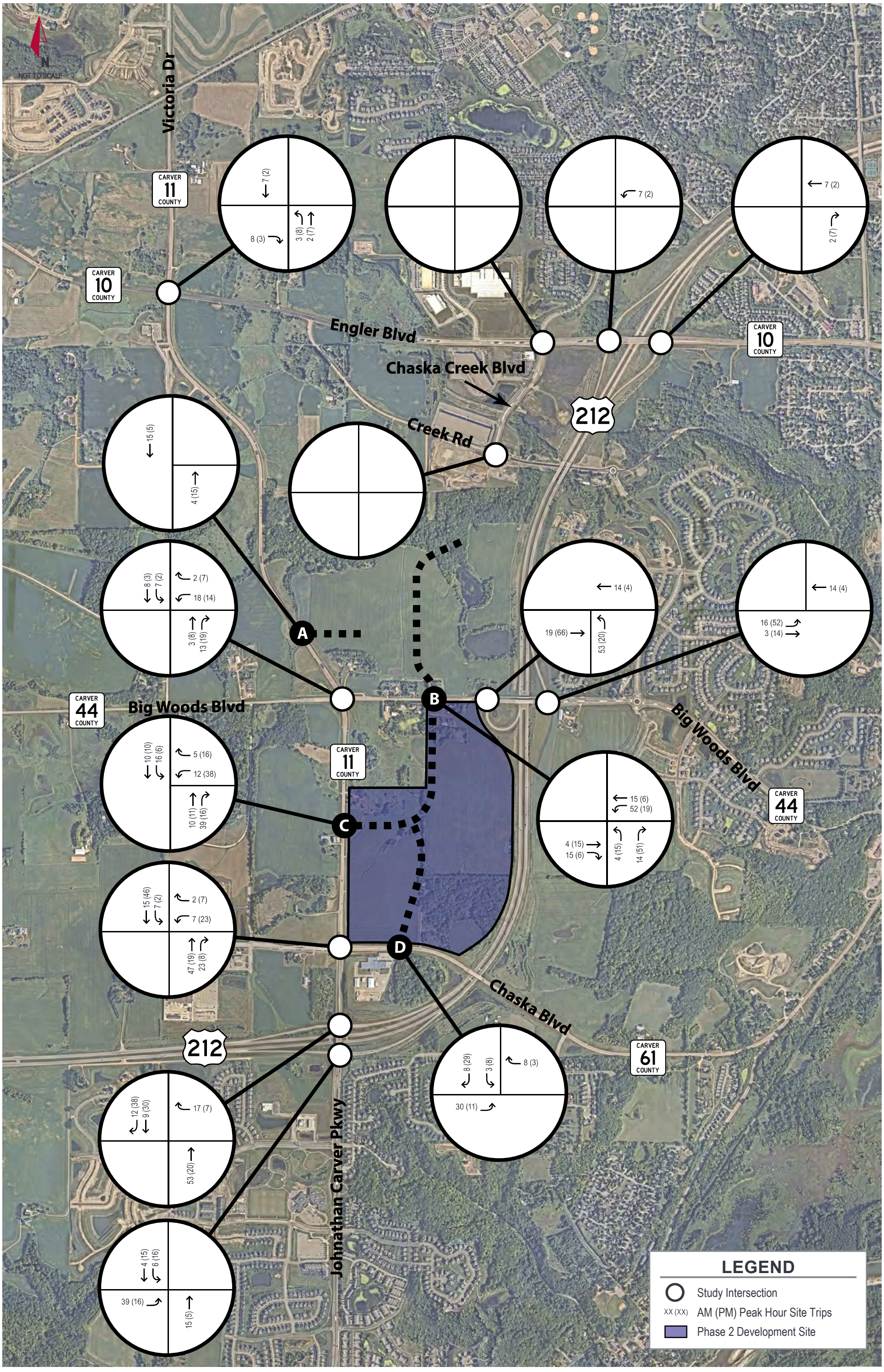



Kimley»Horn

EXHIBIT 13

**TRUCK DISTRIBUTION (PHASE 2)**

**BIG WOODS BUSINESS PARK — CHASKA, MN**

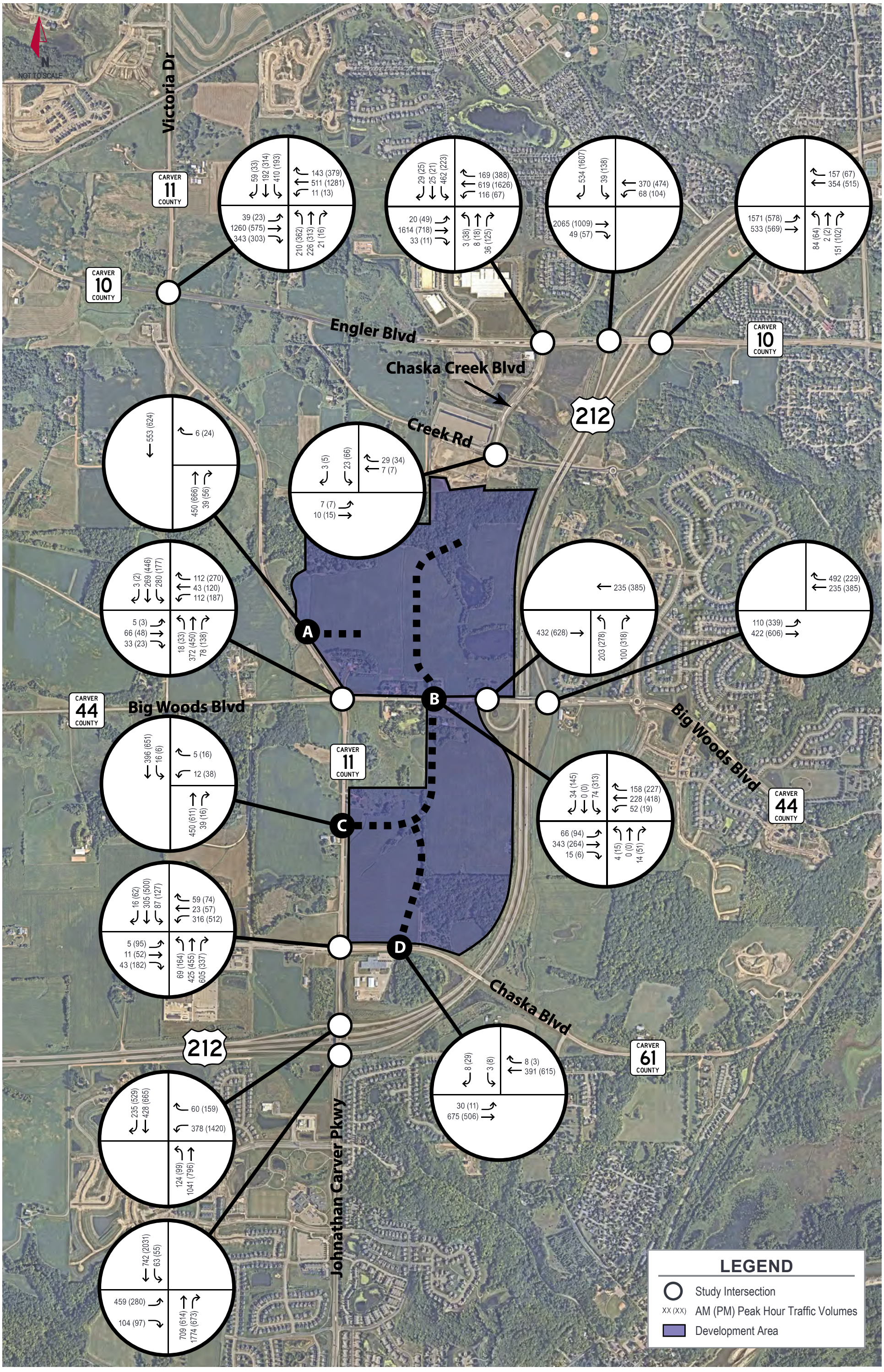



Kimley»Horn

EXHIBIT 14

**SCENARIO 1 PASSENGER VEHICLE TRIPS (PHASE 2)**

**BIG WOODS BUSINESS PARK — CHASKA, MN**

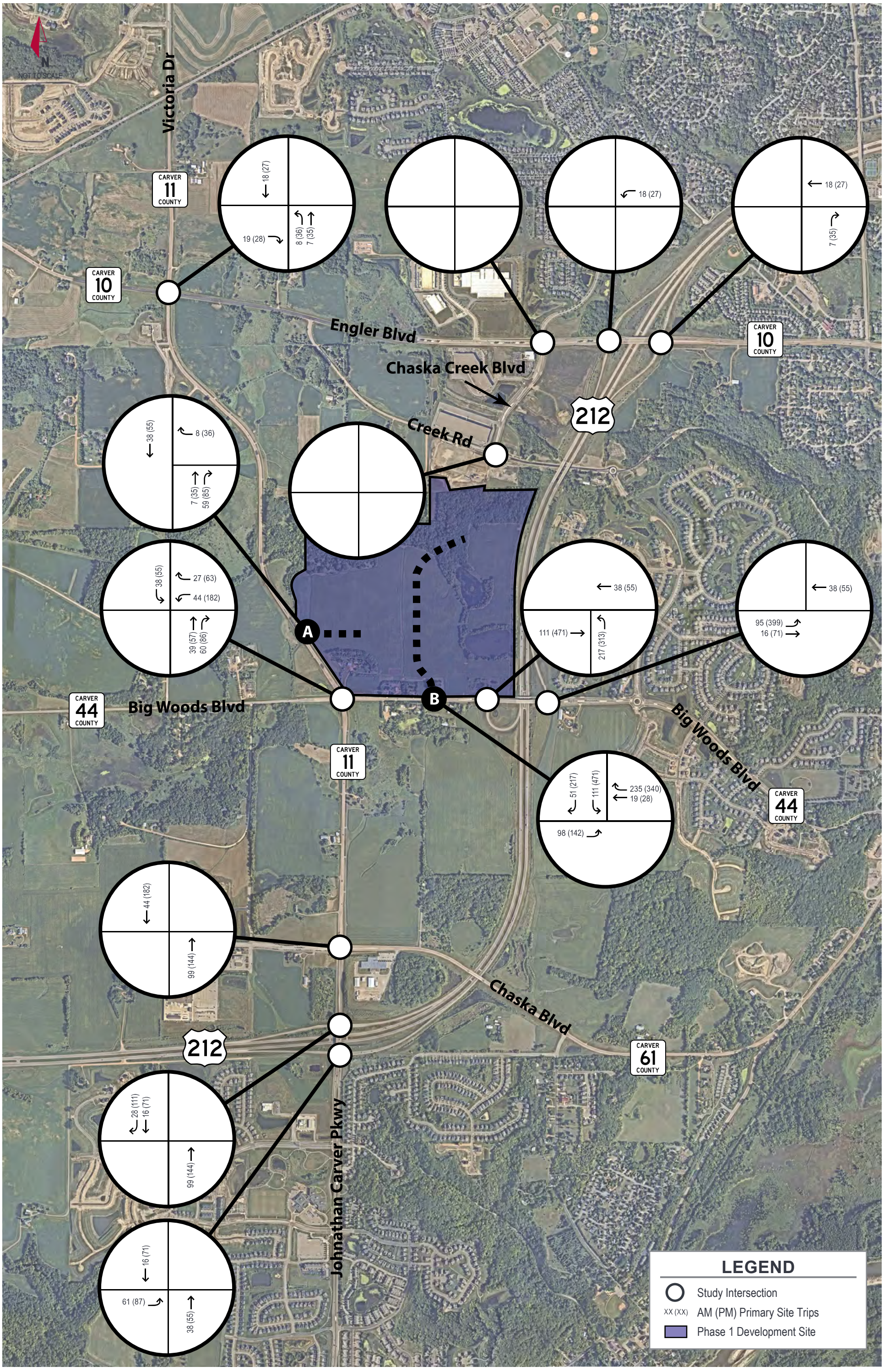



Kimley»Horn

EXHIBIT 15

**DESIGN YEAR (2045) SCENARIO 1 TRAFFIC VOLUMES**

**BIG WOODS BUSINESS PARK — CHASKA, MN**

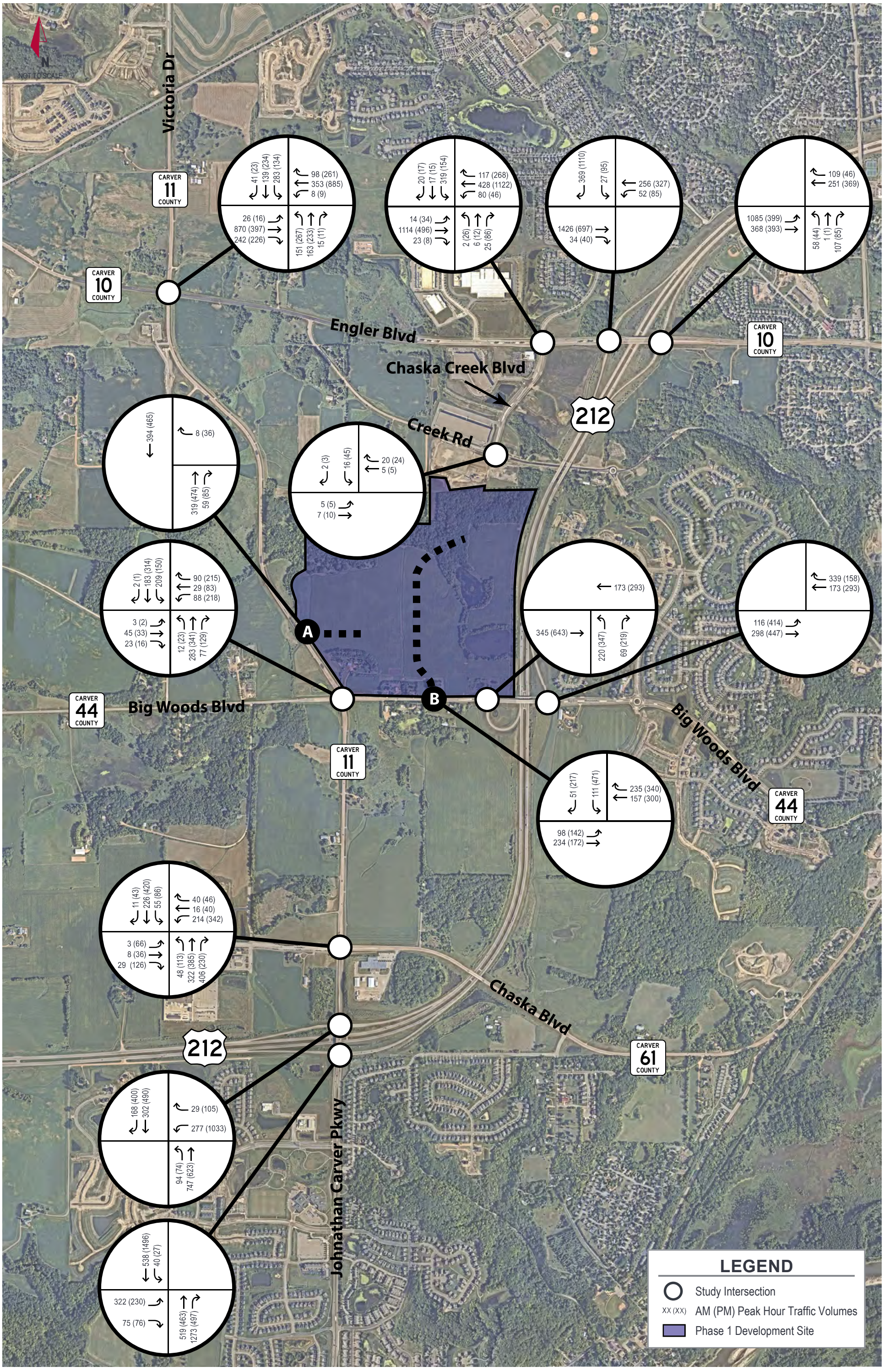



Kimley»Horn

EXHIBIT 16

**SCENARIO 2 PEAK HOUR SITE TRIPS (PHASE 1)**

**BIG WOODS BUSINESS PARK — CHASKA, MN**

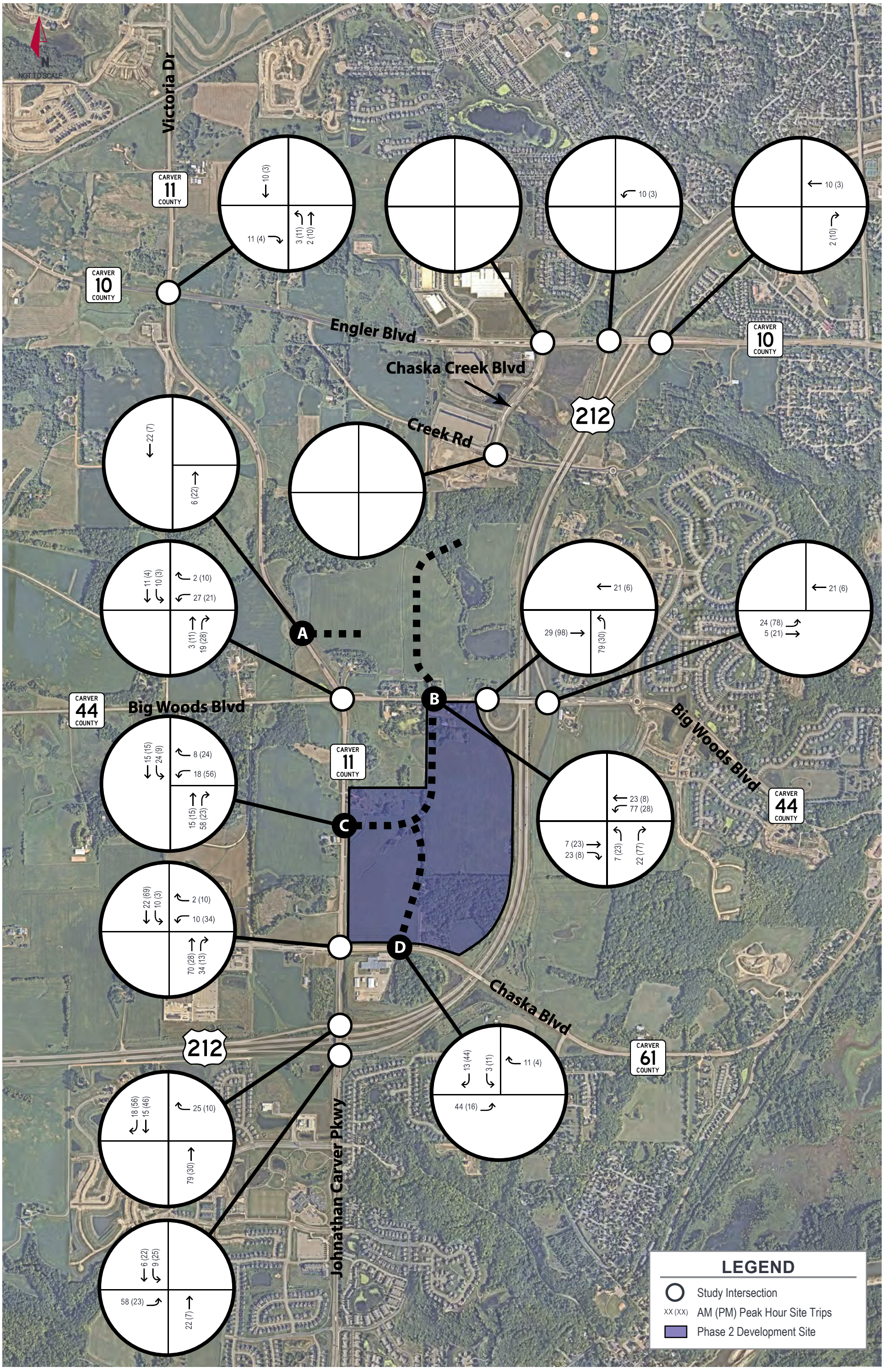



Kimley»Horn

EXHIBIT 17

**OPENING YEAR (2030) SCENARIO 2 TRAFFIC VOLUMES**

**BIG WOODS BUSINESS PARK — CHASKA, MN**

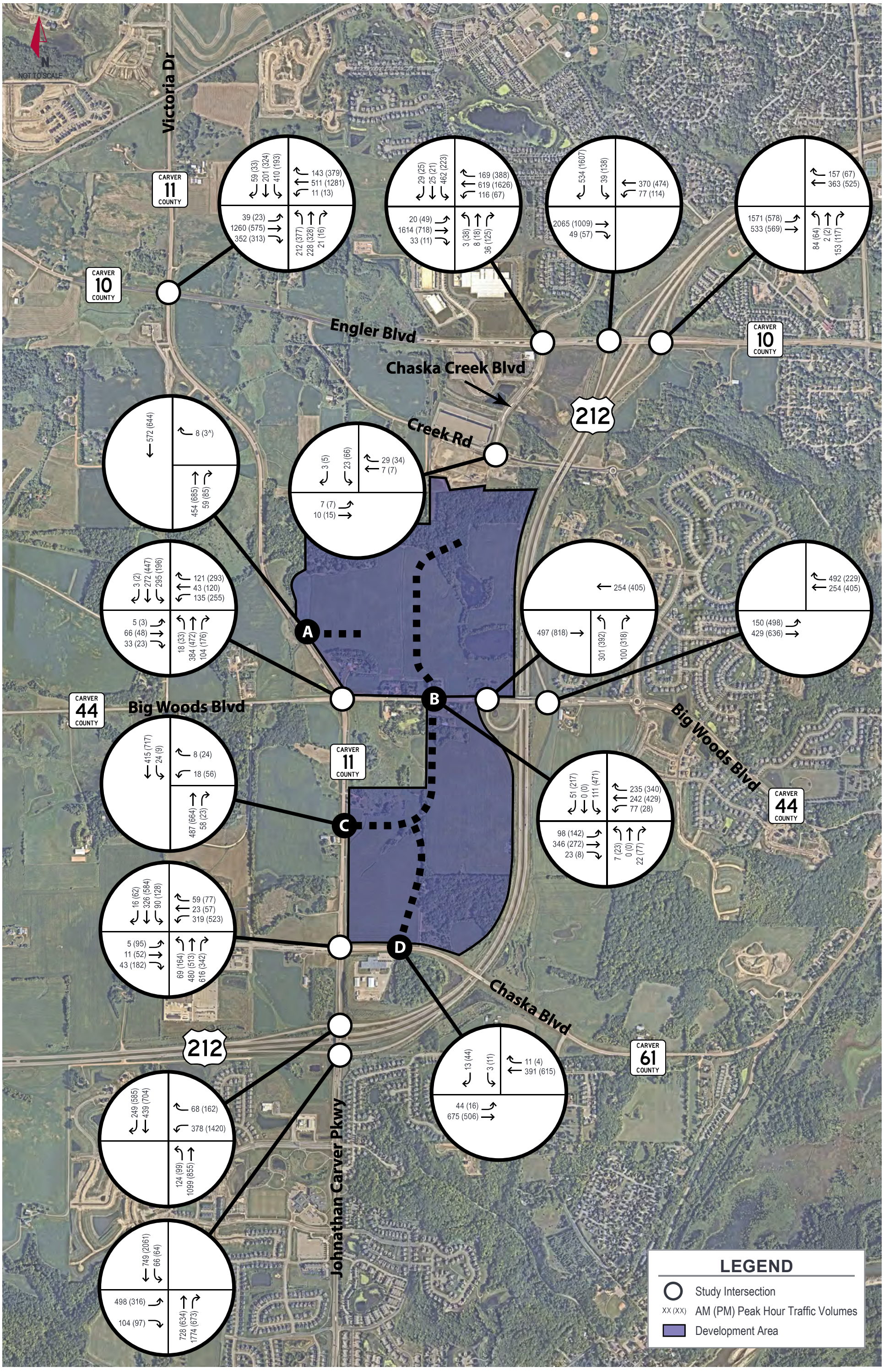



Kimley»Horn

EXHIBIT 18

**SCENARIO 2 PASSENGER VEHICLE TRIPS (PHASE 2)**

**BIG WOODS BUSINESS PARK — CHASKA, MN**




Kimley»Horn

EXHIBIT 19

**DESIGN YEAR (2045) SCENARIO 2 TRAFFIC VOLUMES**

**BIG WOODS BUSINESS PARK — CHASKA, MN**

N
NOT TO SCALE

Victoria Dr

CARVER 11 COUNTY

CARVER 10 COUNTY

Engler Blvd

Chaska Creek Blvd

212

Creek Rd

CARVER 44 COUNTY

Big Woods Blvd

CARVER 61 COUNTY

Chaska Blvd

Johnathan Carver Pkwy

A

B

5%

[5%]

30%

10%

[30%]

25%

50%

[25%]

[35%]

40%

15%

10%

15%

## LEGEND

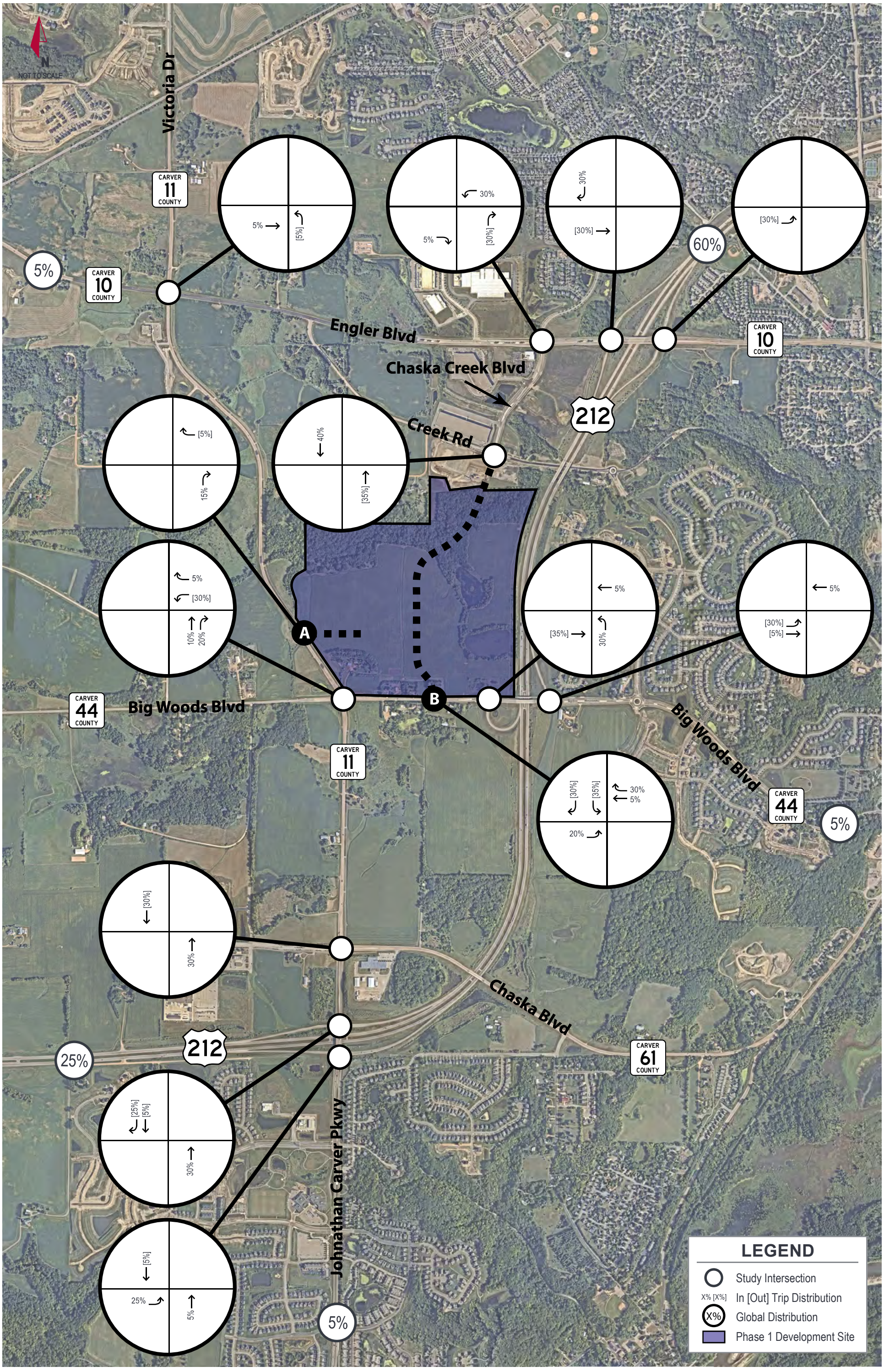
- Study Intersection
- X% [X%] In [Out] Trip Distribution
- X% Global Distribution
- Phase 1 Development Site

Kimley»Horn

EXHIBIT 20

**PASSENGER VEHICLE DISTRIBUTION (PHASE 1 W/ CREEK CROSSING)**

**BIG WOODS BUSINESS PARK — CHASKA, MN**

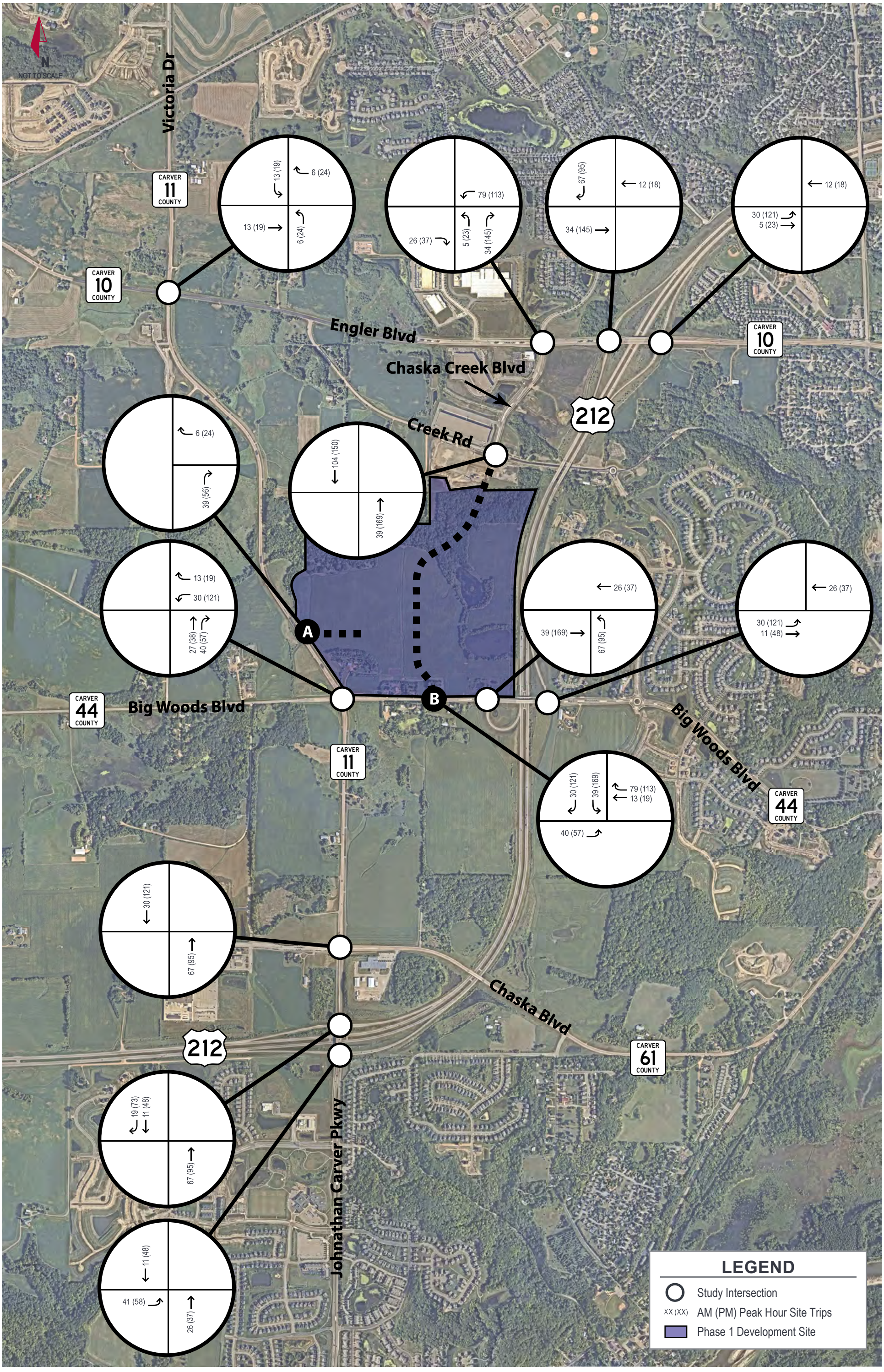



Kimley»Horn

EXHIBIT 21

**HEAVY VEHICLE DISTRIBUTION (PHASE 1 W/ CREEK CROSSING)**

**BIG WOODS BUSINESS PARK — CHASKA, MN**

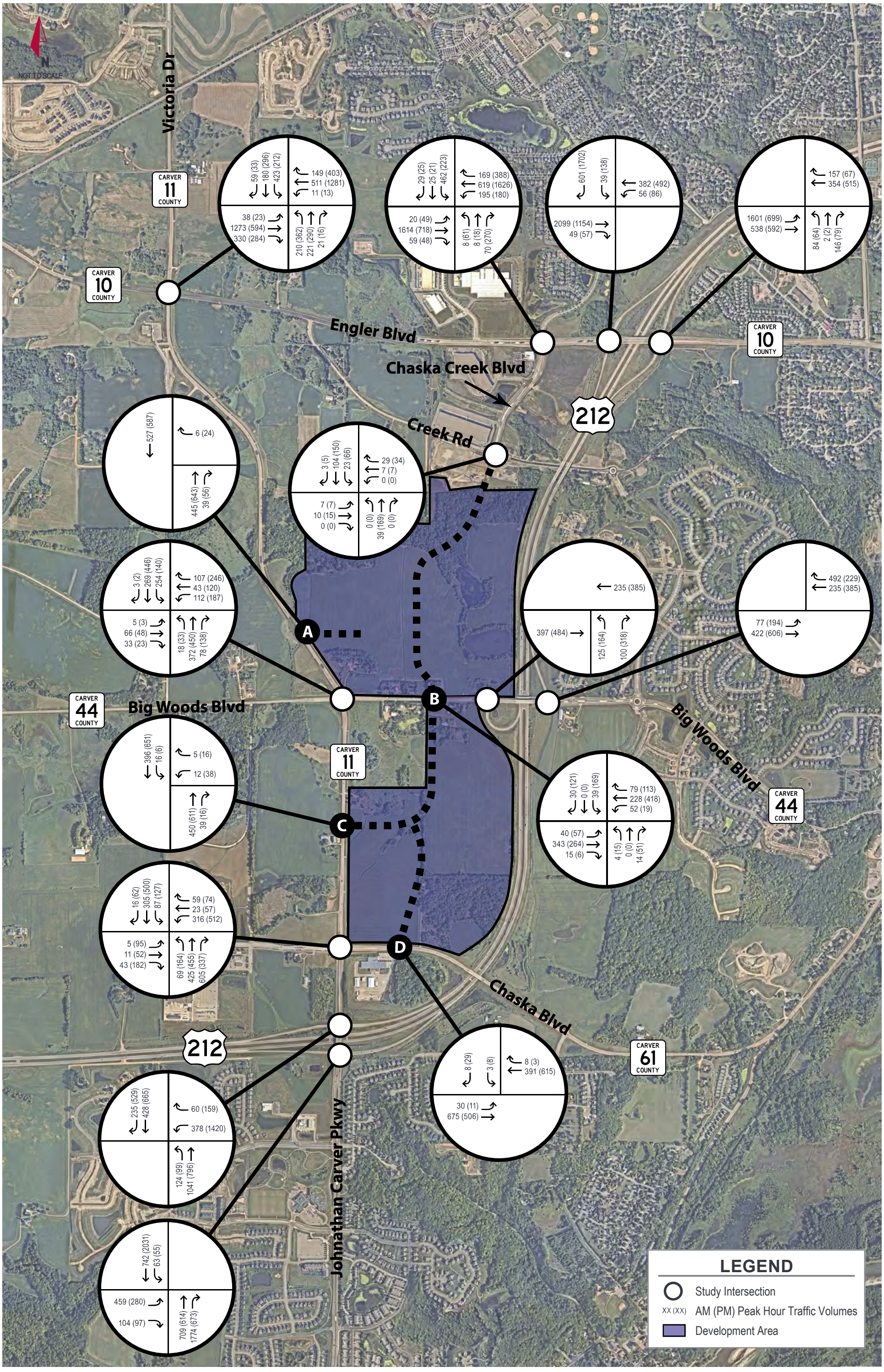



Kimley»Horn

EXHIBIT 22

**SCENARIO 1 TOTAL SITE TRIPS (PHASE 1) WITH CREEK CROSSING**

**BIG WOODS BUSINESS PARK — CHASKA, MN**

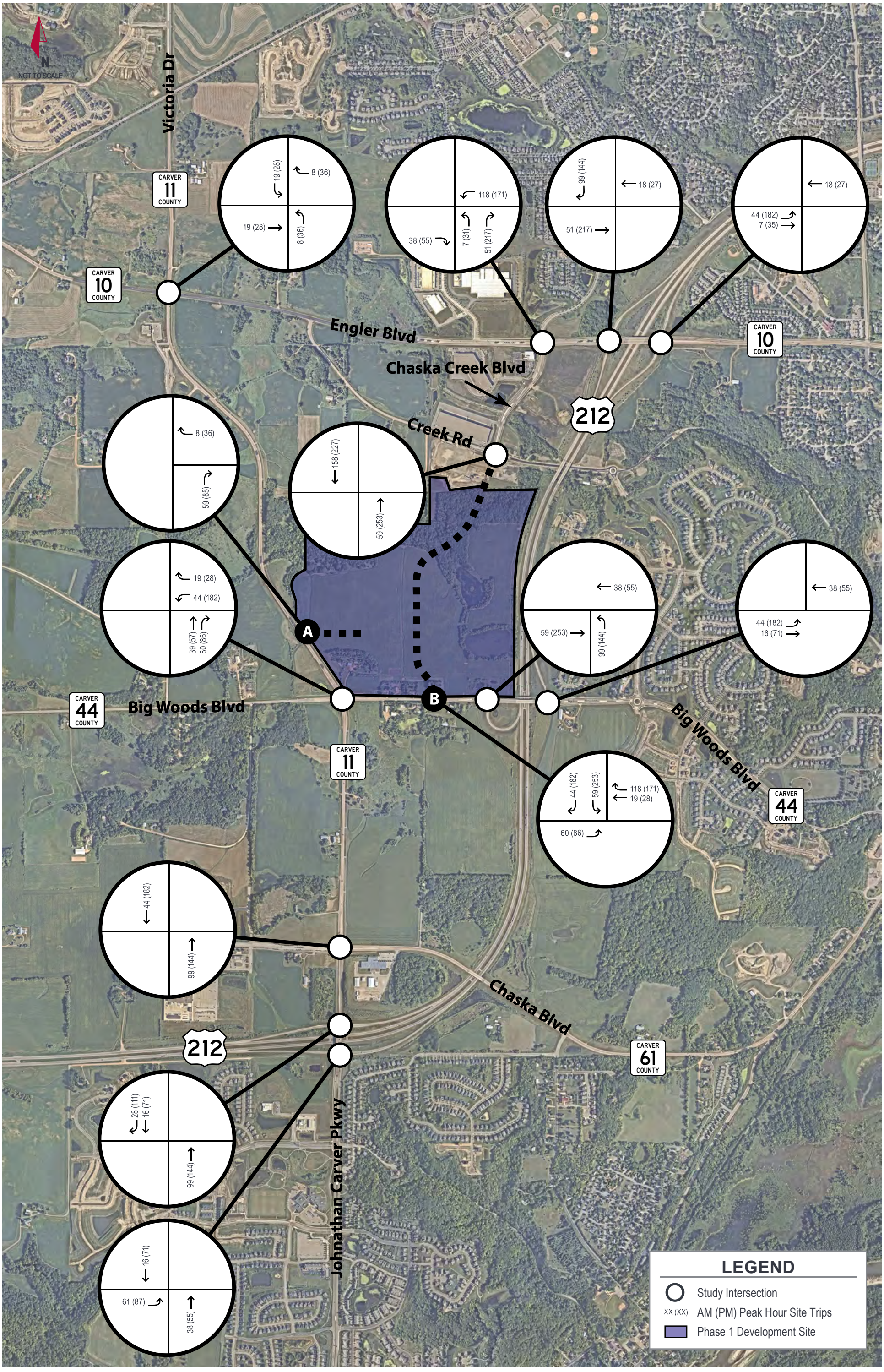



Kimley»Horn

EXHIBIT 23

**DESIGN YEAR (2045) SCENARIO 1 W/ CREEK CROSSING TRAFFIC VOLUMES**

**BIG WOODS BUSINESS PARK — CHASKA, MN**

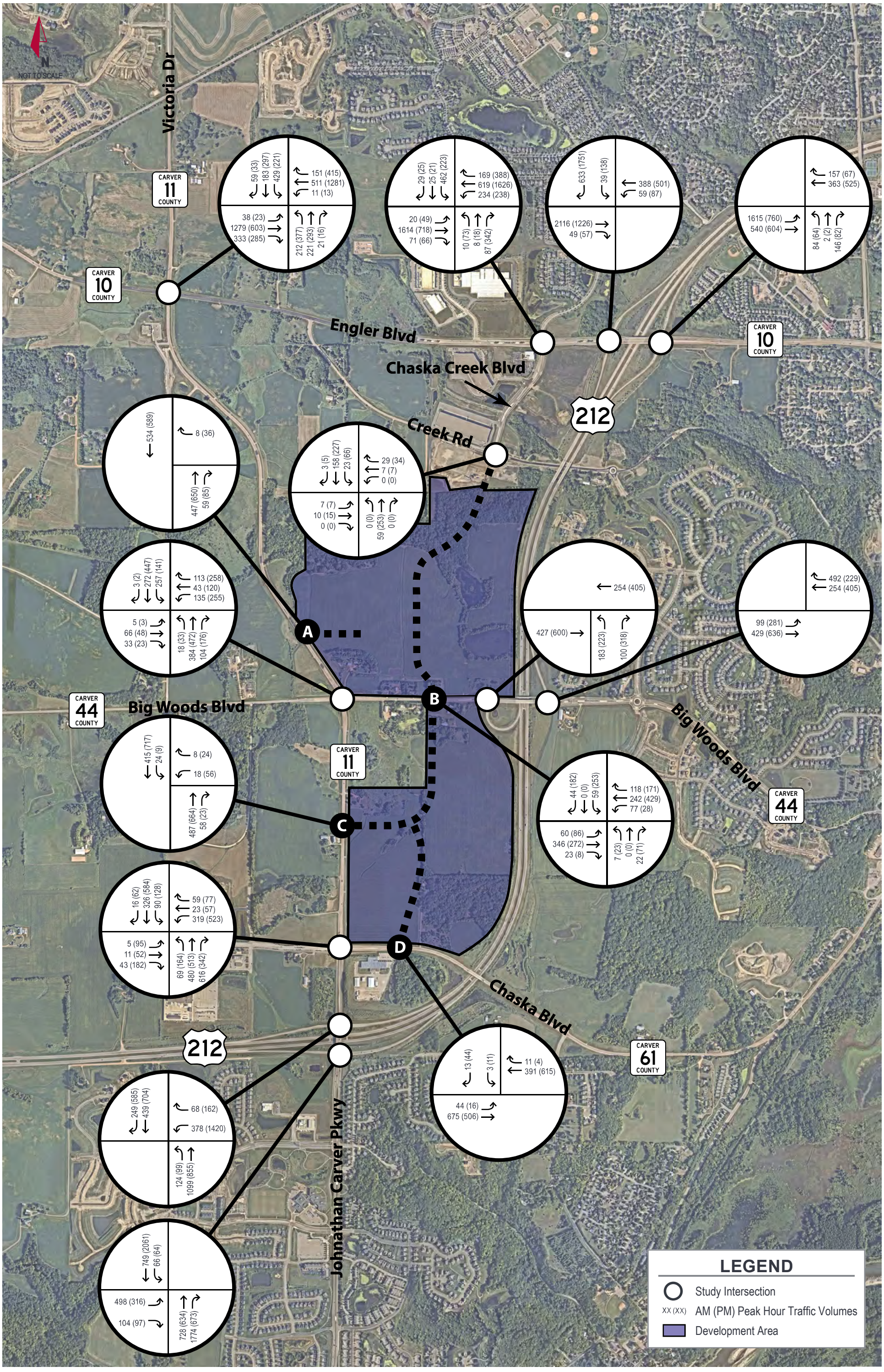



Kimley»Horn

EXHIBIT 24

**SCENARIO 2 TOTAL SITE TRIPS (PHASE 1) WITH CREEK CROSSING**

**BIG WOODS BUSINESS PARK — CHASKA, MN**




Kimley»Horn

EXHIBIT 25

**DESIGN YEAR (2045) SCENARIO 2 W/ CREEK CROSSING TRAFFIC VOLUMES**

**BIG WOODS BUSINESS PARK — CHASKA, MN**

# Appendix B:

# Turning Movement Counts

Kimley-Horn
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 10 (Engler Boulevard) & US Highway 212 Eastbound Ramps
Site Code:
Start Date: 10/21/2025


# Turning Movement Data

| Start Time | CSAH 10 Eastbound | | | | | CSAH 10 Westbound | | | | | US Hwy 212 EB Off-Ramp Northbound | | | | | US Hwy 212 EB On-Ramp 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 | 245 | 34 | 0 | 0 | 279 | 0 | 44 | 27 | 0 | 71 | 9 | 0 | 12 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 371 |
| 7:15 AM | 279 | 72 | 0 | 0 | 351 | 0 | 50 | 31 | 0 | 81 | 17 | 0 | 18 | 0 | 35 | 0 | 0 | 0 | 0 | 0 | 467 |
| 7:30 AM | 243 | 88 | 0 | 0 | 331 | 0 | 60 | 19 | 0 | 79 | 17 | 0 | 16 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 443 |
| 7:45 AM | 236 | 74 | 0 | 0 | 310 | 0 | 49 | 23 | 0 | 72 | 5 | 1 | 27 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 415 |
| Hourly Total | 1003 | 268 | 0 | 0 | 1271 | 0 | 203 | 100 | 0 | 303 | 48 | 1 | 73 | 0 | 122 | 0 | 0 | 0 | 0 | 0 | 1696 |
| 8:00 AM | 196 | 88 | 0 | 0 | 284 | 0 | 45 | 23 | 0 | 68 | 12 | 0 | 27 | 0 | 39 | 0 | 0 | 0 | 0 | 0 | 391 |
| 8:15 AM | 180 | 125 | 0 | 0 | 305 | 0 | 52 | 19 | 0 | 71 | 8 | 0 | 28 | 0 | 36 | 0 | 0 | 0 | 0 | 0 | 412 |
| 8:30 AM | 173 | 100 | 0 | 0 | 273 | 0 | 69 | 11 | 0 | 80 | 6 | 0 | 29 | 0 | 35 | 0 | 0 | 0 | 0 | 0 | 388 |
| 8:45 AM | 139 | 47 | 0 | 0 | 186 | 0 | 45 | 19 | 0 | 64 | 8 | 0 | 11 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 269 |
| Hourly Total | 688 | 360 | 0 | 0 | 1048 | 0 | 211 | 72 | 0 | 283 | 34 | 0 | 95 | 0 | 129 | 0 | 0 | 0 | 0 | 0 | 1460 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4:00 PM | 83 | 87 | 0 | 0 | 170 | 0 | 69 | 11 | 0 | 80 | 4 | 1 | 9 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 264 |
| 4:15 PM | 97 | 85 | 0 | 0 | 182 | 0 | 75 | 10 | 0 | 85 | 12 | 0 | 9 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 288 |
| 4:30 PM | 83 | 77 | 0 | 0 | 160 | 0 | 85 | 9 | 0 | 94 | 15 | 0 | 9 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 278 |
| 4:45 PM | 80 | 89 | 0 | 0 | 169 | 0 | 73 | 11 | 0 | 84 | 8 | 0 | 17 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 278 |
| Hourly Total | 343 | 338 | 0 | 0 | 681 | 0 | 302 | 41 | 0 | 343 | 39 | 1 | 44 | 0 | 84 | 0 | 0 | 0 | 0 | 0 | 1108 |
| 5:00 PM | 94 | 74 | 0 | 0 | 168 | 0 | 62 | 6 | 0 | 68 | 5 | 1 | 16 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 258 |
| 5:15 PM | 85 | 66 | 0 | 0 | 151 | 0 | 72 | 11 | 0 | 83 | 10 | 0 | 8 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 252 |
| 5:30 PM | 73 | 73 | 0 | 0 | 146 | 0 | 78 | 9 | 0 | 87 | 9 | 1 | 17 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 260 |
| 5:45 PM | 90 | 78 | 0 | 0 | 168 | 0 | 56 | 9 | 0 | 65 | 9 | 0 | 11 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 253 |
| Hourly Total | 342 | 291 | 0 | 0 | 633 | 0 | 268 | 35 | 0 | 303 | 33 | 2 | 52 | 0 | 87 | 0 | 0 | 0 | 0 | 0 | 1023 |
| Grand Total | 2376 | 1257 | 0 | 0 | 3633 | 0 | 984 | 248 | 0 | 1232 | 154 | 4 | 264 | 0 | 422 | 0 | 0 | 0 | 0 | 0 | 5287 |
| Approach % | 65.4 | 34.6 | 0.0 | - | - | 0.0 | 79.9 | 20.1 | - | - | 36.5 | 0.9 | 62.6 | - | - | 0.0 | 0.0 | 0.0 | - | - | - |
| Total % | 44.9 | 23.8 | 0.0 | - | 68.7 | 0.0 | 18.6 | 4.7 | - | 23.3 | 2.9 | 0.1 | 5.0 | - | 8.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | - |
| Lights | 2338 | 1225 | 0 | - | 3563 | 0 | 959 | 246 | - | 1205 | 142 | 4 | 256 | - | 402 | 0 | 0 | 0 | - | 0 | 5170 |
| % Lights | 98.4 | 97.5 | - | - | 98.1 | - | 97.5 | 99.2 | - | 97.8 | 92.2 | 100.0 | 97.0 | - | 95.3 | - | - | - | - | - | 97.8 |
| Buses | 13 | 10 | 0 | - | 23 | 0 | 12 | 0 | - | 12 | 7 | 0 | 4 | - | 11 | 0 | 0 | 0 | - | 0 | 46 |
| % Buses | 0.5 | 0.8 | - | - | 0.6 | - | 1.2 | 0.0 | - | 1.0 | 4.5 | 0.0 | 1.5 | - | 2.6 | - | - | - | - | - | 0.9 |
| Trucks | 25 | 22 | 0 | - | 47 | 0 | 13 | 2 | - | 15 | 5 | 0 | 4 | - | 9 | 0 | 0 | 0 | - | 0 | 71 |
| % Trucks | 1.1 | 1.8 | - | - | 1.3 | - | 1.3 | 0.8 | - | 1.2 | 3.2 | 0.0 | 1.5 | - | 2.1 | - | - | - | - | - | 1.3 |
| 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 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Kimley-Horn
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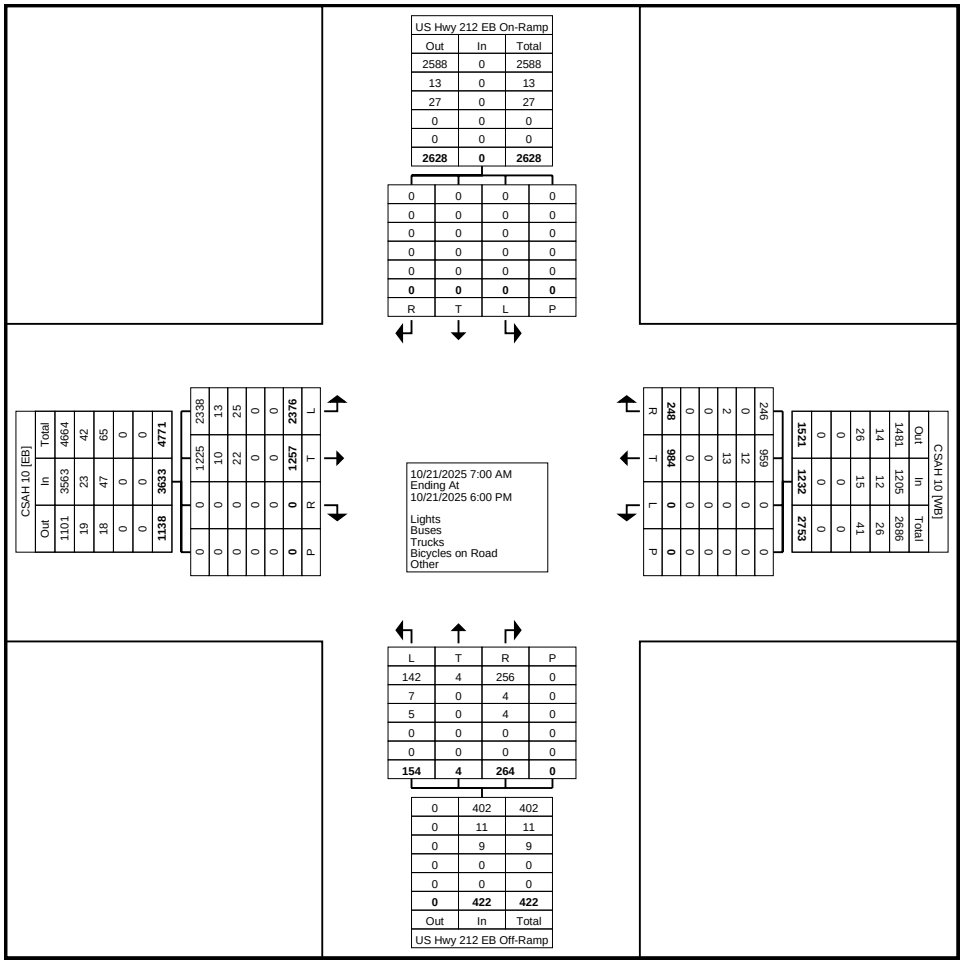
Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 10 (Engler Boulevard) & US Highway 212 Eastbound Ramps
Site Code:
Start Date: 10/21/2025


Turning Movement Data Plot

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Count Name: CSAH 10 (Engler Boulevard) & US Highway 212 Eastbound Ramps
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (7:15 AM)

| Start Time | CSAH 10 Eastbound | | | | | CSAH 10 Westbound | | | | | US Hwy 212 EB Off-Ramp Northbound | | | | | US Hwy 212 EB On-Ramp 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 |
| 7:15 AM | 279 | 72 | 0 | 0 | 351 | 0 | 50 | 31 | 0 | 81 | 17 | 0 | 18 | 0 | 35 | 0 | 0 | 0 | 0 | 0 | 467 |
| 7:30 AM | 243 | 88 | 0 | 0 | 331 | 0 | 60 | 19 | 0 | 79 | 17 | 0 | 16 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 443 |
| 7:45 AM | 236 | 74 | 0 | 0 | 310 | 0 | 49 | 23 | 0 | 72 | 5 | 1 | 27 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 415 |
| 8:00 AM | 196 | 88 | 0 | 0 | 284 | 0 | 45 | 23 | 0 | 68 | 12 | 0 | 27 | 0 | 39 | 0 | 0 | 0 | 0 | 0 | 391 |
| Total | 954 | 322 | 0 | 0 | 1276 | 0 | 204 | 96 | 0 | 300 | 51 | 1 | 88 | 0 | 140 | 0 | 0 | 0 | 0 | 0 | 1716 |
| Approach % | 74.8 | 25.2 | 0.0 | - | - | 0.0 | 68.0 | 32.0 | - | - | 36.4 | 0.7 | 62.9 | - | - | 0.0 | 0.0 | 0.0 | - | - | - |
| Total % | 55.6 | 18.8 | 0.0 | - | 74.4 | 0.0 | 11.9 | 5.6 | - | 17.5 | 3.0 | 0.1 | 5.1 | - | 8.2 | 0.0 | 0.0 | 0.0 | - | 0.0 | - |
| PHF | 0.855 | 0.915 | 0.000 | - | 0.909 | 0.000 | 0.850 | 0.774 | - | 0.926 | 0.750 | 0.250 | 0.815 | - | 0.897 | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.919 |
| Lights | 941 | 313 | 0 | - | 1254 | 0 | 191 | 95 | - | 286 | 47 | 1 | 85 | - | 133 | 0 | 0 | 0 | - | 0 | 1673 |
| % Lights | 98.6 | 97.2 | - | - | 98.3 | - | 93.6 | 99.0 | - | 95.3 | 92.2 | 100.0 | 96.6 | - | 95.0 | - | - | - | - | - | 97.5 |
| Buses | 5 | 4 | 0 | - | 9 | 0 | 5 | 0 | - | 5 | 4 | 0 | 1 | - | 5 | 0 | 0 | 0 | - | 0 | 19 |
| % Buses | 0.5 | 1.2 | - | - | 0.7 | - | 2.5 | 0.0 | - | 1.7 | 7.8 | 0.0 | 1.1 | - | 3.6 | - | - | - | - | - | 1.1 |
| Trucks | 8 | 5 | 0 | - | 13 | 0 | 8 | 1 | - | 9 | 0 | 0 | 2 | - | 2 | 0 | 0 | 0 | - | 0 | 24 |
| % Trucks | 0.8 | 1.6 | - | - | 1.0 | - | 3.9 | 1.0 | - | 3.0 | 0.0 | 0.0 | 2.3 | - | 1.4 | - | - | - | - | - | 1.4 |
| 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 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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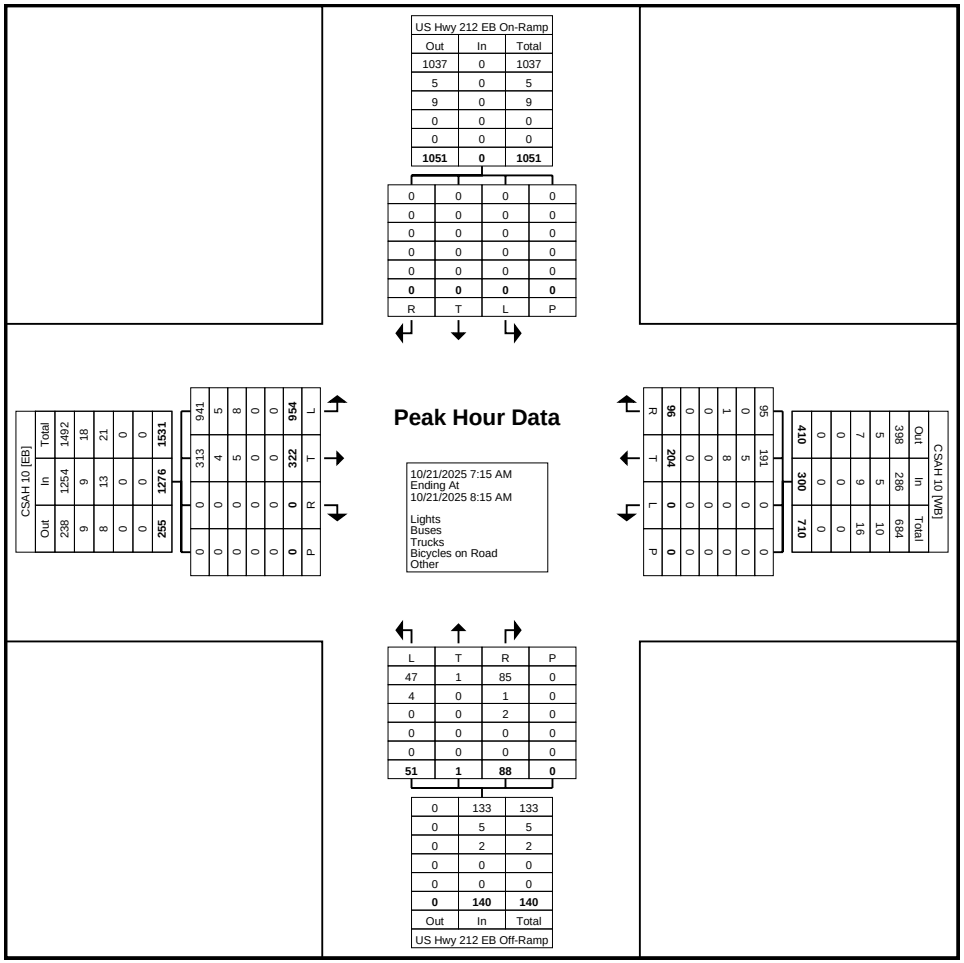
Count Name: CSAH 10 (Engler Boulevard) & US Highway 212 Eastbound Ramps
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (7:15 AM)

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Count Name: CSAH 10 (Engler Boulevard) & US Highway 212 Eastbound Ramps
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (4:00 PM)

| Start Time | CSAH 10 Eastbound | | | | | CSAH 10 Westbound | | | | | US Hwy 212 EB Off-Ramp Northbound | | | | | US Hwy 212 EB On-Ramp 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 | 83 | 87 | 0 | 0 | 170 | 0 | 69 | 11 | 0 | 80 | 4 | 1 | 9 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 264 |
| 4:15 PM | 97 | 85 | 0 | 0 | 182 | 0 | 75 | 10 | 0 | 85 | 12 | 0 | 9 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 288 |
| 4:30 PM | 83 | 77 | 0 | 0 | 160 | 0 | 85 | 9 | 0 | 94 | 15 | 0 | 9 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 278 |
| 4:45 PM | 80 | 89 | 0 | 0 | 169 | 0 | 73 | 11 | 0 | 84 | 8 | 0 | 17 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 278 |
| Total | 343 | 338 | 0 | 0 | 681 | 0 | 302 | 41 | 0 | 343 | 39 | 1 | 44 | 0 | 84 | 0 | 0 | 0 | 0 | 0 | 1108 |
| Approach % | 50.4 | 49.6 | 0.0 | - | - | 0.0 | 88.0 | 12.0 | - | - | 46.4 | 1.2 | 52.4 | - | - | 0.0 | 0.0 | 0.0 | - | - | - |
| Total % | 31.0 | 30.5 | 0.0 | - | 61.5 | 0.0 | 27.3 | 3.7 | - | 31.0 | 3.5 | 0.1 | 4.0 | - | 7.6 | 0.0 | 0.0 | 0.0 | - | 0.0 | - |
| PHF | 0.884 | 0.949 | 0.000 | - | 0.935 | 0.000 | 0.888 | 0.932 | - | 0.912 | 0.650 | 0.250 | 0.647 | - | 0.840 | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.962 |
| Lights | 336 | 328 | 0 | - | 664 | 0 | 299 | 41 | - | 340 | 39 | 1 | 42 | - | 82 | 0 | 0 | 0 | - | 0 | 1086 |
| % Lights | 98.0 | 97.0 | - | - | 97.5 | - | 99.0 | 100.0 | - | 99.1 | 100.0 | 100.0 | 95.5 | - | 97.6 | - | - | - | - | - | 98.0 |
| Buses | 2 | 3 | 0 | - | 5 | 0 | 3 | 0 | - | 3 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 8 |
| % Buses | 0.6 | 0.9 | - | - | 0.7 | - | 1.0 | 0.0 | - | 0.9 | 0.0 | 0.0 | 0.0 | - | 0.0 | - | - | - | - | - | 0.7 |
| Trucks | 5 | 7 | 0 | - | 12 | 0 | 0 | 0 | - | 0 | 0 | 0 | 2 | - | 2 | 0 | 0 | 0 | - | 0 | 14 |
| % Trucks | 1.5 | 2.1 | - | - | 1.8 | - | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 4.5 | - | 2.4 | - | - | - | - | - | 1.3 |
| 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 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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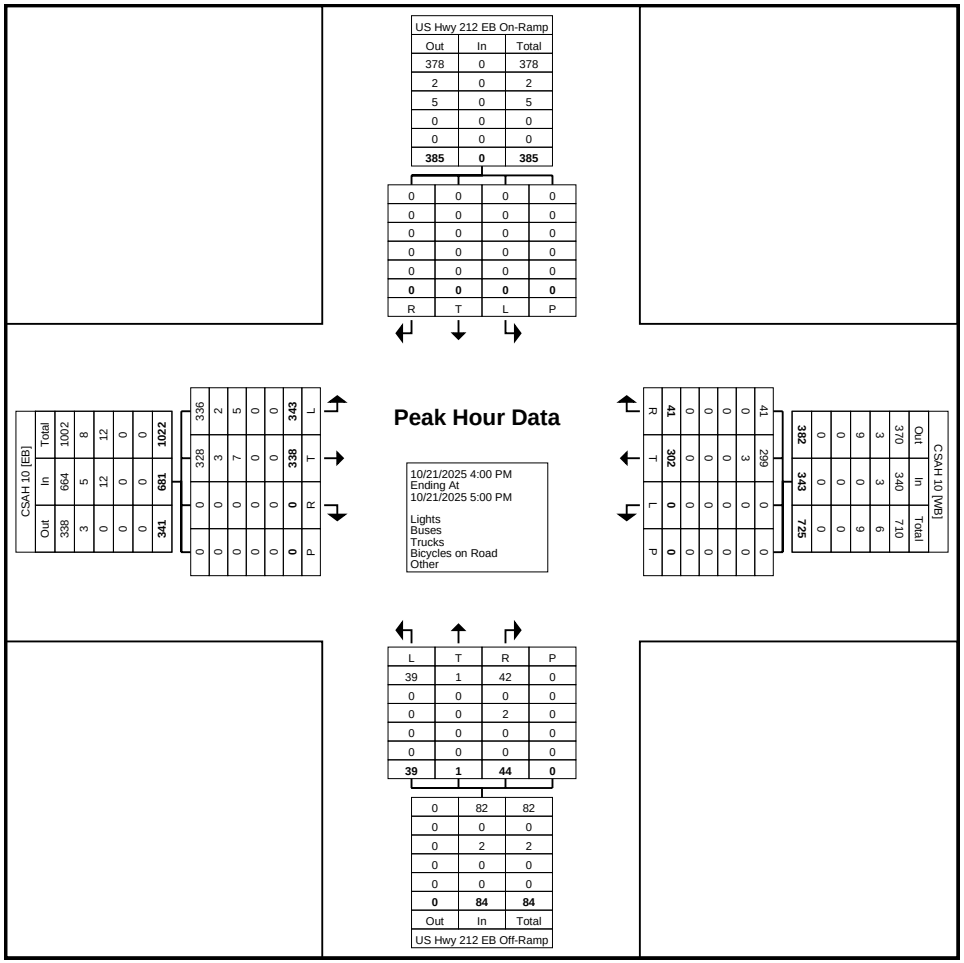
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (4:00 PM)

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Count Name: CSAH 10 (Engler Boulevard) & US Highway 212 Westbound Ramps
Site Code:
Start Date: 10/21/2025


# Turning Movement Data

| Start Time | CSAH 10 Eastbound | | | | | CSAH 10 Westbound | | | | | US Hwy 212 WB On-Ramp Northbound | | | | | US Hwy 212 WB Off-Ramp 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 | 285 | 4 | 0 | 289 | 7 | 45 | 0 | 0 | 52 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 62 | 0 | 65 | 406 |
| 7:15 AM | 0 | 344 | 6 | 0 | 350 | 4 | 62 | 0 | 0 | 66 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 62 | 0 | 67 | 483 |
| 7:30 AM | 0 | 325 | 14 | 0 | 339 | 9 | 71 | 0 | 0 | 80 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 92 | 0 | 97 | 516 |
| 7:45 AM | 0 | 305 | 7 | 0 | 312 | 7 | 46 | 0 | 0 | 53 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 96 | 0 | 104 | 469 |
| Hourly Total | 0 | 1259 | 31 | 0 | 1290 | 27 | 224 | 0 | 0 | 251 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 312 | 0 | 333 | 1874 |
| 8:00 AM | 0 | 286 | 3 | 0 | 289 | 10 | 47 | 0 | 0 | 57 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 76 | 0 | 82 | 428 |
| 8:15 AM | 0 | 276 | 6 | 0 | 282 | 6 | 57 | 0 | 0 | 63 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 81 | 0 | 105 | 450 |
| 8:30 AM | 0 | 244 | 5 | 0 | 249 | 4 | 69 | 0 | 0 | 73 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 69 | 0 | 94 | 416 |
| 8:45 AM | 0 | 187 | 6 | 0 | 193 | 5 | 47 | 0 | 0 | 52 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 74 | 0 | 76 | 321 |
| Hourly Total | 0 | 993 | 20 | 0 | 1013 | 25 | 220 | 0 | 0 | 245 | 0 | 0 | 0 | 0 | 0 | 57 | 0 | 300 | 0 | 357 | 1615 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4:00 PM | 0 | 147 | 10 | 0 | 157 | 16 | 59 | 0 | 0 | 75 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 231 | 0 | 254 | 486 |
| 4:15 PM | 0 | 144 | 6 | 0 | 150 | 13 | 72 | 0 | 0 | 85 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 238 | 0 | 263 | 498 |
| 4:30 PM | 0 | 158 | 11 | 0 | 169 | 12 | 80 | 0 | 0 | 92 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 260 | 0 | 276 | 537 |
| 4:45 PM | 0 | 147 | 8 | 0 | 155 | 10 | 74 | 0 | 0 | 84 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 252 | 0 | 272 | 511 |
| Hourly Total | 0 | 596 | 35 | 0 | 631 | 51 | 285 | 0 | 0 | 336 | 0 | 0 | 0 | 0 | 0 | 84 | 0 | 981 | 0 | 1065 | 2032 |
| 5:00 PM | 0 | 150 | 7 | 0 | 157 | 5 | 69 | 0 | 0 | 74 | 0 | 0 | 0 | 0 | 0 | 17 | 0 | 260 | 0 | 277 | 508 |
| 5:15 PM | 0 | 148 | 7 | 0 | 155 | 14 | 69 | 0 | 0 | 83 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 247 | 0 | 255 | 493 |
| 5:30 PM | 0 | 125 | 5 | 0 | 130 | 9 | 79 | 0 | 0 | 88 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 206 | 0 | 220 | 438 |
| 5:45 PM | 0 | 162 | 3 | 0 | 165 | 10 | 54 | 0 | 0 | 64 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 212 | 0 | 228 | 457 |
| Hourly Total | 0 | 585 | 22 | 0 | 607 | 38 | 271 | 0 | 0 | 309 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 925 | 0 | 980 | 1896 |
| Grand Total | 0 | 3433 | 108 | 0 | 3541 | 141 | 1000 | 0 | 0 | 1141 | 0 | 0 | 0 | 0 | 0 | 217 | 0 | 2518 | 0 | 2735 | 7417 |
| Approach % | 0.0 | 97.0 | 3.0 | - | - | 12.4 | 87.6 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 7.9 | 0.0 | 92.1 | - | - | - |
| Total % | 0.0 | 46.3 | 1.5 | - | 47.7 | 1.9 | 13.5 | 0.0 | - | 15.4 | 0.0 | 0.0 | 0.0 | - | 0.0 | 2.9 | 0.0 | 33.9 | - | 36.9 | - |
| Lights | 0 | 3372 | 104 | - | 3476 | 139 | 969 | 0 | - | 1108 | 0 | 0 | 0 | - | 0 | 213 | 0 | 2472 | - | 2685 | 7269 |
| % Lights | - | 98.2 | 96.3 | - | 98.2 | 98.6 | 96.9 | - | - | 97.1 | - | - | - | - | - | 98.2 | - | 98.2 | - | 98.2 | 98.0 |
| Buses | 0 | 20 | 3 | - | 23 | 0 | 13 | 0 | - | 13 | 0 | 0 | 0 | - | 0 | 2 | 0 | 8 | - | 10 | 46 |
| % Buses | - | 0.6 | 2.8 | - | 0.6 | 0.0 | 1.3 | - | - | 1.1 | - | - | - | - | - | 0.9 | - | 0.3 | - | 0.4 | 0.6 |
| Trucks | 0 | 41 | 1 | - | 42 | 2 | 18 | 0 | - | 20 | 0 | 0 | 0 | - | 0 | 2 | 0 | 38 | - | 40 | 102 |
| % Trucks | - | 1.2 | 0.9 | - | 1.2 | 1.4 | 1.8 | - | - | 1.8 | - | - | - | - | - | 0.9 | - | 1.5 | - | 1.5 | 1.4 |
| 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 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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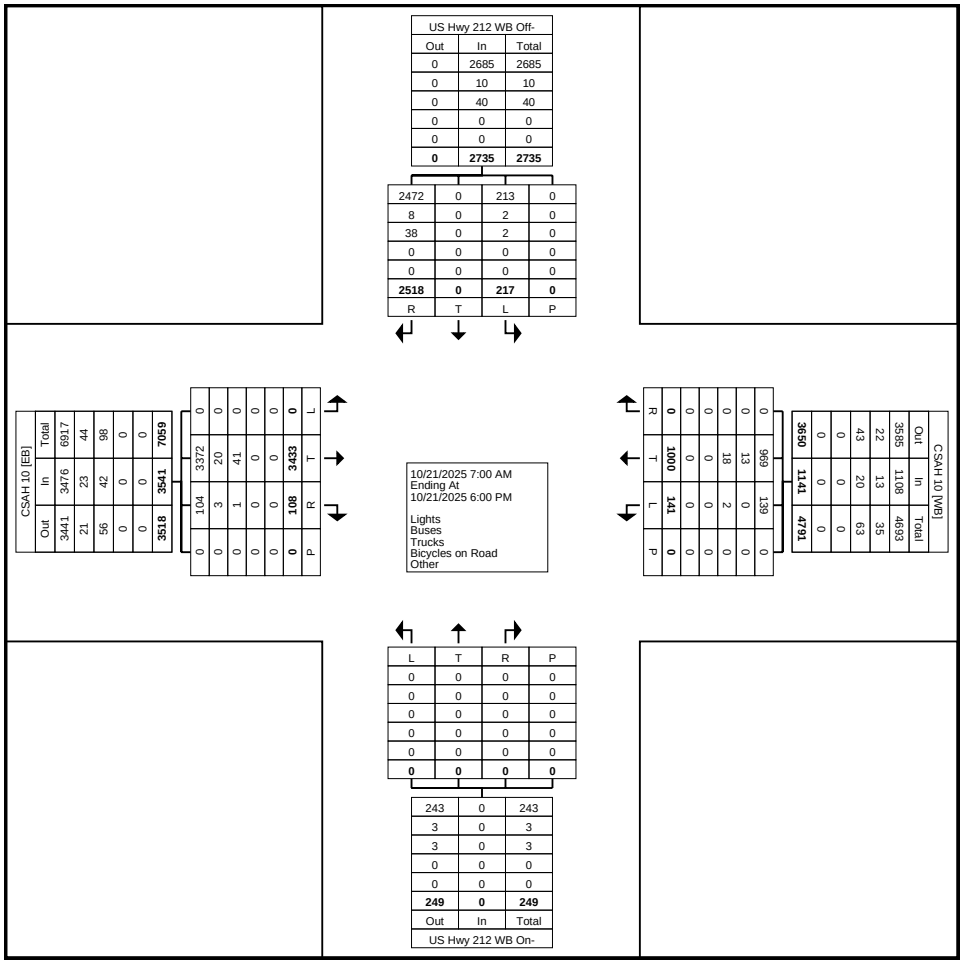


Turning Movement Data Plot

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Count Name: CSAH 10 (Engler Boulevard) & US Highway 212 Westbound Ramps
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (7:15 AM)

| Start Time | CSAH 10 Eastbound | | | | | CSAH 10 Westbound | | | | | US Hwy 212 WB On-Ramp Northbound | | | | | US Hwy 212 WB Off-Ramp 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 |
| 7:15 AM | 0 | 344 | 6 | 0 | 350 | 4 | 62 | 0 | 0 | 66 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 62 | 0 | 67 | 483 |
| 7:30 AM | 0 | 325 | 14 | 0 | 339 | 9 | 71 | 0 | 0 | 80 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 92 | 0 | 97 | 516 |
| 7:45 AM | 0 | 305 | 7 | 0 | 312 | 7 | 46 | 0 | 0 | 53 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 96 | 0 | 104 | 469 |
| 8:00 AM | 0 | 286 | 3 | 0 | 289 | 10 | 47 | 0 | 0 | 57 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 76 | 0 | 82 | 428 |
| Total | 0 | 1260 | 30 | 0 | 1290 | 30 | 226 | 0 | 0 | 256 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 326 | 0 | 350 | 1896 |
| Approach % | 0.0 | 97.7 | 2.3 | - | - | 11.7 | 88.3 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 6.9 | 0.0 | 93.1 | - | - | - |
| Total % | 0.0 | 66.5 | 1.6 | - | 68.0 | 1.6 | 11.9 | 0.0 | - | 13.5 | 0.0 | 0.0 | 0.0 | - | 0.0 | 1.3 | 0.0 | 17.2 | - | 18.5 | - |
| PHF | 0.000 | 0.916 | 0.536 | - | 0.921 | 0.750 | 0.796 | 0.000 | - | 0.800 | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.750 | 0.000 | 0.849 | - | 0.841 | 0.919 |
| Lights | 0 | 1236 | 28 | - | 1264 | 29 | 211 | 0 | - | 240 | 0 | 0 | 0 | - | 0 | 23 | 0 | 305 | - | 328 | 1832 |
| % Lights | - | 98.1 | 93.3 | - | 98.0 | 96.7 | 93.4 | - | - | 93.8 | - | - | - | - | - | 95.8 | - | 93.6 | - | 93.7 | 96.6 |
| Buses | 0 | 8 | 2 | - | 10 | 0 | 8 | 0 | - | 8 | 0 | 0 | 0 | - | 0 | 1 | 0 | 4 | - | 5 | 23 |
| % Buses | - | 0.6 | 6.7 | - | 0.8 | 0.0 | 3.5 | - | - | 3.1 | - | - | - | - | - | 4.2 | - | 1.2 | - | 1.4 | 1.2 |
| Trucks | 0 | 16 | 0 | - | 16 | 1 | 7 | 0 | - | 8 | 0 | 0 | 0 | - | 0 | 0 | 0 | 17 | - | 17 | 41 |
| % Trucks | - | 1.3 | 0.0 | - | 1.2 | 3.3 | 3.1 | - | - | 3.1 | - | - | - | - | - | 0.0 | - | 5.2 | - | 4.9 | 2.2 |
| 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 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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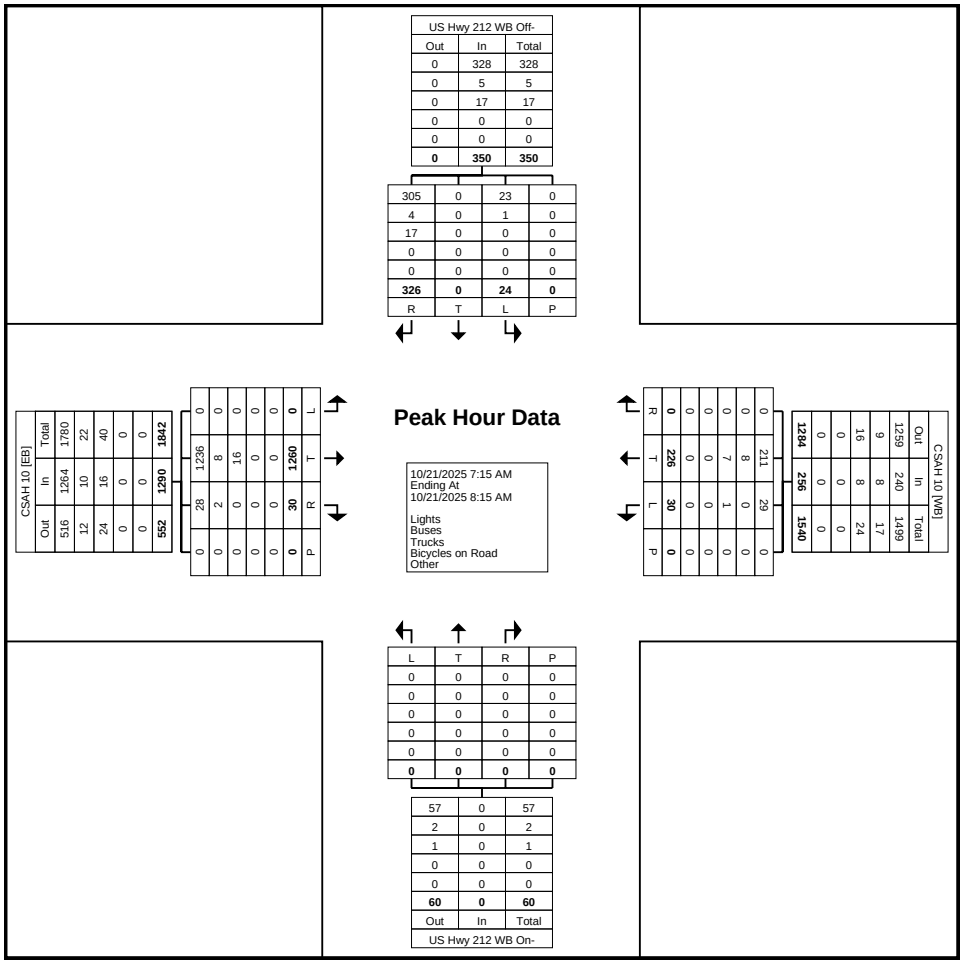
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (7:15 AM)

Kimley-Horn
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 10 (Engler Boulevard) & US Highway 212 Westbound Ramps
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (4:15 PM)

| Start Time | CSAH 10 Eastbound | | | | | CSAH 10 Westbound | | | | | US Hwy 212 WB On-Ramp Northbound | | | | | US Hwy 212 WB Off-Ramp 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 | 144 | 6 | 0 | 150 | 13 | 72 | 0 | 0 | 85 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 238 | 0 | 263 | 498 |
| 4:30 PM | 0 | 158 | 11 | 0 | 169 | 12 | 80 | 0 | 0 | 92 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 260 | 0 | 276 | 537 |
| 4:45 PM | 0 | 147 | 8 | 0 | 155 | 10 | 74 | 0 | 0 | 84 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 252 | 0 | 272 | 511 |
| 5:00 PM | 0 | 150 | 7 | 0 | 157 | 5 | 69 | 0 | 0 | 74 | 0 | 0 | 0 | 0 | 0 | 17 | 0 | 260 | 0 | 277 | 508 |
| Total | 0 | 599 | 32 | 0 | 631 | 40 | 295 | 0 | 0 | 335 | 0 | 0 | 0 | 0 | 0 | 78 | 0 | 1010 | 0 | 1088 | 2054 |
| Approach % | 0.0 | 94.9 | 5.1 | - | - | 11.9 | 88.1 | 0.0 | - | - | 0.0 | 0.0 | 0.0 | - | - | 7.2 | 0.0 | 92.8 | - | - | - |
| Total % | 0.0 | 29.2 | 1.6 | - | 30.7 | 1.9 | 14.4 | 0.0 | - | 16.3 | 0.0 | 0.0 | 0.0 | - | 0.0 | 3.8 | 0.0 | 49.2 | - | 53.0 | - |
| PHF | 0.000 | 0.948 | 0.727 | - | 0.933 | 0.769 | 0.922 | 0.000 | - | 0.910 | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.780 | 0.000 | 0.971 | - | 0.982 | 0.956 |
| Lights | 0 | 594 | 32 | - | 626 | 40 | 292 | 0 | - | 332 | 0 | 0 | 0 | - | 0 | 77 | 0 | 1000 | - | 1077 | 2035 |
| % Lights | - | 99.2 | 100.0 | - | 99.2 | 100.0 | 99.0 | - | - | 99.1 | - | - | - | - | - | 98.7 | - | 99.0 | - | 99.0 | 99.1 |
| Buses | 0 | 2 | 0 | - | 2 | 0 | 1 | 0 | - | 1 | 0 | 0 | 0 | - | 0 | 1 | 0 | 2 | - | 3 | 6 |
| % Buses | - | 0.3 | 0.0 | - | 0.3 | 0.0 | 0.3 | - | - | 0.3 | - | - | - | - | - | 1.3 | - | 0.2 | - | 0.3 | 0.3 |
| Trucks | 0 | 3 | 0 | - | 3 | 0 | 2 | 0 | - | 2 | 0 | 0 | 0 | - | 0 | 0 | 0 | 8 | - | 8 | 13 |
| % Trucks | - | 0.5 | 0.0 | - | 0.5 | 0.0 | 0.7 | - | - | 0.6 | - | - | - | - | - | 0.0 | - | 0.8 | - | 0.7 | 0.6 |
| 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 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Kimley-Horn
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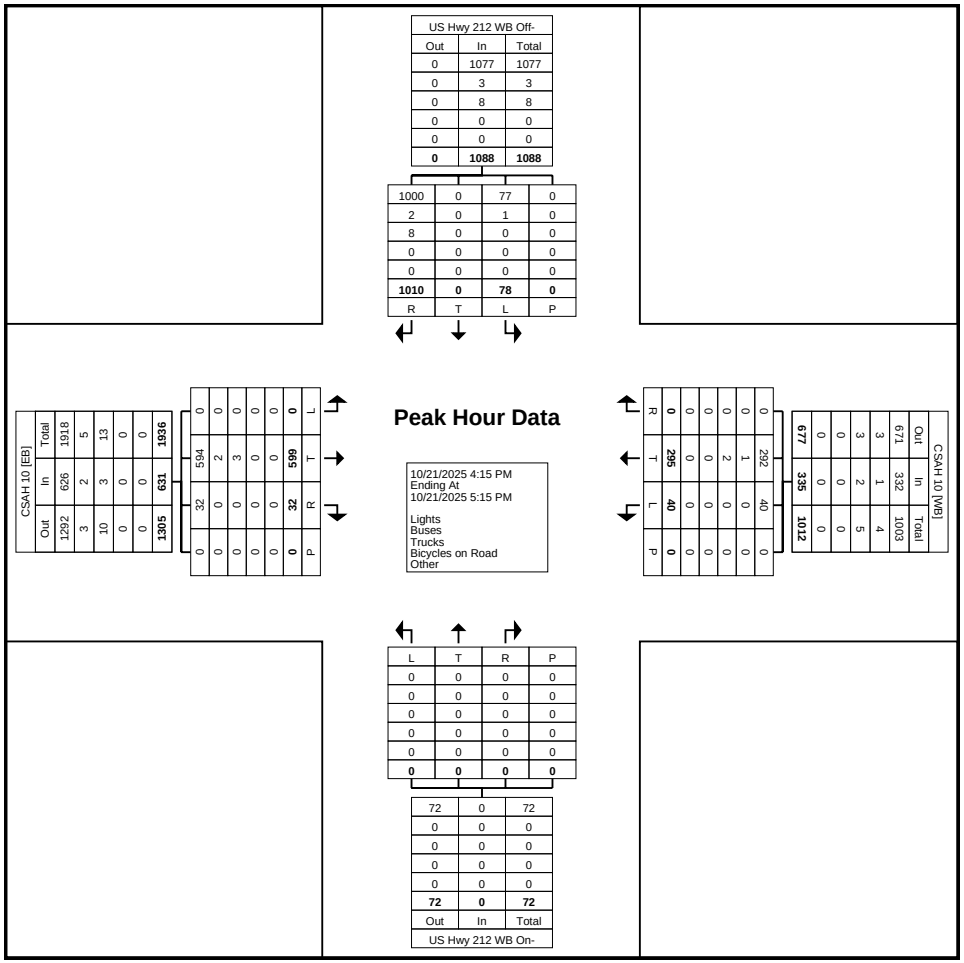
Count Name: CSAH 10 (Engler Boulevard) & US Highway 212 Westbound Ramps
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (4:15 PM)

Kimley-Horn
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 10 (Engler Boulevard) & Chaska Creek Boulevard
Site Code:
Start Date: 10/21/2025


# Turning Movement Data

| Start Time | CSAH 10 Eastbound | | | | | CSAH 10 Westbound | | | | | Chaska Creek Blvd Northbound | | | | | Chaska Creek 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 | 2 | 225 | 4 | 0 | 231 | 9 | 80 | 15 | 0 | 104 | 0 | 0 | 3 | 0 | 3 | 58 | 3 | 2 | 0 | 63 | 401 |
| 7:15 AM | 2 | 266 | 3 | 1 | 271 | 13 | 85 | 26 | 0 | 124 | 0 | 3 | 4 | 0 | 7 | 76 | 3 | 6 | 0 | 85 | 487 |
| 7:30 AM | 3 | 261 | 5 | 0 | 269 | 26 | 101 | 33 | 0 | 160 | 0 | 1 | 6 | 0 | 7 | 83 | 5 | 6 | 0 | 94 | 530 |
| 7:45 AM | 3 | 235 | 7 | 0 | 245 | 19 | 103 | 19 | 0 | 141 | 1 | 0 | 3 | 0 | 4 | 64 | 3 | 4 | 0 | 71 | 461 |
| Hourly Total | 10 | 987 | 19 | 1 | 1016 | 67 | 369 | 93 | 0 | 529 | 1 | 4 | 16 | 0 | 21 | 281 | 14 | 18 | 0 | 313 | 1879 |
| 8:00 AM | 4 | 230 | 5 | 0 | 239 | 13 | 88 | 25 | 0 | 126 | 1 | 1 | 9 | 0 | 11 | 63 | 4 | 2 | 0 | 69 | 445 |
| 8:15 AM | 1 | 211 | 3 | 0 | 215 | 22 | 88 | 27 | 0 | 137 | 0 | 1 | 5 | 0 | 6 | 50 | 6 | 3 | 0 | 59 | 417 |
| 8:30 AM | 6 | 196 | 2 | 0 | 204 | 9 | 111 | 19 | 0 | 139 | 0 | 6 | 7 | 0 | 13 | 44 | 2 | 3 | 0 | 49 | 405 |
| 8:45 AM | 1 | 145 | 11 | 0 | 157 | 11 | 86 | 11 | 0 | 108 | 4 | 3 | 11 | 0 | 18 | 38 | 2 | 3 | 0 | 43 | 326 |
| Hourly Total | 12 | 782 | 21 | 0 | 815 | 55 | 373 | 82 | 0 | 510 | 5 | 11 | 32 | 0 | 48 | 195 | 14 | 11 | 0 | 220 | 1593 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4:00 PM | 6 | 112 | 4 | 0 | 122 | 13 | 225 | 45 | 0 | 283 | 6 | 5 | 20 | 0 | 31 | 34 | 0 | 5 | 0 | 39 | 475 |
| 4:15 PM | 5 | 101 | 0 | 0 | 106 | 9 | 245 | 70 | 0 | 324 | 3 | 2 | 19 | 0 | 24 | 30 | 6 | 4 | 0 | 40 | 494 |
| 4:30 PM | 6 | 114 | 3 | 0 | 123 | 9 | 268 | 65 | 0 | 342 | 8 | 1 | 21 | 0 | 30 | 33 | 6 | 4 | 0 | 43 | 538 |
| 4:45 PM | 13 | 111 | 0 | 0 | 124 | 10 | 257 | 57 | 0 | 324 | 6 | 3 | 16 | 0 | 25 | 39 | 1 | 2 | 0 | 42 | 515 |
| Hourly Total | 30 | 438 | 7 | 0 | 475 | 41 | 995 | 237 | 0 | 1273 | 23 | 11 | 76 | 0 | 110 | 136 | 13 | 15 | 0 | 164 | 2022 |
| 5:00 PM | 6 | 106 | 3 | 0 | 115 | 8 | 251 | 70 | 0 | 329 | 5 | 7 | 20 | 0 | 32 | 27 | 0 | 3 | 0 | 30 | 506 |
| 5:15 PM | 8 | 111 | 0 | 0 | 119 | 3 | 224 | 75 | 0 | 302 | 3 | 4 | 10 | 0 | 17 | 27 | 4 | 4 | 0 | 35 | 473 |
| 5:30 PM | 3 | 107 | 5 | 0 | 115 | 9 | 207 | 68 | 0 | 284 | 1 | 2 | 9 | 0 | 12 | 35 | 0 | 3 | 0 | 38 | 449 |
| 5:45 PM | 6 | 116 | 2 | 0 | 124 | 11 | 195 | 49 | 0 | 255 | 2 | 1 | 6 | 0 | 9 | 16 | 4 | 5 | 0 | 25 | 413 |
| Hourly Total | 23 | 440 | 10 | 0 | 473 | 31 | 877 | 262 | 0 | 1170 | 11 | 14 | 45 | 0 | 70 | 105 | 8 | 15 | 0 | 128 | 1841 |
| Grand Total | 75 | 2647 | 57 | 1 | 2779 | 194 | 2614 | 674 | 0 | 3482 | 40 | 40 | 169 | 0 | 249 | 717 | 49 | 59 | 0 | 825 | 7335 |
| Approach % | 2.7 | 95.3 | 2.1 | - | - | 5.6 | 75.1 | 19.4 | - | - | 16.1 | 16.1 | 67.9 | - | - | 86.9 | 5.9 | 7.2 | - | - | - |
| Total % | 1.0 | 36.1 | 0.8 | - | 37.9 | 2.6 | 35.6 | 9.2 | - | 47.5 | 0.5 | 0.5 | 2.3 | - | 3.4 | 9.8 | 0.7 | 0.8 | - | 11.2 | - |
| Lights | 72 | 2590 | 57 | - | 2719 | 191 | 2551 | 654 | - | 3396 | 40 | 39 | 166 | - | 245 | 701 | 48 | 57 | - | 806 | 7166 |
| % Lights | 96.0 | 97.8 | 100.0 | - | 97.8 | 98.5 | 97.6 | 97.0 | - | 97.5 | 100.0 | 97.5 | 98.2 | - | 98.4 | 97.8 | 98.0 | 96.6 | - | 97.7 | 97.7 |
| Buses | 2 | 9 | 0 | - | 11 | 0 | 14 | 15 | - | 29 | 0 | 1 | 0 | - | 1 | 15 | 1 | 1 | - | 17 | 58 |
| % Buses | 2.7 | 0.3 | 0.0 | - | 0.4 | 0.0 | 0.5 | 2.2 | - | 0.8 | 0.0 | 2.5 | 0.0 | - | 0.4 | 2.1 | 2.0 | 1.7 | - | 2.1 | 0.8 |
| Trucks | 1 | 48 | 0 | - | 49 | 3 | 49 | 5 | - | 57 | 0 | 0 | 3 | - | 3 | 1 | 0 | 1 | - | 2 | 111 |
| % Trucks | 1.3 | 1.8 | 0.0 | - | 1.8 | 1.5 | 1.9 | 0.7 | - | 1.6 | 0.0 | 0.0 | 1.8 | - | 1.2 | 0.1 | 0.0 | 1.7 | - | 0.2 | 1.5 |
| 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 |
| Bicycles on Crosswalk | - | - | - | 1 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | 100.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % Pedestrians | - | - | - | 0.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Kimley-Horn
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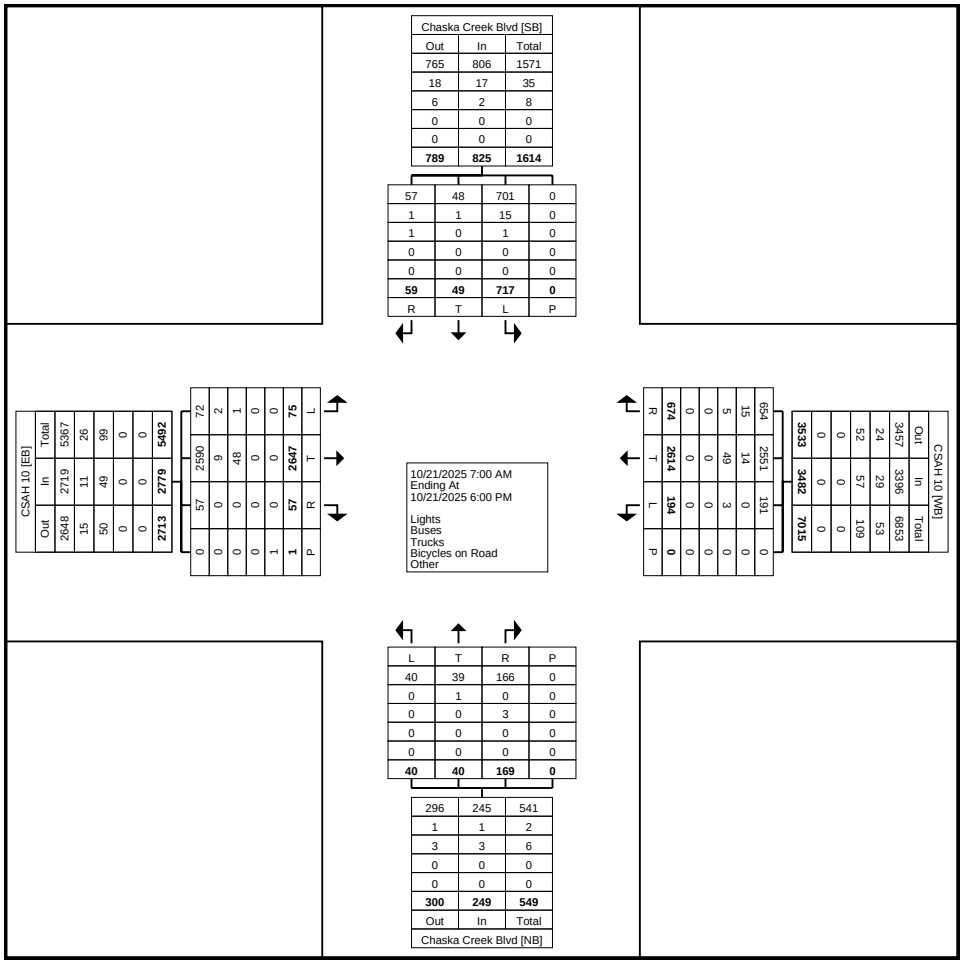
Count Name: CSAH 10 (Engler Boulevard) & Chaska Creek Boulevard
Site Code:
Start Date: 10/21/2025


Turning Movement Data Plot

Kimley-Horn
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 10 (Engler Boulevard) & Chaska Creek Boulevard
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (7:15 AM)

| Start Time | CSAH 10 Eastbound | | | | | CSAH 10 Westbound | | | | | Chaska Creek Blvd Northbound | | | | | Chaska Creek 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 |
| 7:15 AM | 2 | 266 | 3 | 1 | 271 | 13 | 85 | 26 | 0 | 124 | 0 | 3 | 4 | 0 | 7 | 76 | 3 | 6 | 0 | 85 | 487 |
| 7:30 AM | 3 | 261 | 5 | 0 | 269 | 26 | 101 | 33 | 0 | 160 | 0 | 1 | 6 | 0 | 7 | 83 | 5 | 6 | 0 | 94 | 530 |
| 7:45 AM | 3 | 235 | 7 | 0 | 245 | 19 | 103 | 19 | 0 | 141 | 1 | 0 | 3 | 0 | 4 | 64 | 3 | 4 | 0 | 71 | 461 |
| 8:00 AM | 4 | 230 | 5 | 0 | 239 | 13 | 88 | 25 | 0 | 126 | 1 | 1 | 9 | 0 | 11 | 63 | 4 | 2 | 0 | 69 | 445 |
| Total | 12 | 992 | 20 | 1 | 1024 | 71 | 377 | 103 | 0 | 551 | 2 | 5 | 22 | 0 | 29 | 286 | 15 | 18 | 0 | 319 | 1923 |
| Approach % | 1.2 | 96.9 | 2.0 | - | - | 12.9 | 68.4 | 18.7 | - | - | 6.9 | 17.2 | 75.9 | - | - | 89.7 | 4.7 | 5.6 | - | - | - |
| Total % | 0.6 | 51.6 | 1.0 | - | 53.3 | 3.7 | 19.6 | 5.4 | - | 28.7 | 0.1 | 0.3 | 1.1 | - | 1.5 | 14.9 | 0.8 | 0.9 | - | 16.6 | - |
| PHF | 0.750 | 0.932 | 0.714 | - | 0.945 | 0.683 | 0.915 | 0.780 | - | 0.861 | 0.500 | 0.417 | 0.611 | - | 0.659 | 0.861 | 0.750 | 0.750 | - | 0.848 | 0.907 |
| Lights | 10 | 974 | 20 | - | 1004 | 70 | 349 | 94 | - | 513 | 2 | 4 | 21 | - | 27 | 278 | 15 | 17 | - | 310 | 1854 |
| % Lights | 83.3 | 98.2 | 100.0 | - | 98.0 | 98.6 | 92.6 | 91.3 | - | 93.1 | 100.0 | 80.0 | 95.5 | - | 93.1 | 97.2 | 100.0 | 94.4 | - | 97.2 | 96.4 |
| Buses | 2 | 3 | 0 | - | 5 | 0 | 4 | 9 | - | 13 | 0 | 1 | 0 | - | 1 | 7 | 0 | 1 | - | 8 | 27 |
| % Buses | 16.7 | 0.3 | 0.0 | - | 0.5 | 0.0 | 1.1 | 8.7 | - | 2.4 | 0.0 | 20.0 | 0.0 | - | 3.4 | 2.4 | 0.0 | 5.6 | - | 2.5 | 1.4 |
| Trucks | 0 | 15 | 0 | - | 15 | 1 | 24 | 0 | - | 25 | 0 | 0 | 1 | - | 1 | 1 | 0 | 0 | - | 1 | 42 |
| % Trucks | 0.0 | 1.5 | 0.0 | - | 1.5 | 1.4 | 6.4 | 0.0 | - | 4.5 | 0.0 | 0.0 | 4.5 | - | 3.4 | 0.3 | 0.0 | 0.0 | - | 0.3 | 2.2 |
| 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 |
| Bicycles on Crosswalk | - | - | - | 1 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | 100.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | 0.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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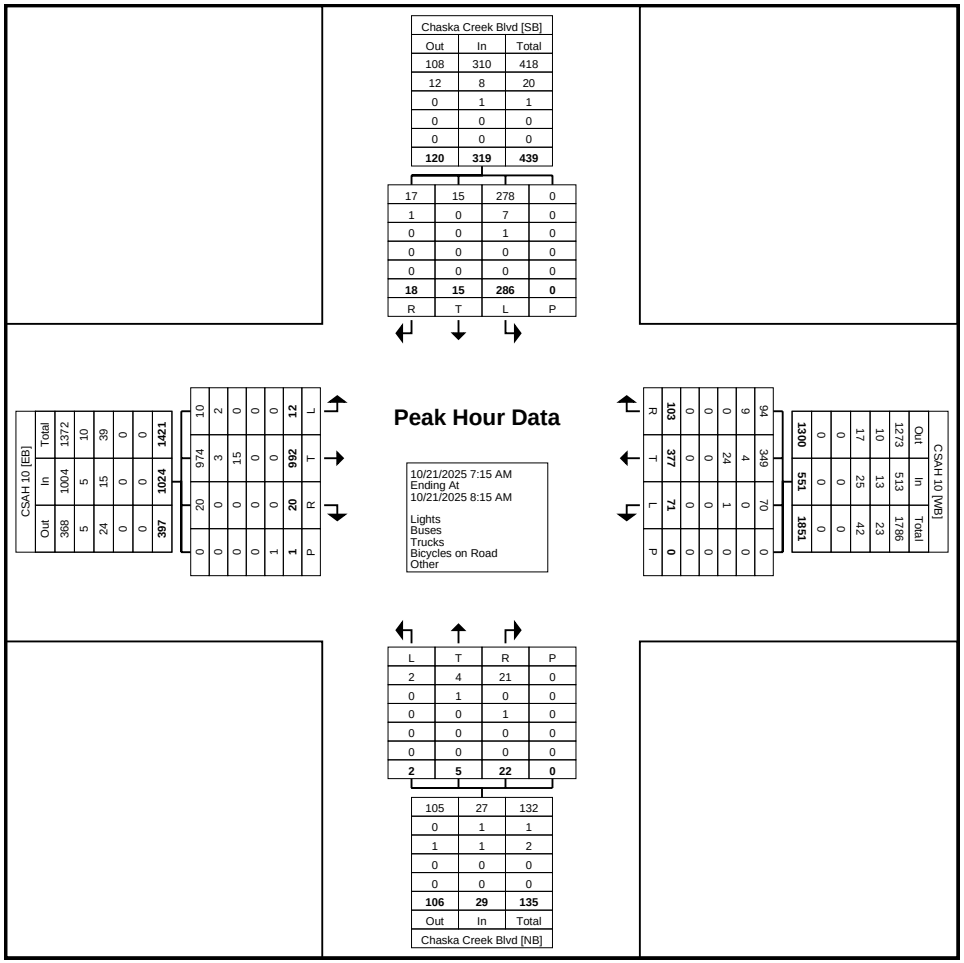
Count Name: CSAH 10 (Engler Boulevard) & Chaska Creek Boulevard
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (7:15 AM)

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(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 10 (Engler Boulevard) & Chaska Creek Boulevard
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (4:15 PM)

| Start Time | CSAH 10 Eastbound | | | | | CSAH 10 Westbound | | | | | Chaska Creek Blvd Northbound | | | | | Chaska Creek 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 |
| 4:15 PM | 5 | 101 | 0 | 0 | 106 | 9 | 245 | 70 | 0 | 324 | 3 | 2 | 19 | 0 | 24 | 30 | 6 | 4 | 0 | 40 | 494 |
| 4:30 PM | 6 | 114 | 3 | 0 | 123 | 9 | 268 | 65 | 0 | 342 | 8 | 1 | 21 | 0 | 30 | 33 | 6 | 4 | 0 | 43 | 538 |
| 4:45 PM | 13 | 111 | 0 | 0 | 124 | 10 | 257 | 57 | 0 | 324 | 6 | 3 | 16 | 0 | 25 | 39 | 1 | 2 | 0 | 42 | 515 |
| 5:00 PM | 6 | 106 | 3 | 0 | 115 | 8 | 251 | 70 | 0 | 329 | 5 | 7 | 20 | 0 | 32 | 27 | 0 | 3 | 0 | 30 | 506 |
| Total | 30 | 432 | 6 | 0 | 468 | 36 | 1021 | 262 | 0 | 1319 | 22 | 13 | 76 | 0 | 111 | 129 | 13 | 13 | 0 | 155 | 2053 |
| Approach % | 6.4 | 92.3 | 1.3 | - | - | 2.7 | 77.4 | 19.9 | - | - | 19.8 | 11.7 | 68.5 | - | - | 83.2 | 8.4 | 8.4 | - | - | - |
| Total % | 1.5 | 21.0 | 0.3 | - | 22.8 | 1.8 | 49.7 | 12.8 | - | 64.2 | 1.1 | 0.6 | 3.7 | - | 5.4 | 6.3 | 0.6 | 0.6 | - | 7.5 | - |
| PHF | 0.577 | 0.947 | 0.500 | - | 0.944 | 0.900 | 0.952 | 0.936 | - | 0.964 | 0.688 | 0.464 | 0.905 | - | 0.867 | 0.827 | 0.542 | 0.813 | - | 0.901 | 0.954 |
| Lights | 29 | 426 | 6 | - | 461 | 36 | 1013 | 258 | - | 1307 | 22 | 13 | 76 | - | 111 | 126 | 12 | 12 | - | 150 | 2029 |
| % Lights | 96.7 | 98.6 | 100.0 | - | 98.5 | 100.0 | 99.2 | 98.5 | - | 99.1 | 100.0 | 100.0 | 100.0 | - | 100.0 | 97.7 | 92.3 | 92.3 | - | 96.8 | 98.8 |
| Buses | 0 | 0 | 0 | - | 0 | 0 | 1 | 2 | - | 3 | 0 | 0 | 0 | - | 0 | 3 | 1 | 0 | - | 4 | 7 |
| % Buses | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.1 | 0.8 | - | 0.2 | 0.0 | 0.0 | 0.0 | - | 0.0 | 2.3 | 7.7 | 0.0 | - | 2.6 | 0.3 |
| Trucks | 1 | 6 | 0 | - | 7 | 0 | 7 | 2 | - | 9 | 0 | 0 | 0 | - | 0 | 0 | 0 | 1 | - | 1 | 17 |
| % Trucks | 3.3 | 1.4 | 0.0 | - | 1.5 | 0.0 | 0.7 | 0.8 | - | 0.7 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 7.7 | - | 0.6 | 0.8 |
| 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 | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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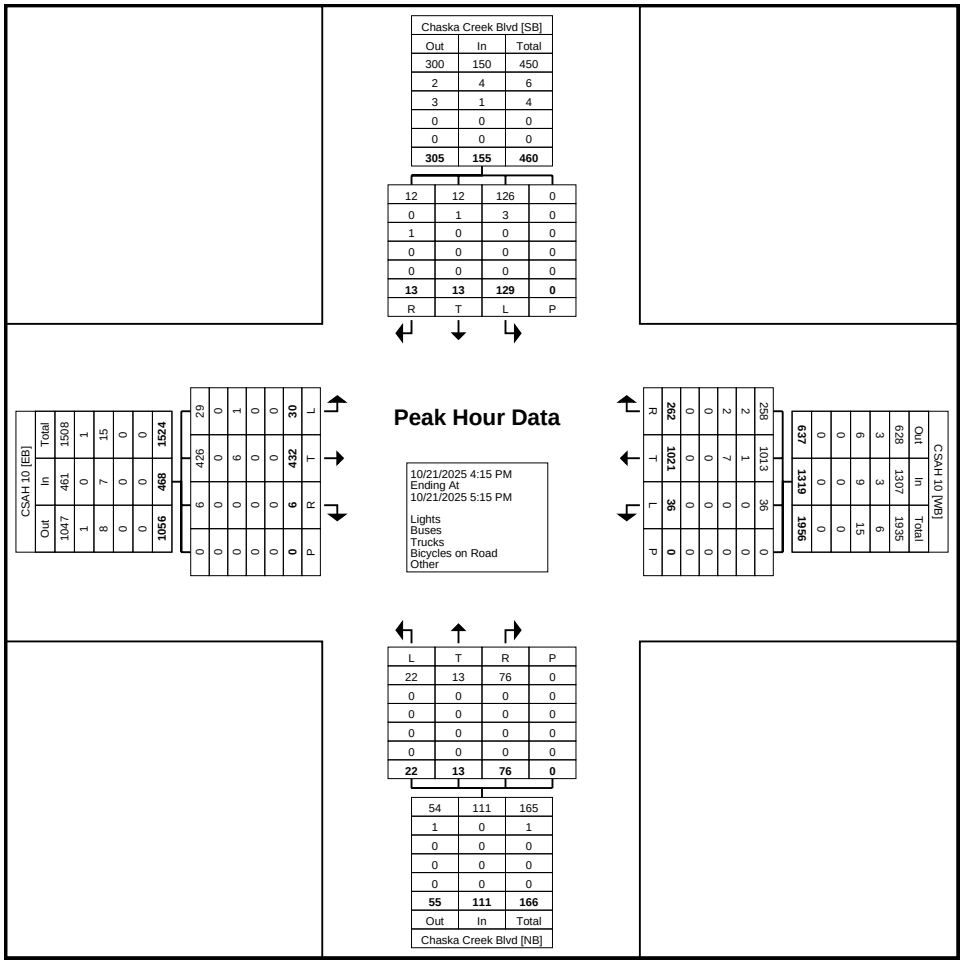
Count Name: CSAH 10 (Engler Boulevard) & Chaska Creek Boulevard
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (4:15 PM)

Kimley-Horn
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Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 10 (Engler Boulevard) & CSAH 11 (Jonathan Carver Parkway)
Site Code:
Start Date: 10/21/2025


# Turning Movement Data

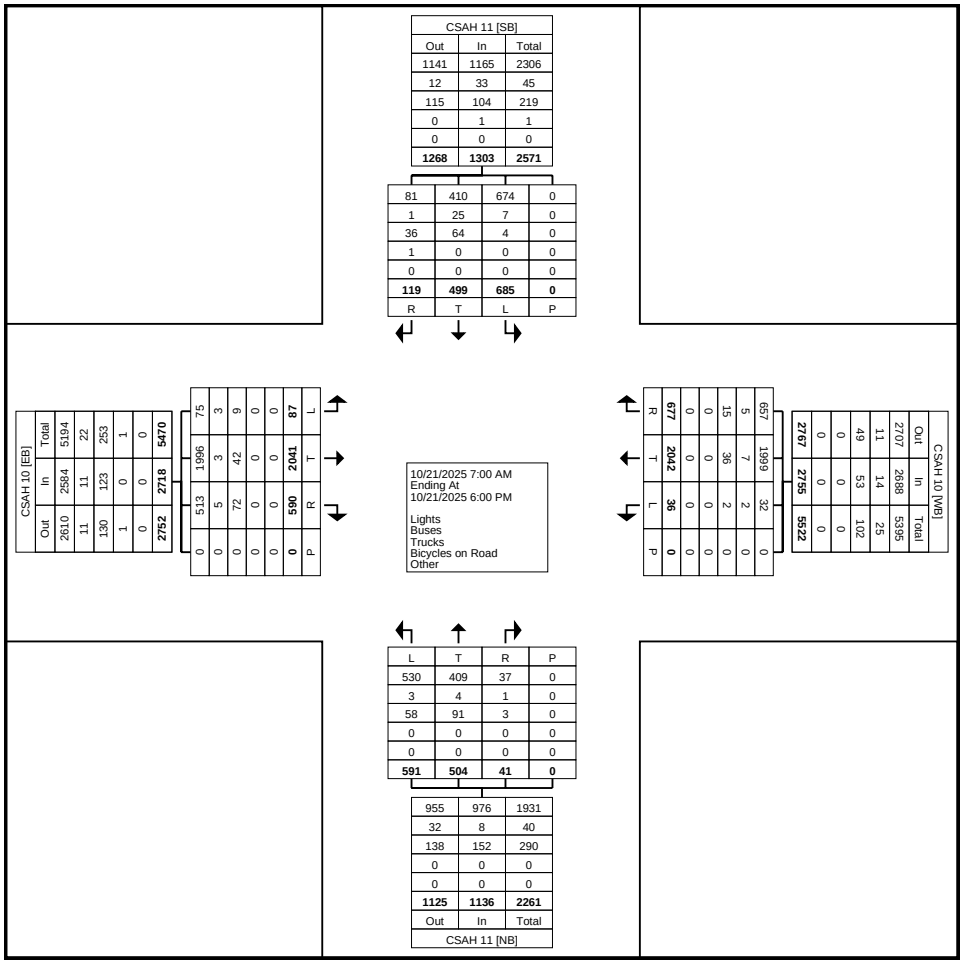
| Start Time | CSAH 10 Eastbound | | | | | CSAH 10 Westbound | | | | | CSAH 11 Northbound | | | | | CSAH 11 Southbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Int. Total |
| 7:00 AM | 5 | 165 | 21 | 0 | 191 | 0 | 71 | 10 | 0 | 81 | 33 | 22 | 0 | 0 | 55 | 57 | 26 | 5 | 0 | 88 | 415 |
| 7:15 AM | 5 | 229 | 54 | 0 | 288 | 0 | 84 | 11 | 0 | 95 | 31 | 29 | 4 | 0 | 64 | 57 | 18 | 4 | 0 | 79 | 526 |
| 7:30 AM | 6 | 189 | 42 | 0 | 237 | 3 | 79 | 20 | 0 | 102 | 45 | 34 | 2 | 0 | 81 | 67 | 28 | 2 | 0 | 97 | 517 |
| 7:45 AM | 7 | 180 | 52 | 0 | 239 | 2 | 82 | 35 | 0 | 119 | 24 | 39 | 4 | 0 | 67 | 66 | 32 | 12 | 0 | 110 | 535 |
| Hourly Total | 23 | 763 | 169 | 0 | 955 | 5 | 316 | 76 | 0 | 397 | 133 | 124 | 10 | 0 | 267 | 247 | 104 | 23 | 0 | 374 | 1993 |
| 8:00 AM | 5 | 171 | 46 | 0 | 222 | 2 | 67 | 21 | 0 | 90 | 15 | 24 | 3 | 0 | 42 | 60 | 25 | 18 | 0 | 103 | 457 |
| 8:15 AM | 6 | 164 | 31 | 0 | 201 | 3 | 57 | 30 | 0 | 90 | 26 | 20 | 1 | 0 | 47 | 57 | 30 | 16 | 0 | 103 | 441 |
| 8:30 AM | 4 | 141 | 36 | 0 | 181 | 2 | 76 | 30 | 0 | 108 | 32 | 19 | 3 | 0 | 54 | 45 | 23 | 8 | 0 | 76 | 419 |
| 8:45 AM | 10 | 104 | 30 | 0 | 144 | 2 | 68 | 27 | 0 | 97 | 16 | 30 | 2 | 0 | 48 | 47 | 26 | 8 | 0 | 81 | 370 |
| Hourly Total | 25 | 580 | 143 | 0 | 748 | 9 | 268 | 108 | 0 | 385 | 89 | 93 | 9 | 0 | 191 | 209 | 104 | 50 | 0 | 363 | 1687 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4:00 PM | 2 | 88 | 41 | 0 | 131 | 3 | 173 | 49 | 0 | 225 | 44 | 38 | 3 | 0 | 85 | 29 | 49 | 6 | 0 | 84 | 525 |
| 4:15 PM | 4 | 79 | 45 | 0 | 128 | 1 | 188 | 69 | 0 | 258 | 49 | 43 | 2 | 0 | 94 | 28 | 37 | 1 | 0 | 66 | 546 |
| 4:30 PM | 3 | 89 | 35 | 0 | 127 | 2 | 208 | 67 | 0 | 277 | 55 | 39 | 4 | 0 | 98 | 34 | 50 | 8 | 0 | 92 | 594 |
| 4:45 PM | 5 | 95 | 42 | 0 | 142 | 2 | 213 | 46 | 0 | 261 | 48 | 47 | 1 | 0 | 96 | 27 | 35 | 5 | 0 | 67 | 566 |
| Hourly Total | 14 | 351 | 163 | 0 | 528 | 8 | 782 | 231 | 0 | 1021 | 196 | 167 | 10 | 0 | 373 | 118 | 171 | 20 | 0 | 309 | 2231 |
| 5:00 PM | 6 | 84 | 35 | 0 | 125 | 2 | 189 | 69 | 0 | 260 | 52 | 38 | 2 | 0 | 92 | 28 | 32 | 7 | 0 | 67 | 544 |
| 5:15 PM | 5 | 86 | 31 | 0 | 122 | 3 | 183 | 74 | 0 | 260 | 54 | 27 | 2 | 0 | 83 | 25 | 36 | 10 | 0 | 71 | 536 |
| 5:30 PM | 9 | 80 | 24 | 0 | 113 | 2 | 151 | 54 | 0 | 207 | 37 | 27 | 5 | 0 | 69 | 33 | 32 | 7 | 0 | 72 | 461 |
| 5:45 PM | 5 | 97 | 25 | 0 | 127 | 7 | 153 | 65 | 0 | 225 | 30 | 28 | 3 | 0 | 61 | 25 | 20 | 2 | 0 | 47 | 460 |
| Hourly Total | 25 | 347 | 115 | 0 | 487 | 14 | 676 | 262 | 0 | 952 | 173 | 120 | 12 | 0 | 305 | 111 | 120 | 26 | 0 | 257 | 2001 |
| Grand Total | 87 | 2041 | 590 | 0 | 2718 | 36 | 2042 | 677 | 0 | 2755 | 591 | 504 | 41 | 0 | 1136 | 685 | 499 | 119 | 0 | 1303 | 7912 |
| Approach % | 3.2 | 75.1 | 21.7 | - | - | 1.3 | 74.1 | 24.6 | - | - | 52.0 | 44.4 | 3.6 | - | - | 52.6 | 38.3 | 9.1 | - | - | - |
| Total % | 1.1 | 25.8 | 7.5 | - | 34.4 | 0.5 | 25.8 | 8.6 | - | 34.8 | 7.5 | 6.4 | 0.5 | - | 14.4 | 8.7 | 6.3 | 1.5 | - | 16.5 | - |
| Lights | 75 | 1996 | 513 | - | 2584 | 32 | 1999 | 657 | - | 2688 | 530 | 409 | 37 | - | 976 | 674 | 410 | 81 | - | 1165 | 7413 |
| % Lights | 86.2 | 97.8 | 86.9 | - | 95.1 | 88.9 | 97.9 | 97.0 | - | 97.6 | 89.7 | 81.2 | 90.2 | - | 85.9 | 98.4 | 82.2 | 68.1 | - | 89.4 | 93.7 |
| Buses | 3 | 3 | 5 | - | 11 | 2 | 7 | 5 | - | 14 | 3 | 4 | 1 | - | 8 | 7 | 25 | 1 | - | 33 | 66 |
| % Buses | 3.4 | 0.1 | 0.8 | - | 0.4 | 5.6 | 0.3 | 0.7 | - | 0.5 | 0.5 | 0.8 | 2.4 | - | 0.7 | 1.0 | 5.0 | 0.8 | - | 2.5 | 0.8 |
| Trucks | 9 | 42 | 72 | - | 123 | 2 | 36 | 15 | - | 53 | 58 | 91 | 3 | - | 152 | 4 | 64 | 36 | - | 104 | 432 |
| % Trucks | 10.3 | 2.1 | 12.2 | - | 4.5 | 5.6 | 1.8 | 2.2 | - | 1.9 | 9.8 | 18.1 | 7.3 | - | 13.4 | 0.6 | 12.8 | 30.3 | - | 8.0 | 5.5 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 1 | - | 1 | 1 |
| % 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 | 0.8 | - | 0.1 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Kimley-Horn
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 10 (Engler Boulevard) & CSAH 11 (Jonathan Carver Parkway)
Site Code:
Start Date: 10/21/2025


Turning Movement Data Plot

Kimley-Horn
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 10 (Engler Boulevard) & CSAH 11 (Jonathan Carver Parkway)
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (7:15 AM)

| Start Time | CSAH 10 Eastbound | | | | | CSAH 10 Westbound | | | | | CSAH 11 Northbound | | | | | CSAH 11 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 |
| 7:15 AM | 5 | 229 | 54 | 0 | 288 | 0 | 84 | 11 | 0 | 95 | 31 | 29 | 4 | 0 | 64 | 57 | 18 | 4 | 0 | 79 | 526 |
| 7:30 AM | 6 | 189 | 42 | 0 | 237 | 3 | 79 | 20 | 0 | 102 | 45 | 34 | 2 | 0 | 81 | 67 | 28 | 2 | 0 | 97 | 517 |
| 7:45 AM | 7 | 180 | 52 | 0 | 239 | 2 | 82 | 35 | 0 | 119 | 24 | 39 | 4 | 0 | 67 | 66 | 32 | 12 | 0 | 110 | 535 |
| 8:00 AM | 5 | 171 | 46 | 0 | 222 | 2 | 67 | 21 | 0 | 90 | 15 | 24 | 3 | 0 | 42 | 60 | 25 | 18 | 0 | 103 | 457 |
| Total | 23 | 769 | 194 | 0 | 986 | 7 | 312 | 87 | 0 | 406 | 115 | 126 | 13 | 0 | 254 | 250 | 103 | 36 | 0 | 389 | 2035 |
| Approach % | 2.3 | 78.0 | 19.7 | - | - | 1.7 | 76.8 | 21.4 | - | - | 45.3 | 49.6 | 5.1 | - | - | 64.3 | 26.5 | 9.3 | - | - | - |
| Total % | 1.1 | 37.8 | 9.5 | - | 48.5 | 0.3 | 15.3 | 4.3 | - | 20.0 | 5.7 | 6.2 | 0.6 | - | 12.5 | 12.3 | 5.1 | 1.8 | - | 19.1 | - |
| PHF | 0.821 | 0.840 | 0.898 | - | 0.856 | 0.583 | 0.929 | 0.621 | - | 0.853 | 0.639 | 0.808 | 0.813 | - | 0.784 | 0.933 | 0.805 | 0.500 | - | 0.884 | 0.951 |
| Lights | 16 | 756 | 169 | - | 941 | 7 | 297 | 74 | - | 378 | 97 | 85 | 11 | - | 193 | 247 | 86 | 21 | - | 354 | 1866 |
| % Lights | 69.6 | 98.3 | 87.1 | - | 95.4 | 100.0 | 95.2 | 85.1 | - | 93.1 | 84.3 | 67.5 | 84.6 | - | 76.0 | 98.8 | 83.5 | 58.3 | - | 91.0 | 91.7 |
| Buses | 3 | 2 | 0 | - | 5 | 0 | 3 | 2 | - | 5 | 0 | 1 | 1 | - | 2 | 3 | 1 | 0 | - | 4 | 16 |
| % Buses | 13.0 | 0.3 | 0.0 | - | 0.5 | 0.0 | 1.0 | 2.3 | - | 1.2 | 0.0 | 0.8 | 7.7 | - | 0.8 | 1.2 | 1.0 | 0.0 | - | 1.0 | 0.8 |
| Trucks | 4 | 11 | 25 | - | 40 | 0 | 12 | 11 | - | 23 | 18 | 40 | 1 | - | 59 | 0 | 16 | 15 | - | 31 | 153 |
| % Trucks | 17.4 | 1.4 | 12.9 | - | 4.1 | 0.0 | 3.8 | 12.6 | - | 5.7 | 15.7 | 31.7 | 7.7 | - | 23.2 | 0.0 | 15.5 | 41.7 | - | 8.0 | 7.5 |
| 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 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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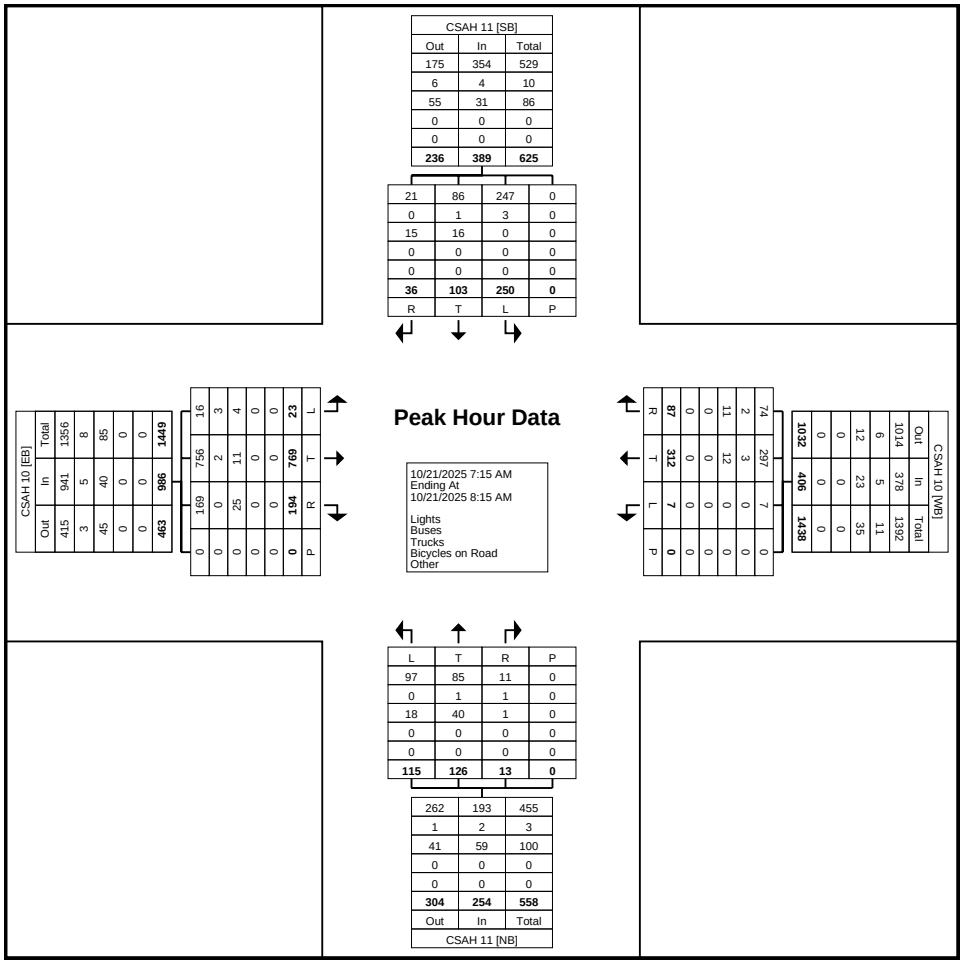
Count Name: CSAH 10 (Engler Boulevard) & CSAH 11 (Jonathan Carver Parkway)
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (7:15 AM)

Kimley-Horn
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(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 10 (Engler Boulevard) & CSAH 11 (Jonathan Carver Parkway)
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (4:15 PM)

| Start Time | CSAH 10 Eastbound | | | | | CSAH 10 Westbound | | | | | CSAH 11 Northbound | | | | | CSAH 11 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 | 4 | 79 | 45 | 0 | 128 | 1 | 188 | 69 | 0 | 258 | 49 | 43 | 2 | 0 | 94 | 28 | 37 | 1 | 0 | 66 | 546 |
| 4:30 PM | 3 | 89 | 35 | 0 | 127 | 2 | 208 | 67 | 0 | 277 | 55 | 39 | 4 | 0 | 98 | 34 | 50 | 8 | 0 | 92 | 594 |
| 4:45 PM | 5 | 95 | 42 | 0 | 142 | 2 | 213 | 46 | 0 | 261 | 48 | 47 | 1 | 0 | 96 | 27 | 35 | 5 | 0 | 67 | 566 |
| 5:00 PM | 6 | 84 | 35 | 0 | 125 | 2 | 189 | 69 | 0 | 260 | 52 | 38 | 2 | 0 | 92 | 28 | 32 | 7 | 0 | 67 | 544 |
| Total | 18 | 347 | 157 | 0 | 522 | 7 | 798 | 251 | 0 | 1056 | 204 | 167 | 9 | 0 | 380 | 117 | 154 | 21 | 0 | 292 | 2250 |
| Approach % | 3.4 | 66.5 | 30.1 | - | - | 0.7 | 75.6 | 23.8 | - | - | 53.7 | 43.9 | 2.4 | - | - | 40.1 | 52.7 | 7.2 | - | - | - |
| Total % | 0.8 | 15.4 | 7.0 | - | 23.2 | 0.3 | 35.5 | 11.2 | - | 46.9 | 9.1 | 7.4 | 0.4 | - | 16.9 | 5.2 | 6.8 | 0.9 | - | 13.0 | - |
| PHF | 0.750 | 0.913 | 0.872 | - | 0.919 | 0.875 | 0.937 | 0.909 | - | 0.953 | 0.927 | 0.888 | 0.563 | - | 0.969 | 0.860 | 0.770 | 0.656 | - | 0.793 | 0.947 |
| Lights | 18 | 342 | 138 | - | 498 | 7 | 787 | 251 | - | 1045 | 187 | 152 | 9 | - | 348 | 116 | 119 | 17 | - | 252 | 2143 |
| % Lights | 100.0 | 98.6 | 87.9 | - | 95.4 | 100.0 | 98.6 | 100.0 | - | 99.0 | 91.7 | 91.0 | 100.0 | - | 91.6 | 99.1 | 77.3 | 81.0 | - | 86.3 | 95.2 |
| Buses | 0 | 0 | 3 | - | 3 | 0 | 2 | 0 | - | 2 | 3 | 0 | 0 | - | 3 | 0 | 22 | 0 | - | 22 | 30 |
| % Buses | 0.0 | 0.0 | 1.9 | - | 0.6 | 0.0 | 0.3 | 0.0 | - | 0.2 | 1.5 | 0.0 | 0.0 | - | 0.8 | 0.0 | 14.3 | 0.0 | - | 7.5 | 1.3 |
| Trucks | 0 | 5 | 16 | - | 21 | 0 | 9 | 0 | - | 9 | 14 | 15 | 0 | - | 29 | 1 | 13 | 3 | - | 17 | 76 |
| % Trucks | 0.0 | 1.4 | 10.2 | - | 4.0 | 0.0 | 1.1 | 0.0 | - | 0.9 | 6.9 | 9.0 | 0.0 | - | 7.6 | 0.9 | 8.4 | 14.3 | - | 5.8 | 3.4 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 1 | - | 1 | 1 |
| % 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 | 4.8 | - | 0.3 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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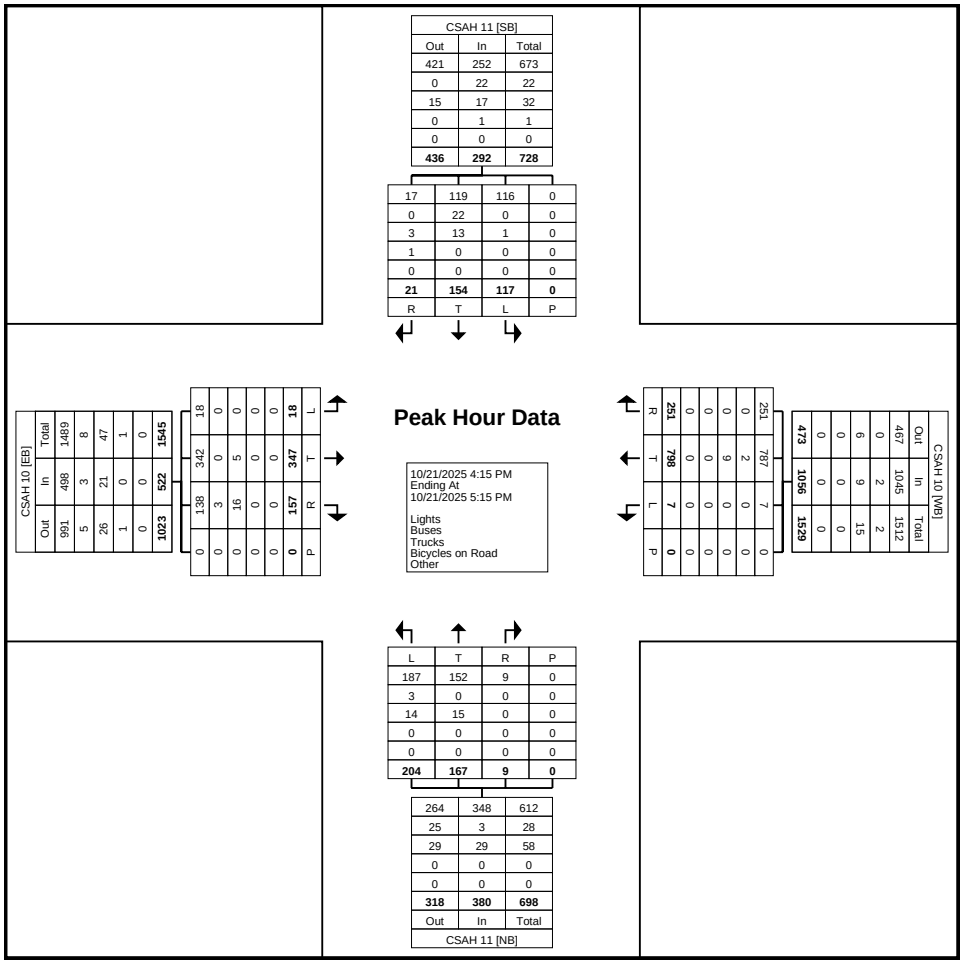
Count Name: CSAH 10 (Engler Boulevard) & CSAH 11 (Jonathan Carver Parkway)
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (4:15 PM)

Kimley-Horn
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Chaska Creek Boulevard & Creek Road
Site Code:
Start Date: 10/21/2025


# Turning Movement Data

| Start Time | Creek Rd Eastbound | | | | Creek Rd Westbound | | | | CHaska Creek Blvd Southbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Peds | App. Total | Thru | Right | Peds | App. Total | Left | Right | Peds | App. Total | Int. Total |
| 7:00 AM | 2 | 3 | 0 | 5 | 3 | 3 | 0 | 6 | 1 | 0 | 0 | 1 | 12 |
| 7:15 AM | 2 | 1 | 0 | 3 | 1 | 3 | 0 | 4 | 2 | 0 | 0 | 2 | 9 |
| 7:30 AM | 0 | 2 | 0 | 2 | 2 | 6 | 0 | 8 | 6 | 0 | 0 | 6 | 16 |
| 7:45 AM | 1 | 1 | 0 | 2 | 0 | 5 | 0 | 5 | 1 | 0 | 0 | 1 | 8 |
| Hourly Total | 5 | 7 | 0 | 12 | 6 | 17 | 0 | 23 | 10 | 0 | 0 | 10 | 45 |
| 8:00 AM | 1 | 2 | 0 | 3 | 1 | 4 | 0 | 5 | 5 | 2 | 0 | 7 | 15 |
| 8:15 AM | 1 | 1 | 0 | 2 | 1 | 7 | 0 | 8 | 6 | 0 | 0 | 6 | 16 |
| 8:30 AM | 0 | 0 | 0 | 0 | 2 | 8 | 0 | 10 | 5 | 0 | 0 | 5 | 15 |
| 8:45 AM | 1 | 0 | 0 | 1 | 0 | 4 | 0 | 4 | 4 | 0 | 0 | 4 | 9 |
| Hourly Total | 3 | 3 | 0 | 6 | 4 | 23 | 0 | 27 | 20 | 2 | 0 | 22 | 55 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4:00 PM | 1 | 1 | 0 | 2 | 2 | 6 | 0 | 8 | 7 | 0 | 1 | 7 | 17 |
| 4:15 PM | 2 | 2 | 0 | 4 | 1 | 7 | 0 | 8 | 12 | 0 | 0 | 12 | 24 |
| 4:30 PM | 0 | 2 | 0 | 2 | 1 | 4 | 0 | 5 | 11 | 1 | 0 | 12 | 19 |
| 4:45 PM | 1 | 4 | 0 | 5 | 0 | 4 | 0 | 4 | 10 | 2 | 0 | 12 | 21 |
| Hourly Total | 4 | 9 | 0 | 13 | 4 | 21 | 0 | 25 | 40 | 3 | 1 | 43 | 81 |
| 5:00 PM | 1 | 1 | 0 | 2 | 1 | 2 | 0 | 3 | 14 | 0 | 0 | 14 | 19 |
| 5:15 PM | 1 | 1 | 0 | 2 | 3 | 4 | 0 | 7 | 3 | 3 | 0 | 6 | 15 |
| 5:30 PM | 0 | 3 | 0 | 3 | 0 | 3 | 0 | 3 | 7 | 1 | 0 | 8 | 14 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 11 | 2 | 0 | 13 | 16 |
| Hourly Total | 2 | 5 | 0 | 7 | 4 | 12 | 0 | 16 | 35 | 6 | 0 | 41 | 64 |
| Grand Total | 14 | 24 | 0 | 38 | 18 | 73 | 0 | 91 | 105 | 11 | 1 | 116 | 245 |
| Approach % | 36.8 | 63.2 | - | - | 19.8 | 80.2 | - | - | 90.5 | 9.5 | - | - | - |
| Total % | 5.7 | 9.8 | - | 15.5 | 7.3 | 29.8 | - | 37.1 | 42.9 | 4.5 | - | 47.3 | - |
| Lights | 14 | 22 | - | 36 | 17 | 72 | - | 89 | 104 | 11 | - | 115 | 240 |
| % Lights | 100.0 | 91.7 | - | 94.7 | 94.4 | 98.6 | - | 97.8 | 99.0 | 100.0 | - | 99.1 | 98.0 |
| Buses | 0 | 1 | - | 1 | 0 | 1 | - | 1 | 1 | 0 | - | 1 | 3 |
| % Buses | 0.0 | 4.2 | - | 2.6 | 0.0 | 1.4 | - | 1.1 | 1.0 | 0.0 | - | 0.9 | 1.2 |
| Trucks | 0 | 1 | - | 1 | 1 | 0 | - | 1 | 0 | 0 | - | 0 | 2 |
| % Trucks | 0.0 | 4.2 | - | 2.6 | 5.6 | 0.0 | - | 1.1 | 0.0 | 0.0 | - | 0.0 | 0.8 |
| 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 |
| Bicycles on Crosswalk | - | - | 0 | - | - | - | 0 | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | 0 | - | - | - | 0 | - | - | - | 1 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - |

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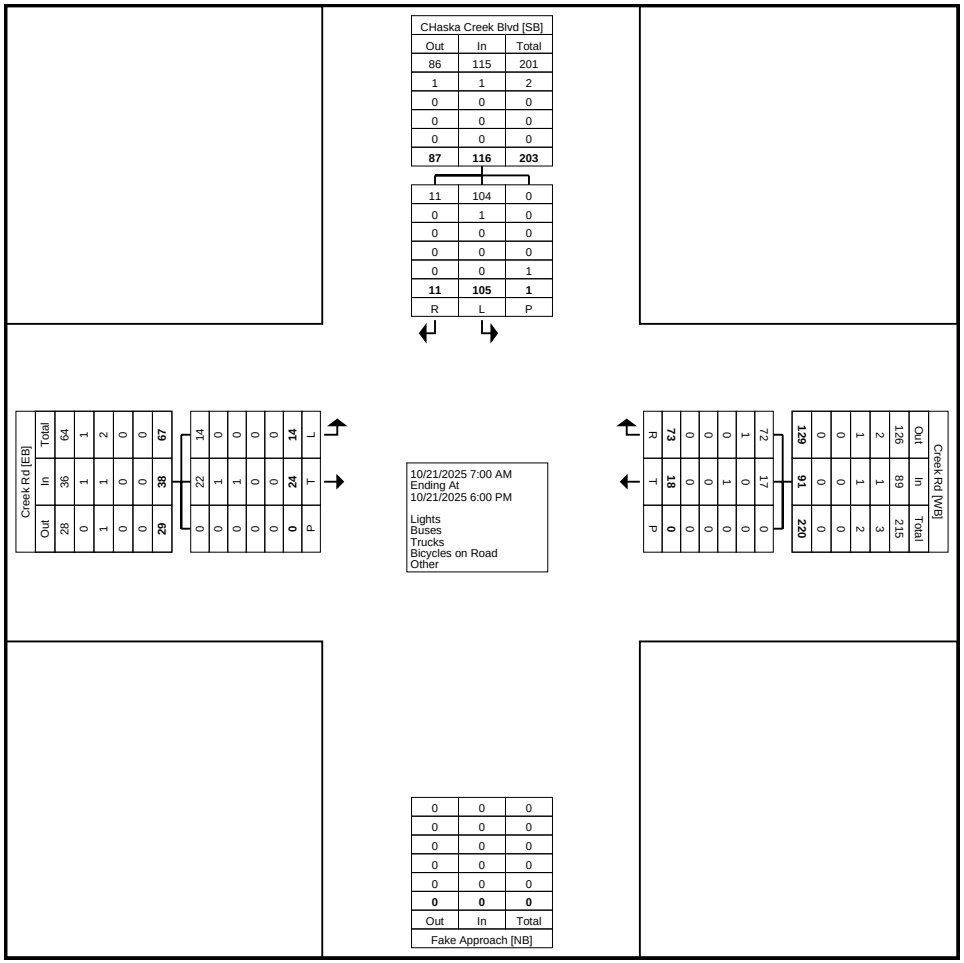
Start Date: 10/21/2025


Turning Movement Data Plot

Kimley-Horn
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Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Chaska Creek Boulevard & Creek Road
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (7:30 AM)

| Start Time | Creek Rd Eastbound | | | | Creek Rd Westbound | | | | CHaska Creek Blvd Southbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Peds | App. Total | Thru | Right | Peds | App. Total | Left | Right | Peds | App. Total | Int. Total |
| 7:30 AM | 0 | 2 | 0 | 2 | 2 | 6 | 0 | 8 | 6 | 0 | 0 | 6 | 16 |
| 7:45 AM | 1 | 1 | 0 | 2 | 0 | 5 | 0 | 5 | 1 | 0 | 0 | 1 | 8 |
| 8:00 AM | 1 | 2 | 0 | 3 | 1 | 4 | 0 | 5 | 5 | 2 | 0 | 7 | 15 |
| 8:15 AM | 1 | 1 | 0 | 2 | 1 | 7 | 0 | 8 | 6 | 0 | 0 | 6 | 16 |
| Total | 3 | 6 | 0 | 9 | 4 | 22 | 0 | 26 | 18 | 2 | 0 | 20 | 55 |
| Approach % | 33.3 | 66.7 | - | - | 15.4 | 84.6 | - | - | 90.0 | 10.0 | - | - | - |
| Total % | 5.5 | 10.9 | - | 16.4 | 7.3 | 40.0 | - | 47.3 | 32.7 | 3.6 | - | 36.4 | - |
| PHF | 0.750 | 0.750 | - | 0.750 | 0.500 | 0.786 | - | 0.813 | 0.750 | 0.250 | - | 0.714 | 0.859 |
| Lights | 3 | 6 | - | 9 | 4 | 22 | - | 26 | 18 | 2 | - | 20 | 55 |
| % Lights | 100.0 | 100.0 | - | 100.0 | 100.0 | 100.0 | - | 100.0 | 100.0 | 100.0 | - | 100.0 | 100.0 |
| Buses | 0 | 0 | - | 0 | 0 | 0 | - | 0 | 0 | 0 | - | 0 | 0 |
| % Buses | 0.0 | 0.0 | - | 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 |
| % Trucks | 0.0 | 0.0 | - | 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 |
| % Bicycles on Road | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | 0 | - | - | - | 0 | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | 0 | - | - | - | 0 | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - |

Kimley-Horn
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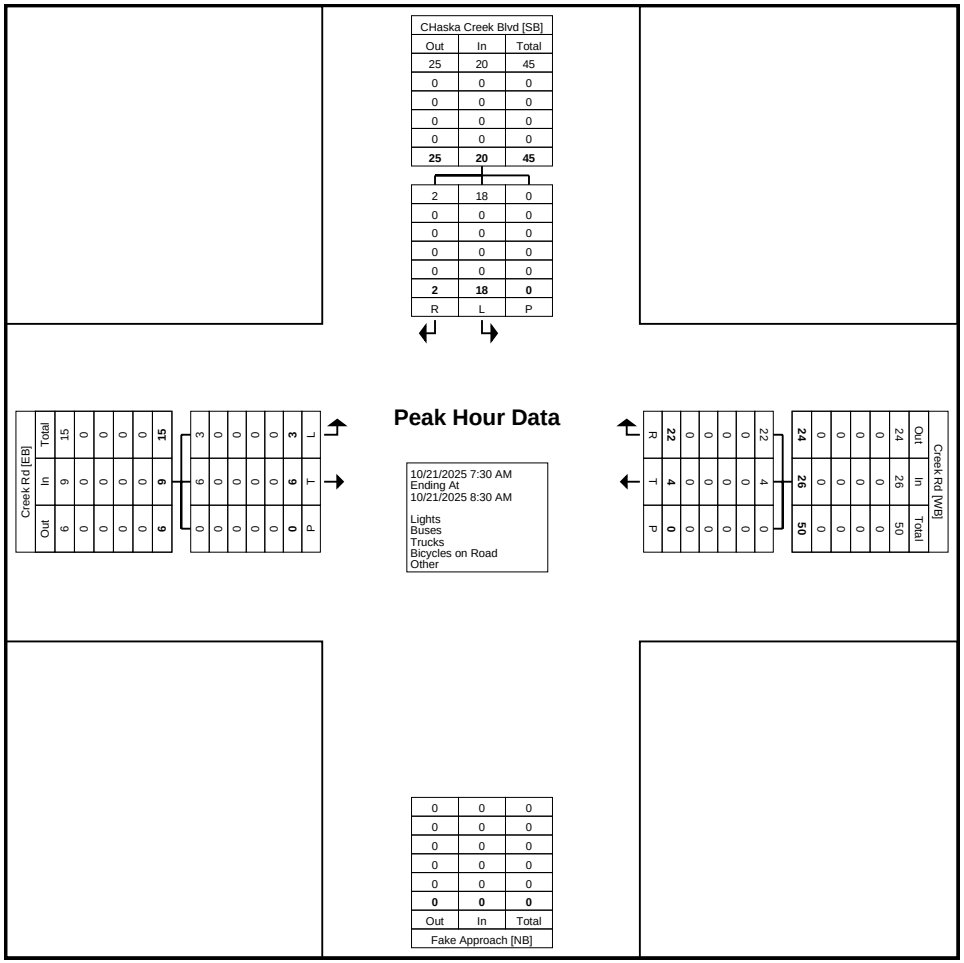
Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Chaska Creek Boulevard & Creek Road
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (7:30 AM)

Kimley-Horn
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Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: Chaska Creek Boulevard & Creek Road
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (4:15 PM)

| Start Time | Creek Rd Eastbound | | | | Creek Rd Westbound | | | | CHaska Creek Blvd Southbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Peds | App. Total | Thru | Right | Peds | App. Total | Left | Right | Peds | App. Total | Int. Total |
| 4:15 PM | 2 | 2 | 0 | 4 | 1 | 7 | 0 | 8 | 12 | 0 | 0 | 12 | 24 |
| 4:30 PM | 0 | 2 | 0 | 2 | 1 | 4 | 0 | 5 | 11 | 1 | 0 | 12 | 19 |
| 4:45 PM | 1 | 4 | 0 | 5 | 0 | 4 | 0 | 4 | 10 | 2 | 0 | 12 | 21 |
| 5:00 PM | 1 | 1 | 0 | 2 | 1 | 2 | 0 | 3 | 14 | 0 | 0 | 14 | 19 |
| Total | 4 | 9 | 0 | 13 | 3 | 17 | 0 | 20 | 47 | 3 | 0 | 50 | 83 |
| Approach % | 30.8 | 69.2 | - | - | 15.0 | 85.0 | - | - | 94.0 | 6.0 | - | - | - |
| Total % | 4.8 | 10.8 | - | 15.7 | 3.6 | 20.5 | - | 24.1 | 56.6 | 3.6 | - | 60.2 | - |
| PHF | 0.500 | 0.563 | - | 0.650 | 0.750 | 0.607 | - | 0.625 | 0.839 | 0.375 | - | 0.893 | 0.865 |
| Lights | 4 | 9 | - | 13 | 3 | 17 | - | 20 | 46 | 3 | - | 49 | 82 |
| % Lights | 100.0 | 100.0 | - | 100.0 | 100.0 | 100.0 | - | 100.0 | 97.9 | 100.0 | - | 98.0 | 98.8 |
| Buses | 0 | 0 | - | 0 | 0 | 0 | - | 0 | 1 | 0 | - | 1 | 1 |
| % Buses | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 2.1 | 0.0 | - | 2.0 | 1.2 |
| 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 |
| 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 |
| Bicycles on Crosswalk | - | - | 0 | - | - | - | 0 | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | 0 | - | - | - | 0 | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - |

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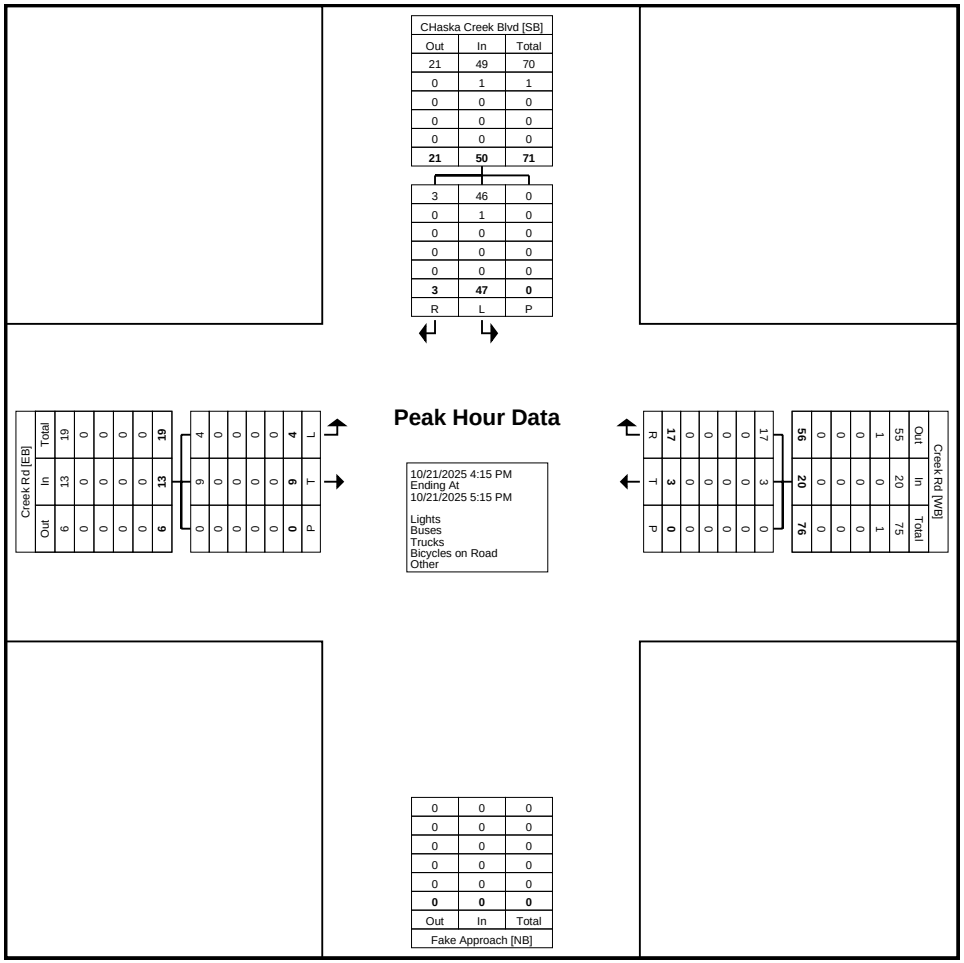
Count Name: Chaska Creek Boulevard & Creek Road
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (4:15 PM)

Kimley-Horn
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Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 44 (Big Woods Boulevard) & US Highway 212 Eastbound Ramps
Site Code:
Start Date: 10/21/2025


# Turning Movement Data

| Start Time | CSAH 44 Eastbound | | | | CSAH 44 Westbound | | | | | US Hwy 212 EB On-Ramp Southbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Right | Peds | App. Total | Int. Total |
| 7:00 AM | 7 | 32 | 0 | 39 | 0 | 28 | 63 | 0 | 91 | 0 | 0 | 0 | 0 | 130 |
| 7:15 AM | 3 | 48 | 0 | 51 | 0 | 44 | 107 | 0 | 151 | 0 | 0 | 2 | 0 | 202 |
| 7:30 AM | 7 | 58 | 0 | 65 | 0 | 27 | 77 | 0 | 104 | 0 | 0 | 0 | 0 | 169 |
| 7:45 AM | 5 | 75 | 0 | 80 | 0 | 28 | 48 | 0 | 76 | 0 | 0 | 0 | 0 | 156 |
| Hourly Total | 22 | 213 | 0 | 235 | 0 | 127 | 295 | 0 | 422 | 0 | 0 | 2 | 0 | 657 |
| 8:00 AM | 4 | 69 | 0 | 73 | 1 | 20 | 68 | 0 | 89 | 0 | 0 | 0 | 0 | 162 |
| 8:15 AM | 5 | 41 | 0 | 46 | 0 | 18 | 51 | 0 | 69 | 0 | 0 | 0 | 0 | 115 |
| 8:30 AM | 2 | 46 | 0 | 48 | 0 | 23 | 49 | 0 | 72 | 0 | 0 | 0 | 0 | 120 |
| 8:45 AM | 3 | 49 | 0 | 52 | 1 | 17 | 34 | 0 | 52 | 0 | 0 | 0 | 0 | 104 |
| Hourly Total | 14 | 205 | 0 | 219 | 2 | 78 | 202 | 0 | 282 | 0 | 0 | 0 | 0 | 501 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4:00 PM | 3 | 71 | 0 | 74 | 0 | 42 | 34 | 0 | 76 | 0 | 0 | 0 | 0 | 150 |
| 4:15 PM | 3 | 94 | 0 | 97 | 1 | 52 | 38 | 0 | 91 | 0 | 0 | 0 | 0 | 188 |
| 4:30 PM | 5 | 90 | 0 | 95 | 0 | 51 | 40 | 0 | 91 | 0 | 0 | 0 | 0 | 186 |
| 4:45 PM | 2 | 78 | 0 | 80 | 0 | 63 | 28 | 0 | 91 | 0 | 0 | 0 | 0 | 171 |
| Hourly Total | 13 | 333 | 0 | 346 | 1 | 208 | 140 | 0 | 349 | 0 | 0 | 0 | 0 | 695 |
| 5:00 PM | 7 | 64 | 0 | 71 | 0 | 61 | 35 | 0 | 96 | 0 | 0 | 0 | 0 | 167 |
| 5:15 PM | 2 | 82 | 0 | 84 | 0 | 39 | 34 | 0 | 73 | 0 | 0 | 0 | 0 | 157 |
| 5:30 PM | 2 | 76 | 0 | 78 | 1 | 31 | 25 | 0 | 57 | 0 | 0 | 0 | 0 | 135 |
| 5:45 PM | 2 | 80 | 0 | 82 | 1 | 25 | 34 | 0 | 60 | 0 | 0 | 0 | 0 | 142 |
| Hourly Total | 13 | 302 | 0 | 315 | 2 | 156 | 128 | 0 | 286 | 0 | 0 | 0 | 0 | 601 |
| Grand Total | 62 | 1053 | 0 | 1115 | 5 | 569 | 765 | 0 | 1339 | 0 | 0 | 2 | 0 | 2454 |
| Approach % | 5.6 | 94.4 | - | - | 0.4 | 42.5 | 57.1 | - | - | 0.0 | 0.0 | - | - | - |
| Total % | 2.5 | 42.9 | - | 45.4 | 0.2 | 23.2 | 31.2 | - | 54.6 | 0.0 | 0.0 | - | 0.0 | - |
| Lights | 59 | 997 | - | 1056 | 4 | 553 | 750 | - | 1307 | 0 | 0 | - | 0 | 2363 |
| % Lights | 95.2 | 94.7 | - | 94.7 | 80.0 | 97.2 | 98.0 | - | 97.6 | - | - | - | - | 96.3 |
| Buses | 2 | 34 | - | 36 | 0 | 6 | 8 | - | 14 | 0 | 0 | - | 0 | 50 |
| % Buses | 3.2 | 3.2 | - | 3.2 | 0.0 | 1.1 | 1.0 | - | 1.0 | - | - | - | - | 2.0 |
| Trucks | 1 | 22 | - | 23 | 1 | 10 | 7 | - | 18 | 0 | 0 | - | 0 | 41 |
| % Trucks | 1.6 | 2.1 | - | 2.1 | 20.0 | 1.8 | 0.9 | - | 1.3 | - | - | - | - | 1.7 |
| Bicycles on Road | 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 |
| Bicycles on Crosswalk | - | - | 0 | - | - | - | - | 0 | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | 0 | - | - | - | - | 0 | - | - | - | 2 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - |

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Warrenville, Illinois, United States 60555
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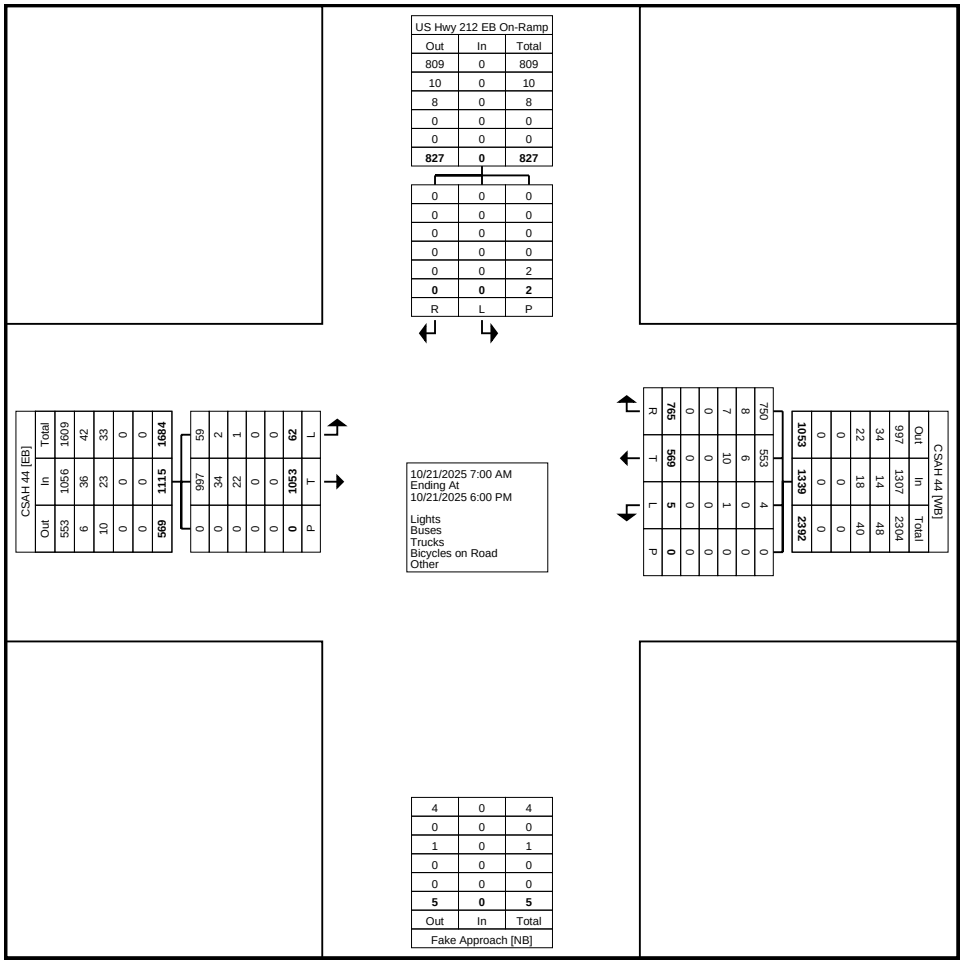
Count Name: CSAH 44 (Big Woods Boulevard) & US Highway 212 Eastbound Ramps
Site Code:
Start Date: 10/21/2025
Page No: 2




Turning Movement Data Plot

Kimley-Horn
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 44 (Big Woods Boulevard) & US Highway 212 Eastbound Ramps
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (7:15 AM)

| Start Time | CSAH 44 Eastbound | | | | CSAH 44 Westbound | | | | | US Hwy 212 EB On-Ramp Southbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Right | Peds | App. Total | Int. Total |
| 7:15 AM | 3 | 48 | 0 | 51 | 0 | 44 | 107 | 0 | 151 | 0 | 0 | 2 | 0 | 202 |
| 7:30 AM | 7 | 58 | 0 | 65 | 0 | 27 | 77 | 0 | 104 | 0 | 0 | 0 | 0 | 169 |
| 7:45 AM | 5 | 75 | 0 | 80 | 0 | 28 | 48 | 0 | 76 | 0 | 0 | 0 | 0 | 156 |
| 8:00 AM | 4 | 69 | 0 | 73 | 1 | 20 | 68 | 0 | 89 | 0 | 0 | 0 | 0 | 162 |
| Total | 19 | 250 | 0 | 269 | 1 | 119 | 300 | 0 | 420 | 0 | 0 | 2 | 0 | 689 |
| Approach % | 7.1 | 92.9 | - | - | 0.2 | 28.3 | 71.4 | - | - | 0.0 | 0.0 | - | - | - |
| Total % | 2.8 | 36.3 | - | 39.0 | 0.1 | 17.3 | 43.5 | - | 61.0 | 0.0 | 0.0 | - | 0.0 | - |
| PHF | 0.679 | 0.833 | - | 0.841 | 0.250 | 0.676 | 0.701 | - | 0.695 | 0.000 | 0.000 | - | 0.000 | 0.853 |
| Lights | 18 | 236 | - | 254 | 0 | 111 | 292 | - | 403 | 0 | 0 | - | 0 | 657 |
| % Lights | 94.7 | 94.4 | - | 94.4 | 0.0 | 93.3 | 97.3 | - | 96.0 | - | - | - | - | 95.4 |
| Buses | 0 | 5 | - | 5 | 0 | 4 | 6 | - | 10 | 0 | 0 | - | 0 | 15 |
| % Buses | 0.0 | 2.0 | - | 1.9 | 0.0 | 3.4 | 2.0 | - | 2.4 | - | - | - | - | 2.2 |
| Trucks | 1 | 9 | - | 10 | 1 | 4 | 2 | - | 7 | 0 | 0 | - | 0 | 17 |
| % Trucks | 5.3 | 3.6 | - | 3.7 | 100.0 | 3.4 | 0.7 | - | 1.7 | - | - | - | - | 2.5 |
| Bicycles on Road | 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 |
| Bicycles on Crosswalk | - | - | 0 | - | - | - | - | 0 | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | 0 | - | - | - | - | 0 | - | - | - | 2 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - |

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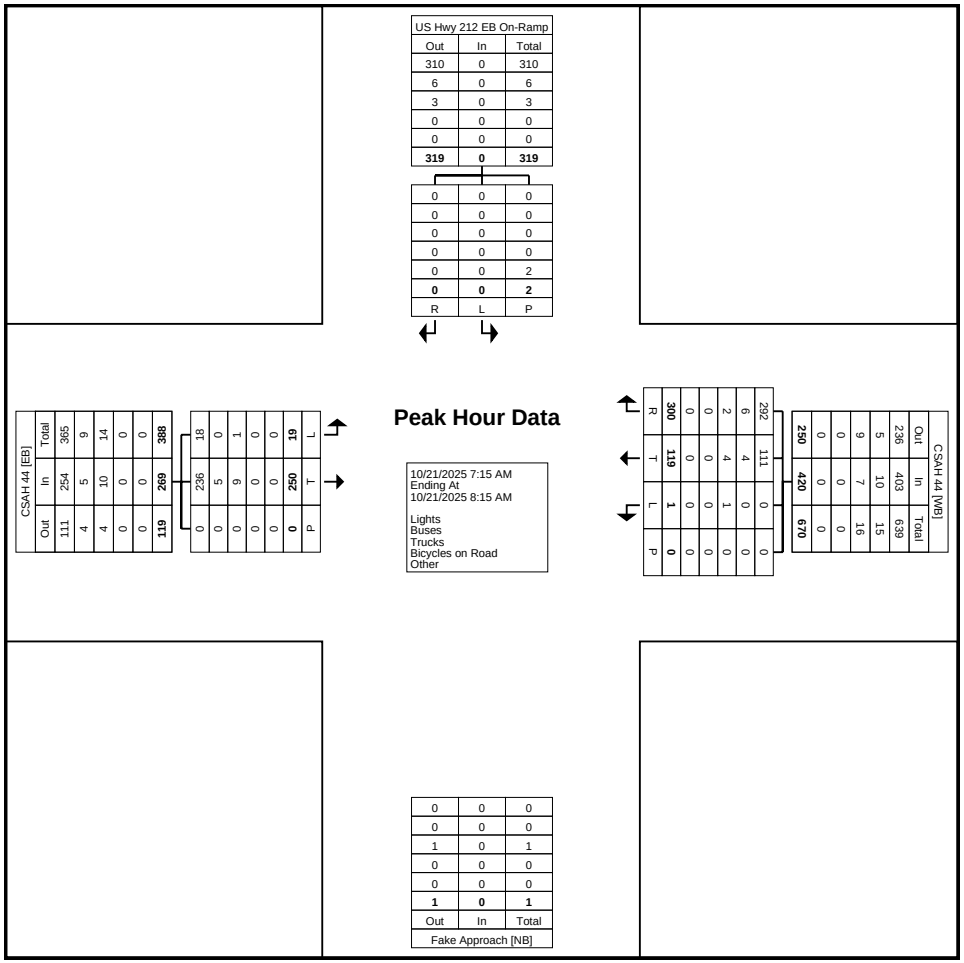
Count Name: CSAH 44 (Big Woods Boulevard) & US Highway 212 Eastbound Ramps
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (7:15 AM)

Kimley-Horn
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Warrenville, Illinois, United States 60555
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Count Name: CSAH 44 (Big Woods Boulevard) & US Highway 212 Eastbound Ramps
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (4:15 PM)

| Start Time | CSAH 44 Eastbound | | | | CSAH 44 Westbound | | | | | US Hwy 212 EB On-Ramp Southbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Right | Peds | App. Total | Int. Total |
| 4:15 PM | 3 | 94 | 0 | 97 | 1 | 52 | 38 | 0 | 91 | 0 | 0 | 0 | 0 | 188 |
| 4:30 PM | 5 | 90 | 0 | 95 | 0 | 51 | 40 | 0 | 91 | 0 | 0 | 0 | 0 | 186 |
| 4:45 PM | 2 | 78 | 0 | 80 | 0 | 63 | 28 | 0 | 91 | 0 | 0 | 0 | 0 | 171 |
| 5:00 PM | 7 | 64 | 0 | 71 | 0 | 61 | 35 | 0 | 96 | 0 | 0 | 0 | 0 | 167 |
| Total | 17 | 326 | 0 | 343 | 1 | 227 | 141 | 0 | 369 | 0 | 0 | 0 | 0 | 712 |
| Approach % | 5.0 | 95.0 | - | - | 0.3 | 61.5 | 38.2 | - | - | 0.0 | 0.0 | - | - | - |
| Total % | 2.4 | 45.8 | - | 48.2 | 0.1 | 31.9 | 19.8 | - | 51.8 | 0.0 | 0.0 | - | 0.0 | - |
| PHF | 0.607 | 0.867 | - | 0.884 | 0.250 | 0.901 | 0.881 | - | 0.961 | 0.000 | 0.000 | - | 0.000 | 0.947 |
| Lights | 16 | 306 | - | 322 | 1 | 226 | 140 | - | 367 | 0 | 0 | - | 0 | 689 |
| % Lights | 94.1 | 93.9 | - | 93.9 | 100.0 | 99.6 | 99.3 | - | 99.5 | - | - | - | - | 96.8 |
| Buses | 1 | 18 | - | 19 | 0 | 0 | 0 | - | 0 | 0 | 0 | - | 0 | 19 |
| % Buses | 5.9 | 5.5 | - | 5.5 | 0.0 | 0.0 | 0.0 | - | 0.0 | - | - | - | - | 2.7 |
| Trucks | 0 | 2 | - | 2 | 0 | 1 | 1 | - | 2 | 0 | 0 | - | 0 | 4 |
| % Trucks | 0.0 | 0.6 | - | 0.6 | 0.0 | 0.4 | 0.7 | - | 0.5 | - | - | - | - | 0.6 |
| Bicycles on Road | 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 |
| Bicycles on Crosswalk | - | - | 0 | - | - | - | - | 0 | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | 0 | - | - | - | - | 0 | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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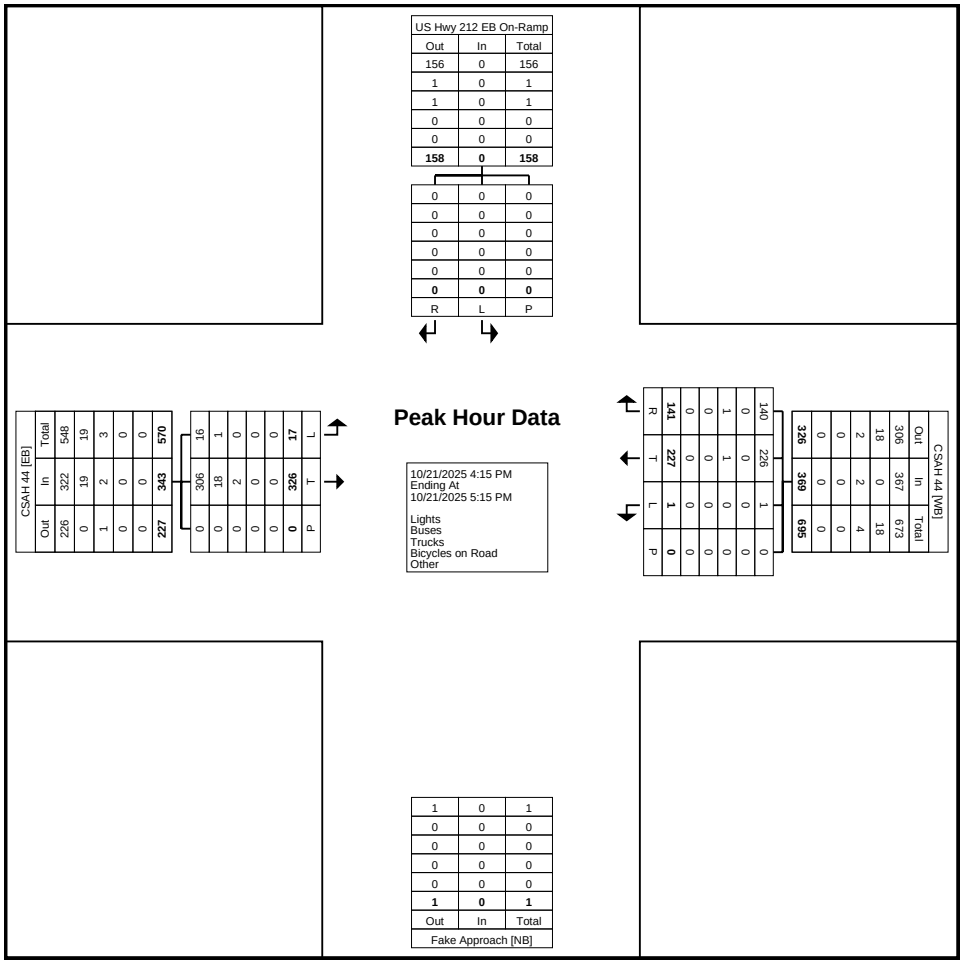
Count Name: CSAH 44 (Big Woods Boulevard) & US Highway 212 Eastbound Ramps
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (4:15 PM)

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Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 44 (Big Woods Boulevard) & US Highway 212 Westbound Ramps
Site Code:
Start Date: 10/21/2025


# Turning Movement Data

| Start Time | CSAH 44 Eastbound | | | | | CSAH 44 Westbound | | | | | US Hwy 212 WB Off-Ramp Northbound | | | | | Southbound Approach 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 | 28 | 0 | 0 | 28 | 0 | 28 | 0 | 0 | 28 | 2 | 0 | 11 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 69 |
| 7:15 AM | 0 | 43 | 0 | 0 | 43 | 0 | 44 | 0 | 0 | 44 | 1 | 0 | 8 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 96 |
| 7:30 AM | 2 | 54 | 0 | 0 | 56 | 0 | 28 | 0 | 0 | 28 | 0 | 0 | 11 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 95 |
| 7:45 AM | 1 | 55 | 0 | 0 | 56 | 0 | 24 | 0 | 0 | 24 | 2 | 0 | 23 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 105 |
| Hourly Total | 3 | 180 | 0 | 0 | 183 | 0 | 124 | 0 | 0 | 124 | 5 | 0 | 53 | 0 | 58 | 0 | 0 | 0 | 0 | 0 | 365 |
| 8:00 AM | 1 | 51 | 0 | 0 | 52 | 0 | 20 | 0 | 0 | 20 | 0 | 0 | 19 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 91 |
| 8:15 AM | 0 | 27 | 0 | 0 | 27 | 0 | 17 | 0 | 0 | 17 | 0 | 0 | 16 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 60 |
| 8:30 AM | 1 | 27 | 0 | 0 | 28 | 0 | 23 | 0 | 0 | 23 | 0 | 0 | 25 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 76 |
| 8:45 AM | 1 | 26 | 0 | 0 | 27 | 1 | 18 | 0 | 0 | 19 | 0 | 0 | 22 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 68 |
| Hourly Total | 3 | 131 | 0 | 0 | 134 | 1 | 78 | 0 | 0 | 79 | 0 | 0 | 82 | 0 | 82 | 0 | 0 | 0 | 0 | 0 | 295 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4:00 PM | 1 | 33 | 0 | 0 | 34 | 0 | 41 | 0 | 0 | 41 | 9 | 0 | 38 | 0 | 47 | 0 | 0 | 0 | 0 | 0 | 122 |
| 4:15 PM | 0 | 39 | 0 | 0 | 39 | 0 | 50 | 0 | 0 | 50 | 8 | 0 | 61 | 0 | 69 | 0 | 0 | 0 | 0 | 0 | 158 |
| 4:30 PM | 0 | 41 | 0 | 0 | 41 | 0 | 55 | 0 | 0 | 55 | 5 | 0 | 52 | 0 | 57 | 0 | 0 | 0 | 0 | 0 | 153 |
| 4:45 PM | 0 | 39 | 0 | 0 | 39 | 0 | 64 | 0 | 0 | 64 | 8 | 0 | 43 | 0 | 51 | 0 | 0 | 0 | 0 | 0 | 154 |
| Hourly Total | 1 | 152 | 0 | 0 | 153 | 0 | 210 | 0 | 0 | 210 | 30 | 0 | 194 | 0 | 224 | 0 | 0 | 0 | 0 | 0 | 587 |
| 5:00 PM | 0 | 32 | 0 | 0 | 32 | 1 | 60 | 0 | 0 | 61 | 7 | 0 | 38 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 138 |
| 5:15 PM | 0 | 24 | 0 | 0 | 24 | 0 | 38 | 0 | 0 | 38 | 8 | 0 | 58 | 0 | 66 | 0 | 0 | 0 | 0 | 0 | 128 |
| 5:30 PM | 0 | 22 | 0 | 0 | 22 | 0 | 33 | 0 | 0 | 33 | 4 | 0 | 56 | 0 | 60 | 0 | 0 | 0 | 0 | 0 | 115 |
| 5:45 PM | 0 | 22 | 0 | 0 | 22 | 0 | 25 | 0 | 0 | 25 | 3 | 0 | 58 | 0 | 61 | 0 | 0 | 0 | 0 | 0 | 108 |
| Hourly Total | 0 | 100 | 0 | 0 | 100 | 1 | 156 | 0 | 0 | 157 | 22 | 0 | 210 | 0 | 232 | 0 | 0 | 0 | 0 | 0 | 489 |
| Grand Total | 7 | 563 | 0 | 0 | 570 | 2 | 568 | 0 | 0 | 570 | 57 | 0 | 539 | 0 | 596 | 0 | 0 | 0 | 0 | 0 | 1736 |
| Approach % | 1.2 | 98.8 | 0.0 | - | - | 0.4 | 99.6 | 0.0 | - | - | 9.6 | 0.0 | 90.4 | - | - | 0.0 | 0.0 | 0.0 | - | - | - |
| Total % | 0.4 | 32.4 | 0.0 | - | 32.8 | 0.1 | 32.7 | 0.0 | - | 32.8 | 3.3 | 0.0 | 31.0 | - | 34.3 | 0.0 | 0.0 | 0.0 | - | 0.0 | - |
| Lights | 6 | 535 | 0 | - | 541 | 2 | 555 | 0 | - | 557 | 56 | 0 | 518 | - | 574 | 0 | 0 | 0 | - | 0 | 1672 |
| % Lights | 85.7 | 95.0 | - | - | 94.9 | 100.0 | 97.7 | - | - | 97.7 | 98.2 | - | 96.1 | - | 96.3 | - | - | - | - | - | 96.3 |
| Buses | 0 | 19 | 0 | - | 19 | 0 | 6 | 0 | - | 6 | 0 | 0 | 14 | - | 14 | 0 | 0 | 0 | - | 0 | 39 |
| % Buses | 0.0 | 3.4 | - | - | 3.3 | 0.0 | 1.1 | - | - | 1.1 | 0.0 | - | 2.6 | - | 2.3 | - | - | - | - | - | 2.2 |
| Trucks | 1 | 9 | 0 | - | 10 | 0 | 7 | 0 | - | 7 | 1 | 0 | 7 | - | 8 | 0 | 0 | 0 | - | 0 | 25 |
| % Trucks | 14.3 | 1.6 | - | - | 1.8 | 0.0 | 1.2 | - | - | 1.2 | 1.8 | - | 1.3 | - | 1.3 | - | - | - | - | - | 1.4 |
| 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 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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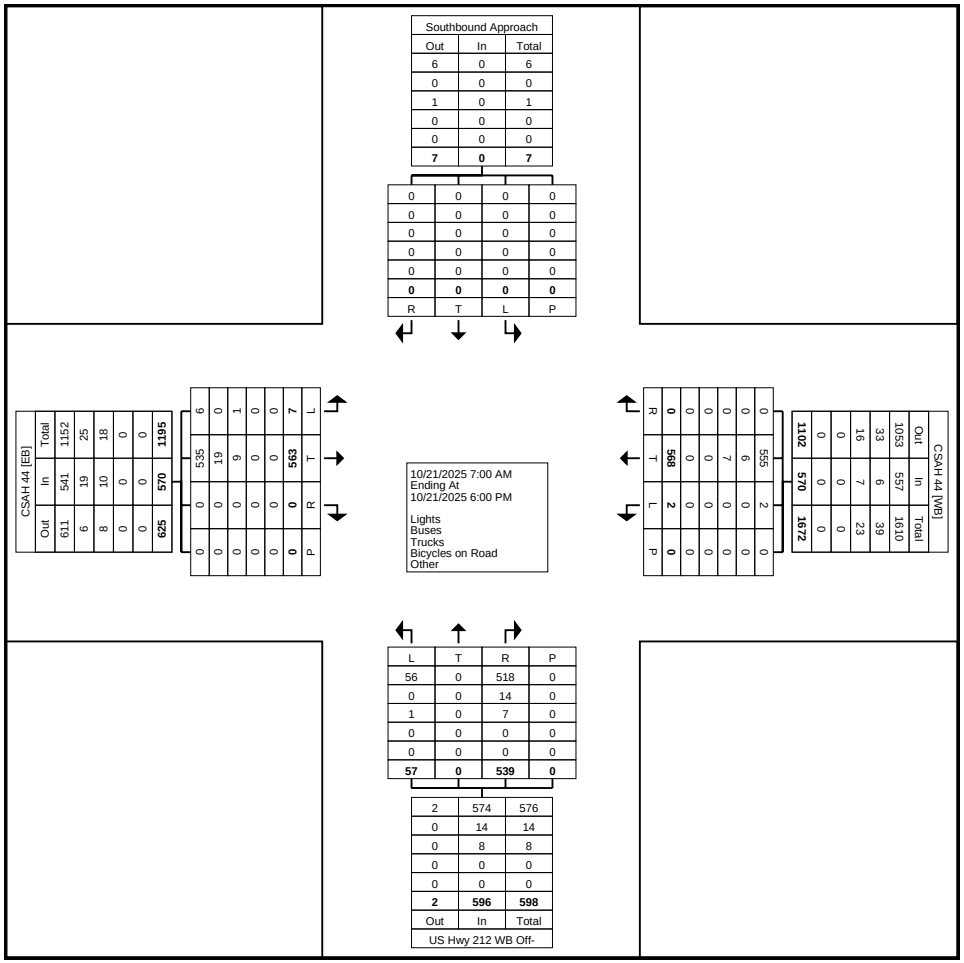
Count Name: CSAH 44 (Big Woods Boulevard) & US Highway 212 Westbound Ramps
Site Code:
Start Date: 10/21/2025


Turning Movement Data Plot

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Count Name: CSAH 44 (Big Woods Boulevard) & US Highway 212 Westbound Ramps
Site Code:
Start Date: 10/21/2025


# Approach Data

| Start Time | Wb Street Westbound | | | | | | Eb Street Eastbound | | | | | | Sb Street Southbound | | | | | | Nb Street Northbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Peds CCW | Peds CW | Circulating | Out | In | Next | Peds CCW | Peds CW | Circulating | Out | In | Next | Peds CCW | Peds CW | Circulating | Out | In | Next | Peds CCW | Peds CW | Circulating | Out | In | Next |
| 7:00 AM | 0 | 0 | 2 | 40 | 28 | 28 | 0 | 0 | 0 | 29 | 28 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 28 | 0 | 13 | 11 |
| 7:15 AM | 0 | 0 | 1 | 52 | 44 | 44 | 0 | 0 | 0 | 46 | 43 | 0 | 0 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 43 | 0 | 9 | 8 |
| 7:30 AM | 0 | 0 | 1 | 62 | 28 | 28 | 0 | 0 | 0 | 29 | 59 | 0 | 0 | 0 | 29 | 0 | 0 | 0 | 0 | 0 | 59 | 0 | 12 | 11 |
| 7:45 AM | 0 | 0 | 3 | 77 | 25 | 24 | 0 | 0 | 0 | 27 | 57 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 57 | 0 | 26 | 23 |
| Hourly Total | 0 | 0 | 7 | 231 | 125 | 124 | 0 | 0 | 0 | 131 | 187 | 0 | 0 | 0 | 132 | 0 | 0 | 0 | 0 | 0 | 187 | 0 | 60 | 53 |
| 8:00 AM | 0 | 0 | 0 | 70 | 20 | 20 | 0 | 0 | 0 | 22 | 52 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 52 | 0 | 19 | 19 |
| 8:15 AM | 0 | 0 | 0 | 44 | 18 | 17 | 0 | 0 | 0 | 17 | 27 | 0 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 27 | 0 | 16 | 16 |
| 8:30 AM | 0 | 0 | 1 | 52 | 23 | 23 | 0 | 0 | 0 | 24 | 28 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 28 | 0 | 25 | 25 |
| 8:45 AM | 0 | 0 | 1 | 50 | 18 | 18 | 0 | 0 | 1 | 19 | 27 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 28 | 0 | 22 | 22 |
| Hourly Total | 0 | 0 | 2 | 216 | 79 | 78 | 0 | 0 | 1 | 82 | 134 | 0 | 0 | 0 | 83 | 0 | 0 | 0 | 0 | 0 | 135 | 0 | 82 | 82 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4:00 PM | 0 | 0 | 10 | 71 | 41 | 41 | 0 | 0 | 0 | 52 | 34 | 0 | 0 | 0 | 51 | 0 | 0 | 0 | 0 | 0 | 34 | 0 | 47 | 38 |
| 4:15 PM | 0 | 0 | 8 | 101 | 50 | 50 | 0 | 0 | 0 | 58 | 39 | 0 | 0 | 0 | 58 | 0 | 0 | 0 | 0 | 0 | 39 | 0 | 69 | 61 |
| 4:30 PM | 0 | 0 | 5 | 93 | 56 | 55 | 0 | 0 | 0 | 59 | 42 | 0 | 0 | 0 | 61 | 0 | 0 | 0 | 0 | 0 | 42 | 0 | 57 | 52 |
| 4:45 PM | 0 | 0 | 8 | 84 | 63 | 64 | 0 | 0 | 0 | 73 | 38 | 0 | 0 | 0 | 71 | 0 | 0 | 0 | 0 | 0 | 38 | 0 | 51 | 43 |
| Hourly Total | 0 | 0 | 31 | 349 | 210 | 210 | 0 | 0 | 0 | 242 | 153 | 0 | 0 | 0 | 241 | 0 | 0 | 0 | 0 | 0 | 153 | 0 | 224 | 194 |
| 5:00 PM | 0 | 0 | 7 | 70 | 61 | 60 | 0 | 0 | 1 | 67 | 33 | 0 | 0 | 0 | 68 | 0 | 0 | 0 | 0 | 0 | 34 | 0 | 45 | 38 |
| 5:15 PM | 0 | 0 | 8 | 82 | 38 | 38 | 0 | 0 | 0 | 46 | 24 | 0 | 0 | 0 | 46 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 66 | 58 |
| 5:30 PM | 0 | 0 | 4 | 78 | 33 | 33 | 0 | 0 | 0 | 37 | 23 | 0 | 0 | 0 | 37 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 60 | 56 |
| 5:45 PM | 0 | 0 | 3 | 81 | 25 | 25 | 0 | 0 | 0 | 28 | 22 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 61 | 58 |
| Hourly Total | 0 | 0 | 22 | 311 | 157 | 156 | 0 | 0 | 1 | 178 | 102 | 0 | 0 | 0 | 179 | 0 | 0 | 0 | 0 | 0 | 103 | 0 | 232 | 210 |
| Grand Total | 0 | 0 | 62 | 1107 | 571 | 568 | 0 | 0 | 2 | 633 | 576 | 0 | 0 | 0 | 635 | 0 | 0 | 0 | 0 | 0 | 578 | 0 | 598 | 539 |
| Approach % | - | - | 2.7 | 48.0 | 24.7 | 24.6 | - | - | 0.2 | 52.3 | 47.6 | 0.0 | - | - | 100.0 | 0.0 | 0.0 | 0.0 | - | - | 33.7 | 0.0 | 34.9 | 31.4 |
| Total % | - | - | 1.1 | 18.9 | 9.7 | 9.7 | - | - | 0.0 | 10.8 | 9.8 | 0.0 | - | - | 10.8 | 0.0 | 0.0 | 0.0 | - | - | 9.8 | 0.0 | 10.2 | 9.2 |
| Lights | - | - | 60 | 1049 | 556 | 555 | - | - | 2 | 619 | 545 | 0 | - | - | 618 | 0 | 0 | 0 | - | - | 547 | 0 | 576 | 518 |
| % Lights | - | - | 96.8 | 94.8 | 97.4 | 97.7 | - | - | 100.0 | 97.8 | 94.6 | - | - | - | 97.3 | - | - | - | - | - | 94.6 | - | 96.3 | 96.1 |
| Buses | - | - | 0 | 37 | 6 | 6 | - | - | 0 | 6 | 21 | 0 | - | - | 6 | 0 | 0 | 0 | - | - | 21 | 0 | 14 | 14 |
| % Buses | - | - | 0.0 | 3.3 | 1.1 | 1.1 | - | - | 0.0 | 0.9 | 3.6 | - | - | - | 0.9 | - | - | - | - | - | 3.6 | - | 2.3 | 2.6 |
| Trucks | - | - | 2 | 21 | 9 | 7 | - | - | 0 | 8 | 10 | 0 | - | - | 11 | 0 | 0 | 0 | - | - | 10 | 0 | 8 | 7 |
| % Trucks | - | - | 3.2 | 1.9 | 1.6 | 1.2 | - | - | 0.0 | 1.3 | 1.7 | - | - | - | 1.7 | - | - | - | - | - | 1.7 | - | 1.3 | 1.3 |
| Bicycles on Road | - | - | 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 |
| Bicycles on Crosswalk | 0 | 0 | - | - | - | - | 0 | 0 | - | - | - | - | 0 | 0 | - | - | - | - | 0 | 0 | - | - | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pedestrians | 0 | 0 | - | - | - | - | 0 | 0 | - | - | - | - | 0 | 0 | - | - | - | - | 0 | 0 | - | - | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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Count Name: CSAH 44 (Big Woods Boulevard) & US Highway 212 Westbound Ramps
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (7:15 AM)

| Start Time | CSAH 44 Eastbound | | | | | CSAH 44 Westbound | | | | | US Hwy 212 WB Off-Ramp Northbound | | | | | Southbound Approach 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 |
| 7:15 AM | 0 | 43 | 0 | 0 | 43 | 0 | 44 | 0 | 0 | 44 | 1 | 0 | 8 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 96 |
| 7:30 AM | 2 | 54 | 0 | 0 | 56 | 0 | 28 | 0 | 0 | 28 | 0 | 0 | 11 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 95 |
| 7:45 AM | 1 | 55 | 0 | 0 | 56 | 0 | 24 | 0 | 0 | 24 | 2 | 0 | 23 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 105 |
| 8:00 AM | 1 | 51 | 0 | 0 | 52 | 0 | 20 | 0 | 0 | 20 | 0 | 0 | 19 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 91 |
| Total | 4 | 203 | 0 | 0 | 207 | 0 | 116 | 0 | 0 | 116 | 3 | 0 | 61 | 0 | 64 | 0 | 0 | 0 | 0 | 0 | 387 |
| Approach % | 1.9 | 98.1 | 0.0 | - | - | 0.0 | 100.0 | 0.0 | - | - | 4.7 | 0.0 | 95.3 | - | - | 0.0 | 0.0 | 0.0 | - | - | - |
| Total % | 1.0 | 52.5 | 0.0 | - | 53.5 | 0.0 | 30.0 | 0.0 | - | 30.0 | 0.8 | 0.0 | 15.8 | - | 16.5 | 0.0 | 0.0 | 0.0 | - | 0.0 | - |
| PHF | 0.500 | 0.923 | 0.000 | - | 0.924 | 0.000 | 0.659 | 0.000 | - | 0.659 | 0.375 | 0.000 | 0.663 | - | 0.640 | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.921 |
| Lights | 4 | 199 | 0 | - | 203 | 0 | 109 | 0 | - | 109 | 3 | 0 | 54 | - | 57 | 0 | 0 | 0 | - | 0 | 369 |
| % Lights | 100.0 | 98.0 | - | - | 98.1 | - | 94.0 | - | - | 94.0 | 100.0 | - | 88.5 | - | 89.1 | - | - | - | - | - | 95.3 |
| Buses | 0 | 1 | 0 | - | 1 | 0 | 4 | 0 | - | 4 | 0 | 0 | 4 | - | 4 | 0 | 0 | 0 | - | 0 | 9 |
| % Buses | 0.0 | 0.5 | - | - | 0.5 | - | 3.4 | - | - | 3.4 | 0.0 | - | 6.6 | - | 6.3 | - | - | - | - | - | 2.3 |
| Trucks | 0 | 3 | 0 | - | 3 | 0 | 3 | 0 | - | 3 | 0 | 0 | 3 | - | 3 | 0 | 0 | 0 | - | 0 | 9 |
| % Trucks | 0.0 | 1.5 | - | - | 1.4 | - | 2.6 | - | - | 2.6 | 0.0 | - | 4.9 | - | 4.7 | - | - | - | - | - | 2.3 |
| 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 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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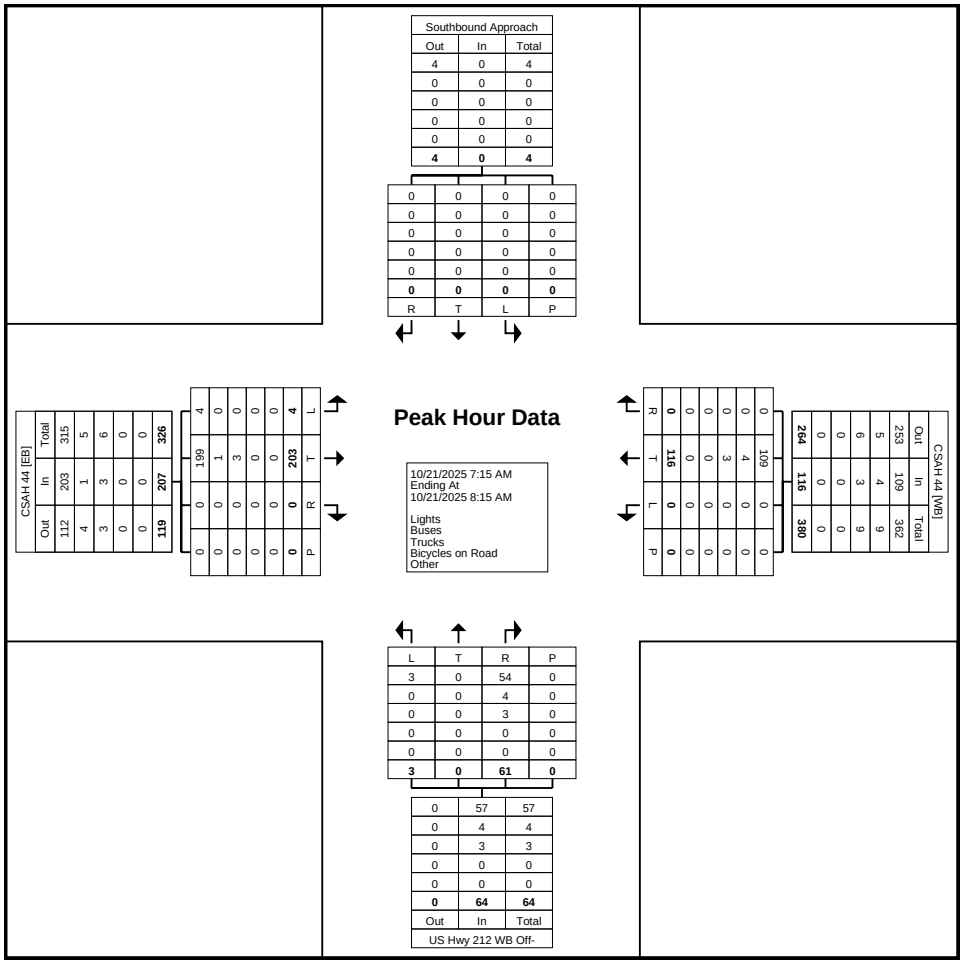
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (7:15 AM)

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Count Name: CSAH 44 (Big Woods Boulevard) & US Highway 212 Westbound Ramps
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (4:15 PM)

| Start Time | CSAH 44 Eastbound | | | | | CSAH 44 Westbound | | | | | US Hwy 212 WB Off-Ramp Northbound | | | | | Southbound Approach 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 | 39 | 0 | 0 | 39 | 0 | 50 | 0 | 0 | 50 | 8 | 0 | 61 | 0 | 69 | 0 | 0 | 0 | 0 | 0 | 158 |
| 4:30 PM | 0 | 41 | 0 | 0 | 41 | 0 | 55 | 0 | 0 | 55 | 5 | 0 | 52 | 0 | 57 | 0 | 0 | 0 | 0 | 0 | 153 |
| 4:45 PM | 0 | 39 | 0 | 0 | 39 | 0 | 64 | 0 | 0 | 64 | 8 | 0 | 43 | 0 | 51 | 0 | 0 | 0 | 0 | 0 | 154 |
| 5:00 PM | 0 | 32 | 0 | 0 | 32 | 1 | 60 | 0 | 0 | 61 | 7 | 0 | 38 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 138 |
| Total | 0 | 151 | 0 | 0 | 151 | 1 | 229 | 0 | 0 | 230 | 28 | 0 | 194 | 0 | 222 | 0 | 0 | 0 | 0 | 0 | 603 |
| Approach % | 0.0 | 100.0 | 0.0 | - | - | 0.4 | 99.6 | 0.0 | - | - | 12.6 | 0.0 | 87.4 | - | - | 0.0 | 0.0 | 0.0 | - | - | - |
| Total % | 0.0 | 25.0 | 0.0 | - | 25.0 | 0.2 | 38.0 | 0.0 | - | 38.1 | 4.6 | 0.0 | 32.2 | - | 36.8 | 0.0 | 0.0 | 0.0 | - | 0.0 | - |
| PHF | 0.000 | 0.921 | 0.000 | - | 0.921 | 0.250 | 0.895 | 0.000 | - | 0.898 | 0.875 | 0.000 | 0.795 | - | 0.804 | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.954 |
| Lights | 0 | 137 | 0 | - | 137 | 1 | 229 | 0 | - | 230 | 27 | 0 | 189 | - | 216 | 0 | 0 | 0 | - | 0 | 583 |
| % Lights | - | 90.7 | - | - | 90.7 | 100.0 | 100.0 | - | - | 100.0 | 96.4 | - | 97.4 | - | 97.3 | - | - | - | - | - | 96.7 |
| Buses | 0 | 12 | 0 | - | 12 | 0 | 0 | 0 | - | 0 | 0 | 0 | 5 | - | 5 | 0 | 0 | 0 | - | 0 | 17 |
| % Buses | - | 7.9 | - | - | 7.9 | 0.0 | 0.0 | - | - | 0.0 | 0.0 | - | 2.6 | - | 2.3 | - | - | - | - | - | 2.8 |
| Trucks | 0 | 2 | 0 | - | 2 | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | - | 0 | 3 |
| % Trucks | - | 1.3 | - | - | 1.3 | 0.0 | 0.0 | - | - | 0.0 | 3.6 | - | 0.0 | - | 0.5 | - | - | - | - | - | 0.5 |
| 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 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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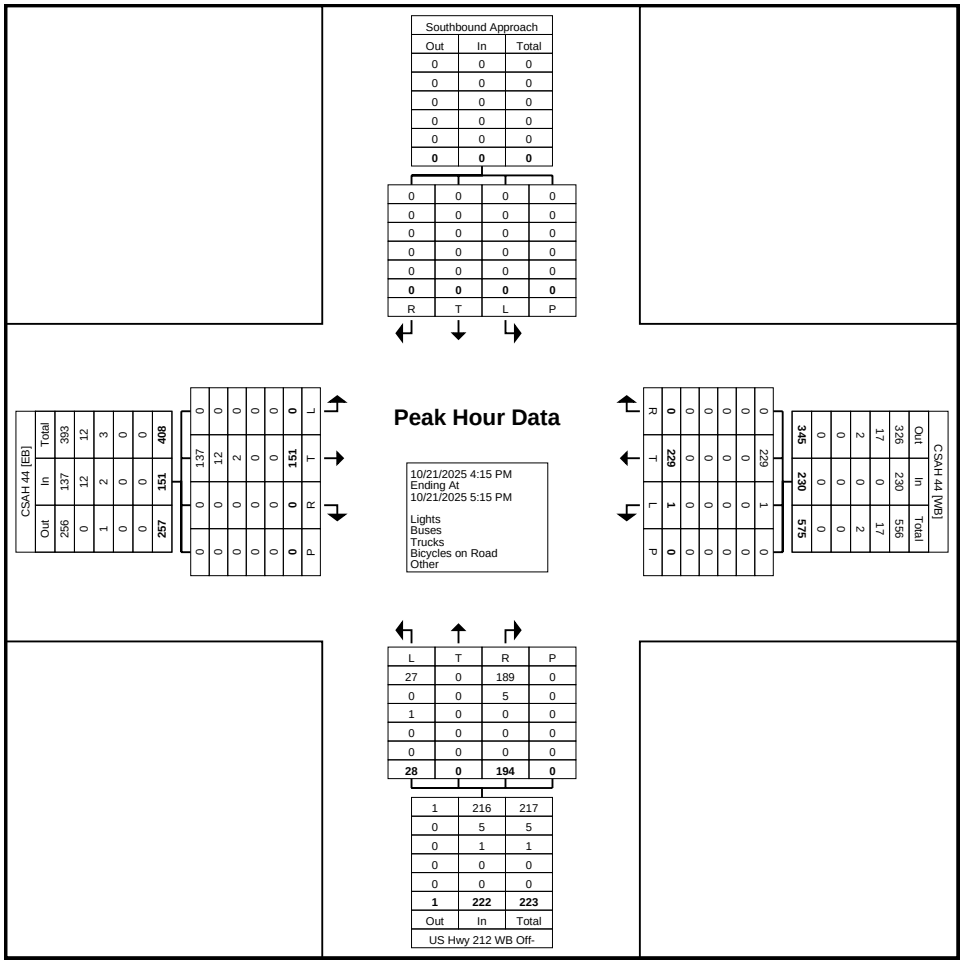
Count Name: CSAH 44 (Big Woods Boulevard) & US Highway 212 Westbound Ramps
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (4:15 PM)

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Count Name: CSAH 11 (Johnathan Carver Parkway) & CSAH 44 (Big Woods Boulevard)
Site Code:
Start Date: 10/21/2025


# Turning Movement Data

| Start Time | CSAH 44 Eastbound | | | | | CSAH 44 Westbound | | | | | CSAH 11 Northbound | | | | | CSAH 11 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 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 1 | 2 | 0 | 0 | 3 | 10 |
| 12:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| 12:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 4 |
| 12:45 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 3 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 3 | 1 | 10 | 0 | 0 | 11 | 1 | 4 | 0 | 0 | 5 | 19 |
| 1:00 AM | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 2 | 1 | 1 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 6 |
| 1:15 AM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 1:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 4 | 4 |
| Hourly Total | 0 | 2 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 2 | 1 | 1 | 0 | 0 | 2 | 2 | 4 | 0 | 0 | 6 | 12 |
| 2:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| 2:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 4 |
| 2:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 2 | 0 | 3 | 1 | 0 | 0 | 0 | 1 | 5 |
| 3:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3:15 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 3 |
| 3:30 AM | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 4 |
| 3:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 2 |
| Hourly Total | 0 | 2 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 6 | 9 |
| 4:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 2 | 4 |
| 4:15 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 3 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 5 |
| 4:30 AM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 2 | 0 | 2 | 1 | 0 | 3 | 0 | 2 | 0 | 0 | 2 | 8 |
| 4:45 AM | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 1 | 4 | 0 | 0 | 5 | 9 |
| Hourly Total | 0 | 2 | 1 | 0 | 3 | 1 | 1 | 4 | 0 | 6 | 0 | 6 | 1 | 0 | 7 | 3 | 7 | 0 | 0 | 10 | 26 |
| 5:00 AM | 0 | 4 | 1 | 0 | 5 | 0 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 4 | 13 |
| 5:15 AM | 0 | 3 | 2 | 0 | 5 | 0 | 0 | 4 | 0 | 4 | 0 | 3 | 0 | 0 | 3 | 1 | 10 | 0 | 0 | 11 | 23 |
| 5:30 AM | 1 | 8 | 1 | 0 | 10 | 0 | 1 | 4 | 0 | 5 | 3 | 11 | 1 | 0 | 15 | 12 | 10 | 0 | 0 | 22 | 52 |
| 5:45 AM | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 4 | 0 | 4 | 1 | 9 | 0 | 0 | 10 | 12 | 8 | 0 | 0 | 20 | 35 |
| Hourly Total | 1 | 15 | 5 | 0 | 21 | 0 | 1 | 14 | 0 | 15 | 4 | 25 | 1 | 0 | 30 | 27 | 30 | 0 | 0 | 57 | 123 |
| 6:00 AM | 0 | 7 | 1 | 0 | 8 | 1 | 0 | 6 | 0 | 7 | 1 | 10 | 0 | 0 | 11 | 9 | 14 | 0 | 0 | 23 | 49 |
| 6:15 AM | 1 | 7 | 2 | 0 | 10 | 0 | 3 | 4 | 0 | 7 | 1 | 23 | 1 | 0 | 25 | 11 | 29 | 0 | 0 | 40 | 82 |
| 6:30 AM | 0 | 8 | 4 | 0 | 12 | 4 | 5 | 19 | 0 | 28 | 1 | 21 | 1 | 0 | 23 | 14 | 36 | 0 | 0 | 50 | 113 |
| 6:45 AM | 0 | 6 | 4 | 0 | 10 | 5 | 7 | 17 | 0 | 29 | 2 | 34 | 2 | 0 | 38 | 19 | 31 | 0 | 0 | 50 | 127 |
| Hourly Total | 1 | 28 | 11 | 0 | 40 | 10 | 15 | 46 | 0 | 71 | 5 | 88 | 4 | 0 | 97 | 53 | 110 | 0 | 0 | 163 | 371 |
| 7:00 AM | 0 | 7 | 3 | 0 | 10 | 4 | 7 | 16 | 0 | 27 | 3 | 33 | 4 | 0 | 40 | 21 | 26 | 0 | 0 | 47 | 124 |

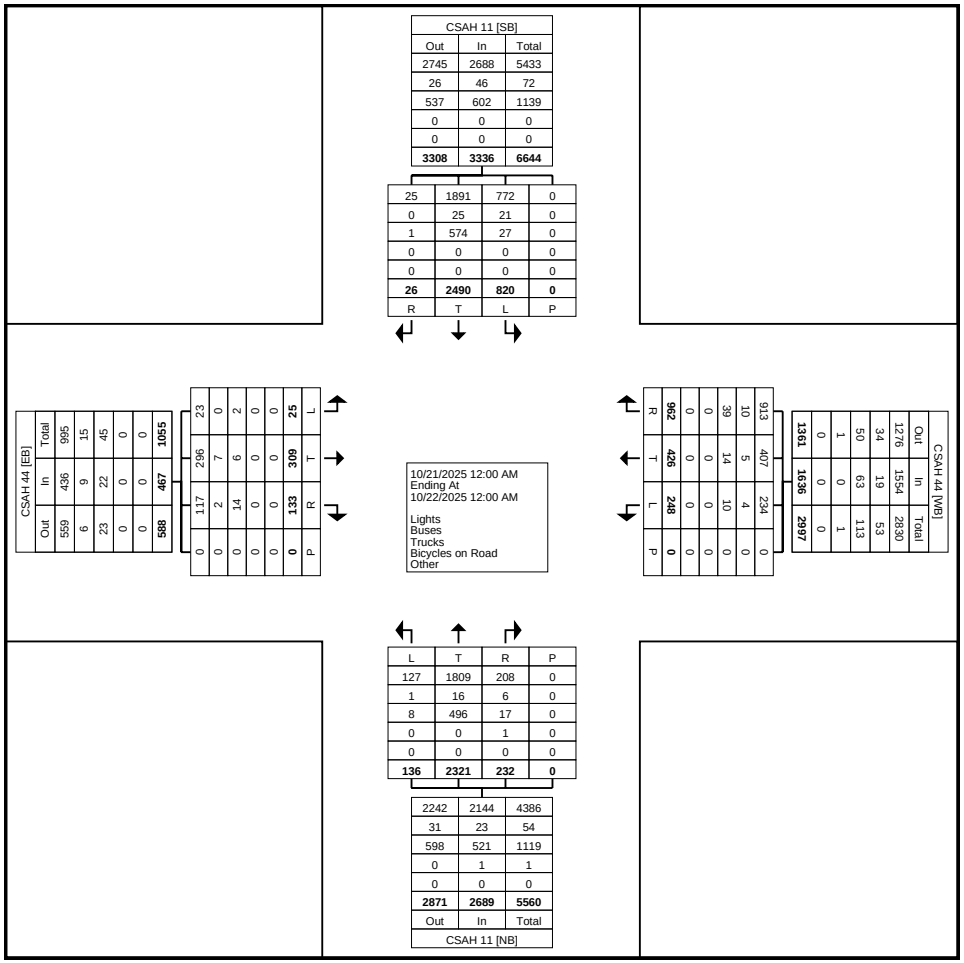
| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7:15 AM | 3 | 7 | 5 | 0 | 15 | 19 | 10 | 14 | 0 | 43 | 2 | 59 | 1 | 0 | 62 | 30 | 44 | 0 | 0 | 74 | 194 |
| 7:30 AM | 0 | 9 | 9 | 0 | 18 | 11 | 4 | 17 | 0 | 32 | 1 | 64 | 5 | 0 | 70 | 44 | 29 | 0 | 0 | 73 | 193 |
| 7:45 AM | 0 | 11 | 4 | 0 | 15 | 6 | 9 | 13 | 0 | 28 | 7 | 41 | 5 | 0 | 53 | 39 | 44 | 0 | 0 | 83 | 179 |
| Hourly Total | 3 | 34 | 21 | 0 | 58 | 40 | 30 | 60 | 0 | 130 | 13 | 197 | 15 | 0 | 225 | 134 | 143 | 0 | 0 | 277 | 690 |
| 8:00 AM | 0 | 14 | 2 | 0 | 16 | 5 | 3 | 13 | 0 | 21 | 1 | 29 | 4 | 0 | 34 | 38 | 37 | 2 | 0 | 77 | 148 |
| 8:15 AM | 0 | 9 | 0 | 0 | 9 | 3 | 1 | 13 | 0 | 17 | 0 | 34 | 1 | 0 | 35 | 18 | 46 | 0 | 0 | 64 | 125 |
| 8:30 AM | 0 | 4 | 4 | 0 | 8 | 1 | 3 | 18 | 0 | 22 | 2 | 46 | 2 | 0 | 50 | 22 | 37 | 0 | 0 | 59 | 139 |
| 8:45 AM | 0 | 8 | 2 | 0 | 10 | 4 | 2 | 12 | 0 | 18 | 0 | 28 | 4 | 0 | 32 | 14 | 50 | 1 | 0 | 65 | 125 |
| Hourly Total | 0 | 35 | 8 | 0 | 43 | 13 | 9 | 56 | 0 | 78 | 3 | 137 | 11 | 0 | 151 | 92 | 170 | 3 | 0 | 265 | 537 |
| 9:00 AM | 0 | 5 | 2 | 0 | 7 | 5 | 5 | 23 | 0 | 33 | 3 | 33 | 6 | 0 | 42 | 14 | 29 | 1 | 0 | 44 | 126 |
| 9:15 AM | 0 | 5 | 0 | 0 | 5 | 6 | 6 | 13 | 0 | 25 | 1 | 36 | 0 | 0 | 37 | 11 | 39 | 0 | 0 | 50 | 117 |
| 9:30 AM | 1 | 8 | 1 | 0 | 10 | 0 | 4 | 12 | 0 | 16 | 2 | 27 | 1 | 0 | 30 | 13 | 46 | 1 | 0 | 60 | 116 |
| 9:45 AM | 0 | 3 | 3 | 0 | 6 | 3 | 6 | 16 | 0 | 25 | 3 | 41 | 4 | 0 | 48 | 12 | 35 | 0 | 0 | 47 | 126 |
| Hourly Total | 1 | 21 | 6 | 0 | 28 | 14 | 21 | 64 | 0 | 99 | 9 | 137 | 11 | 0 | 157 | 50 | 149 | 2 | 0 | 201 | 485 |
| 10:00 AM | 0 | 2 | 3 | 0 | 5 | 2 | 5 | 8 | 0 | 15 | 0 | 36 | 3 | 0 | 39 | 4 | 34 | 0 | 0 | 38 | 97 |
| 10:15 AM | 1 | 5 | 0 | 0 | 6 | 2 | 6 | 9 | 0 | 17 | 1 | 40 | 2 | 0 | 43 | 3 | 41 | 0 | 0 | 44 | 110 |
| 10:30 AM | 0 | 5 | 3 | 0 | 8 | 2 | 2 | 13 | 0 | 17 | 0 | 25 | 2 | 0 | 27 | 7 | 40 | 0 | 0 | 47 | 99 |
| 10:45 AM | 0 | 3 | 2 | 0 | 5 | 0 | 12 | 8 | 0 | 20 | 5 | 33 | 1 | 0 | 39 | 8 | 52 | 0 | 0 | 60 | 124 |
| Hourly Total | 1 | 15 | 8 | 0 | 24 | 6 | 25 | 38 | 0 | 69 | 6 | 134 | 8 | 0 | 148 | 22 | 167 | 0 | 0 | 189 | 430 |
| 11:00 AM | 0 | 5 | 0 | 0 | 5 | 1 | 2 | 14 | 0 | 17 | 3 | 35 | 5 | 0 | 43 | 11 | 37 | 1 | 0 | 49 | 114 |
| 11:15 AM | 0 | 2 | 1 | 0 | 3 | 4 | 1 | 11 | 0 | 16 | 0 | 35 | 3 | 0 | 38 | 8 | 41 | 0 | 0 | 49 | 106 |
| 11:30 AM | 1 | 3 | 2 | 0 | 6 | 1 | 4 | 14 | 0 | 19 | 0 | 33 | 5 | 0 | 38 | 5 | 37 | 1 | 0 | 43 | 106 |
| 11:45 AM | 1 | 5 | 4 | 0 | 10 | 4 | 3 | 8 | 0 | 15 | 0 | 37 | 2 | 0 | 39 | 5 | 28 | 1 | 0 | 34 | 98 |
| Hourly Total | 2 | 15 | 7 | 0 | 24 | 10 | 10 | 47 | 0 | 67 | 3 | 140 | 15 | 0 | 158 | 29 | 143 | 3 | 0 | 175 | 424 |
| 12:00 PM | 0 | 2 | 0 | 0 | 2 | 5 | 3 | 7 | 0 | 15 | 2 | 48 | 2 | 0 | 52 | 4 | 50 | 0 | 0 | 54 | 123 |
| 12:15 PM | 1 | 5 | 0 | 0 | 6 | 7 | 2 | 8 | 0 | 17 | 0 | 27 | 0 | 0 | 27 | 13 | 43 | 2 | 0 | 58 | 108 |
| 12:30 PM | 0 | 2 | 0 | 0 | 2 | 4 | 5 | 10 | 0 | 19 | 2 | 48 | 3 | 0 | 53 | 8 | 46 | 0 | 0 | 54 | 128 |
| 12:45 PM | 1 | 3 | 3 | 0 | 7 | 5 | 10 | 12 | 0 | 27 | 2 | 39 | 3 | 0 | 44 | 7 | 41 | 1 | 0 | 49 | 127 |
| Hourly Total | 2 | 12 | 3 | 0 | 17 | 21 | 20 | 37 | 0 | 78 | 6 | 162 | 8 | 0 | 176 | 32 | 180 | 3 | 0 | 215 | 486 |
| 1:00 PM | 0 | 4 | 2 | 0 | 6 | 1 | 13 | 6 | 0 | 20 | 3 | 40 | 0 | 0 | 43 | 9 | 59 | 1 | 0 | 69 | 138 |
| 1:15 PM | 0 | 6 | 0 | 0 | 6 | 0 | 3 | 10 | 0 | 13 | 0 | 35 | 2 | 0 | 37 | 14 | 44 | 0 | 0 | 58 | 114 |
| 1:30 PM | 0 | 3 | 2 | 0 | 5 | 2 | 9 | 16 | 0 | 27 | 1 | 46 | 1 | 0 | 48 | 10 | 44 | 1 | 0 | 55 | 135 |
| 1:45 PM | 1 | 7 | 0 | 0 | 8 | 2 | 8 | 15 | 0 | 25 | 0 | 38 | 3 | 0 | 41 | 10 | 40 | 1 | 0 | 51 | 125 |
| Hourly Total | 1 | 20 | 4 | 0 | 25 | 5 | 33 | 47 | 0 | 85 | 4 | 159 | 6 | 0 | 169 | 43 | 187 | 3 | 0 | 233 | 512 |
| 2:00 PM | 0 | 3 | 1 | 0 | 4 | 2 | 6 | 6 | 0 | 14 | 1 | 42 | 2 | 0 | 45 | 12 | 52 | 2 | 0 | 66 | 129 |
| 2:15 PM | 0 | 3 | 1 | 0 | 4 | 2 | 5 | 25 | 0 | 32 | 0 | 49 | 5 | 0 | 54 | 12 | 38 | 1 | 0 | 51 | 141 |
| 2:30 PM | 0 | 3 | 2 | 0 | 5 | 2 | 4 | 26 | 0 | 32 | 1 | 48 | 4 | 0 | 53 | 10 | 44 | 0 | 0 | 54 | 144 |
| 2:45 PM | 1 | 4 | 1 | 0 | 6 | 9 | 8 | 15 | 0 | 32 | 6 | 57 | 2 | 0 | 65 | 17 | 57 | 0 | 0 | 74 | 177 |
| Hourly Total | 1 | 13 | 5 | 0 | 19 | 15 | 23 | 72 | 0 | 110 | 8 | 196 | 13 | 0 | 217 | 51 | 191 | 3 | 0 | 245 | 591 |
| 3:00 PM | 0 | 4 | 5 | 0 | 9 | 15 | 5 | 21 | 0 | 41 | 4 | 47 | 3 | 0 | 54 | 17 | 47 | 1 | 0 | 65 | 169 |
| 3:15 PM | 0 | 3 | 2 | 0 | 5 | 8 | 8 | 26 | 0 | 42 | 6 | 51 | 17 | 0 | 74 | 7 | 59 | 0 | 0 | 66 | 187 |
| 3:30 PM | 2 | 3 | 2 | 0 | 7 | 6 | 15 | 26 | 0 | 47 | 2 | 42 | 7 | 0 | 51 | 11 | 61 | 1 | 0 | 73 | 178 |
| 3:45 PM | 0 | 2 | 5 | 0 | 7 | 4 | 12 | 29 | 0 | 45 | 3 | 58 | 9 | 0 | 70 | 19 | 62 | 0 | 0 | 81 | 203 |
| Hourly Total | 2 | 12 | 14 | 0 | 28 | 33 | 40 | 102 | 0 | 175 | 15 | 198 | 36 | 0 | 249 | 54 | 229 | 2 | 0 | 285 | 737 |
| 4:00 PM | 0 | 9 | 4 | 0 | 13 | 9 | 17 | 30 | 0 | 56 | 7 | 57 | 8 | 0 | 72 | 18 | 68 | 0 | 0 | 86 | 227 |
| 4:15 PM | 1 | 5 | 1 | 0 | 7 | 7 | 23 | 31 | 0 | 61 | 6 | 58 | 12 | 0 | 76 | 23 | 67 | 1 | 0 | 91 | 235 |
| 4:30 PM | 1 | 11 | 4 | 0 | 16 | 10 | 16 | 36 | 0 | 62 | 4 | 65 | 5 | 0 | 74 | 20 | 67 | 0 | 0 | 87 | 239 |
| 4:45 PM | 0 | 4 | 5 | 0 | 9 | 9 | 27 | 38 | 0 | 74 | 3 | 56 | 13 | 0 | 72 | 23 | 51 | 0 | 0 | 74 | 229 |
| Hourly Total | 2 | 29 | 14 | 0 | 45 | 35 | 83 | 135 | 0 | 253 | 20 | 236 | 38 | 0 | 294 | 84 | 253 | 1 | 0 | 338 | 930 |
| 5:00 PM | 0 | 8 | 2 | 0 | 10 | 4 | 19 | 33 | 0 | 56 | 3 | 60 | 5 | 0 | 68 | 15 | 51 | 0 | 0 | 66 | 200 |
| 5:15 PM | 1 | 2 | 4 | 0 | 7 | 3 | 18 | 25 | 0 | 46 | 2 | 40 | 6 | 0 | 48 | 16 | 54 | 1 | 0 | 71 | 172 |
| 5:30 PM | 1 | 3 | 1 | 0 | 5 | 5 | 16 | 18 | 0 | 39 | 1 | 52 | 3 | 0 | 56 | 11 | 39 | 0 | 0 | 50 | 150 |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5:45 PM | 0 | 6 | 4 | 0 | 10 | 3 | 9 | 20 | 0 | 32 | 4 | 38 | 9 | 0 | 51 | 10 | 40 | 0 | 0 | 50 | 143 |
| Hourly Total | 2 | 19 | 11 | 0 | 32 | 15 | 62 | 96 | 0 | 173 | 10 | 190 | 23 | 0 | 223 | 52 | 184 | 1 | 0 | 237 | 665 |
| 6:00 PM | 0 | 5 | 2 | 0 | 7 | 3 | 5 | 16 | 0 | 24 | 0 | 29 | 3 | 0 | 32 | 2 | 33 | 0 | 0 | 35 | 98 |
| 6:15 PM | 1 | 6 | 1 | 0 | 8 | 4 | 8 | 22 | 0 | 34 | 4 | 33 | 5 | 0 | 42 | 11 | 37 | 0 | 0 | 48 | 132 |
| 6:30 PM | 0 | 1 | 2 | 0 | 3 | 3 | 9 | 9 | 0 | 21 | 5 | 24 | 3 | 0 | 32 | 7 | 26 | 1 | 0 | 34 | 90 |
| 6:45 PM | 0 | 3 | 1 | 0 | 4 | 2 | 8 | 9 | 0 | 19 | 3 | 21 | 3 | 0 | 27 | 6 | 12 | 0 | 0 | 18 | 68 |
| Hourly Total | 1 | 15 | 6 | 0 | 22 | 12 | 30 | 56 | 0 | 98 | 12 | 107 | 14 | 0 | 133 | 26 | 108 | 1 | 0 | 135 | 388 |
| 7:00 PM | 1 | 1 | 2 | 0 | 4 | 2 | 2 | 7 | 0 | 11 | 2 | 16 | 3 | 0 | 21 | 6 | 24 | 0 | 0 | 30 | 66 |
| 7:15 PM | 0 | 1 | 0 | 0 | 1 | 3 | 1 | 10 | 0 | 14 | 0 | 8 | 1 | 0 | 9 | 3 | 18 | 0 | 0 | 21 | 45 |
| 7:30 PM | 1 | 2 | 1 | 0 | 4 | 2 | 0 | 8 | 0 | 10 | 4 | 20 | 1 | 0 | 25 | 3 | 18 | 0 | 0 | 21 | 60 |
| 7:45 PM | 0 | 3 | 1 | 0 | 4 | 0 | 2 | 5 | 0 | 7 | 0 | 12 | 1 | 0 | 13 | 5 | 23 | 0 | 0 | 28 | 52 |
| Hourly Total | 2 | 7 | 4 | 0 | 13 | 7 | 5 | 30 | 0 | 42 | 6 | 56 | 6 | 0 | 68 | 17 | 83 | 0 | 0 | 100 | 223 |
| 8:00 PM | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 9 | 0 | 11 | 3 | 26 | 5 | 0 | 34 | 1 | 26 | 1 | 0 | 28 | 74 |
| 8:15 PM | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 9 | 0 | 10 | 1 | 13 | 1 | 0 | 15 | 11 | 21 | 1 | 0 | 33 | 59 |
| 8:30 PM | 0 | 1 | 0 | 0 | 1 | 1 | 2 | 3 | 0 | 6 | 0 | 9 | 2 | 0 | 11 | 4 | 18 | 1 | 0 | 23 | 41 |
| 8:45 PM | 0 | 2 | 1 | 0 | 3 | 2 | 3 | 4 | 0 | 9 | 3 | 13 | 3 | 0 | 19 | 10 | 11 | 0 | 0 | 21 | 52 |
| Hourly Total | 0 | 5 | 1 | 0 | 6 | 4 | 7 | 25 | 0 | 36 | 7 | 61 | 11 | 0 | 79 | 26 | 76 | 3 | 0 | 105 | 226 |
| 9:00 PM | 1 | 0 | 0 | 0 | 1 | 0 | 4 | 4 | 0 | 8 | 0 | 7 | 2 | 0 | 9 | 1 | 9 | 0 | 0 | 10 | 28 |
| 9:15 PM | 1 | 0 | 2 | 0 | 3 | 0 | 1 | 7 | 0 | 8 | 0 | 12 | 2 | 0 | 14 | 2 | 15 | 1 | 0 | 18 | 43 |
| 9:30 PM | 1 | 1 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 2 | 1 | 15 | 0 | 0 | 16 | 2 | 6 | 0 | 0 | 8 | 28 |
| 9:45 PM | 0 | 4 | 0 | 0 | 4 | 0 | 1 | 4 | 0 | 5 | 0 | 12 | 0 | 0 | 12 | 3 | 6 | 0 | 0 | 9 | 30 |
| Hourly Total | 3 | 5 | 2 | 0 | 10 | 1 | 6 | 16 | 0 | 23 | 1 | 46 | 4 | 0 | 51 | 8 | 36 | 1 | 0 | 45 | 129 |
| 10:00 PM | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 3 | 0 | 6 | 0 | 13 | 1 | 0 | 14 | 0 | 6 | 0 | 0 | 6 | 27 |
| 10:15 PM | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 4 | 0 | 5 | 0 | 5 | 1 | 0 | 6 | 1 | 12 | 0 | 0 | 13 | 25 |
| 10:30 PM | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 2 | 2 | 7 | 2 | 0 | 11 | 6 | 2 | 0 | 0 | 8 | 22 |
| 10:45 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 | 6 |
| Hourly Total | 0 | 1 | 2 | 0 | 3 | 3 | 3 | 9 | 0 | 15 | 2 | 25 | 4 | 0 | 31 | 7 | 24 | 0 | 0 | 31 | 80 |
| 11:00 PM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 2 | 0 | 2 | 1 | 0 | 3 | 0 | 1 | 0 | 0 | 1 | 7 |
| 11:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 2 | 1 | 2 | 0 | 0 | 3 | 6 |
| 11:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 0 | 0 | 3 | 0 | 5 | 0 | 0 | 5 | 9 |
| 11:45 PM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 3 | 8 |
| Hourly Total | 0 | 2 | 0 | 0 | 2 | 0 | 1 | 5 | 0 | 6 | 0 | 9 | 1 | 0 | 10 | 3 | 9 | 0 | 0 | 12 | 30 |
| Grand Total | 25 | 309 | 133 | 0 | 467 | 248 | 426 | 962 | 0 | 1636 | 136 | 2321 | 232 | 0 | 2689 | 820 | 2490 | 26 | 0 | 3336 | 8128 |
| Approach % | 5.4 | 66.2 | 28.5 | - | - | 15.2 | 26.0 | 58.8 | - | - | 5.1 | 86.3 | 8.6 | - | - | 24.6 | 74.6 | 0.8 | - | - | - |
| Total % | 0.3 | 3.8 | 1.6 | - | 5.7 | 3.1 | 5.2 | 11.8 | - | 20.1 | 1.7 | 28.6 | 2.9 | - | 33.1 | 10.1 | 30.6 | 0.3 | - | 41.0 | - |
| Lights | 23 | 296 | 117 | - | 436 | 234 | 407 | 913 | - | 1554 | 127 | 1809 | 208 | - | 2144 | 772 | 1891 | 25 | - | 2688 | 6822 |
| % Lights | 92.0 | 95.8 | 88.0 | - | 93.4 | 94.4 | 95.5 | 94.9 | - | 95.0 | 93.4 | 77.9 | 89.7 | - | 79.7 | 94.1 | 75.9 | 96.2 | - | 80.6 | 83.9 |
| Buses | 0 | 7 | 2 | - | 9 | 4 | 5 | 10 | - | 19 | 1 | 16 | 6 | - | 23 | 21 | 25 | 0 | - | 46 | 97 |
| % Buses | 0.0 | 2.3 | 1.5 | - | 1.9 | 1.6 | 1.2 | 1.0 | - | 1.2 | 0.7 | 0.7 | 2.6 | - | 0.9 | 2.6 | 1.0 | 0.0 | - | 1.4 | 1.2 |
| Trucks | 2 | 6 | 14 | - | 22 | 10 | 14 | 39 | - | 63 | 8 | 496 | 17 | - | 521 | 27 | 574 | 1 | - | 602 | 1208 |
| % Trucks | 8.0 | 1.9 | 10.5 | - | 4.7 | 4.0 | 3.3 | 4.1 | - | 3.9 | 5.9 | 21.4 | 7.3 | - | 19.4 | 3.3 | 23.1 | 3.8 | - | 18.0 | 14.9 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 1 | - | 1 | 0 | 0 | 0 | - | 0 | 1 |
| % Bicycles on Road | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.4 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Kimley-Horn
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 11 (Johnathan Carver Parkway) & CSAH 44 (Big Woods Boulevard)
Site Code:
Start Date: 10/21/2025


Turning Movement Data Plot

Kimley-Horn
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 11 (Johnathan Carver Parkway) & CSAH 44 (Big Woods Boulevard)
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (7:15 AM)

| Start Time | CSAH 44 Eastbound | | | | | CSAH 44 Westbound | | | | | CSAH 11 Northbound | | | | | CSAH 11 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 |
| 7:15 AM | 3 | 7 | 5 | 0 | 15 | 19 | 10 | 14 | 0 | 43 | 2 | 59 | 1 | 0 | 62 | 30 | 44 | 0 | 0 | 74 | 194 |
| 7:30 AM | 0 | 9 | 9 | 0 | 18 | 11 | 4 | 17 | 0 | 32 | 1 | 64 | 5 | 0 | 70 | 44 | 29 | 0 | 0 | 73 | 193 |
| 7:45 AM | 0 | 11 | 4 | 0 | 15 | 6 | 9 | 13 | 0 | 28 | 7 | 41 | 5 | 0 | 53 | 39 | 44 | 0 | 0 | 83 | 179 |
| 8:00 AM | 0 | 14 | 2 | 0 | 16 | 5 | 3 | 13 | 0 | 21 | 1 | 29 | 4 | 0 | 34 | 38 | 37 | 2 | 0 | 77 | 148 |
| Total | 3 | 41 | 20 | 0 | 64 | 41 | 26 | 57 | 0 | 124 | 11 | 193 | 15 | 0 | 219 | 151 | 154 | 2 | 0 | 307 | 714 |
| Approach % | 4.7 | 64.1 | 31.3 | - | - | 33.1 | 21.0 | 46.0 | - | - | 5.0 | 88.1 | 6.8 | - | - | 49.2 | 50.2 | 0.7 | - | - | - |
| Total % | 0.4 | 5.7 | 2.8 | - | 9.0 | 5.7 | 3.6 | 8.0 | - | 17.4 | 1.5 | 27.0 | 2.1 | - | 30.7 | 21.1 | 21.6 | 0.3 | - | 43.0 | - |
| PHF | 0.250 | 0.732 | 0.556 | - | 0.889 | 0.539 | 0.650 | 0.838 | - | 0.721 | 0.393 | 0.754 | 0.750 | - | 0.782 | 0.858 | 0.875 | 0.250 | - | 0.925 | 0.920 |
| Lights | 1 | 40 | 17 | - | 58 | 38 | 25 | 55 | - | 118 | 9 | 137 | 11 | - | 157 | 147 | 124 | 1 | - | 272 | 605 |
| % Lights | 33.3 | 97.6 | 85.0 | - | 90.6 | 92.7 | 96.2 | 96.5 | - | 95.2 | 81.8 | 71.0 | 73.3 | - | 71.7 | 97.4 | 80.5 | 50.0 | - | 88.6 | 84.7 |
| Buses | 0 | 0 | 1 | - | 1 | 3 | 1 | 0 | - | 4 | 0 | 2 | 1 | - | 3 | 0 | 0 | 0 | - | 0 | 8 |
| % Buses | 0.0 | 0.0 | 5.0 | - | 1.6 | 7.3 | 3.8 | 0.0 | - | 3.2 | 0.0 | 1.0 | 6.7 | - | 1.4 | 0.0 | 0.0 | 0.0 | - | 0.0 | 1.1 |
| Trucks | 2 | 1 | 2 | - | 5 | 0 | 0 | 2 | - | 2 | 2 | 54 | 3 | - | 59 | 4 | 30 | 1 | - | 35 | 101 |
| % Trucks | 66.7 | 2.4 | 10.0 | - | 7.8 | 0.0 | 0.0 | 3.5 | - | 1.6 | 18.2 | 28.0 | 20.0 | - | 26.9 | 2.6 | 19.5 | 50.0 | - | 11.4 | 14.1 |
| 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 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Kimley-Horn
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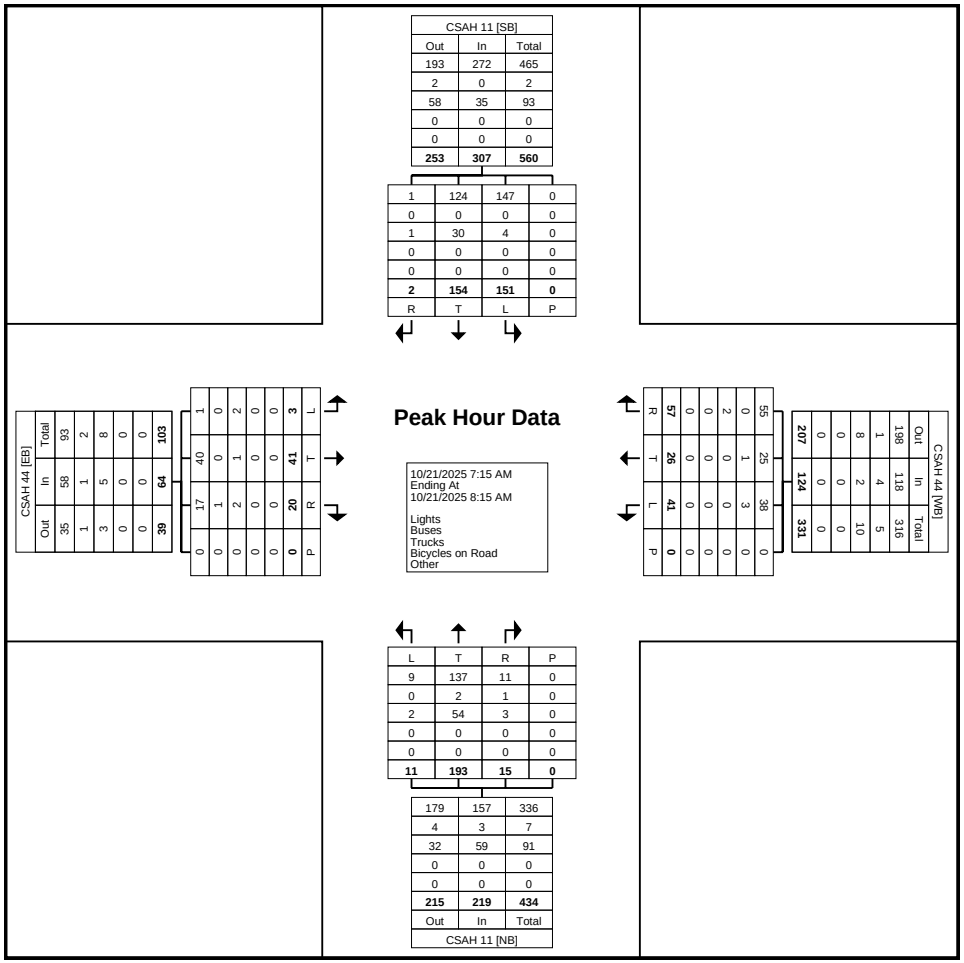
Count Name: CSAH 11 (Johnathan Carver Parkway) & CSAH 44 (Big Woods Boulevard)
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (7:15 AM)

Kimley-Horn
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(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 11 (Johnathan Carver Parkway) & CSAH 44 (Big Woods Boulevard)
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (4:00 PM)

| Start Time | CSAH 44 Eastbound | | | | | CSAH 44 Westbound | | | | | CSAH 11 Northbound | | | | | CSAH 11 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 | 0 | 9 | 4 | 0 | 13 | 9 | 17 | 30 | 0 | 56 | 7 | 57 | 8 | 0 | 72 | 18 | 68 | 0 | 0 | 86 | 227 |
| 4:15 PM | 1 | 5 | 1 | 0 | 7 | 7 | 23 | 31 | 0 | 61 | 6 | 58 | 12 | 0 | 76 | 23 | 67 | 1 | 0 | 91 | 235 |
| 4:30 PM | 1 | 11 | 4 | 0 | 16 | 10 | 16 | 36 | 0 | 62 | 4 | 65 | 5 | 0 | 74 | 20 | 67 | 0 | 0 | 87 | 239 |
| 4:45 PM | 0 | 4 | 5 | 0 | 9 | 9 | 27 | 38 | 0 | 74 | 3 | 56 | 13 | 0 | 72 | 23 | 51 | 0 | 0 | 74 | 229 |
| Total | 2 | 29 | 14 | 0 | 45 | 35 | 83 | 135 | 0 | 253 | 20 | 236 | 38 | 0 | 294 | 84 | 253 | 1 | 0 | 338 | 930 |
| Approach % | 4.4 | 64.4 | 31.1 | - | - | 13.8 | 32.8 | 53.4 | - | - | 6.8 | 80.3 | 12.9 | - | - | 24.9 | 74.9 | 0.3 | - | - | - |
| Total % | 0.2 | 3.1 | 1.5 | - | 4.8 | 3.8 | 8.9 | 14.5 | - | 27.2 | 2.2 | 25.4 | 4.1 | - | 31.6 | 9.0 | 27.2 | 0.1 | - | 36.3 | - |
| PHF | 0.500 | 0.659 | 0.700 | - | 0.703 | 0.875 | 0.769 | 0.888 | - | 0.855 | 0.714 | 0.908 | 0.731 | - | 0.967 | 0.913 | 0.930 | 0.250 | - | 0.929 | 0.973 |
| Lights | 2 | 25 | 12 | - | 39 | 33 | 81 | 135 | - | 249 | 18 | 191 | 38 | - | 247 | 71 | 201 | 1 | - | 273 | 808 |
| % Lights | 100.0 | 86.2 | 85.7 | - | 86.7 | 94.3 | 97.6 | 100.0 | - | 98.4 | 90.0 | 80.9 | 100.0 | - | 84.0 | 84.5 | 79.4 | 100.0 | - | 80.8 | 86.9 |
| Buses | 0 | 3 | 1 | - | 4 | 1 | 0 | 0 | - | 1 | 1 | 3 | 0 | - | 4 | 10 | 15 | 0 | - | 25 | 34 |
| % Buses | 0.0 | 10.3 | 7.1 | - | 8.9 | 2.9 | 0.0 | 0.0 | - | 0.4 | 5.0 | 1.3 | 0.0 | - | 1.4 | 11.9 | 5.9 | 0.0 | - | 7.4 | 3.7 |
| Trucks | 0 | 1 | 1 | - | 2 | 1 | 2 | 0 | - | 3 | 1 | 42 | 0 | - | 43 | 3 | 37 | 0 | - | 40 | 88 |
| % Trucks | 0.0 | 3.4 | 7.1 | - | 4.4 | 2.9 | 2.4 | 0.0 | - | 1.2 | 5.0 | 17.8 | 0.0 | - | 14.6 | 3.6 | 14.6 | 0.0 | - | 11.8 | 9.5 |
| 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 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Kimley-Horn
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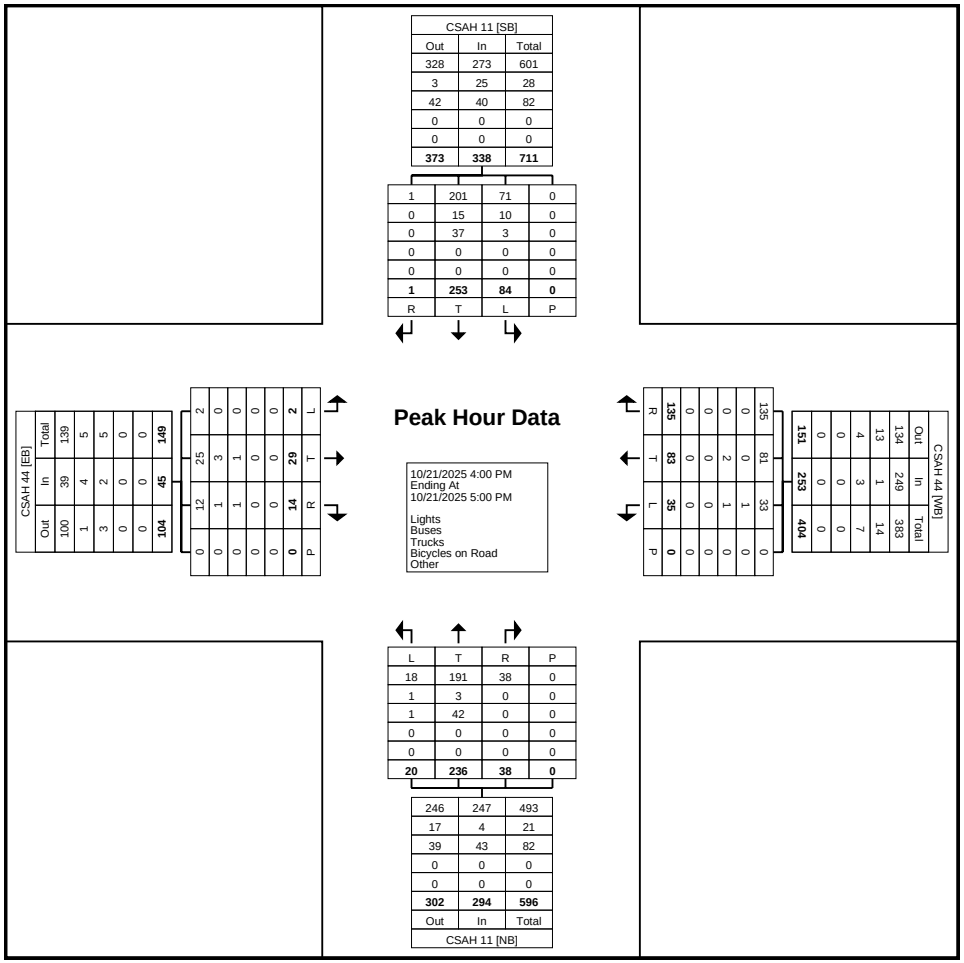
Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 11 (Johnathan Carver Parkway) & CSAH 44 (Big Woods Boulevard)
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (4:00 PM)

Kimley-Horn
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 11 (Johnathan Carver Parkway) & CSAH 61 (Chaska Boulevard)
Site Code:
Start Date: 10/21/2025


# Turning Movement Data

| Start Time | Levi Griffin Rd Eastbound | | | | | CSAH 61 Westbound | | | | | CSAH 11 Northbound | | | | | CSAH 11 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 | 2 | 0 | 0 | 2 | 34 | 1 | 9 | 0 | 44 | 6 | 47 | 52 | 0 | 105 | 5 | 22 | 2 | 0 | 29 | 180 |
| 7:15 AM | 0 | 0 | 3 | 0 | 3 | 46 | 2 | 9 | 0 | 57 | 6 | 56 | 89 | 0 | 151 | 18 | 49 | 1 | 0 | 68 | 279 |
| 7:30 AM | 1 | 2 | 9 | 0 | 12 | 61 | 3 | 11 | 0 | 75 | 9 | 52 | 112 | 0 | 173 | 9 | 32 | 6 | 0 | 47 | 307 |
| 7:45 AM | 1 | 4 | 8 | 0 | 13 | 35 | 5 | 8 | 0 | 48 | 11 | 37 | 84 | 0 | 132 | 13 | 41 | 0 | 0 | 54 | 247 |
| Hourly Total | 2 | 8 | 20 | 0 | 30 | 176 | 11 | 37 | 0 | 224 | 32 | 192 | 337 | 0 | 561 | 45 | 144 | 9 | 0 | 198 | 1013 |
| 8:00 AM | 1 | 1 | 6 | 0 | 8 | 44 | 4 | 7 | 0 | 55 | 16 | 29 | 62 | 0 | 107 | 9 | 31 | 3 | 0 | 43 | 213 |
| 8:15 AM | 2 | 2 | 6 | 0 | 10 | 30 | 4 | 7 | 0 | 41 | 9 | 31 | 50 | 0 | 90 | 7 | 36 | 7 | 0 | 50 | 191 |
| 8:30 AM | 4 | 3 | 7 | 0 | 14 | 48 | 7 | 12 | 0 | 67 | 7 | 25 | 49 | 0 | 81 | 11 | 34 | 2 | 0 | 47 | 209 |
| 8:45 AM | 1 | 1 | 9 | 0 | 11 | 34 | 6 | 9 | 0 | 49 | 14 | 29 | 49 | 0 | 92 | 8 | 35 | 6 | 0 | 49 | 201 |
| Hourly Total | 8 | 7 | 28 | 0 | 43 | 156 | 21 | 35 | 0 | 212 | 46 | 114 | 210 | 0 | 370 | 35 | 136 | 18 | 0 | 189 | 814 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4:00 PM | 14 | 7 | 36 | 0 | 57 | 62 | 8 | 9 | 0 | 79 | 29 | 52 | 44 | 0 | 125 | 19 | 48 | 9 | 0 | 76 | 337 |
| 4:15 PM | 16 | 6 | 25 | 0 | 47 | 75 | 10 | 10 | 0 | 95 | 17 | 46 | 45 | 0 | 108 | 19 | 45 | 13 | 0 | 77 | 327 |
| 4:30 PM | 11 | 12 | 20 | 0 | 43 | 75 | 12 | 11 | 0 | 98 | 29 | 55 | 48 | 0 | 132 | 24 | 53 | 8 | 0 | 85 | 358 |
| 4:45 PM | 17 | 7 | 27 | 0 | 51 | 78 | 5 | 11 | 0 | 94 | 28 | 46 | 58 | 0 | 132 | 14 | 40 | 8 | 0 | 62 | 339 |
| Hourly Total | 58 | 32 | 108 | 0 | 198 | 290 | 35 | 41 | 0 | 366 | 103 | 199 | 195 | 0 | 497 | 76 | 186 | 38 | 0 | 300 | 1361 |
| 5:00 PM | 9 | 9 | 38 | 0 | 56 | 60 | 5 | 9 | 0 | 74 | 22 | 47 | 53 | 0 | 122 | 10 | 35 | 10 | 0 | 55 | 307 |
| 5:15 PM | 6 | 7 | 18 | 0 | 31 | 69 | 3 | 14 | 0 | 86 | 21 | 33 | 53 | 0 | 107 | 10 | 51 | 6 | 0 | 67 | 291 |
| 5:30 PM | 7 | 4 | 31 | 0 | 42 | 55 | 5 | 11 | 0 | 71 | 22 | 30 | 41 | 0 | 93 | 7 | 36 | 3 | 0 | 46 | 252 |
| 5:45 PM | 9 | 3 | 20 | 0 | 32 | 50 | 3 | 9 | 0 | 62 | 20 | 33 | 37 | 0 | 90 | 10 | 34 | 6 | 0 | 50 | 234 |
| Hourly Total | 31 | 23 | 107 | 0 | 161 | 234 | 16 | 43 | 0 | 293 | 85 | 143 | 184 | 0 | 412 | 37 | 156 | 25 | 0 | 218 | 1084 |
| Grand Total | 99 | 70 | 263 | 0 | 432 | 856 | 83 | 156 | 0 | 1095 | 266 | 648 | 926 | 0 | 1840 | 193 | 622 | 90 | 0 | 905 | 4272 |
| Approach % | 22.9 | 16.2 | 60.9 | - | - | 78.2 | 7.6 | 14.2 | - | - | 14.5 | 35.2 | 50.3 | - | - | 21.3 | 68.7 | 9.9 | - | - | - |
| Total % | 2.3 | 1.6 | 6.2 | - | 10.1 | 20.0 | 1.9 | 3.7 | - | 25.6 | 6.2 | 15.2 | 21.7 | - | 43.1 | 4.5 | 14.6 | 2.1 | - | 21.2 | - |
| Lights | 98 | 65 | 259 | - | 422 | 779 | 81 | 138 | - | 998 | 262 | 506 | 863 | - | 1631 | 157 | 514 | 87 | - | 758 | 3809 |
| % Lights | 99.0 | 92.9 | 98.5 | - | 97.7 | 91.0 | 97.6 | 88.5 | - | 91.1 | 98.5 | 78.1 | 93.2 | - | 88.6 | 81.3 | 82.6 | 96.7 | - | 83.8 | 89.2 |
| Buses | 0 | 0 | 0 | - | 0 | 9 | 0 | 0 | - | 9 | 0 | 9 | 12 | - | 21 | 15 | 5 | 0 | - | 20 | 50 |
| % Buses | 0.0 | 0.0 | 0.0 | - | 0.0 | 1.1 | 0.0 | 0.0 | - | 0.8 | 0.0 | 1.4 | 1.3 | - | 1.1 | 7.8 | 0.8 | 0.0 | - | 2.2 | 1.2 |
| Trucks | 1 | 5 | 4 | - | 10 | 68 | 2 | 18 | - | 88 | 4 | 133 | 51 | - | 188 | 21 | 103 | 3 | - | 127 | 413 |
| % Trucks | 1.0 | 7.1 | 1.5 | - | 2.3 | 7.9 | 2.4 | 11.5 | - | 8.0 | 1.5 | 20.5 | 5.5 | - | 10.2 | 10.9 | 16.6 | 3.3 | - | 14.0 | 9.7 |
| 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 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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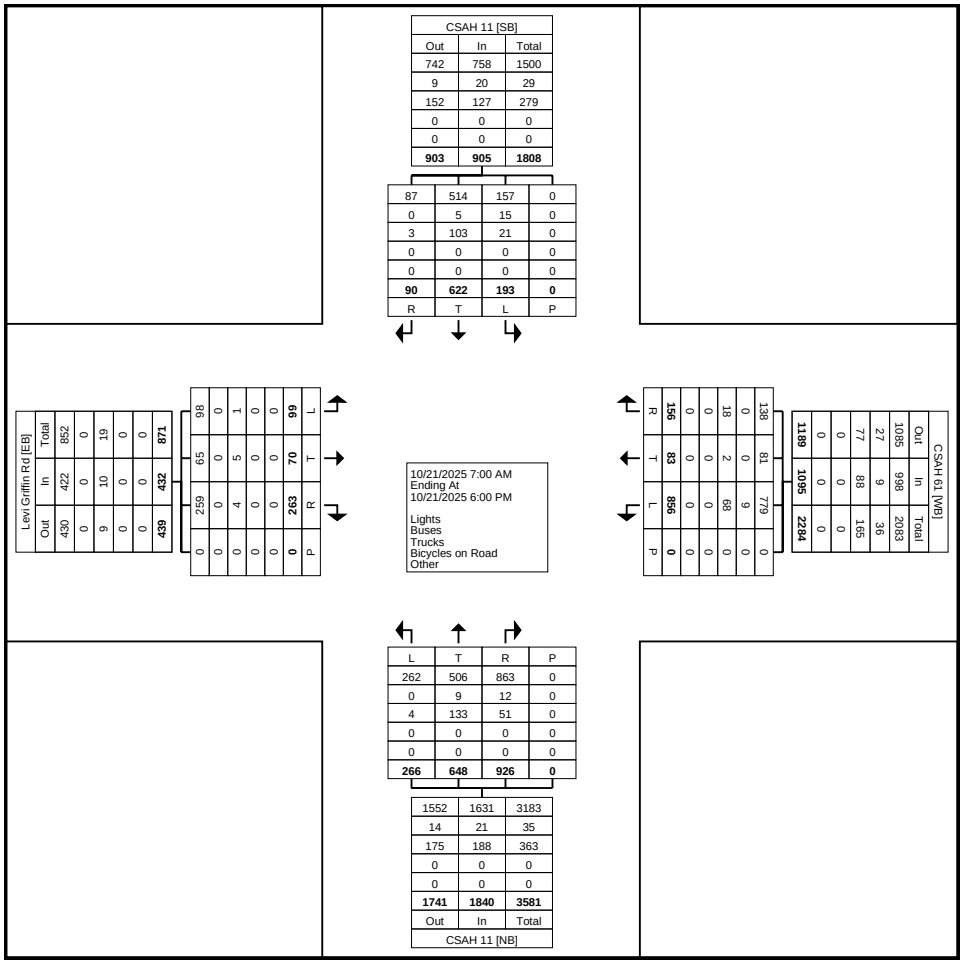
Count Name: CSAH 11 (Johnathan Carver Parkway) & CSAH 61 (Chaska Boulevard)
Site Code:
Start Date: 10/21/2025


Turning Movement Data Plot

Kimley-Horn
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Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 11 (Johnathan Carver Parkway) & CSAH 61 (Chaska Boulevard)
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (7:15 AM)

| Start Time | Levi Griffin Rd Eastbound | | | | | CSAH 61 Westbound | | | | | CSAH 11 Northbound | | | | | CSAH 11 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 |
| 7:15 AM | 0 | 0 | 3 | 0 | 3 | 46 | 2 | 9 | 0 | 57 | 6 | 56 | 89 | 0 | 151 | 18 | 49 | 1 | 0 | 68 | 279 |
| 7:30 AM | 1 | 2 | 9 | 0 | 12 | 61 | 3 | 11 | 0 | 75 | 9 | 52 | 112 | 0 | 173 | 9 | 32 | 6 | 0 | 47 | 307 |
| 7:45 AM | 1 | 4 | 8 | 0 | 13 | 35 | 5 | 8 | 0 | 48 | 11 | 37 | 84 | 0 | 132 | 13 | 41 | 0 | 0 | 54 | 247 |
| 8:00 AM | 1 | 1 | 6 | 0 | 8 | 44 | 4 | 7 | 0 | 55 | 16 | 29 | 62 | 0 | 107 | 9 | 31 | 3 | 0 | 43 | 213 |
| Total | 3 | 7 | 26 | 0 | 36 | 186 | 14 | 35 | 0 | 235 | 42 | 174 | 347 | 0 | 563 | 49 | 153 | 10 | 0 | 212 | 1046 |
| Approach % | 8.3 | 19.4 | 72.2 | - | - | 79.1 | 6.0 | 14.9 | - | - | 7.5 | 30.9 | 61.6 | - | - | 23.1 | 72.2 | 4.7 | - | - | - |
| Total % | 0.3 | 0.7 | 2.5 | - | 3.4 | 17.8 | 1.3 | 3.3 | - | 22.5 | 4.0 | 16.6 | 33.2 | - | 53.8 | 4.7 | 14.6 | 1.0 | - | 20.3 | - |
| PHF | 0.750 | 0.438 | 0.722 | - | 0.692 | 0.762 | 0.700 | 0.795 | - | 0.783 | 0.656 | 0.777 | 0.775 | - | 0.814 | 0.681 | 0.781 | 0.417 | - | 0.779 | 0.852 |
| Lights | 3 | 6 | 24 | - | 33 | 153 | 13 | 29 | - | 195 | 41 | 118 | 330 | - | 489 | 43 | 129 | 9 | - | 181 | 898 |
| % Lights | 100.0 | 85.7 | 92.3 | - | 91.7 | 82.3 | 92.9 | 82.9 | - | 83.0 | 97.6 | 67.8 | 95.1 | - | 86.9 | 87.8 | 84.3 | 90.0 | - | 85.4 | 85.9 |
| Buses | 0 | 0 | 0 | - | 0 | 5 | 0 | 0 | - | 5 | 0 | 3 | 2 | - | 5 | 0 | 4 | 0 | - | 4 | 14 |
| % Buses | 0.0 | 0.0 | 0.0 | - | 0.0 | 2.7 | 0.0 | 0.0 | - | 2.1 | 0.0 | 1.7 | 0.6 | - | 0.9 | 0.0 | 2.6 | 0.0 | - | 1.9 | 1.3 |
| Trucks | 0 | 1 | 2 | - | 3 | 28 | 1 | 6 | - | 35 | 1 | 53 | 15 | - | 69 | 6 | 20 | 1 | - | 27 | 134 |
| % Trucks | 0.0 | 14.3 | 7.7 | - | 8.3 | 15.1 | 7.1 | 17.1 | - | 14.9 | 2.4 | 30.5 | 4.3 | - | 12.3 | 12.2 | 13.1 | 10.0 | - | 12.7 | 12.8 |
| 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 | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Kimley-Horn
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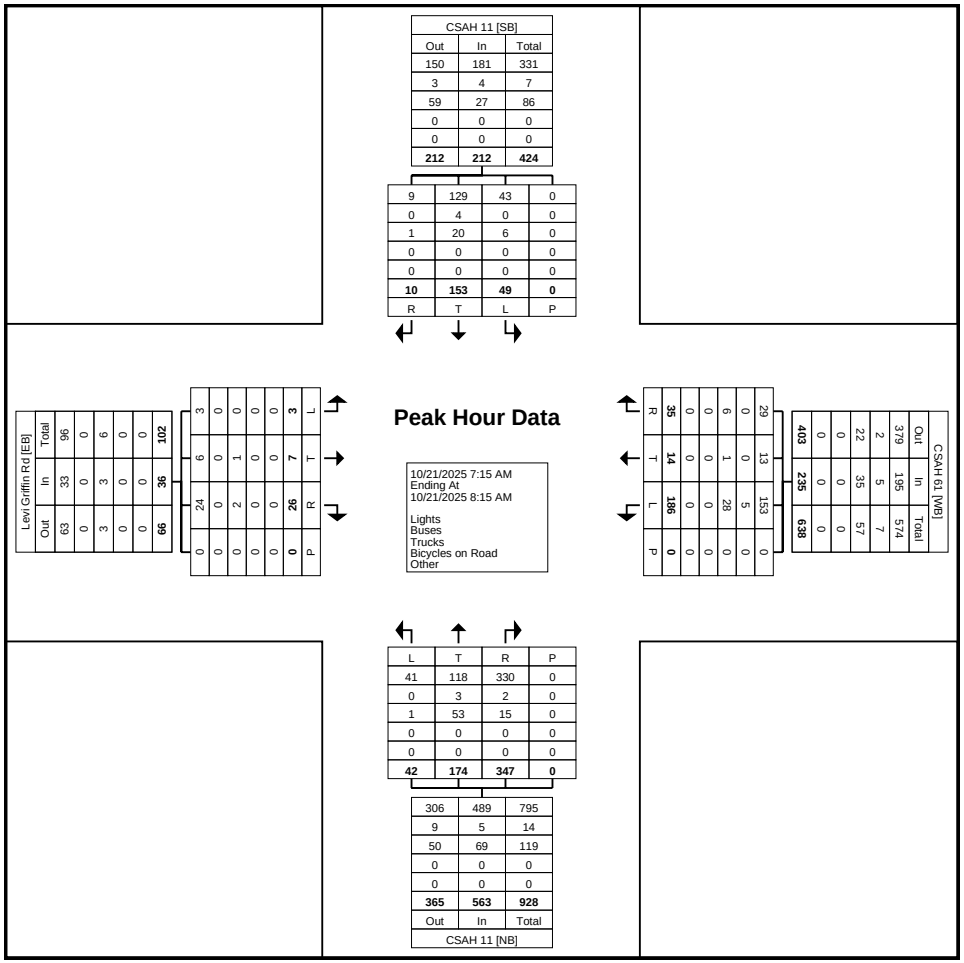
Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 11 (Johnathan Carver Parkway) & CSAH 61 (Chaska Boulevard)
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (7:15 AM)

Kimley-Horn
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 11 (Johnathan Carver Parkway) & CSAH 61 (Chaska Boulevard)
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (4:00 PM)

| Start Time | Levi Griffin Rd Eastbound | | | | | CSAH 61 Westbound | | | | | CSAH 11 Northbound | | | | | CSAH 11 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 | 14 | 7 | 36 | 0 | 57 | 62 | 8 | 9 | 0 | 79 | 29 | 52 | 44 | 0 | 125 | 19 | 48 | 9 | 0 | 76 | 337 |
| 4:15 PM | 16 | 6 | 25 | 0 | 47 | 75 | 10 | 10 | 0 | 95 | 17 | 46 | 45 | 0 | 108 | 19 | 45 | 13 | 0 | 77 | 327 |
| 4:30 PM | 11 | 12 | 20 | 0 | 43 | 75 | 12 | 11 | 0 | 98 | 29 | 55 | 48 | 0 | 132 | 24 | 53 | 8 | 0 | 85 | 358 |
| 4:45 PM | 17 | 7 | 27 | 0 | 51 | 78 | 5 | 11 | 0 | 94 | 28 | 46 | 58 | 0 | 132 | 14 | 40 | 8 | 0 | 62 | 339 |
| Total | 58 | 32 | 108 | 0 | 198 | 290 | 35 | 41 | 0 | 366 | 103 | 199 | 195 | 0 | 497 | 76 | 186 | 38 | 0 | 300 | 1361 |
| Approach % | 29.3 | 16.2 | 54.5 | - | - | 79.2 | 9.6 | 11.2 | - | - | 20.7 | 40.0 | 39.2 | - | - | 25.3 | 62.0 | 12.7 | - | - | - |
| Total % | 4.3 | 2.4 | 7.9 | - | 14.5 | 21.3 | 2.6 | 3.0 | - | 26.9 | 7.6 | 14.6 | 14.3 | - | 36.5 | 5.6 | 13.7 | 2.8 | - | 22.0 | - |
| PHF | 0.853 | 0.667 | 0.750 | - | 0.868 | 0.929 | 0.729 | 0.932 | - | 0.934 | 0.888 | 0.905 | 0.841 | - | 0.941 | 0.792 | 0.877 | 0.731 | - | 0.882 | 0.950 |
| Lights | 58 | 31 | 107 | - | 196 | 273 | 35 | 39 | - | 347 | 102 | 156 | 179 | - | 437 | 57 | 153 | 37 | - | 247 | 1227 |
| % Lights | 100.0 | 96.9 | 99.1 | - | 99.0 | 94.1 | 100.0 | 95.1 | - | 94.8 | 99.0 | 78.4 | 91.8 | - | 87.9 | 75.0 | 82.3 | 97.4 | - | 82.3 | 90.2 |
| Buses | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | - | 1 | 0 | 4 | 8 | - | 12 | 14 | 1 | 0 | - | 15 | 28 |
| % Buses | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.3 | 0.0 | 0.0 | - | 0.3 | 0.0 | 2.0 | 4.1 | - | 2.4 | 18.4 | 0.5 | 0.0 | - | 5.0 | 2.1 |
| Trucks | 0 | 1 | 1 | - | 2 | 16 | 0 | 2 | - | 18 | 1 | 39 | 8 | - | 48 | 5 | 32 | 1 | - | 38 | 106 |
| % Trucks | 0.0 | 3.1 | 0.9 | - | 1.0 | 5.5 | 0.0 | 4.9 | - | 4.9 | 1.0 | 19.6 | 4.1 | - | 9.7 | 6.6 | 17.2 | 2.6 | - | 12.7 | 7.8 |
| 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 | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Kimley-Horn
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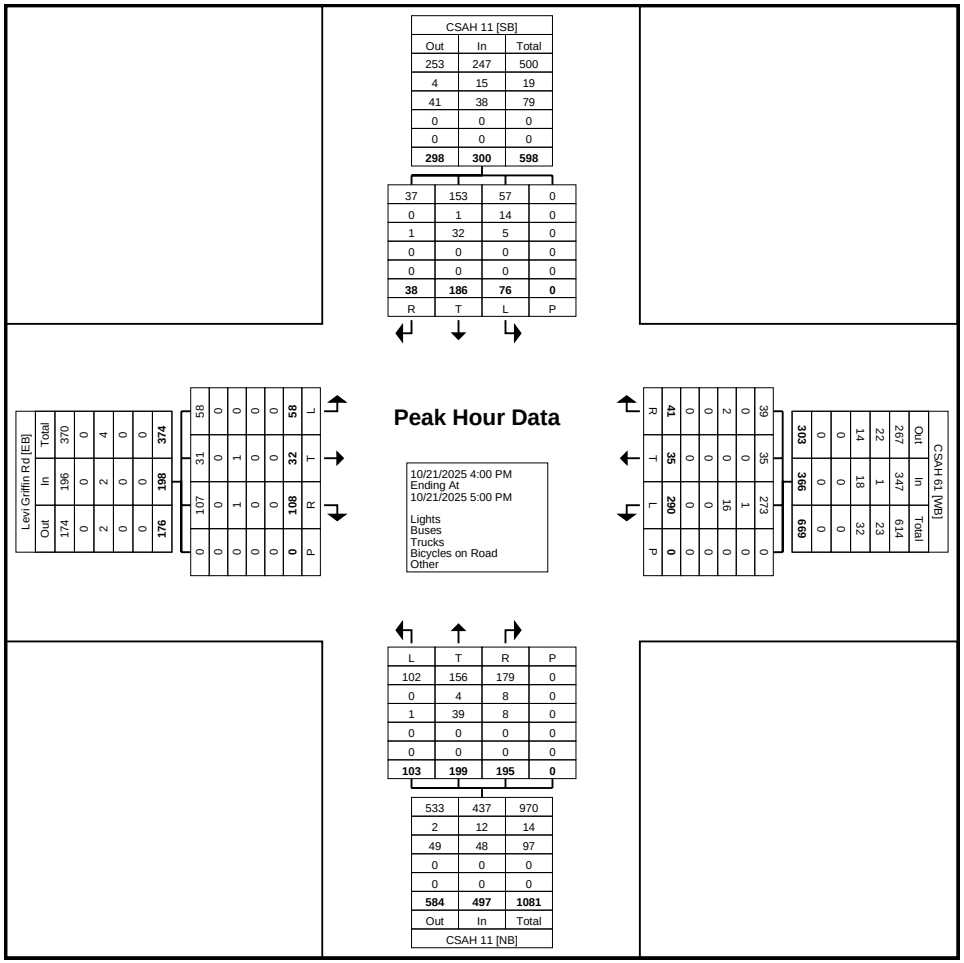
Count Name: CSAH 11 (Johnathan Carver Parkway) & CSAH 61 (Chaska Boulevard)
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (4:00 PM)

Kimley-Horn
4201 Winfield Road Suite 600

Warrenville, Illinois, United States 60555
(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 11 (Johnathan Carver Parkway) & US Highway 212 Westbound Ramps
Site Code:
Start Date: 10/21/2025


# Turning Movement Data

| Start Time | US Hwy 212 WB On-Ramp Eastbound | | | | | US Hwy 212 WB Off-Ramp Westbound | | | | | CSAH 11 Northbound | | | | | CSAH 11 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 | 1 | 0 | 0 | 1 | 46 | 0 | 2 | 0 | 48 | 11 | 103 | 0 | 0 | 114 | 0 | 41 | 18 | 0 | 59 | 222 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 53 | 0 | 4 | 0 | 57 | 8 | 147 | 0 | 0 | 155 | 0 | 56 | 25 | 0 | 81 | 293 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 39 | 0 | 12 | 0 | 51 | 10 | 150 | 0 | 0 | 160 | 0 | 76 | 35 | 0 | 111 | 322 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 61 | 0 | 5 | 0 | 66 | 11 | 130 | 0 | 0 | 141 | 0 | 52 | 31 | 0 | 83 | 290 |
| Hourly Total | 0 | 1 | 0 | 0 | 1 | 199 | 0 | 23 | 0 | 222 | 40 | 530 | 0 | 0 | 570 | 0 | 225 | 109 | 0 | 334 | 1127 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 46 | 0 | 5 | 0 | 51 | 31 | 99 | 0 | 0 | 130 | 0 | 49 | 33 | 0 | 82 | 263 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 4 | 0 | 54 | 13 | 86 | 0 | 0 | 99 | 0 | 41 | 27 | 0 | 68 | 221 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 52 | 0 | 6 | 0 | 58 | 9 | 76 | 0 | 0 | 85 | 0 | 51 | 34 | 0 | 85 | 228 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 41 | 0 | 8 | 0 | 49 | 6 | 83 | 0 | 0 | 89 | 0 | 49 | 30 | 0 | 79 | 217 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 189 | 0 | 23 | 0 | 212 | 59 | 344 | 0 | 0 | 403 | 0 | 190 | 124 | 0 | 314 | 929 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4:00 PM | 0 | 1 | 0 | 0 | 1 | 186 | 0 | 22 | 0 | 208 | 7 | 105 | 0 | 0 | 112 | 0 | 85 | 66 | 0 | 151 | 472 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 196 | 0 | 22 | 0 | 218 | 15 | 92 | 0 | 0 | 107 | 0 | 78 | 65 | 0 | 143 | 468 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 204 | 0 | 24 | 0 | 228 | 14 | 98 | 0 | 0 | 112 | 0 | 83 | 64 | 0 | 147 | 487 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 177 | 0 | 25 | 0 | 202 | 14 | 105 | 0 | 0 | 119 | 0 | 86 | 60 | 0 | 146 | 467 |
| Hourly Total | 0 | 1 | 0 | 0 | 1 | 763 | 0 | 93 | 0 | 856 | 50 | 400 | 0 | 0 | 450 | 0 | 332 | 255 | 0 | 587 | 1894 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 172 | 0 | 25 | 0 | 197 | 14 | 104 | 0 | 0 | 118 | 0 | 76 | 56 | 0 | 132 | 447 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 188 | 0 | 29 | 0 | 217 | 9 | 65 | 0 | 0 | 74 | 0 | 75 | 57 | 0 | 132 | 423 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 172 | 0 | 31 | 0 | 203 | 11 | 66 | 0 | 0 | 77 | 0 | 64 | 52 | 0 | 116 | 396 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 168 | 0 | 20 | 0 | 188 | 12 | 73 | 0 | 0 | 85 | 0 | 67 | 41 | 0 | 108 | 381 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 700 | 0 | 105 | 0 | 805 | 46 | 308 | 0 | 0 | 354 | 0 | 282 | 206 | 0 | 488 | 1647 |
| Grand Total | 0 | 2 | 0 | 0 | 2 | 1851 | 0 | 244 | 0 | 2095 | 195 | 1582 | 0 | 0 | 1777 | 0 | 1029 | 694 | 0 | 1723 | 5597 |
| Approach % | 0.0 | 100.0 | 0.0 | - | - | 88.4 | 0.0 | 11.6 | - | - | 11.0 | 89.0 | 0.0 | - | - | 0.0 | 59.7 | 40.3 | - | - | - |
| Total % | 0.0 | 0.0 | 0.0 | - | 0.0 | 33.1 | 0.0 | 4.4 | - | 37.4 | 3.5 | 28.3 | 0.0 | - | 31.7 | 0.0 | 18.4 | 12.4 | - | 30.8 | - |
| Lights | 0 | 2 | 0 | - | 2 | 1747 | 0 | 234 | - | 1981 | 176 | 1387 | 0 | - | 1563 | 0 | 905 | 642 | - | 1547 | 5093 |
| % Lights | - | 100.0 | - | - | 100.0 | 94.4 | - | 95.9 | - | 94.6 | 90.3 | 87.7 | - | - | 88.0 | - | 87.9 | 92.5 | - | 89.8 | 91.0 |
| Buses | 0 | 0 | 0 | - | 0 | 15 | 0 | 2 | - | 17 | 4 | 20 | 0 | - | 24 | 0 | 15 | 1 | - | 16 | 57 |
| % Buses | - | 0.0 | - | - | 0.0 | 0.8 | - | 0.8 | - | 0.8 | 2.1 | 1.3 | - | - | 1.4 | - | 1.5 | 0.1 | - | 0.9 | 1.0 |
| Trucks | 0 | 0 | 0 | - | 0 | 89 | 0 | 8 | - | 97 | 15 | 175 | 0 | - | 190 | 0 | 109 | 51 | - | 160 | 447 |
| % Trucks | - | 0.0 | - | - | 0.0 | 4.8 | - | 3.3 | - | 4.6 | 7.7 | 11.1 | - | - | 10.7 | - | 10.6 | 7.3 | - | 9.3 | 8.0 |
| 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 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Kimley-Horn
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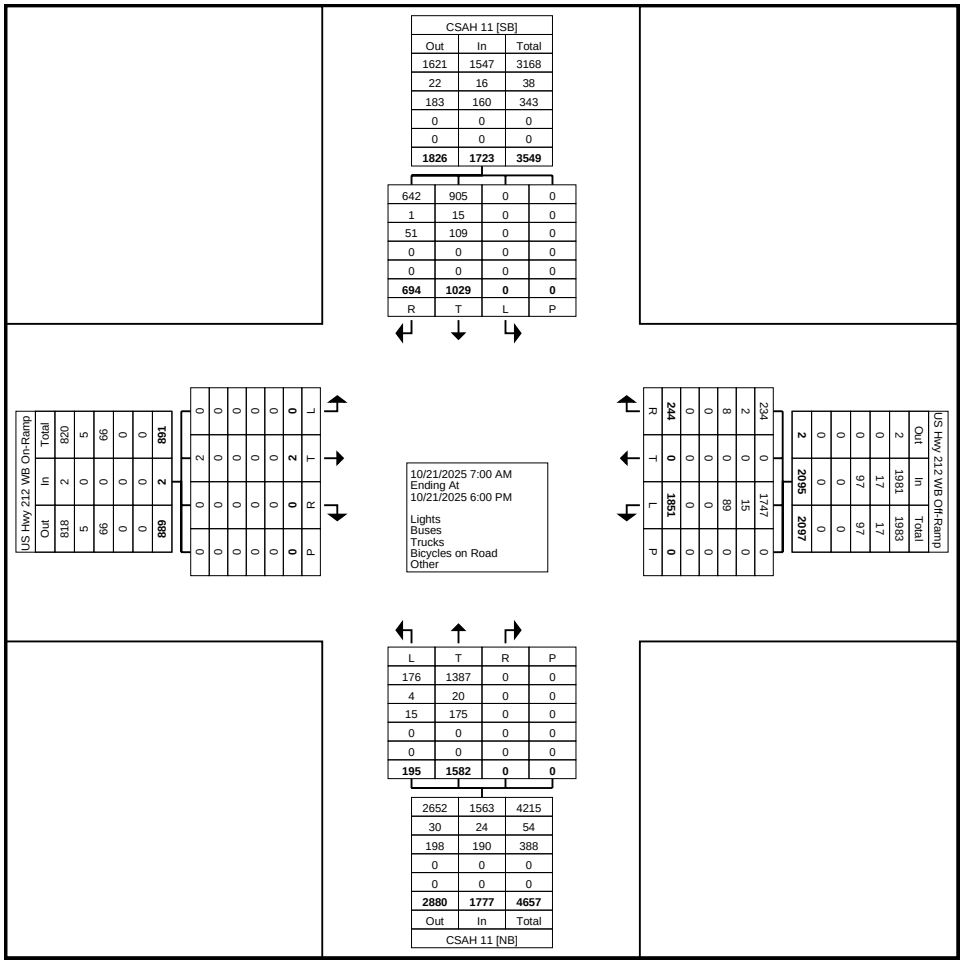
Count Name: CSAH 11 (Johnathan Carver Parkway) & US Highway 212 Westbound Ramps
Site Code:
Start Date: 10/21/2025
Page No: 3




Turning Movement Data Plot

Kimley-Horn
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(630) 487-5550 ethan.scowcroft@kimley-horn.com

Count Name: CSAH 11 (Johnathan Carver Parkway) & US Highway 212 Westbound Ramps
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (7:15 AM)

| Start Time | US Hwy 212 WB On-Ramp Eastbound | | | | | US Hwy 212 WB Off-Ramp Westbound | | | | | CSAH 11 Northbound | | | | | CSAH 11 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 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 53 | 0 | 4 | 0 | 57 | 8 | 147 | 0 | 0 | 155 | 0 | 56 | 25 | 0 | 81 | 293 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 39 | 0 | 12 | 0 | 51 | 10 | 150 | 0 | 0 | 160 | 0 | 76 | 35 | 0 | 111 | 322 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 61 | 0 | 5 | 0 | 66 | 11 | 130 | 0 | 0 | 141 | 0 | 52 | 31 | 0 | 83 | 290 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 46 | 0 | 5 | 0 | 51 | 31 | 99 | 0 | 0 | 130 | 0 | 49 | 33 | 0 | 82 | 263 |
| Total | 0 | 0 | 0 | 0 | 0 | 199 | 0 | 26 | 0 | 225 | 60 | 526 | 0 | 0 | 586 | 0 | 233 | 124 | 0 | 357 | 1168 |
| Approach % | 0.0 | 0.0 | 0.0 | - | - | 88.4 | 0.0 | 11.6 | - | - | 10.2 | 89.8 | 0.0 | - | - | 0.0 | 65.3 | 34.7 | - | - | - |
| Total % | 0.0 | 0.0 | 0.0 | - | 0.0 | 17.0 | 0.0 | 2.2 | - | 19.3 | 5.1 | 45.0 | 0.0 | - | 50.2 | 0.0 | 19.9 | 10.6 | - | 30.6 | - |
| PHF | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.816 | 0.000 | 0.542 | - | 0.852 | 0.484 | 0.877 | 0.000 | - | 0.916 | 0.000 | 0.766 | 0.886 | - | 0.804 | 0.907 |
| Lights | 0 | 0 | 0 | - | 0 | 167 | 0 | 23 | - | 190 | 48 | 458 | 0 | - | 506 | 0 | 201 | 104 | - | 305 | 1001 |
| % Lights | - | - | - | - | - | 83.9 | - | 88.5 | - | 84.4 | 80.0 | 87.1 | - | - | 86.3 | - | 86.3 | 83.9 | - | 85.4 | 85.7 |
| Buses | 0 | 0 | 0 | - | 0 | 4 | 0 | 1 | - | 5 | 3 | 5 | 0 | - | 8 | 0 | 10 | 1 | - | 11 | 24 |
| % Buses | - | - | - | - | - | 2.0 | - | 3.8 | - | 2.2 | 5.0 | 1.0 | - | - | 1.4 | - | 4.3 | 0.8 | - | 3.1 | 2.1 |
| Trucks | 0 | 0 | 0 | - | 0 | 28 | 0 | 2 | - | 30 | 9 | 63 | 0 | - | 72 | 0 | 22 | 19 | - | 41 | 143 |
| % Trucks | - | - | - | - | - | 14.1 | - | 7.7 | - | 13.3 | 15.0 | 12.0 | - | - | 12.3 | - | 9.4 | 15.3 | - | 11.5 | 12.2 |
| 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 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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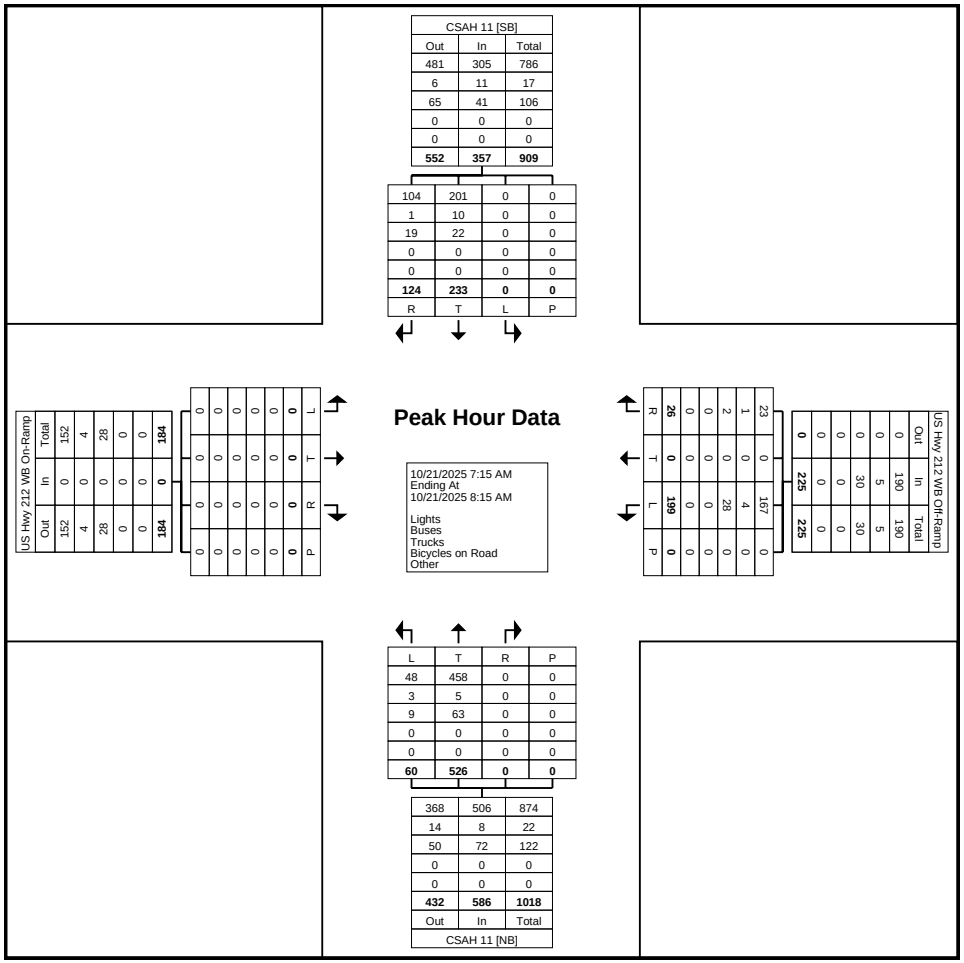
Count Name: CSAH 11 (Johnathan Carver Parkway) & US Highway 212 Westbound Ramps
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (7:15 AM)

Kimley-Horn
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Count Name: CSAH 11 (Johnathan Carver Parkway) & US Highway 212 Westbound Ramps
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (4:00 PM)

| Start Time | US Hwy 212 WB On-Ramp Eastbound | | | | | US Hwy 212 WB Off-Ramp Westbound | | | | | CSAH 11 Northbound | | | | | CSAH 11 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 | 0 | 1 | 0 | 0 | 1 | 186 | 0 | 22 | 0 | 208 | 7 | 105 | 0 | 0 | 112 | 0 | 85 | 66 | 0 | 151 | 472 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 196 | 0 | 22 | 0 | 218 | 15 | 92 | 0 | 0 | 107 | 0 | 78 | 65 | 0 | 143 | 468 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 204 | 0 | 24 | 0 | 228 | 14 | 98 | 0 | 0 | 112 | 0 | 83 | 64 | 0 | 147 | 487 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 177 | 0 | 25 | 0 | 202 | 14 | 105 | 0 | 0 | 119 | 0 | 86 | 60 | 0 | 146 | 467 |
| Total | 0 | 1 | 0 | 0 | 1 | 763 | 0 | 93 | 0 | 856 | 50 | 400 | 0 | 0 | 450 | 0 | 332 | 255 | 0 | 587 | 1894 |
| Approach % | 0.0 | 100.0 | 0.0 | - | - | 89.1 | 0.0 | 10.9 | - | - | 11.1 | 88.9 | 0.0 | - | - | 0.0 | 56.6 | 43.4 | - | - | - |
| Total % | 0.0 | 0.1 | 0.0 | - | 0.1 | 40.3 | 0.0 | 4.9 | - | 45.2 | 2.6 | 21.1 | 0.0 | - | 23.8 | 0.0 | 17.5 | 13.5 | - | 31.0 | - |
| PHF | 0.000 | 0.250 | 0.000 | - | 0.250 | 0.935 | 0.000 | 0.930 | - | 0.939 | 0.833 | 0.952 | 0.000 | - | 0.945 | 0.000 | 0.965 | 0.966 | - | 0.972 | 0.972 |
| Lights | 0 | 1 | 0 | - | 1 | 745 | 0 | 92 | - | 837 | 48 | 344 | 0 | - | 392 | 0 | 294 | 243 | - | 537 | 1767 |
| % Lights | - | 100.0 | - | - | 100.0 | 97.6 | - | 98.9 | - | 97.8 | 96.0 | 86.0 | - | - | 87.1 | - | 88.6 | 95.3 | - | 91.5 | 93.3 |
| Buses | 0 | 0 | 0 | - | 0 | 6 | 0 | 1 | - | 7 | 1 | 11 | 0 | - | 12 | 0 | 2 | 0 | - | 2 | 21 |
| % Buses | - | 0.0 | - | - | 0.0 | 0.8 | - | 1.1 | - | 0.8 | 2.0 | 2.8 | - | - | 2.7 | - | 0.6 | 0.0 | - | 0.3 | 1.1 |
| Trucks | 0 | 0 | 0 | - | 0 | 12 | 0 | 0 | - | 12 | 1 | 45 | 0 | - | 46 | 0 | 36 | 12 | - | 48 | 106 |
| % Trucks | - | 0.0 | - | - | 0.0 | 1.6 | - | 0.0 | - | 1.4 | 2.0 | 11.3 | - | - | 10.2 | - | 10.8 | 4.7 | - | 8.2 | 5.6 |
| 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 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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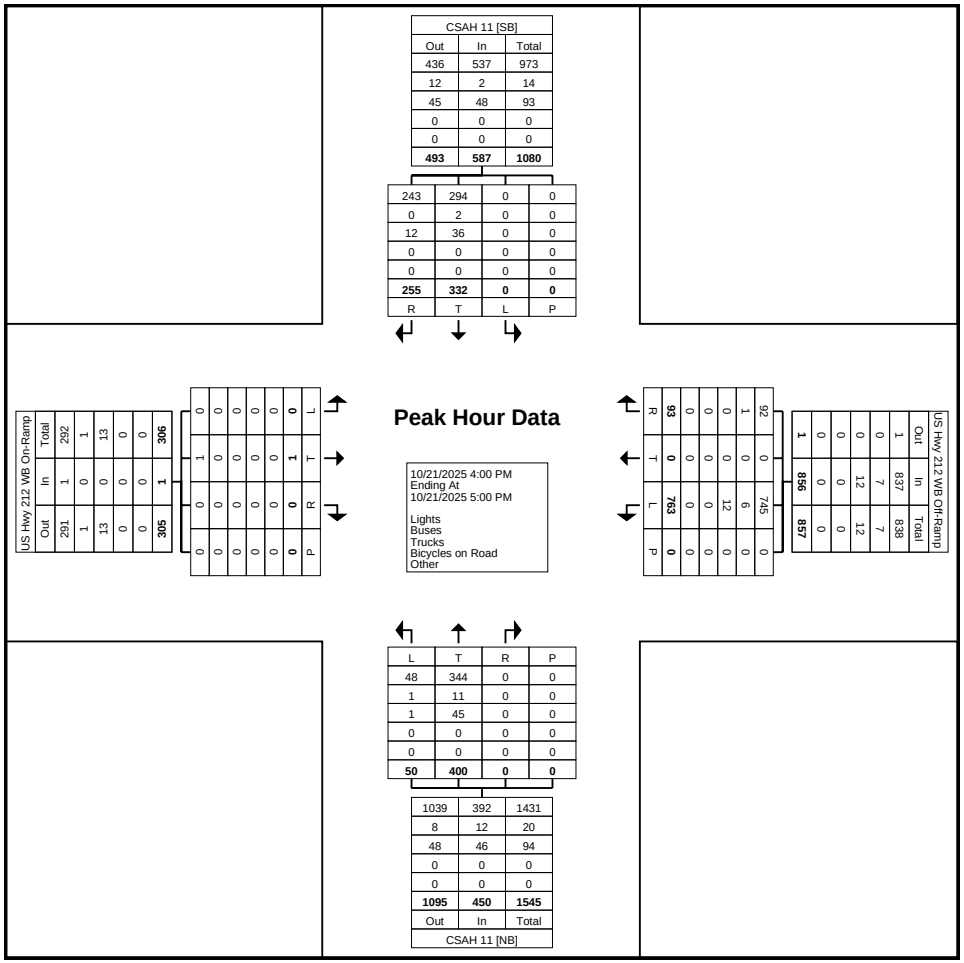
Count Name: CSAH 11 (Johnathan Carver Parkway) & US Highway 212 Westbound Ramps
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (4:00 PM)

Kimley-Horn
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Count Name: CSAH 11 (Johnathan Carver Parkway) & US Highway 212 Eastbound Ramps
Site Code:
Start Date: 10/21/2025


# Turning Movement Data

| Start Time | US Hwy 212 EB Off-Ramp Eastbound | | | | | US Hwy 212 EB On-Ramp Westbound | | | | | CSAH 11 Northbound | | | | | CSAH 11 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 | 27 | 0 | 15 | 0 | 42 | 0 | 0 | 0 | 0 | 0 | 0 | 73 | 97 | 0 | 170 | 9 | 282 | 0 | 0 | 291 | 503 |
| 4:15 PM | 38 | 0 | 3 | 0 | 41 | 0 | 0 | 0 | 0 | 0 | 0 | 73 | 84 | 0 | 157 | 6 | 270 | 0 | 0 | 276 | 474 |
| 4:30 PM | 31 | 0 | 17 | 0 | 48 | 0 | 0 | 1 | 0 | 1 | 0 | 91 | 81 | 0 | 172 | 6 | 267 | 0 | 0 | 273 | 494 |
| 4:45 PM | 30 | 0 | 7 | 0 | 37 | 0 | 0 | 0 | 0 | 0 | 0 | 84 | 86 | 0 | 170 | 3 | 278 | 0 | 0 | 281 | 488 |
| Hourly Total | 126 | 0 | 42 | 0 | 168 | 0 | 0 | 1 | 0 | 1 | 0 | 321 | 348 | 0 | 669 | 24 | 1097 | 0 | 0 | 1121 | 1959 |
| 5:00 PM | 44 | 0 | 7 | 0 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 76 | 81 | 0 | 157 | 8 | 244 | 0 | 0 | 252 | 460 |
| 5:15 PM | 26 | 0 | 6 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 89 | 0 | 145 | 5 | 253 | 0 | 0 | 258 | 435 |
| 5:30 PM | 15 | 0 | 7 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 61 | 106 | 0 | 167 | 10 | 246 | 0 | 0 | 256 | 445 |
| 5:45 PM | 37 | 0 | 4 | 0 | 41 | 0 | 0 | 0 | 0 | 0 | 0 | 54 | 78 | 0 | 132 | 6 | 223 | 0 | 0 | 229 | 402 |
| Hourly Total | 122 | 0 | 24 | 0 | 146 | 0 | 0 | 0 | 0 | 0 | 0 | 247 | 354 | 0 | 601 | 29 | 966 | 0 | 0 | 995 | 1742 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 7:00 AM | 46 | 0 | 12 | 0 | 58 | 0 | 0 | 0 | 0 | 0 | 0 | 63 | 235 | 0 | 298 | 5 | 82 | 0 | 0 | 87 | 443 |
| 7:15 AM | 50 | 0 | 14 | 0 | 64 | 0 | 0 | 0 | 0 | 0 | 0 | 72 | 284 | 0 | 356 | 7 | 110 | 0 | 0 | 117 | 537 |
| 7:30 AM | 69 | 0 | 18 | 0 | 87 | 0 | 0 | 0 | 0 | 0 | 0 | 92 | 262 | 0 | 354 | 13 | 109 | 0 | 0 | 122 | 563 |
| 7:45 AM | 63 | 0 | 12 | 0 | 75 | 0 | 0 | 0 | 0 | 0 | 0 | 101 | 233 | 0 | 334 | 3 | 96 | 0 | 0 | 99 | 508 |
| Hourly Total | 228 | 0 | 56 | 0 | 284 | 0 | 0 | 0 | 0 | 0 | 0 | 328 | 1014 | 0 | 1342 | 28 | 397 | 0 | 0 | 425 | 2051 |
| 8:00 AM | 49 | 0 | 14 | 0 | 63 | 0 | 0 | 2 | 0 | 2 | 0 | 73 | 209 | 0 | 282 | 12 | 93 | 0 | 0 | 105 | 452 |
| 8:15 AM | 31 | 0 | 16 | 0 | 47 | 0 | 0 | 0 | 0 | 0 | 0 | 79 | 166 | 0 | 245 | 2 | 95 | 0 | 0 | 97 | 389 |
| 8:30 AM | 43 | 0 | 19 | 0 | 62 | 0 | 0 | 0 | 0 | 0 | 0 | 61 | 121 | 0 | 182 | 10 | 95 | 0 | 0 | 105 | 349 |
| 8:45 AM | 15 | 0 | 9 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 120 | 0 | 170 | 7 | 78 | 0 | 0 | 85 | 279 |
| Hourly Total | 138 | 0 | 58 | 0 | 196 | 0 | 0 | 2 | 0 | 2 | 0 | 263 | 616 | 0 | 879 | 31 | 361 | 0 | 0 | 392 | 1469 |
| Grand Total | 614 | 0 | 180 | 0 | 794 | 0 | 0 | 3 | 0 | 3 | 0 | 1159 | 2332 | 0 | 3491 | 112 | 2821 | 0 | 0 | 2933 | 7221 |
| Approach % | 77.3 | 0.0 | 22.7 | - | - | 0.0 | 0.0 | 100.0 | - | - | 0.0 | 33.2 | 66.8 | - | - | 3.8 | 96.2 | 0.0 | - | - | - |
| Total % | 8.5 | 0.0 | 2.5 | - | 11.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 16.1 | 32.3 | - | 48.3 | 1.6 | 39.1 | 0.0 | - | 40.6 | - |
| Lights | 560 | 0 | 169 | - | 729 | 0 | 0 | 3 | - | 3 | 0 | 991 | 2202 | - | 3193 | 104 | 2607 | 0 | - | 2711 | 6636 |
| % Lights | 91.2 | - | 93.9 | - | 91.8 | - | - | 100.0 | - | 100.0 | - | 85.5 | 94.4 | - | 91.5 | 92.9 | 92.4 | - | - | 92.4 | 91.9 |
| Buses | 5 | 0 | 1 | - | 6 | 0 | 0 | 0 | - | 0 | 0 | 21 | 23 | - | 44 | 1 | 38 | 0 | - | 39 | 89 |
| % Buses | 0.8 | - | 0.6 | - | 0.8 | - | - | 0.0 | - | 0.0 | - | 1.8 | 1.0 | - | 1.3 | 0.9 | 1.3 | - | - | 1.3 | 1.2 |
| Trucks | 49 | 0 | 10 | - | 59 | 0 | 0 | 0 | - | 0 | 0 | 147 | 107 | - | 254 | 7 | 176 | 0 | - | 183 | 496 |
| % Trucks | 8.0 | - | 5.6 | - | 7.4 | - | - | 0.0 | - | 0.0 | - | 12.7 | 4.6 | - | 7.3 | 6.3 | 6.2 | - | - | 6.2 | 6.9 |
| 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 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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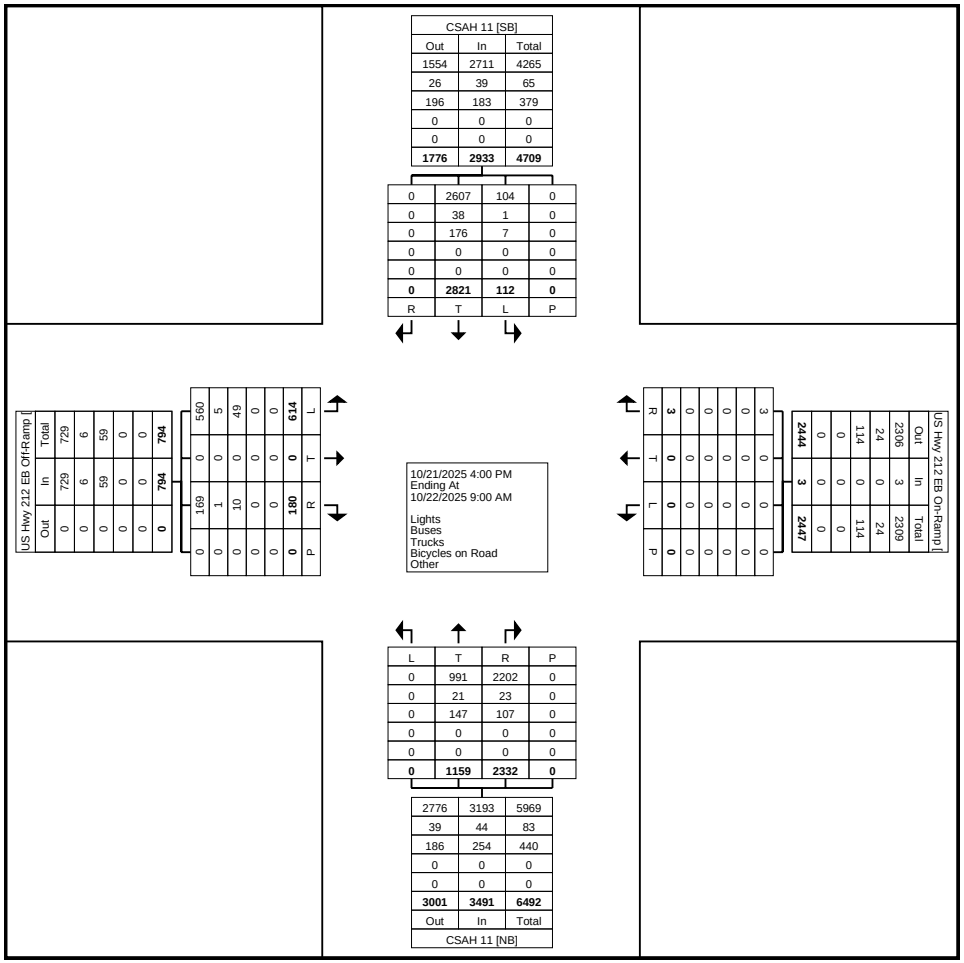
Site Code:
Start Date: 10/21/2025


Turning Movement Data Plot

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Count Name: CSAH 11 (Johnathan Carver Parkway) & US Highway 212 Eastbound Ramps
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (4:00 PM)

| Start Time | US Hwy 212 EB Off-Ramp Eastbound | | | | | US Hwy 212 EB On-Ramp Westbound | | | | | CSAH 11 Northbound | | | | | CSAH 11 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 | 27 | 0 | 15 | 0 | 42 | 0 | 0 | 0 | 0 | 0 | 0 | 73 | 97 | 0 | 170 | 9 | 282 | 0 | 0 | 291 | 503 |
| 4:15 PM | 38 | 0 | 3 | 0 | 41 | 0 | 0 | 0 | 0 | 0 | 0 | 73 | 84 | 0 | 157 | 6 | 270 | 0 | 0 | 276 | 474 |
| 4:30 PM | 31 | 0 | 17 | 0 | 48 | 0 | 0 | 1 | 0 | 1 | 0 | 91 | 81 | 0 | 172 | 6 | 267 | 0 | 0 | 273 | 494 |
| 4:45 PM | 30 | 0 | 7 | 0 | 37 | 0 | 0 | 0 | 0 | 0 | 0 | 84 | 86 | 0 | 170 | 3 | 278 | 0 | 0 | 281 | 488 |
| Total | 126 | 0 | 42 | 0 | 168 | 0 | 0 | 1 | 0 | 1 | 0 | 321 | 348 | 0 | 669 | 24 | 1097 | 0 | 0 | 1121 | 1959 |
| Approach % | 75.0 | 0.0 | 25.0 | - | - | 0.0 | 0.0 | 100.0 | - | - | 0.0 | 48.0 | 52.0 | - | - | 2.1 | 97.9 | 0.0 | - | - | - |
| Total % | 6.4 | 0.0 | 2.1 | - | 8.6 | 0.0 | 0.0 | 0.1 | - | 0.1 | 0.0 | 16.4 | 17.8 | - | 34.2 | 1.2 | 56.0 | 0.0 | - | 57.2 | - |
| PHF | 0.829 | 0.000 | 0.618 | - | 0.875 | 0.000 | 0.000 | 0.250 | - | 0.250 | 0.000 | 0.882 | 0.897 | - | 0.972 | 0.667 | 0.973 | 0.000 | - | 0.963 | 0.974 |
| Lights | 117 | 0 | 41 | - | 158 | 0 | 0 | 1 | - | 1 | 0 | 271 | 310 | - | 581 | 24 | 1039 | 0 | - | 1063 | 1803 |
| % Lights | 92.9 | - | 97.6 | - | 94.0 | - | - | 100.0 | - | 100.0 | - | 84.4 | 89.1 | - | 86.8 | 100.0 | 94.7 | - | - | 94.8 | 92.0 |
| Buses | 4 | 0 | 0 | - | 4 | 0 | 0 | 0 | - | 0 | 0 | 9 | 2 | - | 11 | 0 | 11 | 0 | - | 11 | 26 |
| % Buses | 3.2 | - | 0.0 | - | 2.4 | - | - | 0.0 | - | 0.0 | - | 2.8 | 0.6 | - | 1.6 | 0.0 | 1.0 | - | - | 1.0 | 1.3 |
| Trucks | 5 | 0 | 1 | - | 6 | 0 | 0 | 0 | - | 0 | 0 | 41 | 36 | - | 77 | 0 | 47 | 0 | - | 47 | 130 |
| % Trucks | 4.0 | - | 2.4 | - | 3.6 | - | - | 0.0 | - | 0.0 | - | 12.8 | 10.3 | - | 11.5 | 0.0 | 4.3 | - | - | 4.2 | 6.6 |
| 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 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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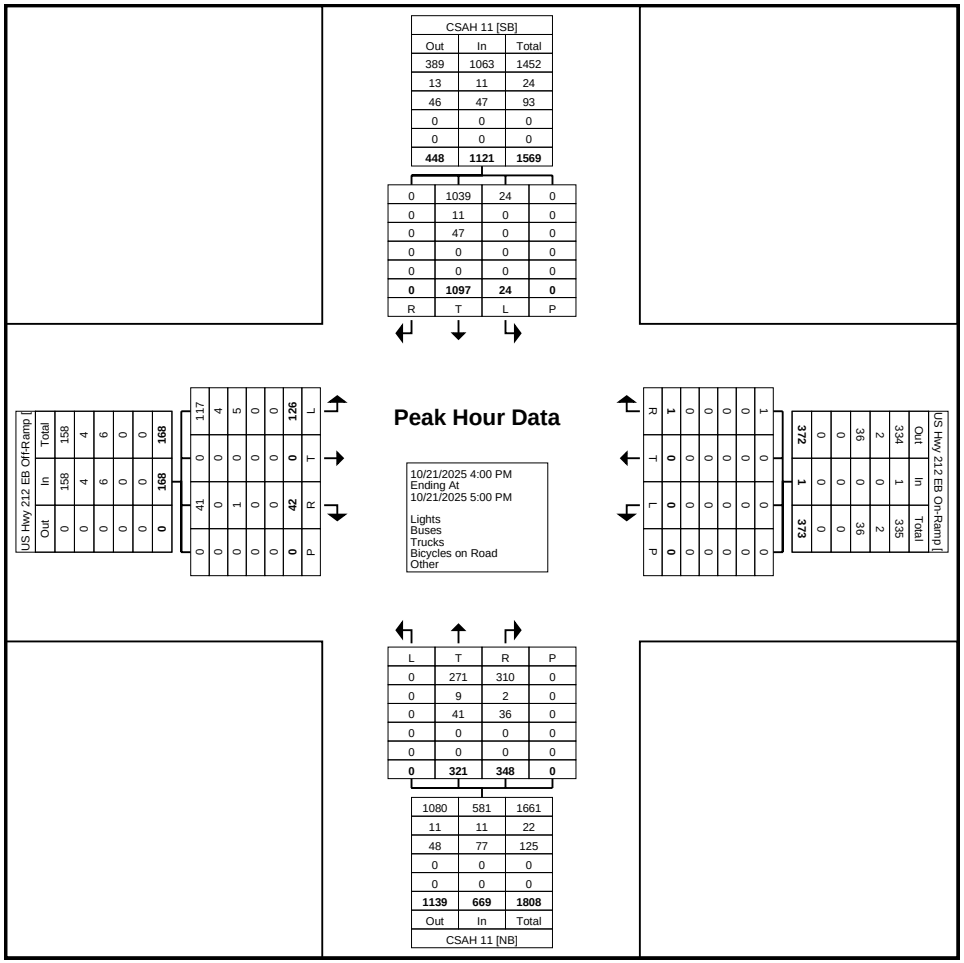
Count Name: CSAH 11 (Johnathan Carver Parkway) & US Highway 212 Eastbound Ramps
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (4:00 PM)

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Count Name: CSAH 11 (Johnathan Carver Parkway) & US Highway 212 Eastbound Ramps
Site Code:
Start Date: 10/21/2025


# Turning Movement Peak Hour Data (7:15 AM)

| Start Time | US Hwy 212 EB Off-Ramp Eastbound | | | | | US Hwy 212 EB On-Ramp Westbound | | | | | CSAH 11 Northbound | | | | | CSAH 11 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 |
| 7:15 AM | 50 | 0 | 14 | 0 | 64 | 0 | 0 | 0 | 0 | 0 | 0 | 72 | 284 | 0 | 356 | 7 | 110 | 0 | 0 | 117 | 537 |
| 7:30 AM | 69 | 0 | 18 | 0 | 87 | 0 | 0 | 0 | 0 | 0 | 0 | 92 | 262 | 0 | 354 | 13 | 109 | 0 | 0 | 122 | 563 |
| 7:45 AM | 63 | 0 | 12 | 0 | 75 | 0 | 0 | 0 | 0 | 0 | 0 | 101 | 233 | 0 | 334 | 3 | 96 | 0 | 0 | 99 | 508 |
| 8:00 AM | 49 | 0 | 14 | 0 | 63 | 0 | 0 | 2 | 0 | 2 | 0 | 73 | 209 | 0 | 282 | 12 | 93 | 0 | 0 | 105 | 452 |
| Total | 231 | 0 | 58 | 0 | 289 | 0 | 0 | 2 | 0 | 2 | 0 | 338 | 988 | 0 | 1326 | 35 | 408 | 0 | 0 | 443 | 2060 |
| Approach % | 79.9 | 0.0 | 20.1 | - | - | 0.0 | 0.0 | 100.0 | - | - | 0.0 | 25.5 | 74.5 | - | - | 7.9 | 92.1 | 0.0 | - | - | - |
| Total % | 11.2 | 0.0 | 2.8 | - | 14.0 | 0.0 | 0.0 | 0.1 | - | 0.1 | 0.0 | 16.4 | 48.0 | - | 64.4 | 1.7 | 19.8 | 0.0 | - | 21.5 | - |
| PHF | 0.837 | 0.000 | 0.806 | - | 0.830 | 0.000 | 0.000 | 0.250 | - | 0.250 | 0.000 | 0.837 | 0.870 | - | 0.931 | 0.673 | 0.927 | 0.000 | - | 0.908 | 0.915 |
| Lights | 210 | 0 | 51 | - | 261 | 0 | 0 | 2 | - | 2 | 0 | 284 | 938 | - | 1222 | 31 | 347 | 0 | - | 378 | 1863 |
| % Lights | 90.9 | - | 87.9 | - | 90.3 | - | - | 100.0 | - | 100.0 | - | 84.0 | 94.9 | - | 92.2 | 88.6 | 85.0 | - | - | 85.3 | 90.4 |
| Buses | 0 | 0 | 1 | - | 1 | 0 | 0 | 0 | - | 0 | 0 | 8 | 16 | - | 24 | 0 | 14 | 0 | - | 14 | 39 |
| % Buses | 0.0 | - | 1.7 | - | 0.3 | - | - | 0.0 | - | 0.0 | - | 2.4 | 1.6 | - | 1.8 | 0.0 | 3.4 | - | - | 3.2 | 1.9 |
| Trucks | 21 | 0 | 6 | - | 27 | 0 | 0 | 0 | - | 0 | 0 | 46 | 34 | - | 80 | 4 | 47 | 0 | - | 51 | 158 |
| % Trucks | 9.1 | - | 10.3 | - | 9.3 | - | - | 0.0 | - | 0.0 | - | 13.6 | 3.4 | - | 6.0 | 11.4 | 11.5 | - | - | 11.5 | 7.7 |
| 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 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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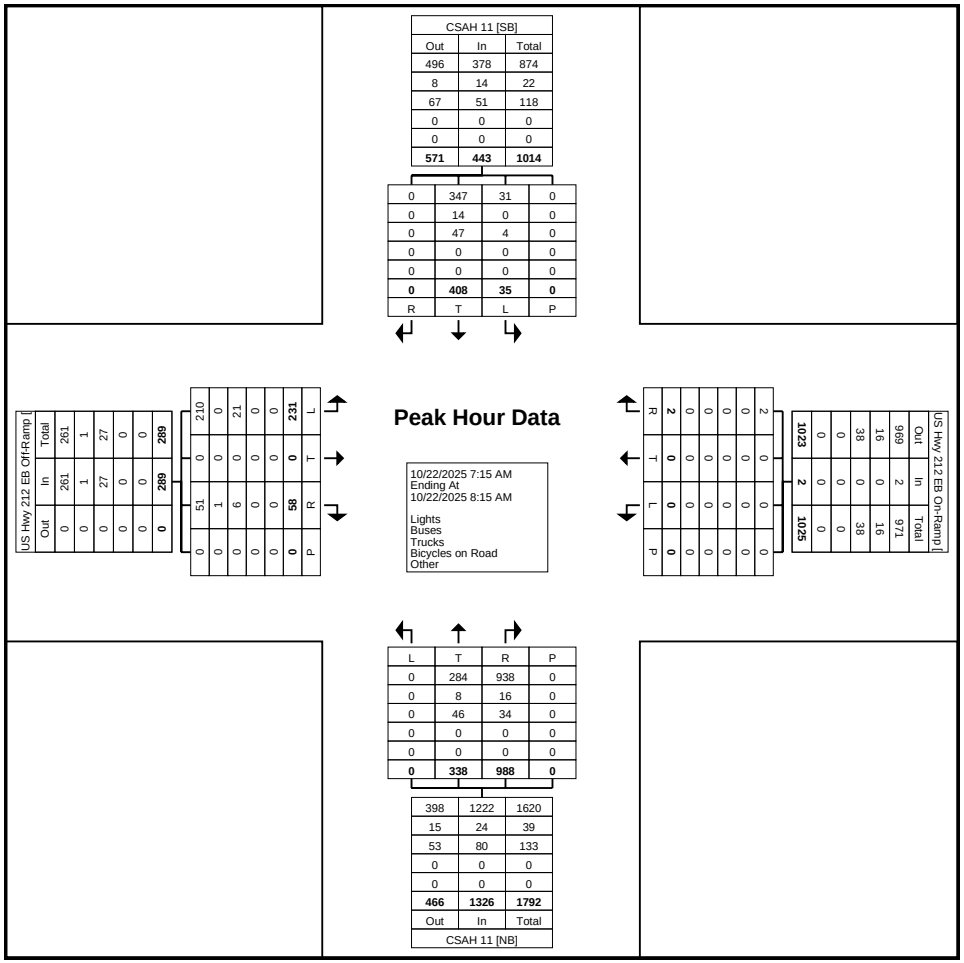
Count Name: CSAH 11 (Johnathan Carver Parkway) & US Highway 212 Eastbound Ramps
Site Code:
Start Date: 10/21/2025


Turning Movement Peak Hour Data Plot (7:15 AM)

# Appendix C:

# Development Scenario Concepts

Figure 3: Development Scenario 1

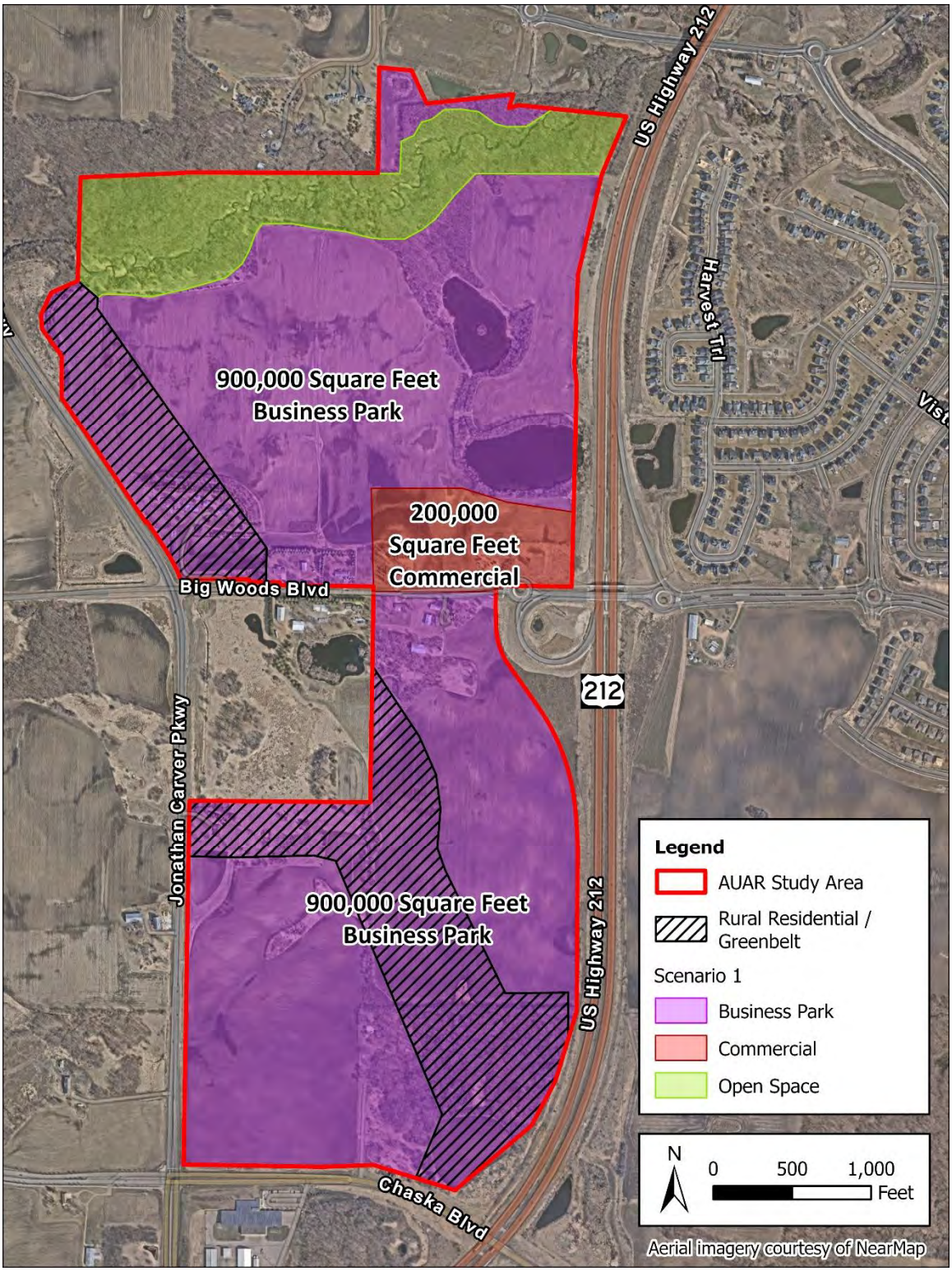
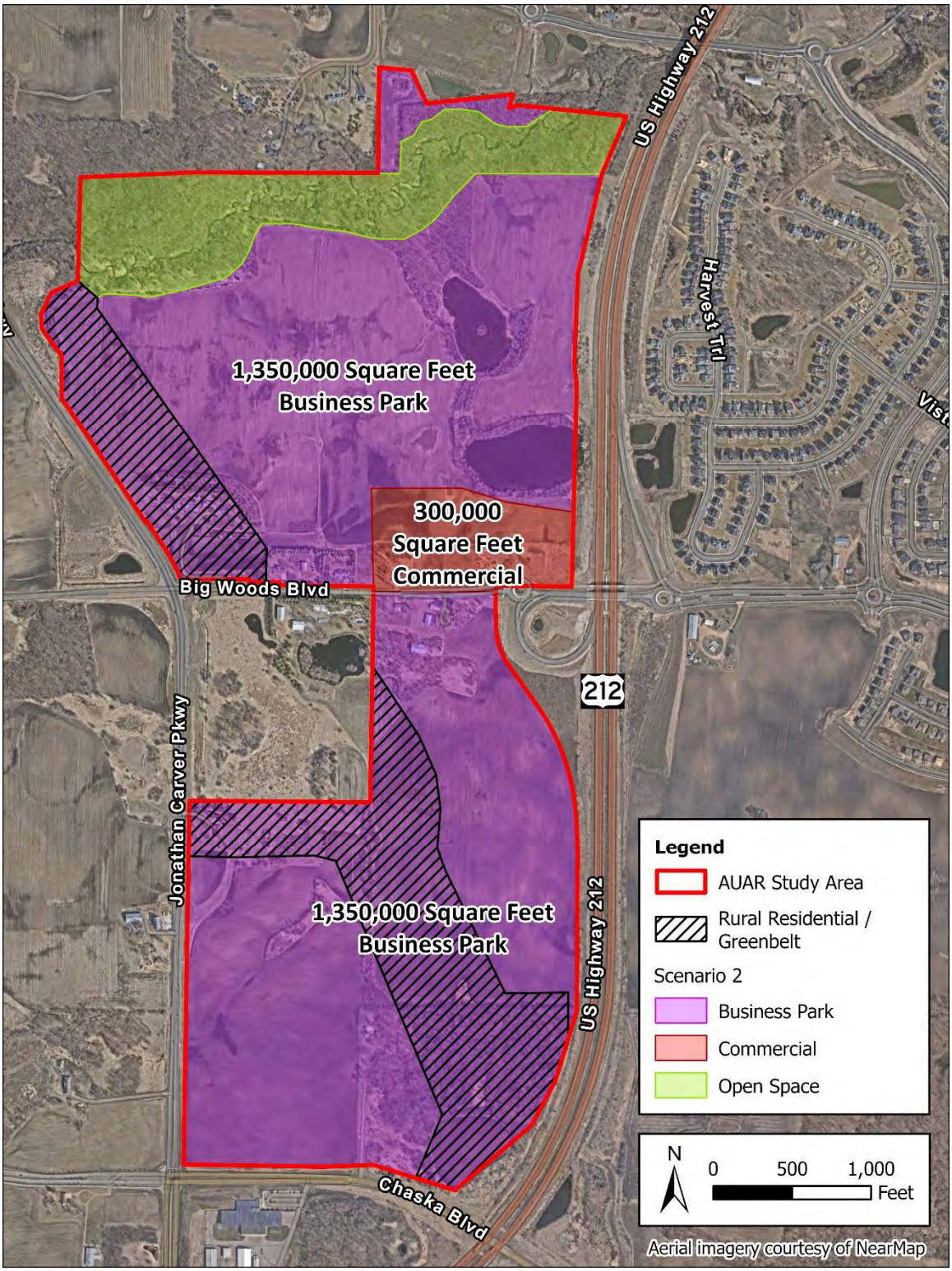


Figure 4: Development Scenario 2



# Appendix D:

# Existing Year (2025) Analysis Report

## 1: US 212 EB Ramps & Engler Blvd Performance by movement

| Movement | EBL | EBT | WBT | WBR | NBL | NBT | NBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.2 | 3.5 | 0.3 | 0.7 | 4.0 | 0.4 |
| Total Del/Veh (s) | 7.6 | 3.3 | 37.5 | 14.7 | 39.5 | 43.5 | 5.8 | 11.5 |

## 2: US 212 WB Ramps & Engler Blvd Performance by movement

| Movement | EBT | EBR | WBL | WBT | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 3.6 | 1.0 | 0.2 |
| Total Del/Veh (s) | 11.7 | 3.1 | 92.0 | 6.6 | 69.9 | 7.2 | 12.3 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.9 | 3.6 | 3.8 |
| Total Del/Veh (s) | 14.5 | 23.5 | 2.8 | 40.9 | 7.5 | 1.5 | 8.1 | 63.5 | 7.5 | 29.2 | 29.7 | 5.4 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.5 |
| Total Del/Veh (s) | 20.3 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 3.1 | 1.5 | 3.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 3.5 | 0.8 | 3.6 |
| Total Del/Veh (s) | 20.0 | 25.3 | 11.3 | 21.0 | 14.9 | 5.5 | 22.8 | 30.8 | 21.5 | 29.0 | 25.8 | 6.2 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 1.4 |
| Total Del/Veh (s) | 21.8 |

## 8: Johnathan Carver Pkwy & Big Woods Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 4.0 | 0.2 | 3.9 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.2 | 0.0 | 0.0 |
| Total Del/Veh (s) | 11.7 | 12.6 | 2.9 | 10.4 | 9.6 | 2.3 | 2.1 | 2.4 | 1.4 | 3.6 | 1.4 | 0.3 |

## 8: Johnathan Carver Pkwy & Big Woods Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.2 |
| Total Del/Veh (s) | 3.6 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 4.0 | 0.1 | 1.3 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 33.2 | 37.2 | 4.6 | 19.4 | 17.4 | 2.5 | 10.3 | 10.7 | 7.5 | 8.9 | 6.8 | 1.2 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.1 |
| Total Del/Veh (s) | 10.3 |

## 10: Johnathan Carver Pkwy & US 212 WB Ramps Performance by movement

| Movement | WBL | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.7 | 3.8 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 |
| Total Del/Veh (s) | 29.4 | 5.9 | 36.6 | 6.9 | 9.8 | 4.0 | 12.6 |

## 11: Johnathan Carver Pkwy & US 212 EB Ramps Performance by movement

| Movement | EBL | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.4 | 3.7 | 0.3 | 0.3 | 0.0 | 0.0 | 0.3 |
| Total Del/Veh (s) | 30.0 | 6.3 | 7.4 | 14.2 | 5.4 | 3.8 | 12.2 |

## Total Zone Performance

| | |
|---|---|
| Denied Del/Veh (s) | 1.3 |
| Total Del/Veh (s) | 784.6 |

## Intersection: 1: US 212 EB Ramps & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | T | T | T | R | LT | R |
| Maximum Queue (ft) | 144 | 165 | 47 | 52 | 182 | 148 | 111 | 90 | 69 |
| Average Queue (ft) | 66 | 68 | 6 | 9 | 81 | 40 | 39 | 33 | 30 |
| 95th Queue (ft) | 128 | 132 | 28 | 38 | 141 | 100 | 80 | 74 | 53 |
| Link Distance (ft) | | 669 | 669 | 669 | 1124 | 1124 | | 745 | |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | 300 | | | | | | 330 | | 210 |
| Storage Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |

## Intersection: 2: US 212 WB Ramps & Engler Blvd

| Movement | EB | EB | EB | WB | WB | WB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | T | T | R | L | T | T | L | TR | R |
| Maximum Queue (ft) | 531 | 218 | 34 | 102 | 9 | 4 | 76 | 141 | 90 |
| Average Queue (ft) | 111 | 39 | 3 | 29 | 0 | 0 | 26 | 53 | 25 |
| 95th Queue (ft) | 324 | 137 | 18 | 76 | 7 | 3 | 64 | 95 | 60 |
| Link Distance (ft) | 909 | 909 | | | 669 | 669 | | 775 | |
| Upstream Blk Time (%) | 0 | | | | | | | | |
| Queuing Penalty (veh) | 0 | | | | | | | | |
| Storage Bay Dist (ft) | | | 275 | 225 | | | 225 | | 225 |
| Storage Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | WB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | L | T | T | R | L | T | R |
| Maximum Queue (ft) | 176 | 484 | 396 | 28 | 85 | 58 | 126 | 87 | 58 | 8 | 30 | 36 |
| Average Queue (ft) | 9 | 235 | 114 | 6 | 41 | 8 | 57 | 11 | 13 | 0 | 4 | 10 |
| 95th Queue (ft) | 66 | 413 | 264 | 25 | 73 | 35 | 107 | 49 | 37 | 5 | 19 | 28 |
| Link Distance (ft) | | 1228 | 1228 | | | | 909 | 909 | | | 1277 | 1277 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 210 | | | 210 | 250 | 250 | | | 150 | 240 | | |
| Storage Blk Time (%) | | 14 | 1 | | | | | | | | | |
| Queuing Penalty (veh) | | 2 | 0 | | | | | | | | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | SB | SB | SB |
|---|---|---|---|
| Directions Served | L | L | TR |
| Maximum Queue (ft) | 161 | 175 | 40 |
| Average Queue (ft) | 80 | 69 | 10 |
| 95th Queue (ft) | 135 | 130 | 29 |
| Link Distance (ft) | | 547 | |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | 100 | | 400 |
| Storage Blk Time (%) | 5 | 2 | |
| Queuing Penalty (veh) | 9 | 4 | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | EB | EB | EB | WB | WB | WB | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | R | L | T | R | L | TR | L | T | R |
| Maximum Queue (ft) | 175 | 482 | 250 | 29 | 236 | 85 | 151 | 196 | 226 | 154 | 80 |
| Average Queue (ft) | 22 | 225 | 81 | 4 | 80 | 23 | 64 | 92 | 110 | 62 | 22 |
| 95th Queue (ft) | 100 | 396 | 220 | 21 | 177 | 57 | 125 | 169 | 186 | 124 | 59 |
| Link Distance (ft) | | 1410 | | | 4237 | | | 865 | | 1154 | |
| Upstream Blk Time (%) | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | |
| Storage Bay Dist (ft) | 175 | | 175 | 175 | | 175 | 225 | | 275 | | 275 |
| Storage Blk Time (%) | | 12 | | | 1 | | | 0 | 0 | | |
| Queuing Penalty (veh) | | 25 | | | 1 | | | 0 | 0 | | |

## Intersection: 8: Johnathan Carver Pkwy & Big Woods Blvd

| Movement | EB | EB | EB | WB | WB | WB | NB | NB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | R | L | T | R | L | R | L | R |
| Maximum Queue (ft) | 18 | 49 | 34 | 58 | 22 | 29 | 12 | 14 | 67 | 4 |
| Average Queue (ft) | 1 | 15 | 7 | 14 | 4 | 2 | 1 | 0 | 23 | 0 |
| 95th Queue (ft) | 7 | 33 | 23 | 38 | 13 | 13 | 8 | 8 | 54 | 3 |
| Link Distance (ft) | | 1369 | | | 1265 | | | | | |
| Upstream Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |
| Storage Bay Dist (ft) | 250 | | 250 | 250 | | 250 | 300 | 300 | 250 | 250 |
| Storage Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | EB | EB | EB | EB | EB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | R | R | L | L | TR | L | T | T | R |
| Maximum Queue (ft) | 22 | 8 | 37 | 52 | 38 | 124 | 147 | 62 | 67 | 128 | 70 | 136 |
| Average Queue (ft) | 3 | 0 | 8 | 11 | 6 | 35 | 72 | 19 | 12 | 41 | 3 | 39 |
| 95th Queue (ft) | 17 | 6 | 29 | 37 | 26 | 91 | 135 | 49 | 38 | 98 | 25 | 98 |
| Link Distance (ft) | | | 1114 | 1114 | | | | 757 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 190 | 190 | | | 190 | 300 | 300 | | 450 | | | 225 |
| Storage Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | SB | SB | SB |
|---|---|---|---|
| Directions Served | L | T | R |
| Maximum Queue (ft) | 62 | 114 | 40 |
| Average Queue (ft) | 23 | 37 | 4 |
| 95th Queue (ft) | 52 | 90 | 21 |
| Link Distance (ft) | | 469 | |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | 325 | | 325 |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 10: Johnathan Carver Pkwy & US 212 WB Ramps

| Movement | WB | WB | WB | NB | NB | NB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | LT | R | L | T | T | T | T | T | R |
| Maximum Queue (ft) | 136 | 198 | 63 | 129 | 117 | 149 | 36 | 94 | 89 | 74 |
| Average Queue (ft) | 45 | 96 | 14 | 51 | 50 | 72 | 4 | 29 | 24 | 22 |
| 95th Queue (ft) | 108 | 167 | 43 | 104 | 101 | 127 | 21 | 70 | 64 | 58 |
| Link Distance (ft) | | 1104 | | 360 | 360 | 360 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |
| Storage Bay Dist (ft) | 275 | | 275 | | | | 150 | | | 100 |
| Storage Blk Time (%) | | | | | | | | 0 | 0 | 0 |
| Queuing Penalty (veh) | | | | | | | | 0 | 0 | 0 |

## Intersection: 11: Johnathan Carver Pkwy & US 212 EB Ramps

| Movement | EB | EB | NB | NB | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | LT | R | T | T | T | R | L | T | T |
| Maximum Queue (ft) | 243 | 119 | 57 | 119 | 153 | 112 | 72 | 69 | 85 |
| Average Queue (ft) | 120 | 27 | 9 | 26 | 36 | 4 | 20 | 17 | 28 |
| 95th Queue (ft) | 191 | 57 | 37 | 75 | 118 | 63 | 53 | 54 | 68 |
| Link Distance (ft) | 1077 | | | 2650 | 2650 | 2650 | 360 | 360 | 360 |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | | 250 | 275 | | | | | | |
| Storage Blk Time (%) | 0 | | | | | | | | |
| Queuing Penalty (veh) | 0 | | | | | | | | |

## Zone Summary

Zone wide Queuing Penalty: 41

## 1: US 212 EB Ramps & Engler Blvd Performance by movement

| Movement | EBL | EBT | WBT | WBR | NBL | NBT | NBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.2 | 3.5 | 0.3 | 0.1 | 3.9 | 0.3 |
| Total Del/Veh (s) | 26.4 | 4.0 | 11.2 | 3.6 | 46.1 | 17.8 | 4.9 | 14.4 |

## 2: US 212 WB Ramps & Engler Blvd Performance by movement

| Movement | EBT | EBR | WBL | WBT | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 3.1 | 1.9 | 1.0 |
| Total Del/Veh (s) | 17.1 | 3.4 | 13.6 | 10.0 | 22.8 | 14.3 | 14.7 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 3.0 | 0.1 | 0.1 | 2.1 | 3.9 | 3.9 |
| Total Del/Veh (s) | 45.8 | 9.0 | 1.7 | 42.9 | 13.5 | 3.7 | 33.5 | 56.1 | 4.7 | 31.4 | 34.9 | 7.6 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.2 |
| Total Del/Veh (s) | 13.7 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 3.4 | 0.8 | 3.3 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.6 | 0.6 | 3.7 |
| Total Del/Veh (s) | 25.1 | 12.1 | 5.0 | 34.8 | 36.4 | 22.1 | 33.4 | 28.9 | 11.7 | 25.8 | 33.4 | 17.6 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.6 |
| Total Del/Veh (s) | 27.0 |

## 8: Johnathan Carver Pkwy & Big Woods Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 4.9 | 0.1 | 4.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 4.2 | 11.9 | 3.4 | 11.1 | 12.7 | 3.0 | 3.0 | 2.6 | 1.2 | 3.9 | 1.8 | 1.6 |

## 8: Johnathan Carver Pkwy & Big Woods Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.1 |
| Total Del/Veh (s) | 3.9 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 3.9 | 0.3 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 24.8 | 39.1 | 6.0 | 26.6 | 32.0 | 7.4 | 16.5 | 18.8 | 6.4 | 13.2 | 15.5 | 1.8 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.3 |
| Total Del/Veh (s) | 17.1 |

## 10: Johnathan Carver Pkwy & US 212 WB Ramps Performance by movement

| Movement | WBL | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 1.1 | 3.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 |
| Total Del/Veh (s) | 38.1 | 8.9 | 43.7 | 16.0 | 16.3 | 6.3 | 24.1 |

## 11: Johnathan Carver Pkwy & US 212 EB Ramps Performance by movement

| Movement | EBL | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.3 | 3.9 | 0.3 | 0.2 | 0.0 | 0.0 | 0.2 |
| Total Del/Veh (s) | 42.5 | 11.8 | 3.5 | 5.0 | 5.1 | 4.3 | 7.0 |

## Total Zone Performance

| | |
|---|---|
| Denied Del/Veh (s) | 1.3 |
| Total Del/Veh (s) | 961.6 |

## Intersection: 1: US 212 EB Ramps & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | T | T | T | R | LT | R |
| Maximum Queue (ft) | 178 | 188 | 50 | 52 | 114 | 65 | 37 | 85 | 41 |
| Average Queue (ft) | 56 | 85 | 13 | 6 | 50 | 20 | 11 | 33 | 19 |
| 95th Queue (ft) | 134 | 159 | 41 | 31 | 102 | 49 | 31 | 72 | 39 |
| Link Distance (ft) | | 669 | 669 | 669 | 1124 | 1124 | | 745 | |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | 300 | | | | | | 330 | | 210 |
| Storage Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |

## Intersection: 2: US 212 WB Ramps & Engler Blvd

| Movement | EB | EB | EB | WB | WB | WB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | T | T | R | L | T | T | L | TR | R |
| Maximum Queue (ft) | 220 | 142 | 32 | 73 | 100 | 80 | 115 | 277 | 251 |
| Average Queue (ft) | 96 | 71 | 10 | 20 | 35 | 30 | 38 | 151 | 105 |
| 95th Queue (ft) | 173 | 127 | 31 | 52 | 79 | 70 | 81 | 237 | 209 |
| Link Distance (ft) | 909 | 909 | | | 669 | 669 | | 775 | |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | | | 275 | 225 | | | 225 | | 225 |
| Storage Blk Time (%) | | | | | | | | 1 | 0 |
| Queuing Penalty (veh) | | | | | | | | 6 | 0 |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | WB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | L | T | T | R | L | T | R |
| Maximum Queue (ft) | 56 | 125 | 120 | 25 | 70 | 30 | 277 | 246 | 62 | 64 | 36 | 48 |
| Average Queue (ft) | 17 | 55 | 43 | 3 | 24 | 2 | 138 | 76 | 23 | 15 | 9 | 19 |
| 95th Queue (ft) | 43 | 107 | 95 | 16 | 55 | 14 | 247 | 191 | 47 | 42 | 27 | 37 |
| Link Distance (ft) | | 1228 | 1228 | | | | 909 | 909 | | | 1277 | 1277 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 210 | | | 210 | 250 | 250 | | | 150 | 240 | | |
| Storage Blk Time (%) | | | | | | | 0 | 0 | | | | |
| Queuing Penalty (veh) | | | | | | | 0 | 1 | | | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | SB | SB | SB |
|---|---|---|---|
| Directions Served | L | L | TR |
| Maximum Queue (ft) | 82 | 111 | 55 |
| Average Queue (ft) | 36 | 45 | 12 |
| 95th Queue (ft) | 71 | 89 | 36 |
| Link Distance (ft) | | 547 | |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | 100 | | 400 |
| Storage Blk Time (%) | 0 | 1 | |
| Queuing Penalty (veh) | 0 | 1 | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | EB | EB | EB | WB | WB | WB | B19 | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | R | L | T | R | T | L | TR | L | T | R |
| Maximum Queue (ft) | 42 | 190 | 101 | 161 | 824 | 250 | 16 | 243 | 219 | 114 | 237 | 56 |
| Average Queue (ft) | 10 | 77 | 33 | 16 | 304 | 108 | 0 | 104 | 89 | 55 | 108 | 12 |
| 95th Queue (ft) | 33 | 141 | 74 | 99 | 651 | 273 | 6 | 190 | 177 | 97 | 191 | 38 |
| Link Distance (ft) | | 1410 | | | 4237 | | 1228 | | 865 | | 1154 | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 175 | | 175 | 175 | | 175 | | 225 | | 275 | | 275 |
| Storage Blk Time (%) | | 0 | 0 | | 17 | | | 0 | 0 | | 0 | |
| Queuing Penalty (veh) | | 1 | 0 | | 42 | | | 1 | 1 | | 0 | |

## Intersection: 8: Johnathan Carver Pkwy & Big Woods Blvd

| Movement | EB | EB | EB | WB | WB | WB | NB | NB | NB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | R | L | T | R | L | T | R | L | T |
| Maximum Queue (ft) | 13 | 42 | 33 | 46 | 53 | 31 | 28 | 12 | 19 | 55 | 4 |
| Average Queue (ft) | 1 | 12 | 4 | 11 | 13 | 5 | 2 | 0 | 1 | 17 | 0 |
| 95th Queue (ft) | 6 | 32 | 17 | 31 | 34 | 19 | 14 | 7 | 8 | 45 | 0 |
| Link Distance (ft) | | 1369 | | | 1265 | | | 2580 | | | 1216 |
| Upstream Blk Time (%) | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | |
| Storage Bay Dist (ft) | 250 | | 250 | 250 | | 250 | 300 | | 300 | 250 | |
| Storage Blk Time (%) | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | EB | EB | EB | EB | EB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | R | R | L | L | TR | L | T | T | R |
| Maximum Queue (ft) | 74 | 54 | 67 | 65 | 47 | 143 | 201 | 85 | 97 | 271 | 129 | 97 |
| Average Queue (ft) | 32 | 10 | 25 | 25 | 22 | 51 | 102 | 29 | 33 | 70 | 9 | 25 |
| 95th Queue (ft) | 62 | 42 | 58 | 50 | 45 | 115 | 170 | 65 | 74 | 185 | 67 | 69 |
| Link Distance (ft) | | | 1114 | 1114 | | | | 757 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 190 | 190 | | | 190 | 300 | 300 | | 450 | | | 225 |
| Storage Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | SB | SB | SB |
|---|---|---|---|
| Directions Served | L | T | R |
| Maximum Queue (ft) | 97 | 186 | 44 |
| Average Queue (ft) | 39 | 77 | 14 |
| 95th Queue (ft) | 85 | 155 | 38 |
| Link Distance (ft) | | 469 | |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | 325 | | 325 |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 10: Johnathan Carver Pkwy & US 212 WB Ramps

| Movement | WB | WB | WB | NB | NB | NB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | LT | R | L | T | T | T | T | T | R |
| Maximum Queue (ft) | 340 | 374 | 233 | 125 | 231 | 179 | 31 | 129 | 127 | 100 |
| Average Queue (ft) | 210 | 250 | 39 | 42 | 103 | 78 | 3 | 55 | 48 | 37 |
| 95th Queue (ft) | 308 | 344 | 129 | 91 | 181 | 140 | 15 | 105 | 100 | 79 |
| Link Distance (ft) | | 1104 | | 360 | 360 | 360 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |
| Storage Bay Dist (ft) | 275 | | 275 | | | | 150 | | | 100 |
| Storage Blk Time (%) | 0 | 4 | | | | | | 0 | 1 | 0 |
| Queuing Penalty (veh) | 2 | 20 | | | | | | 0 | 2 | 0 |

## Intersection: 11: Johnathan Carver Pkwy & US 212 EB Ramps

| Movement | EB | EB | NB | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|
| Directions Served | LT | R | T | T | T | L | T | T |
| Maximum Queue (ft) | 168 | 73 | 38 | 58 | 65 | 45 | 143 | 172 |
| Average Queue (ft) | 92 | 23 | 3 | 16 | 11 | 9 | 39 | 35 |
| 95th Queue (ft) | 154 | 57 | 17 | 49 | 41 | 33 | 111 | 108 |
| Link Distance (ft) | 1077 | | | 2636 | 2636 | 360 | 360 | 360 |
| Upstream Blk Time (%) | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | |
| Storage Bay Dist (ft) | | 250 | 275 | | | | | |
| Storage Blk Time (%) | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | |

## Zone Summary

Zone wide Queuing Penalty: 75

# Operational Results

## 2025 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | Creek Road EB | None | 10 | | 14 | | 6 | 1076 | | 0.0093 | |
| 2 | Creek Road WB | None | 22 | | 4 | | 20 | 1107 | | 0.0199 | |
| 3 | Chaska Creek SB | None | 16 | | 4 | | 22 | 1098 | | 0.0146 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | Creek Road EB | None | 0.09 | | 0.09 | 0.00 | | A | | A |
| 2 | Creek Road WB | None | 3.32 | | 3.32 | 0.06 | | A | | A |
| 3 | Chaska Creek SB | None | 3.28 | | 3.28 | 0.04 | | A | | A |

# Global Results

## Performance and Accidents

### 2025 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 48 | | 48 |
| Capacity | veh/hr | 3280 | | 3280 |
| Average Delay | sec/veh | 2.55 | | 2.55 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 0.03 | | 0.03 |

# Operational Results

## 2025 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | Creek Road EB | None | 13 | | 40 | | 7 | 1062 | | 0.0122 | |
| 2 | Creek Road WB | None | 25 | | 4 | | 49 | 1107 | | 0.0226 | |
| 3 | Chaska Creek SB | None | 43 | | 4 | | 25 | 1098 | | 0.0392 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | Creek Road EB | None | 3.18 | | 3.18 | 0.03 | | A | | A |
| 2 | Creek Road WB | None | 3.36 | | 3.36 | 0.06 | | A | | A |
| 3 | Chaska Creek SB | None | 3.60 | | 3.60 | 0.11 | | A | | A |

# Global Results

## Performance and Accidents

### 2025 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 81 | | 81 |
| Capacity | veh/hr | 3267 | | 3267 |
| Average Delay | sec/veh | 3.31 | | 3.31 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 0.07 | | 0.07 |

# Operational Results

## 2025 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | US 212 Entrance Ramp | None | 0 | | 0 | | 319 | 0 | | 0.0000 | |
| 2 | EB CSAH 44 | None | 268 | | 0 | | 119 | 2005 | | 0.1337 | |
| 3 | WB CSAH 44 | None | 419 | | 19 | | 249 | 1039 | | 0.4031 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | US 212 Entrance Ramp | None | 0.00 | | 0.00 | 0.00 | | A | | A |
| 2 | EB CSAH 44 | None | 3.49 | | 3.49 | 0.48 | | A | | A |
| 3 | WB CSAH 44 | None | 7.92 | | 7.92 | 1.82 | | A | | A |

# Global Results

## Performance and Accidents

### 2025 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 687 | | 687 |
| Capacity | veh/hr | 3044 | | 3044 |
| Average Delay | sec/veh | 5.32 | | 5.32 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 1.02 | | 1.02 |

# Operational Results

## 2025 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | US 212 Entrance Ramp | None | 0 | | 0 | | 153 | 0 | | 0.0000 | |
| 2 | EB CSAH 44 | None | 345 | | 0 | | 210 | 2005 | | 0.1721 | |
| 3 | WB CSAH 44 | None | 350 | | 13 | | 332 | 1124 | | 0.3114 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | US 212 Entrance Ramp | None | 0.00 | | 0.00 | 0.00 | | A | | A |
| 2 | EB CSAH 44 | None | 3.89 | | 3.89 | 0.63 | | A | | A |
| 3 | WB CSAH 44 | None | 6.84 | | 6.84 | 1.29 | | A | | A |

# Global Results

## Performance and Accidents

### 2025 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 695 | | 695 |
| Capacity | veh/hr | 3129 | | 3129 |
| Average Delay | sec/veh | 4.44 | | 4.44 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 0.86 | | 0.86 |

# Operational Results

## 2025 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | EB CSAH 44 | None | 211 | | 0 | | 126 | 1167 | | 0.1808 | |
| 2 | NB US 212 EXIT | Free | 3 | 61 | 211 | 0 | 0 | 995 | 1264 | 0.0030 | 0.0483 |
| 3 | WB CSAH 44 | None | 119 | | 7 | | 268 | 1077 | | 0.1105 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | EB CSAH 44 | None | 5.43 | | 5.43 | 0.64 | | A | | A |
| 2 | NB US 212 EXIT | Free | 0.03 | 0.48 | 0.46 | 0.00 | 0.00 | A | A | A |
| 3 | WB CSAH 44 | None | 4.56 | | 4.56 | 0.34 | | A | | A |

# Global Results

## Performance and Accidents

### 2025 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 333 | 61 | 394 |
| Capacity | veh/hr | 3240 | 1264 | 4504 |
| Average Delay | sec/veh | 4.30 | 0.24 | 3.67 |
| L.O.S. (Signal) | A – F | A | A | A |
| L.O.S. (Unsig) | A – F | A | A | A |
| Total Delay | veh.hrs | 0.40 | 0.00 | 0.40 |

# Operational Results

## 2025 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | EB CSAH 44 | None | 153 | | 0 | | 241 | 1004 | | 0.1524 | |
| 2 | NB US 212 EXIT | Free | 30 | 194 | 153 | 0 | 0 | 1079 | 1301 | 0.0278 | 0.1491 |
| 3 | WB CSAH 44 | None | 210 | | 31 | | 346 | 1151 | | 0.1825 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | EB CSAH 44 | None | 5.20 | | 5.20 | 0.48 | | A | | A |
| 2 | NB US 212 EXIT | Free | 3.60 | 1.49 | 1.78 | 0.08 | 0.00 | A | A | A |
| 3 | WB CSAH 44 | None | 5.50 | | 5.50 | 0.65 | | A | | A |

# Global Results

## Performance and Accidents

### 2025 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 393 | 194 | 587 |
| Capacity | veh/hr | 3233 | 1301 | 4534 |
| Average Delay | sec/veh | 4.44 | 0.75 | 3.22 |
| L.O.S. (Signal) | A – F | A | A | A |
| L.O.S. (Unsig) | A – F | A | A | A |
| Total Delay | veh.hrs | 0.49 | 0.04 | 0.53 |

# Appendix E:

# Opening Year (2030) No-Build Analysis Reports

## 1: US 212 EB Ramps & Engler Blvd Performance by movement

| Movement | EBL | EBT | WBT | WBR | NBL | NBT | NBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.2 | 3.6 | 0.4 | 0.4 | 3.9 | 0.4 |
| Total Del/Veh (s) | 10.0 | 3.2 | 41.4 | 14.5 | 38.5 | 67.6 | 6.2 | 13.6 |

## 2: US 212 WB Ramps & Engler Blvd Performance by movement

| Movement | EBT | EBR | WBL | WBT | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 3.3 | 1.3 | 0.3 |
| Total Del/Veh (s) | 13.0 | 3.3 | 83.9 | 6.6 | 79.1 | 7.9 | 13.1 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.8 | 3.6 | 3.6 |
| Total Del/Veh (s) | 26.4 | 25.9 | 2.8 | 41.0 | 5.6 | 1.8 | 57.0 | 44.8 | 10.1 | 32.3 | 34.7 | 9.8 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.5 |
| Total Del/Veh (s) | 21.6 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 2.6 | 0.3 | 2.6 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 3.5 | 0.7 | 3.3 |
| Total Del/Veh (s) | 13.3 | 12.6 | 4.6 | 19.1 | 12.7 | 4.7 | 17.3 | 21.8 | 6.4 | 19.5 | 23.1 | 4.0 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.9 |
| Total Del/Veh (s) | 13.7 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 4.5 | 0.1 | 1.3 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 25.2 | 33.8 | 4.9 | 21.3 | 17.1 | 2.8 | 10.9 | 11.1 | 10.3 | 10.5 | 7.6 | 1.0 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.1 |
| Total Del/Veh (s) | 11.8 |

## 10: Johnathan Carver Pkwy & US 212 WB Ramps Performance by movement

| Movement | WBL | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.7 | 3.5 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 |
| Total Del/Veh (s) | 30.9 | 8.5 | 36.9 | 7.8 | 11.4 | 4.5 | 14.2 |

## 11: Johnathan Carver Pkwy & US 212 EB Ramps Performance by movement

| Movement | EBL | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.5 | 3.6 | 0.4 | 0.4 | 0.0 | 0.0 | 0.4 |
| Total Del/Veh (s) | 30.2 | 7.2 | 27.2 | 45.8 | 6.9 | 4.2 | 31.0 |

## Total Zone Performance

| | |
|---|---|
| Denied Del/Veh (s) | 1.1 |
| Total Del/Veh (s) | 1111.9 |

## Intersection: 1: US 212 EB Ramps & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | T | T | T | R | LT | R |
| Maximum Queue (ft) | 213 | 212 | 42 | 61 | 164 | 151 | 92 | 103 | 81 |
| Average Queue (ft) | 94 | 94 | 5 | 13 | 86 | 57 | 44 | 44 | 33 |
| 95th Queue (ft) | 174 | 174 | 23 | 45 | 143 | 117 | 81 | 89 | 62 |
| Link Distance (ft) | | 669 | 669 | 669 | 1124 | 1124 | | 745 | |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | 300 | | | | | | 330 | | 210 |
| Storage Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |

## Intersection: 2: US 212 WB Ramps & Engler Blvd

| Movement | EB | EB | EB | WB | SB | SB | SB |
|---|---|---|---|---|---|---|---|
| Directions Served | T | T | R | L | L | TR | R |
| Maximum Queue (ft) | 408 | 122 | 36 | 98 | 75 | 114 | 81 |
| Average Queue (ft) | 140 | 26 | 4 | 31 | 27 | 56 | 31 |
| 95th Queue (ft) | 331 | 83 | 21 | 75 | 63 | 91 | 60 |
| Link Distance (ft) | 909 | 909 | | | | 775 | |
| Upstream Blk Time (%) | | | | | | | |
| Queuing Penalty (veh) | | | | | | | |
| Storage Bay Dist (ft) | | | 275 | 225 | 225 | | 225 |
| Storage Blk Time (%) | | | | | | | |
| Queuing Penalty (veh) | | | | | | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | WB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | L | T | T | R | L | T | R |
| Maximum Queue (ft) | 258 | 536 | 434 | 28 | 93 | 61 | 87 | 96 | 44 | 11 | 26 | 40 |
| Average Queue (ft) | 21 | 263 | 122 | 7 | 43 | 9 | 30 | 26 | 10 | 1 | 3 | 10 |
| 95th Queue (ft) | 128 | 484 | 290 | 26 | 80 | 37 | 65 | 69 | 29 | 6 | 16 | 29 |
| Link Distance (ft) | | 1228 | 1228 | | | | 909 | 909 | | | 1277 | 1277 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 210 | | | 210 | 250 | 250 | | | 150 | 240 | | |
| Storage Blk Time (%) | | 18 | 2 | | | | | | | | | |
| Queuing Penalty (veh) | | 3 | 0 | | | | | | | | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | SB | SB | SB |
|---|---|---|---|
| Directions Served | L | L | TR |
| Maximum Queue (ft) | 168 | 217 | 65 |
| Average Queue (ft) | 97 | 85 | 16 |
| 95th Queue (ft) | 159 | 174 | 47 |
| Link Distance (ft) | | 547 | |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | 100 | | 400 |
| Storage Blk Time (%) | 11 | 4 | |
| Queuing Penalty (veh) | 21 | 8 | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | T | T | R | L | L | T | T |
| Maximum Queue (ft) | 72 | 171 | 143 | 72 | 31 | 102 | 123 | 78 | 93 | 112 | 134 | 121 |
| Average Queue (ft) | 18 | 99 | 60 | 35 | 5 | 43 | 44 | 17 | 31 | 50 | 51 | 48 |
| 95th Queue (ft) | 52 | 152 | 114 | 62 | 21 | 91 | 93 | 50 | 70 | 89 | 103 | 94 |
| Link Distance (ft) | | 1391 | 1391 | | | 4206 | 4206 | | | | 855 | 855 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 175 | | | 175 | 175 | | | 175 | 225 | 225 | | |
| Storage Blk Time (%) | | 0 | 0 | | | | | | | | | |
| Queuing Penalty (veh) | | 0 | 0 | | | | | | | | | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | NB | SB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|
| Directions Served | R | L | L | T | T | R |
| Maximum Queue (ft) | 45 | 103 | 132 | 128 | 41 | 73 |
| Average Queue (ft) | 9 | 41 | 69 | 57 | 5 | 21 |
| 95th Queue (ft) | 31 | 79 | 111 | 105 | 24 | 56 |
| Link Distance (ft) | | | | 1144 | 1144 | |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | 225 | 275 | 275 | | | 275 |
| Storage Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB | NB | NB | SB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | R | R | L | L | TR | L | T | T | R | L |
| Maximum Queue (ft) | 30 | 55 | 49 | 53 | 131 | 163 | 66 | 58 | 172 | 49 | 207 | 70 |
| Average Queue (ft) | 3 | 9 | 14 | 8 | 37 | 80 | 21 | 14 | 50 | 4 | 64 | 24 |
| 95th Queue (ft) | 17 | 34 | 39 | 31 | 93 | 143 | 50 | 37 | 122 | 30 | 160 | 57 |
| Link Distance (ft) | | 1114 | 1114 | | | | 757 | | 1037 | 1037 | | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 190 | | | 190 | 300 | 300 | | 450 | | | 225 | 325 |
| Storage Blk Time (%) | | | | | | | | | | | 0 | |
| Queuing Penalty (veh) | | | | | | | | | | | 0 | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | SB | SB |
|---|---|---|
| Directions Served | T | R |
| Maximum Queue (ft) | 132 | 43 |
| Average Queue (ft) | 44 | 4 |
| 95th Queue (ft) | 99 | 22 |
| Link Distance (ft) | 469 | |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | 325 |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Intersection: 10: Johnathan Carver Pkwy & US 212 WB Ramps

| Movement | WB | WB | WB | NB | NB | NB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | LT | R | L | T | T | T | T | T | R |
| Maximum Queue (ft) | 201 | 232 | 69 | 145 | 136 | 191 | 54 | 102 | 88 | 82 |
| Average Queue (ft) | 69 | 120 | 20 | 60 | 58 | 87 | 8 | 36 | 32 | 25 |
| 95th Queue (ft) | 154 | 192 | 56 | 114 | 115 | 159 | 33 | 79 | 75 | 56 |
| Link Distance (ft) | | 1104 | | 360 | 360 | 360 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |
| Storage Bay Dist (ft) | 275 | | 275 | | | | 150 | | | 100 |
| Storage Blk Time (%) | 0 | 0 | | | | | | 0 | 0 | 0 |
| Queuing Penalty (veh) | 0 | 0 | | | | | | 0 | 0 | 0 |

## Intersection: 11: Johnathan Carver Pkwy & US 212 EB Ramps

| Movement | EB | EB | NB | NB | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | LT | R | T | T | T | R | L | T | T |
| Maximum Queue (ft) | 265 | 83 | 108 | 965 | 1149 | 1205 | 81 | 82 | 69 |
| Average Queue (ft) | 138 | 34 | 14 | 109 | 295 | 314 | 23 | 23 | 30 |
| 95th Queue (ft) | 224 | 67 | 68 | 584 | 991 | 1092 | 60 | 65 | 65 |
| Link Distance (ft) | 1077 | | | 2650 | 2650 | 2650 | 360 | 360 | 360 |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | | 250 | 275 | | | | | | |
| Storage Blk Time (%) | 0 | | | 1 | | | | | |
| Queuing Penalty (veh) | 0 | | | 1 | | | | | |

## Zone Summary

Zone wide Queuing Penalty: 34

## 1: US 212 EB Ramps & Engler Blvd Performance by movement

| Movement | EBL | EBT | WBT | WBR | NBL | NBT | NBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.2 | 3.4 | 0.2 | 0.5 | 3.9 | 0.3 |
| Total Del/Veh (s) | 24.3 | 4.3 | 12.8 | 4.7 | 38.1 | 14.8 | 5.9 | 14.0 |

## 2: US 212 WB Ramps & Engler Blvd Performance by movement

| Movement | EBT | EBR | WBL | WBT | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.1 | 0.0 | 0.0 | 3.3 | 2.3 | 1.2 |
| Total Del/Veh (s) | 18.7 | 3.9 | 13.8 | 9.6 | 20.6 | 14.9 | 15.4 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.2 | 0.1 | 0.1 | 2.0 | 3.9 | 3.8 |
| Total Del/Veh (s) | 43.5 | 9.6 | 1.7 | 46.9 | 11.5 | 4.9 | 31.2 | 48.5 | 5.0 | 30.9 | 34.7 | 7.8 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.2 |
| Total Del/Veh (s) | 13.0 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 3.2 | 0.2 | 3.1 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.6 | 0.4 | 3.7 |
| Total Del/Veh (s) | 19.7 | 11.1 | 3.9 | 13.2 | 15.8 | 10.5 | 19.7 | 18.9 | 3.1 | 19.6 | 26.7 | 7.7 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.5 |
| Total Del/Veh (s) | 15.2 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 3.7 | 0.3 | 1.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 24.4 | 37.4 | 6.7 | 27.2 | 35.3 | 10.1 | 19.4 | 22.0 | 8.4 | 15.8 | 18.3 | 2.0 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.3 |
| Total Del/Veh (s) | 18.7 |

## 10: Johnathan Carver Pkwy & US 212 WB Ramps Performance by movement

| Movement | WBL | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 1.6 | 3.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.8 |
| Total Del/Veh (s) | 42.9 | 13.9 | 41.7 | 18.1 | 21.7 | 7.5 | 28.7 |

## 11: Johnathan Carver Pkwy & US 212 EB Ramps Performance by movement

| Movement | EBL | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.4 | 3.7 | 0.3 | 0.2 | 0.0 | 0.0 | 0.2 |
| Total Del/Veh (s) | 43.9 | 15.0 | 4.5 | 6.9 | 5.8 | 7.8 | 9.3 |

## Total Zone Performance

| | |
|---|---|
| Denied Del/Veh (s) | 1.4 |
| Total Del/Veh (s) | 991.3 |

## Intersection: 1: US 212 EB Ramps & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | T | T | T | R | LT | R |
| Maximum Queue (ft) | 167 | 204 | 78 | 86 | 143 | 92 | 49 | 94 | 51 |
| Average Queue (ft) | 58 | 87 | 15 | 11 | 58 | 29 | 12 | 35 | 19 |
| 95th Queue (ft) | 124 | 156 | 52 | 48 | 115 | 68 | 36 | 75 | 43 |
| Link Distance (ft) | | 669 | 669 | 669 | 1124 | 1124 | | 745 | |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | 300 | | | | | | 330 | | 210 |
| Storage Blk Time (%) | 0 | 0 | | | | | | | |
| Queuing Penalty (veh) | 0 | 0 | | | | | | | |

## Intersection: 2: US 212 WB Ramps & Engler Blvd

| Movement | EB | EB | EB | WB | WB | WB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | T | T | R | L | T | T | L | TR | R |
| Maximum Queue (ft) | 229 | 163 | 41 | 66 | 70 | 104 | 101 | 258 | 226 |
| Average Queue (ft) | 109 | 81 | 11 | 28 | 23 | 46 | 39 | 160 | 121 |
| 95th Queue (ft) | 191 | 142 | 33 | 57 | 59 | 88 | 82 | 245 | 211 |
| Link Distance (ft) | 909 | 909 | | | 669 | 669 | | 775 | |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | | | 275 | 225 | | | 225 | | 225 |
| Storage Blk Time (%) | | | | | | | | 1 | 0 |
| Queuing Penalty (veh) | | | | | | | | 6 | 1 |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | WB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | L | T | T | R | L | T | R |
| Maximum Queue (ft) | 67 | 162 | 118 | 32 | 61 | 33 | 196 | 217 | 76 | 51 | 41 | 53 |
| Average Queue (ft) | 22 | 64 | 48 | 2 | 27 | 1 | 94 | 107 | 30 | 14 | 9 | 20 |
| 95th Queue (ft) | 54 | 127 | 103 | 14 | 54 | 12 | 174 | 192 | 59 | 39 | 30 | 38 |
| Link Distance (ft) | | 1228 | 1228 | | | | 909 | 909 | | | 1277 | 1277 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 210 | | | 210 | 250 | 250 | | | 150 | 240 | | |
| Storage Blk Time (%) | | 0 | | | | | | 2 | | | | |
| Queuing Penalty (veh) | | 0 | | | | | | 6 | | | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | SB | SB | SB |
|---|---|---|---|
| Directions Served | L | L | TR |
| Maximum Queue (ft) | 88 | 121 | 56 |
| Average Queue (ft) | 36 | 47 | 14 |
| 95th Queue (ft) | 70 | 99 | 39 |
| Link Distance (ft) | | 547 | |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | 100 | | 400 |
| Storage Blk Time (%) | 0 | 2 | |
| Queuing Penalty (veh) | 0 | 2 | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | T | T | R | L | L | T | T |
| Maximum Queue (ft) | 39 | 123 | 91 | 79 | 30 | 184 | 176 | 122 | 109 | 123 | 116 | 110 |
| Average Queue (ft) | 10 | 64 | 25 | 29 | 4 | 81 | 80 | 30 | 49 | 59 | 45 | 49 |
| 95th Queue (ft) | 30 | 109 | 61 | 60 | 20 | 154 | 153 | 77 | 92 | 102 | 89 | 92 |
| Link Distance (ft) | | 1391 | 1391 | | | 4206 | 4206 | | | | 855 | 855 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 175 | | | 175 | 175 | | | 175 | 225 | 225 | | |
| Storage Blk Time (%) | | | | | | 0 | 0 | | | | | |
| Queuing Penalty (veh) | | | | | | 0 | 1 | | | | | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | NB | SB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|
| Directions Served | R | L | L | T | T | R |
| Maximum Queue (ft) | 30 | 51 | 95 | 197 | 153 | 61 |
| Average Queue (ft) | 6 | 19 | 44 | 97 | 25 | 16 |
| 95th Queue (ft) | 23 | 47 | 78 | 174 | 91 | 48 |
| Link Distance (ft) | | | | 1144 | 1144 | |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | 225 | 275 | 275 | | | 275 |
| Storage Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | EB | EB | EB | EB | EB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | R | R | L | L | TR | L | T | T | R |
| Maximum Queue (ft) | 77 | 58 | 83 | 67 | 52 | 157 | 207 | 114 | 118 | 204 | 115 | 112 |
| Average Queue (ft) | 34 | 15 | 24 | 30 | 24 | 66 | 109 | 37 | 42 | 84 | 18 | 38 |
| 95th Queue (ft) | 62 | 49 | 58 | 56 | 43 | 128 | 170 | 87 | 93 | 173 | 71 | 91 |
| Link Distance (ft) | | | 1114 | 1114 | | | | 757 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 190 | 190 | | | 190 | 300 | 300 | | 450 | | | 225 |
| Storage Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | SB | SB | SB |
|---|---|---|---|
| Directions Served | L | T | R |
| Maximum Queue (ft) | 123 | 212 | 51 |
| Average Queue (ft) | 46 | 96 | 15 |
| 95th Queue (ft) | 96 | 183 | 40 |
| Link Distance (ft) | | 469 | |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | 325 | | 325 |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 10: Johnathan Carver Pkwy & US 212 WB Ramps

| Movement | WB | WB | WB | NB | NB | NB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | LT | R | L | T | T | T | T | T | R |
| Maximum Queue (ft) | 349 | 676 | 350 | 123 | 210 | 174 | 23 | 159 | 164 | 124 |
| Average Queue (ft) | 280 | 359 | 73 | 55 | 120 | 104 | 4 | 75 | 73 | 45 |
| 95th Queue (ft) | 391 | 569 | 250 | 103 | 193 | 161 | 16 | 132 | 133 | 92 |
| Link Distance (ft) | | 1104 | | 360 | 360 | 360 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |
| Storage Bay Dist (ft) | 275 | | 275 | | | | 150 | | | 100 |
| Storage Blk Time (%) | 3 | 17 | | | | | | 0 | 4 | 0 |
| Queuing Penalty (veh) | 19 | 104 | | | | | | 0 | 11 | 0 |

## Intersection: 11: Johnathan Carver Pkwy & US 212 EB Ramps

| Movement | EB | EB | NB | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|
| Directions Served | LT | R | T | T | T | L | T | T |
| Maximum Queue (ft) | 215 | 91 | 54 | 112 | 82 | 62 | 293 | 315 |
| Average Queue (ft) | 106 | 37 | 8 | 25 | 16 | 15 | 103 | 108 |
| 95th Queue (ft) | 182 | 71 | 32 | 72 | 53 | 46 | 246 | 267 |
| Link Distance (ft) | 1077 | | | 2636 | 2636 | 360 | 360 | 360 |
| Upstream Blk Time (%) | | | | | | | | 0 |
| Queuing Penalty (veh) | | | | | | | | 0 |
| Storage Bay Dist (ft) | | 250 | 275 | | | | | |
| Storage Blk Time (%) | 0 | | | | | | | |
| Queuing Penalty (veh) | 0 | | | | | | | |

## Zone Summary

Zone wide Queuing Penalty: 150

# Operational Results

## 2030 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | Creek Road EB | None | 12 | | 16 | | 7 | 1075 | | 0.0112 | |
| 2 | Creek Road WB | None | 25 | | 5 | | 23 | 1106 | | 0.0226 | |
| 3 | Chaska Creek SB | None | 18 | | 5 | | 25 | 1097 | | 0.0164 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | Creek Road EB | None | 3.14 | | 3.14 | 0.03 | | A | | A |
| 2 | Creek Road WB | None | 3.36 | | 3.36 | 0.06 | | A | | A |
| 3 | Chaska Creek SB | None | 3.30 | | 3.30 | 0.05 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 55 | | 55 |
| Capacity | veh/hr | 3278 | | 3278 |
| Average Delay | sec/veh | 3.20 | | 3.20 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 0.05 | | 0.05 |

# Operational Results

## 2030 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | Creek Road EB | None | 15 | | 45 | | 8 | 1060 | | 0.0142 | |
| 2 | Creek Road WB | None | 29 | | 5 | | 55 | 1106 | | 0.0262 | |
| 3 | Chaska Creek SB | None | 48 | | 5 | | 29 | 1097 | | 0.0438 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | Creek Road EB | None | 3.39 | | 3.39 | 0.04 | | A | | A |
| 2 | Creek Road WB | None | 3.40 | | 3.40 | 0.08 | | A | | A |
| 3 | Chaska Creek SB | None | 3.66 | | 3.66 | 0.13 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 92 | | 92 |
| Capacity | veh/hr | 3263 | | 3263 |
| Average Delay | sec/veh | 3.37 | | 3.37 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 0.09 | | 0.09 |

# Operational Results

## 2030 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | NB CSAH 11 | None | 319 | | 219 | | 250 | 733 | | 0.4352 | |
| 2 | WB CSAH 44 | None | 136 | | 78 | | 460 | 1062 | | 0.1280 | |
| 3 | SB CSAH 11 | None | 356 | | 136 | | 78 | 941 | | 0.3783 | |
| 4 | EB CSAH 44 | None | 71 | | 398 | | 94 | 843 | | 0.0843 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | NB CSAH 11 | None | 8.96 | | 8.96 | 1.72 | | A | | A |
| 2 | WB CSAH 44 | None | 4.89 | | 4.89 | 0.41 | | A | | A |
| 3 | SB CSAH 11 | None | 7.96 | | 7.96 | 1.61 | | A | | A |
| 4 | EB CSAH 44 | None | 5.06 | | 5.06 | 0.26 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 882 | | 882 |
| Capacity | veh/hr | 3579 | | 3579 |
| Average Delay | sec/veh | 6.72 | | 6.72 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 1.65 | | 1.65 |

# Operational Results

## 2030 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | NB CSAH 11 | None | 319 | | 219 | | 250 | 865 | | 0.3688 | |
| 2 | WB CSAH 44 | None | 136 | | 78 | | 460 | 1108 | | 0.1228 | |
| 3 | SB CSAH 11 | None | 356 | | 136 | | 78 | 864 | | 0.4119 | |
| 4 | EB CSAH 44 | None | 71 | | 398 | | 94 | 762 | | 0.0931 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | NB CSAH 11 | None | 8.12 | | 8.12 | 1.46 | | A | | A |
| 2 | WB CSAH 44 | None | 4.76 | | 4.76 | 0.39 | | A | | A |
| 3 | SB CSAH 11 | None | 8.37 | | 8.37 | 1.65 | | A | | A |
| 4 | EB CSAH 44 | None | 5.39 | | 5.39 | 0.26 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 882 | | 882 |
| Capacity | veh/hr | 3599 | | 3599 |
| Average Delay | sec/veh | 6.59 | | 6.59 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 1.61 | | 1.61 |

# Operational Results

## 2030 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | US 212 Entrance Ramp | None | 0 | | 0 | | 360 | 0 | | 0.0000 | |
| 2 | EB CSAH 44 | None | 303 | | 0 | | 135 | 2005 | | 0.1511 | |
| 3 | WB CSAH 44 | None | 474 | | 21 | | 282 | 1038 | | 0.4565 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | US 212 Entrance Ramp | None | 0.00 | | 0.00 | 0.00 | | A | | A |
| 2 | EB CSAH 44 | None | 3.70 | | 3.70 | 0.56 | | A | | A |
| 3 | WB CSAH 44 | None | 8.60 | | 8.60 | 2.26 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 777 | | 777 |
| Capacity | veh/hr | 3043 | | 3043 |
| Average Delay | sec/veh | 5.79 | | 5.79 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 1.25 | | 1.25 |

# Operational Results

## 2030 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | US 212 Entrance Ramp | None | 0 | | 0 | | 173 | 0 | | 0.0000 | |
| 2 | EB CSAH 44 | None | 391 | | 0 | | 238 | 2005 | | 0.1950 | |
| 3 | WB CSAH 44 | None | 396 | | 15 | | 376 | 1123 | | 0.3527 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | US 212 Entrance Ramp | None | 0.00 | | 0.00 | 0.00 | | A | | A |
| 2 | EB CSAH 44 | None | 4.16 | | 4.16 | 0.74 | | A | | A |
| 3 | WB CSAH 44 | None | 7.30 | | 7.30 | 1.56 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 787 | | 787 |
| Capacity | veh/hr | 3128 | | 3128 |
| Average Delay | sec/veh | 4.76 | | 4.76 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 1.04 | | 1.04 |

# Operational Results

## 2030 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | EB CSAH 44 | None | 239 | | 0 | | 143 | 1167 | | 0.2047 | |
| 2 | NB US 212 EXIT | Free | 3 | 69 | 239 | 0 | 0 | 981 | 1264 | 0.0031 | 0.0546 |
| 3 | WB CSAH 44 | None | 135 | | 8 | | 303 | 1077 | | 0.1254 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | EB CSAH 44 | None | 5.73 | | 5.73 | 0.75 | | A | | A |
| 2 | NB US 212 EXIT | Free | 0.03 | 0.55 | 0.53 | 0.00 | 0.00 | A | A | A |
| 3 | WB CSAH 44 | None | 4.76 | | 4.76 | 0.40 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 377 | 69 | 446 |
| Capacity | veh/hr | 3225 | 1264 | 4489 |
| Average Delay | sec/veh | 4.49 | 0.27 | 3.84 |
| L.O.S. (Signal) | A – F | A | A | A |
| L.O.S. (Unsig) | A – F | A | A | A |
| Total Delay | veh.hrs | 0.47 | 0.01 | 0.48 |

# Operational Results

## 2030 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | EB CSAH 44 | None | 173 | | 0 | | 273 | 1004 | | 0.1724 | |
| 2 | NB US 212 EXIT | Free | 34 | 219 | 173 | 0 | 0 | 1068 | 1301 | 0.0318 | 0.1683 |
| 3 | WB CSAH 44 | None | 238 | | 35 | | 391 | 1149 | | 0.2072 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | EB CSAH 44 | None | 5.47 | | 5.47 | 0.55 | | A | | A |
| 2 | NB US 212 EXIT | Free | 3.69 | 1.69 | 1.96 | 0.10 | 0.00 | A | A | A |
| 3 | WB CSAH 44 | None | 5.83 | | 5.83 | 0.76 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 445 | 219 | 664 |
| Capacity | veh/hr | 3220 | 1301 | 4521 |
| Average Delay | sec/veh | 4.64 | 0.84 | 3.39 |
| L.O.S. (Signal) | A – F | A | A | A |
| L.O.S. (Unsig) | A – F | A | A | A |
| Total Delay | veh.hrs | 0.57 | 0.05 | 0.63 |

# Appendix F:

# Opening Year (2030) Build Scenario 1 Analysis Reports

## 1: US 212 EB Ramps & Engler Blvd Performance by movement

| Movement | EBL | EBT | WBT | WBR | NBL | NBT | NBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.2 | 3.6 | 0.5 | 0.1 | 3.9 | 0.5 |
| Total Del/Veh (s) | 10.9 | 3.7 | 39.1 | 16.1 | 42.9 | 28.1 | 7.0 | 14.1 |

## 2: US 212 WB Ramps & Engler Blvd Performance by movement

| Movement | EBT | EBR | WBL | WBT | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 3.3 | 1.3 | 0.3 |
| Total Del/Veh (s) | 13.7 | 4.9 | 77.7 | 6.3 | 71.2 | 7.9 | 13.7 |

## 3: Chaska Creek Blvd & Engler Blvd 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 | 0.0 | 0.0 | 0.0 | 2.5 | 0.0 | 0.0 | 1.9 | 3.7 | 3.6 |
| Total Del/Veh (s) | 18.2 | 17.5 | 3.5 | 39.2 | 5.2 | 2.0 | 49.4 | 51.1 | 9.4 | 33.0 | 35.6 | 6.8 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.3 |
| Total Del/Veh (s) | 17.1 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 2.7 | 0.3 | 2.5 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 3.4 | 0.7 | 3.4 |
| Total Del/Veh (s) | 15.7 | 12.9 | 4.8 | 21.7 | 12.7 | 4.7 | 17.1 | 23.3 | 7.2 | 21.5 | 23.2 | 4.4 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.9 |
| Total Del/Veh (s) | 14.1 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 4.5 | 0.1 | 1.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 20.1 | 35.1 | 4.7 | 21.7 | 9.6 | 2.3 | 10.9 | 12.7 | 9.8 | 9.7 | 7.3 | 1.2 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.1 |
| Total Del/Veh (s) | 11.8 |

## 10: Johnathan Carver Pkwy & US 212 WB Ramps Performance by movement

| Movement | WBL | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.6 | 3.7 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 |
| Total Del/Veh (s) | 30.0 | 7.8 | 35.3 | 7.6 | 11.2 | 4.8 | 13.7 |

## 11: Johnathan Carver Pkwy & US 212 EB Ramps Performance by movement

| Movement | EBL | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.5 | 3.6 | 0.3 | 0.2 | 0.0 | 0.0 | 0.3 |
| Total Del/Veh (s) | 33.3 | 7.7 | 30.3 | 47.6 | 7.7 | 4.4 | 32.7 |

## 12: Johnathan Carver Pkwy & Access A Performance by movement

| Movement | WBR | NBT | NBR | SBT | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 3.4 | 1.9 | 1.1 | 0.7 | 1.2 |

## Total Zone Performance

| | |
|---|---|
| Denied Del/Veh (s) | 1.0 |
| Total Del/Veh (s) | 907.8 |

## Intersection: 1: US 212 EB Ramps & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | T | T | T | R | LT | R |
| Maximum Queue (ft) | 228 | 236 | 109 | 82 | 164 | 133 | 115 | 111 | 82 |
| Average Queue (ft) | 104 | 112 | 11 | 13 | 89 | 55 | 46 | 49 | 35 |
| 95th Queue (ft) | 184 | 203 | 58 | 51 | 147 | 113 | 89 | 98 | 64 |
| Link Distance (ft) | | 669 | 669 | 669 | 1120 | 1120 | | 745 | |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | 300 | | | | | | 330 | | 210 |
| Storage Blk Time (%) | 0 | | | | | | | | |
| Queuing Penalty (veh) | 0 | | | | | | | | |

## Intersection: 2: US 212 WB Ramps & Engler Blvd

| Movement | EB | EB | EB | WB | WB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|
| Directions Served | T | T | R | L | T | L | TR | R |
| Maximum Queue (ft) | 336 | 280 | 34 | 108 | 5 | 80 | 123 | 96 |
| Average Queue (ft) | 107 | 63 | 4 | 38 | 0 | 27 | 59 | 35 |
| 95th Queue (ft) | 255 | 184 | 21 | 83 | 4 | 64 | 102 | 71 |
| Link Distance (ft) | 909 | 909 | | | 669 | | 775 | |
| Upstream Blk Time (%) | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | |
| Storage Bay Dist (ft) | | | 275 | 225 | | 225 | | 225 |
| Storage Blk Time (%) | | 0 | | | | | | |
| Queuing Penalty (veh) | | 0 | | | | | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | WB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | L | T | T | R | L | T | R |
| Maximum Queue (ft) | 45 | 297 | 284 | 33 | 81 | 54 | 88 | 90 | 61 | 14 | 37 | 52 |
| Average Queue (ft) | 9 | 169 | 143 | 7 | 41 | 9 | 31 | 25 | 13 | 1 | 6 | 12 |
| 95th Queue (ft) | 33 | 271 | 248 | 27 | 75 | 36 | 66 | 71 | 38 | 7 | 27 | 35 |
| Link Distance (ft) | | 1228 | 1228 | | | | 909 | 909 | | | 1277 | 1277 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 210 | | | 210 | 250 | 250 | | | 150 | 240 | | |
| Storage Blk Time (%) | | 4 | 1 | | | | | 0 | | | | |
| Queuing Penalty (veh) | | 1 | 0 | | | | | 0 | | | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | SB | SB | SB |
|---|---|---|---|
| Directions Served | L | L | TR |
| Maximum Queue (ft) | 167 | 185 | 63 |
| Average Queue (ft) | 82 | 88 | 14 |
| 95th Queue (ft) | 137 | 153 | 41 |
| Link Distance (ft) | | 547 | |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | 100 | | 400 |
| Storage Blk Time (%) | 5 | 6 | |
| Queuing Penalty (veh) | 10 | 12 | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | T | T | R | L | L | T | T |
| Maximum Queue (ft) | 59 | 169 | 147 | 85 | 26 | 124 | 122 | 61 | 77 | 93 | 117 | 118 |
| Average Queue (ft) | 15 | 106 | 69 | 35 | 4 | 46 | 42 | 15 | 28 | 48 | 50 | 53 |
| 95th Queue (ft) | 48 | 157 | 130 | 67 | 18 | 95 | 94 | 42 | 67 | 85 | 95 | 106 |
| Link Distance (ft) | | 1391 | 1391 | | | 4206 | 4206 | | | | 855 | 855 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 225 | | | 225 | 225 | | | 225 | 225 | 225 | | |
| Storage Blk Time (%) | | 0 | | | | | | | | | | |
| Queuing Penalty (veh) | | 0 | | | | | | | | | | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | NB | SB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|
| Directions Served | R | L | L | T | T | R |
| Maximum Queue (ft) | 55 | 110 | 173 | 122 | 58 | 87 |
| Average Queue (ft) | 11 | 29 | 92 | 60 | 7 | 25 |
| 95th Queue (ft) | 37 | 77 | 146 | 105 | 35 | 64 |
| Link Distance (ft) | | | | 1144 | 1144 | |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | 225 | 275 | 275 | | | 275 |
| Storage Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB | NB | NB | SB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | R | R | L | L | TR | L | T | T | R | L |
| Maximum Queue (ft) | 19 | 45 | 44 | 33 | 128 | 164 | 60 | 50 | 210 | 134 | 221 | 77 |
| Average Queue (ft) | 2 | 7 | 15 | 6 | 40 | 78 | 19 | 13 | 71 | 7 | 63 | 26 |
| 95th Queue (ft) | 12 | 30 | 39 | 24 | 97 | 137 | 48 | 37 | 156 | 46 | 151 | 60 |
| Link Distance (ft) | | 1114 | 1114 | | | | 769 | | 1037 | 1037 | | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 190 | | | 190 | 300 | 300 | | 450 | | | 225 | 325 |
| Storage Blk Time (%) | | | | | | | | | | 0 | 0 | |
| Queuing Penalty (veh) | | | | | | | | | | 0 | 0 | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | SB | SB |
|---|---|---|
| Directions Served | T | R |
| Maximum Queue (ft) | 153 | 30 |
| Average Queue (ft) | 47 | 4 |
| 95th Queue (ft) | 110 | 19 |
| Link Distance (ft) | 449 | |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | 325 |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Intersection: 10: Johnathan Carver Pkwy & US 212 WB Ramps

| Movement | WB | WB | WB | NB | NB | NB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | LT | R | L | T | T | T | T | T | R |
| Maximum Queue (ft) | 199 | 231 | 64 | 145 | 151 | 182 | 45 | 96 | 101 | 96 |
| Average Queue (ft) | 67 | 117 | 18 | 70 | 70 | 82 | 5 | 36 | 28 | 31 |
| 95th Queue (ft) | 148 | 186 | 47 | 129 | 129 | 145 | 23 | 72 | 70 | 70 |
| Link Distance (ft) | | 1104 | | 360 | 360 | 360 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |
| Storage Bay Dist (ft) | 275 | | 275 | | | | 150 | | | 100 |
| Storage Blk Time (%) | | 0 | | | | | | | 0 | 0 |
| Queuing Penalty (veh) | | 0 | | | | | | | 0 | 0 |

## Intersection: 11: Johnathan Carver Pkwy & US 212 EB Ramps

| Movement | EB | EB | NB | NB | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | LT | R | T | T | T | R | L | T | T |
| Maximum Queue (ft) | 347 | 229 | 135 | 944 | 1018 | 1084 | 69 | 80 | 91 |
| Average Queue (ft) | 163 | 41 | 20 | 196 | 374 | 460 | 21 | 26 | 37 |
| 95th Queue (ft) | 283 | 128 | 82 | 729 | 969 | 1069 | 55 | 65 | 76 |
| Link Distance (ft) | 1077 | | | 2636 | 2636 | 2636 | 360 | 360 | 360 |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | | 250 | 275 | | | | | | |
| Storage Blk Time (%) | 2 | | | 1 | | | | | |
| Queuing Penalty (veh) | 2 | | | 2 | | | | | |

## Intersection: 12: Johnathan Carver Pkwy & Access A

| Movement | WB |
|---|---|
| Directions Served | LR |
| Maximum Queue (ft) | 38 |
| Average Queue (ft) | 6 |
| 95th Queue (ft) | 28 |
| Link Distance (ft) | 1061 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Zone Summary

Zone wide Queuing Penalty: 27

## 1: US 212 EB Ramps & Engler Blvd Performance by movement

| Movement | EBL | EBT | WBT | WBR | NBL | NBT | NBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.2 | 3.4 | 0.3 | 0.1 | 4.0 | 0.4 |
| Total Del/Veh (s) | 22.5 | 4.4 | 13.3 | 4.0 | 40.6 | 59.1 | 5.5 | 13.5 |

## 2: US 212 WB Ramps & Engler Blvd Performance by movement

| Movement | EBT | EBR | WBL | WBT | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 3.2 | 2.3 | 1.2 |
| Total Del/Veh (s) | 19.7 | 4.3 | 16.2 | 9.8 | 21.8 | 15.7 | 16.2 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.9 | 0.2 | 0.1 | 2.1 | 3.9 | 4.0 |
| Total Del/Veh (s) | 45.9 | 10.7 | 1.5 | 48.3 | 10.6 | 4.7 | 39.9 | 39.2 | 5.3 | 31.5 | 33.3 | 10.3 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.3 |
| Total Del/Veh (s) | 13.0 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 3.0 | 0.3 | 3.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.5 | 0.5 | 3.5 |
| Total Del/Veh (s) | 52.0 | 12.0 | 4.1 | 51.5 | 19.8 | 11.1 | 43.5 | 35.8 | 4.0 | 47.0 | 48.9 | 9.7 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.6 |
| Total Del/Veh (s) | 24.0 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 3.7 | 0.3 | 1.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 33.3 | 47.2 | 7.8 | 42.9 | 38.8 | 16.8 | 16.8 | 9.0 | 5.4 | 22.4 | 14.0 | 1.6 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.3 |
| Total Del/Veh (s) | 19.6 |

## 10: Johnathan Carver Pkwy & US 212 WB Ramps Performance by movement

| Movement | WBL | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 1.5 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 |
| Total Del/Veh (s) | 29.4 | 11.0 | 59.0 | 17.3 | 26.2 | 9.9 | 23.6 |

## 11: Johnathan Carver Pkwy & US 212 EB Ramps Performance by movement

| Movement | EBL | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.5 | 3.8 | 0.3 | 0.2 | 0.0 | 0.0 | 0.2 |
| Total Del/Veh (s) | 42.1 | 16.4 | 5.3 | 6.6 | 6.7 | 5.2 | 8.4 |

## 12: Johnathan Carver Pkwy & Access A Performance by movement

| Movement | WBR | NBT | NBR | SBT | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 3.8 | 2.4 | 1.3 | 0.8 | 1.6 |

## Total Zone Performance

| | |
|---|---|
| Denied Del/Veh (s) | 1.5 |
| Total Del/Veh (s) | 992.2 |

## Intersection: 1: US 212 EB Ramps & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | T | T | T | R | LT | R |
| Maximum Queue (ft) | 196 | 214 | 53 | 48 | 150 | 120 | 50 | 99 | 63 |
| Average Queue (ft) | 60 | 81 | 12 | 5 | 64 | 32 | 13 | 32 | 25 |
| 95th Queue (ft) | 133 | 151 | 38 | 26 | 128 | 80 | 35 | 72 | 48 |
| Link Distance (ft) | | 669 | 669 | 669 | 1124 | 1124 | | 745 | |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | 300 | | | | | | 330 | | 210 |
| Storage Blk Time (%) | 0 | 0 | | | | | | | |
| Queuing Penalty (veh) | 0 | 0 | | | | | | | |

## Intersection: 2: US 212 WB Ramps & Engler Blvd

| Movement | EB | EB | EB | WB | WB | WB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | T | T | R | L | T | T | L | TR | R |
| Maximum Queue (ft) | 240 | 169 | 30 | 90 | 77 | 110 | 121 | 277 | 255 |
| Average Queue (ft) | 115 | 83 | 12 | 34 | 20 | 45 | 39 | 168 | 126 |
| 95th Queue (ft) | 194 | 140 | 32 | 69 | 59 | 96 | 93 | 257 | 230 |
| Link Distance (ft) | 909 | 909 | | | 669 | 669 | | 775 | |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | | | 275 | 225 | | | 225 | | 225 |
| Storage Blk Time (%) | | | | | | | | 1 | 0 |
| Queuing Penalty (veh) | | | | | | | | 8 | 1 |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | WB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | L | T | T | R | L | T | R |
| Maximum Queue (ft) | 80 | 154 | 133 | 26 | 70 | 30 | 214 | 229 | 70 | 58 | 41 | 54 |
| Average Queue (ft) | 21 | 70 | 55 | 3 | 29 | 2 | 87 | 100 | 28 | 16 | 6 | 22 |
| 95th Queue (ft) | 55 | 132 | 112 | 17 | 59 | 15 | 154 | 175 | 54 | 44 | 25 | 44 |
| Link Distance (ft) | | 1228 | 1228 | | | | 909 | 909 | | | 1277 | 1277 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 210 | | | 210 | 250 | 250 | | | 150 | 240 | | |
| Storage Blk Time (%) | | | | | | | 0 | 1 | | | | |
| Queuing Penalty (veh) | | | | | | | 0 | 3 | | | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | SB | SB | SB |
|---|---|---|---|
| Directions Served | L | L | TR |
| Maximum Queue (ft) | 114 | 110 | 60 |
| Average Queue (ft) | 42 | 50 | 15 |
| 95th Queue (ft) | 89 | 100 | 42 |
| Link Distance (ft) | | 547 | |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | 100 | | 400 |
| Storage Blk Time (%) | 0 | 1 | |
| Queuing Penalty (veh) | 0 | 1 | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | T | T | R | L | L | T | T |
| Maximum Queue (ft) | 52 | 140 | 109 | 81 | 38 | 263 | 267 | 196 | 172 | 181 | 160 | 157 |
| Average Queue (ft) | 13 | 69 | 32 | 33 | 5 | 123 | 125 | 42 | 88 | 100 | 71 | 76 |
| 95th Queue (ft) | 39 | 128 | 83 | 68 | 22 | 231 | 233 | 130 | 153 | 161 | 128 | 129 |
| Link Distance (ft) | | 1391 | 1391 | | | 4206 | 4206 | | | | 855 | 855 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 225 | | | 225 | 175 | | | 175 | 225 | 225 | | |
| Storage Blk Time (%) | | | | | | 3 | 3 | | 0 | 0 | | |
| Queuing Penalty (veh) | | | | | | 0 | 9 | | 0 | 0 | | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | NB | SB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|
| Directions Served | R | L | L | T | T | R |
| Maximum Queue (ft) | 27 | 90 | 138 | 276 | 239 | 77 |
| Average Queue (ft) | 6 | 30 | 70 | 142 | 64 | 16 |
| 95th Queue (ft) | 23 | 69 | 118 | 236 | 176 | 49 |
| Link Distance (ft) | | | | 1144 | 1144 | |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | 225 | 275 | 275 | | | 275 |
| Storage Blk Time (%) | | | | 1 | 0 | |
| Queuing Penalty (veh) | | | | 1 | 0 | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | EB | EB | EB | EB | EB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | R | R | L | L | TR | L | T | T | R |
| Maximum Queue (ft) | 82 | 69 | 111 | 57 | 64 | 237 | 266 | 130 | 80 | 87 | 44 | 80 |
| Average Queue (ft) | 38 | 20 | 31 | 28 | 27 | 95 | 147 | 45 | 26 | 23 | 4 | 13 |
| 95th Queue (ft) | 72 | 61 | 78 | 50 | 51 | 195 | 235 | 96 | 59 | 68 | 23 | 45 |
| Link Distance (ft) | | | 1114 | 1114 | | | | 769 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 190 | 190 | | | 190 | 300 | 300 | | 450 | | | 225 |
| Storage Blk Time (%) | | | | | | | 0 | | | | | |
| Queuing Penalty (veh) | | | | | | | 0 | | | | | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | SB | SB | SB |
|---|---|---|---|
| Directions Served | L | T | R |
| Maximum Queue (ft) | 145 | 238 | 48 |
| Average Queue (ft) | 56 | 117 | 11 |
| 95th Queue (ft) | 117 | 217 | 36 |
| Link Distance (ft) | | 469 | |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | 325 | | 325 |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 10: Johnathan Carver Pkwy & US 212 WB Ramps

| Movement | WB | WB | WB | NB | NB | NB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | LT | R | L | T | T | T | T | T | R |
| Maximum Queue (ft) | 339 | 462 | 131 | 125 | 208 | 194 | 27 | 189 | 236 | 197 |
| Average Queue (ft) | 223 | 269 | 30 | 54 | 112 | 92 | 4 | 102 | 100 | 74 |
| 95th Queue (ft) | 325 | 382 | 84 | 100 | 198 | 169 | 17 | 173 | 183 | 144 |
| Link Distance (ft) | | 1104 | | 360 | 360 | 360 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |
| Storage Bay Dist (ft) | 275 | | 275 | | | | 150 | | | 100 |
| Storage Blk Time (%) | 0 | 5 | | | | | | 2 | 8 | 2 |
| Queuing Penalty (veh) | 2 | 33 | | | | | | 3 | 27 | 3 |

## Intersection: 11: Johnathan Carver Pkwy & US 212 EB Ramps

| Movement | EB | EB | NB | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|
| Directions Served | LT | R | T | T | T | L | T | T |
| Maximum Queue (ft) | 250 | 90 | 40 | 114 | 95 | 48 | 158 | 159 |
| Average Queue (ft) | 129 | 35 | 6 | 30 | 21 | 11 | 61 | 72 |
| 95th Queue (ft) | 211 | 70 | 25 | 79 | 62 | 38 | 126 | 127 |
| Link Distance (ft) | 1077 | | | 2668 | 2668 | 360 | 360 | 360 |
| Upstream Blk Time (%) | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | |
| Storage Bay Dist (ft) | | 250 | 275 | | | | | |
| Storage Blk Time (%) | 0 | | | | | | | |
| Queuing Penalty (veh) | 0 | | | | | | | |

## Intersection: 12: Johnathan Carver Pkwy & Access A

| Movement | WB |
|---|---|
| Directions Served | LR |
| Maximum Queue (ft) | 51 |
| Average Queue (ft) | 15 |
| 95th Queue (ft) | 41 |
| Link Distance (ft) | 1061 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Zone Summary

Zone wide Queuing Penalty: 92

# Operational Results

## 2030 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | SB Access B | None | 108 | | 151 | | 224 | 853 | | 0.1266 | |
| 2 | EB Big Woods Blvd | None | 300 | | 74 | | 185 | 1080 | | 0.2778 | |
| 3 | WB Big Woods Blvd | None | 309 | | 66 | | 308 | 1068 | | 0.2894 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | SB Access B | None | 5.27 | | 5.27 | 0.36 | | A | | A |
| 2 | EB Big Woods Blvd | None | 6.66 | | 6.66 | 1.07 | | A | | A |
| 3 | WB Big Woods Blvd | None | 6.77 | | 6.77 | 1.11 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 717 | | 717 |
| Capacity | veh/hr | 3001 | | 3001 |
| Average Delay | sec/veh | 5.55 | | 5.55 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 1.11 | | 1.11 |

# Operational Results

## 2030 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | SB Access B | None | 458 | | 291 | | 321 | 991 | | 0.4623 | |
| 2 | EB Big Woods Blvd | None | 266 | | 313 | | 436 | 907 | | 0.2932 | |
| 3 | WB Big Woods Blvd | None | 518 | | 94 | | 485 | 1093 | | 0.4739 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | SB Access B | None | 9.57 | | 9.57 | 2.31 | | A | | A |
| 2 | EB Big Woods Blvd | None | 7.43 | | 7.43 | 1.07 | | A | | A |
| 3 | WB Big Woods Blvd | None | 9.16 | | 9.16 | 2.40 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1242 | | 1242 |
| Capacity | veh/hr | 2991 | | 2991 |
| Average Delay | sec/veh | 7.94 | | 7.94 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 2.74 | | 2.74 |

# Operational Results

## 2030 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | NB CSAH 11 | None | 340 | | 246 | | 280 | 800 | | 0.4249 | |
| 2 | WB CSAH 44 | None | 184 | | 286 | | 300 | 892 | | 0.2063 | |
| 3 | SB CSAH 11 | None | 383 | | 115 | | 355 | 990 | | 0.3870 | |
| 4 | EB CSAH 44 | None | 71 | | 455 | | 43 | 816 | | 0.0870 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | NB CSAH 11 | None | 8.88 | | 8.88 | 1.80 | | A | | A |
| 2 | WB CSAH 44 | None | 6.51 | | 6.51 | 0.72 | | A | | A |
| 3 | SB CSAH 11 | None | 7.98 | | 7.98 | 1.72 | | A | | A |
| 4 | EB CSAH 44 | None | 5.24 | | 5.24 | 0.27 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 978 | | 978 |
| Capacity | veh/hr | 3498 | | 3498 |
| Average Delay | sec/veh | 6.86 | | 6.86 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 1.86 | | 1.86 |

# Operational Results

## 2030 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | NB CSAH 11 | None | 445 | | 167 | | 487 | 891 | | 0.4994 | |
| 2 | WB CSAH 44 | None | 435 | | 347 | | 265 | 951 | | 0.4575 | |
| 3 | SB CSAH 11 | None | 447 | | 263 | | 519 | 811 | | 0.5511 | |
| 4 | EB CSAH 44 | None | 51 | | 603 | | 107 | 666 | | 0.0765 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | NB CSAH 11 | None | 9.66 | | 9.66 | 2.42 | | A | | A |
| 2 | WB CSAH 44 | None | 9.75 | | 9.75 | 2.45 | | A | | A |
| 3 | SB CSAH 11 | None | 10.71 | | 10.71 | 2.80 | | B | | B |
| 4 | EB CSAH 44 | None | 5.80 | | 5.80 | 0.22 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1378 | | 1378 |
| Capacity | veh/hr | 3319 | | 3319 |
| Average Delay | sec/veh | 8.91 | | 8.91 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 3.41 | | 3.41 |

# Operational Results

## 2030 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | US 212 Entrance Ramp | None | 0 | | 0 | | 423 | 0 | | 0.0000 | |
| 2 | EB CSAH 44 | None | 377 | | 0 | | 161 | 1756 | | 0.2147 | |
| 3 | WB CSAH 44 | None | 500 | | 84 | | 293 | 1005 | | 0.4973 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | US 212 Entrance Ramp | None | 0.00 | | 0.00 | 0.00 | | A | | A |
| 2 | EB CSAH 44 | None | 4.97 | | 4.97 | 0.94 | | A | | A |
| 3 | WB CSAH 44 | None | 9.37 | | 9.37 | 2.67 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 877 | | 877 |
| Capacity | veh/hr | 2761 | | 2761 |
| Average Delay | sec/veh | 6.48 | | 6.48 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 1.58 | | 1.58 |

# Operational Results

## 2030 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | US 212 Entrance Ramp | None | 0 | | 0 | | 439 | 0 | | 0.0000 | |
| 2 | EB CSAH 44 | None | 705 | | 0 | | 275 | 1892 | | 0.3726 | |
| 3 | WB CSAH 44 | None | 433 | | 281 | | 424 | 981 | | 0.4412 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | US 212 Entrance Ramp | None | 0.00 | | 0.00 | 0.00 | | A | | A |
| 2 | EB CSAH 44 | None | 7.39 | | 7.39 | 2.75 | | A | | A |
| 3 | WB CSAH 44 | None | 9.18 | | 9.18 | 2.34 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1138 | | 1138 |
| Capacity | veh/hr | 2873 | | 2873 |
| Average Delay | sec/veh | 7.07 | | 7.07 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 2.24 | | 2.24 |

# Operational Results

## 2030 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | EB CSAH 44 | None | 313 | | 0 | | 314 | 1102 | | 0.2841 | |
| 2 | NB US 212 EXIT | Free | 148 | 69 | 313 | 0 | 0 | 888 | 1229 | 0.1667 | 0.0562 |
| 3 | WB CSAH 44 | None | 161 | | 153 | | 377 | 1001 | | 0.1609 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | EB CSAH 44 | None | 6.57 | | 6.57 | 1.12 | | A | | A |
| 2 | NB US 212 EXIT | Free | 6.00 | 0.56 | 4.27 | 0.55 | 0.00 | A | A | A |
| 3 | WB CSAH 44 | None | 5.52 | | 5.52 | 0.54 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 622 | 69 | 691 |
| Capacity | veh/hr | 2990 | 1229 | 4219 |
| Average Delay | sec/veh | 5.25 | 0.28 | 4.76 |
| L.O.S. (Signal) | A – F | A | A | A |
| L.O.S. (Unsig) | A – F | A | A | A |
| Total Delay | veh.hrs | 0.91 | 0.01 | 0.91 |

# Operational Results

## 2030 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | EB CSAH 44 | None | 486 | | 0 | | 519 | 1004 | | 0.4842 | |
| 2 | NB US 212 EXIT | Free | 243 | 219 | 486 | 0 | 0 | 887 | 1301 | 0.2739 | 0.1683 |
| 3 | WB CSAH 44 | None | 275 | | 244 | | 704 | 1037 | | 0.2652 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | EB CSAH 44 | None | 8.95 | | 8.95 | 2.43 | | A | | A |
| 2 | NB US 212 EXIT | Free | 7.72 | 1.69 | 4.86 | 1.16 | 0.00 | A | A | A |
| 3 | WB CSAH 44 | None | 6.85 | | 6.85 | 1.08 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1004 | 219 | 1223 |
| Capacity | veh/hr | 2928 | 1301 | 4229 |
| Average Delay | sec/veh | 7.08 | 0.84 | 5.96 |
| L.O.S. (Signal) | A – F | A | A | A |
| L.O.S. (Unsig) | A – F | A | A | A |
| Total Delay | veh.hrs | 1.97 | 0.05 | 2.03 |

# Appendix G:

# Opening Year (2030) Build Scenario 2 Analysis Reports

## 1: US 212 EB Ramps & Engler Blvd Performance by movement

| Movement | EBL | EBT | WBT | WBR | NBL | NBT | NBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.2 | 3.5 | 0.4 | 1.6 | 3.9 | 0.4 |
| Total Del/Veh (s) | 11.3 | 4.2 | 39.2 | 17.2 | 42.5 | 31.5 | 6.6 | 14.6 |

## 2: US 212 WB Ramps & Engler Blvd Performance by movement

| Movement | EBT | EBR | WBL | WBT | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 3.6 | 1.3 | 0.3 |
| Total Del/Veh (s) | 16.6 | 5.8 | 84.6 | 6.6 | 69.4 | 8.2 | 16.1 |

## 3: Chaska Creek Blvd & Engler Blvd 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 | 0.0 | 0.0 | 0.0 | 0.8 | 0.0 | 0.0 | 1.9 | 3.3 | 3.7 |
| Total Del/Veh (s) | 13.9 | 21.0 | 4.4 | 38.5 | 7.8 | 2.5 | 26.6 | 61.0 | 11.8 | 29.3 | 27.8 | 5.4 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.3 |
| Total Del/Veh (s) | 18.8 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 2.6 | 0.3 | 2.5 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 3.4 | 0.7 | 3.4 |
| Total Del/Veh (s) | 14.2 | 13.1 | 4.9 | 20.7 | 13.5 | 5.0 | 17.0 | 24.2 | 8.2 | 22.2 | 23.6 | 3.4 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.9 |
| Total Del/Veh (s) | 14.5 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 4.5 | 0.1 | 1.6 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 23.4 | 36.0 | 4.2 | 21.5 | 12.2 | 2.8 | 12.2 | 12.8 | 8.9 | 10.5 | 7.0 | 1.0 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.1 |
| Total Del/Veh (s) | 11.4 |

## 10: Johnathan Carver Pkwy & US 212 WB Ramps Performance by movement

| Movement | WBL | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.6 | 3.5 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 |
| Total Del/Veh (s) | 29.2 | 7.0 | 37.2 | 7.5 | 11.2 | 4.6 | 13.3 |

## 11: Johnathan Carver Pkwy & US 212 EB Ramps Performance by movement

| Movement | EBL | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.5 | 3.5 | 0.2 | 0.2 | 0.0 | 0.0 | 0.3 |
| Total Del/Veh (s) | 31.5 | 7.5 | 41.1 | 47.6 | 6.7 | 4.6 | 34.5 |

## 12: Johnathan Carver Pkwy & Access A Performance by movement

| Movement | WBR | NBT | NBR | SBT | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 3.1 | 2.3 | 1.3 | 0.7 | 1.4 |

## Total Zone Performance

| | |
|---|---|
| Denied Del/Veh (s) | 1.0 |
| Total Del/Veh (s) | 946.4 |

## Intersection: 1: US 212 EB Ramps & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | T | T | T | R | LT | R |
| Maximum Queue (ft) | 226 | 230 | 98 | 96 | 151 | 135 | 107 | 135 | 80 |
| Average Queue (ft) | 105 | 110 | 11 | 14 | 88 | 57 | 48 | 46 | 33 |
| 95th Queue (ft) | 192 | 202 | 58 | 57 | 139 | 110 | 92 | 94 | 62 |
| Link Distance (ft) | | 669 | 669 | 669 | 1120 | 1120 | | 745 | |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | 300 | | | | | | 330 | | 210 |
| Storage Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |

## Intersection: 2: US 212 WB Ramps & Engler Blvd

| Movement | EB | EB | EB | WB | WB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|
| Directions Served | T | T | R | L | T | L | TR | R |
| Maximum Queue (ft) | 388 | 375 | 36 | 127 | 5 | 82 | 141 | 82 |
| Average Queue (ft) | 155 | 108 | 5 | 46 | 0 | 26 | 59 | 33 |
| 95th Queue (ft) | 327 | 271 | 22 | 98 | 4 | 62 | 100 | 65 |
| Link Distance (ft) | 909 | 909 | | | 669 | | 775 | |
| Upstream Blk Time (%) | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | |
| Storage Bay Dist (ft) | | | 275 | 225 | | 225 | | 225 |
| Storage Blk Time (%) | | 1 | | | | | | |
| Queuing Penalty (veh) | | 0 | | | | | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | WB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | L | T | T | R | L | T | R |
| Maximum Queue (ft) | 38 | 392 | 316 | 34 | 88 | 66 | 90 | 106 | 65 | 8 | 36 | 42 |
| Average Queue (ft) | 10 | 187 | 156 | 7 | 44 | 9 | 39 | 41 | 20 | 1 | 4 | 13 |
| 95th Queue (ft) | 31 | 315 | 279 | 28 | 79 | 38 | 77 | 91 | 45 | 6 | 20 | 33 |
| Link Distance (ft) | | 1228 | 1228 | | | | 909 | 909 | | | 1277 | 1277 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 210 | | | 210 | 250 | 250 | | | 150 | 240 | | |
| Storage Blk Time (%) | | 6 | 3 | | | | | | | | | |
| Queuing Penalty (veh) | | 1 | 1 | | | | | | | | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | SB | SB | SB |
|---|---|---|---|
| Directions Served | L | L | TR |
| Maximum Queue (ft) | 167 | 165 | 45 |
| Average Queue (ft) | 72 | 75 | 14 |
| 95th Queue (ft) | 125 | 131 | 35 |
| Link Distance (ft) | | 547 | |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | 100 | | 400 |
| Storage Blk Time (%) | 2 | 3 | |
| Queuing Penalty (veh) | 4 | 7 | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | T | T | R | L | L | T | T |
| Maximum Queue (ft) | 67 | 178 | 167 | 76 | 27 | 131 | 142 | 72 | 88 | 96 | 92 | 105 |
| Average Queue (ft) | 17 | 104 | 67 | 36 | 4 | 44 | 43 | 18 | 32 | 50 | 42 | 49 |
| 95th Queue (ft) | 52 | 158 | 126 | 63 | 17 | 90 | 92 | 51 | 74 | 85 | 78 | 95 |
| Link Distance (ft) | | 1391 | 1391 | | | 4206 | 4206 | | | | 855 | 855 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 225 | | | 225 | 225 | | | 225 | 225 | 225 | | |
| Storage Blk Time (%) | | 0 | | | | | | | | | | |
| Queuing Penalty (veh) | | 0 | | | | | | | | | | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | NB | SB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|
| Directions Served | R | L | L | T | T | R |
| Maximum Queue (ft) | 55 | 128 | 166 | 150 | 44 | 61 |
| Average Queue (ft) | 10 | 33 | 90 | 61 | 6 | 22 |
| 95th Queue (ft) | 37 | 87 | 141 | 113 | 26 | 56 |
| Link Distance (ft) | | | | 1144 | 1144 | |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | 225 | 275 | 275 | | | 275 |
| Storage Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB | NB | NB | SB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | R | R | L | L | TR | L | T | T | R | L |
| Maximum Queue (ft) | 21 | 45 | 50 | 38 | 129 | 178 | 65 | 45 | 228 | 95 | 156 | 79 |
| Average Queue (ft) | 3 | 7 | 12 | 7 | 35 | 79 | 20 | 15 | 70 | 7 | 53 | 25 |
| 95th Queue (ft) | 15 | 31 | 37 | 27 | 93 | 146 | 45 | 40 | 165 | 41 | 121 | 60 |
| Link Distance (ft) | | 1114 | 1114 | | | | 769 | | 1037 | 1037 | | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 190 | | | 190 | 300 | 300 | | 450 | | | 225 | 325 |
| Storage Blk Time (%) | | | | | | | | | | | 0 | |
| Queuing Penalty (veh) | | | | | | | | | | | 0 | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | SB | SB |
|---|---|---|
| Directions Served | T | R |
| Maximum Queue (ft) | 138 | 24 |
| Average Queue (ft) | 49 | 3 |
| 95th Queue (ft) | 110 | 16 |
| Link Distance (ft) | 449 | |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | 325 |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Intersection: 10: Johnathan Carver Pkwy & US 212 WB Ramps

| Movement | WB | WB | WB | NB | NB | NB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | LT | R | L | T | T | T | T | T | R |
| Maximum Queue (ft) | 167 | 211 | 62 | 165 | 159 | 162 | 46 | 108 | 101 | 84 |
| Average Queue (ft) | 57 | 115 | 17 | 66 | 70 | 77 | 5 | 39 | 32 | 28 |
| 95th Queue (ft) | 129 | 180 | 48 | 130 | 126 | 139 | 24 | 84 | 78 | 64 |
| Link Distance (ft) | | 1104 | | 360 | 360 | 360 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |
| Storage Bay Dist (ft) | 275 | | 275 | | | | 150 | | | 100 |
| Storage Blk Time (%) | | | | | | | | 0 | 0 | 0 |
| Queuing Penalty (veh) | | | | | | | | 0 | 1 | 0 |

## Intersection: 11: Johnathan Carver Pkwy & US 212 EB Ramps

| Movement | EB | EB | NB | NB | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | LT | R | T | T | T | R | L | T | T |
| Maximum Queue (ft) | 311 | 151 | 157 | 946 | 987 | 1050 | 68 | 92 | 86 |
| Average Queue (ft) | 163 | 37 | 17 | 193 | 356 | 411 | 20 | 29 | 38 |
| 95th Queue (ft) | 253 | 90 | 69 | 793 | 1015 | 1098 | 54 | 73 | 77 |
| Link Distance (ft) | 1077 | | | 2636 | 2636 | 2636 | 360 | 360 | 360 |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | | 250 | 275 | | | | | | |
| Storage Blk Time (%) | 1 | | | 3 | | | | | |
| Queuing Penalty (veh) | 1 | | | 5 | | | | | |

## Intersection: 12: Johnathan Carver Pkwy & Access A

| Movement | WB |
|---|---|
| Directions Served | LR |
| Maximum Queue (ft) | 45 |
| Average Queue (ft) | 8 |
| 95th Queue (ft) | 30 |
| Link Distance (ft) | 1061 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Zone Summary

Zone wide Queuing Penalty: 18

## 1: US 212 EB Ramps & Engler Blvd Performance by movement

| Movement | EBL | EBT | WBT | WBR | NBL | NBT | NBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.2 | 3.5 | 0.3 | 0.1 | 3.9 | 0.4 |
| Total Del/Veh (s) | 26.4 | 4.4 | 13.5 | 4.6 | 42.8 | 40.7 | 5.9 | 15.0 |

## 2: US 212 WB Ramps & Engler Blvd Performance by movement

| Movement | EBT | EBR | WBL | WBT | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 3.3 | 2.4 | 1.3 |
| Total Del/Veh (s) | 19.8 | 3.8 | 18.7 | 9.5 | 23.2 | 16.2 | 16.5 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.7 | 0.1 | 0.1 | 2.1 | 3.9 | 3.8 |
| Total Del/Veh (s) | 43.9 | 10.3 | 1.3 | 49.5 | 10.9 | 5.0 | 47.4 | 48.3 | 5.4 | 34.2 | 34.2 | 13.6 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.2 |
| Total Del/Veh (s) | 13.4 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 2.8 | 0.2 | 3.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 3.5 | 0.5 | 3.6 |
| Total Del/Veh (s) | 54.5 | 11.8 | 4.2 | 71.3 | 19.8 | 11.2 | 42.1 | 34.1 | 3.8 | 49.7 | 47.2 | 9.9 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.6 |
| Total Del/Veh (s) | 24.0 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 3.7 | 0.4 | 1.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 33.3 | 55.1 | 8.6 | 47.1 | 39.1 | 13.0 | 21.2 | 9.7 | 5.5 | 21.4 | 12.8 | 1.5 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.3 |
| Total Del/Veh (s) | 20.0 |

## 10: Johnathan Carver Pkwy & US 212 WB Ramps Performance by movement

| Movement | WBL | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 1.5 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 |
| Total Del/Veh (s) | 28.7 | 11.9 | 58.3 | 18.5 | 27.2 | 10.3 | 23.5 |

## 11: Johnathan Carver Pkwy & US 212 EB Ramps Performance by movement

| Movement | EBL | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.5 | 3.6 | 0.2 | 0.2 | 0.0 | 0.0 | 0.2 |
| Total Del/Veh (s) | 42.2 | 16.3 | 5.8 | 6.8 | 9.9 | 5.7 | 9.2 |

## 12: Johnathan Carver Pkwy & Access A Performance by movement

| Movement | WBR | NBT | NBR | SBT | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 4.3 | 2.9 | 1.5 | 0.9 | 1.9 |

## Total Zone Performance

| | |
|---|---|
| Denied Del/Veh (s) | 1.5 |
| Total Del/Veh (s) | 1078.7 |

## Intersection: 1: US 212 EB Ramps & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | T | T | T | R | LT | R |
| Maximum Queue (ft) | 234 | 248 | 54 | 43 | 147 | 122 | 50 | 94 | 60 |
| Average Queue (ft) | 68 | 92 | 11 | 7 | 64 | 37 | 10 | 37 | 27 |
| 95th Queue (ft) | 161 | 184 | 38 | 30 | 128 | 89 | 34 | 80 | 50 |
| Link Distance (ft) | | 669 | 669 | 669 | 1124 | 1124 | | 745 | |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | 300 | | | | | | 330 | | 210 |
| Storage Blk Time (%) | 0 | 0 | | | | | | | |
| Queuing Penalty (veh) | 0 | 0 | | | | | | | |

## Intersection: 2: US 212 WB Ramps & Engler Blvd

| Movement | EB | EB | EB | WB | WB | WB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | T | T | R | L | T | T | L | TR | R |
| Maximum Queue (ft) | 224 | 186 | 28 | 97 | 78 | 105 | 99 | 264 | 254 |
| Average Queue (ft) | 117 | 84 | 10 | 36 | 20 | 44 | 41 | 167 | 129 |
| 95th Queue (ft) | 201 | 152 | 30 | 75 | 56 | 85 | 86 | 242 | 228 |
| Link Distance (ft) | 909 | 909 | | | 669 | 669 | | 775 | |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | | | 275 | 225 | | | 225 | | 225 |
| Storage Blk Time (%) | | | | | | | | 1 | 0 |
| Queuing Penalty (veh) | | | | | | | | 6 | 2 |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | WB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | L | T | T | R | L | T | R |
| Maximum Queue (ft) | 72 | 171 | 142 | 26 | 70 | 40 | 230 | 248 | 114 | 51 | 41 | 57 |
| Average Queue (ft) | 23 | 68 | 52 | 2 | 30 | 3 | 85 | 100 | 30 | 17 | 9 | 22 |
| 95th Queue (ft) | 58 | 137 | 115 | 13 | 61 | 18 | 181 | 198 | 75 | 43 | 32 | 42 |
| Link Distance (ft) | | 1228 | 1228 | | | | 909 | 909 | | | 1277 | 1277 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 210 | | | 210 | 250 | 250 | | | 150 | 240 | | |
| Storage Blk Time (%) | | 0 | 0 | | | | 0 | 2 | | | | |
| Queuing Penalty (veh) | | 0 | 0 | | | | 0 | 6 | | | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | SB | SB | SB |
|---|---|---|---|
| Directions Served | L | L | TR |
| Maximum Queue (ft) | 125 | 135 | 68 |
| Average Queue (ft) | 44 | 51 | 15 |
| 95th Queue (ft) | 93 | 104 | 47 |
| Link Distance (ft) | | 547 | |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | 100 | | 400 |
| Storage Blk Time (%) | 1 | 2 | |
| Queuing Penalty (veh) | 1 | 2 | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | T | T | R | L | L | T | T |
| Maximum Queue (ft) | 48 | 130 | 96 | 87 | 36 | 265 | 275 | 219 | 163 | 172 | 161 | 148 |
| Average Queue (ft) | 14 | 68 | 32 | 35 | 8 | 124 | 124 | 45 | 88 | 105 | 68 | 73 |
| 95th Queue (ft) | 39 | 121 | 80 | 72 | 27 | 236 | 238 | 142 | 146 | 160 | 124 | 127 |
| Link Distance (ft) | | 1391 | 1391 | | | 4206 | 4206 | | | | 855 | 855 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 225 | | | 225 | 175 | | | 175 | 225 | 225 | | |
| Storage Blk Time (%) | | | | | | 3 | 3 | | | 0 | | |
| Queuing Penalty (veh) | | | | | | 0 | 8 | | | 0 | | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | NB | SB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|
| Directions Served | R | L | L | T | T | R |
| Maximum Queue (ft) | 28 | 116 | 137 | 246 | 216 | 53 |
| Average Queue (ft) | 6 | 32 | 69 | 138 | 66 | 13 |
| 95th Queue (ft) | 23 | 74 | 116 | 224 | 174 | 40 |
| Link Distance (ft) | | | | 1144 | 1144 | |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | 225 | 275 | 275 | | | 275 |
| Storage Blk Time (%) | | | | 0 | 0 | |
| Queuing Penalty (veh) | | | | 0 | 0 | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | EB | EB | EB | EB | EB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | R | R | L | L | TR | L | T | T | R |
| Maximum Queue (ft) | 78 | 55 | 77 | 72 | 60 | 243 | 296 | 112 | 104 | 109 | 30 | 84 |
| Average Queue (ft) | 36 | 15 | 30 | 30 | 27 | 107 | 161 | 39 | 32 | 29 | 1 | 14 |
| 95th Queue (ft) | 67 | 50 | 69 | 54 | 50 | 211 | 256 | 83 | 75 | 82 | 13 | 56 |
| Link Distance (ft) | | | 1114 | 1114 | | | | 769 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 190 | 190 | | | 190 | 300 | 300 | | 450 | | | 225 |
| Storage Blk Time (%) | | | | | | 0 | 0 | | | | | |
| Queuing Penalty (veh) | | | | | | 0 | 0 | | | | | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | SB | SB | SB |
|---|---|---|---|
| Directions Served | L | T | R |
| Maximum Queue (ft) | 139 | 253 | 43 |
| Average Queue (ft) | 51 | 113 | 10 |
| 95th Queue (ft) | 104 | 210 | 32 |
| Link Distance (ft) | | 469 | |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | 325 | | 325 |
| Storage Blk Time (%) | | 0 | |
| Queuing Penalty (veh) | | 0 | |

## Intersection: 10: Johnathan Carver Pkwy & US 212 WB Ramps

| Movement | WB | WB | WB | NB | NB | NB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | LT | R | L | T | T | T | T | T | R |
| Maximum Queue (ft) | 346 | 410 | 182 | 119 | 296 | 271 | 40 | 191 | 225 | 196 |
| Average Queue (ft) | 230 | 270 | 37 | 55 | 127 | 105 | 6 | 107 | 104 | 79 |
| 95th Queue (ft) | 338 | 371 | 119 | 104 | 225 | 198 | 25 | 175 | 177 | 153 |
| Link Distance (ft) | | 1104 | | 360 | 360 | 360 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | 0 | 0 | | | | |
| Queuing Penalty (veh) | | | | | 0 | 0 | | | | |
| Storage Bay Dist (ft) | 275 | | 275 | | | | 150 | | | 100 |
| Storage Blk Time (%) | 0 | 6 | | | | | | 2 | 8 | 2 |
| Queuing Penalty (veh) | 2 | 35 | | | | | | 3 | 33 | 3 |

## Intersection: 11: Johnathan Carver Pkwy & US 212 EB Ramps

| Movement | EB | EB | NB | NB | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | LT | R | T | T | T | R | L | T | T |
| Maximum Queue (ft) | 262 | 151 | 74 | 144 | 125 | 10 | 49 | 197 | 211 |
| Average Queue (ft) | 145 | 42 | 9 | 41 | 26 | 0 | 15 | 70 | 84 |
| 95th Queue (ft) | 226 | 97 | 41 | 104 | 79 | 7 | 41 | 152 | 164 |
| Link Distance (ft) | 1077 | | | 2668 | 2668 | 2668 | 360 | 360 | 360 |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | | 250 | 275 | | | | | | |
| Storage Blk Time (%) | 1 | | | | | | | | |
| Queuing Penalty (veh) | 1 | | | | | | | | |

## Intersection: 12: Johnathan Carver Pkwy & Access A

| Movement | WB | B47 |
|---|---|---|
| Directions Served | LR | T |
| Maximum Queue (ft) | 50 | 19 |
| Average Queue (ft) | 22 | 1 |
| 95th Queue (ft) | 48 | 14 |
| Link Distance (ft) | 1061 | 855 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Zone Summary

Zone wide Queuing Penalty: 102

# Operational Results

## 2030 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | SB Access B | None | 162 | | 157 | | 333 | 850 | | 0.1905 | |
| 2 | EB Big Woods Blvd | None | 332 | | 111 | | 208 | 1059 | | 0.3137 | |
| 3 | WB Big Woods Blvd | None | 392 | | 98 | | 345 | 1051 | | 0.3729 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | SB Access B | None | 6.14 | | 6.14 | 0.58 | | A | | A |
| 2 | EB Big Woods Blvd | None | 7.14 | | 7.14 | 1.27 | | A | | A |
| 3 | WB Big Woods Blvd | None | 7.78 | | 7.78 | 1.63 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 886 | | 886 |
| Capacity | veh/hr | 2960 | | 2960 |
| Average Delay | sec/veh | 6.25 | | 6.25 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 1.54 | | 1.54 |

# Operational Results

## 2030 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | SB Access B | None | 688 | | 300 | | 482 | 986 | | 0.6978 | |
| 2 | EB Big Woods Blvd | None | 314 | | 471 | | 517 | 830 | | 0.3784 | |
| 3 | WB Big Woods Blvd | None | 640 | | 142 | | 643 | 1067 | | 0.6000 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | SB Access B | None | 15.14 | | 15.14 | 6.05 | | C | | C |
| 2 | EB Big Woods Blvd | None | 8.97 | | 8.97 | 1.56 | | A | | A |
| 3 | WB Big Woods Blvd | None | 11.64 | | 11.64 | 3.96 | | B | | B |

# Global Results

## Performance and Accidents

### 2030 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1642 | | 1642 |
| Capacity | veh/hr | 2882 | | 2882 |
| Average Delay | sec/veh | 11.60 | | 11.60 |
| L.O.S. (Signal) | A – F | B | | B |
| L.O.S. (Unsig) | A – F | B | | B |
| Total Delay | veh.hrs | 5.29 | | 5.29 |

# Operational Results

## 2030 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | NB CSAH 11 | None | 372 | | 257 | | 294 | 795 | | 0.4677 | |
| 2 | WB CSAH 44 | None | 207 | | 298 | | 331 | 885 | | 0.2338 | |
| 3 | SB CSAH 11 | None | 394 | | 129 | | 376 | 983 | | 0.4010 | |
| 4 | EB CSAH 44 | None | 71 | | 480 | | 43 | 803 | | 0.0884 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | NB CSAH 11 | None | 9.48 | | 9.48 | 2.13 | | A | | A |
| 2 | WB CSAH 44 | None | 6.83 | | 6.83 | 0.85 | | A | | A |
| 3 | SB CSAH 11 | None | 8.19 | | 8.19 | 1.82 | | A | | A |
| 4 | EB CSAH 44 | None | 5.32 | | 5.32 | 0.27 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1044 | | 1044 |
| Capacity | veh/hr | 3467 | | 3467 |
| Average Delay | sec/veh | 7.22 | | 7.22 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 2.09 | | 2.09 |

# Operational Results

## 2030 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | NB CSAH 11 | None | 493 | | 185 | | 548 | 882 | | 0.5589 | |
| 2 | WB CSAH 44 | None | 516 | | 366 | | 312 | 940 | | 0.5491 | |
| 3 | SB CSAH 11 | None | 465 | | 324 | | 558 | 785 | | 0.5924 | |
| 4 | EB CSAH 44 | None | 51 | | 682 | | 107 | 630 | | 0.0809 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | NB CSAH 11 | None | 10.67 | | 10.67 | 3.03 | | B | | B |
| 2 | WB CSAH 44 | None | 11.53 | | 11.53 | 3.58 | | B | | B |
| 3 | SB CSAH 11 | None | 11.69 | | 11.69 | 3.28 | | B | | B |
| 4 | EB CSAH 44 | None | 6.16 | | 6.16 | 0.23 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1525 | | 1525 |
| Capacity | veh/hr | 3237 | | 3237 |
| Average Delay | sec/veh | 10.14 | | 10.14 |
| L.O.S. (Signal) | A – F | B | | B |
| L.O.S. (Unsig) | A – F | B | | B |
| Total Delay | veh.hrs | 4.30 | | 4.30 |

# Operational Results

## 2030 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | US 212 Entrance Ramp | None | 0 | | 0 | | 455 | 0 | | 0.0000 | |
| 2 | EB CSAH 44 | None | 414 | | 0 | | 173 | 1756 | | 0.2358 | |
| 3 | WB CSAH 44 | None | 512 | | 116 | | 298 | 989 | | 0.5176 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | US 212 Entrance Ramp | None | 0.00 | | 0.00 | 0.00 | | A | | A |
| 2 | EB CSAH 44 | None | 5.38 | | 5.38 | 1.14 | | A | | A |
| 3 | WB CSAH 44 | None | 9.79 | | 9.79 | 2.91 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 926 | | 926 |
| Capacity | veh/hr | 2745 | | 2745 |
| Average Delay | sec/veh | 6.82 | | 6.82 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 1.75 | | 1.75 |

# Operational Results

## 2030 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | US 212 Entrance Ramp | None | 0 | | 0 | | 572 | 0 | | 0.0000 | |
| 2 | EB CSAH 44 | None | 861 | | 0 | | 293 | 1892 | | 0.4551 | |
| 3 | WB CSAH 44 | None | 451 | | 414 | | 447 | 911 | | 0.4951 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | US 212 Entrance Ramp | None | 0.00 | | 0.00 | 0.00 | | A | | A |
| 2 | EB CSAH 44 | None | 9.25 | | 9.25 | 4.44 | | A | | A |
| 3 | WB CSAH 44 | None | 10.57 | | 10.57 | 2.98 | | B | | B |

# Global Results

## Performance and Accidents

### 2030 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1312 | | 1312 |
| Capacity | veh/hr | 2803 | | 2803 |
| Average Delay | sec/veh | 8.70 | | 8.70 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 3.17 | | 3.17 |

# Operational Results

## 2030 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | EB CSAH 44 | None | 350 | | 0 | | 398 | 1102 | | 0.3177 | |
| 2 | NB US 212 EXIT | Free | 220 | 69 | 350 | 0 | 0 | 869 | 1229 | 0.2530 | 0.0562 |
| 3 | WB CSAH 44 | None | 173 | | 225 | | 414 | 963 | | 0.1796 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | EB CSAH 44 | None | 6.92 | | 6.92 | 1.31 | | A | | A |
| 2 | NB US 212 EXIT | Free | 7.12 | 0.56 | 5.56 | 0.94 | 0.00 | A | A | A |
| 3 | WB CSAH 44 | None | 5.95 | | 5.95 | 0.62 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 743 | 69 | 812 |
| Capacity | veh/hr | 2934 | 1229 | 4163 |
| Average Delay | sec/veh | 5.78 | 0.28 | 5.31 |
| L.O.S. (Signal) | A – F | A | A | A |
| L.O.S. (Unsig) | A – F | A | A | A |
| Total Delay | veh.hrs | 1.19 | 0.01 | 1.20 |

# Operational Results

## 2030 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | EB CSAH 44 | None | 644 | | 0 | | 641 | 1102 | | 0.5846 | |
| 2 | NB US 212 EXIT | Free | 347 | 219 | 644 | 0 | 0 | 649 | 1047 | 0.5350 | 0.2091 |
| 3 | WB CSAH 44 | None | 293 | | 348 | | 862 | 899 | | 0.3261 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | EB CSAH 44 | None | 10.72 | | 10.72 | 4.01 | | B | | B |
| 2 | NB US 212 EXIT | Free | 13.60 | 2.05 | 9.13 | 3.41 | 0.00 | B | A | A |
| 3 | WB CSAH 44 | None | 7.94 | | 7.94 | 1.39 | | A | | A |

# Global Results

## Performance and Accidents

### 2030 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1284 | 219 | 1503 |
| Capacity | veh/hr | 2649 | 1047 | 3696 |
| Average Delay | sec/veh | 9.86 | 1.05 | 8.58 |
| L.O.S. (Signal) | A – F | A | A | A |
| L.O.S. (Unsig) | A – F | A | A | A |
| Total Delay | veh.hrs | 3.52 | 0.06 | 3.58 |

# Appendix H:

# Design Year (2045) No-Build Analysis Reports

## 1: US 212 EB Ramps & Engler Blvd Performance by movement

| Movement | EBL | EBT | WBT | WBR | NBL | NBT | NBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.3 | 3.4 | 0.6 | 0.6 | 3.8 | 0.4 |
| Total Del/Veh (s) | 20.8 | 5.7 | 47.6 | 32.9 | 59.4 | 59.3 | 8.3 | 22.3 |

## 2: US 212 WB Ramps & Engler Blvd Performance by movement

| Movement | EBT | EBR | WBL | WBT | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 3.5 | 1.4 | 0.3 |
| Total Del/Veh (s) | 28.0 | 10.9 | 168.8 | 6.5 | 125.5 | 12.7 | 26.1 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 | 0.0 | 0.0 | 10.8 | 9.2 | 10.5 |
| Total Del/Veh (s) | 35.2 | 39.4 | 16.7 | 112.1 | 8.7 | 2.9 | 69.3 | 98.9 | 32.1 | 86.2 | 61.0 | 27.8 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 1.8 |
| Total Del/Veh (s) | 40.7 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 2.1 | 0.5 | 2.3 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.1 | 3.3 | 0.9 | 3.0 |
| Total Del/Veh (s) | 18.1 | 18.8 | 7.6 | 29.3 | 15.2 | 7.5 | 23.4 | 31.8 | 15.1 | 35.6 | 28.8 | 6.1 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 1.0 |
| Total Del/Veh (s) | 20.1 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 3.9 | 0.1 | 1.5 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 16.9 | 39.7 | 5.8 | 23.7 | 17.1 | 2.8 | 12.7 | 17.5 | 14.8 | 11.7 | 8.9 | 1.4 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.1 |
| Total Del/Veh (s) | 15.2 |

## 10: Johnathan Carver Pkwy & US 212 WB Ramps Performance by movement

| Movement | WBL | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.8 | 3.5 | 0.1 | 0.0 | 0.0 | 0.1 | 0.3 |
| Total Del/Veh (s) | 31.9 | 9.2 | 51.4 | 9.7 | 12.1 | 5.8 | 16.5 |

## 11: Johnathan Carver Pkwy & US 212 EB Ramps Performance by movement

| Movement | EBL | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.6 | 3.5 | 356.1 | 362.2 | 0.0 | 0.0 | 238.7 |
| Total Del/Veh (s) | 37.3 | 11.2 | 301.8 | 328.7 | 8.5 | 5.3 | 200.6 |

## Total Zone Performance

| | |
|---|---|
| Denied Del/Veh (s) | 112.2 |
| Total Del/Veh (s) | 1931.4 |

## Intersection: 1: US 212 EB Ramps & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | T | T | T | R | LT | R |
| Maximum Queue (ft) | 420 | 469 | 353 | 311 | 240 | 207 | 195 | 164 | 95 |
| Average Queue (ft) | 204 | 217 | 77 | 41 | 135 | 103 | 86 | 71 | 42 |
| 95th Queue (ft) | 383 | 404 | 249 | 155 | 216 | 181 | 164 | 137 | 77 |
| Link Distance (ft) | | 669 | 669 | 669 | 1124 | 1124 | | 745 | |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | 300 | | | | | | 330 | | 210 |
| Storage Blk Time (%) | 2 | 5 | | | | | | 0 | |
| Queuing Penalty (veh) | 19 | 35 | | | | | | 0 | |

## Intersection: 2: US 212 WB Ramps & Engler Blvd

| Movement | EB | EB | EB | WB | WB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|
| Directions Served | T | T | R | L | T | L | TR | R |
| Maximum Queue (ft) | 737 | 724 | 206 | 162 | 17 | 151 | 225 | 195 |
| Average Queue (ft) | 263 | 236 | 11 | 68 | 1 | 55 | 93 | 56 |
| 95th Queue (ft) | 602 | 574 | 104 | 130 | 14 | 123 | 162 | 125 |
| Link Distance (ft) | 909 | 909 | | | 669 | | 775 | |
| Upstream Blk Time (%) | 0 | | | | | | | |
| Queuing Penalty (veh) | 0 | | | | | | | |
| Storage Bay Dist (ft) | | | 275 | 225 | | 225 | | 225 |
| Storage Blk Time (%) | | 7 | | | | | 0 | 0 |
| Queuing Penalty (veh) | | 3 | | | | | 1 | 0 |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | EB | EB | EB | EB | B19 | WB | WB | WB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | T | L | L | T | T | R | L | T |
| Maximum Queue (ft) | 328 | 894 | 864 | 390 | 8 | 212 | 226 | 219 | 197 | 46 | 22 | 65 |
| Average Queue (ft) | 25 | 394 | 372 | 32 | 0 | 79 | 58 | 71 | 64 | 13 | 3 | 11 |
| 95th Queue (ft) | 132 | 754 | 735 | 188 | 6 | 149 | 147 | 161 | 148 | 34 | 15 | 42 |
| Link Distance (ft) | | 1228 | 1228 | | 4206 | | | 909 | 909 | | | 1277 |
| Upstream Blk Time (%) | | 0 | 0 | | | | | | | | | |
| Queuing Penalty (veh) | | 3 | 2 | | | | | | | | | |
| Storage Bay Dist (ft) | 210 | | | 210 | | 250 | 250 | | | 150 | 240 | |
| Storage Blk Time (%) | | 27 | 21 | | | 0 | 0 | 0 | 0 | | | |
| Queuing Penalty (veh) | | 5 | 7 | | | 0 | 0 | 0 | 0 | | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | NB | SB | SB | SB |
|---|---|---|---|---|
| Directions Served | R | L | L | TR |
| Maximum Queue (ft) | 72 | 190 | 574 | 231 |
| Average Queue (ft) | 22 | 157 | 285 | 36 |
| 95th Queue (ft) | 56 | 216 | 582 | 140 |
| Link Distance (ft) | 1277 | | 547 | |
| Upstream Blk Time (%) | | | 11 | |
| Queuing Penalty (veh) | | | 0 | |
| Storage Bay Dist (ft) | | 100 | | 400 |
| Storage Blk Time (%) | | 44 | 45 | 0 |
| Queuing Penalty (veh) | | 124 | 128 | 0 |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | T | T | R | L | L | T | T |
| Maximum Queue (ft) | 178 | 284 | 272 | 184 | 32 | 176 | 190 | 89 | 104 | 140 | 146 | 162 |
| Average Queue (ft) | 25 | 171 | 140 | 54 | 7 | 67 | 66 | 24 | 43 | 60 | 64 | 71 |
| 95th Queue (ft) | 91 | 256 | 237 | 123 | 23 | 140 | 148 | 64 | 87 | 110 | 124 | 135 |
| Link Distance (ft) | | 1391 | 1391 | | | 4206 | 4206 | | | | 855 | 855 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 175 | | | 175 | 175 | | | 175 | 225 | 225 | | |
| Storage Blk Time (%) | | 6 | 2 | 0 | | 0 | 0 | | | | | |
| Queuing Penalty (veh) | | 2 | 7 | 0 | | 0 | 1 | | | | | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | NB | SB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|
| Directions Served | R | L | L | T | T | R |
| Maximum Queue (ft) | 51 | 199 | 235 | 156 | 102 | 86 |
| Average Queue (ft) | 11 | 97 | 145 | 74 | 14 | 32 |
| 95th Queue (ft) | 38 | 184 | 210 | 130 | 55 | 69 |
| Link Distance (ft) | | | | 1144 | 1144 | |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | 225 | 275 | 275 | | | 275 |
| Storage Blk Time (%) | | | 0 | | | |
| Queuing Penalty (veh) | | | 0 | | | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB | NB | NB | SB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | R | R | L | L | TR | L | T | T | R | L |
| Maximum Queue (ft) | 26 | 56 | 58 | 55 | 156 | 182 | 84 | 70 | 275 | 284 | 299 | 103 |
| Average Queue (ft) | 3 | 11 | 17 | 11 | 60 | 102 | 25 | 17 | 82 | 20 | 98 | 36 |
| 95th Queue (ft) | 15 | 37 | 42 | 36 | 126 | 164 | 58 | 48 | 208 | 119 | 221 | 77 |
| Link Distance (ft) | | 1114 | 1114 | | | | 757 | | 1037 | 1037 | | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 190 | | | 190 | 300 | 300 | | 450 | | | 225 | 325 |
| Storage Blk Time (%) | | | | | | | | | | 0 | 1 | |
| Queuing Penalty (veh) | | | | | | | | | | 1 | 2 | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | SB | SB |
|---|---|---|
| Directions Served | T | R |
| Maximum Queue (ft) | 165 | 39 |
| Average Queue (ft) | 68 | 5 |
| 95th Queue (ft) | 138 | 23 |
| Link Distance (ft) | 469 | |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | 325 |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Intersection: 10: Johnathan Carver Pkwy & US 212 WB Ramps

| Movement | WB | WB | WB | NB | NB | NB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | LT | R | L | T | T | T | T | T | R |
| Maximum Queue (ft) | 208 | 243 | 74 | 252 | 154 | 229 | 43 | 118 | 125 | 88 |
| Average Queue (ft) | 91 | 148 | 23 | 93 | 70 | 109 | 8 | 50 | 46 | 37 |
| 95th Queue (ft) | 180 | 221 | 60 | 199 | 132 | 187 | 30 | 102 | 99 | 72 |
| Link Distance (ft) | | 1104 | | 360 | 360 | 360 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | 0 | | | | | | |
| Queuing Penalty (veh) | | | | 1 | | | | | | |
| Storage Bay Dist (ft) | 275 | | 275 | | | | 150 | | | 100 |
| Storage Blk Time (%) | | | | | | | | | 1 | 0 |
| Queuing Penalty (veh) | | | | | | | | | 1 | 0 |

## Intersection: 11: Johnathan Carver Pkwy & US 212 EB Ramps

| Movement | EB | EB | NB | NB | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | LT | R | T | T | T | R | L | T | T |
| Maximum Queue (ft) | 392 | 276 | 295 | 2706 | 2711 | 2713 | 72 | 101 | 100 |
| Average Queue (ft) | 209 | 55 | 47 | 2526 | 2570 | 2583 | 27 | 44 | 50 |
| 95th Queue (ft) | 347 | 169 | 197 | 3159 | 3043 | 3112 | 63 | 89 | 90 |
| Link Distance (ft) | 1077 | | | 2650 | 2650 | 2650 | 360 | 360 | 360 |
| Upstream Blk Time (%) | | | | 48 | 78 | 77 | | | |
| Queuing Penalty (veh) | | | | 0 | 0 | 0 | | | |
| Storage Bay Dist (ft) | | 250 | 275 | | | | | | |
| Storage Blk Time (%) | 6 | | 0 | 4 | | | | | |
| Queuing Penalty (veh) | 6 | | 0 | 8 | | | | | |

## Zone Summary

Zone wide Queuing Penalty: 358

## 1: US 212 EB Ramps & Engler Blvd Performance by movement

| Movement | EBL | EBT | WBT | WBR | NBL | NBT | NBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.2 | 3.3 | 0.4 | 0.7 | 3.9 | 0.4 |
| Total Del/Veh (s) | 26.7 | 4.8 | 16.4 | 6.5 | 35.0 | 38.6 | 7.3 | 16.0 |

## 2: US 212 WB Ramps & Engler Blvd Performance by movement

| Movement | EBT | EBR | WBL | WBT | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.1 | 0.0 | 0.0 | 88.4 | 85.7 | 44.4 |
| Total Del/Veh (s) | 29.6 | 5.5 | 23.8 | 9.3 | 32.1 | 36.5 | 29.5 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.3 | 3.3 | 0.1 | 0.1 | 2.1 | 3.6 | 3.6 |
| Total Del/Veh (s) | 47.1 | 14.8 | 1.9 | 48.1 | 31.7 | 15.4 | 28.5 | 51.2 | 9.5 | 27.3 | 32.9 | 15.4 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.3 |
| Total Del/Veh (s) | 25.3 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 2.6 | 0.3 | 2.8 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.3 | 0.6 | 3.3 |
| Total Del/Veh (s) | 27.0 | 13.6 | 5.6 | 23.2 | 24.7 | 18.2 | 29.1 | 24.9 | 5.2 | 28.3 | 39.8 | 12.8 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.5 |
| Total Del/Veh (s) | 22.6 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 3.6 | 0.3 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 38.6 | 50.2 | 10.0 | 40.2 | 38.1 | 14.2 | 20.9 | 10.1 | 7.7 | 38.1 | 20.8 | 2.0 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.3 |
| Total Del/Veh (s) | 22.6 |

## 10: Johnathan Carver Pkwy & US 212 WB Ramps Performance by movement

| Movement | WBL | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 5.0 | 5.6 | 0.0 | 0.0 | 0.0 | 0.0 | 2.4 |
| Total Del/Veh (s) | 40.3 | 24.8 | 60.7 | 23.2 | 41.1 | 15.9 | 33.8 |

## 11: Johnathan Carver Pkwy & US 212 EB Ramps Performance by movement

| Movement | EBL | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.5 | 3.7 | 0.3 | 0.2 | 0.0 | 0.0 | 0.2 |
| Total Del/Veh (s) | 43.9 | 26.0 | 6.0 | 8.9 | 9.0 | 5.6 | 9.2 |

## Total Zone Performance

| | |
|---|---|
| Denied Del/Veh (s) | 19.5 |
| Total Del/Veh (s) | 1331.8 |

## Intersection: 1: US 212 EB Ramps & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | T | T | T | R | LT | R |
| Maximum Queue (ft) | 209 | 234 | 77 | 72 | 168 | 151 | 63 | 102 | 65 |
| Average Queue (ft) | 86 | 110 | 23 | 13 | 85 | 61 | 20 | 39 | 29 |
| 95th Queue (ft) | 181 | 206 | 59 | 47 | 145 | 121 | 48 | 83 | 57 |
| Link Distance (ft) | | 669 | 669 | 669 | 1124 | 1124 | | 745 | |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | 300 | | | | | | 330 | | 210 |
| Storage Blk Time (%) | 1 | 1 | | | | | | | |
| Queuing Penalty (veh) | 2 | 2 | | | | | | | |

## Intersection: 2: US 212 WB Ramps & Engler Blvd

| Movement | EB | EB | EB | WB | WB | WB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | T | T | R | L | T | T | L | TR | R |
| Maximum Queue (ft) | 477 | 325 | 39 | 93 | 87 | 113 | 353 | 565 | 360 |
| Average Queue (ft) | 206 | 130 | 15 | 39 | 20 | 46 | 71 | 299 | 264 |
| 95th Queue (ft) | 374 | 240 | 37 | 78 | 62 | 92 | 190 | 445 | 362 |
| Link Distance (ft) | 909 | 909 | | | 669 | 669 | | 775 | |
| Upstream Blk Time (%) | | | | | | | | 0 | |
| Queuing Penalty (veh) | | | | | | | | 0 | |
| Storage Bay Dist (ft) | | | 275 | 225 | | | 225 | | 225 |
| Storage Blk Time (%) | | 1 | | | | | | 19 | 9 |
| Queuing Penalty (veh) | | 0 | | | | | | 181 | 82 |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | WB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | L | T | T | R | L | T | R |
| Maximum Queue (ft) | 95 | 233 | 182 | 28 | 74 | 139 | 642 | 645 | 300 | 60 | 50 | 88 |
| Average Queue (ft) | 37 | 109 | 82 | 4 | 35 | 17 | 274 | 289 | 134 | 21 | 11 | 34 |
| 95th Queue (ft) | 79 | 198 | 150 | 18 | 68 | 137 | 576 | 593 | 335 | 52 | 35 | 67 |
| Link Distance (ft) | | 1228 | 1228 | | | | 909 | 909 | | | 1277 | 1277 |
| Upstream Blk Time (%) | | | | | | | 0 | 0 | | | | |
| Queuing Penalty (veh) | | | | | | | 1 | 3 | | | | |
| Storage Bay Dist (ft) | 210 | | | 210 | 250 | 250 | | | 150 | 240 | | |
| Storage Blk Time (%) | | 1 | 0 | | | | 11 | 24 | | | | |
| Queuing Penalty (veh) | | 0 | 0 | | | | 7 | 94 | | | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | SB | SB | SB |
|---|---|---|---|
| Directions Served | L | L | TR |
| Maximum Queue (ft) | 108 | 138 | 66 |
| Average Queue (ft) | 47 | 60 | 21 |
| 95th Queue (ft) | 87 | 108 | 53 |
| Link Distance (ft) | | 547 | |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | 100 | | 400 |
| Storage Blk Time (%) | 0 | 1 | |
| Queuing Penalty (veh) | 0 | 2 | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | T | T | R | L | L | T | T |
| Maximum Queue (ft) | 49 | 182 | 156 | 138 | 50 | 308 | 316 | 225 | 161 | 167 | 150 | 148 |
| Average Queue (ft) | 16 | 90 | 50 | 46 | 10 | 157 | 155 | 72 | 83 | 94 | 68 | 73 |
| 95th Queue (ft) | 42 | 152 | 112 | 94 | 34 | 278 | 272 | 182 | 138 | 146 | 119 | 125 |
| Link Distance (ft) | | 1391 | 1391 | | | 4206 | 4206 | | | | 855 | 855 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 175 | | | 175 | 175 | | | 175 | 225 | 225 | | |
| Storage Blk Time (%) | | 0 | 0 | 0 | | 7 | 6 | 0 | | | | |
| Queuing Penalty (veh) | | 0 | 0 | 0 | | 1 | 23 | 0 | | | | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | NB | SB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|
| Directions Served | R | L | L | T | T | R |
| Maximum Queue (ft) | 41 | 100 | 137 | 267 | 241 | 70 |
| Average Queue (ft) | 8 | 36 | 70 | 153 | 86 | 18 |
| 95th Queue (ft) | 28 | 74 | 121 | 238 | 207 | 52 |
| Link Distance (ft) | | | | 1144 | 1144 | |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | 225 | 275 | 275 | | | 275 |
| Storage Blk Time (%) | | | | 0 | 0 | |
| Queuing Penalty (veh) | | | | 0 | 0 | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | EB | EB | EB | EB | EB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | R | R | L | L | TR | L | T | T | R |
| Maximum Queue (ft) | 100 | 92 | 105 | 87 | 74 | 264 | 293 | 155 | 148 | 78 | 37 | 118 |
| Average Queue (ft) | 48 | 23 | 41 | 40 | 33 | 134 | 185 | 55 | 54 | 20 | 3 | 23 |
| 95th Queue (ft) | 85 | 67 | 83 | 72 | 59 | 222 | 269 | 114 | 113 | 58 | 17 | 73 |
| Link Distance (ft) | | | 1114 | 1114 | | | | 757 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 190 | 190 | | | 190 | 300 | 300 | | 450 | | | 225 |
| Storage Blk Time (%) | | | | | | 0 | 0 | | | | | |
| Queuing Penalty (veh) | | | | | | 0 | 0 | | | | | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | SB | SB | SB |
|---|---|---|---|
| Directions Served | L | T | R |
| Maximum Queue (ft) | 216 | 279 | 50 |
| Average Queue (ft) | 92 | 143 | 18 |
| 95th Queue (ft) | 175 | 245 | 42 |
| Link Distance (ft) | | 469 | |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | 325 | | 325 |
| Storage Blk Time (%) | | 0 | |
| Queuing Penalty (veh) | | 0 | |

## Intersection: 10: Johnathan Carver Pkwy & US 212 WB Ramps

| Movement | WB | WB | WB | NB | NB | NB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | LT | R | L | T | T | T | T | T | R |
| Maximum Queue (ft) | 349 | 709 | 350 | 157 | 266 | 255 | 104 | 308 | 381 | 200 |
| Average Queue (ft) | 304 | 362 | 98 | 77 | 151 | 138 | 9 | 155 | 166 | 111 |
| 95th Queue (ft) | 390 | 531 | 292 | 139 | 239 | 221 | 56 | 252 | 298 | 217 |
| Link Distance (ft) | | 1104 | | 360 | 360 | 360 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | 0 | | | | | | | | |
| Queuing Penalty (veh) | | 0 | | | | | | | | |
| Storage Bay Dist (ft) | 275 | | 275 | | | | 150 | | | 100 |
| Storage Blk Time (%) | 3 | 15 | | | | | | 10 | 28 | 7 |
| Queuing Penalty (veh) | 28 | 131 | | | | | | 20 | 117 | 13 |

## Intersection: 11: Johnathan Carver Pkwy & US 212 EB Ramps

| Movement | EB | EB | NB | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|
| Directions Served | LT | R | T | T | T | L | T | T |
| Maximum Queue (ft) | 253 | 141 | 41 | 104 | 116 | 57 | 192 | 214 |
| Average Queue (ft) | 135 | 56 | 9 | 35 | 35 | 19 | 80 | 79 |
| 95th Queue (ft) | 220 | 109 | 31 | 83 | 88 | 48 | 134 | 139 |
| Link Distance (ft) | 1077 | | | 2636 | 2636 | 360 | 360 | 360 |
| Upstream Blk Time (%) | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | |
| Storage Bay Dist (ft) | | 250 | 275 | | | | | |
| Storage Blk Time (%) | 0 | | | | | | | |
| Queuing Penalty (veh) | 0 | | | | | | | |

## Zone Summary

Zone wide Queuing Penalty: 712

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | Creek Road EB | None | 17 | | 23 | | 10 | 1071 | | 0.0159 | |
| 2 | Creek Road WB | None | 36 | | 7 | | 33 | 1105 | | 0.0326 | |
| 3 | Chaska Creek SB | None | 26 | | 7 | | 36 | 1096 | | 0.0237 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | Creek Road EB | None | 3.37 | | 3.37 | 0.05 | | A | | A |
| 2 | Creek Road WB | None | 3.49 | | 3.49 | 0.09 | | A | | A |
| 3 | Chaska Creek SB | None | 3.40 | | 3.40 | 0.07 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 79 | | 79 |
| Capacity | veh/hr | 3272 | | 3272 |
| Average Delay | sec/veh | 3.30 | | 3.30 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 0.07 | | 0.07 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | Creek Road EB | None | 22 | | 66 | | 12 | 1049 | | 0.0210 | |
| 2 | Creek Road WB | None | 41 | | 7 | | 81 | 1105 | | 0.0371 | |
| 3 | Chaska Creek SB | None | 71 | | 7 | | 41 | 1096 | | 0.0648 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | Creek Road EB | None | 3.51 | | 3.51 | 0.06 | | A | | A |
| 2 | Creek Road WB | None | 3.55 | | 3.55 | 0.11 | | A | | A |
| 3 | Chaska Creek SB | None | 3.93 | | 3.93 | 0.19 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 134 | | 134 |
| Capacity | veh/hr | 3250 | | 3250 |
| Average Delay | sec/veh | 3.50 | | 3.50 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 0.13 | | 0.13 |

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | NB CSAH 11 | None | 385 | | 318 | | 358 | 693 | | 0.5558 | |
| 2 | WB CSAH 44 | None | 199 | | 365 | | 338 | 887 | | 0.2244 | |
| 3 | SB CSAH 11 | None | 511 | | 125 | | 439 | 950 | | 0.5380 | |
| 4 | EB CSAH 44 | None | 104 | | 572 | | 64 | 752 | | 0.1382 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | NB CSAH 11 | None | 11.01 | | 11.01 | 2.69 | | B | | B |
| 2 | WB CSAH 44 | None | 6.93 | | 6.93 | 0.84 | | A | | A |
| 3 | SB CSAH 11 | None | 10.11 | | 10.11 | 3.03 | | B | | B |
| 4 | EB CSAH 44 | None | 6.36 | | 6.36 | 0.46 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1199 | | 1199 |
| Capacity | veh/hr | 3282 | | 3282 |
| Average Delay | sec/veh | 8.57 | | 8.57 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 2.85 | | 2.85 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | NB CSAH 11 | None | 499 | | 189 | | 518 | 880 | | 0.5670 | |
| 2 | WB CSAH 44 | None | 392 | | 440 | | 248 | 897 | | 0.4372 | |
| 3 | SB CSAH 11 | None | 583 | | 205 | | 627 | 836 | | 0.6976 | |
| 4 | EB CSAH 44 | None | 74 | | 633 | | 155 | 646 | | 0.1146 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | NB CSAH 11 | None | 10.83 | | 10.83 | 3.13 | | B | | B |
| 2 | WB CSAH 44 | None | 9.82 | | 9.82 | 2.28 | | A | | A |
| 3 | SB CSAH 11 | None | 13.41 | | 13.41 | 4.81 | | B | | B |
| 4 | EB CSAH 44 | None | 6.52 | | 6.52 | 0.34 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1548 | | 1548 |
| Capacity | veh/hr | 3258 | | 3258 |
| Average Delay | sec/veh | 10.36 | | 10.36 |
| L.O.S. (Signal) | A – F | B | | B |
| L.O.S. (Unsig) | A – F | B | | B |
| Total Delay | veh.hrs | 4.45 | | 4.45 |

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | US 212 Entrance Ramp | None | 0 | | 0 | | 523 | 0 | | 0.0000 | |
| 2 | EB CSAH 44 | None | 439 | | 0 | | 195 | 2005 | | 0.2190 | |
| 3 | WB CSAH 44 | None | 687 | | 31 | | 408 | 1034 | | 0.6647 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | US 212 Entrance Ramp | None | 0.00 | | 0.00 | 0.00 | | A | | A |
| 2 | EB CSAH 44 | None | 4.46 | | 4.46 | 0.88 | | A | | A |
| 3 | WB CSAH 44 | None | 12.36 | | 12.36 | 5.23 | | B | | B |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1126 | | 1126 |
| Capacity | veh/hr | 3039 | | 3039 |
| Average Delay | sec/veh | 8.28 | | 8.28 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 2.59 | | 2.59 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | US 212 Entrance Ramp | None | 0 | | 0 | | 250 | 0 | | 0.0000 | |
| 2 | EB CSAH 44 | None | 565 | | 0 | | 344 | 2005 | | 0.2818 | |
| 3 | WB CSAH 44 | None | 573 | | 21 | | 544 | 1120 | | 0.5117 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | US 212 Entrance Ramp | None | 0.00 | | 0.00 | 0.00 | | A | | A |
| 2 | EB CSAH 44 | None | 4.88 | | 4.88 | 1.20 | | A | | A |
| 3 | WB CSAH 44 | None | 9.47 | | 9.47 | 3.04 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1138 | | 1138 |
| Capacity | veh/hr | 3125 | | 3125 |
| Average Delay | sec/veh | 6.19 | | 6.19 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 1.96 | | 1.96 |

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | EB CSAH 44 | None | 346 | | 0 | | 207 | 1167 | | 0.2964 | |
| 2 | NB US 212 EXIT | Free | 5 | 100 | 346 | 0 | 0 | 927 | 1264 | 0.0054 | 0.0791 |
| 3 | WB CSAH 44 | None | 195 | | 12 | | 439 | 1075 | | 0.1814 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | EB CSAH 44 | None | 6.67 | | 6.67 | 1.24 | | A | | A |
| 2 | NB US 212 EXIT | Free | 0.05 | 0.79 | 0.76 | 0.00 | 0.00 | A | A | A |
| 3 | WB CSAH 44 | None | 5.54 | | 5.54 | 0.61 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 546 | 100 | 646 |
| Capacity | veh/hr | 3169 | 1264 | 4433 |
| Average Delay | sec/veh | 5.24 | 0.40 | 4.49 |
| L.O.S. (Signal) | A – F | A | A | A |
| L.O.S. (Unsig) | A – F | A | A | A |
| Total Delay | veh.hrs | 0.80 | 0.01 | 0.81 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | EB CSAH 44 | None | 250 | | 0 | | 384 | 1004 | | 0.2491 | |
| 2 | NB US 212 EXIT | Free | 49 | 318 | 250 | 0 | 0 | 1023 | 1301 | 0.0479 | 0.2445 |
| 3 | WB CSAH 44 | None | 334 | | 50 | | 567 | 1141 | | 0.2928 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | EB CSAH 44 | None | 6.30 | | 6.30 | 0.88 | | A | | A |
| 2 | NB US 212 EXIT | Free | 4.06 | 2.22 | 2.47 | 0.15 | 0.00 | A | A | A |
| 3 | WB CSAH 44 | None | 6.73 | | 6.73 | 1.22 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 633 | 318 | 951 |
| Capacity | veh/hr | 3167 | 1301 | 4468 |
| Average Delay | sec/veh | 5.41 | 1.22 | 4.01 |
| L.O.S. (Signal) | A – F | A | A | A |
| L.O.S. (Unsig) | A – F | A | A | A |
| Total Delay | veh.hrs | 0.95 | 0.11 | 1.06 |

# Appendix I:

# Design Year (2045) Build Scenario 1 Analysis Reports

## 1: US 212 EB Ramps & Engler Blvd Performance by movement

| Movement | EBL | EBT | WBT | WBR | NBL | NBT | NBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.3 | 3.2 | 0.6 | 0.6 | 3.8 | 0.4 |
| Total Del/Veh (s) | 22.2 | 6.0 | 46.0 | 32.7 | 59.7 | 75.6 | 9.1 | 23.5 |

## 2: US 212 WB Ramps & Engler Blvd Performance by movement

| Movement | EBT | EBR | WBL | WBT | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 3.4 | 1.4 | 0.3 |
| Total Del/Veh (s) | 32.2 | 11.9 | 160.9 | 6.5 | 113.3 | 14.2 | 29.9 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 3.3 | 4.6 | 4.0 |
| Total Del/Veh (s) | 42.1 | 37.9 | 11.6 | 95.4 | 8.6 | 2.9 | 98.4 | 82.7 | 28.1 | 71.7 | 60.6 | 20.0 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.5 |
| Total Del/Veh (s) | 36.8 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 2.2 | 0.5 | 2.3 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 3.2 | 0.8 | 3.2 |
| Total Del/Veh (s) | 19.5 | 18.6 | 7.6 | 34.2 | 16.1 | 8.0 | 24.4 | 32.0 | 12.1 | 36.1 | 30.3 | 5.9 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.9 |
| Total Del/Veh (s) | 20.6 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 3.9 | 0.2 | 1.3 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 20.9 | 36.8 | 6.4 | 26.3 | 12.3 | 3.6 | 13.0 | 18.1 | 14.6 | 14.5 | 9.8 | 1.4 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.1 |
| Total Del/Veh (s) | 15.9 |

## 10: Johnathan Carver Pkwy & US 212 WB Ramps Performance by movement

| Movement | WBL | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.8 | 3.4 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 |
| Total Del/Veh (s) | 32.7 | 11.8 | 38.4 | 8.2 | 13.1 | 6.1 | 14.6 |

## 11: Johnathan Carver Pkwy & US 212 EB Ramps Performance by movement

| Movement | EBL | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.7 | 3.4 | 0.5 | 0.5 | 0.0 | 0.0 | 0.5 |
| Total Del/Veh (s) | 48.8 | 14.8 | 19.8 | 37.6 | 9.9 | 5.4 | 28.3 |

## 12: Johnathan Carver Pkwy & Access A Performance by movement

| Movement | WBR | NBT | NBR | SBT | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 3.1 | 2.3 | 1.5 | 0.9 | 1.6 |

## 14: Johnathan Carver Pkwy & Access C 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) | 10.5 | 5.8 | 2.0 | 0.5 | 5.9 | 2.7 | 2.4 |

## 15: Chaska Blvd & Access D Performance by movement

| Movement | EBL | EBT | WBT | WBR | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.3 | 0.4 | 0.1 | 0.1 | 0.1 |
| Total Del/Veh (s) | 4.3 | 1.9 | 1.0 | 0.6 | 13.2 | 3.8 | 1.6 |

## Total Zone Performance

| | |
|---|---|
| Denied Del/Veh (s) | 1.2 |
| Total Del/Veh (s) | 1102.1 |

## Intersection: 1: US 212 EB Ramps & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | T | T | T | R | LT | R |
| Maximum Queue (ft) | 448 | 524 | 359 | 160 | 251 | 220 | 198 | 166 | 102 |
| Average Queue (ft) | 217 | 223 | 74 | 33 | 148 | 107 | 87 | 79 | 42 |
| 95th Queue (ft) | 404 | 425 | 244 | 103 | 223 | 187 | 150 | 147 | 74 |
| Link Distance (ft) | | 669 | 669 | 669 | 1120 | 1120 | | 745 | |
| Upstream Blk Time (%) | | 0 | | | | | | | |
| Queuing Penalty (veh) | | 0 | | | | | | | |
| Storage Bay Dist (ft) | 300 | | | | | | 330 | | 210 |
| Storage Blk Time (%) | 4 | 6 | | | | 0 | | 0 | |
| Queuing Penalty (veh) | 30 | 44 | | | | 0 | | 0 | |

## Intersection: 2: US 212 WB Ramps & Engler Blvd

| Movement | EB | EB | EB | WB | WB | WB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | T | T | R | L | T | T | L | TR | R |
| Maximum Queue (ft) | 805 | 809 | 295 | 192 | 50 | 4 | 156 | 185 | 154 |
| Average Queue (ft) | 326 | 285 | 27 | 99 | 2 | 0 | 56 | 102 | 62 |
| 95th Queue (ft) | 746 | 714 | 196 | 177 | 28 | 3 | 121 | 164 | 128 |
| Link Distance (ft) | 909 | 909 | | | 669 | 669 | | 775 | |
| Upstream Blk Time (%) | 0 | 0 | | | | | | | |
| Queuing Penalty (veh) | 1 | 1 | | | | | | | |
| Storage Bay Dist (ft) | | | 275 | 225 | | | 225 | | 225 |
| Storage Blk Time (%) | | 11 | | 0 | | | | | |
| Queuing Penalty (veh) | | 5 | | 0 | | | | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | WB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | L | T | T | R | L | T | R |
| Maximum Queue (ft) | 321 | 666 | 674 | 389 | 159 | 168 | 178 | 173 | 56 | 21 | 46 | 82 |
| Average Queue (ft) | 38 | 362 | 340 | 45 | 76 | 52 | 61 | 66 | 14 | 2 | 9 | 23 |
| 95th Queue (ft) | 190 | 646 | 633 | 228 | 127 | 125 | 136 | 143 | 37 | 11 | 34 | 56 |
| Link Distance (ft) | | 1228 | 1228 | | | | 909 | 909 | | | 1277 | 1277 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 210 | | | 210 | 250 | 250 | | | 150 | 240 | | |
| Storage Blk Time (%) | | 28 | 22 | | 0 | 0 | 0 | 0 | | | | |
| Queuing Penalty (veh) | | 5 | 7 | | 0 | 0 | 0 | 1 | | | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | SB | SB | SB |
|---|---|---|---|
| Directions Served | L | L | TR |
| Maximum Queue (ft) | 190 | 518 | 351 |
| Average Queue (ft) | 156 | 249 | 45 |
| 95th Queue (ft) | 219 | 497 | 195 |
| Link Distance (ft) | | 547 | |
| Upstream Blk Time (%) | | 3 | |
| Queuing Penalty (veh) | | 0 | |
| Storage Bay Dist (ft) | 100 | | 400 |
| Storage Blk Time (%) | 40 | 41 | 0 |
| Queuing Penalty (veh) | 113 | 117 | 0 |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | T | T | R | L | L | T | T |
| Maximum Queue (ft) | 89 | 269 | 258 | 154 | 48 | 188 | 180 | 100 | 124 | 143 | 164 | 172 |
| Average Queue (ft) | 25 | 166 | 136 | 54 | 10 | 74 | 73 | 28 | 55 | 72 | 82 | 85 |
| 95th Queue (ft) | 66 | 243 | 223 | 107 | 30 | 156 | 148 | 72 | 100 | 119 | 144 | 145 |
| Link Distance (ft) | | 1391 | 1391 | | | 4206 | 4206 | | | | 855 | 855 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 225 | | | 225 | 225 | | | 225 | 225 | 225 | | |
| Storage Blk Time (%) | | 1 | 0 | | | 0 | 0 | | | | | 0 |
| Queuing Penalty (veh) | | 0 | 1 | | | 0 | 0 | | | | | 0 |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | NB | SB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|
| Directions Served | R | L | L | T | T | R |
| Maximum Queue (ft) | 56 | 194 | 238 | 177 | 178 | 94 |
| Average Queue (ft) | 13 | 103 | 145 | 90 | 26 | 31 |
| 95th Queue (ft) | 42 | 187 | 210 | 153 | 102 | 72 |
| Link Distance (ft) | | | | 1144 | 1144 | |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | 225 | 275 | 275 | | | 275 |
| Storage Blk Time (%) | | | 0 | | | |
| Queuing Penalty (veh) | | | 0 | | | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB | NB | NB | SB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | R | R | L | L | TR | L | T | T | R | L |
| Maximum Queue (ft) | 25 | 62 | 61 | 61 | 180 | 214 | 86 | 68 | 282 | 178 | 278 | 119 |
| Average Queue (ft) | 4 | 10 | 18 | 12 | 69 | 110 | 28 | 20 | 124 | 23 | 109 | 43 |
| 95th Queue (ft) | 18 | 36 | 46 | 40 | 147 | 185 | 63 | 48 | 239 | 103 | 209 | 87 |
| Link Distance (ft) | | 1114 | 1114 | | | | 769 | | 1037 | 1037 | | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 190 | | | 190 | 300 | 300 | | 450 | | | 225 | 325 |
| Storage Blk Time (%) | | | | | 0 | 0 | | | | 0 | 1 | |
| Queuing Penalty (veh) | | | | | 0 | 0 | | | | 1 | 2 | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | SB | SB |
|---|---|---|
| Directions Served | T | R |
| Maximum Queue (ft) | 188 | 42 |
| Average Queue (ft) | 73 | 5 |
| 95th Queue (ft) | 141 | 24 |
| Link Distance (ft) | 449 | |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | 325 |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Intersection: 10: Johnathan Carver Pkwy & US 212 WB Ramps

| Movement | WB | WB | WB | NB | NB | NB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | LT | R | L | T | T | T | T | T | R |
| Maximum Queue (ft) | 232 | 258 | 117 | 204 | 185 | 194 | 68 | 126 | 124 | 97 |
| Average Queue (ft) | 95 | 151 | 33 | 89 | 86 | 112 | 11 | 58 | 51 | 39 |
| 95th Queue (ft) | 193 | 228 | 75 | 163 | 156 | 179 | 39 | 108 | 102 | 78 |
| Link Distance (ft) | | 1104 | | 360 | 360 | 360 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |
| Storage Bay Dist (ft) | 275 | | 275 | | | | 150 | | | 100 |
| Storage Blk Time (%) | 0 | 0 | | | | | | 0 | 1 | 0 |
| Queuing Penalty (veh) | 0 | 0 | | | | | | 0 | 2 | 0 |

## Intersection: 11: Johnathan Carver Pkwy & US 212 EB Ramps

| Movement | EB | EB | NB | NB | NB | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | LT | R | T | T | T | R | R | L | T | T |
| Maximum Queue (ft) | 505 | 325 | 140 | 430 | 1103 | 1241 | 231 | 89 | 122 | 112 |
| Average Queue (ft) | 275 | 84 | 35 | 80 | 150 | 143 | 10 | 36 | 47 | 53 |
| 95th Queue (ft) | 458 | 249 | 101 | 170 | 537 | 674 | 112 | 77 | 97 | 92 |
| Link Distance (ft) | 1077 | | | 2636 | 2636 | 2636 | | 360 | 360 | 360 |
| Upstream Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |
| Storage Bay Dist (ft) | | 250 | 275 | | | | 450 | | | |
| Storage Blk Time (%) | 18 | | | 0 | | 0 | | | | |
| Queuing Penalty (veh) | 19 | | | 0 | | 1 | | | | |

## Intersection: 12: Johnathan Carver Pkwy & Access A

| Movement | WB |
|---|---|
| Directions Served | LR |
| Maximum Queue (ft) | 52 |
| Average Queue (ft) | 9 |
| 95th Queue (ft) | 34 |
| Link Distance (ft) | 1061 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Intersection: 14: Johnathan Carver Pkwy & Access C

| Movement | WB | B44 | SB |
|---|---|---|---|
| Directions Served | LR | T | LT |
| Maximum Queue (ft) | 66 | 110 | 70 |
| Average Queue (ft) | 17 | 0 | 6 |
| 95th Queue (ft) | 52 | 0 | 34 |
| Link Distance (ft) | 639 | 449 | 2596 |
| Upstream Blk Time (%) | | 0 | |
| Queuing Penalty (veh) | | 0 | |
| Storage Bay Dist (ft) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 15: Chaska Blvd & Access D

| Movement | EB | SB |
|---|---|---|
| Directions Served | LT | LR |
| Maximum Queue (ft) | 112 | 50 |
| Average Queue (ft) | 15 | 10 |
| 95th Queue (ft) | 69 | 33 |
| Link Distance (ft) | 769 | 506 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Zone Summary

Zone wide Queuing Penalty: 353

## 1: US 212 EB Ramps & Engler Blvd Performance by movement

| Movement | EBL | EBT | WBT | WBR | NBL | NBT | NBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.2 | 3.2 | 0.5 | 0.8 | 3.8 | 0.4 |
| Total Del/Veh (s) | 26.7 | 5.5 | 17.2 | 5.8 | 34.6 | 69.8 | 7.5 | 16.3 |

## 2: US 212 WB Ramps & Engler Blvd Performance by movement

| Movement | EBT | EBR | WBL | WBT | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.1 | 0.0 | 0.0 | 119.7 | 116.2 | 60.4 |
| Total Del/Veh (s) | 32.5 | 5.3 | 24.0 | 9.2 | 34.7 | 37.6 | 30.9 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.9 | 0.1 | 0.1 | 2.0 | 3.6 | 3.6 |
| Total Del/Veh (s) | 40.9 | 14.0 | 2.2 | 46.1 | 31.8 | 14.3 | 27.7 | 44.5 | 9.0 | 26.9 | 30.6 | 19.4 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.2 |
| Total Del/Veh (s) | 24.9 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 2.7 | 0.3 | 2.9 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.3 | 0.6 | 3.3 |
| Total Del/Veh (s) | 27.9 | 13.4 | 5.8 | 24.1 | 24.7 | 18.1 | 28.2 | 27.1 | 5.9 | 28.4 | 38.4 | 15.8 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.5 |
| Total Del/Veh (s) | 22.5 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 3.6 | 0.4 | 1.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 37.7 | 49.7 | 13.4 | 43.4 | 38.7 | 17.4 | 31.2 | 15.0 | 9.9 | 44.6 | 26.0 | 2.9 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.3 |
| Total Del/Veh (s) | 26.1 |

## 10: Johnathan Carver Pkwy & US 212 WB Ramps Performance by movement

| Movement | WBL | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 10.7 | 10.1 | 0.0 | 0.0 | 0.0 | 0.2 | 4.6 |
| Total Del/Veh (s) | 44.4 | 30.0 | 61.2 | 26.2 | 56.6 | 29.8 | 40.4 |

## 11: Johnathan Carver Pkwy & US 212 EB Ramps Performance by movement

| Movement | EBL | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.6 | 3.5 | 0.3 | 0.2 | 0.0 | 0.0 | 0.2 |
| Total Del/Veh (s) | 56.0 | 34.0 | 7.8 | 6.2 | 9.5 | 6.4 | 11.2 |

## 12: Johnathan Carver Pkwy & Access A Performance by movement

| Movement | WBR | NBT | NBR | SBT | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 5.6 | 3.3 | 2.3 | 0.9 | 2.2 |

## 14: Johnathan Carver Pkwy & Access C 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) | 19.4 | 10.0 | 1.3 | 0.4 | 7.8 | 4.0 | 3.2 |

## 15: Chaska Blvd & Access D Performance by movement

| Movement | EBL | EBT | WBT | WBR | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.5 | 0.2 | 0.1 | 0.1 | 0.3 |
| Total Del/Veh (s) | 4.4 | 2.0 | 1.5 | 0.4 | 26.6 | 6.1 | 2.0 |

## Total Zone Performance

| | |
|---|---|
| Denied Del/Veh (s) | 26.0 |
| Total Del/Veh (s) | 1225.8 |

## Intersection: 1: US 212 EB Ramps & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | T | T | T | R | LT | R |
| Maximum Queue (ft) | 176 | 203 | 105 | 119 | 184 | 148 | 51 | 98 | 84 |
| Average Queue (ft) | 81 | 105 | 24 | 18 | 95 | 59 | 19 | 43 | 36 |
| 95th Queue (ft) | 144 | 174 | 65 | 66 | 161 | 115 | 42 | 84 | 66 |
| Link Distance (ft) | | 669 | 669 | 669 | 1124 | 1124 | | 745 | |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | 300 | | | | | | 330 | | 210 |
| Storage Blk Time (%) | | 0 | | | | | | | |
| Queuing Penalty (veh) | | 0 | | | | | | | |

## Intersection: 2: US 212 WB Ramps & Engler Blvd

| Movement | EB | EB | EB | WB | WB | WB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | T | T | R | L | T | T | L | TR | R |
| Maximum Queue (ft) | 456 | 289 | 42 | 118 | 84 | 113 | 262 | 533 | 359 |
| Average Queue (ft) | 224 | 147 | 14 | 45 | 22 | 45 | 63 | 302 | 274 |
| 95th Queue (ft) | 378 | 244 | 37 | 87 | 64 | 91 | 139 | 439 | 362 |
| Link Distance (ft) | 909 | 909 | | | 669 | 669 | | 775 | |
| Upstream Blk Time (%) | | | | | | | | 0 | |
| Queuing Penalty (veh) | | | | | | | | 0 | |
| Storage Bay Dist (ft) | | | 275 | 225 | | | 225 | | 225 |
| Storage Blk Time (%) | | 0 | | | | | | 22 | 10 |
| Queuing Penalty (veh) | | 0 | | | | | | 204 | 93 |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | WB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | L | T | T | R | L | T | R |
| Maximum Queue (ft) | 92 | 233 | 184 | 28 | 84 | 280 | 596 | 625 | 300 | 63 | 49 | 91 |
| Average Queue (ft) | 30 | 104 | 76 | 6 | 39 | 28 | 275 | 290 | 133 | 19 | 11 | 33 |
| 95th Queue (ft) | 66 | 193 | 144 | 23 | 72 | 187 | 529 | 553 | 333 | 46 | 33 | 67 |
| Link Distance (ft) | | 1228 | 1228 | | | | 909 | 909 | | | 1277 | 1277 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 210 | | | 210 | 250 | 250 | | | 150 | 240 | | |
| Storage Blk Time (%) | | 1 | 0 | | | | 11 | 25 | 0 | | | |
| Queuing Penalty (veh) | | 0 | 0 | | | | 8 | 98 | 0 | | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | SB | SB | SB |
|---|---|---|---|
| Directions Served | L | L | TR |
| Maximum Queue (ft) | 104 | 134 | 86 |
| Average Queue (ft) | 47 | 63 | 23 |
| 95th Queue (ft) | 86 | 119 | 62 |
| Link Distance (ft) | | 547 | |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | 100 | | 400 |
| Storage Blk Time (%) | 0 | 2 | |
| Queuing Penalty (veh) | 1 | 4 | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | T | T | R | L | L | T | T |
| Maximum Queue (ft) | 57 | 156 | 139 | 123 | 88 | 328 | 362 | 250 | 172 | 166 | 146 | 156 |
| Average Queue (ft) | 20 | 89 | 47 | 49 | 12 | 153 | 150 | 78 | 84 | 94 | 81 | 89 |
| 95th Queue (ft) | 48 | 142 | 100 | 93 | 65 | 277 | 282 | 195 | 142 | 149 | 131 | 141 |
| Link Distance (ft) | | 1391 | 1391 | | | 4206 | 4206 | | | | 855 | 855 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 225 | | | 225 | 175 | | | 175 | 225 | 225 | | |
| Storage Blk Time (%) | | | | | | 6 | 5 | 0 | | | | |
| Queuing Penalty (veh) | | | | | | 1 | 20 | 0 | | | | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | NB | SB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|
| Directions Served | R | L | L | T | T | R |
| Maximum Queue (ft) | 32 | 105 | 140 | 251 | 229 | 75 |
| Average Queue (ft) | 9 | 35 | 66 | 145 | 75 | 22 |
| 95th Queue (ft) | 29 | 72 | 112 | 227 | 187 | 59 |
| Link Distance (ft) | | | | 1144 | 1144 | |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | 225 | 275 | 275 | | | 275 |
| Storage Blk Time (%) | | | | 0 | 0 | |
| Queuing Penalty (veh) | | | | 0 | 0 | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | EB | EB | EB | EB | EB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | R | R | L | L | TR | L | T | T | R |
| Maximum Queue (ft) | 89 | 76 | 128 | 97 | 82 | 301 | 345 | 151 | 178 | 168 | 45 | 175 |
| Average Queue (ft) | 46 | 21 | 45 | 41 | 37 | 149 | 202 | 65 | 77 | 47 | 4 | 38 |
| 95th Queue (ft) | 80 | 66 | 98 | 76 | 69 | 254 | 305 | 131 | 144 | 131 | 24 | 118 |
| Link Distance (ft) | | | 1114 | 1114 | | | | 769 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 190 | 190 | | | 190 | 300 | 300 | | 450 | | | 225 |
| Storage Blk Time (%) | | | | | | 0 | 1 | | | | | 0 |
| Queuing Penalty (veh) | | | | | | 0 | 1 | | | | | 1 |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | SB | SB | SB | B44 |
|---|---|---|---|---|
| Directions Served | L | T | R | T |
| Maximum Queue (ft) | 273 | 390 | 54 | 13 |
| Average Queue (ft) | 97 | 219 | 18 | 0 |
| 95th Queue (ft) | 196 | 357 | 43 | 9 |
| Link Distance (ft) | | 469 | | 450 |
| Upstream Blk Time (%) | 0 | 0 | | |
| Queuing Penalty (veh) | 0 | 2 | | |
| Storage Bay Dist (ft) | 325 | | 325 | |
| Storage Blk Time (%) | | 2 | | |
| Queuing Penalty (veh) | | 3 | | |

## Intersection: 10: Johnathan Carver Pkwy & US 212 WB Ramps

| Movement | WB | WB | WB | NB | NB | NB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | LT | R | L | T | T | T | T | T | R |
| Maximum Queue (ft) | 349 | 530 | 350 | 155 | 293 | 290 | 152 | 475 | 534 | 200 |
| Average Queue (ft) | 314 | 358 | 125 | 74 | 184 | 168 | 16 | 236 | 265 | 168 |
| 95th Queue (ft) | 383 | 477 | 339 | 133 | 272 | 257 | 85 | 508 | 566 | 248 |
| Link Distance (ft) | | 1104 | | 360 | 360 | 360 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | 0 | 0 | |
| Queuing Penalty (veh) | | | | | | | | 0 | 0 | |
| Storage Bay Dist (ft) | 275 | | 275 | | | | 150 | | | 100 |
| Storage Blk Time (%) | 5 | 16 | | | | | | 26 | 46 | 22 |
| Queuing Penalty (veh) | 41 | 136 | | | | | | 58 | 242 | 49 |

## Intersection: 11: Johnathan Carver Pkwy & US 212 EB Ramps

| Movement | EB | EB | NB | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|
| Directions Served | LT | R | T | T | T | L | T | T |
| Maximum Queue (ft) | 393 | 243 | 48 | 164 | 161 | 70 | 216 | 232 |
| Average Queue (ft) | 215 | 72 | 11 | 58 | 43 | 26 | 89 | 81 |
| 95th Queue (ft) | 353 | 177 | 39 | 129 | 109 | 61 | 160 | 155 |
| Link Distance (ft) | 1077 | | | 2668 | 2668 | 360 | 360 | 360 |
| Upstream Blk Time (%) | | | | | | | | 0 |
| Queuing Penalty (veh) | | | | | | | | 0 |
| Storage Bay Dist (ft) | | 250 | 275 | | | | | |
| Storage Blk Time (%) | 9 | | | | | | | |
| Queuing Penalty (veh) | 9 | | | | | | | |

## Intersection: 12: Johnathan Carver Pkwy & Access A

| Movement | WB | B47 |
|---|---|---|
| Directions Served | LR | T |
| Maximum Queue (ft) | 47 | 33 |
| Average Queue (ft) | 16 | 1 |
| 95th Queue (ft) | 42 | 17 |
| Link Distance (ft) | 1061 | 855 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Intersection: 14: Johnathan Carver Pkwy & Access C

| Movement | WB | SB |
|---|---|---|
| Directions Served | LR | LT |
| Maximum Queue (ft) | 93 | 91 |
| Average Queue (ft) | 34 | 4 |
| 95th Queue (ft) | 73 | 49 |
| Link Distance (ft) | 639 | 2596 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Intersection: 15: Chaska Blvd & Access D

| Movement | EB | SB |
|---|---|---|
| Directions Served | LT | LR |
| Maximum Queue (ft) | 89 | 49 |
| Average Queue (ft) | 7 | 17 |
| 95th Queue (ft) | 44 | 41 |
| Link Distance (ft) | 769 | 506 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Zone Summary

Zone wide Queuing Penalty: 971

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | SB Access B | None | 108 | | 284 | | 224 | 813 | | 0.1329 | |
| 2 | EB Big Woods Drive | None | 424 | | 126 | | 266 | 1021 | | 0.4153 | |
| 3 | NB Access B | None | 18 | | 483 | | 67 | 582 | | 0.0309 | |
| 4 | WB Big Woods Dr | None | 438 | | 70 | | 431 | 1033 | | 0.4238 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | SB Access B | None | 5.61 | | 5.61 | 0.39 | | A | | A |
| 2 | EB Big Woods Drive | None | 8.36 | | 8.36 | 1.92 | | A | | A |
| 3 | NB Access B | None | 5.22 | | 5.22 | 0.07 | | A | | A |
| 4 | WB Big Woods Dr | None | 8.31 | | 8.31 | 1.95 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 988 | | 988 |
| Capacity | veh/hr | 3449 | | 3449 |
| Average Delay | sec/veh | 7.03 | | 7.03 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 1.93 | | 1.93 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | SB Access B | None | 458 | | 452 | | 321 | 907 | | 0.5050 | |
| 2 | EB Big Woods Drive | None | 364 | | 332 | | 578 | 811 | | 0.4489 | |
| 3 | NB Access B | None | 66 | | 671 | | 25 | 746 | | 0.0885 | |
| 4 | WB Big Woods Dr | None | 664 | | 109 | | 628 | 1050 | | 0.6326 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | SB Access B | None | 10.91 | | 10.91 | 2.77 | | B | | B |
| 2 | EB Big Woods Drive | None | 9.43 | | 9.43 | 1.87 | | A | | A |
| 3 | NB Access B | None | 5.84 | | 5.84 | 0.26 | | A | | A |
| 4 | WB Big Woods Dr | None | 12.10 | | 12.10 | 4.29 | | B | | B |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1552 | | 1552 |
| Capacity | veh/hr | 3514 | | 3514 |
| Average Delay | sec/veh | 9.88 | | 9.88 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 4.26 | | 4.26 |

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | NB CSAH 11 | None | 468 | | 350 | | 414 | 702 | | 0.6667 | |
| 2 | WB CSAH 44 | None | 267 | | 394 | | 424 | 825 | | 0.3236 | |
| 3 | SB CSAH 11 | None | 552 | | 173 | | 488 | 925 | | 0.5968 | |
| 4 | EB CSAH 44 | None | 103 | | 661 | | 64 | 680 | | 0.1514 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | NB CSAH 11 | None | 13.30 | | 13.30 | 4.19 | | B | | B |
| 2 | WB CSAH 44 | None | 8.20 | | 8.20 | 1.35 | | A | | A |
| 3 | SB CSAH 11 | None | 11.36 | | 11.36 | 3.85 | | B | | B |
| 4 | EB CSAH 44 | None | 6.98 | | 6.98 | 0.50 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1390 | | 1390 |
| Capacity | veh/hr | 3132 | | 3132 |
| Average Delay | sec/veh | 10.10 | | 10.10 |
| L.O.S. (Signal) | A – F | B | | B |
| L.O.S. (Unsig) | A – F | B | | B |
| Total Delay | veh.hrs | 3.90 | | 3.90 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | NB CSAH 11 | None | 621 | | 228 | | 656 | 860 | | 0.7218 | |
| 2 | WB CSAH 44 | None | 577 | | 486 | | 363 | 870 | | 0.6634 | |
| 3 | SB CSAH 11 | None | 625 | | 340 | | 723 | 778 | | 0.8037 | |
| 4 | EB CSAH 44 | None | 74 | | 810 | | 155 | 565 | | 0.1310 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | NB CSAH 11 | None | 14.56 | | 14.56 | 5.75 | | B | | B |
| 2 | WB CSAH 44 | None | 15.38 | | 15.38 | 6.02 | | C | | C |
| 3 | SB CSAH 11 | None | 17.63 | | 17.63 | 7.62 | | C | | C |
| 4 | EB CSAH 44 | None | 7.55 | | 7.55 | 0.40 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1897 | | 1897 |
| Capacity | veh/hr | 3073 | | 3073 |
| Average Delay | sec/veh | 14.56 | | 14.56 |
| L.O.S. (Signal) | A – F | B | | B |
| L.O.S. (Unsig) | A – F | B | | B |
| Total Delay | veh.hrs | 7.67 | | 7.67 |

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | US 212 Entrance Ramp | None | 0 | | 0 | | 602 | 0 | | 0.0000 | |
| 2 | EB CSAH 44 | None | 532 | | 0 | | 235 | 1756 | | 0.3030 | |
| 3 | WB CSAH 44 | None | 727 | | 110 | | 422 | 992 | | 0.7327 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | US 212 Entrance Ramp | None | 0.00 | | 0.00 | 0.00 | | A | | A |
| 2 | EB CSAH 44 | None | 5.64 | | 5.64 | 1.46 | | A | | A |
| 3 | WB CSAH 44 | None | 14.75 | | 14.75 | 7.23 | | B | | B |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1259 | | 1259 |
| Capacity | veh/hr | 2748 | | 2748 |
| Average Delay | sec/veh | 9.90 | | 9.90 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 3.46 | | 3.46 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | US 212 Entrance Ramp | None | 0 | | 0 | | 568 | 0 | | 0.0000 | |
| 2 | EB CSAH 44 | None | 945 | | 0 | | 385 | 1892 | | 0.4995 | |
| 3 | WB CSAH 44 | None | 614 | | 339 | | 606 | 951 | | 0.6459 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | US 212 Entrance Ramp | None | 0.00 | | 0.00 | 0.00 | | A | | A |
| 2 | EB CSAH 44 | None | 8.71 | | 8.71 | 4.34 | | A | | A |
| 3 | WB CSAH 44 | None | 13.66 | | 13.66 | 5.66 | | B | | B |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1559 | | 1559 |
| Capacity | veh/hr | 2843 | | 2843 |
| Average Delay | sec/veh | 9.66 | | 9.66 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 4.18 | | 4.18 |

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | EB CSAH 44 | None | 439 | | 0 | | 445 | 1167 | | 0.3761 | |
| 2 | NB US 212 EXIT | Free | 203 | 100 | 439 | 0 | 0 | 880 | 1264 | 0.2306 | 0.0791 |
| 3 | WB CSAH 44 | None | 235 | | 210 | | 532 | 974 | | 0.2413 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | EB CSAH 44 | None | 7.58 | | 7.58 | 1.78 | | A | | A |
| 2 | NB US 212 EXIT | Free | 7.04 | 0.79 | 4.98 | 0.87 | 0.00 | A | A | A |
| 3 | WB CSAH 44 | None | 6.60 | | 6.60 | 0.90 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 877 | 100 | 977 |
| Capacity | veh/hr | 3021 | 1264 | 4285 |
| Average Delay | sec/veh | 6.19 | 0.40 | 5.60 |
| L.O.S. (Signal) | A – F | A | A | A |
| L.O.S. (Unsig) | A – F | A | A | A |
| Total Delay | veh.hrs | 1.51 | 0.01 | 1.52 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | EB CSAH 44 | None | 630 | | 0 | | 665 | 1004 | | 0.6277 | |
| 2 | NB US 212 EXIT | Free | 278 | 318 | 630 | 0 | 0 | 772 | 1261 | 0.3599 | 0.2521 |
| 3 | WB CSAH 44 | None | 385 | | 280 | | 946 | 1018 | | 0.3783 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | EB CSAH 44 | None | 11.35 | | 11.35 | 4.25 | | B | | B |
| 2 | NB US 212 EXIT | Free | 9.77 | 2.26 | 5.76 | 1.80 | 0.00 | A | A | A |
| 3 | WB CSAH 44 | None | 8.31 | | 8.31 | 1.85 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1293 | 318 | 1611 |
| Capacity | veh/hr | 2794 | 1261 | 4055 |
| Average Delay | sec/veh | 9.10 | 1.26 | 7.55 |
| L.O.S. (Signal) | A – F | A | A | A |
| L.O.S. (Unsig) | A – F | A | A | A |
| Total Delay | veh.hrs | 3.27 | 0.11 | 3.38 |

## 1: US 212 EB Ramps & Engler Blvd Performance by movement

| Movement | EBL | EBT | WBT | WBR | NBL | NBT | NBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.3 | 3.4 | 0.6 | 0.5 | 3.8 | 0.4 |
| Total Del/Veh (s) | 19.8 | 8.2 | 46.6 | 34.8 | 62.4 | 66.8 | 9.0 | 23.0 |

## 2: US 212 WB Ramps & Engler Blvd Performance by movement

| Movement | EBT | EBR | WBL | WBT | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.5 | 0.0 | 0.0 | 0.0 | 3.3 | 1.4 | 0.6 |
| Total Del/Veh (s) | 44.1 | 15.9 | 163.3 | 6.1 | 125.0 | 16.2 | 37.0 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.4 | 0.8 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.1 | 22.4 | 16.2 | 24.4 |
| Total Del/Veh (s) | 40.7 | 43.2 | 16.7 | 155.6 | 7.9 | 2.5 | 77.6 | 94.8 | 51.7 | 101.6 | 83.0 | 47.1 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 3.7 |
| Total Del/Veh (s) | 49.3 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 2.2 | 0.5 | 2.3 | 0.2 | 0.0 | 0.2 | 0.1 | 0.0 | 0.1 | 3.2 | 0.8 | 3.1 |
| Total Del/Veh (s) | 19.5 | 19.8 | 7.5 | 29.4 | 15.2 | 7.3 | 24.3 | 33.3 | 14.9 | 36.0 | 29.4 | 6.1 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.9 |
| Total Del/Veh (s) | 20.7 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 3.6 | 0.2 | 1.2 | 0.2 | 0.1 | 0.0 | 0.1 | 0.1 | 0.2 | 0.0 | 0.1 | 0.0 |
| Total Del/Veh (s) | 21.6 | 41.1 | 6.8 | 30.8 | 13.9 | 4.0 | 14.6 | 20.9 | 16.4 | 14.4 | 10.0 | 1.8 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.2 |
| Total Del/Veh (s) | 18.1 |

## 10: Johnathan Carver Pkwy & US 212 WB Ramps Performance by movement

| Movement | WBL | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.8 | 3.5 | 0.0 | 0.0 | 0.0 | 0.1 | 0.3 |
| Total Del/Veh (s) | 31.9 | 11.9 | 40.0 | 10.1 | 13.4 | 6.2 | 15.5 |

## 11: Johnathan Carver Pkwy & US 212 EB Ramps Performance by movement

| Movement | EBL | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.7 | 3.2 | 0.5 | 0.5 | 0.0 | 0.0 | 0.5 |
| Total Del/Veh (s) | 30.8 | 10.5 | 32.2 | 26.6 | 12.2 | 5.5 | 23.4 |

## 12: Johnathan Carver Pkwy & Access A Performance by movement

| Movement | WBR | NBT | NBR | SBT | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.1 | 0.0 | 0.1 | 0.1 | 0.1 |
| Total Del/Veh (s) | 3.5 | 2.4 | 1.6 | 0.8 | 1.6 |

## 14: Johnathan Carver Pkwy & Access C Performance by movement

| Movement | WBL | WBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.1 | 0.1 | 0.1 | 0.2 | 0.1 | 0.0 | 0.1 |
| Total Del/Veh (s) | 13.0 | 5.7 | 2.2 | 0.6 | 5.5 | 2.9 | 2.6 |

## 15: Chaska Blvd & Access D Performance by movement

| Movement | EBL | EBT | WBT | WBR | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.1 | 0.3 | 0.4 | 0.1 | 0.1 | 0.2 |
| Total Del/Veh (s) | 3.5 | 1.8 | 1.0 | 0.4 | 16.6 | 3.6 | 1.6 |

## Total Zone Performance

| | |
|---|---|
| Denied Del/Veh (s) | 2.6 |
| Total Del/Veh (s) | 1109.9 |

## Intersection: 1: US 212 EB Ramps & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | T | T | T | R | LT | R |
| Maximum Queue (ft) | 359 | 374 | 363 | 319 | 255 | 210 | 188 | 199 | 83 |
| Average Queue (ft) | 176 | 216 | 143 | 70 | 145 | 103 | 93 | 85 | 42 |
| 95th Queue (ft) | 327 | 382 | 351 | 211 | 224 | 187 | 163 | 160 | 72 |
| Link Distance (ft) | | 669 | 669 | 669 | 1120 | 1120 | | 745 | |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | 300 | | | | | | 330 | | 210 |
| Storage Blk Time (%) | 1 | 4 | | | | | | 0 | |
| Queuing Penalty (veh) | 8 | 29 | | | | | | 1 | |

## Intersection: 2: US 212 WB Ramps & Engler Blvd

| Movement | EB | EB | EB | WB | SB | SB | SB |
|---|---|---|---|---|---|---|---|
| Directions Served | T | T | R | L | L | TR | R |
| Maximum Queue (ft) | 895 | 896 | 475 | 163 | 127 | 214 | 192 |
| Average Queue (ft) | 468 | 440 | 58 | 85 | 52 | 123 | 72 |
| 95th Queue (ft) | 960 | 917 | 305 | 158 | 113 | 204 | 158 |
| Link Distance (ft) | 909 | 909 | | | | 775 | |
| Upstream Blk Time (%) | 1 | 1 | | | | | |
| Queuing Penalty (veh) | 13 | 9 | | | | | |
| Storage Bay Dist (ft) | | | 275 | 225 | 225 | | 225 |
| Storage Blk Time (%) | | 23 | | | | 0 | 0 |
| Queuing Penalty (veh) | | 11 | | | | 1 | 0 |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | WB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | L | T | T | R | L | T | R |
| Maximum Queue (ft) | 321 | 857 | 868 | 390 | 268 | 283 | 257 | 234 | 50 | 32 | 61 | 157 |
| Average Queue (ft) | 29 | 414 | 391 | 67 | 155 | 142 | 62 | 53 | 13 | 7 | 10 | 52 |
| 95th Queue (ft) | 166 | 832 | 808 | 286 | 271 | 294 | 210 | 160 | 35 | 25 | 39 | 125 |
| Link Distance (ft) | | 1228 | 1228 | | | | 909 | 909 | | | 1277 | 1277 |
| Upstream Blk Time (%) | | 0 | 0 | | | | | | | | | |
| Queuing Penalty (veh) | | 1 | 1 | | | | | | | | | |
| Storage Bay Dist (ft) | 210 | | | 210 | 250 | 250 | | | 150 | 240 | | |
| Storage Blk Time (%) | | 29 | 26 | 0 | 6 | 4 | | 0 | | | | |
| Queuing Penalty (veh) | | 6 | 15 | 0 | 19 | 14 | | 0 | | | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | SB | SB | SB |
|---|---|---|---|
| Directions Served | L | L | TR |
| Maximum Queue (ft) | 190 | 583 | 425 |
| Average Queue (ft) | 168 | 308 | 60 |
| 95th Queue (ft) | 215 | 613 | 240 |
| Link Distance (ft) | | 547 | |
| Upstream Blk Time (%) | | 14 | |
| Queuing Penalty (veh) | | 0 | |
| Storage Bay Dist (ft) | 100 | | 400 |
| Storage Blk Time (%) | 56 | 47 | 0 |
| Queuing Penalty (veh) | 159 | 134 | 0 |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | T | T | R | L | L | T | T |
| Maximum Queue (ft) | 118 | 294 | 265 | 119 | 89 | 187 | 182 | 136 | 102 | 132 | 148 | 151 |
| Average Queue (ft) | 29 | 182 | 140 | 52 | 14 | 72 | 68 | 30 | 47 | 67 | 74 | 77 |
| 95th Queue (ft) | 84 | 269 | 233 | 96 | 53 | 149 | 145 | 82 | 90 | 113 | 129 | 131 |
| Link Distance (ft) | | 1391 | 1391 | | | 4206 | 4206 | | | | 855 | 855 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 225 | | | 225 | 225 | | | 225 | 225 | 225 | | |
| Storage Blk Time (%) | | 2 | 0 | | | 0 | | | | | | |
| Queuing Penalty (veh) | | 1 | 1 | | | 0 | | | | | | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | NB | SB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|
| Directions Served | R | L | L | T | T | R |
| Maximum Queue (ft) | 79 | 194 | 240 | 172 | 136 | 91 |
| Average Queue (ft) | 20 | 92 | 143 | 86 | 23 | 33 |
| 95th Queue (ft) | 53 | 182 | 210 | 146 | 80 | 75 |
| Link Distance (ft) | | | | 1144 | 1144 | |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | 225 | 275 | 275 | | | 275 |
| Storage Blk Time (%) | | | 0 | | | |
| Queuing Penalty (veh) | | | 0 | | | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB | NB | NB | SB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | R | R | L | L | TR | L | T | T | R | L |
| Maximum Queue (ft) | 24 | 53 | 62 | 43 | 230 | 277 | 101 | 89 | 312 | 326 | 345 | 100 |
| Average Queue (ft) | 3 | 9 | 18 | 9 | 76 | 126 | 28 | 23 | 134 | 71 | 125 | 42 |
| 95th Queue (ft) | 14 | 35 | 43 | 32 | 165 | 216 | 67 | 55 | 262 | 217 | 259 | 86 |
| Link Distance (ft) | | 1114 | 1114 | | | | 769 | | 1037 | 1037 | | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 190 | | | 190 | 300 | 300 | | 450 | | | 225 | 325 |
| Storage Blk Time (%) | | | | | | 0 | | | 0 | 0 | 2 | |
| Queuing Penalty (veh) | | | | | | 0 | | | 0 | 2 | 5 | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | SB | SB |
|---|---|---|
| Directions Served | T | R |
| Maximum Queue (ft) | 174 | 42 |
| Average Queue (ft) | 80 | 6 |
| 95th Queue (ft) | 156 | 28 |
| Link Distance (ft) | 449 | |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | 325 |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Intersection: 10: Johnathan Carver Pkwy & US 212 WB Ramps

| Movement | WB | WB | WB | NB | NB | NB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | LT | R | L | T | T | T | T | T | R |
| Maximum Queue (ft) | 197 | 243 | 94 | 201 | 196 | 222 | 54 | 141 | 128 | 114 |
| Average Queue (ft) | 93 | 144 | 35 | 93 | 105 | 121 | 10 | 61 | 52 | 43 |
| 95th Queue (ft) | 181 | 212 | 75 | 162 | 169 | 190 | 36 | 115 | 101 | 84 |
| Link Distance (ft) | | 1104 | | 360 | 360 | 360 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |
| Storage Bay Dist (ft) | 275 | | 275 | | | | 150 | | | 100 |
| Storage Blk Time (%) | | 0 | | | | | | 0 | 1 | 0 |
| Queuing Penalty (veh) | | 0 | | | | | | 0 | 1 | 0 |

## Intersection: 11: Johnathan Carver Pkwy & US 212 EB Ramps

| Movement | EB | EB | NB | NB | NB | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | LT | R | T | T | T | R | R | L | T | T |
| Maximum Queue (ft) | 355 | 235 | 254 | 533 | 1025 | 651 | 461 | 89 | 118 | 124 |
| Average Queue (ft) | 211 | 48 | 56 | 129 | 194 | 179 | 91 | 34 | 47 | 50 |
| 95th Queue (ft) | 319 | 134 | 170 | 338 | 611 | 472 | 332 | 72 | 98 | 94 |
| Link Distance (ft) | 1077 | | | 2636 | 2636 | 2636 | | 360 | 360 | 360 |
| Upstream Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |
| Storage Bay Dist (ft) | | 250 | 275 | | | | 450 | | | |
| Storage Blk Time (%) | 5 | | 1 | 3 | | 0 | | | | |
| Queuing Penalty (veh) | 5 | | 1 | 8 | | 1 | | | | |

## Intersection: 12: Johnathan Carver Pkwy & Access A

| Movement | WB | B47 | B47 |
|---|---|---|---|
| Directions Served | LR | T | |
| Maximum Queue (ft) | 45 | 23 | 27 |
| Average Queue (ft) | 6 | 1 | 1 |
| 95th Queue (ft) | 28 | 12 | 14 |
| Link Distance (ft) | 1061 | 855 | 855 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 14: Johnathan Carver Pkwy & Access C

| Movement | WB | B44 | B44 | SB |
|---|---|---|---|---|
| Directions Served | LR | T | | LT |
| Maximum Queue (ft) | 74 | 27 | 30 | 96 |
| Average Queue (ft) | 20 | 1 | 2 | 10 |
| 95th Queue (ft) | 59 | 15 | 19 | 55 |
| Link Distance (ft) | 639 | 449 | 449 | 2596 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (ft) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

## Intersection: 15: Chaska Blvd & Access D

| Movement | EB | SB |
|---|---|---|
| Directions Served | LT | LR |
| Maximum Queue (ft) | 108 | 39 |
| Average Queue (ft) | 12 | 8 |
| 95th Queue (ft) | 58 | 28 |
| Link Distance (ft) | 769 | 506 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Zone Summary

Zone wide Queuing Penalty: 447

## 1: US 212 EB Ramps & Engler Blvd Performance by movement

| Movement | EBL | EBT | WBT | WBR | NBL | NBT | NBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.2 | 3.3 | 0.3 | 0.8 | 4.0 | 0.3 |
| Total Del/Veh (s) | 27.8 | 5.7 | 16.8 | 7.7 | 35.7 | 70.9 | 8.1 | 17.2 |

## 2: US 212 WB Ramps & Engler Blvd Performance by movement

| Movement | EBT | EBR | WBL | WBT | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.3 | 0.0 | 0.0 | 0.0 | 205.7 | 206.1 | 104.5 |
| Total Del/Veh (s) | 61.5 | 6.6 | 25.1 | 9.1 | 35.4 | 38.7 | 41.3 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.3 | 0.3 | 0.7 | 1.9 | 0.1 | 0.5 | 2.3 | 3.5 | 3.8 |
| Total Del/Veh (s) | 43.8 | 34.0 | 6.9 | 43.9 | 38.6 | 15.8 | 23.0 | 27.5 | 15.3 | 26.3 | 35.5 | 16.6 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.5 |
| Total Del/Veh (s) | 32.2 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 3.0 | 0.3 | 2.8 | 2.2 | 0.0 | 0.0 | 0.2 | 0.0 | 0.2 | 3.3 | 0.6 | 3.3 |
| Total Del/Veh (s) | 25.5 | 13.9 | 5.7 | 30.9 | 23.7 | 15.9 | 26.9 | 24.8 | 5.0 | 28.7 | 38.9 | 14.5 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.6 |
| Total Del/Veh (s) | 21.7 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 3.6 | 0.3 | 1.8 | 0.1 | 0.1 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 39.5 | 49.0 | 14.0 | 43.7 | 38.8 | 15.3 | 28.4 | 11.6 | 8.8 | 58.0 | 26.1 | 3.1 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.3 |
| Total Del/Veh (s) | 26.2 |

## 10: Johnathan Carver Pkwy & US 212 WB Ramps Performance by movement

| Movement | WBL | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 19.7 | 19.9 | 0.0 | 0.0 | 0.1 | 0.2 | 8.6 |
| Total Del/Veh (s) | 45.1 | 30.7 | 59.5 | 25.6 | 48.2 | 21.0 | 37.8 |

## 11: Johnathan Carver Pkwy & US 212 EB Ramps Performance by movement

| Movement | EBL | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.6 | 3.4 | 0.3 | 0.2 | 0.0 | 0.0 | 0.2 |
| Total Del/Veh (s) | 52.6 | 30.5 | 7.2 | 6.2 | 10.6 | 5.9 | 10.3 |

## 12: Johnathan Carver Pkwy Performance by movement

| Movement | WBR | NBT | NBR | SBT | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.1 | 0.0 | 0.2 | 0.0 | 0.0 |
| Total Del/Veh (s) | 5.4 | 3.0 | 1.9 | 0.9 | 2.1 |

## 14: Johnathan Carver Pkwy & Access C Performance by movement

| Movement | WBL | WBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.1 | 0.1 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 |
| Total Del/Veh (s) | 17.5 | 6.4 | 1.5 | 0.4 | 7.9 | 4.1 | 3.3 |

## 15: Chaska Blvd & Access D Performance by movement

| Movement | EBL | EBT | WBT | WBR | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.5 | 0.5 | 0.1 | 0.1 | 0.3 |
| Total Del/Veh (s) | 8.5 | 2.4 | 1.4 | 0.7 | 20.4 | 6.9 | 2.2 |

## Total Zone Performance

| | |
|---|---|
| Denied Del/Veh (s) | 47.4 |
| Total Del/Veh (s) | 1312.6 |

## Intersection: 1: US 212 EB Ramps & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | T | T | T | R | LT | R |
| Maximum Queue (ft) | 169 | 194 | 89 | 96 | 181 | 139 | 60 | 102 | 76 |
| Average Queue (ft) | 91 | 121 | 20 | 19 | 94 | 57 | 22 | 43 | 31 |
| 95th Queue (ft) | 144 | 176 | 57 | 63 | 160 | 111 | 48 | 87 | 60 |
| Link Distance (ft) | | 669 | 669 | 669 | 1124 | 1124 | | 745 | |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | 300 | | | | | | 330 | | 210 |
| Storage Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |

## Intersection: 2: US 212 WB Ramps & Engler Blvd

| Movement | EB | EB | EB | WB | WB | WB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | T | T | R | L | T | T | L | TR | R |
| Maximum Queue (ft) | 741 | 626 | 132 | 107 | 79 | 99 | 353 | 574 | 360 |
| Average Queue (ft) | 457 | 290 | 24 | 40 | 27 | 43 | 76 | 324 | 282 |
| 95th Queue (ft) | 826 | 600 | 117 | 83 | 68 | 83 | 209 | 459 | 384 |
| Link Distance (ft) | 909 | 909 | | | 669 | 669 | | 775 | |
| Upstream Blk Time (%) | 1 | 0 | | | | | | 0 | |
| Queuing Penalty (veh) | 4 | 0 | | | | | | 0 | |
| Storage Bay Dist (ft) | | | 275 | 225 | | | 225 | | 225 |
| Storage Blk Time (%) | | 11 | | | | | | 27 | 5 |
| Queuing Penalty (veh) | | 6 | | | | | | 270 | 52 |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | WB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | L | T | T | R | L | T | R |
| Maximum Queue (ft) | 139 | 345 | 310 | 117 | 114 | 420 | 639 | 653 | 300 | 77 | 63 | 165 |
| Average Queue (ft) | 46 | 179 | 151 | 33 | 71 | 76 | 323 | 335 | 145 | 29 | 12 | 78 |
| 95th Queue (ft) | 160 | 395 | 360 | 160 | 110 | 302 | 600 | 619 | 347 | 61 | 46 | 140 |
| Link Distance (ft) | | 1228 | 1228 | | | | 909 | 909 | | | 1277 | 1277 |
| Upstream Blk Time (%) | | | | | | | 0 | 0 | | | | |
| Queuing Penalty (veh) | | | | | | | 1 | 2 | | | | |
| Storage Bay Dist (ft) | 210 | | | 210 | 250 | 250 | | | 150 | 240 | | |
| Storage Blk Time (%) | | 10 | 7 | | | | 17 | 31 | 0 | | | |
| Queuing Penalty (veh) | | 5 | 3 | | | | 31 | 119 | 2 | | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | SB | SB | SB |
|---|---|---|---|
| Directions Served | L | L | TR |
| Maximum Queue (ft) | 140 | 139 | 78 |
| Average Queue (ft) | 54 | 53 | 23 |
| 95th Queue (ft) | 105 | 106 | 59 |
| Link Distance (ft) | | 547 | |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | 100 | | 400 |
| Storage Blk Time (%) | 1 | 2 | |
| Queuing Penalty (veh) | 2 | 3 | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | T | T | R | L | L | T | T |
| Maximum Queue (ft) | 45 | 171 | 121 | 139 | 82 | 309 | 320 | 237 | 163 | 169 | 124 | 154 |
| Average Queue (ft) | 13 | 97 | 52 | 49 | 17 | 143 | 136 | 63 | 82 | 98 | 66 | 75 |
| 95th Queue (ft) | 38 | 157 | 104 | 99 | 57 | 260 | 250 | 156 | 132 | 155 | 117 | 125 |
| Link Distance (ft) | | 1391 | 1391 | | | 4206 | 4206 | | | | 855 | 855 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 225 | | | 225 | 175 | | | 175 | 225 | 225 | | |
| Storage Blk Time (%) | | | | | | 5 | 3 | 0 | | | | |
| Queuing Penalty (veh) | | | | | | 1 | 13 | 0 | | | | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | NB | SB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|
| Directions Served | R | L | L | T | T | R |
| Maximum Queue (ft) | 54 | 126 | 189 | 288 | 236 | 82 |
| Average Queue (ft) | 11 | 41 | 75 | 152 | 79 | 23 |
| 95th Queue (ft) | 38 | 91 | 143 | 252 | 194 | 63 |
| Link Distance (ft) | | | | 1144 | 1144 | |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | 225 | 275 | 275 | | | 275 |
| Storage Blk Time (%) | | | | 1 | 0 | |
| Queuing Penalty (veh) | | | | 1 | 0 | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | EB | EB | EB | EB | EB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | R | R | L | L | TR | L | T | T | R |
| Maximum Queue (ft) | 132 | 66 | 101 | 82 | 74 | 308 | 359 | 149 | 186 | 118 | 52 | 137 |
| Average Queue (ft) | 52 | 24 | 44 | 40 | 32 | 165 | 215 | 55 | 81 | 31 | 5 | 29 |
| 95th Queue (ft) | 102 | 64 | 88 | 73 | 60 | 280 | 330 | 112 | 156 | 81 | 29 | 86 |
| Link Distance (ft) | | | 1114 | 1114 | | | | 769 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 190 | 190 | | | 190 | 300 | 300 | | 450 | | | 225 |
| Storage Blk Time (%) | 0 | | | | | 0 | 2 | | | | | |
| Queuing Penalty (veh) | 0 | | | | | 0 | 2 | | | | | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | SB | SB | SB | B44 |
|---|---|---|---|---|
| Directions Served | L | T | R | T |
| Maximum Queue (ft) | 281 | 412 | 59 | 14 |
| Average Queue (ft) | 110 | 217 | 21 | 1 |
| 95th Queue (ft) | 220 | 361 | 46 | 10 |
| Link Distance (ft) | | 469 | | 450 |
| Upstream Blk Time (%) | 0 | 0 | | |
| Queuing Penalty (veh) | 0 | 3 | | |
| Storage Bay Dist (ft) | 325 | | 325 | |
| Storage Blk Time (%) | 0 | 2 | | |
| Queuing Penalty (veh) | 1 | 3 | | |

## Intersection: 10: Johnathan Carver Pkwy & US 212 WB Ramps

| Movement | WB | WB | WB | NB | NB | NB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | LT | R | L | T | T | T | T | T | R |
| Maximum Queue (ft) | 349 | 607 | 350 | 196 | 311 | 295 | 89 | 399 | 427 | 200 |
| Average Queue (ft) | 315 | 370 | 104 | 78 | 178 | 160 | 10 | 207 | 198 | 146 |
| 95th Queue (ft) | 388 | 499 | 299 | 151 | 274 | 250 | 48 | 334 | 345 | 238 |
| Link Distance (ft) | | 1104 | | 360 | 360 | 360 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | 0 | 0 | | | | |
| Queuing Penalty (veh) | | | | | 0 | 0 | | | | |
| Storage Bay Dist (ft) | 275 | | 275 | | | | 150 | | | 100 |
| Storage Blk Time (%) | 4 | 17 | | | | | | 25 | 39 | 19 |
| Queuing Penalty (veh) | 33 | 150 | | | | | | 56 | 206 | 42 |

## Intersection: 11: Johnathan Carver Pkwy & US 212 EB Ramps

| Movement | EB | EB | NB | NB | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | LT | R | T | T | T | R | L | T | T |
| Maximum Queue (ft) | 383 | 287 | 102 | 135 | 126 | 32 | 60 | 240 | 242 |
| Average Queue (ft) | 212 | 65 | 13 | 55 | 44 | 2 | 26 | 84 | 84 |
| 95th Queue (ft) | 337 | 162 | 53 | 111 | 102 | 17 | 53 | 159 | 157 |
| Link Distance (ft) | 1077 | | | 2668 | 2668 | 2668 | 360 | 360 | 360 |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | | 250 | 275 | | | | | | |
| Storage Blk Time (%) | 7 | | | | | | | | |
| Queuing Penalty (veh) | 7 | | | | | | | | |

## Intersection: 12: Johnathan Carver Pkwy

| Movement | WB | B47 | B47 |
|---|---|---|---|
| Directions Served | LR | T | |
| Maximum Queue (ft) | 55 | 106 | 95 |
| Average Queue (ft) | 17 | 5 | 6 |
| 95th Queue (ft) | 44 | 41 | 41 |
| Link Distance (ft) | 1061 | 855 | 855 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 14: Johnathan Carver Pkwy & Access C

| Movement | WB | B44 | B44 | SB |
|---|---|---|---|---|
| Directions Served | LR | T | | LT |
| Maximum Queue (ft) | 79 | 8 | 11 | 95 |
| Average Queue (ft) | 35 | 0 | 0 | 7 |
| 95th Queue (ft) | 66 | 6 | 8 | 43 |
| Link Distance (ft) | 639 | 469 | 469 | 2596 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (ft) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

## Intersection: 15: Chaska Blvd & Access D

| Movement | EB | SB |
|---|---|---|
| Directions Served | LT | LR |
| Maximum Queue (ft) | 152 | 72 |
| Average Queue (ft) | 17 | 19 |
| 95th Queue (ft) | 91 | 52 |
| Link Distance (ft) | 769 | 506 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Zone Summary

Zone wide Queuing Penalty: 1019

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | US 212 Entrance Ramp | None | 0 | | 0 | | 569 | 0 | | 0.0000 | |
| 2 | EB CSAH 44 | None | 499 | | 0 | | 235 | 1756 | | 0.2842 | |
| 3 | WB CSAH 44 | None | 727 | | 77 | | 422 | 1009 | | 0.7205 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | US 212 Entrance Ramp | None | 0.00 | | 0.00 | 0.00 | | A | | A |
| 2 | EB CSAH 44 | None | 5.28 | | 5.28 | 1.25 | | A | | A |
| 3 | WB CSAH 44 | None | 14.16 | | 14.16 | 6.78 | | B | | B |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1226 | | 1226 |
| Capacity | veh/hr | 2765 | | 2765 |
| Average Delay | sec/veh | 9.55 | | 9.55 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 3.25 | | 3.25 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | US 212 Entrance Ramp | None | 0 | | 0 | | 423 | 0 | | 0.0000 | |
| 2 | EB CSAH 44 | None | 800 | | 0 | | 385 | 1892 | | 0.4228 | |
| 3 | WB CSAH 44 | None | 614 | | 194 | | 606 | 1028 | | 0.5975 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | US 212 Entrance Ramp | None | 0.00 | | 0.00 | 0.00 | | A | | A |
| 2 | EB CSAH 44 | None | 6.97 | | 6.97 | 2.72 | | A | | A |
| 3 | WB CSAH 44 | None | 11.71 | | 11.71 | 4.45 | | B | | B |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1414 | | 1414 |
| Capacity | veh/hr | 2920 | | 2920 |
| Average Delay | sec/veh | 8.03 | | 8.03 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 3.15 | | 3.15 |

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | EB CSAH 44 | None | 404 | | 0 | | 367 | 1102 | | 0.3668 | |
| 2 | NB US 212 EXIT | Free | 125 | 100 | 404 | 0 | 0 | 843 | 1229 | 0.1483 | 0.0814 |
| 3 | WB CSAH 44 | None | 235 | | 132 | | 497 | 1012 | | 0.2323 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | EB CSAH 44 | None | 7.47 | | 7.47 | 1.63 | | A | | A |
| 2 | NB US 212 EXIT | Free | 5.97 | 0.82 | 3.68 | 0.49 | 0.00 | A | A | A |
| 3 | WB CSAH 44 | None | 6.35 | | 6.35 | 0.85 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 764 | 100 | 864 |
| Capacity | veh/hr | 2956 | 1229 | 4185 |
| Average Delay | sec/veh | 5.92 | 0.41 | 5.28 |
| L.O.S. (Signal) | A – F | A | A | A |
| L.O.S. (Unsig) | A – F | A | A | A |
| Total Delay | veh.hrs | 1.26 | 0.01 | 1.27 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | EB CSAH 44 | None | 486 | | 0 | | 551 | 1102 | | 0.4412 | |
| 2 | NB US 212 EXIT | Free | 164 | 318 | 486 | 0 | 0 | 803 | 1229 | 0.2043 | 0.2588 |
| 3 | WB CSAH 44 | None | 385 | | 166 | | 802 | 994 | | 0.3874 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | EB CSAH 44 | None | 8.40 | | 8.40 | 2.23 | | A | | A |
| 2 | NB US 212 EXIT | Free | 6.99 | 2.29 | 3.89 | 0.72 | 0.00 | A | A | A |
| 3 | WB CSAH 44 | None | 8.15 | | 8.15 | 1.78 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1035 | 318 | 1353 |
| Capacity | veh/hr | 2898 | 1229 | 4127 |
| Average Delay | sec/veh | 7.09 | 1.29 | 5.73 |
| L.O.S. (Signal) | A – F | A | A | A |
| L.O.S. (Unsig) | A – F | A | A | A |
| Total Delay | veh.hrs | 2.04 | 0.11 | 2.15 |

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | SB Access B | None | 69 | | 284 | | 119 | 813 | | 0.0849 | |
| 2 | EB Big Woods Drive | None | 398 | | 91 | | 262 | 1041 | | 0.3825 | |
| 3 | NB Access B | None | 18 | | 422 | | 67 | 605 | | 0.0298 | |
| 4 | WB Big Woods Dr | None | 359 | | 44 | | 396 | 1047 | | 0.3430 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | SB Access B | None | 4.96 | | 4.96 | 0.24 | | A | | A |
| 2 | EB Big Woods Drive | None | 7.85 | | 7.85 | 1.67 | | A | | A |
| 3 | NB Access B | None | 5.02 | | 5.02 | 0.07 | | A | | A |
| 4 | WB Big Woods Dr | None | 7.28 | | 7.28 | 1.39 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 844 | | 844 |
| Capacity | veh/hr | 3505 | | 3505 |
| Average Delay | sec/veh | 6.38 | | 6.38 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 1.50 | | 1.50 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | SB Access B | None | 290 | | 452 | | 170 | 907 | | 0.3198 | |
| 2 | EB Big Woods Drive | None | 327 | | 188 | | 554 | 875 | | 0.3737 | |
| 3 | NB Access B | None | 66 | | 490 | | 25 | 842 | | 0.0784 | |
| 4 | WB Big Woods Dr | None | 550 | | 72 | | 484 | 1071 | | 0.5137 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | SB Access B | None | 8.09 | | 8.09 | 1.28 | | A | | A |
| 2 | EB Big Woods Drive | None | 8.04 | | 8.04 | 1.39 | | A | | A |
| 3 | NB Access B | None | 5.14 | | 5.14 | 0.23 | | A | | A |
| 4 | WB Big Woods Dr | None | 9.64 | | 9.64 | 2.70 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1233 | | 1233 |
| Capacity | veh/hr | 3694 | | 3694 |
| Average Delay | sec/veh | 7.64 | | 7.64 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 2.62 | | 2.62 |

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | NB CSAH 11 | None | 468 | | 325 | | 414 | 690 | | 0.6784 | |
| 2 | WB CSAH 44 | None | 262 | | 395 | | 398 | 869 | | 0.3016 | |
| 3 | SB CSAH 11 | None | 526 | | 173 | | 484 | 927 | | 0.5675 | |
| 4 | EB CSAH 44 | None | 104 | | 635 | | 64 | 721 | | 0.1443 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | NB CSAH 11 | None | 13.31 | | 13.31 | 4.17 | | B | | B |
| 2 | WB CSAH 44 | None | 7.91 | | 7.91 | 1.27 | | A | | A |
| 3 | SB CSAH 11 | None | 10.79 | | 10.79 | 3.42 | | B | | B |
| 4 | EB CSAH 44 | None | 6.68 | | 6.68 | 0.48 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1360 | | 1360 |
| Capacity | veh/hr | 3206 | | 3206 |
| Average Delay | sec/veh | 9.81 | | 9.81 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 3.71 | | 3.71 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | NB CSAH 11 | None | 621 | | 191 | | 655 | 879 | | 0.7063 | |
| 2 | WB CSAH 44 | None | 553 | | 486 | | 326 | 870 | | 0.6357 | |
| 3 | SB CSAH 11 | None | 588 | | 340 | | 698 | 778 | | 0.7561 | |
| 4 | EB CSAH 44 | None | 74 | | 772 | | 155 | 583 | | 0.1268 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | NB CSAH 11 | None | 13.89 | | 13.89 | 5.37 | | B | | B |
| 2 | WB CSAH 44 | None | 14.46 | | 14.46 | 5.30 | | B | | B |
| 3 | SB CSAH 11 | None | 15.85 | | 15.85 | 6.20 | | C | | C |
| 4 | EB CSAH 44 | None | 7.28 | | 7.28 | 0.39 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1836 | | 1836 |
| Capacity | veh/hr | 3110 | | 3110 |
| Average Delay | sec/veh | 13.44 | | 13.44 |
| L.O.S. (Signal) | A – F | B | | B |
| L.O.S. (Unsig) | A – F | B | | B |
| Total Delay | veh.hrs | 6.85 | | 6.85 |

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | SB Chaska Creek Blvd | None | 130 | | 7 | | 75 | 930 | | 0.1398 | |
| 2 | EB Creek Road | None | 17 | | 127 | | 10 | 1002 | | 0.0170 | |
| 3 | NB Chaska Creek Blvd | None | 39 | | 40 | | 104 | 737 | | 0.0529 | |
| 4 | WB Creek Dr | None | 36 | | 46 | | 33 | 1032 | | 0.0349 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | SB Chaska Creek Blvd | None | 5.15 | | 5.15 | 0.40 | | A | | A |
| 2 | EB Creek Road | None | 3.58 | | 3.58 | 0.05 | | A | | A |
| 3 | NB Chaska Creek Blvd | None | 4.45 | | 4.45 | 0.13 | | A | | A |
| 4 | WB Creek Dr | None | 3.68 | | 3.68 | 0.10 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 222 | | 222 |
| Capacity | veh/hr | 3700 | | 3700 |
| Average Delay | sec/veh | 4.18 | | 4.18 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 0.26 | | 0.26 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | SB Chaska Creek Blvd | None | 221 | | 7 | | 210 | 1096 | | 0.2016 | |
| 2 | EB Creek Road | None | 22 | | 216 | | 12 | 981 | | 0.0224 | |
| 3 | NB Chaska Creek Blvd | None | 169 | | 88 | | 150 | 1054 | | 0.1603 | |
| 4 | WB Creek Dr | None | 41 | | 176 | | 81 | 1008 | | 0.0407 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | SB Chaska Creek Blvd | None | 5.80 | | 5.80 | 0.66 | | A | | A |
| 2 | EB Creek Road | None | 3.77 | | 3.77 | 0.06 | | A | | A |
| 3 | NB Chaska Creek Blvd | None | 5.38 | | 5.38 | 0.50 | | A | | A |
| 4 | WB Creek Dr | None | 3.91 | | 3.91 | 0.11 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 453 | | 453 |
| Capacity | veh/hr | 4139 | | 4139 |
| Average Delay | sec/veh | 4.56 | | 4.56 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 0.57 | | 0.57 |

# Appendix K:

# Turn Lane Warrant Analysis

## 1: US 212 EB Ramps & Engler Blvd Performance by movement

| Movement | EBL | EBT | WBT | WBR | NBL | NBT | NBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.3 | 3.3 | 0.7 | 0.1 | 3.7 | 0.5 |
| Total Del/Veh (s) | 22.9 | 5.9 | 47.8 | 30.9 | 60.4 | 27.0 | 9.8 | 23.9 |

## 2: US 212 WB Ramps & Engler Blvd Performance by movement

| Movement | EBT | EBR | WBL | WBT | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 3.2 | 1.4 | 0.3 |
| Total Del/Veh (s) | 38.5 | 15.4 | 170.8 | 7.1 | 126.7 | 14.3 | 34.5 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.3 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.6 | 10.6 | 10.6 |
| Total Del/Veh (s) | 49.5 | 50.7 | 18.2 | 110.4 | 8.3 | 2.9 | 61.1 | 84.6 | 48.0 | 87.3 | 71.7 | 30.9 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 1.5 |
| Total Del/Veh (s) | 46.8 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 2.2 | 0.5 | 2.2 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 3.3 | 0.8 | 3.2 |
| Total Del/Veh (s) | 21.9 | 20.1 | 7.8 | 33.9 | 16.8 | 7.7 | 26.3 | 31.9 | 14.1 | 38.3 | 30.3 | 7.0 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

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

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 4.5 | 0.1 | 1.4 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 21.8 | 37.8 | 6.6 | 28.8 | 14.2 | 4.0 | 15.1 | 20.2 | 16.3 | 13.8 | 10.8 | 1.6 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.1 |
| Total Del/Veh (s) | 17.5 |

## 10: Johnathan Carver Pkwy & US 212 WB Ramps Performance by movement

| Movement | WBL | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.8 | 3.5 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 |
| Total Del/Veh (s) | 31.5 | 13.1 | 36.6 | 9.8 | 13.0 | 6.5 | 15.0 |

## 11: Johnathan Carver Pkwy & US 212 EB Ramps Performance by movement

| Movement | EBL | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.8 | 3.1 | 0.4 | 0.5 | 0.0 | 0.0 | 0.5 |
| Total Del/Veh (s) | 33.1 | 12.1 | 20.4 | 31.4 | 13.1 | 6.3 | 24.0 |

## 12: Johnathan Carver Pkwy & Access A Performance by movement

| Movement | WBR | NBT | NBR | SBT | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 4.6 | 2.8 | 1.5 | 0.9 | 1.8 |

## 14: Johnathan Carver Pkwy & Access C 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) | 17.0 | 6.7 | 2.3 | 0.6 | 5.2 | 3.4 | 3.0 |

## 15: Chaska Blvd & Access D Performance by movement

| Movement | EBL | EBT | WBT | WBR | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.3 | 0.5 | 0.1 | 0.1 | 0.1 |
| Total Del/Veh (s) | 4.2 | 2.2 | 1.1 | 0.8 | 20.9 | 6.5 | 1.9 |

## Total Zone Performance

| | |
|---|---|
| Denied Del/Veh (s) | 1.5 |
| Total Del/Veh (s) | 1170.1 |

## Intersection: 1: US 212 EB Ramps & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | T | T | T | R | LT | R |
| Maximum Queue (ft) | 418 | 420 | 371 | 202 | 278 | 246 | 211 | 167 | 101 |
| Average Queue (ft) | 229 | 232 | 96 | 32 | 147 | 114 | 80 | 73 | 48 |
| 95th Queue (ft) | 404 | 408 | 303 | 106 | 230 | 203 | 159 | 142 | 85 |
| Link Distance (ft) | | 669 | 669 | 669 | 1120 | 1120 | | 745 | |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | 300 | | | | | | 330 | | 210 |
| Storage Blk Time (%) | 3 | 6 | | | | | | 0 | |
| Queuing Penalty (veh) | 27 | 44 | | | | | | 0 | |

## Intersection: 2: US 212 WB Ramps & Engler Blvd

| Movement | EB | EB | EB | WB | WB | WB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | T | T | R | L | T | T | L | TR | R |
| Maximum Queue (ft) | 855 | 824 | 390 | 233 | 154 | 23 | 136 | 212 | 175 |
| Average Queue (ft) | 409 | 369 | 36 | 108 | 9 | 1 | 53 | 101 | 56 |
| 95th Queue (ft) | 882 | 865 | 226 | 213 | 70 | 17 | 110 | 175 | 122 |
| Link Distance (ft) | 909 | 909 | | | 669 | 669 | | 775 | |
| Upstream Blk Time (%) | 1 | 0 | | | | | | | |
| Queuing Penalty (veh) | 7 | 5 | | | | | | | |
| Storage Bay Dist (ft) | | | 275 | 225 | | | 225 | | 225 |
| Storage Blk Time (%) | | 17 | | 4 | 0 | | | 0 | 0 |
| Queuing Penalty (veh) | | 8 | | 7 | 0 | | | 1 | 0 |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | EB | EB | EB | EB | B19 | B19 | WB | WB | WB | WB | WB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | T | T | L | L | T | T | R | L |
| Maximum Queue (ft) | 326 | 790 | 790 | 390 | 147 | 146 | 166 | 171 | 201 | 168 | 41 | 16 |
| Average Queue (ft) | 27 | 470 | 441 | 51 | 22 | 22 | 83 | 62 | 64 | 54 | 12 | 1 |
| 95th Queue (ft) | 146 | 915 | 894 | 251 | 205 | 205 | 143 | 142 | 153 | 126 | 33 | 7 |
| Link Distance (ft) | | 1228 | 1228 | | 4206 | 4206 | | | 909 | 909 | | |
| Upstream Blk Time (%) | | 3 | 3 | | | | | | | | | |
| Queuing Penalty (veh) | | 27 | 24 | | | | | | | | | |
| Storage Bay Dist (ft) | 210 | | | 210 | | | 250 | 250 | | | 150 | 240 |
| Storage Blk Time (%) | | 34 | 26 | | | | | | 0 | 0 | | |
| Queuing Penalty (veh) | | 7 | 9 | | | | | | 0 | 0 | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|
| Directions Served | T | R | L | L | TR |
| Maximum Queue (ft) | 70 | 105 | 190 | 562 | 423 |
| Average Queue (ft) | 11 | 28 | 156 | 282 | 56 |
| 95th Queue (ft) | 40 | 82 | 216 | 565 | 222 |
| Link Distance (ft) | 1277 | 1277 | | 547 | |
| Upstream Blk Time (%) | | | | 8 | |
| Queuing Penalty (veh) | | | | 0 | |
| Storage Bay Dist (ft) | | | 100 | | 400 |
| Storage Blk Time (%) | | | 43 | 42 | 0 |
| Queuing Penalty (veh) | | | 123 | 120 | 0 |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | T | T | R | L | L | T | T |
| Maximum Queue (ft) | 130 | 305 | 285 | 149 | 32 | 198 | 184 | 78 | 130 | 130 | 143 | 157 |
| Average Queue (ft) | 30 | 180 | 145 | 50 | 7 | 74 | 75 | 23 | 57 | 69 | 72 | 78 |
| 95th Queue (ft) | 87 | 271 | 243 | 108 | 24 | 156 | 161 | 60 | 104 | 113 | 124 | 137 |
| Link Distance (ft) | | 1391 | 1391 | | | 4206 | 4206 | | | | 855 | 855 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 225 | | | 225 | 225 | | | 225 | 225 | 225 | | |
| Storage Blk Time (%) | | 2 | 1 | | | 0 | 0 | | | | | |
| Queuing Penalty (veh) | | 1 | 3 | | | 0 | 0 | | | | | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | NB | SB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|
| Directions Served | R | L | L | T | T | R |
| Maximum Queue (ft) | 56 | 233 | 256 | 185 | 160 | 98 |
| Average Queue (ft) | 15 | 99 | 147 | 97 | 27 | 34 |
| 95th Queue (ft) | 42 | 200 | 223 | 162 | 99 | 79 |
| Link Distance (ft) | | | | 1144 | 1144 | |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | 225 | 275 | 275 | | | 275 |
| Storage Blk Time (%) | | 0 | 1 | | | |
| Queuing Penalty (veh) | | 0 | 1 | | | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB | NB | NB | SB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | R | R | L | L | TR | L | T | T | R | L |
| Maximum Queue (ft) | 28 | 44 | 53 | 50 | 185 | 220 | 101 | 82 | 302 | 342 | 320 | 99 |
| Average Queue (ft) | 4 | 8 | 18 | 10 | 71 | 115 | 28 | 24 | 131 | 38 | 120 | 39 |
| 95th Queue (ft) | 19 | 31 | 42 | 35 | 145 | 192 | 65 | 59 | 259 | 185 | 251 | 79 |
| Link Distance (ft) | | 1114 | 1114 | | | | 769 | | 1037 | 1037 | | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 190 | | | 190 | 300 | 300 | | 450 | | | 225 | 325 |
| Storage Blk Time (%) | | | | | | 0 | | | | 0 | 2 | |
| Queuing Penalty (veh) | | | | | | 0 | | | | 0 | 6 | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | SB | SB |
|---|---|---|
| Directions Served | T | R |
| Maximum Queue (ft) | 234 | 60 |
| Average Queue (ft) | 89 | 9 |
| 95th Queue (ft) | 179 | 35 |
| Link Distance (ft) | 449 | |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | 325 |
| Storage Blk Time (%) | 0 | |
| Queuing Penalty (veh) | 0 | |

## Intersection: 10: Johnathan Carver Pkwy & US 212 WB Ramps

| Movement | WB | WB | WB | NB | NB | NB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | LT | R | L | T | T | T | T | T | R |
| Maximum Queue (ft) | 202 | 246 | 85 | 160 | 194 | 225 | 45 | 136 | 129 | 106 |
| Average Queue (ft) | 98 | 153 | 31 | 84 | 106 | 123 | 8 | 59 | 54 | 45 |
| 95th Queue (ft) | 183 | 225 | 66 | 145 | 168 | 196 | 29 | 109 | 108 | 85 |
| Link Distance (ft) | | 1104 | | 360 | 360 | 360 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |
| Storage Bay Dist (ft) | 275 | | 275 | | | | 150 | | | 100 |
| Storage Blk Time (%) | | 0 | | | | | | 0 | 1 | 0 |
| Queuing Penalty (veh) | | 0 | | | | | | 0 | 2 | 0 |

## Intersection: 11: Johnathan Carver Pkwy & US 212 EB Ramps

| Movement | EB | EB | NB | NB | NB | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | LT | R | T | T | T | R | R | L | T | T |
| Maximum Queue (ft) | 434 | 322 | 116 | 224 | 519 | 858 | 362 | 107 | 140 | 160 |
| Average Queue (ft) | 243 | 62 | 34 | 84 | 123 | 66 | 19 | 41 | 53 | 60 |
| 95th Queue (ft) | 384 | 182 | 89 | 170 | 349 | 428 | 158 | 84 | 104 | 116 |
| Link Distance (ft) | 1077 | | | 2636 | 2636 | 2636 | | 360 | 360 | 360 |
| Upstream Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |
| Storage Bay Dist (ft) | | 250 | 275 | | | | 450 | | | |
| Storage Blk Time (%) | 10 | | | | | 0 | | | | |
| Queuing Penalty (veh) | 10 | | | | | 1 | | | | |

## Intersection: 12: Johnathan Carver Pkwy & Access A

| Movement | WB |
|---|---|
| Directions Served | LR |
| Maximum Queue (ft) | 36 |
| Average Queue (ft) | 8 |
| 95th Queue (ft) | 29 |
| Link Distance (ft) | 1061 |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (ft) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

## Intersection: 14: Johnathan Carver Pkwy & Access C

| Movement | WB | NB | SB |
|---|---|---|---|
| Directions Served | LR | TR | LT |
| Maximum Queue (ft) | 84 | 4 | 118 |
| Average Queue (ft) | 26 | 0 | 16 |
| 95th Queue (ft) | 68 | 3 | 63 |
| Link Distance (ft) | 639 | 470 | 2596 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 15: Chaska Blvd & Access D

| Movement | EB | SB |
|---|---|---|
| Directions Served | LT | LR |
| Maximum Queue (ft) | 104 | 60 |
| Average Queue (ft) | 21 | 10 |
| 95th Queue (ft) | 70 | 38 |
| Link Distance (ft) | 769 | 506 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Zone Summary

Zone wide Queuing Penalty: 433

## 1: US 212 EB Ramps & Engler Blvd Performance by movement

| Movement | EBL | EBT | WBT | WBR | NBL | NBT | NBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.2 | 3.3 | 0.4 | 0.4 | 3.9 | 0.4 |
| Total Del/Veh (s) | 25.6 | 5.9 | 17.0 | 6.2 | 36.7 | 34.0 | 7.8 | 15.9 |

## 2: US 212 WB Ramps & Engler Blvd Performance by movement

| Movement | EBT | EBR | WBL | WBT | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 102.5 | 109.7 | 56.7 |
| Total Del/Veh (s) | 40.1 | 6.1 | 24.7 | 9.2 | 34.7 | 36.3 | 32.7 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 2.9 | 0.2 | 0.1 | 2.0 | 3.9 | 3.8 |
| Total Del/Veh (s) | 41.3 | 14.6 | 1.9 | 49.2 | 32.6 | 16.6 | 27.1 | 43.6 | 9.3 | 26.9 | 35.8 | 17.6 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.3 |
| Total Del/Veh (s) | 25.6 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 2.7 | 0.3 | 2.8 | 0.3 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 3.3 | 0.6 | 3.2 |
| Total Del/Veh (s) | 27.9 | 13.7 | 6.4 | 23.5 | 24.1 | 17.6 | 27.4 | 25.2 | 5.8 | 28.4 | 41.0 | 16.3 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.6 |
| Total Del/Veh (s) | 22.5 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 3.6 | 0.4 | 1.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 35.1 | 48.0 | 15.3 | 41.6 | 37.9 | 15.8 | 35.5 | 16.4 | 10.0 | 51.1 | 31.8 | 3.7 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.3 |
| Total Del/Veh (s) | 27.5 |

## 10: Johnathan Carver Pkwy & US 212 WB Ramps Performance by movement

| Movement | WBL | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 15.3 | 14.8 | 0.0 | 0.0 | 0.0 | 0.0 | 6.3 |
| Total Del/Veh (s) | 44.0 | 30.2 | 63.1 | 28.2 | 59.1 | 33.7 | 41.6 |

## 11: Johnathan Carver Pkwy & US 212 EB Ramps Performance by movement

| Movement | EBL | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.6 | 3.5 | 0.3 | 0.2 | 0.0 | 0.0 | 0.2 |
| Total Del/Veh (s) | 59.5 | 34.9 | 8.5 | 6.3 | 11.9 | 6.7 | 12.2 |

## 12: Johnathan Carver Pkwy & Access A Performance by movement

| Movement | WBR | NBT | NBR | SBT | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 5.9 | 4.1 | 2.6 | 1.0 | 2.7 |

## 14: Johnathan Carver Pkwy & Access C Performance by movement

| Movement | WBL | WBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.2 | 0.2 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s) | 36.1 | 21.0 | 1.7 | 0.5 | 12.0 | 5.9 | 5.5 |

## 15: Chaska Blvd & Access D Performance by movement

| Movement | EBL | EBT | WBT | WBR | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.5 | 0.7 | 0.1 | 0.1 | 0.3 |
| Total Del/Veh (s) | 8.4 | 2.6 | 1.6 | 0.8 | 17.7 | 6.3 | 2.5 |

## Total Zone Performance

| | |
|---|---|
| Denied Del/Veh (s) | 25.2 |
| Total Del/Veh (s) | 1318.7 |

## Intersection: 1: US 212 EB Ramps & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | T | T | T | R | LT | R |
| Maximum Queue (ft) | 156 | 191 | 85 | 112 | 183 | 155 | 55 | 111 | 78 |
| Average Queue (ft) | 73 | 102 | 26 | 22 | 90 | 59 | 17 | 43 | 36 |
| 95th Queue (ft) | 124 | 163 | 66 | 69 | 158 | 125 | 43 | 86 | 62 |
| Link Distance (ft) | | 669 | 669 | 669 | 1124 | 1124 | | 745 | |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | 300 | | | | | | 330 | | 210 |
| Storage Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |

## Intersection: 2: US 212 WB Ramps & Engler Blvd

| Movement | EB | EB | EB | WB | WB | WB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | T | T | R | L | T | T | L | TR | R |
| Maximum Queue (ft) | 502 | 376 | 137 | 109 | 98 | 121 | 306 | 559 | 360 |
| Average Queue (ft) | 258 | 171 | 22 | 49 | 20 | 47 | 76 | 295 | 261 |
| 95th Queue (ft) | 482 | 331 | 114 | 93 | 64 | 98 | 193 | 432 | 355 |
| Link Distance (ft) | 909 | 909 | | | 669 | 669 | | 775 | |
| Upstream Blk Time (%) | | | | | | | | 0 | |
| Queuing Penalty (veh) | | | | | | | | 0 | |
| Storage Bay Dist (ft) | | | 275 | 225 | | | 225 | | 225 |
| Storage Blk Time (%) | | 4 | | | | | | 19 | 9 |
| Queuing Penalty (veh) | | 2 | | | | | | 178 | 84 |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | WB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | L | T | T | R | L | T | R |
| Maximum Queue (ft) | 90 | 215 | 180 | 27 | 74 | 315 | 589 | 617 | 300 | 73 | 53 | 104 |
| Average Queue (ft) | 34 | 103 | 81 | 3 | 39 | 34 | 279 | 295 | 131 | 22 | 12 | 34 |
| 95th Queue (ft) | 73 | 184 | 154 | 17 | 69 | 224 | 584 | 602 | 330 | 54 | 36 | 74 |
| Link Distance (ft) | | 1228 | 1228 | | | | 909 | 909 | | | 1277 | 1277 |
| Upstream Blk Time (%) | | | | | | | 0 | | | | | |
| Queuing Penalty (veh) | | | | | | | 0 | | | | | |
| Storage Bay Dist (ft) | 210 | | | 210 | 250 | 250 | | | 150 | 240 | | |
| Storage Blk Time (%) | | 0 | 0 | | | | 10 | 24 | 0 | | | |
| Queuing Penalty (veh) | | 0 | 0 | | | | 7 | 95 | 1 | | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | SB | SB | SB |
|---|---|---|---|
| Directions Served | L | L | TR |
| Maximum Queue (ft) | 117 | 143 | 82 |
| Average Queue (ft) | 47 | 62 | 23 |
| 95th Queue (ft) | 96 | 115 | 60 |
| Link Distance (ft) | | 547 | |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | 100 | | 400 |
| Storage Blk Time (%) | 1 | 2 | |
| Queuing Penalty (veh) | 1 | 4 | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | T | T | R | L | L | T | T |
| Maximum Queue (ft) | 52 | 166 | 145 | 183 | 77 | 348 | 373 | 249 | 152 | 159 | 140 | 159 |
| Average Queue (ft) | 17 | 90 | 51 | 57 | 11 | 151 | 151 | 75 | 87 | 95 | 77 | 85 |
| 95th Queue (ft) | 43 | 150 | 113 | 124 | 50 | 284 | 291 | 197 | 134 | 142 | 130 | 140 |
| Link Distance (ft) | | 1391 | 1391 | | | 4206 | 4206 | | | | 855 | 855 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 225 | | | 225 | 175 | | | 175 | 225 | 225 | | |
| Storage Blk Time (%) | | | | 0 | | 6 | 5 | 0 | | | | |
| Queuing Penalty (veh) | | | | 0 | | 1 | 20 | 0 | | | | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | NB | SB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|
| Directions Served | R | L | L | T | T | R |
| Maximum Queue (ft) | 28 | 96 | 212 | 324 | 271 | 69 |
| Average Queue (ft) | 8 | 38 | 70 | 156 | 88 | 20 |
| 95th Queue (ft) | 27 | 74 | 135 | 258 | 211 | 53 |
| Link Distance (ft) | | | | 1144 | 1144 | |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | 225 | 275 | 275 | | | 275 |
| Storage Blk Time (%) | | | | 1 | 0 | |
| Queuing Penalty (veh) | | | | 2 | 0 | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | EB | EB | EB | EB | EB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | R | R | L | L | TR | L | T | T | R |
| Maximum Queue (ft) | 96 | 63 | 100 | 102 | 85 | 311 | 341 | 208 | 234 | 178 | 90 | 145 |
| Average Queue (ft) | 48 | 19 | 37 | 46 | 35 | 148 | 206 | 68 | 85 | 56 | 8 | 38 |
| 95th Queue (ft) | 83 | 60 | 79 | 82 | 63 | 266 | 310 | 149 | 174 | 135 | 41 | 101 |
| Link Distance (ft) | | | 1114 | 1114 | | | | 769 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 190 | 190 | | | 190 | 300 | 300 | | 450 | | | 225 |
| Storage Blk Time (%) | | | | | | 0 | 2 | | | | | |
| Queuing Penalty (veh) | | | | | | 0 | 2 | | | | | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | SB | SB | SB | B44 |
|---|---|---|---|---|
| Directions Served | L | T | R | T |
| Maximum Queue (ft) | 331 | 446 | 139 | 25 |
| Average Queue (ft) | 119 | 268 | 28 | 2 |
| 95th Queue (ft) | 252 | 445 | 139 | 28 |
| Link Distance (ft) | | 469 | | 450 |
| Upstream Blk Time (%) | 0 | 1 | 0 | |
| Queuing Penalty (veh) | 0 | 9 | 0 | |
| Storage Bay Dist (ft) | 325 | | 325 | |
| Storage Blk Time (%) | | 7 | | |
| Queuing Penalty (veh) | | 13 | | |

## Intersection: 10: Johnathan Carver Pkwy & US 212 WB Ramps

| Movement | WB | WB | WB | NB | NB | NB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | LT | R | L | T | T | T | T | T | R |
| Maximum Queue (ft) | 350 | 720 | 347 | 141 | 317 | 300 | 214 | 481 | 602 | 200 |
| Average Queue (ft) | 304 | 358 | 100 | 81 | 197 | 181 | 32 | 247 | 292 | 177 |
| 95th Queue (ft) | 382 | 526 | 282 | 133 | 288 | 280 | 126 | 438 | 536 | 244 |
| Link Distance (ft) | | 1104 | | 360 | 360 | 360 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | 0 | 0 | | | | |
| Queuing Penalty (veh) | | | | | 0 | 0 | | | | |
| Storage Bay Dist (ft) | 275 | | 275 | | | | 150 | | | 100 |
| Storage Blk Time (%) | 5 | 15 | | | | | 0 | 33 | 49 | 32 |
| Queuing Penalty (veh) | 41 | 131 | | | | | 0 | 78 | 284 | 76 |

## Intersection: 11: Johnathan Carver Pkwy & US 212 EB Ramps

| Movement | EB | EB | NB | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|
| Directions Served | LT | R | T | T | T | L | T | T |
| Maximum Queue (ft) | 435 | 295 | 58 | 154 | 137 | 119 | 210 | 222 |
| Average Queue (ft) | 240 | 81 | 14 | 63 | 48 | 36 | 87 | 82 |
| 95th Queue (ft) | 385 | 205 | 42 | 128 | 105 | 79 | 153 | 158 |
| Link Distance (ft) | 1077 | | | 2668 | 2668 | 360 | 360 | 360 |
| Upstream Blk Time (%) | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | |
| Storage Bay Dist (ft) | | 250 | 275 | | | | | |
| Storage Blk Time (%) | 13 | | | | | | | |
| Queuing Penalty (veh) | 13 | | | | | | | |

## Intersection: 12: Johnathan Carver Pkwy & Access A

| Movement | WB | B47 |
|---|---|---|
| Directions Served | LR | T |
| Maximum Queue (ft) | 52 | 104 |
| Average Queue (ft) | 22 | 4 |
| 95th Queue (ft) | 48 | 52 |
| Link Distance (ft) | 1061 | 855 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Intersection: 14: Johnathan Carver Pkwy & Access C

| Movement | WB | NB | B44 | B44 | SB |
|---|---|---|---|---|---|
| Directions Served | LR | TR | T | | LT |
| Maximum Queue (ft) | 190 | 19 | 14 | 15 | 197 |
| Average Queue (ft) | 61 | 1 | 1 | 1 | 21 |
| 95th Queue (ft) | 141 | 11 | 11 | 11 | 111 |
| Link Distance (ft) | 639 | 450 | 469 | 469 | 2596 |
| Upstream Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |
| Storage Bay Dist (ft) | | | | | |
| Storage Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |

## Intersection: 15: Chaska Blvd & Access D

| Movement | EB | WB | SB |
|---|---|---|---|
| Directions Served | LT | TR | LR |
| Maximum Queue (ft) | 177 | 4 | 55 |
| Average Queue (ft) | 19 | 0 | 24 |
| 95th Queue (ft) | 91 | 3 | 47 |
| Link Distance (ft) | 769 | 1447 | 506 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Zone Summary

Zone wide Queuing Penalty: 1040

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | SB Access B | None | 162 | | 326 | | 333 | 793 | | 0.2042 | |
| 2 | EB Big Woods Drive | None | 467 | | 188 | | 300 | 987 | | 0.4731 | |
| 3 | NB Access B | None | 29 | | 555 | | 100 | 555 | | 0.0523 | |
| 4 | WB Big Woods Dr | None | 554 | | 105 | | 479 | 1015 | | 0.5457 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | SB Access B | None | 6.69 | | 6.69 | 0.64 | | A | | A |
| 2 | EB Big Woods Drive | None | 9.37 | | 9.37 | 2.43 | | A | | A |
| 3 | NB Access B | None | 5.75 | | 5.75 | 0.13 | | A | | A |
| 4 | WB Big Woods Dr | None | 10.22 | | 10.22 | 3.15 | | B | | B |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1212 | | 1212 |
| Capacity | veh/hr | 3350 | | 3350 |
| Average Delay | sec/veh | 8.33 | | 8.33 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 2.81 | | 2.81 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | SB Access B | None | 688 | | 480 | | 482 | 892 | | 0.7715 | |
| 2 | EB Big Woods Drive | None | 422 | | 498 | | 668 | 736 | | 0.5730 | |
| 3 | NB Access B | None | 100 | | 884 | | 36 | 633 | | 0.1580 | |
| 4 | WB Big Woods Dr | None | 797 | | 165 | | 819 | 1018 | | 0.7828 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | SB Access B | None | 19.88 | | 19.88 | 8.80 | | C | | C |
| 2 | EB Big Woods Drive | None | 12.18 | | 12.18 | 2.96 | | B | | B |
| 3 | NB Access B | None | 7.86 | | 7.86 | 0.51 | | A | | A |
| 4 | WB Big Woods Dr | None | 17.59 | | 17.59 | 8.38 | | C | | C |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 2007 | | 2007 |
| Capacity | veh/hr | 3280 | | 3280 |
| Average Delay | sec/veh | 15.76 | | 15.76 |
| L.O.S. (Signal) | A – F | B | | B |
| L.O.S. (Unsig) | A – F | C | | C |
| Total Delay | veh.hrs | 8.79 | | 8.79 |

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | NB CSAH 11 | None | 506 | | 366 | | 440 | 695 | | 0.7278 | |
| 2 | WB CSAH 44 | None | 299 | | 407 | | 465 | 818 | | 0.3656 | |
| 3 | SB CSAH 11 | None | 570 | | 196 | | 510 | 914 | | 0.6239 | |
| 4 | EB CSAH 44 | None | 104 | | 702 | | 64 | 660 | | 0.1576 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | NB CSAH 11 | None | 14.91 | | 14.91 | 5.31 | | B | | B |
| 2 | WB CSAH 44 | None | 8.79 | | 8.79 | 1.63 | | A | | A |
| 3 | SB CSAH 11 | None | 12.02 | | 12.02 | 4.30 | | B | | B |
| 4 | EB CSAH 44 | None | 7.24 | | 7.24 | 0.53 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1479 | | 1479 |
| Capacity | veh/hr | 3086 | | 3086 |
| Average Delay | sec/veh | 11.03 | | 11.03 |
| L.O.S. (Signal) | A – F | B | | B |
| L.O.S. (Unsig) | A – F | B | | B |
| Total Delay | veh.hrs | 4.53 | | 4.53 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | NB CSAH 11 | None | 681 | | 247 | | 724 | 851 | | 0.8003 | |
| 2 | WB CSAH 44 | None | 668 | | 507 | | 419 | 857 | | 0.7793 | |
| 3 | SB CSAH 11 | None | 645 | | 407 | | 767 | 749 | | 0.8616 | |
| 4 | EB CSAH 44 | None | 74 | | 896 | | 155 | 525 | | 0.1409 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | NB CSAH 11 | None | 17.57 | | 17.57 | 8.19 | | C | | C |
| 2 | WB CSAH 44 | None | 21.35 | | 21.35 | 11.12 | | C | | C |
| 3 | SB CSAH 11 | None | 21.10 | | 21.10 | 10.15 | | C | | C |
| 4 | EB CSAH 44 | None | 8.19 | | 8.19 | 0.44 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 2068 | | 2068 |
| Capacity | veh/hr | 2982 | | 2982 |
| Average Delay | sec/veh | 18.57 | | 18.57 |
| L.O.S. (Signal) | A – F | B | | B |
| L.O.S. (Unsig) | A – F | C | | C |
| Total Delay | veh.hrs | 10.67 | | 10.67 |

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | US 212 Entrance Ramp | None | 0 | | 0 | | 642 | 0 | | 0.0000 | |
| 2 | EB CSAH 44 | None | 579 | | 0 | | 254 | 1756 | | 0.3298 | |
| 3 | WB CSAH 44 | None | 746 | | 150 | | 429 | 972 | | 0.7677 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | US 212 Entrance Ramp | None | 0.00 | | 0.00 | 0.00 | | A | | A |
| 2 | EB CSAH 44 | None | 6.12 | | 6.12 | 1.76 | | A | | A |
| 3 | WB CSAH 44 | None | 16.34 | | 16.34 | 8.68 | | C | | C |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1325 | | 1325 |
| Capacity | veh/hr | 2727 | | 2727 |
| Average Delay | sec/veh | 10.88 | | 10.88 |
| L.O.S. (Signal) | A – F | B | | B |
| L.O.S. (Unsig) | A – F | B | | B |
| Total Delay | veh.hrs | 4.00 | | 4.00 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | US 212 Entrance Ramp | None | 0 | | 0 | | 727 | 0 | | 0.0000 | |
| 2 | EB CSAH 44 | None | 1134 | | 0 | | 405 | 1892 | | 0.5994 | |
| 3 | WB CSAH 44 | None | 634 | | 498 | | 636 | 866 | | 0.7319 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | US 212 Entrance Ramp | None | 0.00 | | 0.00 | 0.00 | | A | | A |
| 2 | EB CSAH 44 | None | 11.29 | | 11.29 | 7.33 | | B | | B |
| 3 | WB CSAH 44 | None | 18.11 | | 18.11 | 9.10 | | C | | C |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1768 | | 1768 |
| Capacity | veh/hr | 2758 | | 2758 |
| Average Delay | sec/veh | 12.73 | | 12.73 |
| L.O.S. (Signal) | A – F | B | | B |
| L.O.S. (Unsig) | A – F | B | | B |
| Total Delay | veh.hrs | 6.25 | | 6.25 |

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | EB CSAH 44 | None | 486 | | 0 | | 562 | 1102 | | 0.4412 | |
| 2 | NB US 212 EXIT | Free | 301 | 100 | 486 | 0 | 0 | 803 | 1229 | 0.3750 | 0.0814 |
| 3 | WB CSAH 44 | None | 254 | | 308 | | 579 | 920 | | 0.2762 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | EB CSAH 44 | None | 8.40 | | 8.40 | 2.23 | | A | | A |
| 2 | NB US 212 EXIT | Free | 9.03 | 0.82 | 6.98 | 1.70 | 0.00 | A | A | A |
| 3 | WB CSAH 44 | None | 7.24 | | 7.24 | 1.09 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1041 | 100 | 1141 |
| Capacity | veh/hr | 2824 | 1229 | 4053 |
| Average Delay | sec/veh | 7.30 | 0.41 | 6.70 |
| L.O.S. (Signal) | A – F | A | A | A |
| L.O.S. (Unsig) | A – F | A | A | A |
| Total Delay | veh.hrs | 2.11 | 0.01 | 2.12 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | EB CSAH 44 | None | 820 | | 0 | | 796 | 1102 | | 0.7444 | |
| 2 | NB US 212 EXIT | Free | 392 | 318 | 819 | 0 | 0 | 455 | 875 | 0.8616 | 0.3636 |
| 3 | WB CSAH 44 | None | 405 | | 392 | | 1135 | 876 | | 0.4625 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | EB CSAH 44 | None | 15.14 | | 15.14 | 8.35 | | C | | C |
| 2 | NB US 212 EXIT | Free | 42.42 | 2.82 | 24.68 | 19.23 | 0.00 | E | A | C |
| 3 | WB CSAH 44 | None | 9.97 | | 9.97 | 2.45 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1617 | 318 | 1935 |
| Capacity | veh/hr | 2432 | 875 | 3307 |
| Average Delay | sec/veh | 19.46 | 1.82 | 16.56 |
| L.O.S. (Signal) | A – F | B | A | B |
| L.O.S. (Unsig) | A – F | C | A | C |
| Total Delay | veh.hrs | 8.74 | 0.16 | 8.90 |

## 1: US 212 EB Ramps & Engler Blvd Performance by movement

| Movement | EBL | EBT | WBT | WBR | NBL | NBT | NBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.3 | 3.3 | 0.6 | 0.8 | 3.8 | 0.5 |
| Total Del/Veh (s) | 20.7 | 8.1 | 46.9 | 34.6 | 61.8 | 63.0 | 9.1 | 23.4 |

## 2: US 212 WB Ramps & Engler Blvd Performance by movement

| Movement | EBT | EBR | WBL | WBT | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 1.2 | 0.1 | 0.1 | 0.0 | 34.5 | 34.8 | 8.0 |
| Total Del/Veh (s) | 61.9 | 29.3 | 157.6 | 10.9 | 138.0 | 51.3 | 56.0 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 2.9 | 0.6 | 0.0 | 0.0 | 0.1 | 0.2 | 0.0 | 0.2 | 47.2 | 44.6 | 45.8 |
| Total Del/Veh (s) | 73.0 | 76.3 | 38.6 | 501.3 | 9.4 | 2.9 | 105.3 | 100.0 | 98.3 | 123.6 | 104.7 | 50.6 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 8.8 |
| Total Del/Veh (s) | 94.4 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 2.1 | 0.5 | 2.2 | 0.3 | 0.0 | 0.2 | 0.1 | 0.0 | 0.1 | 3.2 | 0.9 | 3.2 |
| Total Del/Veh (s) | 22.0 | 20.9 | 7.3 | 33.5 | 17.1 | 7.9 | 26.0 | 33.2 | 15.5 | 39.1 | 31.4 | 5.5 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.9 |
| Total Del/Veh (s) | 22.2 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 4.2 | 0.1 | 1.5 | 0.2 | 0.1 | 0.0 | 0.3 | 0.2 | 0.3 | 0.0 | 0.1 | 0.0 |
| Total Del/Veh (s) | 26.3 | 38.3 | 6.4 | 28.1 | 13.3 | 3.6 | 14.4 | 22.0 | 16.7 | 15.5 | 9.8 | 1.4 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.2 |
| Total Del/Veh (s) | 17.9 |

## 10: Johnathan Carver Pkwy & US 212 WB Ramps Performance by movement

| Movement | WBL | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.9 | 3.3 | 0.0 | 0.0 | 0.1 | 0.2 | 0.3 |
| Total Del/Veh (s) | 31.9 | 14.4 | 38.9 | 10.4 | 12.8 | 6.4 | 15.4 |

## 11: Johnathan Carver Pkwy & US 212 EB Ramps Performance by movement

| Movement | EBL | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.8 | 3.3 | 0.5 | 0.5 | 0.0 | 0.0 | 0.5 |
| Total Del/Veh (s) | 36.0 | 12.8 | 34.2 | 27.9 | 12.5 | 5.9 | 25.3 |

## 12: Johnathan Carver Pkwy & Access A Performance by movement

| Movement | WBR | NBT | NBR | SBT | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.1 | 0.0 | 0.0 | 0.1 | 0.1 |
| Total Del/Veh (s) | 4.5 | 2.7 | 1.6 | 0.8 | 1.7 |

## 14: Johnathan Carver Pkwy & Access C Performance by movement

| Movement | WBL | WBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.1 | 0.1 | 0.2 | 0.1 | 0.0 | 0.0 | 0.1 |
| Total Del/Veh (s) | 13.4 | 6.8 | 2.6 | 0.8 | 6.4 | 3.5 | 3.2 |

## 15: Chaska Blvd & Access D Performance by movement

| Movement | EBL | EBT | WBT | WBR | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.1 | 0.3 | 0.2 | 0.1 | 0.1 | 0.2 |
| Total Del/Veh (s) | 4.1 | 2.2 | 1.0 | 0.2 | 50.1 | 3.4 | 1.9 |

## Total Zone Performance

| | |
|---|---|
| Denied Del/Veh (s) | 7.3 |
| Total Del/Veh (s) | 1211.3 |

## Intersection: 1: US 212 EB Ramps & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | T | T | T | R | LT | R |
| Maximum Queue (ft) | 334 | 386 | 378 | 346 | 252 | 228 | 183 | 176 | 107 |
| Average Queue (ft) | 179 | 226 | 153 | 69 | 156 | 105 | 93 | 82 | 45 |
| 95th Queue (ft) | 315 | 389 | 373 | 232 | 239 | 204 | 164 | 153 | 80 |
| Link Distance (ft) | | 669 | 669 | 669 | 1120 | 1120 | | 745 | |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | 300 | | | | | | 330 | | 210 |
| Storage Blk Time (%) | 0 | 5 | | | | | | 0 | |
| Queuing Penalty (veh) | 4 | 40 | | | | | | 0 | |

## Intersection: 2: US 212 WB Ramps & Engler Blvd

| Movement | EB | EB | EB | WB | WB | WB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | T | T | R | L | T | T | L | TR | R |
| Maximum Queue (ft) | 923 | 920 | 475 | 198 | 123 | 111 | 253 | 600 | 308 |
| Average Queue (ft) | 657 | 617 | 149 | 86 | 20 | 9 | 58 | 250 | 130 |
| 95th Queue (ft) | 1120 | 1076 | 506 | 173 | 101 | 66 | 167 | 639 | 306 |
| Link Distance (ft) | 909 | 909 | | | 669 | 669 | | 775 | |
| Upstream Blk Time (%) | 4 | 3 | | | | | | 12 | |
| Queuing Penalty (veh) | 45 | 35 | | | | | | 0 | |
| Storage Bay Dist (ft) | | | 275 | 225 | | | 225 | | 225 |
| Storage Blk Time (%) | | 36 | | 0 | 0 | | | 20 | 1 |
| Queuing Penalty (veh) | | 18 | | 0 | 0 | | | 71 | 4 |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | EB | EB | EB | EB | B19 | B19 | WB | WB | WB | WB | WB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | T | T | L | L | T | T | R | L |
| Maximum Queue (ft) | 389 | 1306 | 1318 | 390 | 459 | 501 | 375 | 500 | 837 | 812 | 64 | 41 |
| Average Queue (ft) | 47 | 616 | 605 | 92 | 66 | 75 | 293 | 343 | 358 | 242 | 12 | 9 |
| 95th Queue (ft) | 237 | 1323 | 1319 | 350 | 340 | 378 | 443 | 592 | 992 | 794 | 39 | 30 |
| Link Distance (ft) | | 1228 | 1228 | | 4206 | 4206 | | | 909 | 909 | | |
| Upstream Blk Time (%) | | 12 | 11 | | | | | | 17 | 0 | | |
| Queuing Penalty (veh) | | 102 | 94 | | | | | | 86 | 1 | | |
| Storage Bay Dist (ft) | 210 | | | 210 | | | 250 | 250 | | | 150 | 240 |
| Storage Blk Time (%) | | 40 | 35 | | | | 62 | 56 | | 0 | | |
| Queuing Penalty (veh) | | 8 | 25 | | | | 194 | 176 | | 0 | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|
| Directions Served | T | R | L | L | TR |
| Maximum Queue (ft) | 98 | 262 | 190 | 577 | 425 |
| Average Queue (ft) | 10 | 103 | 172 | 362 | 90 |
| 95th Queue (ft) | 58 | 240 | 213 | 687 | 331 |
| Link Distance (ft) | 1277 | 1277 | | 547 | |
| Upstream Blk Time (%) | | | | 25 | |
| Queuing Penalty (veh) | | | | 0 | |
| Storage Bay Dist (ft) | | | 100 | | 400 |
| Storage Blk Time (%) | | | 61 | 56 | 0 |
| Queuing Penalty (veh) | | | 175 | 159 | 0 |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | T | T | R | L | L | T | T |
| Maximum Queue (ft) | 175 | 340 | 279 | 119 | 82 | 212 | 221 | 138 | 115 | 123 | 153 | 146 |
| Average Queue (ft) | 35 | 202 | 150 | 49 | 16 | 71 | 71 | 30 | 54 | 70 | 74 | 77 |
| 95th Queue (ft) | 100 | 305 | 250 | 91 | 53 | 153 | 160 | 88 | 98 | 111 | 130 | 133 |
| Link Distance (ft) | | 1391 | 1391 | | | 4206 | 4206 | | | | 855 | 855 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 225 | | | 225 | 225 | | | 225 | 225 | 225 | | |
| Storage Blk Time (%) | | 5 | 1 | | | 1 | 0 | | | | | |
| Queuing Penalty (veh) | | 2 | 3 | | | 0 | 1 | | | | | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | NB | SB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|
| Directions Served | R | L | L | T | T | R |
| Maximum Queue (ft) | 81 | 201 | 247 | 186 | 135 | 80 |
| Average Queue (ft) | 24 | 108 | 154 | 85 | 20 | 34 |
| 95th Queue (ft) | 63 | 200 | 233 | 146 | 80 | 70 |
| Link Distance (ft) | | | | 1144 | 1144 | |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | 225 | 275 | 275 | | | 275 |
| Storage Blk Time (%) | | | 0 | | | |
| Queuing Penalty (veh) | | | 0 | | | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | EB | EB | EB | EB | EB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | R | R | L | L | TR | L | T | T | R |
| Maximum Queue (ft) | 27 | 10 | 50 | 52 | 45 | 194 | 239 | 90 | 84 | 347 | 339 | 298 |
| Average Queue (ft) | 2 | 0 | 8 | 17 | 10 | 72 | 112 | 26 | 23 | 139 | 69 | 133 |
| 95th Queue (ft) | 15 | 7 | 33 | 46 | 34 | 149 | 191 | 61 | 53 | 272 | 222 | 257 |
| Link Distance (ft) | | | 1114 | 1114 | | | | 769 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 190 | 190 | | | 190 | 300 | 300 | | 450 | | | 225 |
| Storage Blk Time (%) | | | | | | | 0 | | | 0 | 1 | 1 |
| Queuing Penalty (veh) | | | | | | | 0 | | | 0 | 6 | 4 |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | SB | SB | SB |
|---|---|---|---|
| Directions Served | L | T | R |
| Maximum Queue (ft) | 113 | 216 | 48 |
| Average Queue (ft) | 42 | 83 | 7 |
| 95th Queue (ft) | 87 | 172 | 30 |
| Link Distance (ft) | | 449 | |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | 325 | | 325 |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 10: Johnathan Carver Pkwy & US 212 WB Ramps

| Movement | WB | WB | WB | NB | NB | NB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | LT | R | L | T | T | T | T | T | R |
| Maximum Queue (ft) | 216 | 248 | 100 | 203 | 174 | 258 | 62 | 133 | 128 | 114 |
| Average Queue (ft) | 95 | 148 | 40 | 87 | 107 | 127 | 13 | 55 | 53 | 46 |
| 95th Queue (ft) | 189 | 221 | 82 | 160 | 164 | 197 | 44 | 108 | 108 | 92 |
| Link Distance (ft) | | 1104 | | 360 | 360 | 360 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |
| Storage Bay Dist (ft) | 275 | | 275 | | | | 150 | | | 100 |
| Storage Blk Time (%) | | 0 | | | | | | 0 | 1 | 1 |
| Queuing Penalty (veh) | | 0 | | | | | | 0 | 2 | 1 |

## Intersection: 11: Johnathan Carver Pkwy & US 212 EB Ramps

| Movement | EB | EB | NB | NB | NB | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | LT | R | T | T | T | R | R | L | T | T |
| Maximum Queue (ft) | 543 | 325 | 259 | 534 | 943 | 692 | 440 | 94 | 128 | 151 |
| Average Queue (ft) | 255 | 66 | 64 | 145 | 249 | 212 | 87 | 41 | 50 | 58 |
| 95th Queue (ft) | 421 | 212 | 183 | 366 | 737 | 605 | 315 | 78 | 102 | 104 |
| Link Distance (ft) | 1077 | | | 2636 | 2636 | 2636 | | 360 | 360 | 360 |
| Upstream Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |
| Storage Bay Dist (ft) | | 250 | 275 | | | | 450 | | | |
| Storage Blk Time (%) | 11 | | 0 | 4 | | 0 | | | | |
| Queuing Penalty (veh) | 12 | | 0 | 10 | | 0 | | | | |

## Intersection: 12: Johnathan Carver Pkwy & Access A

| Movement | WB | B47 | B47 |
|---|---|---|---|
| Directions Served | LR | T | |
| Maximum Queue (ft) | 38 | 40 | 33 |
| Average Queue (ft) | 7 | 1 | 1 |
| 95th Queue (ft) | 28 | 12 | 17 |
| Link Distance (ft) | 1061 | 855 | 855 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 14: Johnathan Carver Pkwy & Access C

| Movement | WB | B44 | B44 | SB |
|---|---|---|---|---|
| Directions Served | LR | T | | LT |
| Maximum Queue (ft) | 82 | 354 | 48 | 132 |
| Average Queue (ft) | 25 | 6 | 2 | 16 |
| 95th Queue (ft) | 69 | 86 | 25 | 71 |
| Link Distance (ft) | 639 | 449 | 449 | 2596 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (ft) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

## Intersection: 15: Chaska Blvd & Access D

| Movement | EB | SB |
|---|---|---|
| Directions Served | LT | LR |
| Maximum Queue (ft) | 94 | 61 |
| Average Queue (ft) | 21 | 12 |
| 95th Queue (ft) | 68 | 39 |
| Link Distance (ft) | 769 | 506 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

## Zone Summary

Zone wide Queuing Penalty: 1277

## 1: US 212 EB Ramps & Engler Blvd Performance by movement

| Movement | EBL | EBT | WBT | WBR | NBL | NBT | NBR | All |
|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.2 | 3.2 | 0.5 | 0.2 | 3.9 | 0.4 |
| Total Del/Veh (s) | 28.7 | 6.3 | 17.0 | 7.5 | 35.2 | 33.4 | 8.0 | 17.7 |

## 2: US 212 WB Ramps & Engler Blvd Performance by movement

| Movement | EBT | EBR | WBL | WBT | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 2.0 | 0.0 | 0.0 | 0.0 | 243.8 | 243.8 | 124.3 |
| Total Del/Veh (s) | 94.0 | 10.1 | 26.0 | 8.8 | 36.8 | 38.7 | 52.8 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.3 | 1.5 | 0.1 | 0.7 | 2.3 | 3.7 | 3.7 |
| Total Del/Veh (s) | 87.9 | 92.3 | 36.0 | 45.0 | 33.2 | 13.3 | 24.5 | 37.9 | 25.2 | 27.3 | 33.1 | 15.4 |

## 3: Chaska Creek Blvd & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.4 |
| Total Del/Veh (s) | 43.1 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 2.8 | 0.3 | 2.8 | 2.3 | 0.1 | 0.0 | 0.2 | 0.0 | 0.4 | 3.3 | 0.6 | 3.4 |
| Total Del/Veh (s) | 27.1 | 13.9 | 6.1 | 25.4 | 24.3 | 15.9 | 26.6 | 24.7 | 5.4 | 28.4 | 37.8 | 15.1 |

## 4: Johnathan Carver Pkwy & Engler Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.6 |
| Total Del/Veh (s) | 21.8 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 3.5 | 0.4 | 1.9 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 |
| Total Del/Veh (s) | 36.6 | 46.8 | 14.6 | 42.0 | 43.5 | 18.0 | 35.6 | 14.1 | 9.0 | 45.8 | 37.0 | 4.4 |

## 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd Performance by movement

| Movement | All |
|---|---|
| Denied Del/Veh (s) | 0.4 |
| Total Del/Veh (s) | 28.1 |

## 10: Johnathan Carver Pkwy & US 212 WB Ramps Performance by movement

| Movement | WBL | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 18.5 | 16.8 | 0.0 | 0.0 | 0.1 | 0.2 | 7.7 |
| Total Del/Veh (s) | 46.8 | 33.1 | 64.0 | 26.5 | 66.2 | 36.7 | 44.2 |

## 11: Johnathan Carver Pkwy & US 212 EB Ramps Performance by movement

| Movement | EBL | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.6 | 3.5 | 0.3 | 0.2 | 0.0 | 0.0 | 0.3 |
| Total Del/Veh (s) | 57.1 | 31.6 | 8.0 | 6.3 | 13.4 | 6.1 | 11.2 |

## 12: Johnathan Carver Pkwy Performance by movement

| Movement | WBR | NBT | NBR | SBT | All |
|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.1 | 0.1 | 0.2 | 0.0 | 0.1 |
| Total Del/Veh (s) | 6.4 | 4.2 | 2.5 | 0.9 | 2.7 |

## 14: Johnathan Carver Pkwy & Access C Performance by movement

| Movement | WBL | WBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.2 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 |
| Total Del/Veh (s) | 32.2 | 19.2 | 2.0 | 0.7 | 9.7 | 5.5 | 5.0 |

## 15: Chaska Blvd & Access D Performance by movement

| Movement | EBL | EBT | WBT | WBR | SBL | SBR | All |
|---|---|---|---|---|---|---|---|
| Denied Del/Veh (s) | 0.0 | 0.0 | 0.5 | 0.5 | 0.1 | 0.1 | 0.3 |
| Total Del/Veh (s) | 6.5 | 2.4 | 1.6 | 0.8 | 25.1 | 6.9 | 2.4 |

## Total Zone Performance

| | |
|---|---|
| Denied Del/Veh (s) | 54.7 |
| Total Del/Veh (s) | 1322.8 |

## Intersection: 1: US 212 EB Ramps & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | T | T | T | R | LT | R |
| Maximum Queue (ft) | 172 | 206 | 80 | 80 | 186 | 126 | 65 | 100 | 82 |
| Average Queue (ft) | 92 | 122 | 21 | 20 | 93 | 56 | 20 | 42 | 37 |
| 95th Queue (ft) | 137 | 173 | 57 | 58 | 155 | 112 | 47 | 85 | 66 |
| Link Distance (ft) | | 669 | 669 | 669 | 1124 | 1124 | | 745 | |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | 300 | | | | | | 330 | | 210 |
| Storage Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |

## Intersection: 2: US 212 WB Ramps & Engler Blvd

| Movement | EB | EB | EB | WB | WB | WB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | T | T | R | L | T | T | L | TR | R |
| Maximum Queue (ft) | 930 | 868 | 299 | 105 | 100 | 99 | 352 | 620 | 360 |
| Average Queue (ft) | 716 | 386 | 33 | 40 | 29 | 40 | 78 | 330 | 276 |
| 95th Queue (ft) | 1024 | 706 | 159 | 82 | 83 | 81 | 203 | 488 | 381 |
| Link Distance (ft) | 909 | 909 | | | 669 | 669 | | 775 | |
| Upstream Blk Time (%) | 3 | 0 | | | | | | 0 | |
| Queuing Penalty (veh) | 18 | 0 | | | | | | 0 | |
| Storage Bay Dist (ft) | | | 275 | 225 | | | 225 | | 225 |
| Storage Blk Time (%) | | 19 | | | | | | 28 | 4 |
| Queuing Penalty (veh) | | 11 | | | | | | 289 | 46 |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | EB | EB | EB | EB | B19 | B19 | WB | WB | WB | WB | WB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | T | T | L | L | T | T | R | L |
| Maximum Queue (ft) | 267 | 787 | 745 | 254 | 6 | 11 | 132 | 350 | 607 | 603 | 300 | 95 |
| Average Queue (ft) | 79 | 347 | 310 | 107 | 0 | 0 | 81 | 95 | 284 | 297 | 131 | 43 |
| 95th Queue (ft) | 291 | 893 | 854 | 366 | 4 | 0 | 120 | 321 | 527 | 556 | 336 | 81 |
| Link Distance (ft) | | 1228 | 1228 | | 4206 | 4206 | | | 909 | 909 | | |
| Upstream Blk Time (%) | | 0 | 0 | | | | | | | | | |
| Queuing Penalty (veh) | | 2 | 0 | | | | | | | | | |
| Storage Bay Dist (ft) | 210 | | | 210 | | | 250 | 250 | | | 150 | 240 |
| Storage Blk Time (%) | | 30 | 25 | | | | | | 13 | 25 | | |
| Queuing Penalty (veh) | | 15 | 17 | | | | | | 31 | 98 | | |

## Intersection: 3: Chaska Creek Blvd & Engler Blvd

| Movement | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|
| Directions Served | T | R | L | L | TR |
| Maximum Queue (ft) | 154 | 282 | 128 | 127 | 53 |
| Average Queue (ft) | 16 | 130 | 58 | 57 | 19 |
| 95th Queue (ft) | 70 | 241 | 106 | 106 | 48 |
| Link Distance (ft) | 1277 | 1277 | | 547 | |
| Upstream Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |
| Storage Bay Dist (ft) | | | 100 | | 400 |
| Storage Blk Time (%) | 0 | | 2 | 2 | |
| Queuing Penalty (veh) | 0 | | 3 | 2 | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | EB | EB | EB | EB | WB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | R | L | T | T | R | L | L | T | T |
| Maximum Queue (ft) | 57 | 162 | 150 | 126 | 95 | 315 | 331 | 237 | 146 | 173 | 142 | 145 |
| Average Queue (ft) | 17 | 94 | 55 | 48 | 15 | 160 | 155 | 83 | 82 | 100 | 71 | 75 |
| 95th Queue (ft) | 44 | 155 | 120 | 95 | 62 | 293 | 292 | 212 | 126 | 152 | 114 | 130 |
| Link Distance (ft) | | 1391 | 1391 | | | 4206 | 4206 | | | | 855 | 855 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 225 | | | 225 | 175 | | | 175 | 225 | 225 | | |
| Storage Blk Time (%) | | | | | | 7 | 6 | 0 | | | | |
| Queuing Penalty (veh) | | | | | | 1 | 23 | 0 | | | | |

## Intersection: 4: Johnathan Carver Pkwy & Engler Blvd

| Movement | NB | SB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|
| Directions Served | R | L | L | T | T | R |
| Maximum Queue (ft) | 58 | 101 | 207 | 315 | 263 | 82 |
| Average Queue (ft) | 12 | 39 | 78 | 145 | 83 | 21 |
| 95th Queue (ft) | 41 | 77 | 144 | 252 | 207 | 57 |
| Link Distance (ft) | | | | 1144 | 1144 | |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | 225 | 275 | 275 | | | 275 |
| Storage Blk Time (%) | | | | 0 | 0 | |
| Queuing Penalty (veh) | | | | 1 | 0 | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | EB | EB | EB | EB | EB | WB | WB | WB | NB | NB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | R | R | L | L | TR | L | T | T | R |
| Maximum Queue (ft) | 127 | 127 | 110 | 102 | 88 | 294 | 354 | 177 | 213 | 146 | 56 | 114 |
| Average Queue (ft) | 56 | 27 | 40 | 43 | 38 | 152 | 206 | 67 | 100 | 42 | 8 | 33 |
| 95th Queue (ft) | 102 | 78 | 88 | 80 | 69 | 251 | 300 | 143 | 180 | 107 | 35 | 86 |
| Link Distance (ft) | | | 1114 | 1114 | | | | 769 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 190 | 190 | | | 190 | 300 | 300 | | 450 | | | 225 |
| Storage Blk Time (%) | | | | | | 0 | 1 | | | | | |
| Queuing Penalty (veh) | | | | | | 0 | 2 | | | | | |

## Intersection: 9: Johnathan Carver Pkwy & Levi Griffin Rd/Chaska Blvd

| Movement | SB | SB | SB | B44 |
|---|---|---|---|---|
| Directions Served | L | T | R | T |
| Maximum Queue (ft) | 311 | 534 | 221 | 200 |
| Average Queue (ft) | 113 | 306 | 41 | 12 |
| 95th Queue (ft) | 277 | 505 | 192 | 117 |
| Link Distance (ft) | | 469 | | 450 |
| Upstream Blk Time (%) | 0 | 3 | 0 | 0 |
| Queuing Penalty (veh) | 0 | 25 | 0 | 2 |
| Storage Bay Dist (ft) | 325 | | 325 | |
| Storage Blk Time (%) | | 12 | | |
| Queuing Penalty (veh) | | 22 | | |

## Intersection: 10: Johnathan Carver Pkwy & US 212 WB Ramps

| Movement | WB | WB | WB | NB | NB | NB | SB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | LT | R | L | T | T | T | T | T | R |
| Maximum Queue (ft) | 349 | 612 | 350 | 185 | 283 | 287 | 224 | 638 | 679 | 200 |
| Average Queue (ft) | 313 | 376 | 113 | 83 | 191 | 166 | 25 | 297 | 307 | 182 |
| 95th Queue (ft) | 386 | 518 | 306 | 151 | 277 | 262 | 115 | 579 | 639 | 240 |
| Link Distance (ft) | | 1104 | | 360 | 360 | 360 | | 1037 | 1037 | |
| Upstream Blk Time (%) | | | | | | | | 0 | 0 | |
| Queuing Penalty (veh) | | | | | | | | 1 | 1 | |
| Storage Bay Dist (ft) | 275 | | 275 | | | | 150 | | | 100 |
| Storage Blk Time (%) | 4 | 16 | | | | | | 40 | 52 | 35 |
| Queuing Penalty (veh) | 38 | 143 | | | | | | 94 | 303 | 82 |

## Intersection: 11: Johnathan Carver Pkwy & US 212 EB Ramps

| Movement | EB | EB | NB | NB | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|
| Directions Served | LT | R | T | T | T | R | L | T | T |
| Maximum Queue (ft) | 393 | 323 | 100 | 146 | 135 | 82 | 95 | 227 | 256 |
| Average Queue (ft) | 226 | 83 | 17 | 61 | 47 | 3 | 33 | 84 | 82 |
| 95th Queue (ft) | 365 | 221 | 62 | 127 | 106 | 38 | 74 | 162 | 160 |
| Link Distance (ft) | 1077 | | | 2668 | 2668 | 2668 | 360 | 360 | 360 |
| Upstream Blk Time (%) | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | |
| Storage Bay Dist (ft) | | 250 | 275 | | | | | | |
| Storage Blk Time (%) | 10 | | | | | | | | |
| Queuing Penalty (veh) | 10 | | | | | | | | |

## Intersection: 12: Johnathan Carver Pkwy

| Movement | WB | B47 | B47 |
|---|---|---|---|
| Directions Served | LR | T | |
| Maximum Queue (ft) | 55 | 59 | 48 |
| Average Queue (ft) | 19 | 2 | 3 |
| 95th Queue (ft) | 45 | 22 | 25 |
| Link Distance (ft) | 1061 | 855 | 855 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Intersection: 14: Johnathan Carver Pkwy & Access C

| Movement | WB | B44 | B44 | SB |
|---|---|---|---|---|
| Directions Served | LR | T | | LT |
| Maximum Queue (ft) | 130 | 83 | 73 | 180 |
| Average Queue (ft) | 51 | 5 | 5 | 14 |
| 95th Queue (ft) | 104 | 43 | 40 | 82 |
| Link Distance (ft) | 639 | 469 | 469 | 2596 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (ft) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

## Intersection: 15: Chaska Blvd & Access D

| Movement | EB | WB | SB |
|---|---|---|---|
| Directions Served | LT | TR | LR |
| Maximum Queue (ft) | 154 | 4 | 72 |
| Average Queue (ft) | 19 | 0 | 26 |
| 95th Queue (ft) | 81 | 3 | 53 |
| Link Distance (ft) | 769 | 1447 | 506 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (ft) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

## Zone Summary

Zone wide Queuing Penalty: 1280

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | SB Chaska Creek Blvd | None | 184 | | 7 | | 95 | 930 | | 0.1979 | |
| 2 | EB Creek Road | None | 17 | | 181 | | 10 | 972 | | 0.0175 | |
| 3 | NB Chaska Creek Blvd | None | 59 | | 40 | | 158 | 737 | | 0.0801 | |
| 4 | WB Creek Dr | None | 36 | | 66 | | 33 | 1020 | | 0.0353 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | SB Chaska Creek Blvd | None | 5.91 | | 5.91 | 0.61 | | A | | A |
| 2 | EB Creek Road | None | 3.69 | | 3.69 | 0.05 | | A | | A |
| 3 | NB Chaska Creek Blvd | None | 4.79 | | 4.79 | 0.19 | | A | | A |
| 4 | WB Creek Dr | None | 3.72 | | 3.72 | 0.10 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 296 | | 296 |
| Capacity | veh/hr | 3658 | | 3658 |
| Average Delay | sec/veh | 4.58 | | 4.58 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 0.38 | | 0.38 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | SB Chaska Creek Blvd | None | 298 | | 7 | | 294 | 1096 | | 0.2719 | |
| 2 | EB Creek Road | None | 22 | | 293 | | 12 | 941 | | 0.0234 | |
| 3 | NB Chaska Creek Blvd | None | 253 | | 88 | | 227 | 1054 | | 0.2400 | |
| 4 | WB Creek Dr | None | 41 | | 260 | | 81 | 965 | | 0.0425 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | SB Chaska Creek Blvd | None | 6.48 | | 6.48 | 0.98 | | A | | A |
| 2 | EB Creek Road | None | 3.93 | | 3.93 | 0.06 | | A | | A |
| 3 | NB Chaska Creek Blvd | None | 6.33 | | 6.33 | 0.83 | | A | | A |
| 4 | WB Creek Dr | None | 4.09 | | 4.09 | 0.12 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 614 | | 614 |
| Capacity | veh/hr | 4056 | | 4056 |
| Average Delay | sec/veh | 5.25 | | 5.25 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 0.90 | | 0.90 |

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | NB CSAH 11 | None | 681 | | 192 | | 724 | 744 | | 0.9152 | |
| 2 | WB CSAH 44 | None | 633 | | 505 | | 364 | 801 | | 0.7901 | |
| 3 | SB CSAH 11 | None | 590 | | 407 | | 730 | 813 | | 0.7253 | |
| 4 | EB CSAH 44 | None | 74 | | 842 | | 155 | 616 | | 0.1201 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | NB CSAH 11 | None | 20.50 | | 20.50 | 10.94 | | C | | C |
| 2 | WB CSAH 44 | None | 22.29 | | 22.29 | 12.22 | | C | | C |
| 3 | SB CSAH 11 | None | 16.05 | | 16.05 | 6.90 | | C | | C |
| 4 | EB CSAH 44 | None | 7.19 | | 7.19 | 0.40 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1978 | | 1978 |
| Capacity | veh/hr | 2975 | | 2975 |
| Average Delay | sec/veh | 18.26 | | 18.26 |
| L.O.S. (Signal) | A – F | B | | B |
| L.O.S. (Unsig) | A – F | C | | C |
| Total Delay | veh.hrs | 10.03 | | 10.03 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | NB CSAH 11 | None | 681 | | 192 | | 724 | 879 | | 0.7750 | |
| 2 | WB CSAH 44 | None | 633 | | 508 | | 365 | 857 | | 0.7385 | |
| 3 | SB CSAH 11 | None | 590 | | 408 | | 732 | 749 | | 0.7882 | |
| 4 | EB CSAH 44 | None | 74 | | 842 | | 155 | 552 | | 0.1340 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | NB CSAH 11 | None | 16.13 | | 16.13 | 7.22 | | C | | C |
| 2 | WB CSAH 44 | None | 18.84 | | 18.84 | 8.83 | | C | | C |
| 3 | SB CSAH 11 | None | 17.50 | | 17.50 | 7.18 | | C | | C |
| 4 | EB CSAH 44 | None | 7.74 | | 7.74 | 0.42 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1978 | | 1978 |
| Capacity | veh/hr | 3037 | | 3037 |
| Average Delay | sec/veh | 16.11 | | 16.11 |
| L.O.S. (Signal) | A – F | B | | B |
| L.O.S. (Unsig) | A – F | C | | C |
| Total Delay | veh.hrs | 8.85 | | 8.85 |

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | US 212 Entrance Ramp | None | 0 | | 0 | | 591 | 0 | | 0.0000 | |
| 2 | EB CSAH 44 | None | 528 | | 0 | | 254 | 1756 | | 0.3007 | |
| 3 | WB CSAH 44 | None | 746 | | 99 | | 429 | 998 | | 0.7476 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | US 212 Entrance Ramp | None | 0.00 | | 0.00 | 0.00 | | A | | A |
| 2 | EB CSAH 44 | None | 5.54 | | 5.54 | 1.41 | | A | | A |
| 3 | WB CSAH 44 | None | 15.23 | | 15.23 | 7.76 | | C | | C |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1274 | | 1274 |
| Capacity | veh/hr | 2754 | | 2754 |
| Average Delay | sec/veh | 10.21 | | 10.21 |
| L.O.S. (Signal) | A – F | B | | B |
| L.O.S. (Unsig) | A – F | B | | B |
| Total Delay | veh.hrs | 3.61 | | 3.61 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | US 212 Entrance Ramp | None | 0 | | 0 | | 510 | 0 | | 0.0000 | |
| 2 | EB CSAH 44 | None | 917 | | 0 | | 405 | 1892 | | 0.4847 | |
| 3 | WB CSAH 44 | None | 634 | | 281 | | 636 | 981 | | 0.6460 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | US 212 Entrance Ramp | None | 0.00 | | 0.00 | 0.00 | | A | | A |
| 2 | EB CSAH 44 | None | 8.11 | | 8.11 | 3.80 | | A | | A |
| 3 | WB CSAH 44 | None | 13.35 | | 13.35 | 5.60 | | B | | B |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1551 | | 1551 |
| Capacity | veh/hr | 2873 | | 2873 |
| Average Delay | sec/veh | 9.25 | | 9.25 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 3.99 | | 3.99 |

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | EB CSAH 44 | None | 434 | | 0 | | 444 | 1102 | | 0.3940 | |
| 2 | NB US 212 EXIT | Free | 183 | 100 | 434 | 0 | 0 | 828 | 1229 | 0.2210 | 0.0814 |
| 3 | WB CSAH 44 | None | 254 | | 190 | | 527 | 981 | | 0.2588 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | EB CSAH 44 | None | 7.80 | | 7.80 | 1.83 | | A | | A |
| 2 | NB US 212 EXIT | Free | 7.03 | 0.82 | 4.83 | 0.80 | 0.00 | A | A | A |
| 3 | WB CSAH 44 | None | 6.75 | | 6.75 | 0.98 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 871 | 100 | 971 |
| Capacity | veh/hr | 2911 | 1229 | 4140 |
| Average Delay | sec/veh | 6.33 | 0.41 | 5.72 |
| L.O.S. (Signal) | A – F | A | A | A |
| L.O.S. (Unsig) | A – F | A | A | A |
| Total Delay | veh.hrs | 1.53 | 0.01 | 1.54 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | EB CSAH 44 | None | 602 | | 0 | | 630 | 1102 | | 0.5465 | |
| 2 | NB US 212 EXIT | Free | 223 | 318 | 602 | 0 | 0 | 746 | 1229 | 0.2990 | 0.2588 |
| 3 | WB CSAH 44 | None | 405 | | 225 | | 918 | 963 | | 0.4206 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | EB CSAH 44 | None | 10.01 | | 10.01 | 3.42 | | B | | B |
| 2 | NB US 212 EXIT | Free | 8.50 | 2.29 | 4.85 | 1.22 | 0.00 | A | A | A |
| 3 | WB CSAH 44 | None | 8.76 | | 8.76 | 2.06 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1230 | 318 | 1548 |
| Capacity | veh/hr | 2810 | 1229 | 4039 |
| Average Delay | sec/veh | 8.33 | 1.29 | 6.88 |
| L.O.S. (Signal) | A – F | A | A | A |
| L.O.S. (Unsig) | A – F | A | A | A |
| Total Delay | veh.hrs | 2.84 | 0.11 | 2.96 |

# Operational Results

## 2045 AM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | SB Access B | None | 103 | | 326 | | 178 | 793 | | 0.1298 | |
| 2 | EB Big Woods Drive | None | 429 | | 136 | | 293 | 1016 | | 0.4221 | |
| 3 | NB Access B | None | 29 | | 465 | | 100 | 589 | | 0.0493 | |
| 4 | WB Big Woods Dr | None | 437 | | 67 | | 427 | 1035 | | 0.4224 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | SB Access B | None | 5.67 | | 5.67 | 0.38 | | A | | A |
| 2 | EB Big Woods Drive | None | 8.48 | | 8.48 | 1.97 | | A | | A |
| 3 | NB Access B | None | 5.40 | | 5.40 | 0.12 | | A | | A |
| 4 | WB Big Woods Dr | None | 8.28 | | 8.28 | 1.93 | | A | | A |

# Global Results

## Performance and Accidents

### 2045 AM Peak Global Performance

| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 998 | | 998 |
| Capacity | veh/hr | 3433 | | 3433 |
| Average Delay | sec/veh | 7.07 | | 7.07 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 1.96 | | 1.96 |

# Operational Results

## 2045 PM Peak - 60 minutes

### Flows and Capacity

| Leg | Leg Names | Bypass Type | Flows (veh/hr) | | | | | Capacity (veh/hr) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Arrival Flow | | Opposing Flow | | Exit Flow | Capacity | | Average VCR | |
| | | | Entry | Bypass | Entry | Bypass | | Entry | Bypass | Entry | Bypass |
| 1 | SB Access B | None | 435 | | 480 | | 257 | 892 | | 0.4879 | |
| 2 | EB Big Woods Drive | None | 366 | | 281 | | 634 | 833 | | 0.4391 | |
| 3 | NB Access B | None | 100 | | 611 | | 36 | 777 | | 0.1287 | |
| 4 | WB Big Woods Dr | None | 628 | | 109 | | 602 | 1050 | | 0.5981 | |

### Delays, Queues and Level of Service

| Leg | Leg Names | Bypass Type | Average Delay (sec) | | | 95% Queue (veh) | | Level of Service | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Entry | Bypass | Leg | Entry | Bypass | Entry | Bypass | Leg |
| 1 | SB Access B | None | 10.72 | | 10.72 | 2.59 | | B | | B |
| 2 | EB Big Woods Drive | None | 9.13 | | 9.13 | 1.80 | | A | | A |
| 3 | NB Access B | None | 6.24 | | 6.24 | 0.40 | | A | | A |
| 4 | WB Big Woods Dr | None | 11.33 | | 11.33 | 3.74 | | B | | B |

# Global Results

## Performance and Accidents

### 2045 PM Peak Global Performance

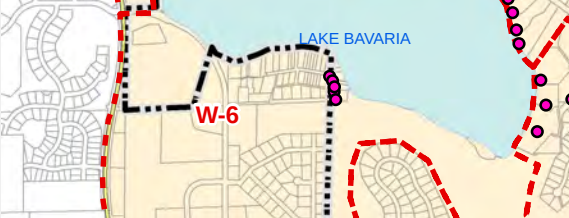
| Parameter | Units | Entries | Bypasses | Total |
|---|---|---|---|---|
| Arrive Flows | veh/hr | 1529 | | 1529 |
| Capacity | veh/hr | 3552 | | 3552 |
| Average Delay | sec/veh | 9.32 | | 9.32 |
| L.O.S. (Signal) | A – F | A | | A |
| L.O.S. (Unsig) | A – F | A | | A |
| Total Delay | veh.hrs | 3.96 | | 3.96 |

City of Chaska

# APPENDIX E: EXISTING TRUNK SEWER SYSTEM FIGURE

# Trunk Sewer System
## Chaska, Minnesota
## Comprehensive Sewer Plan

**Map 1**




0 750 1,500 3,000 4,500 6,000 Feet

1 inch = 2,500 feet (At original document size of 11x17)

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Revised: 2019-08-07 By: hduan

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City of Chaska

# APPENDIX F: COMMENT RESPONSES

## OVERVIEW

Pursuant to Minnesota Rules, part 4410.3610, subpart 5a(C), the Responsible Governmental Unit (RGU) shall revise the environmental analysis document based on comments received during the comment period. The RGU shall include in the document a section specifically responding to each timely, substantive comment received that indicates in what way the comment has been addressed.

The 30-day Alternative Urban Areawide Review (AUAR) comment period began December 30, 2025, and comments were accepted through February 5, 2026. During the public and agency comment period, comments were received from five government agencies. Responses to the agency comments are included in Table 1. Copies of the comment letters are included in Attachment G.

### Table 1. Agency Comments

| Comment | Response |
|---|---|
| ***1. Minnesota Pollution Control Agency*** | |
| The DAUAR indicates that the Blue Lake WRRF has the capacity to treat 32 MGD. This should be corrected to state that the Blue Lake WRRF has a capacity to treat the permitted average wet weather design flow of 42 MGD. | This has been revised in the Final AUAR. |
| The DAUAR should indicate the type of wastewater that will be generated by the proposed project (domestic, industrial). | The proposed development is commercial and industrial for both scenarios. The anticipated wastewater is domestic and light industrial. This has been added to the Final AUAR. |
| A figure of the existing sanitary sewer system features in the project area should be provided in the DAUAR. | This figure has been added as Appendix E in the Final AUAR. |
| Include that Chaska Creek (07020012-803) is impaired for Fish Bioassessment and Invertebrate bioassessment and there are no TMDLs for those impairments. | This has been added to the Final AUAR. |
| Include the year of Impaired Waters List that was used. | This has been added to the Final AUAR. |
| Good to see a chloride management section. Another resource could be the Minnesota Stormwater Manual low Salt Design strategies and design principles. | Comment noted. This resource has also been included in the Stormwater section of the Final AUAR. |
| ***2. Minnesota Department of Agriculture*** | |
| **Background** | Comment noted. |

| Comment | Response |
|---|---|
| The MDA has historically played a significant role in the preservation of agriculture as an industry and a vocation, as well as preserving the farmland that is the natural resource base of agriculture. We recognize that land use change is inevitable especially within urban areas. Nonetheless, agricultural production, in particular specialty food crops, can provide economic, environmental, and public health benefits to urban communities. We encourage the planning processes involved in guiding future land use change in Prior Lake to consider the benefits of incorporating local food production in plans for future development. | |
| Local food production is an umbrella term for a wide variety of activities that can be classified as either small-scale commercial or recreational. Small-scale commercial farms provide a variety of fresh food to local markets through direct sales to consumers or through sales to schools, restaurants, and retail stores. When allowed, they can also attract tourists though fun seasonal activities, educational opportunities, and outdoor events. These small businesses can be economically successful on small parcels of 'leftover' land that are oddly shaped or too small for other forms of development in commercial, industrial, and low-density residential areas.<br><br>Recreational local food production typically takes the form of community gardens, often incorporated into park and open space areas within residential areas. Community gardens can improve residents' diet, physical fitness, mental health, and social connectedness, and have even been shown to improve public safety and raise nearby property values. They add the most value in medium- and high-density residential settings.<br><br>Additionally, urban agriculture and community gardens can help provide environmental benefits important to cities such as combatting urban heat islands, reducing runoff, sequestering carbon, and supporting pollinators. When perennial crops such as fruit trees and bushes are planted, they can also provide shade and contribute to the tree canopy.<br><br>Finally, setting aside land for local food production in the AUAR can help the City of Prior Lake advance further in the GreenStep Cities program through Best Practice #27: Local Food as well as the new Gold Leaf Challenge. | Comment noted. The proposed development is located in the City of Chaska. Chaska is not currently in the GreenStep Cities program. |
| Opportunities within the Prior Lake AUAR<br>The MDA encourages the City of Chaska to consider two modifications to the Big Woods Business Park AUAR scenarios to preserve more space for local food production. These changes would help | Comment noted. |

| Comment | Response |
|---|---|
| reduce the Urban Heat Island effect, lower the number of cooling degree days, reduce the intensity of stormwater runoff, as well as some of the other benefits mentioned above.<br><br>Recommendation #1<br>• Expand the greenbelt area within the AUAR study area (easier to do in Scenario 1 than 2)<br>• Allow certain types of agricultural activities within the greenbelt, such as those already allowed in the RR1 and RR2 zoning districts<br>• Modify the RR1 and RR2 districts to explicitly allow hoop houses (also known as high tunnels) as permitted uses, as these are by far the most common structures needed on small farms.<br>• If only RR2 is being considered for the Greenbelt, consider instead a mix of RR1 and RR2 to allow for different sized farms to use the space<br><br>Recommendation #2<br>• Allow some urban agriculture uses to as permitted or conditional uses in the Business Park or Commercial areas. These could include:<br>• Rooftop farming<br>• Indoor agriculture (also known as Controlled Environment Agriculture), including hydroponics, aquaponics, mushroom cultivation, and "freight container farms"<br>• Greenhouses<br>• Community gardens | |
| ***3. Metropolitan Council*** | |
| Item 6: Project Description *(MacKenzie Young-Walters, 651-602-1373)*<br>It is unlikely that both the baseline and maximum development scenarios will maintain 76 acres of rural residential/greenbelt, especially since Table 3 shows Scenario 2 contemplating 70 more acres of impervious surface than Scenario 1. Figure 4 shows the greenbelt area cutting through currently cultivated areas that are presumably prime for development and not the areas of high value natural resources the greenbelt is intended to preserve. Given this, Table 1 should be revised to have Scenario 2 reflect the reduced greenbelt area that would presumably result from a maximum development scenario. | Additional development/impervious surface described in Scenario 2 is not intended to extend into the Greenbelt area. Because exact locations of development are not known at this time, the AUAR will assume that 76 acres of greenbelt could remain post-development in the maximum development scenario. |
| Item 7: Climate *(MacKenzie Young-Walters, 651-602-1373)*<br>The discussion of anticipated climate trends and associated adaptations are adequate. Given the large amount of parking surface typically associated with developments of this nature, low salt design and a project specific chloride management plan should be considered to help offset the | Comment noted. Chloride management is discussed in Item 12. Both scenarios will plant trees and incorporate landscaped areas (described further in Item 8). |

| Comment | Response |
|---|---|
| impact of increased freeze/thaw cycles on water resources. Additionally, opportunities for additional tree planting should be identified to mitigate the loss of 19 acres of mature trees and help minimize the urban heat island effect created by the project's impervious surface. | |
| Item 9: Permits and Approvals *(MacKenzie Young-Walters, 651-602-1373)*<br>A comprehensive plan amendment will be required if business park development is proposed for the areas guided Rural Residential. | Comment noted. Item 10 of the AUAR states "An amendment to the 2040 Comprehensive Plan would be needed for both scenarios to accommodate development within the Chaska Green Belt". |
| Item 10: Land Use *(Colin Kelly, 651-602-1361)*<br>The Southwest Regional Trail is approximately 0.1-mile north of the study area, additionally while a long-range plan has not yet been approved by the Council, the Carver County Highway 11 Regional Trail Search Corridor is proposed to travel along the western portions of the AUAR study area, along Jonathan Carver Pkwy/Carver County Highway 11, as depicted on the City of Chaska's Regional Parks and Trails System map. Council Parks and Trails staff encourage the City of Chaska to coordinate bicycle and pedestrian trail connections in this area with Carver County, the Regional Park Implementing Agency that manages the Southwest Regional Trail and that would manage a future Carver County Highway 11 Regional Trail. Well-connected regional and local trail systems benefit both residents and visitors. | Comment noted. The City intends to promote connections from the proposed development to nearby trails (including the Southwest Regional Trail) and foster pedestrian connections within the overall business park area. |
| Item 10: Land Use *(Todd Graham, 651-602-1322)*<br>During the winter of 2024-2025, Chaska city staff and Council staff discussed the potential for this business park. If fully developed with a floor area ratio (FAR) that is typical of a suburban edge location, the subject area could accommodate up to 3 million square feet of built floor space and at most 3,000 jobs. Council staff invite Chaska's planners to discuss the employment forecast impacts with us as the City prepares for its 2050 Plan Update. | Comment noted. The City will continue to coordinate with the Metropolitan Council regarding employment forecasts. |
| Item 11: Geology, Soils, and Topography/Landforms *(Eric Wojchik 651-602-1330)*<br>Page 33 of the Draft AUAR states, "Mass grading has been completed within the northern portion of the AUAR study area to prepare for the development of buildings, roadways, stormwater, public improvements, and landscaping. This grading required approximately 600,000 cubic yards of cut and 700,000 cubic yards of fill. Similar activities will take place within the southern portion of the study area." Under Minnesota Statute 116D.04, subdivision 2b, work is strictly prohibited from commencing before the environmental review process is finalized. The developer must not | This has been clarified in the AUAR. Only desktop review/planning efforts for mass grading have occurred, work has not commenced within the AUAR study area. Grading will not occur until the AUAR is complete and relevant permits are obtained. |

| Comment | Response |
|---|---|
| commence any further work on the site prior to completion of the environmental review process and prior to obtaining relevant permits. | |
| Item 12: Water Resource – Wastewater *(Roger Janzig, 651-602-1119)*<br>Clarify if the Greenbelt area is going to be developed. The AUAR is not clear as to if this area is contemplated for development as Business Park or if the areas will be permanent open space. If this area is to be developed, a comprehensive plan amendment will be needed to bring the area into the 2030 MUSA. | Development may occur within the greenbelt area. Item 19.c. of the AUAR states that "The City would advance a comprehensive plan amendment to also establish MUSA staging for this area prior to development occurring." This has been added to Table 6 (Anticipated Permits and Approvals) in the Final AUAR. |
| Item 12: Water Resources- Surface Water *(Eric Wojchik, 651-602-1330)*<br>The Council encourages the project proposer to continue to work with The Carver County Water Management Organization (CCWMO) on best management practices to protect and enhance the water resource quality of the Priority 1 Stream in the North of the site, which is a tributary of Chaska Creek. The project proposer should make every effort to reduce impervious surface across the site, especially near the stream, ponds, and wetland features that extend diagonally from the North/Northwest to the Southeast of the site. The project proposer should preserve and integrate the existing natural systems on site to retain terrestrial and aquatic habitat corridors. | Comment noted. The project proposer will continue to coordinate with the CCWMO and reduce impervious surface where feasible as site planning advances. |
| Item 12: Water Resources- Ground Water *(Lanya Ross, 651-602-1803)*<br>The AUAR correctly acknowledges that the study area is not located within a wellhead protection area or a DWSMA; however, it notes that DWSMAs are located approximately 0.1 to 0.3 miles northeast and southeast of the study area (page 41 and Figure 15 on page 42). While the project is not currently within a DWSMA, the proximity to these areas suggests that any high-capacity pumping or significant land-use changes could potentially influence the capture zones of nearby municipal wells. The information is sufficient for current status, but the RGU should monitor upcoming updates to the City's Wellhead Protection Plan. Also, considering that regional groundwater flow direction is generally from northwest to southeast toward the Minnesota River valley, it is worthwhile to identify and promote source water protection practices where development occurs up-gradient from the city's wells. | Comment noted. The City will continue to monitor any upcoming updates that may be needed to the City's Wellhead Protection Plan. |
| Item 12 Water Resources- Water Appropriation *(Lanya Ross, 651-602-1803)*<br>The AUAR provides information about the proposed source of water for the study area and how future demand compares to current capacity under two proposed scenarios (Page 50, Section 12.b.iii - Water Appropriation). While this information is generally sufficient to demonstrate | Table 13 is average day demand – this has been updated in the AUAR. |

| Comment | Response |
|---|---|
| system capacity exists to serve the proposed development under the scenarios presented, details on the specific "infrastructure improvements needed to expand capacity" mentioned in the Mitigation Plan remain vague and should be refined in the Final AUAR. For example, please clarify if the water demand reported in Table 13 (page 50) represents maximum day demand or average day demand, so that reviewers can correctly compare potential future demand against existing capacity. | |
| Item 14 Fish, Wildlife, Plan Communities, and Sensitive Ecological Resources (Rare Features) *(Lanya Ross, 651-602-1803)*<br>The AUAR identifies a protected calcareous fen documented in the vicinity, over two miles from the site (page 59 and Appendix B). The document acknowledges that calcareous fens depend on groundwater upwelling and can be impacted by activities "several miles away," specifically citing groundwater pumping as a risk factor. The AUAR concludes impacts are unlikely but is missing technical information to confirm that the additional municipal demand and related groundwater pumping will not affect the specific aquifer serving the fen. This assessment should be refined in the Final AUAR. | No groundwater wells are anticipated to be drilled as a part of this project that could impact groundwater upwelling and pumping. Dewatering may be necessary if groundwater is encountered during construction. The contractor would be responsible for obtaining all necessary permits for dewatering including the Water Appropriation Permit through MnDNR. |
| Item 18: Greenhouse Gas Emissions *(MacKenzie Young-Walters, 651-602-1373)*<br>The discussion of projected greenhouse gas emissions is generally adequate; however, it is unlikely that an additional 1,000,000 square feet of building area and 70 acres of impervious surface could be constructed without out increasing the emissions from construction equipment. The assumptions underpinning the identical construction equipment emissions for Scenarios 1 and 2 should be re-examined. In addition to the listed mitigation measures, items like energy efficient building shells, solar ready design, and incorporating solar as an accessory use to allow for in-boundary energy generation should be considered. If on-site EV charging is not currently feasible, EV ready charging infrastructure could also be considered to lower the barriers to future EV charging stations.<br>The Council will not take formal action on the AUAR. If you have any questions or need further information, please contact MacKenzie Young-Walters, Principal Reviewer, at 651-602- 1373 or via email at MacKenzie.Young-Walters@metc.state.mn.us. | The EQB's Climate Calculator tool was used to estimate construction and operational emissions. Construction equipment emissions are calculated based on the acreage of development rather than square footage or area of impervious surface. The calculations for construction emissions are consistent with this methodology.<br><br>As a separate note, the greenhouse gas emissions estimate tables have been updated in the Final AUAR to reflect that a portion of the development is planned for commercial use that was inadvertently missed in the Draft AUAR.<br><br>The additional solar items suggested have been added to the Mitigation Plan for |

| Comment | Response |
|---|---|
| | future consideration as site planning advances. |
| ***4. Carver County*** | |
| **1. Stormwater – Areawide Approach.** The County strongly encourages that the developer(s) for these areas consider an overall approach to stormwater management for the AUAR area. The developer(s) should coordinate with the city of Chaska and the County early in the development process on proposed stormwater management practices and siting. Protection or restoration of natural upland areas can be eligible for use as a volume control stormwater strategy (see item 4 for additional information). | The project proposer has reached out to CCWMO and the City to request regional stormwater models and discuss stormwater approach. We have received a regional HydroCAD model from CCWMO and plan to use it in the stormwater analysis. The City of Chaska has not shared any regional models. It is understood that the city model would take precedent for rate control modeling over the CCWMO Model. |
| **2. Stormwater –Adjacent property impacts.** Please note that the CCWMO reviews for potential stormwater related impacts to upstream and downstream properties. Please see below for a summary of requirements.<br>• **Upstream.** Drainage flowing onto the site from upstream areas must be managed and accommodated. Alterations to flow paths which impound or slow down water will not be allowed unless it can be shown that the upstream system can accommodate the change.<br>• **Downstream.**<br>o To the extent possible, existing drainage areas and discharge points from the site should be maintained post-development and concentrated flows onto neighboring properties should be avoided or mitigated. The downstream conveyance system (natural or structural) must be able to accommodate, to the nearest major receiving waterbody, increased volumes caused by development.<br>o If diversions from existing drainage areas and alterations to discharge points are proposed, the responsible party shall provide additional documentation (rates, volumes, velocities, duration of flow, etc.) to demonstrate that the downstream conveyance system can accommodate the change. The responsible party shall provide evidence of easements or other agreements concerning water flow if a plan involves increased impervious or directing concentrated runoff onto a neighboring property. | These requirements are listed in the Final AUAR in Item 12.b.ii. |

| Comment | Response |
|---|---|
| 3. **Land use authority.** The majority of the proposed Business Park/Commercial development area is within land currently under the jurisdiction of the City of Chaska. While a small portion of the scoping document includes land in Dahlgren Township (under Carver County's land use authority), this area is identified in the Carver County 2040 Comprehensive Plan as a future growth area for the City of Chaska. It is also designated as a Transition Overlay District under the Carver County Land Use Map and Zoning Code.<br><br>Accordingly, the proposed AUAR Scoping Document aligns with the identified future growth opportunities for the City of Chaska, the Dahlgren Township chapter of the Carver County 2040 Comprehensive Plan, and Carver County land use standards. | Comment noted. This information has been added to the Final AUAR in Item 10 Land Use. |
| 4. **Recommendation.** Explore including incorporating the small remnant acreage owned by Christy H Haasken Schuller Rev Trust (PUD #040010710 - east of County Road 11) into the AUAR plans as part of the city of Chaska's green belt or stormwater management plan for the site as a preservation area/volume control practice. | The project proposer does not intend to incorporate this parcel at this time as this parcel is not currently planned to be annexed. |
| 5. **Right-of-way dedication.** Carver County Public Works requests right-of-way dedications along County Highways in accordance with the County Comprehensive Plan, along with any necessary intersection sight corners. | Comment noted. |
| 6. **Limit access to functional area of intersections.** Carver County Public Works requests that parking lot accesses be kept outside of the functional area of intersections on County Highways (160' or turn lane length, whichever is greater). | Comment noted. |
| 7. **CSAH 61 Access Point.** The proposed access point on CSAH 61 does not need to align with the entrance to the MnDOT garage but should be coordinated with Carver County Public Works to ensure adequate sight lines are maintained. | Comment noted. Final access locations will be coordinated with Carver County Public Works. |
| 8. **Southern CSAH 11 Access Point.** The southern access point on CSAH 11 (between 11 and 44) should be coordinated with the City of Carver to ensure alignment and compliance with the Carver County Access Spacing Policy (0.25 miles from other intersections in this instance). | Comment noted. Final access locations will be coordinated with Carver County Public Works. |
| 9. **Northern CSAH 11 Access Point.** The northern access point on CSAH 11 should be shifted slightly north in compliance with the same Access Spacing Policy. Exact location should be coordinated with both Carver County Public Works and the City of Carver to ensure compliance and compatibility with other future accesses. | Comment noted. Final access locations will be coordinated with Carver County Public Works. |
| 10. **Traffic impacts from connecting CSAH 44 to Creek Road.** While the connection from CSAH 44 north to Creek Road is not a component of this proposed development, the projected traffic impact of making this connection should be explored. Such work should include any expected | A section has been added to the TIA Appendix that analyzes the impacts of the proposed creek crossing. Overall, the creek |

| Comment | Response |
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| trip increases or decreases to County Highways with/without the connection and expected impacts on the necessary improvements to CSAH 44. The existence of this connection was assumed in the justification of the existing US 212/CSAH 44 interchange. | crossing is not anticipated to provide significant benefit from an operations standpoint to the site as currently proposed. However, the precise impacts of the creek crossing will depend on the local development patterns and whether or not the CSAH 44 interchange is completed. A future analysis should be completed when the area is more developed to determine if a creek crossing and/or completion of the CSAH 44 interchange are appropriate. |
| 11. **CSAH 44 Roundabout.** More information is needed regarding the necessity of the proposed roundabout on CSAH 44 between the existing interchange and the forthcoming CSAH 11/CSAH 44 roundabout. Options should be explored for linking access to the existing interchange roundabout. As this access does not, and cannot, meet Carver County's Access Spacing Policy requirements (0.25 miles) in this location but represents a necessary connection, analysis is needed demonstrating the lowest level of access and gradually stepping up from a right-in, right-out to ¾ intersection, to a full intersection without a roundabout, and finally a roundabout. Work should also include trigger points that would necessitate "stepping up" the intersection type (percent buildout, completion of connection to Creek Road, final land use, etc) | An additional analysis will be completed and submitted in the near future that will include analysis of the alternative access scenarios including installation of a right-in/right-out or three-quarter access along CSAH 44, the use of the existing Westbound US 212 roundabout for access to the north side of the site, and other potential changes to the proposed access configuration. |
| ***5. Minnesota Department of Transportation*** | |
| ***Access:***<br>The conversion of the current US 212 and Big Woods Blvd partial interchange to a full interchange (adding the southbound entrance and northbound exit ramps) was identified as a future improvement "when warranted by development." However, it should be noted that there is no MnDOT funding available for these improvements and MnDOT's funding for future interchange improvements is already tightly constrained. More discussion concerning the proposed ramps, including whether the improvements identified for the adjacent US 212 interchanges at CSAH 10 and CSAH 11 would be necessary if the Big Woods Blvd. ramps were constructed.<br>Similarly, the City may want to consider whether a connection to the Creek Road/Chaska Creek Blvd intersection provides an overall system benefit. | Thank you for your review. The City will continue to coordinate with MnDOT on the need and timing of any future interchange improvements to US 212 and big Woods Blvd. |

| Comment | Response |
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| Questions about these comments should be directed to Bryant Ficek, MnDOT South Area Manager at bryant.ficek@state.mn.us or 651-443-2564. | |
| ***Water Resources:***<br>The AUAR area drains easterly to at least 3 culverts under US 212 that range in size from 24" - 42". The AUAR should note that they will need a MnDOT drainage permit for the development and flow rates to each culvert must be maintained. If the developer wishes to do early coordination with MnDOT they can contact Derek Beaudry of MnDOT's Water Resources at derek.beauduy@state.mn.us or 651-234-7534.<br><br>Any projects adjacent to MnDOT Right-of-Way or connecting to MnDOT drainage facilities will require a MnDOT drainage permit to ensure that current drainage rates to MnDOT right-of-way will not be increased. The drainage permit application, including the information below, should be submitted online to: https://dotapp7.dot.state.mn.us/OLPA/.<br>The following information must be submitted with the drainage permit application:<br>1) A grading plan showing existing and proposed contours.<br>2) Drainage area maps for the proposed project showing existing and proposed drainage areas. Any off-site areas that drain to the project area should also be included in the drainage area maps. The direction of flow for each drainage area must be indicated by arrows.<br>3) Drainage computations for pre and post construction conditions during the 2, 10, and 100 year rain events.<br>4) Time of concentration calculations.<br>5) An electronic copy of any computer modeling used for the drainage computations.<br>6) See also the attached Drainage Permits Checklist for more information.<br>Once a drainage permit application is submitted, a thorough review will be completed and additional information may be requested. | This drainage information has been updated in Item 12 Water Resources under the stormwater section and a MnDOT permit has been added to the permit table in the Final AUAR. |
| ***Permits:***<br>As mentioned above a drainage permit will be required. Any other use of, or work within or affecting, MnDOT right of way will require a permit.<br>Permits can be applied for at this site: https://olpa.dot.state.mn.us/OLPA/. Please upload a copy of this letter when applying for any permits.<br>Please direct questions regarding permit requirements to Jeff Dierberger of MnDOT's Metro Permits Section at 651-775-0404 or jeffrey.dierberger@state.mn.us. | Thank you for the information. Comment noted. |

City of Chaska

# Appendix G: Agency Comment Letters

MINNESOTA POLLUTION CONTROL AGENCY

Marshall Office | 504 Fairgrounds Road | Suite 200 | Marshall, MN 56258-1688 | 507-537-7146

800-657-3864 | Use your preferred relay service | info.pca@state.mn.us | Equal Opportunity Employer

January 21, 2026

Elizabeth Hanson
City of Chaska
One City Hall Plaza
Chaska, Minnesota 55318
ehanson@chaskamn.gov

RE: Big Woods Business Park – Draft Alternative Urban Areawide Review

Dear Elizabeth Hanson:

Thank you for the opportunity to review and comment on the Draft Alternative Urban Areawide Review (DAUAR) for the Big Woods Business Park project (Project) located in Carver County, Minnesota. The Project consists of the AUAR study area, encompassing approximately 359 acres across 17 parcels in the City of Chaska and Dahlgren Township, Carver County, Minnesota (shown in Figure 2). The study area is generally bounded to the north by Creek Road, to the west by Jonathan Carver Parkway, to the south by Chaska Boulevard, and to the east by U.S. Highway 212 (US 212). Two parcels within the DAUAR study area are located within Dahlgren Township (shown in Figure 2). These parcels are intended to be annexed into the City of Chaska. Dahlgren Township and the City of Chaska adopted an Orderly Annexation Agreement for these parcels on September 8, 2025. The agreement outlines the terms and conditions for an annexation. It is expected that the annexation will occur when development on those parcels occurs. Regarding matters for which the Minnesota Pollution Control Agency (MPCA) has regulatory responsibility and other interests, the MPCA staff has the following comments for your consideration.

Wastewater

- The DAUAR indicates that the Blue Lake WRRF has the capacity to treat 32 MGD. This should be corrected to state that the Blue Lake WRRF has a capacity to treat the permitted average wet weather design flow of 42 MGD.
- The DAUAR should indicate the type of wastewater that will be generated by the proposed project (domestic, industrial).
- A figure of the existing sanitary sewer system features in the project area should be provided in the DAUAR.

Watershed

- Section 12, Surface waters:
  - Include that Chaska Creek (07020012-803) is impaired for Fish Bioassessment and Invertebrate bioassessment and there are no TMDLs for those impairments.
  - Include the year of Impaired Waters List that was used.
  - Good to see a chloride management section. Another resource could be the Minnesota Stormwater Manual low Salt Design strategies and design principles.

We appreciate the opportunity to review this Project. Please be aware that this letter does not constitute approval by the MPCA of any or all elements of the Project for the purpose of pending or future permit actions by the MPCA. Ultimately, it is the responsibility of the Project Proposer to secure any required permits and to comply with any requisite permit conditions. If you have any questions concerning our review of this EA, please contact me by email at chris.green@state.mn.us or by telephone at 507-476-4258.

Sincerely,

Chris Green

This document has been electronically signed.

Chris Green, Project Manager
Environmental Review Unit
Resource Management and Assistance Division

CG:rs

Attachment

cc: Amy Timm, MPCA (w/attachment)
Melina Neville, MPCA (w/attachment)
Nicole Peterson, MPCA (w/attachment)
Lauren Dickerson, MPCA (w/attachment)
Deepa deAlwis, MPCA (w/attachment)
Julie Henderson, MPCA (w/attachment)
David Sahli, MPCA (w/attachment)

DEPARTMENT OF AGRICULTURE

January 23, 2026

Elizabeth Hanson
City of Chaska
One City Hall Plaza
Chaska, MN 55318

RE: Big Woods Business Park – Draft Alternative Urban Areawide Review

Dear Ms. Hanson:

The Minnesota Department of Agriculture (MDA) appreciates the opportunity to comment on the proposed Big Woods Business Park AUAR.

**Background**

The MDA has historically played a significant role in the preservation of agriculture as an industry and a vocation, as well as preserving the farmland that is the natural resource base of agriculture. We recognize that land use change is inevitable especially within urban areas. Nonetheless, agricultural production, in particular specialty food crops, can provide economic, environmental, and public health benefits to urban communities. We encourage the planning processes involved in guiding future land use change in Prior Lake to consider the benefits of incorporating local food production in plans for future development.

**Local Food Production**

Local food production is an umbrella term for a wide variety of activities that can be classified as either small-scale commercial or recreational. Small-scale commercial farms provide a variety of fresh food to local markets through direct sales to consumers or through sales to schools, restaurants, and retail stores. When allowed, they can also attract tourists though fun seasonal activities, educational opportunities, and outdoor events. These small businesses can be economically successful on small parcels of 'leftover' land that are oddly shaped or too small for other forms of development in commercial, industrial, and low-density residential areas.

Recreational local food production typically takes the form of community gardens, often incorporated into park and open space areas within residential areas. Community gardens can improve residents' diet, physical fitness, mental health, and social connectedness, and have even been shown to improve public safety and raise nearby property values. They add the most value in medium- and high-density residential settings.

Additionally, urban agriculture and community gardens can help provide environmental benefits important to cities such as combatting urban heat islands, reducing runoff, sequestering carbon, and supporting pollinators. When perennial crops such as fruit trees and bushes are planted, they can also provide shade and contribute to the tree canopy.


In accordance with the Americans with Disabilities Act, this information is available in alternative forms of communication upon request by calling 651-201-6000. TTY users can call the Minnesota Relay Service at 711. The MDA is an equal opportunity employer and provider.

Finally, setting aside land for local food production in the AUAR can help the City of Prior Lake advance further in the GreenStep Cities program through Best Practice #27: Local Food as well as the new Gold Leaf Challenge.

**Opportunities within the Prior Lake AUAR**

The MDA encourages the City of Chaska to consider two modifications to the Big Woods Business Park AUAR scenarios to preserve more space for local food production. These changes would help reduce the Urban Heat Island effect, lower the number of cooling degree days, reduce the intensity of stormwater runoff, as well as some of the other benefits mentioned above.

**Recommendation #1**

- Expand the greenbelt area within the AUAR study area (easier to do in Scenario 1 than 2)
- Allow certain types of agricultural activities within the greenbelt, such as those already allowed in the RR1 and RR2 zoning districts
- Modify the RR1 and RR2 districts to explicitly allow hoop houses (also known as high tunnels) as permitted uses, as these are by far the most common structures needed on small farms.
- If only RR2 is being considered for the Greenbelt, consider instead a mix of RR1 and RR2 to allow for different sized farms to use the space

**Recommendation #2**

- Allow some urban agriculture uses to as permitted or conditional uses in the Business Park or Commercial areas. These could include:
    - Rooftop farming
    - Indoor agriculture (also known as Controlled Environment Agriculture), including hydroponics, aquaponics, mushroom cultivation, and “freight container farms”
    - Greenhouses
    - Community gardens

If you have any questions about the MDA’s comments, or would like additional information about local food production, please feel free to contact me.

Sincerely,

Mike Zastoupil

Agricultural and Food Systems Planner

Energy and Environment Section

651-201-6369

michael.zastoupil@state.mn.us

cc: Stephen Roos, Environmental Planner, MDA

February 4, 2026

Elizabeth Hanson, City Planner
City of Chaska
One City Hall Plaza
Chaska, MN 55318

**RE: City of Chaska – Alternative Urban Areawide Review AUAR – Big Woods Business Park**
Metropolitan Council Review File No. 23132-2
Metropolitan Council District No. 4

Dear Elizabeth Hanson:

The Draft AUAR covers approximately 359 acres in the City of Chaska and Dahlgren Township that will predominately be developed as a business park. The AUAR evaluates a lower-intensity and higher-intensity development scenario for the area with different square footages for business park and commercial building areas. Metropolitan Council staff completed its review of the Big Woods Business Park AUAR to determine its accuracy and completeness in addressing regional concerns.

Staff conclude that the AUAR is complete and accurate with respect to regional concerns and does not raise major issues of consistency with Council policies. However, staff offers the following comments for your consideration:

**Item 6: Project Description** *(MacKenzie Young-Walters, 651-602-1373)*
It is unlikely that both the baseline and maximum development scenarios will maintain 76 acres of rural residential/greenbelt, especially since Table 3 shows Scenario 2 contemplating 70 more acres of impervious surface than Scenario 1. Figure 4 shows the greenbelt area cutting through currently cultivated areas that are presumably prime for development and not the areas of high value natural resources the greenbelt is intended to preserve. Given this, Table 1 should be revised to have Scenario 2 reflect the reduced greenbelt area that would presumably result from a maximum development scenario.

**Item 7: Climate** *(MacKenzie Young-Walters, 651-602-1373)*
The discussion of anticipated climate trends and associated adaptations are adequate. Given the large amount of parking surface typically associated with developments of this nature, low salt design and a project specific chloride management plan should be considered to help offset the impact of increased freeze/thaw cycles on water resources. Additionally, opportunities for additional tree planting should be identified to mitigate the loss of 19 acres of mature trees and help minimize the urban heat island effect created by the project's impervious surface.

**Item 9: Permits and Approvals** *(MacKenzie Young-Walters, 651-602-1373)*
A comprehensive plan amendment will be required if business park development is proposed for the areas guided Rural Residential.

**Item 10: Land Use** *(Colin Kelly, 651-602-1361)*
The Southwest Regional Trail is approximately 0.1-mile north of the study area, additionally while a long-range plan has not yet been approved by the Council, the Carver County Highway 11 Regional Trail Search Corridor is proposed to travel along the western portions of the AUAR study area, along Jonathan Carver Pkwy/Carver County Highway 11, as depicted on the City of Chaska's Regional Parks and Trails System map. Council Parks and Trails staff encourage the City of Chaska to coordinate bicycle and pedestrian trail connections in this area with Carver County, the Regional Park Implementing Agency that manages the Southwest Regional Trail and that would manage a future Carver County Highway 11 Regional Trail. Well-connected regional and local trail systems benefit both residents and visitors.

**Item 10: Land Use** *(Todd Graham, 651-602-1322)*
During the winter of 2024-2025, Chaska city staff and Council staff discussed the potential for this business park. If fully developed with a floor area ratio (FAR) that is typical of a suburban edge location, the subject area could accommodate up to 3 million square feet of built floor space and at most 3,000 jobs. Council staff invite Chaska's planners to discuss the employment forecast impacts with us as the City prepares for its 2050 Plan Update.

**Item 11: Geology, Soils, and Topography/Landforms** *(Eric Wojchik 651-602-1330)*
Page 33 of the Draft AUAR states, "Mass grading has been completed within the northern portion of the AUAR study area to prepare for the development of buildings, roadways, stormwater, public improvements, and landscaping. This grading required approximately 600,000 cubic yards of cut and 700,000 cubic yards of fill. Similar activities will take place within the southern portion of the study area." Under Minnesota Statute 116D.04, subdivision 2b, work is strictly prohibited from commencing before the environmental review process is finalized. The developer must not commence any further work on the site prior to completion of the environmental review process and prior to obtaining relevant permits.

**Item 12: Water Resource – Wastewater** *(Roger Janzig, 651-602-1119)*
Clarify if the Greenbelt area is going to be developed. The AUAR is not clear as to if this area is contemplated for development as Business Park or if the areas will be permanent open space. If this area is to be developed, a comprehensive plan amendment will be needed to bring the area into the 2030 MUSA.

**Item 12: Water Resources- Surface Water** *(Eric Wojchik, 651-602-1330)*
The Council encourages the project proposer to continue to work with The Carver County Water Management Organization (CCWMO) on best management practices to protect and enhance the water resource quality of the Priority 1 Stream in the North of the site, which is a tributary of Chaska Creek. The project proposer should make every effort to reduce impervious surface across the site, especially near the stream, ponds, and wetland features that extend diagonally from the North/Northwest to the Southeast of the site. The project proposer should preserve and integrate the existing natural systems on site to retain terrestrial and aquatic habitat corridors.

**Item 12: Water Resources- Ground Water** *(Lanya Ross, 651-602-1803)*
The AUAR correctly acknowledges that the study area is not located within a wellhead protection area or a DWSMA; however, it notes that DWSMAs are located approximately 0.1 to 0.3 miles northeast and southeast of the study area (page 41 and Figure 15 on page 42). While the project is not currently within a DWSMA, the proximity to these areas suggests that any high-capacity pumping or significant land-use changes could potentially influence the capture zones of nearby municipal wells. The information is sufficient for current status, but the RGU should monitor upcoming updates to the City's Wellhead Protection Plan. Also, considering that regional groundwater flow direction is generally from northwest to southeast toward the Minnesota River

valley, it is worthwhile to identify and promote source water protection practices where development occurs up-gradient from the city's wells.

**Item 12 Water Resources- Water Appropriation** *(Lanya Ross, 651-602-1803)*
The AUAR provides information about the proposed source of water for the study area and how future demand compares to current capacity under two proposed scenarios (Page 50, Section 12.b.iii - Water Appropriation). While this information is generally sufficient to demonstrate system capacity exists to serve the proposed development under the scenarios presented, details on the specific "infrastructure improvements needed to expand capacity" mentioned in the Mitigation Plan remain vague and should be refined in the Final AUAR. For example, please clarify if the water demand reported in Table 13 (page 50) represents maximum day demand or average day demand, so that reviewers can correctly compare potential future demand against existing capacity.

**Item 14 Fish, Wildlife, Plan Communities, and Sensitive Ecological Resources (Rare Features)** *(Lanya Ross, 651-602-1803)*
The AUAR identifies a protected calcareous fen documented in the vicinity, over two miles from the site (page 59 and Appendix B). The document acknowledges that calcareous fens depend on groundwater upwelling and can be impacted by activities "several miles away," specifically citing groundwater pumping as a risk factor. The AUAR concludes impacts are unlikely but is missing technical information to confirm that the additional municipal demand and related groundwater pumping will not affect the specific aquifer serving the fen. This assessment should be refined in the Final AUAR.

**Item 18: Greenhouse Gas Emissions** *(MacKenzie Young-Walters, 651-602-1373)*
The discussion of projected greenhouse gas emissions is generally adequate; however, it is unlikely that an additional 1,000,000 square feet of building area and 70 acres of impervious surface could be constructed without out increasing the emissions from construction equipment. The assumptions underpinning the identical construction equipment emissions for Scenarios 1 and 2 should be re-examined. In addition to the listed mitigation measures, items like energy efficient building shells, solar ready design, and incorporating solar as an accessory use to allow for in-boundary energy generation should be considered. If on-site EV charging is not currently feasible, EV ready charging infrastructure could also be considered to lower the barriers to future EV charging stations.

The Council will not take formal action on the AUAR. If you have any questions or need further information, please contact MacKenzie Young-Walters, Principal Reviewer, at 651-602- 1373 or via email at MacKenzie.Young-Walters@metc.state.mn.us.

Sincerely,

Angela R. Torres, AICP, Senior Manager
Local Planning Assistance

CC: Tod Sherman, Development Reviews Coordinator, MnDOT - Metro Division
Deb Barber, Metropolitan Council District No. 4
Judy Sventek, Water Resources Manager
MacKenzie Young-Walters, Sector Representative/ Principal Reviewer
Reviews Coordinator

*N:\CommDev\LPA\Communities\Chaska\Letters\Chaska 2026 Big Woods Business Park Draft AUAR Admin Review 23132-2.docx*

Public Services
Planning and Water Management Dept
Government Center - Administration Building
600 East 4th Street
Chaska, Minnesota 55318
Phone: (952)361-1820
www.co.carver.mn.us

February 5, 2026

Elizabeth Hanson, AICP
City of Chaska

**RE: Big Woods Business Park AUAR**

Dear Ms. Hanson,

Carver County appreciates the opportunity to review and comment on the Big Woods Business Park Alternative Urban Areawide Review (AUAR). Please consider the following comments.

**Water Management Organization**

1. **Stormwater – Areawide Approach.** The County strongly encourages that the developer(s) for these areas consider an overall approach to stormwater management for the AUAR area. The developer(s) should coordinate with the city of Chaska and the County early in the development process on proposed stormwater management practices and siting. Protection or restoration of natural upland areas can be eligible for use as a volume control stormwater strategy (see item 4 for additional information).

2. **Stormwater –Adjacent property impacts.** Please note that the CCWMO reviews for potential stormwater related impacts to upstream and downstream properties. Please see below for a summary of requirements.

    a. **Upstream.** Drainage flowing onto the site from upstream areas must be managed and accommodated. Alterations to flow paths which impound or slow down water will not be allowed unless it can be shown that the upstream system can accommodate the change.

    b. **Downstream.**
        i. To the extent possible, existing drainage areas and discharge points from the site should be maintained post-development and concentrated flows onto neighboring properties should be avoided or mitigated. The downstream conveyance system (natural or structural) must be able to accommodate, to the nearest major receiving waterbody, increased volumes caused by development.
        ii. If diversions from existing drainage areas and alterations to discharge points are proposed, the responsible party shall provide additional documentation (rates, volumes, velocities, duration of flow, etc.) to demonstrate that the downstream conveyance system can accommodate the change. The responsible party shall provide evidence of easements or other agreements concerning water flow if a plan involves increased impervious or directing concentrated runoff onto a neighboring property.

**Land Management**

3. **Land use authority.** The majority of the proposed Business Park/Commercial development area is within land currently under the jurisdiction of the City of Chaska. While a small portion of the scoping document includes land in Dahlgren Township (under Carver County's land use authority), this area is identified in the Carver County 2040 Comprehensive Plan as a future growth area for the City of Chaska. It is also designated as a Transition Overlay District under the Carver County Land Use Map and Zoning Code.

   Accordingly, the proposed AUAR Scoping Document aligns with the identified future growth opportunities for the City of Chaska, the Dahlgren Township chapter of the Carver County 2040 Comprehensive Plan, and Carver County land use standards.

4. **Recommendation.** Explore including incorporating the small remnant acreage owned by Christy H Haasken Schuller Rev Trust (PUD #040010710 - east of County Road 11) into the AUAR plans as part of the city of Chaska's green belt or stormwater management plan for the site as a preservation area/volume control practice.

**Public Works**

5. **Right-of-way dedication.** Carver County Public Works requests right-of-way dedications along County Highways in accordance with the County Comprehensive Plan, along with any necessary intersection sight corners.

6. **Limit access to functional area of intersections.** Carver County Public Works requests that parking lot accesses be kept outside of the functional area of intersections on County Highways (160' or turn lane length, whichever is greater).

7. **CSAH 61 Access Point.** The proposed access point on CSAH 61 does not need to align with the entrance to the MnDOT garage but should be coordinated with Carver County Public Works to ensure adequate sight lines are maintained.

8. **Southern CSAH 11 Access Point.** The southern access point on CSAH 11 (between 11 and 44) should be coordinated with the City of Carver to ensure alignment and compliance with the Carver County Access Spacing Policy (0.25 miles from other intersections in this instance).

9. **Northern CSAH 11 Access Point.** The northern access point on CSAH 11 should be shifted slightly north in compliance with the same Access Spacing Policy. Exact location should be coordinated with both Carver County Public Works and the City of Carver to ensure compliance and compatibility with other future accesses.

10. **Traffic impacts from connecting CSAH 44 to Creek Road.** While the connection from CSAH 44 north to Creek Road is not a component of this proposed development, the projected traffic impact of making this connection should be explored. Such work should include any expected trip increases or decreases to County Highways with/without the connection and expected impacts on the necessary

improvements to CSAH 44. The existence of this connection was assumed in the justification of the existing US 212/CSAH 44 interchange.

11. **CSAH 44 Roundabout.** More information is needed regarding the necessity of the proposed roundabout on CSAH 44 between the existing interchange and the forthcoming CSAH 11/CSAH 44 roundabout. Options should be explored for linking access to the existing interchange roundabout. As this access does not, and cannot, meet Carver County's Access Spacing Policy requirements (0.25 miles) in this location but represents a necessary connection, analysis is needed demonstrating the lowest level of access and gradually stepping up from a right-in, right-out to ¾ intersection, to a full intersection without a roundabout, and finally a roundabout. Work should also include trigger points that would necessitate "stepping up" the intersection type (percent buildout, completion of connection to Creek Road, final land use, etc)

Thank you for considering these comments in the Big Woods Business Park Alternative Urban Areawide Review. Please contact us with any questions of clarification.

Sincerely,

Kristen Larson

Kristen Larson
Carver County Planning & Water Management

Metropolitan District
Waters Edge Building
1500 County Road B2 West
Roseville, MN 55113

February 26, 2026

Elizabeth Janson
City Planner
City of Chaska
One City Hall Plaza
Chaska, MN 55318-2101

SUBJECT: MnDOT Review # **AUAR26-002**
**Big Woods Business Park**
West Side US 212 north and south of Big Woods Blvd
Chaska, Carver County

Dear Ms. Janson:

Thank you for the opportunity to review the plans for the **Big Woods Business Park.** MnDOT has reviewed the documents and has the following comments:

***Access:***
The conversion of the current US 212 and Big Woods Blvd partial interchange to a full interchange (adding the southbound entrance and northbound exit ramps) was identified as a future improvement "when warranted by development." However, it should be noted that there is no MnDOT funding available for these improvements and MnDOT's funding for future interchange improvements is already tightly constrained. More discussion concerning the proposed ramps, including whether the improvements identified for the adjacent US 212 interchanges at CSAH 10 and CSAH 11 would be necessary if the Big Woods Blvd. ramps were constructed.

Similarly, the City may want to consider whether a connection to the Creek Road/Chaska Creek Blvd intersection provides an overall system benefit.

Questions about these comments should be directed to Bryant Ficek, MnDOT South Area Manager at bryant.ficek@state.mn.us or 651-443-2564.

***Water Resources:***
The AUAR area drains easterly to at least 3 culverts under US 212 that range in size from 24" - 42". The AUAR should note that they will need a MnDOT drainage permit for the development and flow rates to each culvert must be maintained. If the developer wishes to do early coordination with MnDOT they can contact Derek Beaudry of MnDOT's Water Resources at derek.beauduy@state.mn.us or 651-234-7534.

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Any projects adjacent to MnDOT Right-of-Way or connecting to MnDOT drainage facilities will require a MnDOT drainage permit to ensure that current drainage rates to MnDOT right-of-way will not be increased. The drainage permit application, including the information below, should be submitted online to: https://dotapp7.dot.state.mn.us/OLPA/.

The following information must be submitted with the drainage permit application:

1) A grading plan showing existing and proposed contours.
2) Drainage area maps for the proposed project showing existing and proposed drainage areas. Any off-site areas that drain to the project area should also be included in the drainage area maps. The direction of flow for each drainage area must be indicated by arrows.
3) Drainage computations for pre and post construction conditions during the 2, 10, and 100 year rain events.
4) Time of concentration calculations.
5) An electronic copy of any computer modeling used for the drainage computations.
6) See also the attached Drainage Permits Checklist for more information.

Once a drainage permit application is submitted, a thorough review will be completed and additional information may be requested.

Please direct questions concerning drainage issues to Derek Beauduy, MnDOT Metro Water Resources at (651-234-7534) or derek.beauduy@state.mn.us.

***Permits:***

As mentioned above a drainage permit will be required. Any other use of, or work within or affecting, MnDOT right of way will require a permit.

Permits can be applied for at this site: https://olpa.dot.state.mn.us/OLPA/. Please upload a copy of this letter when applying for any permits.

Please direct questions regarding permit requirements to Jeff Dierberger of MnDOT's Metro Permits Section at 651-775-0404 or jeffrey.dierberger@state.mn.us.

***Review Submittal Options***

MnDOT's goal is to complete reviews within 30 calendar days. Review materials received electronically can be processed more rapidly. Do not submit files via a cloud service or SharePoint link. In order of preference, review materials may be submitted as:

1. Email documents and plans to metrodevreviews.dot@state.mn.us. Attachments may not exceed 20 MB (megabytes) per email. Documents can be zipped as well. If multiple emails are necessary, number each email.

2. Files over 20 MB can also be uploaded to MnDOT's Web Transfer Client site: https://mft.dot.state.mn.us. Contact metrodevreviews.dot@state.mn.us, and staff will

create a shared folder in which files can be uploaded. Please send an accompanying email with a narrative for the development.

If you have any questions concerning this review, please contact me at (651) 234-7797 or Cameron.muhic@state.mn.us.

Sincerely,

Cameron Muhic
Principal Planner

**Copy sent via E-Mail:**

Jeff Dierberger, Permits
Derek Beauduy, Water Resources
Bryant Ficek, Area Manager
Mohamoud Mire, South Area Support
Tristan Trejo, Pedestrian/Bicycle
Douglas Nelson, Right-of-Way
Heather Gardner, Design
Almin Ramic, Traffic
Diane Langenbach, Area Engineer
Michael Kowski, Maintenance
Amrish Patel, Transit
Joe Widing, Metropolitan Council

# MnDOT Drainage Permits Checklist

## Purpose of the MnDOT Drainage Permit

MnDOT Metro District regulates activities that impact its drainage systems and its MS4 regulated area. The purpose of the Drainage Permit is to protect State of Minnesota investment in infrastructure including but not limited to roadways, storm water treatment basins, ditches and storm sewer systems. Excess storm water and/or sediment laden storm water added to MnDOT's drainage systems leads to degradation of these assets. Negative impacts include but are not limited to: sediment deposition, loss of flood storage capacity and also loss of hydraulic conveyance capacity. These impacts may cause premature flooding of the road surface and/or erosion damage on State right-of-way.

## Technical Requirements of the MnDOT Drainage Permit

The permit applicant shall demonstrate that offsite runoff coming to MnDOT drainage system and/or right-of-way will not increase as a result of the proposed project. This is quantified as a "no increase in discharge" criteria for the 2-year, 10-year and 100-year storm events. Compliance is demonstrated by applying hydraulic/hydrologic software models. HydroCAD and XPSWMM are the approved models to compare the pre and post project discharge values. Typically, HydroCAD is sufficient to model most proposed projects. However, XPSWMM may be required if the project contains extensive storm water pipe systems connected to MnDOT storm sewer or if HydroCAD cannot in MnDOT's judgment effectively model pressure flow, complex junctions and/or backwater effects that are present. The 2-year, 10-year and 100-year storm events shall be based upon Atlas 14 runoff amounts per the NOAA website.

In addition, Drainage Permit Applicants shall meet all applicable water quality treatment requirements established by the local Watershed District(s) and the MPCA.

Permit applicants should anticipate that specific projects that seek to divert runoff to another sub-watershed or watershed will be denied. It is MnDOT practice to avoid such watershed diversions whenever practicable.

### Submittal Requirements:

- Readable/legible watershed maps that show pre and post project drainage conditions. These two separate contour maps shall be large enough in scale so that approximate flow paths can be determined for verifying the Time of Concentrations used in the models. The drainage/watershed maps shall include enough detail so that Curve Numbers used in the hydraulic models may be verified by MnDOT.

- Surface water flow direction and storm water pipe water flow direction shall be indicated on the pre and post project watershed maps.

- Minimum recommended watershed map scale is 1" =100'. Project applications submitted with smaller scales (e.g., 1"=500') may be rejected and returned to the applicant. The same would apply for project watershed maps that do not include topographic contours or basic land use information such as the location of buildings, pavement and "green space". Watershed maps submitted as pdf files or CAD files shall be readily printable at scales that allow for good readability.

- Pre and post project watershed maps shall be clearly linked to the drainage models such that the names of the sub-watersheds, ponds and drainage structures are the same in the models as shown on the watershed maps. In addition, watershed and sub-watershed boundaries shall be clearly shown.

- Submission of the actual pre and post project HydroCAD or XPSWMM models is required: pdf copies of the drainage model simulations are unacceptable. In the event that the models cannot be transferred readily by electronic mail or electronic repository site, a hardcopy CD shall be provided.

- Curve numbers shall be determined per NRCS methodology and should be modified as needed based upon detailed knowledge of soil type and specific conditions on site. HydroCAD modeling software includes NRCS guidance for determining curve numbers based upon land use and condition.

- Time of concentration (Tc) computations and assumptions that in MnDOT's assessment clearly overestimate or underestimate this critical runoff parameter will be rejected. Two common assumptions that lead to overestimating Tc include: using the "Lag/CN" method to determine peak runoff from watersheds that have a relatively long and/or diverse flow path, and assuming that sheet flow occurs for a distance exceeding100 feet. Conversely, pre-project Tc shall not be underestimated to offset post project increases in peak discharge.

- Available freeboard for existing and proposed treatment ponds shall be shown on the watershed maps as well as the normal and 100-year high water levels. All proposed pond treatment systems along MnDOT right-of-way shall have a minimum freeboard of 2.0 feet between the road surface and the proposed 100-year HWL.

- Infiltration basins, filtration basins and ponds adjacent to MnDOT right-of-way shall be designed to provide at least 2 feet of elevation difference between the 100-year HWL and the crest of the basin berm. The berm crest shall be at least 5 feet wide. The emergency overflow shall be lined from crest to toe of slope with Turf Reinforcement mat or Category 6 or 7 Erosion Control Blanket.

- Best management practices (BMP's) including infiltration/filtration sites, storm water ponds, etc. shall be clearly labeled on the pre and post project watershed maps.

- Plan sheets submitted as watershed maps shall be evaluated as such. They shall be readable and legible and meet all the same requirements including clear delineation of watershed boundaries, readable map scale, and land use shown by an aerial photo background map, or that is clearly depicted based on details on the plan sheet or sheets submitted.

- Project plan sheets relevant to the Drainage Permit are required and include: existing site conditions, the proposed grading plan as well as proposed site drainage system plans and profiles. The plans shall include applicable wetland impact/mitigation features and temporary sediment and erosion control measures for the project. In addition, erosion control blanket will be used to stabilize disturbed area on MnDOT right-of-way unless other methods such as rip-rap treatment are called for in the plans and approved by MnDOT.

- Pond and basin special structures including weirs and orifices shall be consistent with what is used in the HydroCAD or XPSWMM models submitted and include relevant calculations/details.

- A table summary of existing versus proposed site discharge to MnDOT drainage system/right-of-way is required for the 2-year, 10-year and 100-year Atlas 14 rainfall events.

- Post project storm water discharge to MnDOT ditches or other open channel shall be limited to flow velocities of 6 fps or less for a 50-year Atlas 14 rainfall event.

- Project discharge points that will connect to MnDOT ditch or channel shall be located such that they do not cause erosion or conflict with the grade of the existing ditch or channel.

- Proposed access road culverts on MnDOT right-of-way shall be designed for the 10-year Atlas 14 rainfall event unless they are part of a significant drainage ditch along the roadway in which case a 100-year or 50-year design will apply.

- Direct connections to MnDOT storm system shall be avoided. Connection to open ditch, or channel is preferred. If direct storm sewer connections cannot be avoided, it is the applicant's responsibility to provide a good connection typically via a new structure. Furthermore, MnDOT offers no warranty that there will not be a hydraulic backwater effects on the new storm line upstream that is connected to MnDOT's existing storm sewer.

- For all disturbed areas that sheet flow to MnDOT right-of-way and any disturbed areas within MnDOT right-of-way, either Erosion Control Mat or Bonded Fiber Matrix shall be used for temporary/permanent erosion control.

- Silt fence shall not be used for erosion control at the proposed project site perimeter. Rather, continuous Wood Chip or compost Sediment Control Logs shall be implemented.

Permit applicants are encouraged to contact MnDOT Metro Water Resource Engineering with questions/concerns. Questions posed early in the permit application process help to avoid project delays. This is particularly true for large project Drainage Permits with significant complexity.