FORD SITE

A 21st Century Community

DRAFT ALTERNATIVE URBAN AREAWIDE REVIEW (AUAR)

AUGUST 2019

Prepared for SAINT PAUL In cooperation with RYAN

Prepared by Kimley»Horn

Table of Contents

List of Figures

List of Tables

List of Appendices

Draft Alternative Urban Areawide Review

This Alternative Urban Areawide Review (AUAR) follows the format of an Environmental Assessment Worksheet (EAW) (July 2013 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

Ford Site

2. Proposer

Proposer: Ryan Companies US, Inc. (Ryan)
Contact Person: Tony Barranco
Title: Senior Vice President of Real Estate Development
Address: 533 South Third Street, Suite 100
City, State, ZIP: Minneapolis, MN 55415
Phone: 612-492-4339
Email: tony.barranco@ryancompanies.com

3. RGU

RGU: City of Saint Paul
Contact Person: Menaka Mohan
Title: Ford Site City Planner
Address: 25 W 4th Street
City, State, ZIP: Saint Paul, MN 55102
Phone: 651-266-6093
Email: FordSitePlanning@ci.stpaul.mn.us
Website: stpaul.gov/Ford-auar

4. Reason for EAW Preparation

AUAR Guidance: Not applicable to an AUAR.

5. Project Location

County: Ramsey
City/Township: Saint Paul
PLS Location (¼, ¼, Section, Township, Range): NE ¼ and SE ¼ of Section 17, Township 28N, Range 23W
Watershed (81 major watershed scale): Mississippi River – Twin Cities
Tax Parcel Number: 123-172823130002, 123-172823110092, 123-172823410001, 123-172823410002

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 and Figure 3)
- **Cover type map as required for Item 7** (see Figure 5)
- **Land use and planning and zoning maps as required in conjunction with Item 9** (see Figure 3)

Figure 1: USGS Map

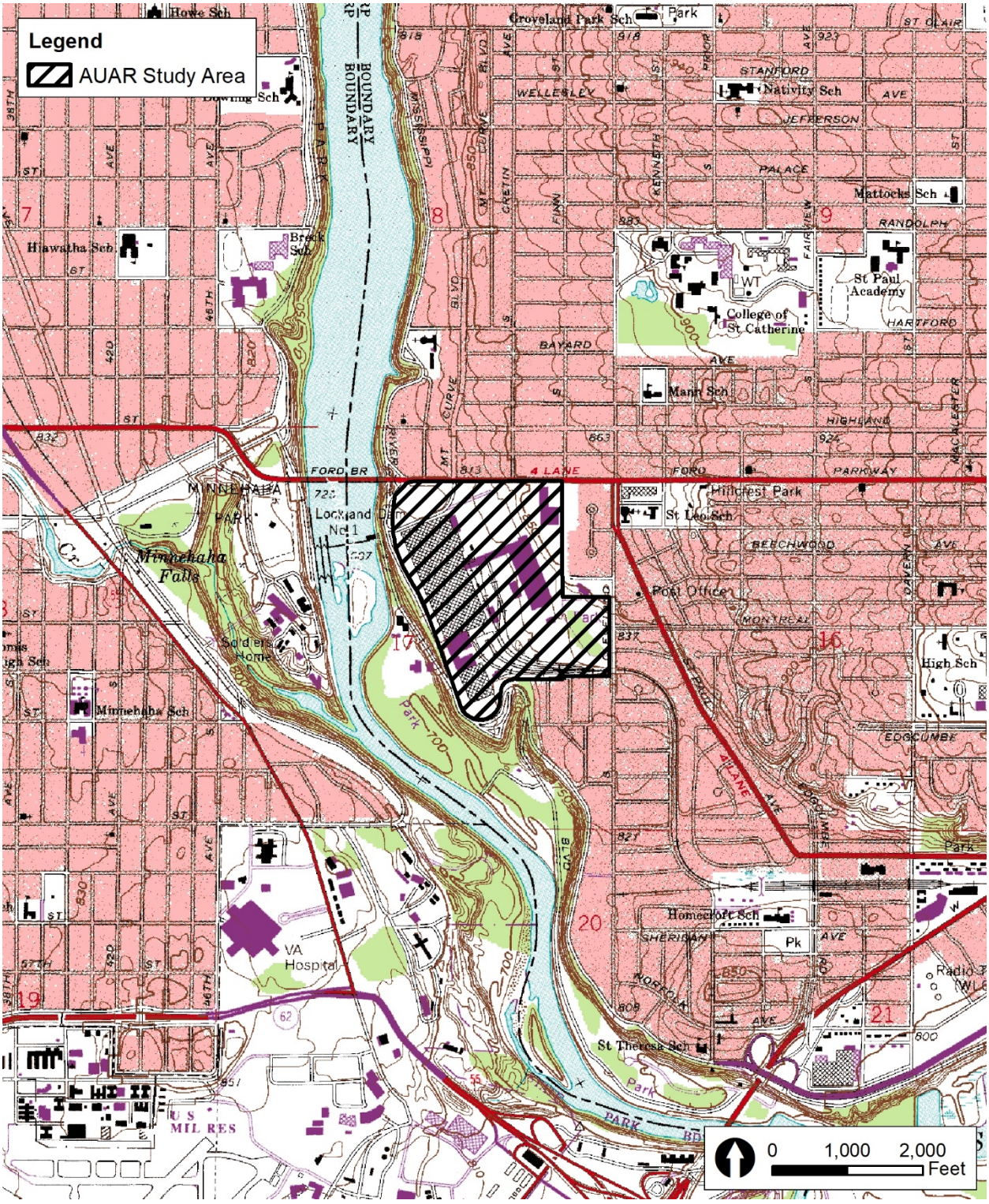
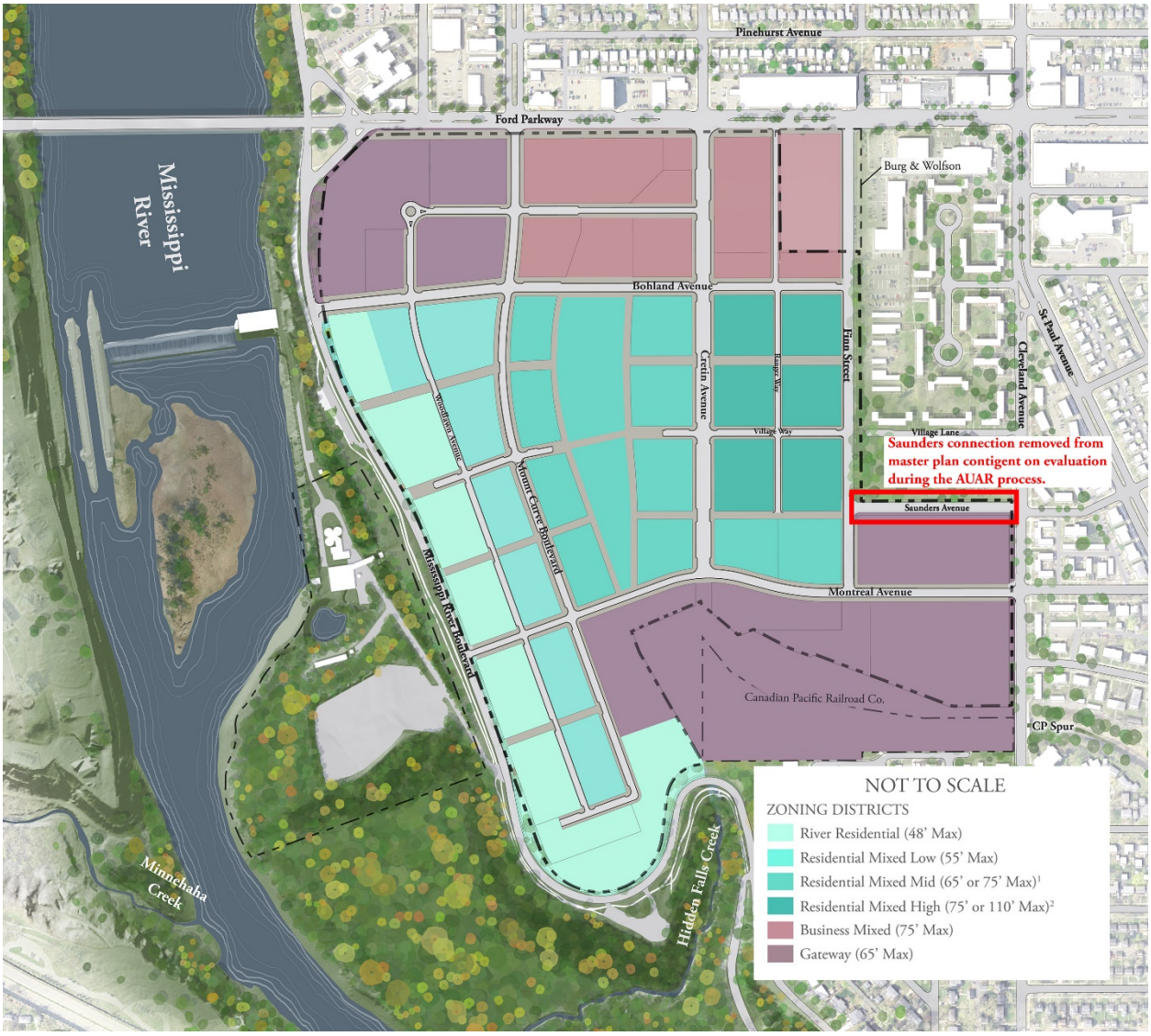


Figure 2: AUAR Study Area

Figure 3: *Ford Site Zoning and Public Realm Master Plan* Zoning Map



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 four parcels totaling approximately 139 acres, all of which are covered in the *Ford Site Zoning and Public Realm Master Plan* (Ford MP) adopted by the Saint Paul City Council on September 27, 2017 and amended on April 10, 2019. The four parcels, shown on Figure 2, include:

- One 122-acre parcel referred to as the Ford Site
- One 4-acre parcel referred to as the Burg & Wolfson (Lunds & Byerlys) property
- Two parcels totaling 13 acres referred to as the Canadian Pacific Railway property

Ryan Companies US, Inc. (Ryan) is proposing to redevelop the 122-acre Ford Site, which is the location of a former Ford Motor Company assembly plant (see Figure 2). The proposed development would include residential, retail/service, office/employment, and civic/institutional land uses. The Burg & Wolfson (Lunds & Byerlys) property and Canadian Pacific Railway property are also included in the Ford MP, but there are currently no development proposals for those properties.

Two development scenarios were evaluated in the AUAR as outlined in Table 1. These scenarios and the study area are consistent with the Ford MP. The Ryan Development Scenario represents the density of the development proposed by Ryan on the Ford Site (illustrated in Figure 4). The Master Plan Maximum Development Scenario represents the maximum density allowed under the current regulating documents on all four parcels within the study area.

Table 1: Development Scenarios

Land Use	Ryan Development Scenario	Master Plan Maximum Development Scenario
Residential (dwelling units)	3,800	4,000
Retail and Service (square feet of gross floor area)	150,000	300,000
Office and Employment (square feet of gross floor area)	265,000	450,000
Civic and Institutional (square feet of gross floor area)	50,000	150,000

Figure 4: Ryan Development Scenario

The intent of the AUAR is to identify the worst-case potential impacts and the mitigation measures that may be taken to compensate for those impacts.

Ryan Development Scenario and Master Plan Maximum Development Scenario

In both development scenarios, infrastructure improvements are proposed in the study area to serve the needs of future development. Six main access points are proposed, including Cretin Avenue, Mount Curve Boulevard, and Finn Street off Ford Parkway, Montreal Avenue and Bohland Avenue off Mississippi River Boulevard, and Montreal Avenue off Cleveland Avenue. The internal street network will follow what is outlined in the Ford MP and is shown on Figure 3 and Figure 4. Off-site roadway improvements to be considered under each scenario are discussed under Item 18: Transportation.

The site will also contain a system of wet and dry utilities (*i.e.*, water, sewers, electric, gas, telecommunications), some of which are currently located within the AUAR study area and others will be constructed along the proposed city street network. The developer,[1] in conjunction with the City, will construct the public utilities, including the roadway network needed for the proposed development. Public right-of-way drainage and utility easements will be made available for private utilities (gas, electric, and telecommunications). All utilities will be constructed underground per City ordinance. Stormwater management will be developed on site to manage run-off and provide treatment (see Item 11: Water Resources for more information).

Infrastructure improvements will be constructed consistent with City of Saint Paul requirements and all applicable standards. New watermain and sanitary sewer piping will be constructed along with stormwater piping, stormwater basins and filtration basins, public roadways, trails, and sidewalks needed for the development.

Construction of the proposed development within the AUAR study area is anticipated to start in late winter 2019 or early spring 2020 and will be ongoing for the next 10 to 15 years, subject to market conditions.

7. 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.*

[1] Developer refers to the entity that proposes development on the properties within the AUAR study area.

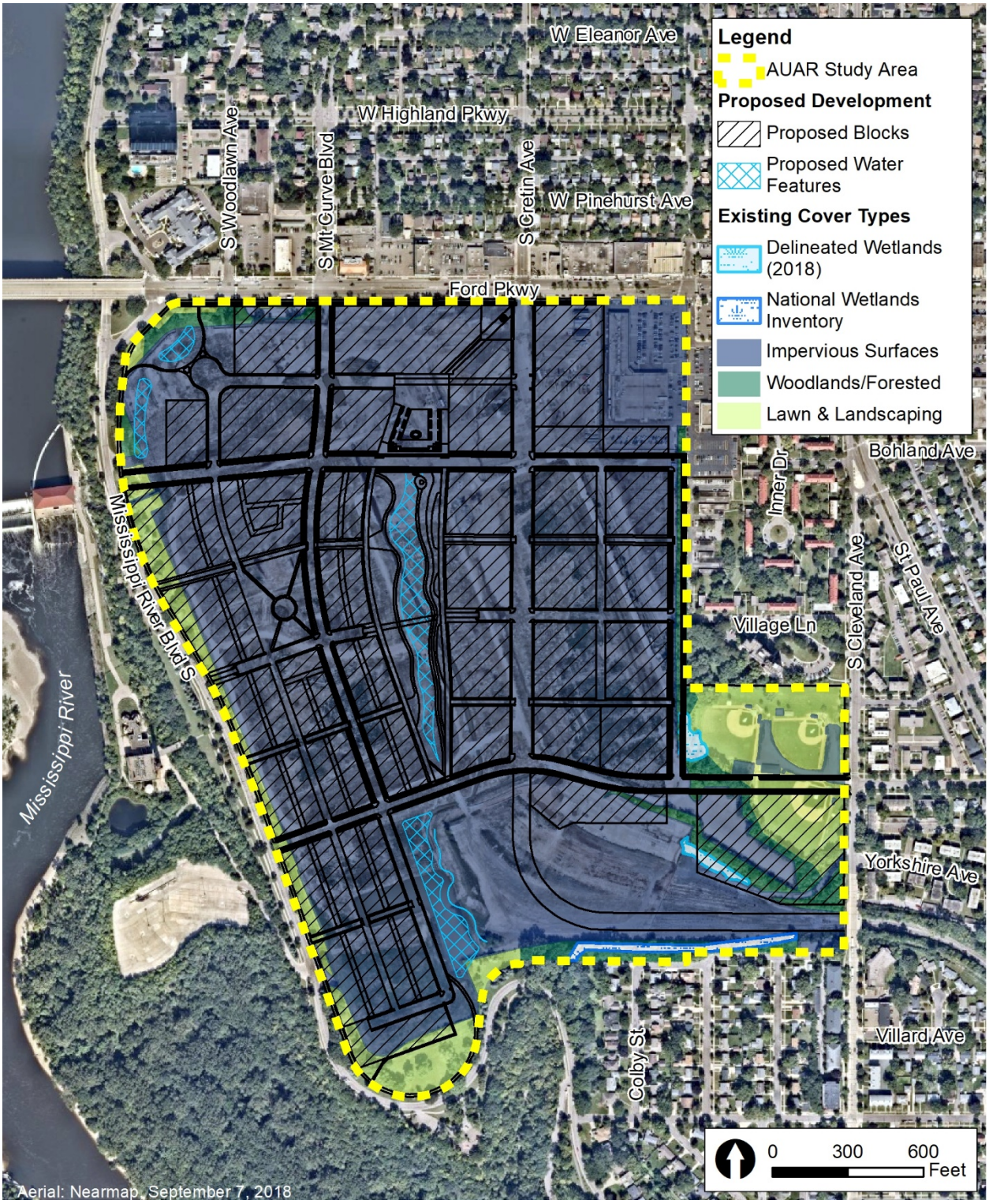
The AUAR study area is approximately 139 acres of urban land. Approximately 122 acres of the AUAR study area (excluding the Burg & Wolfson (Lunds & Byerlys) property and Canadian Pacific Railway property) were cleared of prior improvements for redevelopment. Existing cover types within the study area are summarized in Table 2 and are shown on Figure 5. For the purposes of the AUAR, the site prior to demolition of the Ford Motor Company assembly plant is considered the existing condition. The proposed development scenario is shown on Figure 6.

Table 2: Existing and Proposed Cover Types

Cover Type	Pre-Demolition (Existing Conditions) (acres)	Post-Demolition (2019) (acres)	Ryan Development Scenario (acres)	Master Plan Maximum Development Scenario (acres)
Impervious	118.2	37.0	105	105
Woodlands/Forested	5.9	5.9	1.1	0
Lawn and Landscaping	13.8	92.9	27.7	29.4
Wetlands	1.1	1.1	0.6	0
Stormwater Treatment/ Water Feature	0	2.1	4.6	4.6
TOTAL	139	139	139	139

Figure 5: Existing (Pre-Demolition) Cover Types

Figure 6: Existing Cover Types with Proposed Development Overlay



8. 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.

Anticipated permits and approvals for both development scenarios are listed in Table 3.

Table 3: Anticipated Permits and Approvals

Unit of Government	Type of Application	Status
Federal		
Federal Aviation Administration	Obstruction Evaluation/Notice of Proposed Construction or Alteration (Form 7460-1)	To be applied for
US Army Corps of Engineers	Section 404 Approval	To be applied for
	Wetland Delineation Concurrence	To be applied for
State		
Minnesota Department of Natural Resources	Temporary Water Appropriation Permit for Construction Dewatering	To be applied for
Minnesota Pollution Control Agency	National Pollutant Discharge Elimination System Stormwater Permit for Construction Activities	To be applied for
	Sanitary Sewer Extension Permit	To be applied for
	Construction Contingency Plan Approval	To be applied for, if needed
	Section 401 Water Quality Certification	To be applied for, if needed
Minnesota Department of Health	Watermain Installation Permit	To be applied for
Local		
Metropolitan Council	Sanitary Sewer Extension Permit	To be applied for
	Sanitary Sewer Permit to Connect	To be applied for
Capitol Region Watershed District	Permit for Stormwater Management, Erosion and Sediment Control, Wetland Management	To be applied for
Saint Paul Regional Water Services	Plumbing Permits	To be applied for
	Watermain Installation	To be applied for
Ramsey County	Right-of-Way Permits	To be applied for
	Road Access Permits	To be applied for
City of Saint Paul	Alternative Urban Areawide Review	In process
	Site Plan Review	To be applied for
	Preliminary & Final Plat	To be applied for
	Development Agreements	To be applied for
	Sign Permits	To be applied for
	Building Permits	To be applied for
	Excavation and Grading Permits	To be applied for
	Certificate of Occupancy	To be applied for
	Ordinance Permit for Construction of Public Improvements	To be applied for

Unit of Government	Type of Application	Status
	Right-of-Way Excavation and Obstruction Permits	To be applied for
	Sewer Utility Connection Permits	To be applied for
	Wetland Conservation Act Approval	To be applied for

9. Land Use

a. Describe:

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

The AUAR study area consists of four parcels, one of which is the former location of a Ford Motor Company assembly plant. The plant operated from 1925 to 2011 and was decommissioned in 2014 and 2015, including the demolition of buildings and the removal of a majority of the slabs and subsurface structures. The majority of the study area is disturbed land with a strip of grass and trees around the edge. The Ford Little League Field, which includes three baseball fields, is in the southeast corner of the study area along Cleveland Avenue and is part of the Ford Site property. The other three parcels are adjacent to the former Ford Motor Company assembly plant and include two existing railyard parcels owned by Canadian Pacific Railway and the parcel owned by Burg & Wolfson (Lunds & Byerlys) in the northeast corner of the AUAR study area (see Figure 2).

Ford Parkway (County-State Aid Highway 42) borders the study area to the north. There is a row of commercial and office buildings on the north side of Ford Parkway and residential further to the north. The area between the AUAR study area, Ford Parkway, and Cleveland Avenue includes retail/commercial uses and multi-family residential. East of Cleveland Avenue is multi-family and single-family residential (see Figure 7).

To the west of the study area is a parcel owned by Ford Motor Company that contains a vacant steam plant, vacant wastewater treatment plant and a former waste disposal area, all of which served the assembly plant on the main parcel.

To the southwest is Hidden Falls Regional Park and to the northwest is Mississippi Gorge Regional Park, both of which are managed by the City of Saint Paul. A trail to the west of the study area is part of both the Saint Paul Grand Round and the Mississippi River Trail (see Figure 7).

Portions of the AUAR study area are located within the Mississippi National River and Recreation Area (MNRRA). The boundary of the Mississippi River Corridor Critical Area (MRCCA) is the same as the MNRRA boundary (see Figure 8 for boundary). The MNRRA boundary includes 54,000 acres of river and adjoining land along a 72-mile stretch of the Mississippi River. The purpose of MNRRA is to preserve, enhance, and protect the river corridor while providing a tool for coordinated planning and management. The MNRRA Comprehensive Management Plan (CMP) provides guidance for actions within the MNRRA boundary. The State of Minnesota also designated the Mississippi River corridor as a critical area in 1976 with State Executive Order No. 79-19. Both the

Ryan Development Scenario and Master Plan Maximum Development Scenario are generally consistent with MNRRA Plan policies. One of the relevant policies of the CMP is to "provide for continued economic activity and development." The plan also states: "in downtown areas and historic districts, development will be more visible but still complement the aesthetics of the river corridor, appealing to area residents and serving as an attraction to visitors to the metropolitan area" and that "this plan recognizes the importance of economic activities and provides for the commercial use of the corridor consistent with the MNRRA legislation."

When specific building plans within the MNRRA boundary are finalized, proposed site plan(s) would be reviewed for compatibility with the MNRRA CMP and the City of Saint Paul's zoning provisions for the RC3 River Corridor Urban Open Overlay District as part of the city's site plan review.

There is no farmland within or adjacent to the study area.

Figure 7: Parks and Trails

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.

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.

The Ford MP was developed specifically for this site and was adopted by the Saint Paul City Council on September 27, 2017. Amendments to the Ford MP were adopted by the City Council on April 10, 2019. The Ford MP defines minimum and maximum development for the site, and the Ryan Development Scenario would be within the range defined in the Ford MP. Figure 3 shows the anticipated land use within the study area.

A portion of the AUAR study area is within the MRCCA, which is a joint state, regional, and local program that provides coordinated planning and management for the 72-mile stretch of the Mississippi River through the seven-county metropolitan area (see Figure 8). Within the AUAR study area, the boundary of the MRCCA is the same as the City of Saint Paul's RC3 River Corridor Urban Open Overlay District. The City of Saint Paul has developed its draft MRCCA Plan as part of the City's 2040 Comprehensive Plan, which has been submitted to the Metropolitan Council for review. The City of Saint Paul is also proceeding with its review of the Minnesota Department of Natural Resources' (DNR) draft model MRCCA zoning ordinance for potential adoption by the City.

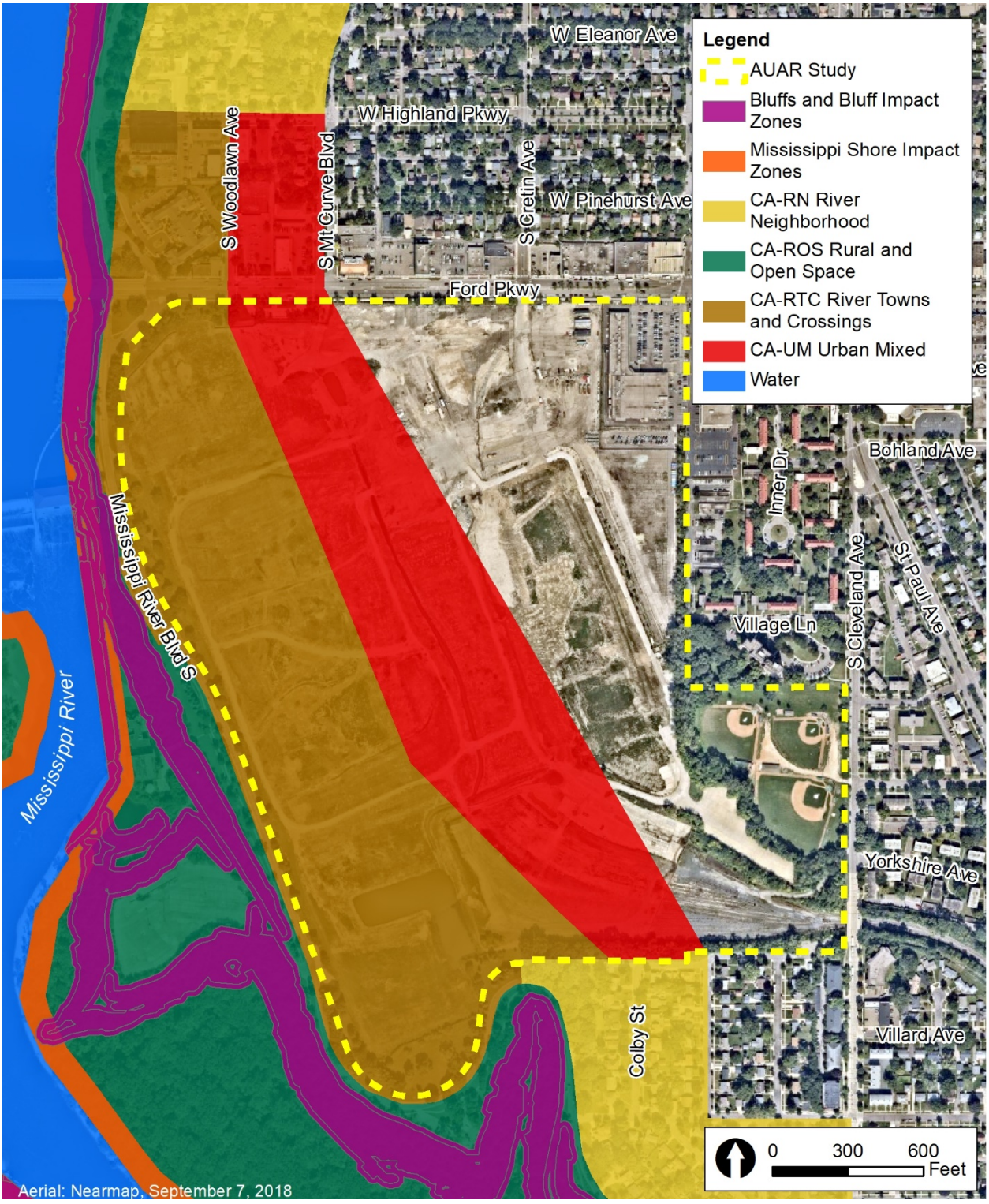
Based on the June 5, 2019 draft of the MRCCA Plan, both the Ryan Development Scenario and Master Plan Maximum Development Scenario are generally consistent with MRCCA Plan policies. One of the relevant guiding principles of the plan related to development in the MRCCA is Policy CA-1: Guide land use and development activities consistent with the management purpose of each of the MRCCA Districts. The two districts that are within the proposed development are CA-RTC River Towns and Crossings and CA-UM Urban Mixed (see Table 4 for a description of District requirements and Figure 8 for location). The land uses proposed within the CA-UM District are consistent with the intent of the District, which includes a mix of uses, including institutional, commercial, industrial, and residential areas and parks and open space. Development within the CA-RTC District is intended to provide "more intensive redevelopment in limited areas at river crossings to accommodate compact walkable development patterns and connections to the river… and minimize erosion and flow of untreated storm water in the river" (MRCCA, 2019). Consistent with the Ford MP, the scenarios propose lower building heights and less intense development within the CA-RTC District, and the proposed stormwater facilities will be designed to accommodate the new development runoff. The proposed stormwater facilities are described in Item 11: Water Resources.

Table 4: MRCCA District Requirements

District	Description	Maximum Building Height	River Setback	Bluff Setback
CA-UM	Includes large areas of highly urbanized mixed use that are a part of the urban fabric of the river corridor, including institutional, commercial, industrial, and residential areas and parks and open space. The CA-UM district must be managed in a manner that allows for future growth and potential transition of intensely developed areas that does not negatively affect public river corridor views and that protects bluffs and floodplains. Restoring and enhancing bluff and shoreline habitat, minimizing erosion and flow of untreated storm water into the river, and providing public access to and public views of the river are priorities in the district.	65 feet[2]	50 feet	40 feet
CA-RTC	Characterized by historic downtown areas and limited nodes of intense development at specific river crossings, as well as institutional campuses that predate designation of the Mississippi River and that include taller buildings. The CA-RTC district must be managed in a manner that allows continued growth and redevelopment in historic downtowns and more intensive redevelopment in limited areas at river crossings to accommodate compact walkable development patterns and connections to the river. Minimizing erosion and the flow of untreated storm water into the river, providing public access to and public views of the river, and restoring natural vegetation in riparian areas and tree canopy are priorities in the district.	48 feet[2]	75 feet	40 feet

[2] Provided tiering of structures away from the Mississippi River and from blufflines is given priority, with lower structure heights closer to the river and blufflines, and that structure design and placement minimize interference with public river corridor views.

Figure 8: MRCCA Districts



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

The study area was previously zoned as light industrial and was rezoned as part of the Ford MP and related amendments to the city zoning code. The study area now contains six zoning districts identified in the adopted Ford MP as summarized in Table 5 and shown in Figure 3.

Table 5: Zoning District Summary

Zoning District	Description	Land Uses/Building Types	Building Heights	Floor Area Ratio
F1: River Residential	High quality design and residential form that is compatible with the look of Mississippi River Boulevard	Residential mix of single-family homes, multi-unit homes, and carriage houses	20 feet minimum 48 feet maximum	0.25 - 1.5
F2: Residential Mixed Low	Primarily residential with few business uses; lower density	Residential mix of primarily townhouses with some small multi-family	30 feet minimum 55 feet maximum	1.0 - 2.0
F3: Residential Mixed Mid	Primarily residential with some business uses; medium density	Predominantly multi-family residential, with limited retail, service, and office	30 feet minimum 65 feet maximum	1.0 - 4.0
F4: Residential Mixed High	Mix of residential and business uses; high density	Predominantly multi-family residential, with limited retail, service, and office	48 feet minimum 75 feet maximum	3.0 - 6.0
F5: Business Mixed	Primarily retail, office, and service with some multi-family residential	Primarily retail, service, and office with some multi-family	40 feet minimum 65 or 75 feet maximum	2.0 - 4.0
F6: Gateway	Attractive gateways into site, focused on employment with some retail, service, and housing	Office, institutional, retail, and service, mixed-use residential and multi-family residential	30 feet minimum 65 feet maximum	1.0 - 3.0

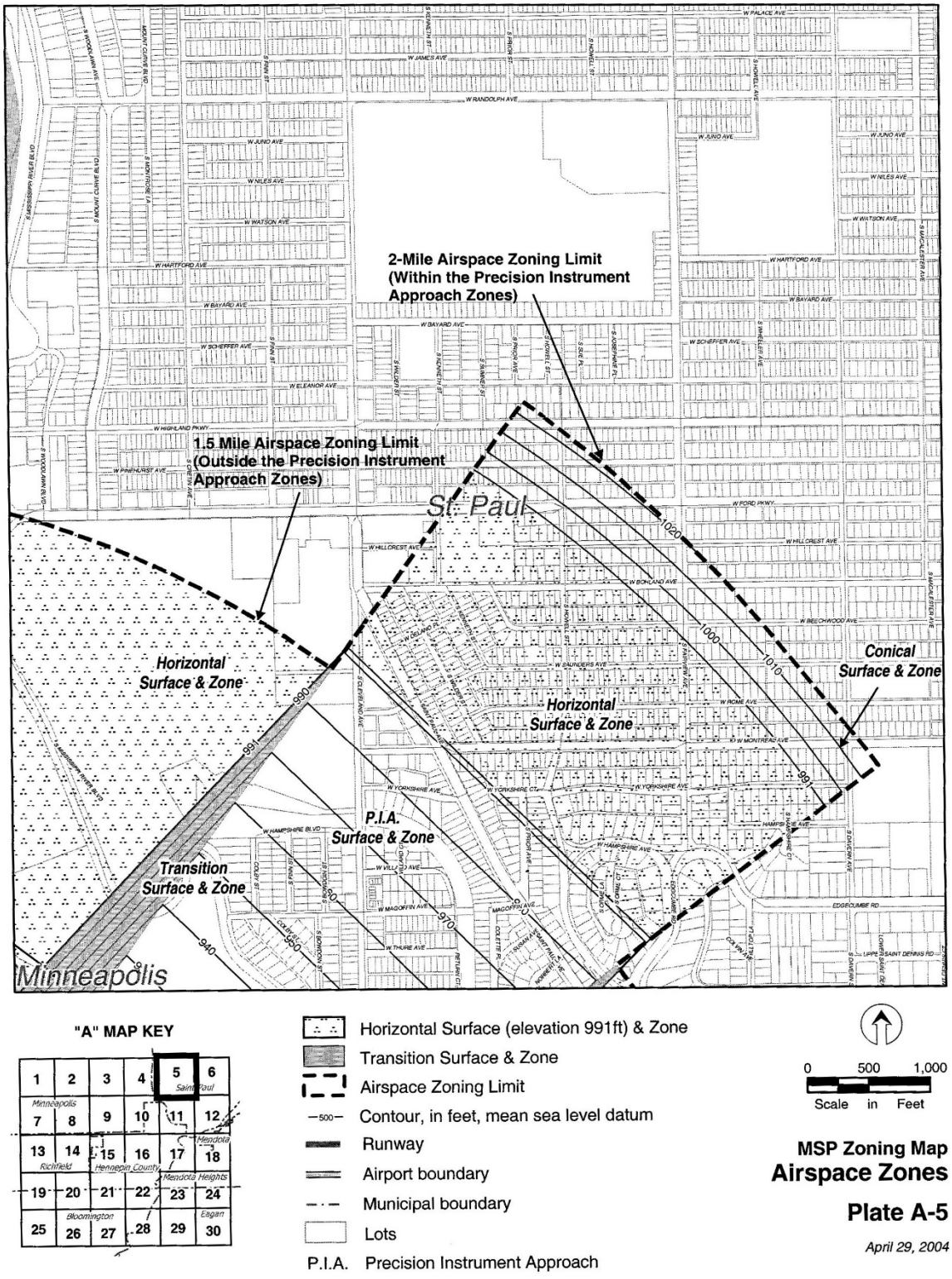
The dimensional standards for building heights stated in the Ford MP and underlying zoning districts (F2 Residential Mixed Low, F3 Residential Mixed Mid, F5 Business Mixed, and F6 Gateway) potentially exceed the MRCCA requirements related to building heights. The MRCCA Plan states that for this area: “Saint Paul will need to a strike a balance between the economic and social benefits of redevelopment and the natural, cultural and recreational resources of the Mississippi River. The City may pursue flexibility in building height and/or district designation in the MRCCA ordinance.” Within the AUAR study area, the underlying zoning districts (F2 Residential Mixed Low, F3 Residential Mixed Mid, F5 Business Mixed, and F6 Gateway) allow building heights 7-17 feet taller than those generally permitted in the CA-RTC and CA-UM districts. The City of Saint Paul’s RC3 River Corridor Urban Open Overlay District currently limits development to 40 feet in height within the same boundary as the CA-RTC and CA-UM districts.

No proposed development is within the MRCCA Shore Impact Zone or Bluff Impact Zone (see Figure 8). Structure setbacks from the Bluff Impact Zone is 40-100 feet from the top of bluff/bluffline. The Shore Impact Zone is identified as lands located between the ordinary high-water level of public waters and a line parallel to it at a setback of 50 percent of the requirement MRCCA district structure. The AUAR study area is 60 feet away from the closest point of both the Bluff and Shore Impact Zone.

The majority of the western half of the AUAR study area is within the Minneapolis-Saint Paul International (MSP) Airport Horizontal Surface Zone, which has a maximum building height of 110 feet. Both development scenarios would be consistent with this building height limit in all zoning districts (see Table 5). A portion of the AUAR study area by the Canadian Pacific Railway property is within Safety Zone B for the MSP Airport (see Figure 9). Land use safety zones are intended to restrict land uses that may be hazardous to the operational safety of aircraft using the airport and to protect the safety and property of people on the ground in the area near the airport. Within the boundaries of Safety Zone B, the following land uses are not allowed: churches, hospitals, schools, theaters, stadiums, hotels, motels, trailer courts, campgrounds, other places of frequent public or semi-public assembly, and ponds.

The proposed Ryan Development Scenario was sent to the Metropolitan Airports Commission (MAC) for review. The provided response from MAC concluded that the developer must file an aeronautical study (Form 7460-1) with the Federal Aviation Administration (FAA) for the proposed development (including all construction equipment and solar installations) to ensure that it will not have an adverse impact on the MSP Airport (see Appendix A for correspondence).

Figure 9: MSP Airspace Zones[3]



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

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 any of the development scenarios 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 various development scenarios studied, with emphasis on any incompatible elements.

Ryan Development Scenario and Master Plan Maximum Development Scenario

Both development scenarios are consistent with the adopted Ford MP. The proposed parks and trails included in the Ryan Development Scenario are compatible with adjacent land uses and make connections into the city and regional trail network. Existing bikeways adjacent to the site include an enhanced shared lane along Ford Parkway and an off-street path and bike lane along Mississippi River Boulevard. Several planned roads include protected bike lanes that connect the AUAR study area to these existing bike facilities via Mount Curve Boulevard, Bohland Avenue, Cretin Avenue, and Montreal Avenue.

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

Ryan Development Scenario and Master Plan Maximum Development Scenario

Both development scenarios are compatible with the Ford MP and the planned land use in the project vicinity.

10. Geology, Soils, and Topography/Land Forms

a. Geology – Describe the geology underlying the project area and identify and map any susceptible geologic features such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. Discuss any limitations of these features

[3] Source: *Minneapolis-St. Paul International Airport (Wold-Chamberlain Field) Zoning Ordinance.* Available at https://www.metroairports.org/Metroairports/media/Media/Documents/ordinances/JAZB_Ordinance_2004.pdf.

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.

The following sources were consulted for this section: geotechnical reports, Ramsey County Geologic Atlas (geologic atlas), Minnesota Well Index, and the Ramsey County Soil Survey.

The AUAR study area is underlain by stream sediment and hillside sediment. These deposits range from sand and gravel with some fine sediment (clay and silt) to angular bedrock fragments with fine sediments. The upper layer of sediment within the AUAR study area is fill material as a result of previous construction activities within the area. The fill materials range in depth from 0 to 22 feet below ground surface (bgs) and consist of silty sand, clayey sand, poorly-graded sand, and crushed concrete and limestone.

Bedrock is encountered at varying depths across the AUAR study area, ranging in depth from approximately 4 feet bgs on the western half to 22 feet bgs on the eastern half. Bedrock is comprised of the Decorah Shale underlain by the Platteville Limestone/Dolostone, Glenwood Shale, and St. Peter Sandstone formations. The AUAR study area sits on the river bluff, which is approximately 100 feet above the Mississippi River and adjacent parkland.

The uppermost aquifer is the St. Peter Sandstone formation, and groundwater is present at approximately 100 to 115 feet below the surface. Perched groundwater is present in the unconsolidated overburden at shallow depths; however, the lateral extent is discontinuous.

Based on the geologic atlas, there are no known sinkholes, unconfined/shallow aquifers, or karst conditions located within the AUAR 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 eight different soil types. The erosion hazard rating included in Table 6 indicates the hazard of soil loss from off-road areas after disturbance activities that expose the soil surface. Within the AUAR study area, most of the soils are either not rated or have a “slight” rating, meaning that erosion is unlikely under ordinary climatic conditions. One soil type, the Doreton –

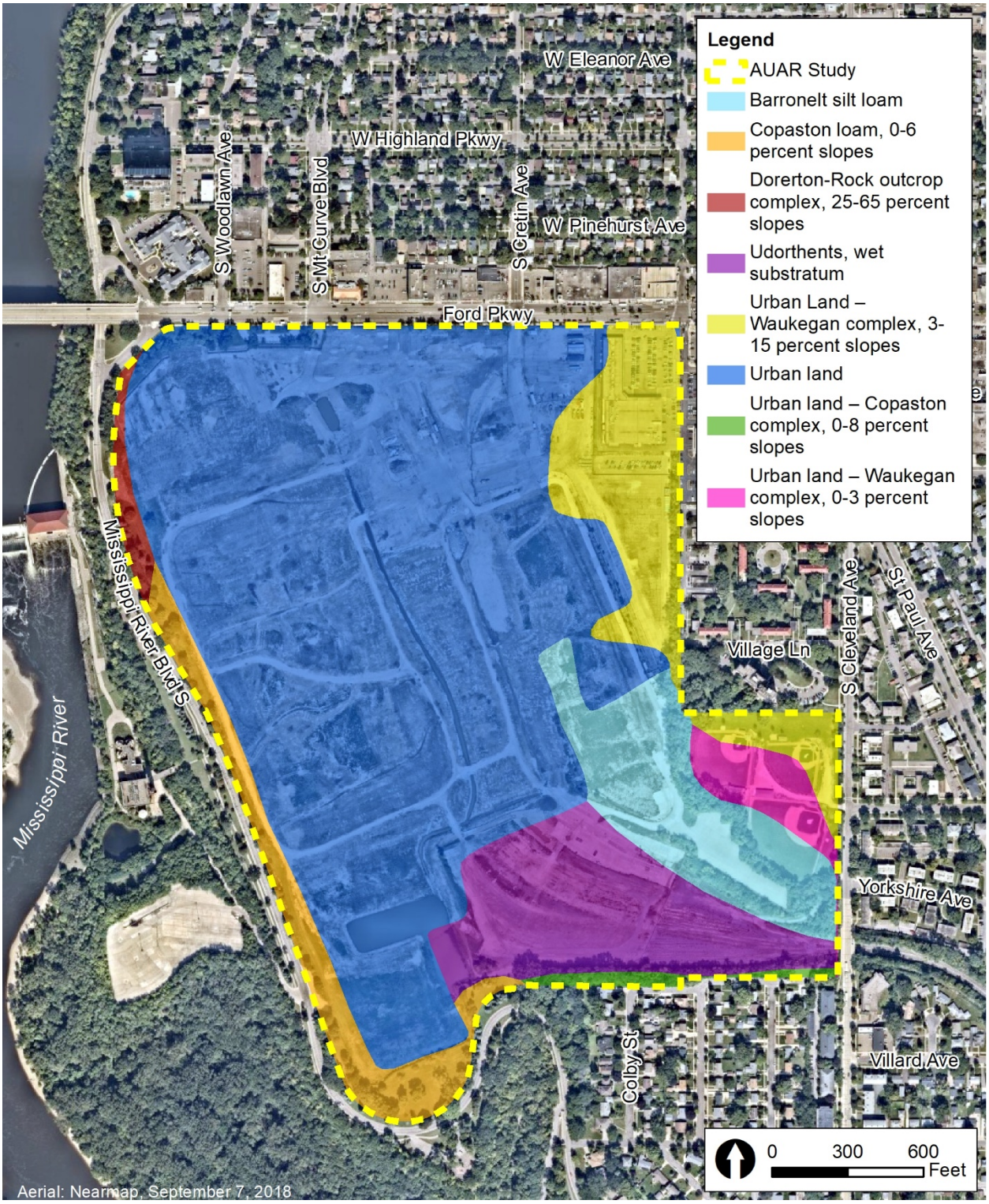
Rock outcrop complex, which is approximately 1 percent of the overall study area, has a moderate rating. The soils information is included in Table 6 and Figure 10.

Table 6: Soil Types

Soil Type	Map Unit Symbol	Acres within Study Area	Percent of Site	Erosion Hazard
Copaston loam, 0-6 percent slopes	100B	7.5	5.4%	Slight
Barronelt silt loam	456	12.1	8.7%	Slight
Urban land – Copaston complex, 0-8 percent slopes	852B	1.0	0.7%	Not rated
Urban land – Waukegan complex, 0-3 percent slopes	857	3.2	2.3%	Not rated
Urban Land – Waukegan complex, 3-15 percent slopes	857C	13.3	9.6%	Not rated
Udorthents, wet substratum	1027	14.9	10.8%	Not rated
Urban land	1039	85.1	61.5%	Not rated
Dorerton-Rock outcrop complex, 25-65 percent slopes	1819F	1.4	1.0%	Moderate

Geotechnical borings have been completed for the 122-acre Ford Site within the AUAR study area and found that the upper layer of soil consists of fill material. The overall site slopes from east to west with the existing surface elevations ranging from approximately 810 to 860 feet, with the highest elevations along the eastern property line. Grading activities within the site are anticipated to begin in late winter 2019 or early spring 2020. 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 Capitol Region Watershed District's and the City of Saint Paul's erosion and sediment control standards.

Figure 10: Soil Types



11. 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 scenarios, 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.

The AUAR study area is a highly disturbed urban area; however, based on the National Wetlands Inventory, updated by DNR in 2016, and a wetland delineation that was completed for the Ford Site parcel, approximately 1.14 acres of wetland are located within the AUAR study area (see Figure 11). The wetland delineation for the 122-acre Ford Site parcel will be submitted to the US Army Corps of Engineers and the City of Saint Paul for concurrence and approval.

There are no DNR Public Waters within the AUAR study area; however, the Mississippi River is in the vicinity of the study area's western boundary.

Historically, a creek was present within the AUAR study area and was buried (pre-1924) prior to construction on the Ford Site.

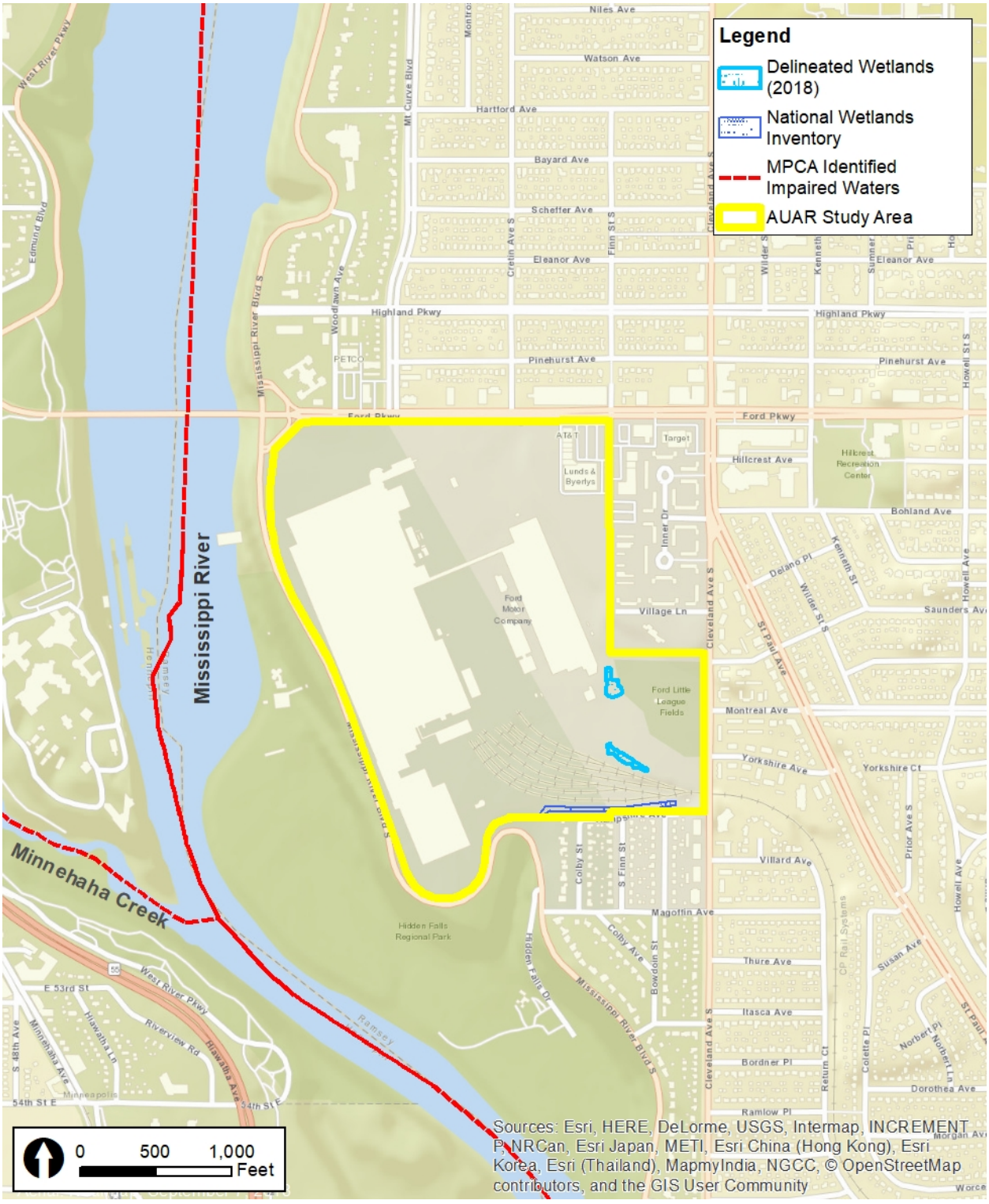
Two impaired waters on the Minnesota Pollution Control Agency's (MPCA's) Part 303d Impaired Waters List are within one mile of the study area (see Table 7).

Table 7: Impaired Waters

Impaired Waters	ID Number	Impairments
Mississippi River	07010206-814	Mercury, PCB, PFOS, Nutrients, Total Suspended Solids
Minnehaha Creek	07010206-539	Fecal Coliform, Chloride, Dissolved Oxygen, Fishes Bioassessments, Aquatic Macroinvertebrate Bioassessments

Drainage from the project area flows toward Hidden Falls Regional Park.

Figure 11: 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.

The depth to groundwater within the AUAR study area is 100 to 115 feet below the surface in the St. Peter Sandstone formation (uppermost aquifer). Perched water is present in the unconsolidated overburden at shallow depths; however, the lateral extent is not continuous. Seeps can be intermittently observed off site on the face of the bluff west of Mississippi River Boulevard.

According to the Phase I Environmental Site Assessment (ESA) completed in 2018 for the 122-acre Ford Site, there are three sealed wells and 14 monitoring wells that remain on the site. These wells are identified in Table 8. There are no verified wells located within the Burg & Wolfson (Lunds & Byerlys) or Canadian Pacific Railway properties.

Table 8: Wells Within the Ford Site Parcel[4]

Unique ID	Well Type
457647	Sealed
457646	Sealed
457645	Sealed
751336	Monitoring well
751335	Monitoring well
751330	Monitoring well
751332	Monitoring well
751333	Monitoring well
751339	Monitoring well
751331	Monitoring well
751337	Monitoring well
751334	Monitoring well
756581	Monitoring well
812978	Monitoring well
812977	Monitoring well
812976	Monitoring well
812975	Monitoring well

The AUAR study area is not located within a wellhead protection area or drinking water supply management area.

In November 2018, Ford Motor Company submitted their 2018 Supplemental Groundwater Monitoring Report to the MPCA. In the report, Ford Motor Company requested permission from the MPCA to abandon the groundwater monitoring wells on the 122-acre Ford Site parcel. Ford Motor Company is currently awaiting the MPCA's response to that request. All wells will be sealed and abandoned following Minnesota Department of Health (MDH) and MPCA protocol.

[4] Source: Terracon Consultants, Inc. Phase I Environmental Site Assessment. September 18, 2018.

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.

Existing sanitary sewers to serve the AUAR study area are located along Ford Parkway and Mississippi River Boulevard. These convey wastewater via city sanitary sewers to the Metropolitan Council interceptor system and eventually to the Metropolitan Wastewater Treatment Plant. The Metropolitan Council Wastewater Treatment Plant is an advanced secondary treatment plant with ultraviolet disinfection. The plant currently treats approximately 178 million gallons per day (GPD), with a total capacity of up to 314 million GPD according to the Metropolitan Council Environmental Services (MCES) Plant Inflow Summary Report for the period ending September 30, 2014. Thus, the existing plant has excess capacity (greater than 40 percent unused).

Ryan Development Scenario

Based on the MCES Sewer Availability Charge (SAC) program, the estimated daily flow for the Ryan Development Scenario is 0.586 million gallons per day (MGD). Based on a Ten States Standards peaking factor of 2.955, the estimated peak flow generated is 0.072 MGD (less than 1 percent of existing capacity). No land uses that would generate wastewater requiring pretreatment are anticipated. The proposed development scenario is consistent with the City's planned sanitary sewer usage as identified in the 2040 Comprehensive Plan. The City of Saint Paul Sewer Utility Division has confirmed that the regional treatment facility and the wastewater collection system have sufficient long-term capacity to handle the additional wastewater flow generated by the Ryan Development Scenario.

Master Plan Maximum Development Scenario

Based on the MCES SAC program, the estimated daily flow for the Master Plan Maximum Development Scenario is 0.669 MGD. Based on a Ten States Standards peaking factor of 2.934, the estimated peak flow generated is 0.082 MGD (less than 1 percent of existing capacity). No land uses that would generate wastewater requiring pretreatment are anticipated. The proposed development scenario is consistent with the City's planned sanitary sewer usage as identified in the 2040 Comprehensive Plan. The City of Saint Paul Sewer Utility Division has confirmed that the regional treatment facility and the wastewater collection system have sufficient long-term capacity to handle the additional wastewater flow generated by the Master Plan Maximum Development Scenario.

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.**

Not applicable.

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.**

Not applicable.

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

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.*

A network of below grade pipes remains today conveying stormwater runoff to Hidden Falls. The existing AUAR study area is divided into three main drainage areas with three discharge points from the Ford Site parcel. The existing storm sewer network in the AUAR study area vicinity eventually outfalls into Hidden Falls and the Mississippi River. The existing drainage areas are shown in Appendix B. The existing impervious areas total 118.3 acres within the AUAR study area. The AUAR study area currently has no treatment for stormwater runoff into the existing system.

Ryan Development Scenario and Master Plan Maximum Development Scenario

Both development scenarios will treat the stormwater on site and will comply with City and Capitol Region Watershed District rules and requirements for water quality, volume and rate control, and erosion control.

As required by the Capitol Region Watershed District and the City, the quantity and rate of stormwater runoff from the 2-, 10-, and 100-year rainfall events using the volume of 1.1-inch of runoff over the impervious of the site be retained on site. If infiltration of stormwater is not practical due to existing site conditions, filtration of stormwater will be used. The required runoff volume shall be multiplied by a factor of 1.82 (55 percent filtration credit). The incorporation of iron-enhanced sand into the filtration medium reduces the factor to 1.25 (80 percent filtration credit). The proposed development scenarios will also be required to incorporate effective non-point source pollution reduction best management practices (BMPs) to achieve 90 percent total suspended solids removal from the runoff generated by 2.5-inch rainfall event.

The National Pollutant Discharge Elimination System (NPDES) Stormwater Permit requires treatment of 1-inch of runoff for the new impervious area since more than one acre of disturbance will occur. This falls within the more stringent Capitol Region Watershed District Rule C Stormwater Management requirements.

Infrastructure will be built within the AUAR study area to convey stormwater to stormwater management areas to help achieve the appropriate water quality treatment. The proposed impervious surfaces for both development scenarios will be about 75 percent of the total acreage, which is about 105 acres.

For both development scenarios, the primary method of treatment will be retention ponds and sand filtration basins used for improving water quality.

Ryan Development Scenario

The AUAR study area has been divided into two proposed main drainage areas, both of which are located on the 122-acre Ford Site parcel. The proposed drainage areas are shown in Figure 12. The proposed stormwater management for the 122-acre Ford Site is also included in Appendix B. This shows the central stormwater retention feature along with filtration areas and other stormwater management areas located in the northwest corner of the AUAR study area. The central stormwater feature will discharge into the same outfall structure within the study area and ultimately into Hidden Falls Creek and to the Mississippi River. The northwest drainage area will ultimately discharge into the existing system. The new system will provide pretreatment and rate and volume control to improve water quality of runoff leaving the site and to prevent further sedimentation and erosion issues within Hidden Falls Creek.

The proposed stormwater management BMPs will be designed to comply with all City and Capitol Region Watershed District standards and with all maintenance/monitoring requirements of the City and watershed district.

Temporary erosion and sediment control measures will be implemented during construction. These could include any of the following: vegetative restoration, stormwater inlet protection, construction entrance protection, silt fence, temporary sediment basins, or bio-rolls.

Master Plan Maximum Development Scenario

Under the Master Plan Maximum Development Scenario, stormwater management on the 122-acre Ford Site would be as described above. However, the stormwater management system as described above for the 122-acre Ford Site is not designed to accommodate stormwater from the Burg & Wolfson (Lunds & Byerlys) or Canadian Pacific Railway properties. Development on these properties will be required to meet the same regulatory requirements identified above.

Figure 12: Ryan Development Scenario Proposed Drainage Areas

iii. Water Appropriation – Describe if the project proposes to appropriate surface or groundwater (including dewatering). Describe the source, quantity, duration, use, and purpose of the water use and if a DNR water appropriation permit is required. Describe any well abandonment. If connecting to an existing municipal water supply, identify the wells to be used as a water source and any effects on, or required expansion of, municipal water infrastructure. Discuss environmental effects from water appropriation, including an assessment of the water resources available for appropriation. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation.

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.

Construction dewatering may be required for the development of the AUAR study area. Construction activities associated with dewatering will include discharging into temporary sedimentation basins to reduce the rate of water discharged from the site, as well as discharging to temporary stormwater BMPs. Any temporary dewatering will require a DNR Temporary Water Appropriations General Permit 1997-0005 if less than 50 million gallons per year and less than one year in duration. It is anticipated that the temporary dewatering would only occur during utility installation and potential construction of building footings.

The water supply will be obtained from the municipal water supply system operated by Saint Paul Regional Water Services (SPRWS). SPRWS obtains water from the Mississippi River, which is filtered through a chain of lakes and drawn into the treatment plant from Vadnais Lake. The system also has 10 water supply wells, which obtain water from the Prairie du Chien and Jordan aquifers. These wells are typically only used for emergency backup or are run at limited volumes to help control temperature and odor from the surface water intakes. By only running the wells at these limited times, SPRWS is reducing the potential impact to the available groundwater supplies, relying instead on the available surface water supplies.

The AUAR study area does not currently have watermain infrastructure within the Ford Site to serve the needs of the proposed redevelopment. The Ford assembly plant infrastructure was removed during site demolition. Installation of additional public watermain within the study area will be required. The SPRWS distribution system has a 12-inch watermain on Mount Curve Boulevard at Ford Parkway and a 16-inch watermain on Cleveland Avenue South at Montreal Avenue that can be used for connection points to serve the study area. Water and fire service will be provided within the new roadway right-of-way within the AUAR study area.

Ryan Development Scenario

The Ryan Development Scenario would require 663,800 gallons per day. SPRWS infrastructure has existing capacity to supply this development scenario.

Master Plan Maximum Development Scenario

The Master Plan Maximum Development Scenario would require 746,600 gallons per day. SPRWS infrastructure has the existing capacity to supply this development scenario.

iv. Surface Waters

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

Ryan Development Scenario and Master Plan Maximum Development Scenario

Given the location of the wetlands within the AUAR study area and the proposed development scenarios, wetland impacts may be unavoidable. Considering only portions of the AUAR study area have been formally delineated, exact wetland impacts are not known at this time. As a mass grading plan is created and development of the site commences, wetland impacts will be avoided and minimized to the extent practicable. The project would be required to comply with all federal, state, and local wetland requirements including wetland mitigation requirements.

Wetland impacts will be replaced at a minimum of a 2:1 replacement ratio with wetland replacement in accordance with Capitol Region Watershed District requirements. Wetland buffers are also required by the watershed district. The wetland buffers will be unmanicured vegetative ground cover at a minimum of 25-feet around the wetlands located within the AUAR study area. The wetland buffers will be incorporated into site design, which will be reviewed by the watershed district.

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

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

Ryan Development Scenario and Master Plan Maximum Development Scenario

No additional surface water features have been identified within the AUAR study area.

12. Contamination/Hazardous Materials/Wastes

a. Pre-project Site Conditions – Describe existing contamination or potential environmental hazards on or in close proximity to the project site, such as soil or 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.

Ford Motor Company and its environmental consultant Arcadis conducted environmental remediation activities across the site beginning in 2013. Prior to the site cleanup, soil and groundwater contaminates were found in the study area. The most prominent soil contaminants included lead, arsenic, petroleum, and paint solvents, while those found in lesser quantities included chlorinated solvents and wood preservation chemicals. A small volume of surficial soil that contained a concentration of arsenic slightly above typical background levels was removed from one baseball field in 2008. While the soil did not pose a risk to human health or the environment, Ford elected to remove the soil as a precautionary measure. Information regarding the remediation activities on the ball field is included in Appendix A. Ford completed its remediation activities in January 2019, and the MPCA issued a Certificate of Completion for the site on May 15, 2019. The Certification of Completion is included in Appendix A.

The main shallow groundwater contaminants found included petroleum and solvents, which have since been cleaned up during the excavation of contaminated soils. Deep groundwater contamination was identified along the western property boundary and in two monitoring wells. The contaminants included trichloroethene, nickel, cobalt, copper, zinc, aluminum, and thallium. It has been determined that the groundwater contamination does not pose a risk to people or the Mississippi River.[5]

The Burg & Wolfson (Lunds & Byerlys) property is fully developed, and any redevelopment may require coordination with the MPCA. During the Ford Site remediation efforts, 23,000 cubic yards of impacted soil was remediated on the Canadian Pacific Railway property near the rail yards on the Ford Site parcel. Any redevelopment of the property will require additional coordination with the MPCA.

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

[5] Additional information on the history and cleanup of the 122-acre Ford Site parcel can be found at https://www.pca.state.mn.us/waste/saint-paul-ford-site.

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.

Ryan Development Scenario and Master Plan Maximum Development Scenario

Construction of either development scenario would 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.

Toxic or hazardous substances may be used during project construction and operations (e.g., petroleum products, hydraulic fluid, and chemical products such as sealants).

Products will be kept in their original containers unless they cannot be resealed. Original labels and Material Safety Data Sheets will be retained on site and accessible. If surplus product must be disposed of, the recommendations of the manufacturer or local or state guidelines will be followed.

According to the 2018 Ramsey County Solid Waste Management Master Plan, Ramsey County will ensure compliance with applicable laws, rules, and ordinances related to the management of solid and hazardous waste as required by Minnesota Statutes, section 473.811.

Recycling for residential units and commercial 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). Furthermore, City Leg. Code § 357.09 requires mandatory source separation and curbside pick-up within the City.

The proposed development would generate new demands on solid waste management and sanitation services provided in the project area. The US Environmental Protection Agency's (EPA) 2011 report titled *Municipal Solid Waste in the United States* was consulted as a basis for estimating municipal solid waste (MSW) generation for the proposed development. It is estimated that 4.4 pounds of MSW will be generated per person per day. An average household occupancy of 2.61 was applied to the estimated residential units based on US Census Bureau 2008-2012 data, and traffic analysis was referenced with a factor of 1.59 applied to the trips generated based on US Department of Energy Vehicle Occupancy Rates for 2010. The resulting range of MSW generated per year based upon the Ryan Development Scenario and the Master Plan Maximum Development Scenario is 43,640 tons and 45,940 tons, respectively. Per EPA document AP-42, Vol, I Ch 2.4: Municipal Solid Waste Landfills, it is estimated that the non-residential (commercial/industrial) waste stream will range from 7,200 to 13,900 tons per year under the Ryan Development Scenario and the Master Plan Maximum Development Scenario, respectively.

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).

Ryan Development Scenario and Master Plan Maximum Development Scenario

No underground or above ground storage tanks have been identified for the proposed development scenarios. Diesel fuel tanks may be needed for emergency generators for the commercial, office, and residential buildings. The actual location of these tanks will be determined as design progresses, and the location and use of storage thanks will be in compliance with all state and local rules and regulations.

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.

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

a. Describe fish and wildlife resources as well as habitats and vegetation on or 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 scenarios should be highlighted in the discussion.

The current site provides no fish habitat as there are no above ground streams, rivers, lakes, or ponds located within the AUAR study area. Minimal wildlife habitat is located within the AUAR study area due to the prior extent of impervious surfaces and minimal natural vegetation. Currently the majority of the AUAR study area is fenced with limited access and is covered by impervious surfaces and minimal vegetation. Wildlife that can be found within the study area are some song birds and small mammals that have adapted to the highly-disturbed urban environment. No native plant communities or sites of biodiversity have been identified within the AUAR study area.

Existing and proposed cover types are shown in Figure 5 and Table 2.

b. Describe rare features such as state-listed (endangered, threatened, or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-843) 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 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.

Based on a review of the state-listed threatened, endangered, and special concern species, there are 22 species within one mile of the AUAR study area.[6] The majority of these species are found within the Mississippi River or Minnehaha Creek. The only records identified in proximity to the AUAR study area include two mussel species (mucket and black sandshell) and the blue sucker, which are found in the Mississippi River. The DNR reviewed the identified species and noted the mussels within the river. The DNR correspondence letter is included in Appendix A.

The rusty-patched bumble bee, a federally-listed species, was identified by the DNR in their correspondence. The AUAR study area is located within the high potential zone for the rusty-patched bumble bee. Rusty-patched bumble bees prefer grasslands with flowering plants from April through October, underground and abandoned rodent cavities or clumps of grasses above ground as nesting sites, and undisturbed soil for hibernating queens to overwinter.

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.

Ryan Development Scenario and Master Plan Maximum Development Scenario

No adverse impacts are anticipated to state-listed or federally-listed species. The AUAR study area is highly disturbed with a lack of bumble bee or other native wildlife habitat. Species currently using the AUAR study area are adapted to a highly disturbed urban environment, and minimal impacts are anticipated to those species.

Invasive species will be controlled on site during construction, and turf grass and other native landscape plants will be used within the AUAR study area to provide some additional habitat for song birds, small mammals, and insects including any rusty-patched bumble bees in the AUAR study area.

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

Ryan Development Scenario and Master Plan Maximum Development Scenario

Scattered trees and woodland areas are found along the perimeter of the AUAR study area. Negligible suitable rusty-patched bumble bee habitat is located within the AUAR study area due to the highly disturbed nature of the area. The proposed development plans include areas of native landscaping and green space that will provide suitable habitat for bees and other

[6] Data were provided by the Division of Ecological and Water Resources, Minnesota Department of Natural Resources, and were current as of 7/2017. These data are not based on an exhaustive inventory of the state. The lack of data for any geographic area shall not be construed to mean that no significant features are present.

pollinators. The proposed development scenarios will follow the landscape and green space guidelines outlined in the Ford MP.

To protect the listed mussels in the river, the DNR recommends effective erosion prevention and sediment control practices be incorporated into any stormwater management plan and also must be implemented and maintained near the river.

Wildlife friendly erosion control methods will be utilized within the study area to minimize impacts to wildlife using the site during construction.

14. Historic Properties

Describe any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to the site. Include 1) historic designations; 2) known artifact areas; and 3) architectural features. Attach letter received from the 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.

Ryan Development Scenario and Master Plan Maximum Development Scenario

A historical survey report was completed for the majority of the AUAR study area in 2007 (see Appendix C). The Ford Twin Cities Assembly Plant ("Ford Site") was constructed in 1924. The Ford Site contained several buildings including the main assembly building, which was located within the AUAR study area. Due to multiple changes including additions to the main assembly building, the 2007 historical survey report found that the Ford Site was not considered eligible for listing on the National Register of Historic Places (NRHP).

Most of the AUAR study area is highly disturbed due to the previous development of the Ford Site Assembly Plant, development of Burg & Wolfson (Lunds & Byerlys) property, and the soil remediation activities within the 122-acre Ford Site parcel and within a portion of the Canadian Pacific Railway property. A large portion of the 122-acre Ford Site is characterized by shallow depth to bedrock with limited fill or topsoil cover. Pursuant to the terms of the Ford Plant Demolition Master Site Plan ("MSP") dated December 28, 2012 (Site Plan 12-210553), Ford Motor Company demolished the Assembly Plant and removed building slabs, foundations, and utilities. Subgrade demolition and abandonment was completed generally to an excavation depth of six feet. Several large areas of the site included demolition and abandonment to depths greater than six feet, including removal and demolition of foundations, designated underground utilities, basements, pits, and tunnels. Due to the highly disturbed nature of the site, no archaeological resources are anticipated within the 122-acre Ford Site parcel.

The only areas of the AUAR study area that contain undisturbed or minimally disturbed soils are located on the Canadian Pacific Railway property. There are currently no development proposals for the 13-acre Canadian Pacific Railway property. An archaeological survey will be required prior to development of the Canadian Pacific Railway property.

The Minnesota State Historic Preservation Office (SHPO) noted that site 21RAK (Rumtown) may be located within in the AUAR study area. Historical maps locate the Rumtown site generally south of the Hidden Falls outfall.[7] There are currently no development proposals for the area south of the Hidden Falls outfall.

SHPO further noted that the following properties are within proximity of the AUAR study area:

- Minnesota Soldiers Home Historic District – listed in the NRHP
- Minnehaha Historic District – listed in the NRHP
- Bridge No. 3575 (Ford Parkway Bridge) – listed in the NRHP
- Ford Hydroelectric Facilities – eligible for listing in the NRHP
- Lock & Dam No. 1 (Ford Dam) – eligible for listing in the NRHP

The three sites noted as being listed in the NRHP are outside of the study area for the project. The Minnesota Soldier's Home District and the Minnehaha Historic District are both located across the Mississippi River Gorge from the study area. The River Gorge and its riverine vegetation provide a substantial physical and visual barrier between the project area and these historic districts. The Ford MP and the City's official controls further regulate building setbacks and heights within the western edge of the AUAR study area closest to the river bluff. Because of these physical barriers, regulatory controls, and the relative distances between these districts and project, no adverse impacts are reasonably foreseeable.

The Ford Parkway Bridge is similarly buffered from the project area on the Minneapolis side of the Mississippi River. The design elements and land use plan for the AUAR study area and the proposed Ryan Development Scenario provide for a visual, auditory, and atmospheric buffer between the bridge and the development on the Saint Paul side of the Mississippi River.

The Ford Dam and Hydroelectric Facilities are not NRHP-listed properties and are located below, and shielded by, the bluff line and vegetation beyond the western edge of AUAR study area. There are currently no development proposals for the Ford Dam and Hydroelectric Facilities.

The SHPO letter is included in Appendix A.

15. Visual

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

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.

[7] Henning, Barbara J., Historical Study Former U.S. Bureau of Mines Property Twin Cities Research Center, Rivercrest Associates, October 2002, Figure 3 (R. Ames Colby. Topographical View of a Portion of the Military Reserve, Embracing Fort Snelling, Ca. October and November 1839).

Ryan Development Scenario and Master Plan Maximum Development Scenario

The City of Saint Paul's 2030 Comprehensive Plan identifies significant public views in the city; none are located within or near the AUAR study area. The map of significant public views was updated in conjunction with the MRCCA Plan and the 2040 Comprehensive Plan. The Public River Corridor Views (PRCV) identified in the MRCCA Plan are located on public property, including parks and trails, historic properties, and bridge overlooks. Views toward bluffs from the opposite side of the shore are also noted. The closest PRCV to the AUAR study area is View #5 - Ford Dam Overlook; however, the view direction is towards the Mississippi River (away from the AUAR study area).

The relevant policies related to visual impacts from the MRCCA Plan include:

- Policy CA-11: Protect and minimize impacts to PRCVs from public development activities.
- Policy CA-13: Support shorter buildings closer to the river's edge and taller buildings as distance from the river increases in order to maximize views of and from the river, and preserve visual access to the river as a public good.

Neither of the proposed scenarios are located in the view range of PRCV and, therefore, will not have an impact on any identified significant public views, which is consistent with Policy CA-11. Additionally, the proposed building heights and setback are consistent with the requirements of the MRCCA Districts and Ford MP zoning. The proposed building heights are lower (20-48 feet) along the Mississippi River front and gradually increase in height farther into the study area, which supports Policy CA-13.

The site lighting for the proposed development scenarios will be consistent with the lighting requirements identified in the Ford MP. All exterior lights will be LED "warm-white" or LED filtered light to minimize blue emission and will not include direct upward lighting or lighting aimed at structures to minimize visual impacts. A specific lighting plan will be developed and submitted to the City of Saint Paul during the site planning review and approval.

In a comment letter received from SHPO during the Scoping EAW comment period, the following records were provided that indicate the presence of historic properties within the AUAR study area vicinity; however, these properties are not located within the AUAR study area:

- Minnesota Soldiers Home Historic District – listed in the NRHP. Roughly bounded by Minnehaha Avenue, Mississippi River, and Godfrey Parkway in Minneapolis.
- Minnehaha Historic District – listed in the NRHP. Generally bounded by Nawadaha Boulevard, 39th Avenue South, 49th Street, Hiawatha Avenue, Minnehaha Avenue, Minnehaha Creek, and the Mississippi River in Minneapolis
- Bridge No. 3575 (Intercity, or Ford Parkway, Bridge) – listed in the NRHP. Located northwest of the AUAR study area and stretches across the Mississippi River.
- Ford Hydroelectric Facilities – eligible for listing in the NRHP. Located directly west of the AUAR study area on Mississippi River Boulevard.
- Lock & Dam No. 1 (Ford Dam) – eligible for listing in the NRHP. Located directly west of the AUAR study area in the Mississippi River.

Visual impacts are not anticipated to affect any of these historic properties or districts as both development scenarios are not located in proximity to the resources that would affect views to or from these resources.

16. Air

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

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.

Ryan Development Scenario and Master Plan Maximum Development Scenario

Motorized vehicles affect air quality by emitting airborne pollutants. Changes in traffic volumes, travel patterns, and roadway locations affect air quality by changing the number of vehicles in an area and the congestion levels. The air quality impacts from the proposed development scenarios are analyzed by addressing criteria pollutants, a group of common air pollutants regulated by the EPA on the basis of criteria (information on health and/or environmental effects of pollution). The criteria pollutants identified by the EPA are ozone, particulate matter, carbon monoxide, nitrogen dioxide, lead, and sulfur dioxide. Potential impacts resulting from these pollutants are assessed by comparing projected concentrations to National Ambient Air Quality Standards (NAAQS).

In addition to the criteria air pollutants, the EPA also regulates a category of pollutants known as mobile source air toxics (MSATs), which are generated by emissions from mobile sources. A qualitative evaluation of MSATs has been performed for this project, as documented below. The scope and methods of the analysis performed were developed in collaboration with the Minnesota Department of Transportation (MnDOT), MPCA, and the Federal Highway Administration (FHWA).

Conformity

The project area is designated by the EPA as in attainment (or complying) with the NAAQS for all air pollutants. While the project area is in attainment with the carbon monoxide (CO) NAAQS, part of the project area was formerly a nonattainment area for CO and is currently a "maintenance" area for this pollutant. Therefore, Transportation Conformity rules (40 CFR 93, Subpart A) apply only to vehicle emissions of CO in the AUAR study area.

CO evaluation is performed by evaluating the worst-operating (hot spot) intersections in the AUAR study area. The EPA has approved a screening method to determine which intersections need hot-spot analysis. The hot-spot screening method uses a traffic volume threshold of 82,300 entering vehicles per day. None of the intersections within the AUAR study area meet this threshold. Therefore, no hot-spot analysis or screening procedure was needed nor completed.

Improvements in vehicle technology and in motor fuel regulations continue to result in reductions in vehicle emission rates. The EPA MOVES 2010b emissions model estimates that emission rates will continue to decline from existing rates through year 2040. Consequently, year 2040 vehicle-related CO concentrations in the project area are likely to be lower than existing concentrations even considering the increase in development-related and background traffic.

On November 8, 2010, the EPA approved a limited maintenance plan request for the Twin Cities maintenance area. Under a limited maintenance plan, the EPA has determined that there is no requirement for project emissions over the maintenance period and that "an emission budget may be treated as essentially non-constraining for the length of the maintenance period. The reason is that it is unreasonable to expect that our maintenance area will experience so much growth within this period that a violation of CO National Ambient Air Quality Standard (NAAQS) would result."[8]

Air Toxics

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the EPA regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS).[9] In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA).[10] These are acrolein, benzene, 1,3-butidiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules. The 2007 EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines.

A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions. The AUAR study area is currently meeting all NAAQS for the criteria air pollutants. For the foreseeable future the trend of lower per vehicle emissions is expected to at least offset growth in vehicle volumes. Therefore, the AUAR study area is expected to continue meeting NAAQS, without or with implementation of the development scenarios. Based on the proposed volumes, the proposed development scenarios do not exceed thresholds that would

[8] US Environmental Protection Agency, Limited Maintenance Plan Option for Nonclassifiable CO Nonattainment Areas (October 6, 1995)
[9] US Environmental Protection Agency, Limited Risk Information System; available at http://www.epa.gov/iris/
[10] US Environmental Protection Agency, Technical Air Pollution Resources; available at http://www.epa.gov/ttn/atw/nata1999/

require a quantitative MSAT analysis; therefore, the project is not expected to adversely affect air quality.

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.

Ryan Development Scenario and Master Plan Maximum Development Scenario

The proposed development will generate temporary fugitive dust emissions during construction. These emissions will be controlled by watering, sprinkling, or calcium chloride application, as appropriate or as prevailing weather and soil conditions dictate. In accordance with Saint Paul City Ordinances (Section 221.02), during construction of the proposed development contractors will maintain streets, alleys, sidewalks, or other public places adjacent to construction, demolition, or building sites free from dust, litter, or other matter originating from their construction, demolition, or building sites, including that effected by erosion and landslides. Dust emissions are not anticipated during operations as all ground surfaces will either be impervious or vegetated.

17. Noise

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

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.

Ryan Development Scenario and Master Plan Maximum Development Scenario

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 noise analysis. It should also be noted that full and limited access county roads are exempt from State noise standards.[11] Construction activities (i.e., blasting, pile-driving, crushing, and grading

[11] Minnesota Statutes, section 116.07, subdivision 2a(3)

activities) will be conducted in compliance with the City of Saint Paul Noise regulations to minimize noise levels and nighttime construction activities.[12]

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 as 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 level increases attributable to the project are well below the amount that would generate a sound increase that could be noticeable. The AUAR study area will be developed such that any land use activities that are sensitive (i.e., residential units) to noise will have sufficient setbacks from existing noise sources to thereby reduce the potential for noise impacts. These details will be determined as the development proceeds.

The change in traffic noise levels is not anticipated to be readily perceptible. Permits related to construction noise will be obtained prior to the start of construction.

18. Transportation

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

The Ford Site, as a large-scale industrial development, acted as a barrier to public movement within the Highland neighborhood, elongating trips in order to circulate around the site and contributing to congestion at its periphery. The redevelopment of the property will remove this barrier and integrate the site into the area transportation network, ensuring access for all modes of transportation.

The redevelopment of the Ford Site parcel is expected to take approximately 10 to 15 years, depending on market conditions, and currently there are no proposals for redevelopment of the Canadian Pacific Railway or Burg & Wolfson (Lunds & Byerlys) properties. Therefore, for purposes of developing traffic forecasts and evaluating future conditions, a horizon year of 2040 was used. Traffic forecasts were developed for three future conditions, including year 2040 no-build; year 2040 Ryan Development Scenario; and year 2040 Master Plan Maximum Build Scenario. Due to the extended timeline of development, it is anticipated that traffic patterns and volume will incrementally change and be spread out over a number of years as development occurs, affording the ongoing opportunity for data collection and modification of the transportation networks over time.

[12] Chapter 239: https://library.municode.com/mn/st._paul/codes/code_of_ordinances?nodeId=PTIILECO_TITXXVIIIMIOF_CH293NORE

1. Parking

There are currently no existing parking spaces on the Ford Site parcel or the Canadian Pacific Railway property. There are approximately 250 existing parking spaces on the Burg & Wolfson (Lunds & Byerlys) property.

Redevelopment of any portion of the AUAR study area will require provision of vehicular and bicycle parking spaces in compliance with the City's zoning and Ford MP requirements.

Ryan Development Scenario

The Ryan Development Scenario would include approximately 5,890 off-street vehicular parking spaces and approximately 3,700 bicycle parking spaces. On-street parking is planned along the proposed public roadways within the Ford Site parcel in accordance with the Ford MP. The amount of on-street parking will be reviewed as part of the developer's infrastructure design and City permitting process.

Under the Ryan Development Scenario, vehicular parking on the Burg & Wolfson (Lunds & Byerlys) property and the Canadian Pacific Railway property would not change from the existing conditions as identified above.

Master Plan Maximum Development Scenario

The Master Plan Maximum Development Scenario would provide vehicular parking spaces and bicycle parking spaces similar to the Ryan Development Scenario plus required parking spaces for the Burg & Wolfson (Lunds & Byerlys) and Canadian Pacific Railway properties.

2. Trip Generation

Trip generation estimates were calculated using the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition, and account for multi-use trip reductions based on a combination of the internal capture rate methodology in the ITE Trip Generation Handbook and the Traffic Generated by Mixed-Use Developments – Thirteen-Region Study Using Consistent Measures of Built Environment (2015). In addition, trip reductions were applied to the estimates to account for various characteristics of the AUAR study area and surrounding area, including the existing level of transit service, the existing and proposed walking/bicycling facilities and environment, jobs and housing balance, including the amount of affordable housing described in the Ford MP, and anticipated Travel Demand Management (TDM) Programs. These various reductions were identified leveraging data from multiple resources and case-studies locally and throughout the country, each of which are documented within the appendix of the Ford Site AUAR Transportation Analysis (see Appendix D).

Ryan Development Scenario

Average Daily Traffic Volume

Based on the results of the traffic analysis, the Ryan Development Scenario is anticipated to generate approximately 21,790 vehicular trips per day; 4,490 transit trips per day; and 5,470 pedestrian/bicyclist trips per day. These trips represent the total external trip generation by transportation mode, as summarized in Table 9.

Peak Hour Traffic Volume

Based on the results of the traffic analysis, the Ryan Development Scenario is anticipated to generate approximately 1,440 a.m. peak hour and 1,850 p.m. peak hour vehicular trips. The proposed development is also anticipated to generate approximately 300 a.m. peak hour and 380 p.m. peak hour transit trips, as well as 360 a.m. peak hour and 470 p.m. peak hour pedestrian/bicyclist trips. The a.m. peak hour represents a typical weekday from 7:30 a.m. to 8:30 a.m., while the p.m. peak hour represents a typical weekday from 4:45 p.m. to 5:45 p.m. These trips represent the total external trip generation by transportation mode, as summarized in Table 9.

Master Plan Maximum Development Scenario

Average Daily Traffic Volume

Based on the results of the traffic analysis, the Master Plan Maximum Development Scenario is anticipated to generate approximately 27,570 vehicular trips per day; 5,930 transit trips per day; and 7,230 pedestrian/bicyclist trips per day. These trips represent the total external trip generation by transportation mode, as summarized in Table 9.

Peak Hour Traffic Volume

Based on the results of the traffic analysis, the Master Plan Maximum Development Scenario is anticipated to generate approximately 1,770 a.m. peak hour and 2,360 p.m. peak hour vehicular trips. The development is also anticipated to generate approximately 380 a.m. peak hour and 510 p.m. peak hour transit trips, as well as 460 a.m. peak hour and 620 p.m. peak hour pedestrian/bicyclist trips. The a.m. peak hour represents a typical weekday from 7:30 a.m. to 8:30 a.m., while the p.m. peak hour represents a typical weekday from 4:45 p.m. to 5:45 p.m. These trips represent the total external trip generation by transportation mode, as summarized in Table 9.

Table 9: External Trip Generation Summary by Transportation Mode

Transportation Mode	A.M. Peak Hour External Trips	P.M. Peak Hour External Trips	Weekday Daily External Trips
Ryan Development Scenario			
Vehicular Trips	1,440	1,850	21,790
Transit Trips	300	380	4,490
Walk/Bike Trips	360	470	5,470
Master Plan Maximum Development Scenario			
Vehicular Trips	1,770	2,360	27,570
Transit Trips	380	510	5,930
Walk/Bike Trips	460	620	7,230

3. Availability of Transit and/or Other Transportation Modes

Ryan Development Scenario and Master Plan Maximum Development Scenario

Transit Service

The AUAR study area is served by existing transit, including the A Line bus rapid transit (BRT) line as well as Routes 23, 46, 70, 74, 84, and 134 in varying frequencies and destinations. The A Line includes enhanced transit service such as limited stop service, high customer amenity

stations, and transit signal priority. The current transit routes serving the AUAR study area are summarized in Table 10. Transit stops are located at nearly every block along Ford Parkway and Cleveland Avenue, which border the AUAR study area. There is also an existing on-street layover area along Kenneth Street, south of Ford Parkway. Existing transit service serving the area surround the AUAR study area is also depicted in Figure 13.

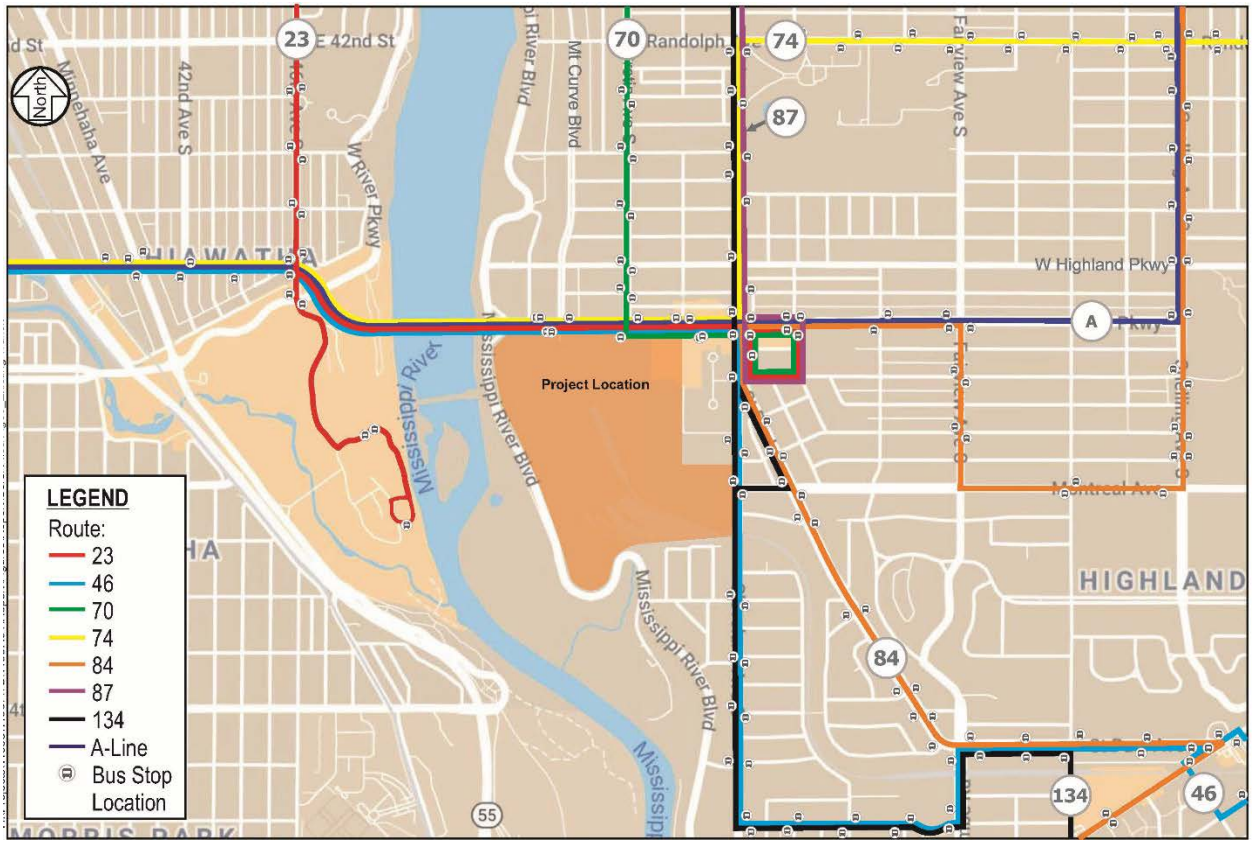
Cretin Avenue is one of the main north-south roadways planned on the Ford Site. Redevelopment of the Ford Site will extend Cretin Avenue south from Ford Parkway and connect it to the planned extension of Montreal Avenue. Within the Ford MP, space has been allocated on each side of the Cretin Avenue extension for future enhanced transit service, including the potential for dedicated transit lanes. The Ford MP also envisions the potential for a multi-modal shared transportation corridor south of the Montreal Avenue extension and connecting the Cretin Avenue extension through the Canadian Pacific Railway Property.

Table 10: Existing Transit Service[13]

Route	Weekday					Saturday			Sunday		
	AM Peak	Midday	PM Peak	Evening	Span	Midday	Evening	Span	Midday	Evening	Span
23	60	60	30-60	60	7a-8p	20-40	60	8a-8p	60	60-90	8a-8p
46	30	30	30	30-60	6a-11p	30	60	7a-p	30	60	8a-8p
54	15	15	13	15-30	3a-1a	15	15-30	3a-1a	20	20-30	3a-1a
70	30	60	30	NA	6a-7p	NA	NA	NA	NA	NA	NA
74	15	15-20	15	30	5a-1a	20	30	5a-1a	30	30	5a-12a
83	30	30	30	30-60	6a-10p	30	30-60	7a-10p	30	30-60	7a-10p
84	30	30	30	30	5a-9p	30	NA	6a-8p	30	NA	9a-8p
87	20	30	20	30-60	4a-12p	30	60	6a-12p	30	60	6a-12p
134	15	NA	15	NA	6a-7p	NA	NA	NA	NA	NA	NA
A Line	10	10	10	15	4a-1a	10	15-30	4a-1a	10	15-30	4a-1a

[13] Source: Draft Saint Paul Highland Park Transit Service Study, Metro Transit, June 2019.

Figure 13: Existing Transit Service



Bicycle and Pedestrian Facilities

A summary of the existing bicycle and pedestrian facilities and sidewalk gaps[14] in the existing network are shown in Figure 14 and Figure 15. By resolution, the City of Saint Paul formally adopted a sidewalk infill policy in 2017 providing for the construction of sidewalks on both sides of every street as part of street construction projects. The City's adopted Pedestrian Plan (adopted June 5, 2019) reiterates the sidewalk in-fill policy and further requires private property owners to install sidewalk adjacent to all streets abutting properties undergoing site redevelopment. It is therefore expected that these gaps will be in-filled over time.

[14] A gap is identified where there are either no sidewalk facilities, or a sidewalk is only present on one side of an existing roadway.

Figure 14: Existing Sidewalk Network

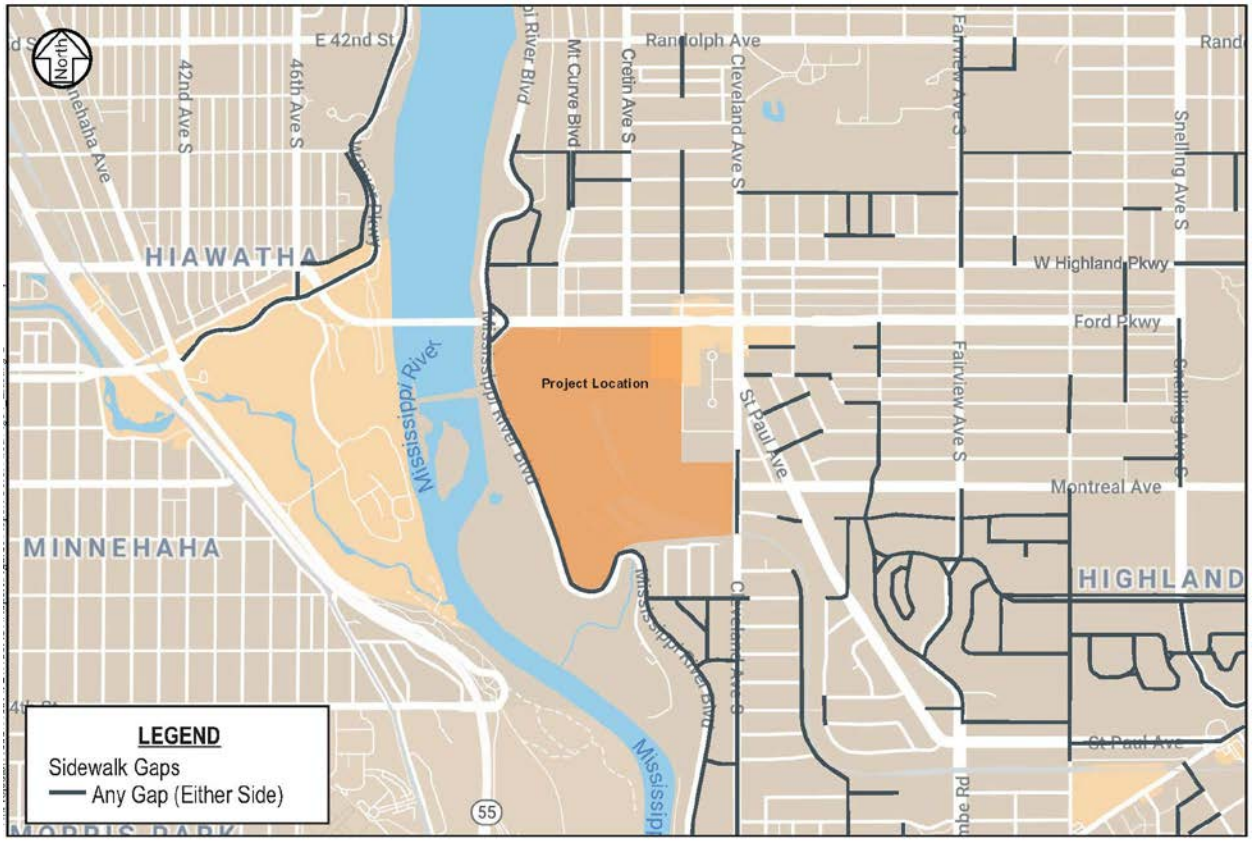
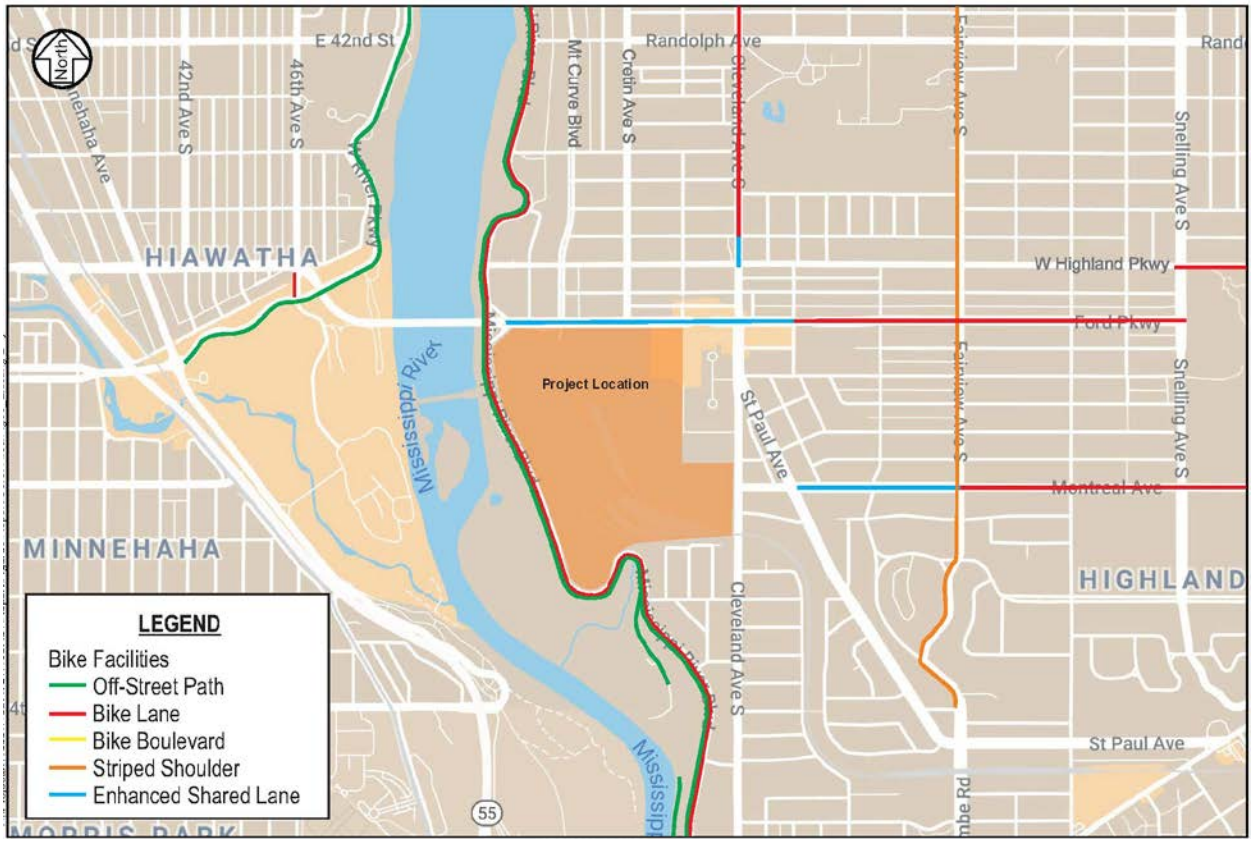


Figure 15: Existing Bicycle Facilities



The City of Saint Paul Bicycle Plan identifies the existing and planned bicycle facilities, including several bikeway priorities serving the AUAR study area. A summary of the existing and planned facilities is summarized in Table 11.

Table 11: Existing and Planned Bicycle Facilities

Roadway	Existing Facility	Planned Facility (per Saint Paul Bicycle Plan)
Ford Parkway	Bike lanes (east of Kenneth/Howell)	Enhanced shared/in-street lanes
Cleveland Avenue	Bike lanes (north of Eleanor Avenue)	Enhanced shared/in-street lanes
Saint Paul Avenue	None	In-street lanes
Edgcumbe Road	None	In-street lanes
Highland Parkway	None	Enhanced shared lanes
Montreal Avenue	Bike lanes (east of Fairview); enhanced shared lanes (west of Fairview)	Enhanced shared/in-street lanes
Mississippi River Boulevard	Bike lane (southbound); shared use path	Off-street path/in-street lanes
Fairview Avenue	Striped shoulders	In-street lanes

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.

In accordance with EQB guidance, an independent traffic analysis was completed. The results of the study can be found in Appendix D. Based on the detailed findings of the Ford Site AUAR Transportation Analysis, the area transportation network is expected to be able to support redevelopment within the AUAR study area. The AUAR Transportation Analysis also identifies certain traffic improvements that may be implemented over time to address future traffic impacts that could occur as a result of development within the AUAR study area (see Item 18c). The AUAR Transportation Analysis covers key traffic metrics for both motorized and non-motorized modes. Metrics for motorized modes include intersection level of service (LOS) and length of queuing. For non-motorized modes, metrics include an analysis of gaps in the existing bicycle and pedestrian facility networks and availability of transit within the existing transportation network.

As part of the Ford Site AUAR Transportation Analysis, a regional planning-level review was completed to understand potential impacts associated with a wider geographic area, including MN TH 55 (Hiawatha Avenue) to the west, MN TH 5 (7th Street) to the south, MN Highway 51 (Snelling Avenue/Montreal Avenue) to the east, Cretin Avenue near Marshall Avenue (County Road 35), and Saint Paul Avenue near MN TH 5 (7th Street). This review focused on the existing travel patterns and also assessed development-related assumed traffic volumes for the identified segments surrounding the AUAR study area during the a.m. and p.m. peak hours. Stakeholders including MnDOT, Metro Transit, Hennepin County, Ramsey County, Minneapolis, and Saint Paul were engaged with the existing condition and the assumptions for the future traffic projections.

The primary regional roadways within the area and their anticipated future average daily traffic volumes under each scenario are summarized in Table 12, along with the estimated roadway capacities. Due to the gradual phasing of development within the AUAR study area, it is anticipated these changes will occur incrementally and be spread out over a number of years. Although traffic volumes on these roadways are anticipated to increase at full build-out, they are within or below the estimated capacity of the roadway facilities. The central location of the AUAR study area further mitigates the impact to any one particular roadway because development related traffic volumes are dispersed relatively evenly to the west, east, north, and south.

Table 12: Regional Roadway Traffic Volume Changes

Roadway	Average Daily Traffic Volume (vehicles per day)			
	Existing	Year 2040 Ryan Development Scenario	Year 2040 Master Plan Maximum Development	Estimated Roadway Capacity
MN TH 55 (Hiawatha Avenue)	17,400	21,400	22,250	30,000 to 36,000
MN TH 5 (7th Street) at MN River Bridge	56,000	63,400	64,500	55,000 to 70,000
MN TH 51 (Snelling Avenue)	15,600	18,100	18,600	18,000 to 22,000
MN TH 51 (Montreal Avenue)	11,800	14,500	15,100	12,000 to 17,000
Cretin Avenue north of Summit Avenue	15,100	18,100	18,700	18,000 to 22,000
Saint Paul Avenue east of Edgcumbe	3,600	4,450	4,600	30,000 to 36,000
CR 46 (Edgcumbe Road)	16,600	20,500	21,300	30,000 to 36,000

As development occurs within the AUAR study area and larger regional area, further review, planning, and development of the regional transportation network is expected to occur. More information on the planning-level analysis is included in the Ford Site AUAR Transportation Analysis (see Appendix D).

Based on the results of the transportation analysis, intersection levels of service were identified for existing conditions and the proposed development scenarios, including the no-build scenario. LOS A indicates the best traffic operation and LOS F indicates an intersection where demand exceeds capacity. Overall intersection levels of service at LOS A through D are considered acceptable within the Twin Cities Metropolitan Area, although lower levels of service may be accepted during limited periods of time or for specific movements. It is common in urban areas for intersections to operate at LOS E or LOS F for short periods of time.

Based on the results of the study and the estimated traffic generated by the proposed development scenarios within the AUAR study area, a limited number of intersections may operate at less than LOS D; none of the intersections are anticipated to operate below LOS E. More detailed information on the traffic analysis is included in Appendix D.

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

Ryan Development Scenario and Master Plan Maximum Development Scenario

The AUAR Transportation Analysis identified certain traffic improvements that could be implemented over time to address future potential traffic impacts for each scenario (*i.e.*, year 2040 No Build, year 2040 Ryan Development Scenario, and year 2040 Master Plan Maximum Development Scenario). These improvements may be implemented to address either an

intersection capacity issue (*i.e.*, extended LOS E or LOS F) or a queuing issue (*i.e.*, greater than 600 feet). The intent is to have an overall intersection level of service of LOS D or reduced periods of time with levels of service at LOS E or LOS F, including typical queues of traffic less than 600 feet during the a.m. and p.m. peak hours. It is important to recognize that traffic improvement measures identified for one mode of transportation may impact another mode of transportation; therefore, potential improvements or actions that have been identified for consideration are intended to provide discretion and engineering judgement to the responsible stakeholders and decision makers with respect to balancing the needs of the various modes of travel. These considerations have been outlined in the AUAR Transportation Analysis.

Table 13 summarizes the potential traffic improvements identified in the AUAR Transportation Analysis for consideration to mitigate anticipated traffic impacts in the Ryan Development Scenario and 2040 Master Plan Maximum Development Scenario. Consideration of the identified traffic improvements is contingent upon the feasibility of each proposed improvement, including the potential for impacts to other modes of transportation, and the level and phasing of development that occurs over the extended period of time it is anticipated to complete redevelopment within the AUAR study area.

Table 13: Summary of Transportation Issues and Mitigation

Issue	Traffic Improvement	2040 Ryan Development Scenario	2040 Master Plan Maximum Development Scenario
Ford Parkway/Mount Curve Boulevard			
Side-street delays	1) Signalize/turn lane improvements	X	X
Ford Parkway/Cretin Avenue			
Southbound queues	1) Modify signal timing and phasing 2) Extend eastbound and westbound left-turn lanes 3) Restrict parking to Pinehurst/Highland and restripe segment	X	X
	4) Construct southbound right turn lane	N/A	X
Ford Parkway/Cleveland Avenue			
Intersection operations and queues	1) Extend eastbound left turn lane 2) Remove parking and provide a southbound right turn lane	X	X
Ford Parkway/Fairview Avenue			
Left turn operations and queues	1) Provide left turn signal phasing	X	X
Intersection operations and queues	2) Construct southbound right turn lane	X	X
	3) Implement TDM strategies and refine land use guidance[15]	N/A	X
Cleveland Avenue/Montreal Avenue			
Travel pattern changes	1) Switch side-street stop control to north/south approach or install all-way stop control 2) Construct intersection for potential future signal[15]	X	X
Saint Paul Avenue/Montreal Avenue			
Intersection operations and queues	1) Install traffic signal/turn lanes or hybrid roundabout	X	X
Cretin Avenue/Randolph Avenue			
Intersection queues	1) Provide northbound/southbound left turn lanes	X	X

[15] For the Maximum Development Scenario, relocating density to the southern portion of study area could impact timing of the potential signal at the Cleveland Avenue/Montreal Avenue intersection

Based on the traffic improvement measures identified above, the intersections identified in Table 13 would function at LOS D or higher or have queues less than 600 feet. Resulting intersection level of service are summarized in Table 14 and Table 15.

Table 14: Intersection Capacity Analysis with Traffic Improvements for the A.M. Peak Hour

Intersection	2040 Ryan Development Scenario	2040 Master Plan Maximum Development Scenario
46th Street/46th Avenue	B	B
Ford Parkway/Ford Parkway Ramps[16]	A/A	A/A
Ford Parkway/Woodlawn Avenue[16]	A/A	A/A
Ford Parkway/Mount Curve Boulevard	A	A
Ford Parkway/Cretin Avenue	B	B
Ford Parkway/Finn Street	B	B
Ford Parkway/Cleveland Avenue	C	C
Ford Parkway/Kenneth Street	A	A
Ford Parkway/Fairview Avenue	C	C
Cleveland Avenue/Highland Parkway	A	A
Cleveland Ave/Saint Paul Avenue/Bohland Avenue[16]	A/C	A/C
Saint Paul Avenue/Montreal Avenue[17]	B	B
Saint Paul Avenue/Edgcumbe Road	C	C
Montreal Avenue/Cleveland Avenue[16]	A/B	A/B
Montreal Avenue/Fairview Avenue	B	B
Mississippi River Boulevard/Ford Parkway North[16]	A/A	A/A
Mississippi River Boulevard/South Ford Parkway South[16]	A/A	A/A
Mississippi River Boulevard/Bohland Avenue[16]	A/A	A/A
Mississippi River Boulevard/Montreal Avenue[16]	A/A	A/A
Mount Curve Boulevard/Highland Parkway[17]	A	A
Cretin Avenue/Randolph Avenue	B	B
Cretin Avenue/Highland Parkway[16]	A/B	A/B

Table 15: Intersection Capacity Analysis with Traffic Improvements for the P.M. Peak Hour

Intersection	2040 Ryan Development Scenario	2040 Master Plan Maximum Development Scenario
46th Street/46th Avenue	C	C
Ford Parkway/Ford Parkway Ramps[16]	A/A	A/B
Ford Parkway/Woodlawn Avenue[16]	A/C	A/C

[16] Indicates an unsignalized intersection with side-street stop control where the overall LOS is shown followed by the worst-case approach LOS.
[17] Indicates an unsignalized intersection with all-way stop control.

Intersection	2040 Ryan Development Scenario	2040 Master Plan Maximum Development Scenario
Ford Parkway/Mount Curve Boulevard	B	B
Ford Parkway/Cretin Avenue	C	D
Ford Parkway/Finn Street	B	B
Ford Parkway/Cleveland Avenue	D	D
Ford Parkway/Kenneth Street	B	B
Ford Parkway/Fairview Avenue	D	E
Cleveland Avenue/Highland Parkway	B	B
Cleveland Avenue/Saint Paul Avenue/Bohland Avenue[16]	A/C	A/C
Saint Paul Avenue/Montreal Avenue[17]	B	C
Saint Paul Avenue/Edgcumbe Road	C	C
Montreal Avenue/Cleveland Avenue[16]	A/C	A/D
Montreal Avenue/Fairview Avenue	C	C
Mississippi River Boulevard/Ford Parkway North[16]	A/A	A/A
Mississippi River Boulevard/South Ford Parkway South[16]	A/A	A/A
Mississippi River Boulevard/Bohland Avenue[16]	A/A	A/A
Mississippi River Boulevard/Montreal Avenue[16]	A/A	A/A
Mount Curve Boulevard/Highland Parkway[17]	A	A
Cretin Avenue/Randolph Avenue	B	B
Cretin Avenue/Highland Parkway[16]	A/C	A/E

19. 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 impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or persons undertakes such actions." The geographic areas considered for cumulative effects are those areas adjacent to the AUAR study area, and the timeframe considered includes projects that would be constructed in the reasonably foreseeable future.

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.

No reasonably foreseeable future projects that may interact with the environmental effects of the Ford Site have been identified other than the Burg & Wolfson (Lunds & Byerlys) and Canadian Pacific Railway property, which are included in the AUAR study area and analyses.

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.

Because no reasonably foreseeable future projects have been identified, there is no known potential for cumulative effects. Impacts from future developments adjacent to the study area will be addressed via the regulatory permitting and approval processes and will be individually mitigated to ensure minimal cumulative impacts occur.

20. Other Potential Environmental Effects

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

Various mined spaces/utility tunnels are located over 75 feet below the ground surface under the AUAR study area and have been sealed.[18] Due to the depth of these areas, no impacts are anticipated from the future development of the AUAR study area. Developers of individual blocks will be advised of the tunnels and the need to mitigate any issues that may result from their development.

[18] Source: Application for Site Plan Review. Available at http://stpdocs.stpaul.gov/web/TCAP/Title%20Sheet%20Thru%20Section%20I.pdf.

Draft Mitigation Plan

This Mitigation Plan is submitted as part of the Draft 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 Draft Mitigation Plan will be revised and updated based on comments received during the Draft 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.

There were no impacts or mitigation strategies identified in Item 15; therefore, this area is not included in the Mitigation Plan. The remaining AUAR items have identified regulatory requirements and/or mitigation measures that reduce the level of potential impact of development within the study area. The plan is formatted consistent with the sections of the AUAR for ease of reference.

8. Permits and Approvals Required

Table 16: Anticipated Permits and Approvals

Unit of Government	Type of Application	Status
Federal		
Federal Aviation Administration	Obstruction Evaluation/Notice of Proposed Construction or Alteration (Form 7460-1)	To be applied for
US Army Corps of Engineers	Section 404 Approval	To be applied for
	Wetland Delineation Concurrence	To be applied for
State		
Minnesota Department of Natural Resources	Temporary Water Appropriation Permit for Construction Dewatering	To be applied for
Minnesota Pollution Control Agency	National Pollutant Discharge Elimination System Stormwater Permit for Construction Activities	To be applied for
	Sanitary Sewer Extension Permit	To be applied for
	Construction Contingency Plan Approval	To be applied for, if needed
	Section 401 Water Quality Certification	To be applied for, if needed
Minnesota Department of Health	Watermain Installation Permit	To be applied for
Local		
Metropolitan Council	Sanitary Sewer Extension Permit	To be applied for
	Sanitary Sewer Permit to Connect	To be applied for
Capitol Region Watershed District	Permit for Stormwater Management, Erosion and Sediment Control, Wetland Management	To be applied for
Saint Paul Regional Water Services	Plumbing Permits	To be applied for
	Watermain Installation	To be applied for
Ramsey County	Right-of-Way Permits	To be applied for
	Road Access Permits	To be applied for
City of Saint Paul	Alternative Urban Areawide Review	In process
	Site Plan Review	To be applied for
	Preliminary & Final Plat	To be applied for
	Development Agreements	To be applied for
	Sign Permits	To be applied for
	Building Permits	To be applied for
	Excavation and Grading Permits	To be applied for
	Certificate of Occupancy	To be applied for
	Ordinance Permit for Construction of Public Improvements	To be applied for
	Right-of-Way Excavation and Obstruction Permits	To be applied for
	Sewer Utility Connection Permits	To be applied for
	Wetland Conservation Act Approval	To be applied for

9. Land Use

Ryan Development Scenario and Master Plan Maximum Development Scenario

Potential Impacts

- The dimensional standards for building heights stated in the Ford MP and underlying zoning districts (F2 Residential Mixed Low, F3 Residential Mixed Mid, F5 Business Mixed, and F6 Gateway) potentially exceed the MRCCA requirements related to building heights; however, the City of Saint Paul's RC3 River Corridor Urban Open Overlay District currently limits development to 40 feet in height within the same boundary as the CA-RTC and CA-UM districts.
- A portion of the AUAR study area is within the MSP airport restriction zones.

Mitigation Strategies

- Any zoning inconsistencies for either development scenario, such as floor area ratio or building height, will be addressed through the City's variance and/or conditional use permit process.

How Mitigation Will be Applied and Assured

- Mitigation will be regulated through the City's development review process. Proposed site plans must address relevant mitigation measures prior to final approval by the City.
- The developer[19] must submit an aeronautical study (Form 7460-1) with the FAA for the proposed development within the airport restriction zones.

Involvement by Other Agencies (if applicable)

- The developer will coordinate with the Metropolitan Airports Commission to ensure uses are compatible with the Minneapolis-St. Paul Airport.

10. Geology, Soils, and Topography/Land Forms

Ryan Development Scenario and Master Plan Maximum Development Scenario

Potential Impacts

- Asphalt and concrete crushing and grading activities within the study area are anticipated to begin in early spring of 2020. These construction activities will involve moving soil and/or excavation and have potential to cause erosion and sedimentation impacts to surface waters.

Mitigation Strategies

- Where required, slope stabilization will be provided by means of vegetation establishment, erosion control blankets, or other standard methods of erosion and sediment control.

How Mitigation Will be Applied and Assured

- The proposed development within the AUAR study area will require compliance with the Capitol Region Watershed District's and the City of Saint Paul's erosion and sediment control standards.

[19] Developer refers to the entity that proposes development on the properties within the AUAR study area.

- The developer must acquire an NPDES General Stormwater Permit for construction activity from the MPCA prior to initiating earthwork.

Involvement by Other Agencies (if applicable)

- The developer will apply for an Erosion Control Permit through the Capitol Region Watershed District and the City of Saint Paul.

11. Water Resources

Ryan Development Scenario and Master Plan Maximum Development Scenario

Potential Impacts

- The quantity, quality, and discharge rate of stormwater runoff in the post-development conditions will be designed to improve water quality of runoff leaving the site and to prevent further sedimentation and erosion issues within Hidden Falls Creek.
- Temporary dewatering may be required for construction or on an intermittent basis with either development scenario.
- Wetlands may be impacted as a result of either the Master Plan Maximum Development Scenario or the Ryan Development Scenario due to building footprints and/or roadway configurations.
- Sanitary sewer and water main extensions will be needed within the AUAR study area.
- Groundwater monitoring wells abandonment has been requested from the MPCA by Ford Motor Company.

Mitigation Strategies

- Infrastructure will be built within the AUAR study area to convey stormwater to stormwater management areas to help achieve the appropriate water quality treatment.
- Stormwater will be conveyed by means of an underground storm sewer to designed stormwater management areas. Conveyance systems will be designed in accordance with acceptable industry standards and in conformance with jurisdictional requirements.
- Wetland impacts will be minimized and avoided to the extent practicable as a mass grading plan and specific development plans are created.
- Wetland impacts will be replaced at a minimum of a 2:1 replacement ratio with wetland replacement occurring within Capitol Region Watershed District standards.
- At minimum, a 25-foot unmanicured vegetative buffer is required around all remaining wetlands located within the AUAR study area. The wetland buffers will be incorporated into site design.
- Construction activities associated with dewatering will include discharging into temporary sedimentation basins to reduce the rate of water discharged from the site, as well as discharging to temporary stormwater BMPs.
- Groundwater monitoring wells will be abandoned prior to construction within the AUAR study area per MPCA and MDH well sealing requirements.

How Mitigation Will be Applied and Assured

- The primary method of stormwater treatment will be through the use of retention ponds and sand filtration basins for the removal of total phosphorus and total suspended solids.
- Maintenance of the stormwater management areas will be performed by Saint Paul Public Works to ensure long term effectiveness of the facilities.
- The developer will apply for a Section 404 permit from the US Army Corps of Engineers for impacts to wetlands determined jurisdictional under Section 404 of the Clean Water Act.
- The developer will apply for a Wetland Conservation Act Replacement Plan Approval from Capitol Region Watershed District for wetland impacts.

Involvement by Other Agencies (if applicable)

- The developer will apply for a Temporary Water Appropriations General Permit 1997-005 for construction dewatering from the DNR for construction dewatering.
- The proposed development within the AUAR study area will require compliance with the standards of the Capitol Region Watershed District and the City for water quality, volume, runoff, and erosion control.
- Potential wetland mitigation would be evaluated by Capitol Region Watershed District and the US Army Corps of Engineers (if the wetlands are determined to be jurisdictional under Section 404 of the Clean Water Act).
- The developer will apply for a permit to from the MDH for a watermain installation.
- The developer will apply for a permit from the Metropolitan Council for a sewer extension and permit to connect.

12. Contamination/Hazardous Waste

Ryan Development Scenario and Master Plan Maximum Development Scenario

Potential Impacts

- Construction of either development scenario would 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.
- Toxic or hazardous substances may be used during project construction and operations (e.g., petroleum products, hydraulic fluid, and chemical products such as sealants).
- The proposed development would generate new demands on solid waste management and sanitation services provided in the project area.

Mitigation Strategies

- Products will be kept in their original containers unless they cannot be resealed. Original labels and Material Safety Data Sheets will be made available. Surplus materials will be properly removed from the property upon completion of use.

- A Construction Contingency Plan will be developed and submitted to the MPCA to address proper handling of any potential impacted soils or other regulated materials/wastes that may be encountered during construction.

How Mitigation Will be Applied and Assured

- Mitigation will be regulated through the MPCA's review process.

Involvement by Other Agencies (if applicable)

- Ramsey County will ensure compliance with applicable laws, rules, and ordinances related to the management of solid and hazardous waste as required by Minnesota Statutes, section 473.811.
- The developer will coordinate with the MPCA regarding the required plans, material handling and disposal.

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

Ryan Development Scenario and Master Plan Maximum Development Scenario

Potential Impacts

- No adverse impacts are anticipated to state-listed or federally-listed species. Species currently using the AUAR study area are adapted to a highly disturbed urban environment, and minimal impacts are anticipated to those species.

Mitigation Strategies

- Effective erosion prevention and sediment control practices will be incorporated into any stormwater management plan and also must be implemented and maintained near the Mississippi River to protect listed mussel species in the river.
- Wildlife friendly erosion control methods will be utilized within the study area to minimize impacts to wildlife using the site during construction.

How Mitigation Will be Applied and Assured

- Erosion prevention and sediment control practices will be implemented on site per the NPDES General Stormwater Permit requirements.

Involvement by Other Agencies (if applicable)

- Not applicable.

14. Historic Properties

Ryan Development Scenario and Master Plan Maximum Development Scenario

Potential Impacts

- Due to the highly disturbed nature of the site, no archaeological resources are anticipated within the 122-acre Ford Site parcel or the Burg & Wolfson (Lunds & Byerlys) property. The only areas of the AUAR study area that contain undisturbed or minimally disturbed soils are located on the Canadian Pacific Railway property.

Mitigation Strategies

- An archaeological survey will be required prior to development of the Canadian Pacific Railway property.

How Mitigation Will be Applied and Assured

- Mitigation will be regulated through the City's development review process. Proposed site plans must address relevant mitigation measures prior to final approval by the City.

Involvement by Other Agencies (if applicable)

- It is anticipated that the archaeological survey will be coordinated with SHPO.

16. Air

Ryan Development Scenario and Master Plan Maximum Development Scenario

Potential Impacts

- The proposed development will generate temporary fugitive dust emissions during construction.

Mitigation Strategies

- These emissions will be controlled by sweeping, watering, sprinkling, or applying calcium chloride, as appropriate or as prevailing weather and soil conditions dictate.

How Mitigation Will be Applied and Assured

- In accordance with Saint Paul City Ordinances (Section 221.02), during construction of the proposed development contractors will maintain streets, alleys, sidewalks, or other public places adjacent to construction, demolition, or building sites free from dust, litter, or other matter originating from their construction, demolition, or building sites, including that effected by erosion and landslides.

Involvement by Other Agencies (if applicable)

- Not applicable.

17. Noise

Ryan Development Scenario and Master Plan Maximum Development Scenario

Potential Impacts

- Construction activities may result in temporarily elevated noise levels.

Mitigation Strategies

- Construction activities (i.e., blasting, pile-driving, crushing, and grading activities) will be conducted in compliance with the City of Saint Paul Noise regulations to minimize noise levels and nighttime construction activities.[20]

[20] Chapter 239: https://library.municode.com/mn/st._paul/codes/code_of_ordinances?nodeId=PTIILECO_TITXXVIIIMIOF_CH293NORE

How Mitigation Will be Applied and Assured

- Permits related to construction noise will be obtained from the City prior to the start of construction.

Involvement by Other Agencies (if applicable)

- Not applicable.

18. Transportation

Ryan Development Scenario and Master Plan Maximum Development Scenario

Potential Impacts

- Increased traffic on the regional roadway network surrounding the study area.

Mitigation Strategies

Ryan Development Scenario

The following mitigation measures are recommended for consideration for the Ryan Development Scenario:

- Ford Parkway/Mount Curve Boulevard
  - Signalize/turn lane improvements
- Ford Parkway/Cretin Avenue
  - Modify signal timing and phasing
  - Extend eastbound and westbound left-turn lanes
  - Restrict parking to Pinehurst/Highland and restripe segment
- Ford Parkway/Cleveland Avenue
  - Extend eastbound left turn lane
  - Restrict parking and provide a southbound right turn lane
- Ford Parkway/Fairview Avenue
  - Provide left turn signal phasing
  - Provide southbound right turn lane
- Cretin Avenue/Montreal Avenue
  - Switch side-street stop control to north/south approach or install all-way stop control
  - Construct intersection for potential future signal
- Saint Paul Avenue/Montreal Avenue
  - Install traffic signal/turn lanes or hybrid roundabout
- Cretin Avenue/Randolph Avenue
  - Provide northbound/southbound left turn lanes

Master Plan Maximum Development Scenario

In addition to the mitigation described above, the following additional mitigation measures are recommended for consideration for the Master Plan Maximum Development Scenario:

- Ford Parkway/Cretin Avenue
  - Construct southbound right turn lane

- Ford Parkway/Fairview Avenue
    - Implement TDM strategies and refine land use guidance

How Mitigation Will be Applied and Assured

- Mitigation will be regulated through the City of Saint Paul development review, site plan, and permitting process. Implementation of feasible mitigation measures will be addressed through permitting and developer agreements with the City of Saint Paul.
- As a condition of City of Saint Paul master site plan approval for redevelopment of the Ford Site under either the Ryan Development Scenario or 2040 Master Plan Maximum Development Scenario, feasible traffic improvements will be evaluated and planned for each of the following intersections in coordination with other applicable authorities: Ford Parkway/Mount Curve Boulevard; Ford Parkway/Cretin Avenue; and Cleveland Avenue/Montreal Avenue. As development occurs, feasible traffic improvements will also be evaluated and planned for the following intersections under the regulatory control of the City of Saint Paul and in coordination with other applicable authorities: Ford Parkway/Cleveland Avenue; Ford Parkway/Fairview Avenue; Saint Paul Avenue/Montreal Avenue; and Cretin Avenue/Randolph Avenue.

Involvement by Other Agencies (if applicable)

- Mitigation measures will be coordinated with other applicable agencies and authorities having jurisdiction over identified transportation facilities.

Appendix A: Correspondence

Metropolitan Airports Commission
6040 28th Avenue South, Minneapolis, MN 55450 • 612-726-8100 • metroairports.org

August 24, 2018

Mr. Anthony Adams
Civil Engineer
Ryan A+E, Inc.
533 South 3rd Street, Suite 100
Minneapolis, MN 55415

Re: Ford Development Site – Airport Zoning Restrictions

SENT VIA EMAIL (anthony.adams@ryancompanies.com)

Dear Mr. Adams:

As requested in your email dated August 17, 2018, the Metropolitan Airports Commission (MAC) offers the following observations about airport zoning restrictions for the proposed Ford Development Site in Saint Paul, as depicted on the attached exhibit.

A portion of the development site appears to be in Safety Zone B as defined by the Minneapolis-St. Paul International Airport (Wold Chamberlain Field) Zoning Ordinance, which was adopted by the Wold-Chamberlain Field Joint Airport Zoning Board on April 29, 2004.

The MSP Airport Zoning Ordinance can be downloaded via the following website link: https://metroairports.org/Metroairports/media/Media/Documents/ordinances/JAZB_Ordinance_2004.pdf

Land parcels within Safety Zone B are subject to the following restrictions:

- Height restrictions (per Section IV.B of the MSP Zoning Ordinance)
- General land use restrictions (per Section V.B.1 of the MSP Zoning Ordinance)
- Specific land use restrictions (per Section V.B.3 of the MSP Zoning Ordinance) that prohibit the following uses: amphitheaters, campgrounds, churches, fuel storage tank farms and above-ground fuel tanks, gasoline stations, hospitals, nursing homes, residential uses (including low, medium, and high density residential uses), schools, stadiums, theaters, trailer courts, ponds or other uses that might attract waterfowl or other birds such as putrescible waste disposal operations, wastewater treatment facilities and associated settling ponds, and dredge spoil containment areas; provided, however, the prohibition on ponds or other uses that might attract waterfowl or other birds shall not apply to areas below an elevation of eight hundred (800) feet above mean sea level along any Bluff of either the Mississippi River or the Minnesota River.

The MSP Zoning Ordinance provides for a Board of Adjustment, which has the power to hear and decide variances, appeals from decisions made by the zoning administrators, and any special exceptions that might exist to the MSP Zoning Ordinance. The variance application process is outlined in Section IX of the MSP Zoning Ordinance.

Regarding solar installations, the MSP Zoning Ordinance does not prohibit solar panels within Safety Zone B. However, if a particular solar installation is determined to cause glare issues for pilots or air traffic controllers, the zoning ordinance would serve as a basis to work with the property owner to mitigate the visual impairment.

Finally, please note that applicant must file an aeronautical study with the Federal Aviation Administration (FAA) for the proposed development (including all construction equipment and solar installations) to ensure that it will not have an adverse impact on Minneapolis-St. Paul International Airport.

The requirements for filing an aeronautical study with the FAA for proposed structures vary based on a number of factors: site elevation, structure height, proximity to an airport, and frequencies emitted from the structure, etc.

The FAA provides a "Notice Criteria Tool" on its Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) website that can be used to determine if an aeronautical study is warranted. The OE/AAA website can be accessed via the following link:
https://oeaaa.faa.gov/oeaaa/external/portal.jsp

Thank you for reaching out to us in a proactive manner to discuss future development on the Ford Site. If you have any questions about the items contained in this letter, please contact me at 612-726-8129 or via e-mail at neil.ralston@mspmac.org.

Sincerely,

Neil Ralston

Neil Ralston, A.A.E.
Airport Planner

cc: Dana Nelson, MAC
Pat Mosites, MAC

Attachment: Ford Site exhibit

RYAN

FORD SITE - ST. PAUL, MN

FAA EXHIBIT

08/17/2018

Minnesota Pollution Control Agency
520 Lafayette Road North | St. Paul, MN 55155-4194 | 651-296-6300 | 1-800-657-3864 | 651-282-5332 TTY | www.pca.state.mn.us

April 10, 2008

Ms. Barbara Rusinowski
Ford Motor Company
3 Parkland Boulevard, Suite 950 PTW
Dearborn, Michigan 48126

RE: Ford Twin Cities Plant
966 S. Mississippi River Blvd., St. Paul
MPCA Project Number VP23530
Approval of Response Action Implementation Report – Baseball Fields

Dear Ms. Rusinowski:

The Minnesota Pollution Control Agency (MPCA) staff in the Voluntary Investigation and Cleanup (VIC) program has reviewed the "Response Action Implementation Report for the Baseball Fields – Feature 139" (Report) for the Ford Twin Cities Plant site, located at the address referenced above (the Site). The Report, dated March 13, 2008, was prepared and submitted on your behalf by Arcadis U.S., Inc.

The Report describes the removal of a small volume of surficial soil from one baseball field. The shallow excavation removed soil which contained a concentration of arsenic deemed to be slightly above typical background levels. While the soil did not pose a risk to human health or the environment, Ford Motor Company elected to remove the soil as a precautionary measure. Fill soils were imported to the Site to backfill the excavation.

The Report is hereby approved. This letter is subject to the standard disclaimers in Attachment A. If you have any questions regarding this letter, please contact me at 651-297-3080 or Amy Hadiaris, Hydrogeologist, at 651-296-8947.

Sincerely,

Kären Kromar

Kären Kromar
Project Manager
Superfund and Emergency Response Section
Remediation Division

KK/jmp

cc: Bryan Zinda, Arcadis
Merritt Clapp-Smith, City of St. Paul

ATTACHMENT A
STANDARD DISCLAIMERS
Ford Twin Cities Plant
MPCA Project Number VP23530

1. Reservation of Authorities

The MPCA Commissioner reserves the authority to take any appropriate actions with respect to any release, threatened release, or other conditions at the Site. The MPCA Commissioner also reserves the authority to take such actions if the voluntary party does not proceed in the manner described in this letter or if actions taken or omitted by the voluntary party with respect to the Site contribute to any release or threatened release, or create an imminent and substantial danger to public health and welfare.

2. No MPCA Assumption of Liability

The MPCA, its Commissioner and staff do not assume any liability for any release, threatened release or other conditions at the Site or for any actions taken or omitted by the voluntary party with regard to the release, threatened release, or other conditions at the Site, whether the actions taken or omitted are in accordance with this letter or otherwise.

3. Letter Based on Current Information

All statements, conclusions and representations in this letter are based upon information known to the MPCA Commissioner and staff at the time this letter was issued. The MPCA Commissioner and staff reserve the authority to modify or rescind any such statement, conclusion or representation and to take any appropriate action under his authority if the MPCA Commissioner or staff acquires information after issuance of this letter that provides a basis for such modification or action.

4. Disclaimer Regarding Use or Development of the Property

The MPCA, its Commissioner and staff do not warrant that the Site is suitable or appropriate for any particular use.

5. Disclaimer Regarding Investigative or Response Action at the Property

Nothing in this letter is intended to authorize any response action under Minn. Stat. § 115B.17, subd. 12.

MINNESOTA POLLUTION CONTROL AGENCY

520 Lafayette Road North | St. Paul, Minnesota 55155-4194 | 651-296-6300

800-657-3864 | Use your preferred relay service | info.pca@state.mn.us | Equal Opportunity Employer

May 15, 2019

Charles Pinter
Ford Motor Company Environmental Quality Office
Fairlane Plaza North
290 Town Center Drive, Suite 800
Dearborn, MI 48126

RE: Certificate of Completion
Ford Twin Cities Plant
966 South Mississippi River Boulevard, St. Paul
MPCA Site ID: VP23530
MPCA Billing ID: 685
PIN: 172823130002 (Main Parcel)

Dear Mr. Pinter:

The Minnesota Pollution Control Agency (MPCA) staff in the Voluntary Investigation and Cleanup (VIC) Program is pleased to send the enclosed Commissioner's Certificate of Completion of Response Actions Under the Land Recycling Act of 1992, As Amended (Certificate of Completion) for the main parcel of the Ford Twin Cities Plant site. The MPCA appreciates the cooperative effort of Ford Motor Company during the extended investigation and cleanup of the main parcel.

If you have any questions about the enclosed Certificate of Completion, please contact me at (651) 757-2402 or by email at amy.hadiaris@state.mn.us, or Shanna Schmitt at (651) 757-2697 or shanna.schmitt@state.mn.us.

Sincerely,

Amy K. Hadiaris

This document has been electronically signed.

Amy K. Hadiaris
Supervisor, Voluntary Investigation and Cleanup Program
Remediation Division

AH:ah

Enclosure

ecc: Ryan Oesterreich, Arcadis
Menaka Mohan, St. Paul PED
Melanie McMahon, St. Paul Ward 3
Zack Hansen, Ramsey County Environmental Health
Jon Blaha, Ryan Companies
Mark Miller, Terracon

STATE OF MINNESOTA
Minnesota Pollution Control Agency

Commissioner's Certificate of Completion of Response Actions Under the Land Recycling Act of 1992, As Amended

WHEREAS, Ford Motor Company has undertaken response actions pursuant to Minn. Stat. § 115B.175 (the Land Recycling Act of 1992, as amended) on the main parcel of the Ford Twin Cities Plant site, located at 966 S Mississippi River Blvd, Saint Paul and further described in a legal description in **Exhibit A** to this Certificate (the Site) and shown on the map in **Exhibit D** to this Certificate; and

WHEREAS, Ford Motor Company submitted a Voluntary Response Action Plan (comprised of the documents and reports listed as nos. 43 through 62 in **Exhibit B** of this Certificate) including an Investigation Report (comprised of the documents and reports listed as 1 through 42 in Exhibit B of this Certificate), to the Minnesota Pollution Control Agency (MPCA) under Minn. Stat. § 115B.17, subd. 14, governing review of voluntary investigation and response actions; and

WHEREAS, in accordance with Minn. Stat. §§ 115B.17 subd. 14, and 115B.175, the Commissioner of the MPCA or the Commissioner's delegate has determined that the Investigation Report adequately identified and evaluated the nature and extent of the releases and threatened releases at or from the Site; and

WHEREAS, the Commissioner or the Commissioner's delegate has approved a Voluntary Response Action Plan (comprised of documents 43 through 62 in Exhibit B of this Certificate) including the response actions determined by the Commissioner or the Commissioner's delegate to be necessary to protect public health and welfare, and the environment, from releases or threatened releases of hazardous substances, pollutants, or contaminants at or from the Site, as described in **Exhibit C** of this Certificate; and

WHEREAS, Ford Motor Company has completed the response actions set forth in the approved Voluntary Response Action Plan, including the actions necessary to carry out any reuse or development of the Site as proposed by Ryan Companies, Inc. in a manner that protects public health and welfare and the environment.

NOW, THEREFORE, pursuant to Minn. Stat. § 115B.175, subd. 5,

The Commissioner of the Minnesota Pollution Control Agency certifies under Minn. Stat. § 115b.175 (the land recycling act of 1992, as amended), that response actions have been completed as set forth in the approved voluntary response action plan for the site.

Upon issuance of this Certificate, the persons qualified for protection under Minn. Stat. § 115B.175, subd. 6a, are entitled to protection from liability under Minn. Stat. §§ 115B.01 to 115B.18, to the extent provided in the Land Recycling Act of 1992, as amended. The protection from liability provided under Minn. Stat. § 115B.175, does not apply to any person excluded from that protection under Minn. Stat § 115B.175, subd. 7.

Nothing in this Certificate or in the Land Recycling Act of 1992, as amended, affects the authority of the MPCA or the MPCA Commissioner to exercise any powers or duties under Minn. Stat §§ 115B.01 to 115B.18, or other law with respect to any release or threatened release at the Site, or the right of the MPCA or the MPCA Commissioner to seek any relief available under those sections against any person who is not entitled to protection from liability under the Land Recycling Act of 1992, as amended, with respect to such release or threatened release.

Signed and Certified this 15th day of May, 2019.

Kathryn J. Sather

Kathryn J. Sather
Division Director
Remediation Division

State of Minnesota)
) ss.
County of Ramsey)

The foregoing was acknowledged before me this 15th day of May, 2019, by Kathryn J. Sather, pursuant to delegation by Laura Bishop, Commissioner of the Minnesota Pollution Control Agency, a state agency, on behalf of the State of Minnesota.

DEBORAH A. KLOOZ
NOTARY PUBLIC - MINNESOTA
My Commission Expires Jan. 31, 2020

Deborah A Klooz

Notary Public

My Commission Expires 1-31-2020

Exhibit A

Legal Description of Main Parcel

FORD TWIN CITIES PLANT

MPCA VIC Project Number VP23530

Parcel A1 (Abstract property):

That part of Lot 1, Auditor's Subdivision No. 87, lying north of the plat of Ford Motor Company First Addition,

Except that part of said Lot 1 lying within the east 671.40 feet of the Northeast Quarter of Section 17, Township 28, Range 23, and lying north of a line drawn at right angles to the east line of said Northeast Quarter from a point on said east line distant 1530.54 feet south from the intersection of the south line of Ford Road with the east line of said Northeast Quarter,

And except that part of said Lot 1 contained within the following: Beginning at the intersection of the southerly right-of-way of Ford Parkway, as now established, with a line distant westerly 671.40 feet from and parallel with the east line of Section 17, Township 28, Range 23; thence southerly 500 feet along a line distant 671.40 feet westerly and parallel with the east line of said Section 17; thence westerly and parallel with the southerly right-of-way line of Ford Parkway, as now established, a distance of 328 feet; thence northerly along a line distant westerly 999.40 feet and parallel with the east line of said Section 17, a distance of 500 feet to the southerly right-of-way line of Ford Parkway, as now established; thence easterly along the said southerly right-of-way line of Ford Parkway, as now established, a distance of 328 feet to the point of beginning,

And except the following described parcel: All of the North half of the Southeast quarter of the Northeast quarter of Section 17, Township 28, Range 23 West of the Fourth Principal Meridian, except the East 671.40 feet thereof (being part of Lot 1, Auditor's Subdivsion No. 87),

And except the following described parcel: All that part of the Southeast quarter of the Northeast quarter of Section 17, Township 28, Range 23 lying South of a line dividing the North and South halves of the Southeast quarter of the Northeast quarter of said Section 17 except those parts of said Tract taken and condemned by the City of St. Paul, Minnesota for the widening of Cleveland Avenue, and also except from the above property that part described as follows: Beginning at a point in the East line of said Section 17 which point is 1280.54 feet south of the intersection of the present south line of the Ford Road with the said East line of said Section 17; thence West at right angles with said East line of Section 17, a distance of 671.40 feet to a point; thence North and parallel with the said East line of Section 17, a distance of 22.66 feet to a point in the North line of said South half of the Southeast quarter of the Northeast quarter of said Section 17; thence East along the North line of the South half of the Southeast quarter of the Northeast quarter of Section 17, 671.40 feet to the said East line of Section 17 aforesaid; thence South 26.34 feet to the place of beginning; also except that part described as follows: Beginning at a point in the East line of Section 17 which point is 1280.54 feet South of the intersection of the present South line of Ford Road with the said East line of Section 17; thence West at right angles with the said East line of Section 17 a distance of 671.40 feet to a point; thence South and parallel with the said East line of Section 17 a distance of 250.00 feet to a point; thence East and parallel with the first course of the land herein described 671.40 feet to a point in the said East line of Section 17; thence North along the said East line of Section 17 a distance of 250.00 feet to the point of beginning.

Parcel A2 (Certificate of Title No. 203819):

All of the North half of the Southeast quarter of the Northeast quarter of Section 17, Township 28, Range 23 West of the Fourth Principal Meridian, except the East 671.40 feet thereof, (being part of Lot 1, Auditor's Subdivision No. 87).

Parcel A3 (Certificate of Title No. 231951):

All that part of the Southeast quarter of the Northeast quarter of Section 17, Township 28, Range 23 lying South of a line dividing the North and South halves of the Southeast quarter of the Northeast quarter of said Section 17 except those parts of said Tract taken and condemned by the City of St. Paul, Minnesota for the widening of Cleveland Avenue, and also except from the above property that part described as follows: Beginning at a point in the East line of said Section 17 which point is 1280.54 feet south of the intersection of the present south line of the Ford Road with the said East line of said Section 17; thence West at right angles with said East line of Section 17, a distance of 671.40 feet to a point; thence North and parallel with the said East line of Section 17, a distance of 22.66 feet to a point in the North line of said South half of the Southeast quarter of the Northeast quarter of said Section 17; thence East along the North line of the South half of the Southeast quarter of the Northeast quarter of Section 17, 671.40 feet to the said East line of Section 17 aforesaid; thence South 26.34 feet to the place of beginning; also except that part described as follows: Beginning at a point in the East line of Section 17 which point is 1280.54 feet South of the intersection of the present South line of Ford Road with the said East line of Section 17; thence West at right angles with the said East line of Section 17 a distance of 671.40 feet to a point; thence South and parallel with the said East line of Section 17 a distance of 250.00 feet to a point; thence East and parallel with the first course of the land herein described, 671.40 feet to a point in the said East line of Section 17; thence North along the said East line of Section 17 a distance of 250.00 feet to the point of beginning.

Parcel B1 (Abstract property):

Lot 2, Auditor's Subdivision No. 87,

Except that part thereof lying within the plat of Ford Motor Company First Addition,

And except the following described parcel: All of the North Half of Lot 2, Section 17, Township 28, Range 23 according to the Government Survey thereof, which is situated East of the Easterly line of the Mississippi River Boulevard Number 2 as said easterly line is determined and defined by the recorded plat of said Mississippi River Boulevard Number 2 on file and of recorded in the office of the Register of Deeds in and for said County of Ramsey and State of Minnesota,

And except the following described parcel: That part of Government Lot 2, Section 17, Township 28, Range 23, lying southerly of a line dividing the North and South halves of the Southeast Quarter of the Northeast Quarter of said Section 17 prolonged and extended in a straight line in a West direction to the Mississippi River and lying easterly and southerly of the following described line: Beginning at the intersection of a line dividing the North and South halves of the Southeast Quarter of the Northeast Quarter of said Section 17 prolonged and extended in a straight line in a West direction to the Mississippi River and the westerly line of Mississippi River Blvd.; thence South 30 degrees 15 minutes 28 seconds East, assumed bearing along said westerly line a distance of 126.12 feet, thence South 60 degrees 37 minutes 58 seconds West, to the Mississippi River and there terminating; excepting however from said tract, that part taken for Mississippi River Blvd.

Parcel B2 (Certificate of Title No. 81985):

All of the North half of Lot 2 Section 17, Township 28, Range 23, according to the Government Survey thereof, which is situated East of the Easterly line of the Mississippi River Boulevard Number 2 as said Easterly line is determined and defined by the recorded plat of said Mississippi River Boulevard Number 2 on file and of record in the office of the Register of Deeds in and for said County of Ramsey and State of Minnesota.

Parcel B3 (proposed subdivision of the land on Certificate of Title No. 570430):

That part of Government Lot 2, Section 17, Township 28, Range 23, lying southerly of a line dividing the North and South halves of the Southeast Quarter of the Northeast Quarter of said Section 17 prolonged and extended in a straight line in a West direction to the Mississippi River, and lying East of the Easterly line of the Mississippi River Boulevard Number 2 as said Easterly line is determined and defined by the recorded plat of said Mississippi River Boulevard Number 2 on file and of record in the office of the County Recorder in and for said County of Ramsey and State of Minnesota.

Parcel C (Certificate of Title No. 270211):

Lot 1, Block 1, Ford Motor Company First Addition.

Parcel D (Abstract property):

That part of Lot 3, Block 1, Ford Motor Company First Addition, lying northeasterly, northerly and northwesterly of the following described line: Beginning at a point on the west line of said Lot 3; said point of beginning being located along said west line South 00 degrees 06 minutes 52 seconds West, assumed bearing, a distance of 10.58 feet from the northwest corner of said Lot 3; thence South 49 degrees 54 minutes 51 seconds East a distance of 199.01 feet; thence North 67 degrees 29 minutes 09 seconds East a distance of 61.60 feet; thence South 62 degrees 12 minutes 36 seconds East a distance of 163.97 feet; thence South 69 degrees 21 minutes 00 seconds East a distance of 100.00 feet; thence North 67 degrees 29 minutes 09 seconds East a distance of 18.93 feet; thence South 69 degrees 21 minutes 00 seconds East a distance of 605.99 feet; thence North 89 degrees 37 minutes 00 seconds East a distance of 249.70 feet to the northeast corner of said Lot 3 and there terminating

Exhibit B

Site Documents

FORD TWIN CITIES PLANT

MPCA VIC Project Number VP23530

All documents prepared by Arcadis, U.S., Inc. on behalf of Ford Motor Company

Investigation Reports

Phase I Environmental Site Assessment

1. Phase I Environmental Site Assessment, June 29, 2007
2. Initial Receptor Survey, November 1, 2010
3. Final Receptor Survey, July 18, 2011

Phase II Investigation Work Plans

4. Soil Investigation and Risk Assessment Work Plan - Baseball Fields, September 7, 2007
5. Quarterly Groundwater Sampling Events Work Plan, December 19, 2007
6. Groundwater Seep & Mississippi River Sampling Work Plan, April 11, 2008
7. Supplemental Phase II Exterior Investigation Work Plan, May 13, 2008
8. North Parking Area Supplemental Phase II - Exterior Investigation Work Plan, May 19, 2008
9. Phase II - Interior Investigation Work Plan, May 28, 2010
10. Subsurface Investigation Work Plan - Element 1, July 15, 2013
11. Subsurface Investigation Work Plan - Element 2, June 6, 2014
12. Former Fill Areas A and B Investigation Work Plan, December 8, 2014
13. Subsurface Investigation Work Plan - Element 3, July 6, 2015
14. Work Plan for Installation and Sampling of Bedrock Monitoring Wells, January 7, 2016
15. Work Plan for Site-Wide Groundwater Sampling of Monitoring Wells, May 11, 2016
16. Interim Groundwater Sampling Work Plan, May 4, 2018

Phase II Investigation Reports

17. Soil Investigation Report - Baseball Fields, September 7, 2007
18. Initial Phase II - Exterior Investigation Report, October 29, 2007
19. Additional Soil Investigation and Surface Soil Risk Assessment - Baseball Fields, Dec. 19, 2007
20. December 2007 Quarterly Groundwater Sampling Event, March 24, 2008
21. March 2008 Quarterly Groundwater Sampling Event, June 27, 2008
22. September 2008 Quarterly Groundwater Sampling Event, December 31, 2008
23. 2009 Groundwater Sampling Event, February 18, 2010
24. Technical Memorandum – Seep and River Sampling Events, February 22, 2011
25. Technical Memorandum – Underground Storage Tank Sampling Event, February 28, 2011
26. Initial Phase II - Interior Investigation Report, March 13, 2011
27. Supplemental Phase II Exterior Investigation Report, May 31, 2012
28. Summary of Underground Storage Tank (UST) Sump Sampling Events, December 4, 2012
29. Sampling of Propane Tank Removals, May 2, 2013
30. Supplemental Phase II Exterior Investigation Report, May 29, 2013
31. Solvent UST Removal Summary, November 12, 2013
32. Work Element 1 Data Summary, January 28, 2014

33. Data Collected from Monitoring Wells Along the Mississippi, September 2, 2014
34. Underground Gasoline Storage Tank Removal Report, April 10, 2015
35. Phase II Comprehensive Investigation Report, March 31, 2016
36. Comprehensive Phase II Site Investigation Report: Soil Addendum, August 8. 2016
37. Comprehensive Phase II Site Investigation Report: Groundwater Addendum, September 19, 2016
38. Technical Memorandum – Summary of Thallium Detections and Review of Fate and Transport Properties, November 30, 2017
39. 2017 Fourth Quarter Groundwater Sampling Summary, April 20, 2018
40. Technical Memorandum – Main Parcel Soil Vapor Monitoring Report, October 25, 2018
41. Supplemental Groundwater Monitoring Report, November 12, 2018
42. Technical Memorandum – St. Peter Sandstone Geochemistry Evaluation, November 14, 2018

Voluntary Response Action Plan

43. Soil Removal Work Plan – Baseball Fields, January 3, 2008
44. Remedial Action Plan, 1A Tunnel Barrier Wall, December 14, 2009
45. Underground Storage Tank Removal - Environmental Contingency Plan, April 9, 2013
46. Site-Wide Environmental Contingency Plan, July 17, 2013
47. Site Decommissioning Response Action Plan (SDRAP), April 1, 2015
48. SDRAP Addendums #1 through #63 (2015 - 2016)
49. Interim Response Action Plan - Isolated Impact Areas, June 8, 2016
50. Interim Response Action Plan - Consolidated Impact Areas, October 2016
51. Arsenic Addendum to the Consolidated Impact Areas Response Action Plan, June 28, 2017
52. *Interim Response Action Plan - CP Rail Property, November 2017**

Response Action Plan Implementation

53. Response Action Implementation Report - Baseball Fields, March 13, 2008
54. Tunnel 1A Response Action Implementation Report, January 11, 2011
55. Excavation of Temporary Sediment Retention Ponds, July 11, 2014
56. SDRAP Implementation Report, March 31, 2016
57. SDRAP Addendum Implementation Report, December 19, 2018
58. Isolated Impact Area Response Action Implementation Report, July 23, 2018
59. Consolidated Impact Area Response Action Implementation Report, August 16, 2018
60. Technical Memorandum – Additional Excavation Work Completed Outside of Approved Interim Response Action Plans, December 5, 2018
61. Comprehensive Response Action Implementation Report (Summary Report), March 12, 2019
62. *Canadian Pacific Railway Response Action Implementation Report, March 12, 2019**

* *The CP Rail Property is not part of the Ford Twin Cities Plant site, but Ford Motor Company completed a soil response action on the western portion of the CP Rail Property due to a historical burn/disposal area (Area A/B) extending across the property boundary onto the CP Rail parcel. The two reports pertaining to the CP Rail property are included in the above list.*

Exhibit C

Site Summary

FORD TWIN CITIES PLANT

MPCA Project Number VP23530

This Certificate of Completion applies to the 122-acre main parcel of the larger Ford Twin Cities Plant site. Construction of the original portion of the main assembly building began in 1923, with various additions completed through the 1980s. The plant was used for automobile manufacturing and assembly until the mid-1970s, when it was converted to an assembly plant for light duty trucks, using parts manufactured elsewhere. The Twin Cities Assembly Plant ceased operation in December 2011. The Site is currently vacant land with a few remaining concrete/asphalt paved areas. Ryan Companies intends to construct a mixed use residential/commercial development at the Site.

ENVIRONMENTAL INVESTIGATION

Ford Motor Company (Ford) completed several environmental investigations at the Site between 2007 and 2018. Over 1,300 soil borings were advanced at the Site, with additional soil screening and sampling taking place during decommissioning activities, as building slabs and subsurface features were removed. Soil contaminants identified at the Site include heavy metals such as lead and arsenic, volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and petroleum compounds. The most widespread VOCs detected in soil at the Site were associated with hydrocarbon solvents used in former painting operations (benzene, toluene, xylene, trimethylbenzene, etc.). Chlorinated VOCs were detected in relatively few soil samples and, with the exception of three discrete areas within the footprint of the main assembly building, were generally present at trace to low concentrations. The three discrete areas with high concentrations of tetrachloroethene (PCE) and trichloroethene (TCE) in soil were cleaned up during subsequent site-wide soil response actions.

The groundwater investigation at the Site included evaluation of shallow discontinuous perched groundwater in the unconsolidated material overlying the bedrock, perched groundwater in the Platteville Formation, and groundwater in the St. Peter aquifer, which contains the regional water table at a depth of approximately 100 feet below ground surface. Perched groundwater in the Platteville Formation flows towards the river valley and emerges from the upper portion of the bluff wall via small seeps. Groundwater in the St. Peter aquifer discharges to the Mississippi River, which is located a short distance west of the Site, across Mississippi River Boulevard. There are no drinking water receptors between the Site and the Mississippi River. This stretch of the Mississippi River is a designated Class 2 Water of the State, thus surface water quality standards for aquatic life and recreation were used to evaluate potential risk to the Mississippi River from the discharge of groundwater from the St. Peter aquifer.

Elevated concentrations of petroleum compounds (diesel range organics/gasoline range organics) and hydrocarbon VOCs (benzene, toluene, xylene, trimethylbenzene, etc.) were found in pockets of shallow perched groundwater in the unconsolidated overburden, and to a lesser extent in the Platteville Formation. Impacts to perched groundwater at the Site were dealt with by removing the impacted soil that caused the groundwater contamination. Minimal groundwater contamination was found in the St. Peter aquifer under the majority of the Site. Groundwater in the St. Peter aquifer is generally well protected from surface sources of contaminants by the overlying Decorah, Platteville, and Glenwood bedrock units.

Chlorinated VOCs are present in groundwater samples collected from three monitoring wells located along the west boundary of the Site, between the former main assembly building and Mississippi River Boulevard. In the Platteville monitoring well AMW-06, located just west of the northern portion of the former main assembly building, trichloroethene (TCE) and cis-1,2-dichloroethene (cis-DCE) first appeared in 2016 after having not been detected during previous sampling events. These chlorinated VOCs have continued to be present in AMW-06 since that time. The maximum concentrations of TCE and cis-DCE in AMW-06 were, respectively, 43 micrograms per liter (µg/l) and 720 µg/l. The change in groundwater quality observed at AMW-06 is likely due to greater infiltration at the Site after building slabs and parking lots had been removed, but prior to completion of soil remediation. Groundwater samples collected from temporary wells during the Site investigation identified an area of TCE-impacted perched groundwater in the overburden at the north end of the former main assembly building, which is likely related to the chlorinated VOCs detected in Platteville monitoring well AMW-06 beginning in 2016.

TCE has also been detected in St. Peter monitoring wells AMW-29 and AMW-30 at concentrations up to 34 micrograms per liter (µg/L). These two wells are located just west of the central portion of the former main assembly building. Each monitoring well is downgradient of a discrete area of TCE-impacted soil discovered within the footprint of the main assembly building. Each source area of TCE-impacted soil was excavated during subsequent response actions.

In addition to the TCE impacts in AMW-29 and AMW-30, described above, groundwater samples from these two St. Peter monitoring wells show low pH values and high concentrations of dissolved metals. The collective body of information suggests that this may be the result of a geochemical reaction caused by oxygenated water coming into contact with naturally occurring reduced metal sulfide minerals such as pyrite. The resulting oxidation of reduced metal sulfide minerals creates sulfuric acid and releases any trace metals that are commonly adsorbed or co-precipitated with the metal sulfides, such as thallium. Additionally, the low pH created by the sulfuric acid can result in additional dissolution or desorption of other metals present in the aquifer matrix. While an anthropogenic source for the metals cannot be ruled out, no metals-impacted soil was identified in this portion of the Site during decommissioning or environmental investigation activities. The pH values of groundwater in the St. Peter aquifer downgradient of AMW-29 and AMW-30 (closer to the Mississippi River) are higher, and the concentration of metals much lower, suggesting that the geochemical conditions of the aquifer return to a more typical state prior to discharging to the river. A Tier 2 surface water evaluation demonstrated that the dissolved metals detected in the St. Peter aquifer do not pose a risk to the Mississippi River.

RESPONSE ACTIONS

Soil remediation began in 2013, during removal of building slabs and other features, and continued through January 2019. Soil response actions included the excavation of impacted soil, screening and visual inspection of all excavated and exposed soil, collection of confirmation samples to ensure removal of all impacted soil, and backfilling of excavations. Approximately 440,000 cubic yards of contaminated soil was excavated from the main parcel and the adjacent Central Pacific Rail parcel and sent to a permitted landfill for disposal. Excavated areas are shown on the figure in Exhibit E. Many areas of the Site were excavated down to bedrock. Soil confirmation samples indicate that soil with contaminant concentrations exceeding residential risk-based values was successfully removed from the Site. No groundwater response actions were necessary.

POST-CLEANUP DUE DILIGENCE

In July/August of 2018, Ryan Companies conducted a post-cleanup due diligence investigation at the Site. Ryan's environmental investigation included 46 soil borings, 59 test pits, 9 temporary wells, and a geophysical survey. A low concentration of diesel range organics (DRO, 186 mg/kg) was identified in soil at one test pit location and was excavated for landfill disposal, since the concentration exceeded the MPCA's unregulated fill criteria. No other exceedances of soil cleanup criteria were identified.

SOIL VAPOR

A total of 84 soil vapor monitoring points were installed at various locations and depths across the main parcel, in a phased approach as soil response actions were completed in different areas. Fourteen locations couldn't be sampled because of subsequent saturated conditions due to localized perched water. Of the 70 sampled locations, 12 locations had VOCs at concentrations greater than the MPCA's action level of thirty-three times (33x) residential intrusion screening values (ISVs). Specific VOCs which exceeded the MPCA's residential action level include benzene, ethylbenzene, xylene, 1,2,4- and 1,3,5-trimethylbenzene, hexane, cyclohexane, dichlorodifluoromethane (CFC-12), tetrachloroethene (PCE), and vinyl chloride. In all cases, the concentration of VOCs in other soil vapor samples located between the exceedances and potential off-site receptors were less than the action level of 33x residential ISVs. Based on the site-wide screening evaluation presented in the Soil Vapor Report (Document #40 on Exhibit B), there is not an off-site vapor intrusion risk related to vapor migration from the Site.

Of the 70 sampled locations, PCE was detected at 12 locations at concentrations ranging from 7.5 to 170 $\mu g/m^3$, exceeding its residential action level of 110 $\mu g/m^3$ at two locations. Trichloroethene (TCE) was detected at five locations at concentrations ranging from 6.1 to 24 $\mu g/m^3$, all less than its residential action level of 70 $\mu g/m^3$. Vinyl chloride was detected at one sample location at a concentration of 670 $\mu g/m^3$, exceeding its action level of 110 $\mu g/m^3$.

The MPCA considers the on-site soil vapor data collected to date to be a screening level evaluation of potential vapor intrusion risk at the Site. Additional soil vapor data will be necessary as the Site is redeveloped, to help inform future building-specific vapor mitigation decisions. The additional soil vapor data will be collected by the developer, prior to construction of Site buildings, and under the oversight of the MPCA.

Exhibit D

Main Parcel

FORD TWIN CITIES PLANT

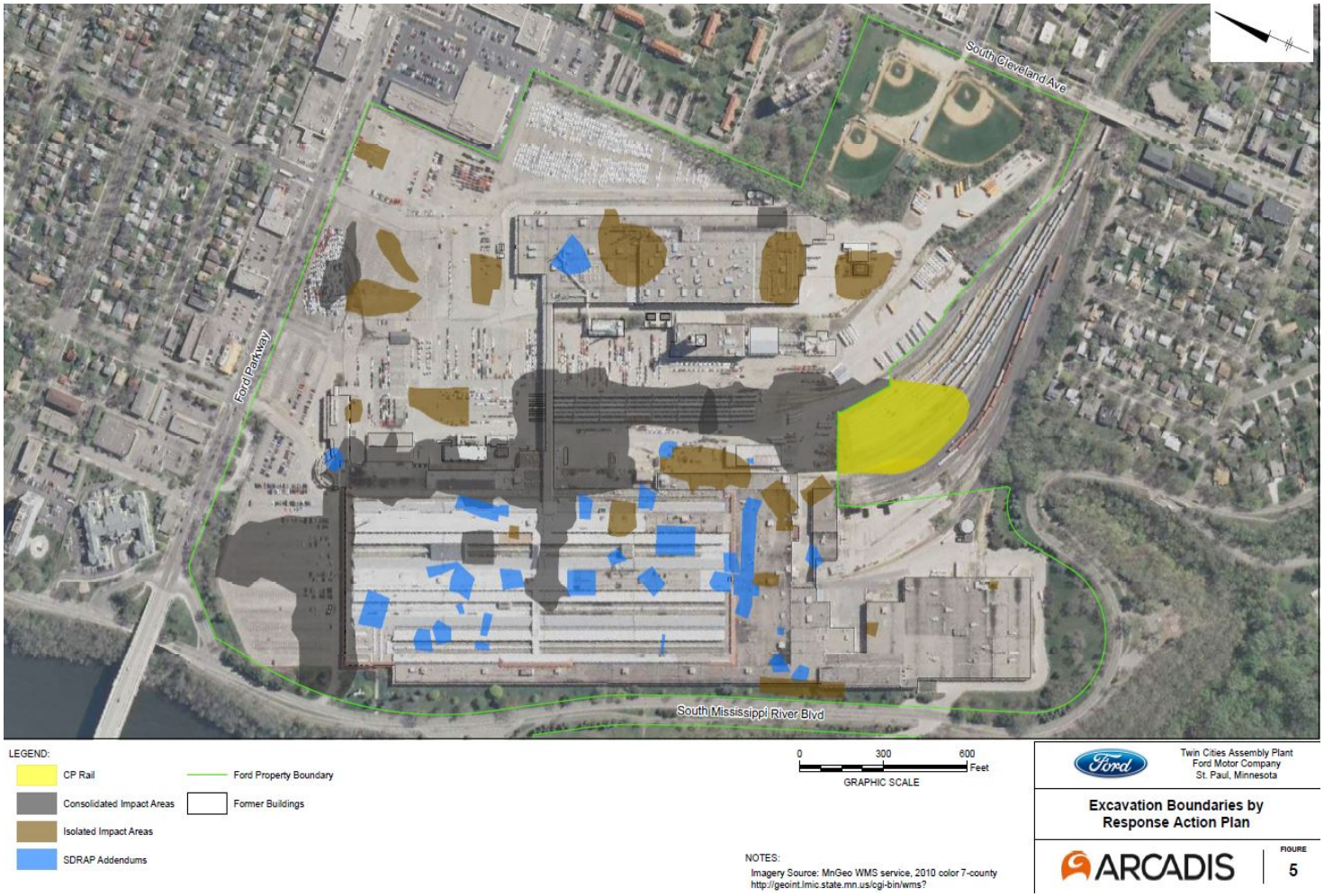
MPCA VIC Project Number VP23530

Exhibit E

Soil Excavation Areas

FORD TWIN CITIES PLANT

MPCA VIC Project Number VP23530



From:	Bump, Samantha (DNR)
To:	Payne, Ashley
Cc:	Horton, Becky (DNR); Parris, Leslie (DNR)
Subject:	RE: NHIS Review Request for the Ford Site AUAR
Date:	Wednesday, July 17, 2019 4:08:14 PM
Attachments:	image003.png image004.png image005.png image002.png

Hi Ashley,

I have reviewed your assessment regarding the above project. As you are aware:

- Several state-listed mussels have been documented in the Mississippi River in the vicinity of the proposed project. Given that nearby storm sewer inlets discharge to the Mississippi River and that mussels are particularly vulnerable to deterioration in water quality, especially increased siltation, it is important that effective erosion prevention and sediment control practices be incorporated into any stormwater management plan and also must be implemented and maintained near the river.
- The rusty patched bumble bee (*Bombus affinis*), a federally-listed endangered species, was documented in the vicinity of the proposed project. The rusty patched bumble bee typically occurs in grasslands and urban gardens with flowering plants from April through October. This species nests underground in abandoned rodent cavities or in clumps of grasses. Please reference the guidance at the USFWS rusty patched bumble bee website to determine if the project has the potential to impact this protected species.

Thank you for notifying us of this project, and for the opportunity to provide comments.

Have a great day,

Samantha Bump
NHIS Review Specialist | Ecological & Water Resources
Minnesota Department of Natural Resources
500 Lafayette Road
St. Paul, MN 55155
Phone: 651-259-5091
Samantha.Bump@state.mn.us

From: Payne, Ashley <Ashley.Payne@kimley-horn.com>
Sent: Tuesday, June 18, 2019 5:07 PM

To: MN_NHIS, Review (DNR) <Review.NHIS@state.mn.us>
Cc: Payne, Ashley <Ashley.Payne@kimley-horn.com>
Subject: NHIS Review Request for the Ford Site AUAR

Hello,

Kimley-Horn is currently working on an AUAR for the Ford Site located along Ford Parkway and Mississippi River Boulevard, in the City of St. Paul, Ramsey County, MN (see attached project location map). The project is located in NE ¼ and SE ¼ of Section 17, Township 28N, Range 23W.

Project Description:
The AUAR study area encompasses four parcels totaling approximately 139 acres, all of which are covered in the *Ford Site Zoning and Public Realm Master Plan* adopted by the Saint Paul City Council on September 27, 2017 and amended on April 10, 2019. The four parcels, shown on Figure 2, include:

- One 122-acre parcel referred to as the Ford Site
- One 4-acre parcel referred to as the Burg & Wolfson (Lunds & Byerlys) property
- Two parcels totaling 13 acres referred to as the Canadian Pacific Railway property

Ryan Companies US, Inc. (Ryan) is proposing to redevelop the 122-acre Ford Site, which is the location of a former Ford Motor Company assembly plant (see Figure 2). The proposed development would include residential, retail/service, office/employment, and civic/institutional land uses. The Burg & Wolfson (Lunds and Byerlys) property and Canadian Pacific Railway property are also included in the *Ford Site Zoning and Public Realm Master Plan*, but there are currently no development proposals for those properties.
Two scenarios are proposed for evaluation in the AUAR as outlined in Table 1. These scenarios and the study area are consistent with the *Ford Site Zoning and Public Realm Master Plan*. The Ryan Development Scenario represents the density of the development proposed by Ryan on the Ford Site (illustrated in Figure 4). The Master Plan Maximum Development Scenario represents the maximum density allowed under the current comprehensive plan on all four parcels within the study area.

In reviewing the NHIS database information for Ramsey County (LA-843), numerous species have been identified within 1-mile of the AUAR study area. Most species are associated with the Mississippi River and surrounding regional park areas. Attached is a spreadsheet for those species. Based on the highly disturbed nature of the site, no species are anticipated to be found within the AUAR study area. Wildlife Friendly erosion control methods will be used on the site to minimize any potential impacts to wildlife using the site.

Kimley-Horn requests confirmation on the conclusion that no state-listed species are anticipated to be found within the Ford Site AUAR study area. Please let me know if you have any questions or would like to discuss in further detail.

Thank you!
Ashley

Ashley Payne, CWD
Kimley-Horn | 323 South Broadway, Rochester, MN 55904
Direct: 507-216-0763 | Mobile: 507-251-6096
Celebrating 12 years as one of FORTUNE's 100 Best Companies to Work For

DEPARTMENT OF ADMINISTRATION
STATE HISTORIC PRESERVATION OFFICE

July 11, 2019

Menaka Mohan
Ford Site City Planner
City of St. Paul
25 W. 4th Street, Suite 1400
St. Paul, MN 55102

RE: Ford Site Redevelopment
St. Paul, Ramsey County
SHPO Number: 2019-1850

Dear Menaka Mohan:

Thank you for providing our office with a copy of the Scoping Environmental Assessment Worksheet (SEAW) for the above referenced project.

Based upon information provided in the SEAW and the City of St. Paul's follow up submittal to our office (dated June 4, 2019), we understand that Ryan Companies is proposing to develop a 122-acre site which is the location of the former Ford Motor Company's Twin Cities Assembly Plant. The proposed development would include residential, retail/service, office/employment, and civic/institutional land uses.

We have reviewed the information provided under section *14. Historic Properties* of the SEAW, along with the documentation included with your June 4th submittal which included the historic property evaluation report titled *Ford Motor Company Twin Cities Assembly Plant: An Assessment of Significance and Eligibility, 966 South Mississippi River Boulevard, Saint Paul, Ramsey County, Minnesota* (Hess, Roise and Company; November 2007).

Our comments as they pertain to adequate identification of historic properties, including archaeological resources, as well as consideration of potential effects to identified historic properties which may be caused by the proposed development project, are provided below.

Archaeology
Section 14 of the SEAW references, but does not provide documentation in support of, the opinion by the City that due to the "highly disturbed nature of the site, no archaeological resources are anticipated within the AUAR study area" and therefore an archaeological survey is not "anticipated."

State archaeological site records indicate that previously recorded site 21RAk (Rumtown) is located in the project area. Also, there are several recorded archaeological sites on both sides of the Mississippi River in the vicinity of the project. Based upon our assessment of the nature and location of the proposed project, as well as consideration of the minimal documentation provided to our office in reference to previous ground disturbance within the project area, our office recommends, as a first step, the preparation of a Phase IA literature search and archaeological assessment. This Phase IA literature search and archaeological assessment should include archival research and analysis of Sanborn Insurance maps for the project area in order to determine the history of land use, including documentation pertaining to the extent (horizontal and vertical) of previous ground disturbance, and assess the potential for both intact subsurface pre-contact archaeological and historic archaeological features. The Phase IA assessment should include a recommendation made by a qualified archaeologist, as well as one specializing in historical archaeology, as to whether further field survey is warranted prior to project implementation. We recommend that you coordinate a review of the Phase IA survey report with our office.

Architecture/History Properties
Section 14 of the SEAW references the "historical survey report" a copy of which was included in your June 4th submittal. Our records indicate that we have never received or been requested by the City to review this earlier historic property evaluation for the Ford Motor Company Twin Cities Assembly Plant, which has now been demolished.

Although not mentioned in the SEAW, our records indicate the presence of several designated historic properties within the immediate project area:

- Minnesota Soldiers Home Historic District – listed in the National Register of Historic Places (NRHP)
- Minnehaha Historic District – listed in the NRHP
- Bridge No. 3575 (Intercity, or Ford Parkway, Bridge) – listed in the NRHP
- Ford Hydroelectric Facilities – eligible for listing in the NRHP
- Lock & Dam No. 1 (Ford Dam) – eligible for listing in the NRHP

Although it does not appear that the above historic properties will be directly impacted by the proposed development project, we recommend that the City confirm this and also evaluate the potential for any secondary, or indirect effects, that the proposed project may cause - including visual, atmospheric, auditory, access, use, and associated traffic changes - to these historic properties.

Our records indicate that other areas surrounding the project site have not been comprehensively surveyed for the presence of historic/architectural properties. As with our recommendation above regarding a Phase IA archaeological literature review and assessment, we recommend that the City undertake and complete a similar survey, typically a Phase I reconnaissance-level survey, for historic/architectural properties 45 years or older which may be directly or indirectly affected by the proposed project.

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

If you have any questions regarding our review of this project or wish to consult further with our office regarding recommendations presented in this letter, please contact me at (651) 201-3290 or sarah.beimers@state.mn.us.

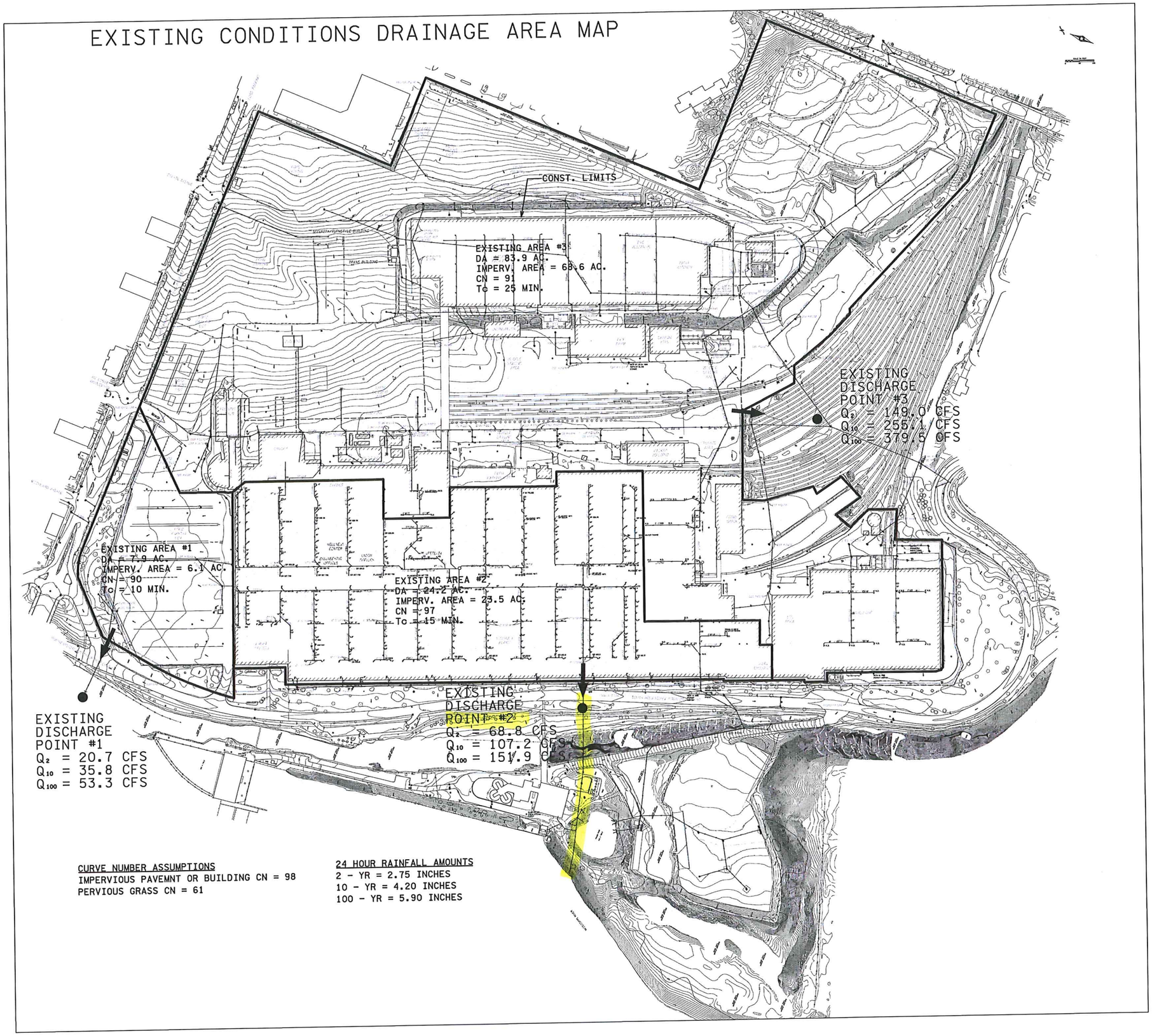
Sincerely,

Sarah J. Beimers
Environmental Review Program Manager

cc via email only:
Amanda Gronhovd, Office of the State Archaeologist

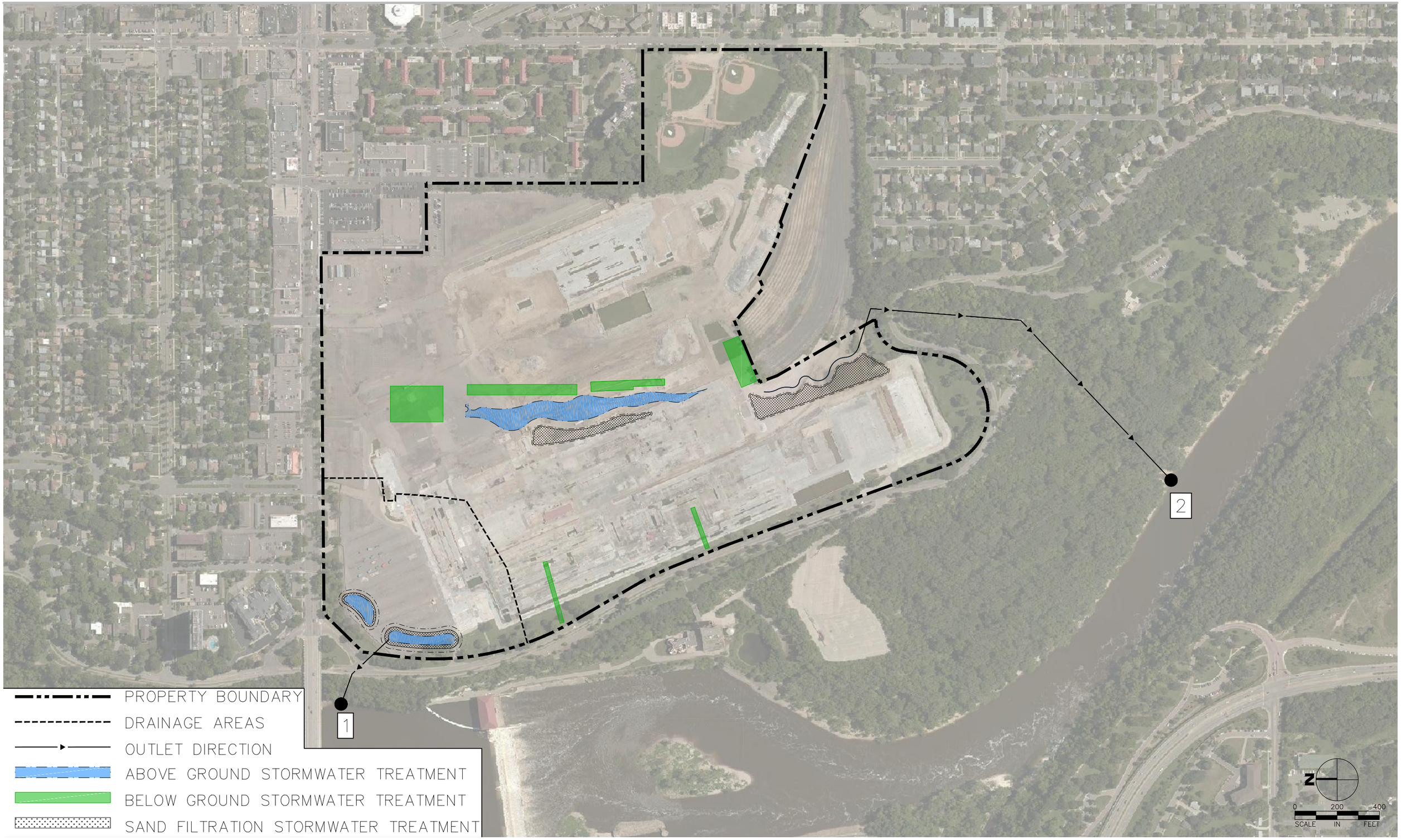
Appendix B: Stormwater Exhibits

EXISTING CONDITIONS DRAINAGE AREA MAP



CURVE NUMBER ASSUMPTIONS
IMPERVIOUS PAVEMNT OR BUILDING CN = 98
PERVIOUS GRASS CN = 61

24 HOUR RAINFALL AMOUNTS
2 - YR = 2.75 INCHES
10 - YR = 4.20 INCHES
100 - YR = 5.90 INCHES


PROPERTY BOUNDARY
DRAINAGE AREAS
OUTLET DIRECTION
ABOVE GROUND STORMWATER TREATMENT
BELOW GROUND STORMWATER TREATMENT
SAND FILTRATION STORMWATER TREATMENT
1
2
N
0
200
400
SCALE IN FEET

Appendix C: Historical Survey Report

Postcard, ca. 1930 (Minnesota Historical Society)

FORD MOTOR COMPANY TWIN CITIES ASSEMBLY PLANT: AN ASSESSMENT OF SIGNIFICANCE AND ELIGIBILITY

966 SOUTH MISSISSIPPI RIVER BOULEVARD
SAINT PAUL, RAMSEY COUNTY, MINNESOTA

PREPARED BY

ERIN HANAFIN BERG AND CHARLENE ROISE, HISTORIANS
PENNY PETERSEN, RESEARCHER
HESS, ROISE AND COMPANY
THE FOSTER HOUSE
100 NORTH FIRST STREET
MINNEAPOLIS, MINNESOTA 55401

NOVEMBER 2007

TABLE OF CONTENTS

INTRODUCTION

In June 2007, the Ford Motor Land Development Corporation (Ford Land), the real estate arm of Ford Motor Company, retained Hess, Roise and Company to evaluate the historical significance of the Twin Cities Assembly Plant (often referred to as TCAP) at 966 South Mississippi River Boulevard in Saint Paul, Minnesota. This evaluation was triggered by the planned closure of the plant in 2009 and the pending sale of the Ford property, including the assembly plant, associated buildings, and surrounding land.

Hess Roise was familiar with the property, having evaluated the facility's hydroelectric plant in May 2001 as part of that facility's relicensing by the Federal Energy Regulatory Commission. That report concluded that the dam and the hydroelectric plant are eligible for listing in the National Register of Historic Places, with the assessment based primarily in the context of hydroelectric power development on the Mississippi River and the civic rivalry between Minneapolis and Saint Paul. While the plant was constructed by the Ford Motor Company to provide power for its branch factory, the company's association with the building's design and operation was not evaluated by the 2001 report.[1]

Since the hydroelectric plant already has been determined eligible for historic designation, the current study has focused on analyzing the historical significance of the remaining buildings and structures on the property. The following report includes an illustrated narrative history of the development of the plant, laying the groundwork for evaluating the resources. The physical characteristics and integrity of the elements are summarized and the historical significance of individual resources and the property as a whole are assessed.

Charlene Roise, president of Hess Roise, served as the study's principal investigator. Erin Hanafin Berg conducted the research and fieldwork and compiled inventory and contextual information, with the assistance of Penny Petersen. This report was written by Ms. Roise and Ms. Berg. Roger Gaudette, director of asset management, and Chris Johnson, decommissioning project manager, oversaw the project for Ford Land. Brad Bystrom was the primary Ford contact at the plant.

METHODOLOGY

Assessment of the property began with interior and exterior reconnaissance fieldwork, leading to an understanding of the physical characteristics of the plant. Primary consideration was given to components that were built between 1924, when the plant was established, and 1969, when a large addition was made to the west side of the main plant. Areas that appeared to be of historical or architectural interest were noted and additional research was conducted on these resources using visual tools including historic and aerial photographs, site plans, and maps. Elements that were constructed after 1969 were assumed not to be of historical value and were not extensively researched, but their impacts on other resources were noted. Primary written sources, including

[1] Charlene K. Roise and Elizabeth A. Gales, "Response to Additional Information Request, Ford Hydroelectric Project," FERC Project No. 362 / SHPO Project No. 2000-3518, September 2003, available at the State Historic Preservation Office, Minnesota Historical Society, Saint Paul.

documents and publications from the Ford archives that were obtained by Hess Roise during previous studies, were consulted for historical and contextual details. A narrative history of the plant was drafted using this information, as well as broader studies of the development and operations of the Ford Motor Company. Digital photographs were taken of the property to assist with assessment of the site and to illustrate this report. Historic photographs were obtained from the Minnesota Historical Society, the John R. Borchert Map Library at the University of Minnesota, and historic newspapers and other publications.

After a preliminary assessment of the property's historical integrity and significance, Hess Roise consulted with Susan Roth and Dennis Gimmestad, the National Register historian and compliance officer with the State Historic Preservation Office (SHPO), to determine whether the property is eligible for listing in the National Register. Ms. Roth and Mr. Gimmestad toured the site, reviewed the materials that had been prepared by Hess Roise, and concluded that the site does not retain sufficient integrity for historic designation. Amy Spong, historic preservation specialist with the City of Saint Paul and staff to the Saint Paul Heritage Preservation Commission, also was asked to determine whether the property met the criteria for local landmark designation. Ms. Spong concurred that the property's integrity is insufficient for historic designation. These findings are elaborated later in this report.

CRITERIA FOR HISTORIC DESIGNATION

Properties are assessed for historical significance using the criteria of the National Register of Historic Places and applicable municipal ordinances. While mainly an honorary designation, listing in the National Register or a determination of eligibility for listing requires federally funded or permitted projects to be reviewed in terms of their impacts on historic resources, as directed by Section 106 of the National Historic Preservation Act. Designation under local landmarks laws often includes protective measures including review by the heritage preservation commission of proposed alterations and demolition.

The criteria for National Register and local landmark designation are similar, but the standards for National Register evaluation are higher and more restrictive. Established by the National Historic Preservation Act of 1966, the National Register consists of properties "significant in American history, architecture, archeology, engineering, and culture." To be considered significant, a property must meet one or more of the following criteria:

Criterion A:	be associated with events important to broad patterns of history;
Criterion B:	have a significant association with the life of an important person;
Criterion C:	represent a type, period, or method of construction; or be the work of a master; or express high artistic values; or
Criterion D:	yield, or be likely to yield, information important in prehistory or history.

Typically, above-ground properties merit National Register designation based on the first three criteria; Criterion D is usually applied to archaeological sites. Properties can achieve significance on a local, state, or national level. A property may be individually eligible for listing or eligible as a contributing component of a historic district. In addition to significance, a property must

maintain physical integrity to be considered for the National Register, and must be over fifty years old unless it ranks as exceptionally important. The Twin Cities Ford plant was established in 1924 and readily meets the standard of age, but alterations and additions to the plant that have occurred since that time must be considered for their impacts on the integrity of the plant.

Criteria in the City of Saint Paul Legislative Code (Chapter 73) provide for the designation of areas, places, buildings, structures, or similar objects as heritage preservation sites. Properties merit designation under the following criteria:

1. The properties' character, interest, or value is part of the heritage or cultural characteristics of the city of Saint Paul, state of Minnesota, or the United States;
2. The properties' location is the site of a significant historic event;
3. The properties are identifiable with a person or persons who significantly contributed to the culture and development of the city of Saint Paul;
4. The properties exhibit a distinguished characteristic of an architectural or engineering specimen;
5. The properties are identifiable as the work of an architect, engineer, or master builder whose individual work has influenced the development of Saint Paul;
6. The properties embody elements of architectural or engineering design, detail, materials, or craftsmanship that represents a significant architectural or engineering innovation;
7. The properties' unique location or physical characteristic is established and familiar in the neighborhoods or communities of the city of Saint Paul.

There is no standard of age for landmark designation, and the review is generally less restrictive than for the National Register.

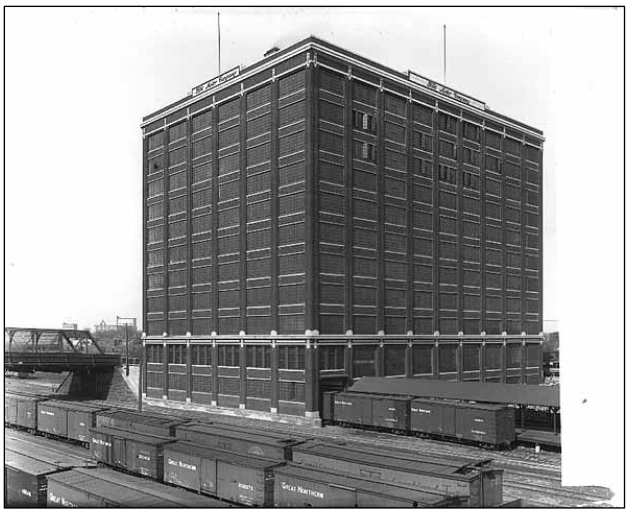
HISTORICAL CONTEXT

Ford Motor Company Branch Assembly Plants

In 1913, only one year before the Ford Motor Company completed construction of a branch plant in downtown Minneapolis, Henry Ford implemented a moving assembly line at his production facility in Highland Park, Michigan. This apparatus transferred the car through the shop, where it was put together in an orderly, continuous progression by assembly line workers, who repeatedly performed the same tasks. The moving assembly line revolutionized the automobile industry and manufacturing in general. Ford and his production engineers refined the design of the assembly line over the following years, and it was not long before the multi-level equipment employed in most of the Ford Motor Company's twenty-five U.S. branch plants—including the ten-story Minneapolis plant—was obsolete. Fewer than ten years after Ford's first assembly line was installed, the company launched a vigorous program of modernization, replacing old branch plants like the one in Minneapolis with sprawling, single-story buildings for the assembly of its popular Model "T"s.[2]

[2] Allan Nevins and Frank Ernest Hill, *Ford: Expansion and Challenge, 1915-1933* (New York: Charles Scribner's Sons, 1957), 6, 9, 255-256; Douglas Brinkley, *Wheels for the World: Henry Ford, His Company, and a Century of*

Around the same time, Henry Ford envisioned a fully integrated company where raw materials and refineries, parts production and vehicle assembly, power sources and transportation were all controlled by one entity that commanded the flow of materials and products through the entire manufacturing process. Ford acquired timber land for harvesting lumber and producing charcoal, iron mines for making steel, coal mines and hydroelectric sites for electricity, and railroads and freighters for shipping. He combined some of these components at a massive compound at the River Rouge, outside of Detroit, which was the largest integrated factory complex in the world when completed in 1928. The Rouge plant produced everything except fully finished Fords, which were put together at the nearby Highland Park plant or branch assembly plants.[3]



The Ford Motor Company branch assembly plant at 420-428 North Fifth Street, Minneapolis, was built in 1914-1915. (Minnesota Historical Society)

Ford also aimed to decentralize his company's manufacturing operations. He believed that doing so would result in lower costs and higher quality products while providing valuable supplemental work for agricultural families. This practice also would distribute purchasing power to relatively remote areas of the country and fuel the desire for Ford cars, trucks, and tractors. Ford set up "village industries," small-parts factories scattered along streams and rivers where they could run on available waterpower. He built small plants at rural sites along the Rouge River, and later progressed to larger factories on the Huron River in Michigan, the Miami River in Ohio, and the Hudson River in upstate New York. Ford also appreciated river transport as an inexpensive and rational alternative to railroads, which he viewed as undependable. In the early 1920s, Ford insisted that all future manufacturing and assembly plants would be built on navigable waters.[4]

With the foundation for a hydroelectric plant already in place and barge activity thriving in nearby downtown Saint Paul, the site selected for the Twin Cities Assembly Plant readily fulfilled two of Henry Ford's expansion objectives. His personal penchant for rural conservation was also satisfied, as the scenic bluff-top location was still largely undeveloped despite its proximity to two booming cities. Ford secured 167½ acres for the assembly plant through extensive negotiations with the City of Saint Paul and its business boosters on the Greater Saint

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Progress (New York: Viking Press, 2003), 151-156; Carl Hennemann, "Secrecy Marked Coming of Ford Plant to Saint Paul Thirty Years Ago," *Saint Paul Pioneer Press*, June 14, 1953.

[3] Nevins and Hill, *Ford: Expansion and Challenge*, 200-226, 256; Brinkley, *Wheels for the World*, 284-287; "History of the Rouge," *The Henry Ford: Ford Rouge Factory Tour*, available at http://www.thehenryford.org/rouge/history.asp; "River Rouge Plant," *Wikipedia*, available at http://en.wikipedia.org/wiki/River_Rouge_Plant.

[4] Nevins and Hill, *Ford: Expansion and Challenge*, 226-230, 256.

Paul Committee. Meetings were kept secret, lest Minneapolitans hear of the plans and propose a counteroffer. On January 9, 1923, the *Pioneer Press* broke the news that Ford was coming to Saint Paul with a giant manufacturing plant.[5]

This photograph, published in the Saint Paul Daily News on April 26, 1923, shows Henry Ford (far left) and his son Edsel Ford (third from left) with a group of engineers inspecting the site of the planned Ford hydroelectric plant. (Minnesota Historical Society)

According to an article celebrating the thirtieth anniversary of the announcement, "Henry Ford got everything he asked for when he decided to build his plant in Saint Paul." The federal government granted Ford a fifty-year license to generate power and the authorization to construct a hydroelectric plant. The Chicago, Milwaukee, and Saint Paul Railroad extended a transcontinental freight route right to the doors of the plant. The streetcar company agreed to lengthen its Randolph Avenue line from Snelling Avenue to Cleveland Avenue and then west to the Mississippi River—in the middle of winter. The Saint Paul City Council approved construction of a 1½-mile "super highway" (Saint Paul Avenue) from West Seventh Street to Cleveland Avenue. Henry Ford insisted on construction of a bridge over the Mississippi River to carry workers, dealers, and buyers. Minneapolis and Saint Paul joined together in 1927 to share the $1.3 million cost of constructing the Intercity Bridge.[6]

When the Twin Cities Assembly Plant was completed, the Ford Motor Company boasted that it was the largest branch plant in its organization and that it had been described by architects as "the finest structure devoted to this purpose anywhere." The assembly building was one of three main components to the plant, which also included the hydroelectric plant (the company's largest nationwide, and the only one associated with an assembly plant) and a model steam-power station. The entire plant was hailed as "an outstanding example of industrial utility combined with architectural beauty," in part because of its picturesque location on the bluffs of the Mississippi River. Careful attention was given to landscaping and the layout of the grounds "to harmonize with the city's plans for the development of the parkway" along the river.[7]

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[5] Brinkley, *Wheels for the World*, 217-219; Hennemann, "Secrecy Marked Coming of Ford Plant to Saint Paul Thirty Years Ago."

[6] Hennemann, "Secrecy Marked Coming of Ford Plant to Saint Paul Thirty Years Ago"; "Hydro Plant to Be Ready by Autumn," *Ford News*, January 15, 1924; Peggie Autin Haschle, "Ford Paved the Way for Commercial Development of Area Sixty Years Ago," *Highland Villager*, March 8, 1993. The Intercity Bridge (Bridge No. 3575, commonly known as the Ford Bridge) was listed in the National Register of Historic Places for its engineering significance in 1989.

[7] "Work on Twin Cities Plant Well Under Way," *Ford News*, October 15, 1923; "Largest Ford Branch Plant Is Occupied at Twin Cities," *Ford News*, June 1, 1925; "Hydro Station in Operation at Saint Paul," *Ford News*,

The Twin Cities Assembly Plant was designed by Albert Kahn, who was the architect of many Ford facilities including the River Rouge plant. The main building's exterior resembled the Ford Engineering Laboratory in Dearborn, Michigan, also designed by Kahn and completed earlier in 1924. The manufacturing and assembly building was one story in height "in keeping with the latest Ford standard practice," according to the company's internal newsletter.[8]

The exterior style of Albert Kahn's Ford Engineering Laboratory (left) was reinterpreted in his design for the Twin Cities Assembly Plant. (Federico Bucci, Albert Kahn: Architect of Ford)

Main Assembly Plant

The assembly building measured 1,400 feet long and 600 feet wide, with a total floor area of more than nineteen acres. The front and side facades were clad with buff Indiana limestone. Rectangular in plan, the building had a two-story, hipped-roof block in the center of the west facade that projected from the adjacent wall surfaces. The northwest and southwest corners also projected slightly. Fluted pilasters framed multi-light, steel-sash windows, evenly dividing the facades into seventy-two bays on the east and west and twenty-eight bays on the north and south. The bays were crowned with a streamlined frieze and a slightly projecting cornice supported by broad dentils. Bas-relief carvings were centered over the windows on the corner blocks. The main entrance was located on the west facade near the 4,400-square-foot

The clerestories that provided natural light to the interior of the main assembly plant are evident on this 1930 photograph of the rear facade. (Minnesota Historical Society)

November 15, 1924; "Introduction" (orientation handout), typescript, [1978?], available at Ford Motor Company Twin Cities Assembly Plant.

[8] "Engineering Laboratory at Dearborn Completed," *Ford News*, December 1, 1924; F. A. Fairbrother, "Processes Affect Design of Automobile Factories," *Engineering News-Record* 93 (November 20, 1924): 834-836; Fay Leone Faurote, "How Ford Plans His Layout of Grounds, Buildings, and Plant," *Factory and Industrial Management* 75 (June 1928): 1196-1199.

showroom in the northwest corner, which contained large, plate-glass display windows with six-light transoms. The building was topped with a hipped, red clay-tile roof at the perimeter and a flat roof in the center with rows of linear, M-shaped clerestories and monitors.[9]

The open interior of the plant was carefully designed to accommodate the snaking assembly line and specialty areas such as the paint shop, with little surplus space. Henry Ford stated how the interiors of his plants were planned:

> Our machines are placed very close together—every foot of floor space in the factory carries, of course, the same overhead charge. . . . We measure on each job the exact amount of room that a man needs; he must not be cramped—that would be waste. But if he and his machine occupy more space than is required, that is also waste. This brings our machines closer together than in probably any other factory in the world. . . . Our factory buildings are not intended to be used as strolling parks.[10]

At the Twin Cities plant, Ford's fundamental principles—the economy of space and insistence upon cleanliness, lighting, and ventilation—were apparent. Exposed steel columns, beams, and trusses organized the space into large, open bays with minimal structural intrusions. To conserve floor space for assembly equipment, lavatories and other service areas were elevated on platforms attached to the steel structure of the building. Extensive windows on the exterior walls and angled rooftop monitors flooded the plant with natural light, essential at the time due to poor output from electric lamps. The windows and clerestories could be opened mechanically to provide ventilation. A network of exposed radiator pipes near the ceiling brought hot-water heat—warmed by the steam plant—to the assembly floor.[11]

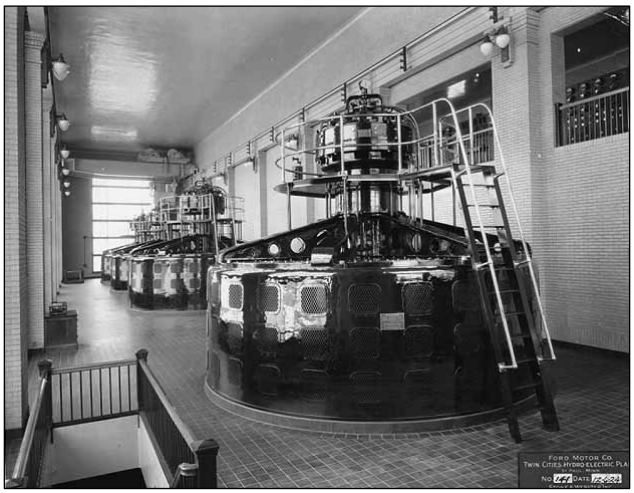
The exposed interior structure, pipes, and ductwork can be seen in this photograph of a finished car on the assembly line along the west wall of the plant, 1935. (Minnesota Historical Society)

[9] "Largest Ford Branch Plant Is Occupied at Twin Cities"; Benjamin M. Cowan, "The Twin Cities Plant of the Ford Motor Company," *Stone and Webster Journal* 37 (July 1925): 60-72.
[10] Federico Bucci, *Albert Kahn: Architect of Ford* (New York: Princeton Architectural Press, 2002), 41.
[11] Ibid; Cowan, "The Twin Cities Plant of the Ford Motor Company."

Hydroelectric and Steam Plants

The same economy of design appeared in the two other principal components of the complex, the hydroelectric and steam plants, which were also the work of Albert Kahn. Described shortly after its completion as "a gem of a little building," the hydroelectric plant was similar in style to the main assembly plant. The structure, which measured 160 feet long by about 74 feet wide and stood 48 feet high, was positioned at the base of the river bluff on a foundation poured when the adjacent dam was built between 1913 and 1917. (The foundation had to be modified to house Ford's vertical turbine-generator units, rather than the older horizontal units it had been designed to accommodate.) The plant's rectangular form had an exterior of buff-colored brick with a wide, limestone frieze. Vertical, multi-light windows filled each facade, separated by brick piers. Bas-relief sculptures of stylized Indian heads were centered over each of the window bays. The building was capped with a red clay-tile hipped roof.

An enormous generator room that spanned the length of the building and had a thirty-six-foot high ceiling dominated the interior of the plant. Four huge generators, each twenty feet wide and rising eighteen feet above the floor level, filled the vaulted space. Three balconies overlooking half of the generator room housed electrical control equipment. The interior was finely appointed, with red and black tile floors, pressed-brick walls, enameled steel beams with exposed rivets, and polished nickel railings and trim. The large windows flooded the interior with light, aided by double sconces placed high on the capitals of the pilasters separating the windows.



Four 4,500-foot generators filled the main level of the hydroelectric plant. (Minnesota Historical Society)

The generators, each capable of 4,500-horsepower, were operated by vertical turbines located twenty-eight feet below the main level of the plant. Underground transmission lines supplied the electricity to the assembly plant. The hydroelectric plant was placed in service in July 1924. The electricity generated was sold to Northern States Power (NSP), the local utility, until the assembly plant was completed the following spring, and excess power in subsequent years was also sold to NSP.

Although the steam plant lacked the clay-tile hipped roof characteristic of the assembly and hydroelectric plants, its exterior was compatible in style to these other principal buildings. The walls were buff-colored brick, with multi-light, steel-sash windows on all sides. Like the nearby hydroelectric plant, the building also stood at the river level, but the five-story building was formed of two set-back blocks. Only the tapered, cylindrical, buff-colored brick smokestack projected above the bluff.

The five-level interior of the steam plant had walls of glazed brick with rounded corners, red tile floors, and enameled steel beams. There was an exposed staircase with enameled steel treads and polished nickel railings in the northeast corner, and an adjacent passenger elevator with three sliding, wire-glass doors. Large multi-light windows, two rooftop skylights, and decorative wall sconces lit the vaulted interior spaces.

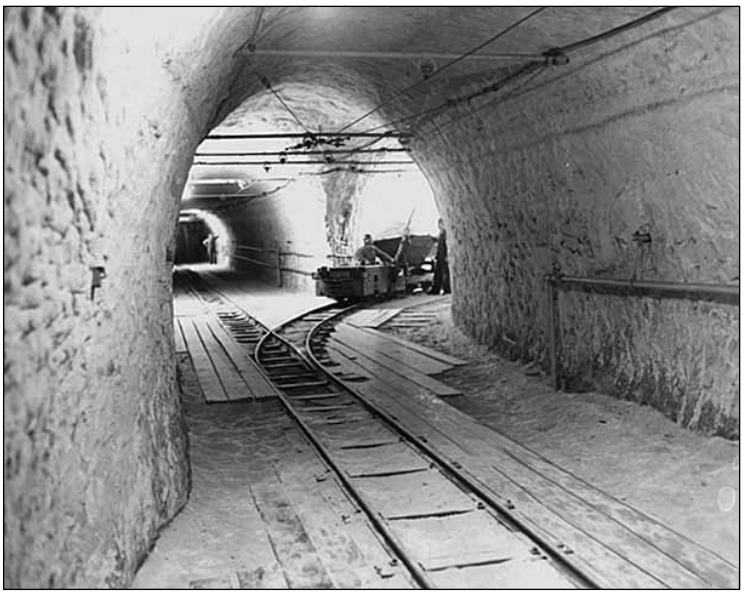
The steam plant also was hailed for its efficiency, with equipment arranged to maximize heat extraction for electricity generation, manufacturing purposes, and warming the assembly plant. The steam plant contained two boilers fired by pulverized coal and a 5,000-kilowatt turbo generator, with space for one more. Coal traveled underground by belt conveyor from the hopper house on the east side of the assembly plant across an enclosed bridge to the upper level of the steam plant.

An enclosed bridge connected the steam plant to an underground conveyor that carried coal from the east side of the assembly plant. The tunnel entrance and barge dock are also shown in this 1936 photograph. (Minnesota Historical Society)

Accessory Buildings, Structures, and Objects

In addition to the three main buildings, the Twin Cities Assembly Plant contained several accessory buildings and structures that contributed to the operational efficiency of the plant. A buff-colored brick, gable-roofed building on the east side pumped oils to the painting and enameling equipment near the center of the assembly floor. Another freestanding, rectangular hopper house near the east wall of the assembly plant had massive doors on the north and west facades, where coal cars deposited their loads as they were pulled through the building. Railroad spur lines approached the plant from the southeast and reached inside the assembly plant in two depressed troughs so that the car and plant floors were level. In a utility tunnel underneath the main assembly plant, a belt conveyor over one thousand feet long moved coal from the hopper house directly to the steam plant. The conveyor passed through an enclosed bridge that connected the tunnel at the edge of the bluff to equipment on the upper level of the steam plant, where the coal was pulverized before being fed to the boilers. A 650-foot wharf between the steam and hydroelectric plants was equipped for barge shipping, and underground transport tunnels extended from the base of the river bluff near the barge dock to parallel freight elevators that rose 150 feet to the main plant. A well house drew water from the Mississippi directly to the boilers of the steam plant, screening it to remove particulates and increase efficiency.[12]

[12] "Largest Ford Branch Plant Is Occupied at Twin Cities"; "New Saint Paul Steam Plant Designed for Fuel Conservation," *Ford News*, February 1, 1925; Cowan, "The Twin Cities Plant of the Ford Motor Company."



Sand for glassmaking was mined under the plant in tunnels that grew in length until operations at the glass plant ceased in 1959. This photograph dates from 1941. (Minnesota Historical Society)

Shortly after the plant was put into operation, additional tunnels were excavated for sand mines and a glass factory was set up inside the assembly plant. The glass plant was an afterthought, constructed only because the silica in the sandstone underneath the site was found to be the proper composition for glassmaking. Also, shipment of completed automobiles by tunnel and barge proved cumbersome and difficult, rendering the tunnels otherwise useless. The glass plant, the only facility of its type in the world housed within an automobile assembly plant, was used continuously from 1926 to 1932, was decommissioned for about five years during the Great Depression, and was put back into service in 1937 with new equipment and production methods. Over approximately thirty years, the network of glass mine tunnels under the plant grew to more than three miles in length before glassmaking operations ceased at the plant in 1959.[13]

Changes at the Twin Cities Assembly Plant

As an active industrial facility, the plant has experienced numerous interior and exterior changes (see appended site plan). The assembly line in the main building has been reconfigured repeatedly for the production of different models, but the basic orientation of the line has remained constant, with the heavy body work taking place on the east half and the assembly and finish production along the west wall of the plant.

Over a period of about thirty years, the assembly building was expanded nine times, from its original size of approximately 840,000 square feet to over 1.3 million square feet. The first significant addition occurred in 1943, when a 14,000-square-foot warehouse was built on the east side of the main plant, coinciding with conversion of the plant for Pratt and Whitney aircraft engine construction during World War II. In 1961, plant manager F. O. Fason announced the first Ford-led expansion, a 40,000-square-foot addition on the southeast corner of the main plant. Governor Elmer L. Andersen welcomed the announcement, stating, “The news that Ford Motor Company has launched a program of expansion and modernization is welcome and reassuring. We hope an improvement in the Minnesota business climate will result in a further and greatly enlarged expansion of the Saint Paul operation.” Andersen’s wish was granted only a few months later, when construction began on a second addition—twice the size of the first—near the southwest corner of the plant. Although these improvements were used for storage and

[13] Hennemann, “Secrecy Marked Coming of Ford Plant to Saint Paul Thirty Years Ago”; Haschle, “Ford Paved the Way for Commercial Development of Area Sixty Years Ago.”

shipping and did not directly increase production capacity, they freed other areas of the plant for new assembly equipment and allowed the company "to build a better car," according to Fason.[14]

Fewer than eight years later, another expansion added 85,000 square feet to the west side of the plant, bringing the total area of the building to over 1.3 million square feet. The 1969 addition housed a lengthened final assembly line with extra storage along the line, touted as a first step towards total modernization of the plant. The 1,420-foot length of the addition replaced over three-quarters of the original west facade with a solid wall of ribbed, cast-concrete panels. The addition was set back from the northwest corner of the plant, contrasting with the display windows and streamlined Classical ornament of the historic showroom exterior. The sixty-foot width of the addition's north facade was smooth, limestone veneer. It contained an insert of the original bas relief carving of the plant's motto, which had been salvaged from the frieze of the center block on the west facade. The phrase, "Excellence Is Never Granted to Man But as the Reward of Labor," had been selected by Henry Ford when the plant was constructed in 1924.[15]

An 85,000-square-foot addition on the west side of the main assembly plant was dedicated on July 16, 1969. (Saint Paul Pioneer Press, July 17, 1969)

The solid facades of the addition, which was designed by the office of Albert Kahn, were distinctly modern in form and materials. The design epitomized the changes that were being made at the plant, in the company, and particularly in the American automobile industry, which was contending with the growing popularity of compact cars and import models. The addition also eliminated the glare and heat of the sun through the plant's original, west-facing windows (a total of 11,025 square feet of glass), which made working conditions uncomfortable.[16]

Ford built a 154,000-square-foot, freestanding warehouse south of the main plant in 1966, later linked to the larger building by a series of small additions. Other structures and accessory buildings were constructed along the south and east sides of the main plant in the 1970s and 1980s. In 1984, a 275,000-square-foot vehicle painting facility was erected "on the hill" to the

[14] "History of Twin City [sic] Branch," typescript, May 7, 1952, available at Ford Motor Company Twin Cities Assembly Plant; "Introduction" (orientation handout), [1978?]; "Fason Announces Plans for Twin Cities Addition," *Twin Cities Ford News*, March 22, 1961; "New TC Plant Addition Puts Twenty-two Acres under Single Roof," *Twin Cities Ford News*, November 29, 1961.

[15] "Expanded Ford Plant Dedicated," *Minneapolis Star*, July 17, 1969; "Ford Plant Dedicates Twin Cities Addition," *Saint Paul Pioneer Press*, July 17, 1969.

[16] "Expanded Ford Plant Dedicated"; "Ford Plant Dedicates Twin Cities Addition"; Virgil W. Smith, "Ford, Here Since 1903, Expands Saint Paul Plant," *Saint Paul Pioneer Press*, January 26, 1969; "Building Windows Sprayed for Employee Comfort," *Twin Cities Ford News*, July 11, 1962; Brinkley, *Wheels for the World*, 594-597; Alton F. Doody and Ron Bingaman, *Reinventing the Wheels: Ford's Spectacular Comeback* (Cambridge, Mass.: Ballinger Publishing Company, 1988), 4-12.

east of the plant. An elevated bridge spanning the east yard of the site extended the assembly line to the main plant. Most recently, a collaboration of Ford, the United Auto Workers, and Saint Paul College built an automotive training center near the northeast corner of the main assembly building in 1999.[17]

The Mississippi River flooded on April 12, 1952, swamping the ground level of the steam plant and causing the plant to shut down for one week. Damaged in the flood were a 13,000-volt transformer, twenty-four electric motors, seventeen pumps, electric cabling and oil switches, and the starters on all equipment. After the floodwaters receded, earthen fill was placed in the area around the steam plant, barge dock, and tunnel entrance. This raised the entrance of the steam plant one level, and the west-facing windows on the lower section of the plant were later filled in with brick. Three sides of the screen house and the entrance to the nearby tunnels were also buried. A gas-extracting building that had been added to the south side of the steam plant in 1926 was demolished in 1962.[18]

Most of the historic accessory buildings and additions are extant, although in some cases they have been further expanded and are now contiguous to the assembly plant. Freestanding modular structures that are scattered around the perimeter of the main plant obscure views of the historic buildings and their original dimensions and character.

Site features such as the railroad spur lines and paved parking and storage areas have expanded over the decades. Some of the landscape features, which were important early characteristics of the property, have also been altered by maturing vegetation or the removal of landscaped areas for parking or building expansion. When the main assembly plant was first constructed, the mature trees along Ford Parkway were retained, but around 1965, a large area with grass and trees was converted to surface parking. Large trees still line the perimeter of the intersection of Ford Parkway and South Mississippi River Boulevard at the northwest

The entire length of the plant's west facade, shown above in 1936, was clearly visible from South Mississippi River Boulevard. Passersby could watch as vehicles progressed down the assembly line next to the west-facing windows. The northwest corner housing the showroom is near the center of the photograph. (Minnesota Historical Society)

[17] "Progress Report" (photograph caption), *Twin Cities Ford News*, July 15, 1966.
[18] "The Year of the Big Flood," *Twin Cities Ford News*, April 18, 1962.

corner of the property. The open space along the west side of the assembly plant has evolved in the opposite manner. Historic photographs show that the original plantings were low and scattered, with a wide expanse of lawn affording clear views of the windowed facade. Now, there are many mature trees in this area, obscuring more of the building than was originally intended. The trees might have been planted around the time of the 1969 addition, which altered the original facade.

The Ford Motor Company property extends several hundred feet east of the assembly plant and all the way to Cleveland Avenue along its southern border. The east yard area was once occupied by an oval test track, built in 1942 for the testing of armored personnel carriers manufactured at the plant during World War II. Aerial photographs seem to indicate that Ford employees planted gardens within the track during the Depression and war years, a practice that was promoted by Henry Ford at locations throughout the country. The test track was removed in 1966 and the area leveled. The land was used for open storage until a shopping center was developed on the site in the mid-1970s. The paint plant, built in 1984, took up the remainder of the site.[19]

Near the intersection of Cleveland and Montreal Avenues stands a cluster of three baseball fields on property owned by Ford Motor Company. The fields have been used by the Little League organization since 1954, when the automobile company first granted the Highland Civic Association use of the site. One field was established that first season, with concrete-block dugouts, a concession stand, and wooden bleachers. Two similar fields were added in the early 1960s, and the original concession stand was replaced with a larger hipped-roof building that also housed restrooms. Two sets of dugouts, including the ones at the original field, have since been raised entirely above ground, but excavated dugouts are present at the southernmost field. The ball fields were in seasonal use until the summer of 2007, when high levels of contaminants were found in the soil and play was suspended at the site.

Ford-Highland Field was established in 1954 on Ford Motor Company property near Cleveland and Montreal Avenues. Two additional fields were constructed in the early 1960s.

[19] Nevins and Hill, *Ford: Expansion and Challenge*, 589.

FINDINGS

Areas of Significance

The Twin Cities Assembly Plant has potential significance in two different historical contexts due to its role in the physical and economic expansion of the Ford Motor Company and its influence on the development of the Highland Park neighborhood and the cities of Saint Paul and Minneapolis.

When constructed in 1924, the Twin Cities Assembly Plant was the largest of several branch plants built by Ford at locations around the country. The company first developed branch assembly plants in the early 1910s—the downtown Minneapolis plant, built in 1914, was part of this first wave of expansion. By 1916, Ford operated twenty-eight branch factories nationwide and had fifty-one plants that produced parts and automobile components. Branch plants, which provided convenient shipping points for outlying territories, were essential to meeting the national consumer demand for Ford's single automobile, the Model "T", which revolutionized the industry with its standardization and affordability.[20]

As Henry Ford refined production methods, the company needed to replace the earlier multi-story factories, which had been constructed for stationary assembly of vehicles and could not be retrofitted with conveyors and assembly lines. Ford embarked on a second expansion phase beginning in 1921, planning facilities in Saint Paul as well as in Chicago, Memphis, Charlotte, Norfolk (Virginia), and Jacksonville, where assembly plants were under construction by 1924. At the same time, additions were made to older branch plants in Kansas City and Oklahoma City. A few years later, plants were established or expanded in cities including Philadelphia, Cleveland, Dallas, Seattle, Long Beach and Richmond (California), Edgewater (New Jersey), and Alexandria (Virginia).[21]

The designs for these single-story assembly buildings were based on the company's successful prototype in Highland Park, which began to take shape in 1909, and its immense River Rouge compound, begun in Dearborn in 1917. These suburban Detroit complexes were designed by industrial architect Albert Kahn, beginning Kahn's long association with Ford. Most of the branch plants constructed through the 1940s also were designed by Kahn, and his office continued to be employed by Ford into the 1960s.[22]

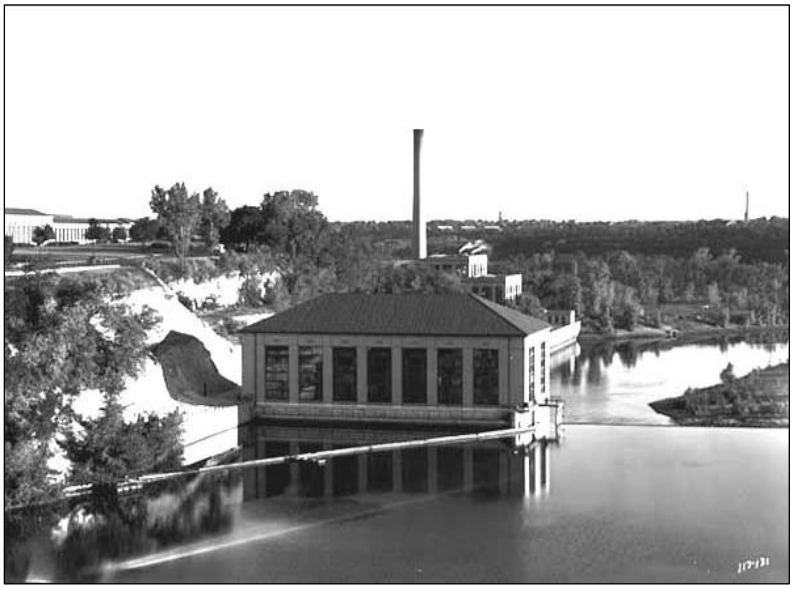
Of the eight facilities built in the early to mid-1920s, only the Twin Cities and Chicago plants have been in continuous operation. The Memphis, Charlotte, and Jacksonville facilities were closed during the Great Depression and never reopened by Ford. The Oklahoma City factory was reorganized as a parts depot in 1931, which then closed in 1967. The Kansas City plant was replaced by a new facility in 1940. Many of the later branch assembly plants designed by Kahn also are no longer associated with Ford, although some still stand. Notably, the 1931 Richmond Assembly Plant in the San Francisco Bay area has been listed in the National Register and

[20] Nevins and Hill, *Ford: Expansion and Challenge*, 255.
[21] "Six Thousand Cars Yearly to Be Added to Branch Capacity," *Ford News*, March 15, 1924; Bucci, *Albert Kahn: Architect of Ford*, 62-64; Nevins and Hill, *Ford: Expansion and Challenge*, 574.
[22] Bucci, *Albert Kahn: Architect of Ford*, 38-57.

renovated to house the Rosie the Riveter National Park, interpreting home-front efforts during World War II.[23]

As evidenced by the failure of so many plants, the Ford Motor Company's expansion from the 1910s through the 1930s was impulsive and uneven, guided more by Henry Ford's zeal than his business sense. During this time, the company itself was unorganized and somewhat ineffectual. In the mid-1920s, Ford's Model "T" fell out of favor with consumers and the company had difficulty maintaining its market share in competition with the variety of models produced by General Motors and Chrysler. Ford decided to scrap the Model "T" in 1926, just a short time after opening a number of new plants, including the Twin Cities Assembly Plant. The factories were closed down and retooled to produce the Model "A". Fortunately for Ford, the Model "A" was an equal success and the premature building investment left the company well positioned for production—that is, until the full effects of the Great Depression hit the automobile market in 1931. Ford shuttered dozens of plants nationwide; the Twin Cities facility was closed from 1933 to 1935.

One factor that made the Twin Cities Assembly Plant more successful than most was its hydroelectric plant, which provided an inexpensive supply of electricity during even the most economically difficult years. Although the plant was shut down for two years during the Great Depression, it was able to continue operating the hydroelectric plant, selling the electricity to local utilities.



The Ford Hydroelectric Plant, shown above in 1936, has been in operation since it first went on-line in 1924. It still provides nearly all the electricity needed by the plant. (Minnesota Historical Society)

The Twin Cities plant might also have been favored by Henry Ford because it successfully embodied so many of his personal and business philosophies. The factory was located on a scenic site, outside of the central city. It had easy access to multiple forms of transportation, although Ford's aspirations to ship completed vehicles by barge proved cumbersome and unfruitful. It also fulfilled his fascination with hydroelectric power, which he had pursued on a smaller scale at numerous other sites. The Twin Cities hydroelectric plant was, in fact, the largest in the Ford Company and the only one capable of supplying all of the electricity needed by its accompanying assembly plant.

[23] In addition to eight assembly plants that are listed in the National Register, several Ford plants have been documented for the Historic American Engineering Record (HAER): Ford Motor Company Long Beach Assembly Plant (HAER No. CA-82), Rosie the Riveter National Historical Park, Ford Assembly Plant (HAER No. CA-326-H), and Ford Motor Company Edgewater Assembly Plant (HAER No. NJ-53).

The Twin Cities Ford plant was important outside of the company, as well. The plant's presence fueled waves of residential and commercial development in Highland Park, as the surrounding area of Saint Paul soon became known. The neighborhood was not the only geographical entity to be named in honor of the company. The street that borders the north edge of the plant was called Edsel Avenue before its current name—Ford Parkway—was determined.

Real estate speculation was rampant following the announcement of Ford's expansion to Saint Paul, but the difficulties of the Great Depression resulted in most of the residential lots standing vacant until after World War II. Historic aerial photographs illustrate the pace of development. In the 1920s, the land surrounding the plant was mostly vacant and wooded. Few houses stood on the Minneapolis side of the river, even though the Intercity Bridge was opened in 1927. By 1930, several commercial and apartment buildings had been built in the vicinity of the plant. Within the decade, several blocks of single-family houses were constructed on both sides of the Mississippi only a short distance from the plant. The Highland Village Apartments was built by the Works Progress Administration (WPA) directly to the east of the Ford plant in the late 1930s. By 1951, the commercial area at the intersection of Ford Parkway and Cleveland Avenue was well established and blocks of single-family houses completed the neighborhood. Similar growth took place on the west side of the river, especially north of East Forty-sixth Street.

This aerial photograph from about 1926 shows the largely undeveloped areas of Saint Paul to the north and east of the Ford Twin Cities Assembly Plant and South Minneapolis on the opposite side of the Mississippi River. (Minnesota Historical Society)

The increasing demand for water service to the area also indicates the rate of growth. The year that the Ford assembly plant was constructed, the City of Saint Paul built a tiered, underground water reservoir at Snelling Avenue and Ford Parkway. Four years later, the 200,000-gallon Highland Park water tower was completed. By 1959, residential development had grown to the extent that another reservoir and a one million-gallon water tower were needed to meet the needs of the area.[24]

While it is not possible to directly measure the influence of Ford on the growth rate of Highland Park and South Minneapolis, the plant clearly served as an anchor to the development of these neighborhoods.

By the mid-1950s commercial areas and residential blocks were well established in the Highland Park neighborhood of Saint Paul. (Minnesota Historical Society)

Assessment of Integrity

The Twin Cities Assembly Plant contains several buildings and other resources that date from its original period of construction. The three principal structures—the main assembly building and the hydroelectric and steam plants—are present. The historic integrity of the hydroelectric plant is excellent; although the equipment has been updated, the building itself has experienced few exterior or interior alterations. The main building and steam plant, on the other hand, have had numerous alterations that compromise their historic integrity.

The main assembly building—the largest individual resource at the plant—has experienced the most change. The exterior of the building was dramatically altered in 1969 by the addition along its west facade. Multiple additions on the south side of the building and the enclosure of the window bays on the north facade also have had deleterious effects. These additions and alterations do not contribute to the significance of the building on the basis of age (they are fewer than fifty years old) and they do not appear to be of exceptional importance, as would be required to meet National Register Criteria Consideration G.

[24] Highland Water Tower information display, available from the Saint Paul Regional Water Services, Saint Paul, Minnesota.

Many of the assembly building's distinctive historic features do remain, such as six of the original window bays on two facades at the northwest corner of the building. These windows, which once opened to the company showroom, are largely intact, with six-light vertical transoms over modern, six-light display windows. The transom mullions, lower rail, and outside window frames are cast iron with scrollwork motifs, but the transom glass has been replaced by insulated, painted sheet metal. Original cast-iron lamps project from the fluted pilasters between the windows.

The northwest corner of the plant, which was the location of the historic salesroom, is relatively intact.

Four more bays on the west facade retain their original dimensions and some historic characteristics. Original steel, multi-light transoms and sashes surround a modern door that replaced the original main entrance to the south of the showroom area. The remaining three openings on this facade have modern, nine-part windows. On the north facade, the two window bays east of the corner block have steel, multi-light transoms over modern, six-part windows. The original window bay dimensions are intact along the remainder of the north facade, although in most cases the openings have been filled with painted concrete block. Many of the bays contain one or two small, fixed-pane windows.

The hipped, clay-tile roof of the original structure is intact, but not visible at present, as it sits behind the flat roof of the 1969 addition. The plank sheathing of the entire roof and the vaulted, hipped form of the original center pavilion can still be seen inside the plant.

The historic appearance of the west facade has been eclipsed by the 1969 addition (shown at right) and mature trees.

Despite the frequent reconfigurations of the assembly line, the basic structural elements of the main plant interior are intact. Distinctive features such as the exposed steel columns, beams, and trusses, elevated restrooms and service areas, and network of plumbing and heating pipes are evident. The glass in the original clerestories and monitors has been replaced with corrugated, insulated fiberglass, but the structures themselves are unaltered.

The historic integrity of the steam plant also has been compromised by window enclosures, primarily on the entire west facade. When the site surrounding the steam plant was regraded in the 1950s to prevent future flood damage, other historic resources in the area were affected. Three facades of the screening house to the west of the steam plant were also buried, so that only the flat roof of the building is immediately visible. The nearby entrance to the glass and transport tunnels is intact but buried so that only the top two steps of the entrance wall are visible. A concrete slab with two vertical access hatches sits in front of the tunnel wall, and the exterior view gives no indication of the extensive tunnel system beyond. The tunnels were a pivotal element of the assembly plant at the time of its construction and would be critical in interpreting the history of the plant. The barge dock, which was another important feature of the site, has had no significant alterations.

The window openings on the west facade of the steam plant were enclosed following flooding in the 1950s.

The changes to the Twin Cities Assembly Plant must also be assessed within the context of the Ford organization. Since the plant initially was designed with an "economy of space," there was an obvious need for expansion as production grew over the course of the twentieth century. Inherent in Ford's conception was an idea of industrial production susceptible to continuous, necessary revisions. All continually operating Ford Motor Company assembly plants, including the one in the Twin Cities, have experienced some degree of physical change. In fact, most that have not were decommissioned by Ford only a short time after they were completed and were never given the opportunity to grow. Although no longer in use, plants built around the same time as the Twin Cities Assembly Plant might better represent the architectural characteristics of the company's mid-1920s expansion. Other plants that were earlier examples of the evolution of assembly line manufacturing, such as the facilities in downtown Louisville, Cincinnati, Omaha, and Cleveland, are listed in the National Register. Most of these buildings have been adaptively reused as commercial or residential spaces.[25]

[25] Bucci, *Albert Kahn: Architect of Ford*, 42. Assembly plants buildings from the mid-1920s that appear to be relatively intact include those in Memphis, Charlotte, Alexandria, and southwest Louisville.

Although some of the changes to the main assembly building and steam plant could be reversed, restoring their historic appearance, numerous later additions to the plant would be more difficult to undo. Ultimately, the individual buildings and the site as a whole have experienced so many alterations and additions that the plant is not sufficiently intact to convey its age and importance.

Window openings on the north facade of the main assembly building have been enclosed with concrete block.

The Ford-Highland Fields have no apparent significance pertaining to the Ford Motor Company or the Twin Cities Assembly Plant. Evaluating their potential significance in the context of recreation and sports is beyond the scope of this project. In any event, the ball fields could only be eligible for listing in the National Register under Criterion A (Recreation) if they qualified as exceptionally important under Criteria Consideration G, because their current configuration is a product of the 1960s expansion—too recent to meet the National Register's fifty-year threshold.

CONCLUSION

While the Ford Motor Company Twin Cities Assembly Plant might meet criteria for listing in the National Register of Historic Places and designation by the Saint Paul Heritage Preservation Commission, its integrity is too compromised for the property to qualify for either. The hydroelectric plant is eligible for National Register listing under Criterion A in the area of Industry, as previously determined. Further study would be needed to assess the potential for the significance of the Ford-Highland Fields under National Register Criterion A in the area of Recreation, but the fields would have to be "exceptionally important" under Criteria Consideration G because of their relatively recent vintage.

Although the plant's poor integrity disqualifies it for local or national designation, this does not negate its historical significance to the city of Saint Paul, the state of Minnesota, or the Ford Motor Company. New development on this site should incorporate references to the history of the plant and its importance to the community (for example, adapting design motifs; using salvaged materials—or even reusing structures, if feasible; acknowledging segments of the layout of the plant, such as the assembly line, and the overall facility; creating an exhibit). Prior to the plant's demolition, the entire facility should be documented for the Minnesota Historic Property Record with large-format archival photographs and a written narrative explaining the significance of the plant, including the context of the mid-1920s wave of national expansion.

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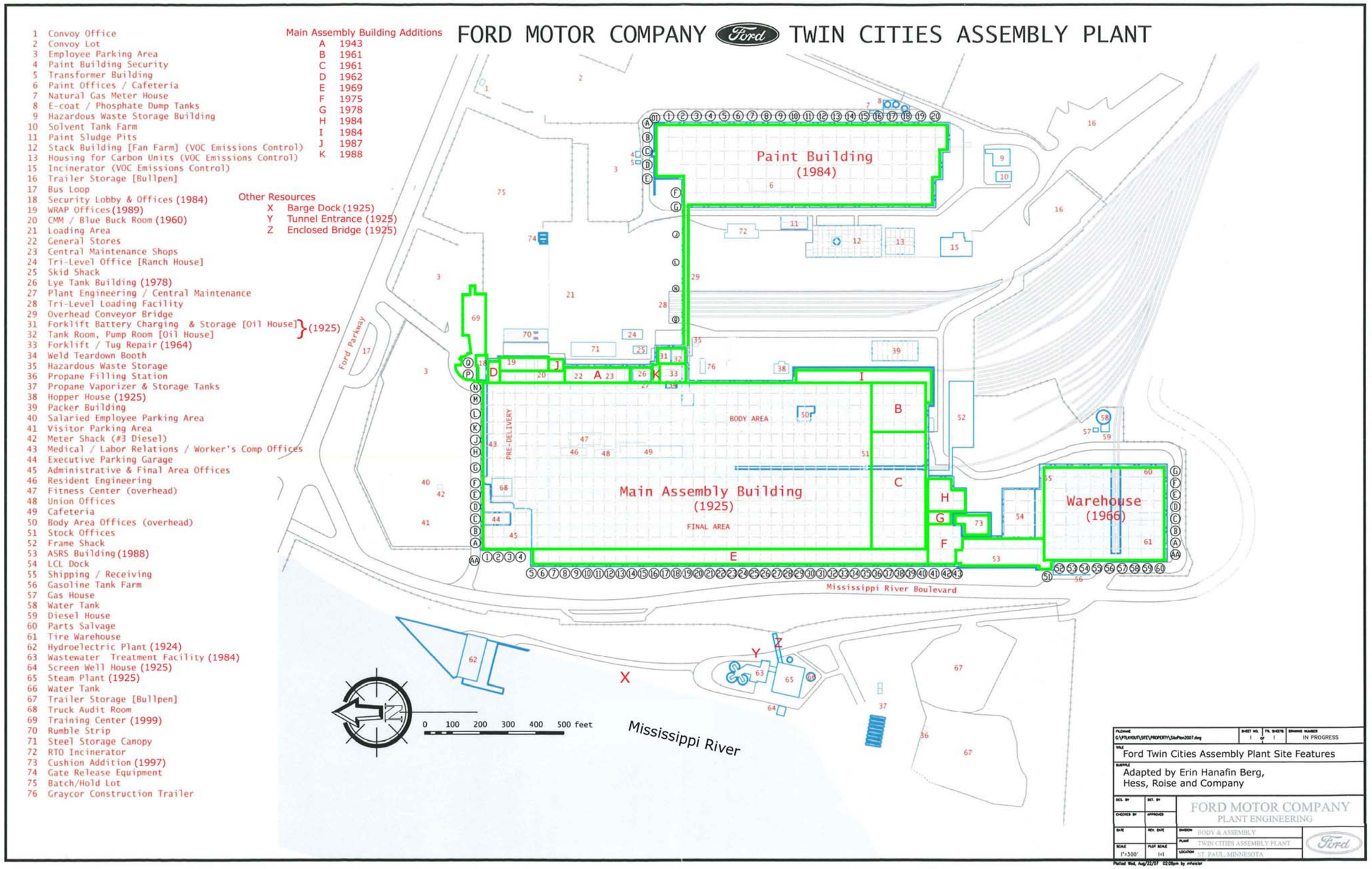
APPENDIX


FORD MOTOR COMPANY Ford TWIN CITIES ASSEMBLY PLANT
1 Convoy Office
2 Convoy Lot
3 Employee Parking Area
4 Paint Building Security
5 Transformer Building
6 Paint Offices / Cafeteria
7 Natural Gas Meter House
8 E-coat / Phosphate Dump Tanks
9 Hazardous Waste Storage Building
10 Solvent Tank Farm
11 Paint Sludge Pits
12 Stack Building [Fan Farm] (VOC Emissions Control)
13 Housing for Carbon Units (VOC Emissions Control)
15 Incinerator (VOC Emissions Control)
16 Trailer Storage [Bullpen]
17 Bus Loop
18 Security Lobby & Offices (1984)
19 WRAP Offices (1989)
20 CMM / Blue Buck Room (1960)
21 Loading Area
22 General Stores
23 Central Maintenance Shops
24 Tri-Level Office [Ranch House]
25 Skid Shack
26 Lye Tank Building (1978)
27 Plant Engineering / Central Maintenance
28 Tri-Level Loading Facility
29 Overhead Conveyor Bridge
31 Forklift Battery Charging & Storage [Oil House]
32 Tank Room, Pump Room [Oil House]
(1925)
33 Forklift / Tug Repair (1964)
34 Weld Teardown Booth
35 Hazardous Waste Storage
36 Propane Filling Station
37 Propane Vaporizer & Storage Tanks
38 Hopper House (1925)
39 Packer Building
40 Salaried Employee Parking Area
41 Visitor Parking Area
42 Meter Shack (#3 Diesel)
43 Medical / Labor Relations / Worker's Comp Offices
44 Executive Parking Garage
45 Administrative & Final Area Offices
46 Resident Engineering
47 Fitness Center (overhead)
48 Union Offices
49 Cafeteria
50 Body Area Offices (overhead)
51 Stock Offices
52 Frame Shack
53 ASRS Building (1988)
54 LCL Dock
55 Shipping / Receiving
56 Gasoline Tank Farm
57 Gas House
58 Water Tank
59 Diesel House
60 Parts Salvage
61 Tire Warehouse
62 Hydroelectric Plant (1924)
63 Wastewater Treatment Facility (1984)
64 Screen Well House (1925)
65 Steam Plant (1925)
66 Water Tank
67 Trailer Storage [Bullpen]
68 Truck Audit Room
69 Training Center (1999)
70 Rumble Strip
71 Steel Storage Canopy
72 RTO Incinerator
73 Cushion Addition (1997)
74 Gate Release Equipment
75 Batch/Hold Lot
76 Graycor Construction Trailer
Main Assembly Building Additions
A 1943
B 1961
C 1961
D 1962
E 1969
F 1975
G 1978
H 1984
I 1984
J 1987
K 1988
Other Resources
X Barge Dock (1925)
Y Tunnel Entrance (1925)
Z Enclosed Bridge (1925)
Paint Building (1984)
Main Assembly Building (1925)
FINAL AREA
BODY AREA
PRE-DELIVERY
Warehouse (1966)
Ford Parkway
Mississippi River Boulevard
Mississippi River
0 100 200 300 400 500 feet
N
Ford Twin Cities Assembly Plant Site Features
Adapted by Erin Hanafin Berg, Hess, Roise and Company
FORD MOTOR COMPANY
PLANT ENGINEERING
BODY & ASSEMBLY
TWIN CITIES ASSEMBLY PLANT
ST. PAUL, MINNESOTA
IN PROGRESS

Appendix D: Transportation Analysis Report

Memorandum

SRF No. 11967.01

To: Randy Newton, PE, PTOE, Traffic Engineer
City of Saint Paul

From: Matt Pacyna, PE, Principal
Brent Clark, PE, Senior Engineer

Date: August 12, 2019

Subject: Ford Site AUAR Transportation Analysis

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

Matthew R. Pacyna, PE
License No.: 47670

Introduction

SRF has completed a transportation analysis for the Ford Site Alternative Urban Area-wide Review (AUAR). The Ford Site is generally bounded by Ford Parkway to the North, Mississippi River Boulevard to the West and South, and Cleveland Avenue to the East. The main objectives of this memorandum are to document the assumptions, methodology, stakeholder coordination, findings, and recommendations associated with the Ford Site AUAR Transportation Analysis. SRF has coordinated with project stakeholders throughout the analysis process to confirm and review the study scope, analysis assumptions, methodology, findings, and mitigation, including agency representatives from Saint Paul, Minneapolis, Minneapolis Park and Recreation Board, Ramsey County, Hennepin County, Minnesota Department of Transportation (MnDOT), Metro Transit, and Ryan Companies.

The AUAR transportation analysis is an independent study that reviews potential site design scenarios and identifies area transportation impacts and mitigation for all users and transportation modes. Although some issues and mitigation identified are based on key traffic metrics such as level of service and queuing, they also must consider other parts of the transportation system, such as pedestrians, bicyclists, and transit. This study recognizes that some mitigation may conflict with other transportation modal priorities and therefore are offered for consideration. The mitigation identified is intended to provide discretion to stakeholders with respect to transportation priorities and implementation. The following information summarizes the Ford Site AUAR transportation analysis process and findings.

Analysis Background

A previous study titled the *Saint Paul Ford Site: Multimodal Transportation Study and Report* was developed by Nelson and Nygaard and SRF Consulting Group, Inc. (SRF), dated May 2017. This study evaluated preliminary Ford Site master plan concepts, helped refine the overall Ford Site Master Plan, and identified potential transportation mitigation measures. The previous study evaluation focused on vehicular, pedestrian, and bicycle operations external to the site, focusing along Ford Parkway from the Mississippi River to Cleveland Avenue, as well as key intersections along Cleveland Avenue and Saint Paul Avenue, south of Ford Parkway. As noted earlier, the Ford Site AUAR transportation analysis is an independent study separate from this previous analysis.

Agency Coordination

SRF worked closely with area agencies to define the transportation system study area, scope of the traffic analysis, and review assumptions and findings. This agency coordination included technical representatives from:

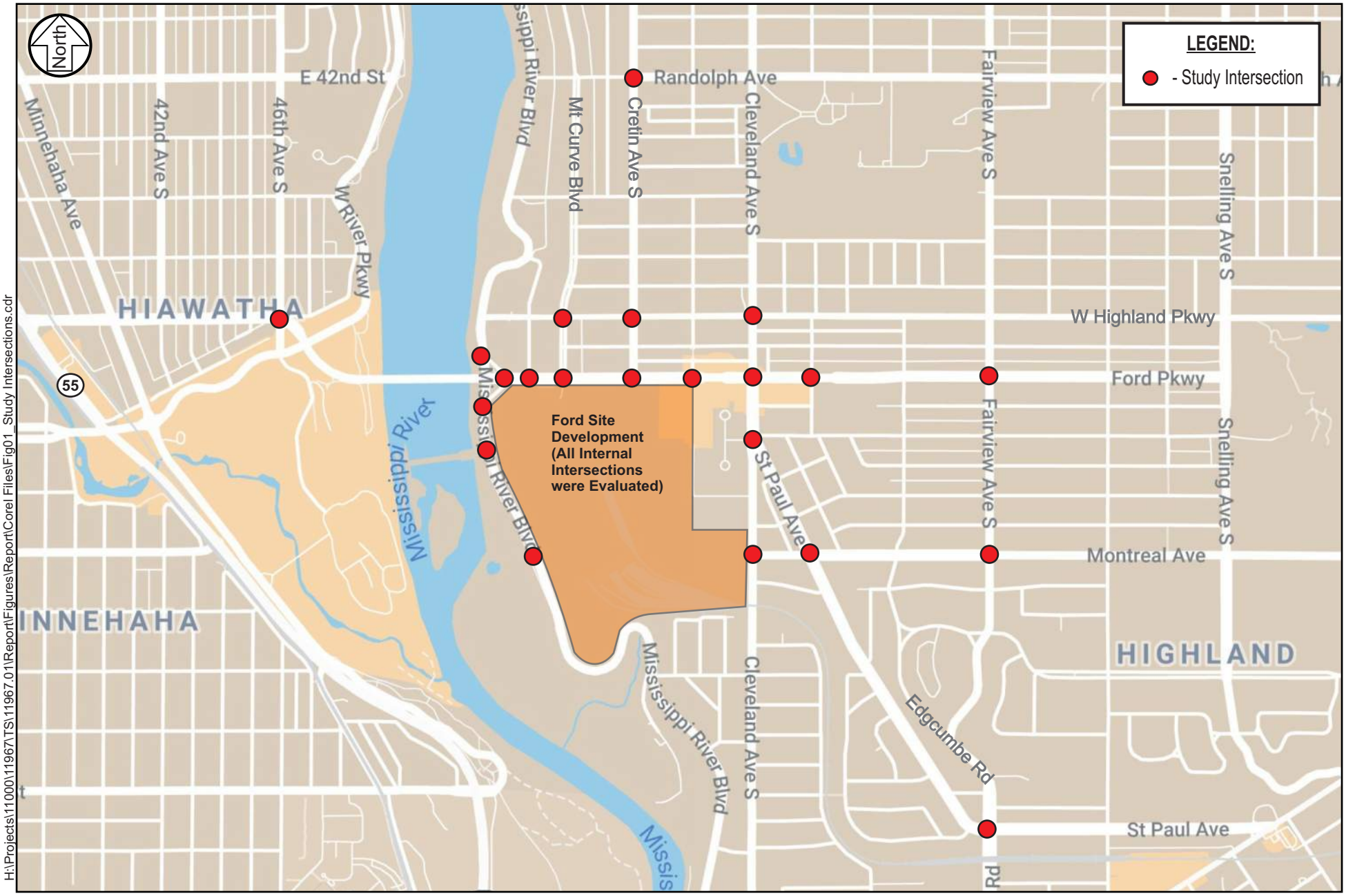
- MnDOT
- Metro Transit
- Ramsey County
- Hennepin County
- Saint Paul
- Minneapolis
- Minneapolis Park and Recreation Board
- Kimley-Horn & Associates
- Ryan Companies

Regular coordination meetings occurred weekly throughout the study process beginning in May 2019, at the formal initiation of the AUAR process. In addition, there were three agency coordination meetings to review the study scope, preliminary findings, and draft mitigation. These meetings provided each agency the opportunity to provide feedback on the study process, assumptions, and findings. The following provides a summary of the agency meetings and key goals.

- Agency Meeting 1 - Traffic Analysis Scoping (September 12, 2018)
- Agency Meeting 2 - Assumptions/Regional Traffic Impact Review (May 29, 2019)
- Agency Meeting 3 - Preliminary Findings/Mitigation Review (June 12, 2019)

Transportation System Study Area

A map depicting the primary study intersections identified by the project team and other agencies is provided in Figure 1. Note that the internal Ford Site roadways, intersections, and connections to public roadways are included as part of the transportation system study area. Additional locations outside of the primary study intersections were reviewed from a planning-level perspective. This planning-level review considered a wider geographic area, including Minnesota (Mn) Trunk Highway (TH) 55 (Hiawatha Avenue) to the West, Mn TH 5 (7th Street) to the South, Mn TH 51 (Snelling Avenue/Montreal Avenue) to the east, Cretin Avenue near Marshall Avenue (County Road 35), and Saint Paul Avenue near MN TH 5 (7th Street). Further discussion regarding the planning-level review is provided later in this document.



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Study Intersections

Ford Site AUAR Transportation Analysis
City of Saint Paul

Figure 1

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August 2019

Existing Conditions

The existing conditions were reviewed to establish a baseline to identify any future impacts associated with the future AUAR scenarios. The evaluation of existing conditions includes various data collection efforts, identification of current transportation characteristics (roadways, pedestrians, bicycles, and transit), and an intersection capacity analysis, which are outlined in the following sections.

Data Collection

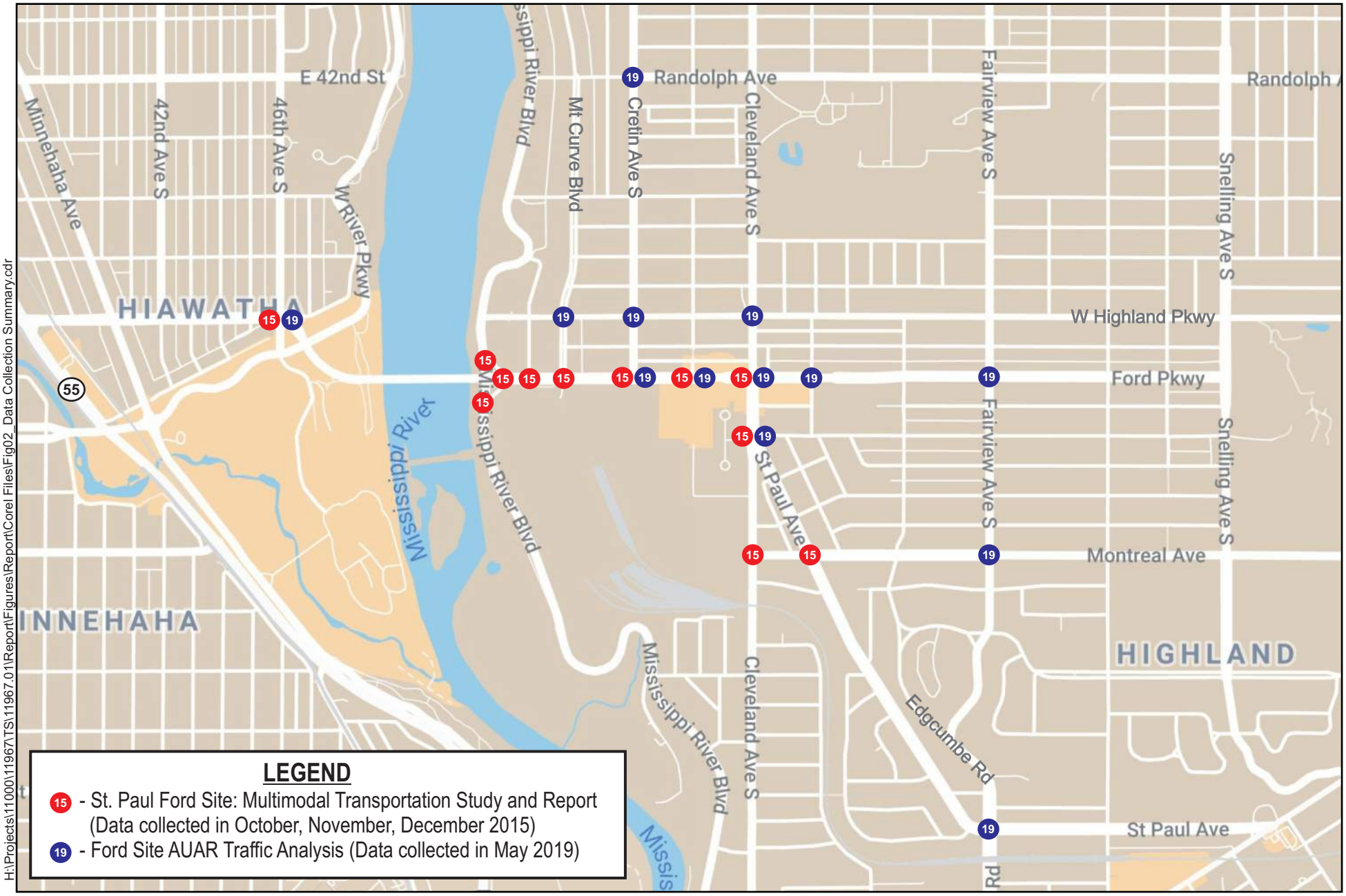
Weekday a.m. and p.m. peak period vehicular turning movement and pedestrian and bicyclist counts were collected at the following locations in May 2019 (between May 8th and May 22nd) during typical weekday conditions (i.e. a Tuesday, Wednesday, or Thursday) while area schools and universities were still in session:

- 46th Street/46th Avenue (Minneapolis)
- Ford Parkway/Cretin Avenue
- Ford Parkway/Finn Avenue
- Ford Parkway/Cleveland Avenue
- Ford Parkway/Kenneth Street
- Ford Parkway/Fairview Avenue
- Cretin Avenue/Randolph Avenue
- St Paul Avenue/Edgcumbe Road
- Montreal Avenue/Fairview Avenue
- Highland Parkway/Mount Curve Boulevard
- Highland Parkway/Cretin Avenue
- Highland Parkway/Cleveland Avenue
- Cleveland Avenue/Saint Paul Avenue

In addition to the new data, previously collected vehicular turning movement and pedestrian counts from Fall of 2015 were reviewed, which was prior to completion of the A-Line Bus Rapid Transit service. The following study intersections were previously collected in October, November, or December of 2015 and were adjusted and balanced based on the newly collected data to reflect current year 2019 conditions.

- Mississippi River Boulevard at Ford Parkway North
- Mississippi River Boulevard at Ford Parkway South
- Ford Parkway/Mississippi River Boulevard
- Ford Parkway/Woodlawn Avenue
- Ford Parkway/Mount Curve Boulevard
- Cleveland Avenue/Montreal Avenue
- Saint Paul Avenue/Montreal Avenue

The data collected in May 2019 is generally consistent with the previous counts as area traffic volumes have been relatively stable over the past 10 to 15-years. Reviewing data sets from multiple years and different time periods, provides insight into how area traffic volumes within the study can fluctuate based on a number of factors, such as park and school activity. A data collection summary is shown in Figure 2. Historical traffic volume context with respect to Ford Site operations is provided later in this document.



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Data Collection Summary

Ford Site AUAR Transportation Analysis

City of Saint Paul

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Figure 2

Roadway Characteristics

A field assessment was completed to identify various roadway characteristics within the transportation system study area, such as jurisdiction, functional classification, general configuration, posted speed limit, and presence of on-street parking or a bicycle facility. A summary of these roadway characteristics is shown in Table 1. Note that these are general characteristics and that there are some deviations within the area or segments of the roadways.

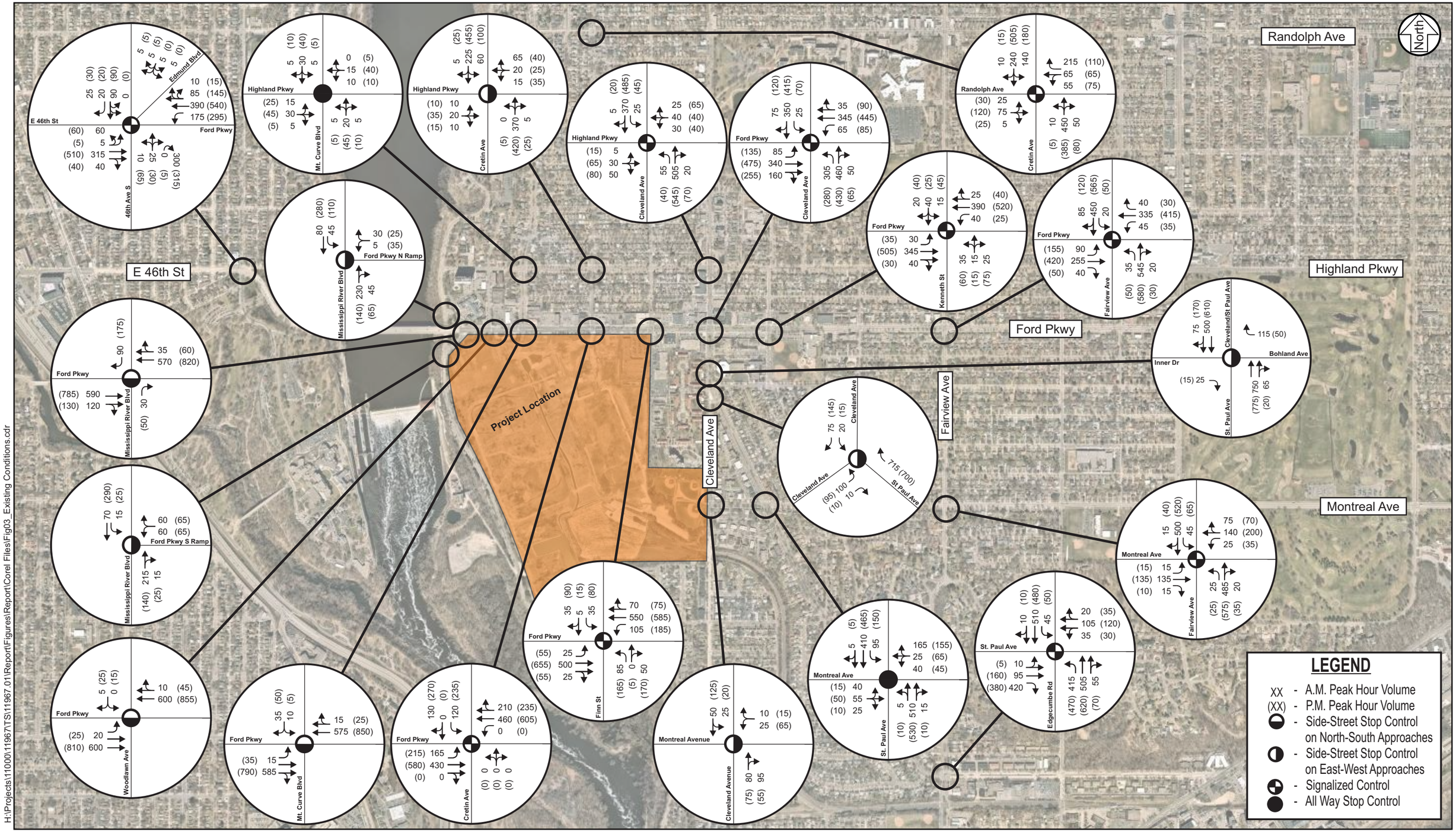
Table 1. Existing Roadway Characteristics

Roadway	Jurisdiction	Functional Classification	General Configuration	Posted Speed Limit (mph)	On-Street Parking	Ped (P) or Bike (B) Facility
Ford Parkway	County	Minor Arterial	4-/2-lane divided	30 mph	Yes	P, B
Cleveland Avenue	City/County	Minor Arterial	4-/2-lane undivided	30 mph	Yes	P, B
St Paul Avenue	County	Minor Arterial	4-lane divided	30 mph	Yes	P
Edgcumbe Road	City/County	Minor Arterial	4-lane divided	30 mph	No	P
Highland Parkway	City	Major Collector	2-lane divided	30 mph	Yes	P
Montreal Avenue	City	Major Collector	2-lane divided	30 mph	Yes	P, B
Mississippi River Blvd	City	Local Road	2-lane undivided	25 mph	Yes	P, B
Mount Curve Blvd	City	Local Road	2-lane divided	30 mph	Yes	P
Cretin Avenue	City	Minor Arterial	2-land undivided	30 mph	Yes	P
Fairview Avenue	City	Minor Arterial	3-lane	30 mph	No	P, B

In addition to the general roadway characteristics, there are varying types of traffic controls within the transportation system study area. The following study intersections are signalized:

- 46th Street/46th Avenue (Minneapolis)
- Ford Parkway/Cretin Avenue
- Ford Parkway/Finn Avenue
- Ford Parkway/Cleveland Avenue
- Ford Parkway/Kenneth Street
- Ford Parkway/Fairview Avenue
- Cretin Avenue/Randolph Avenue
- St Paul Avenue/Edgcumbe Road
- Montreal Avenue/Fairview Avenue
- Cleveland Avenue/Highland Parkway

The St Paul Avenue/Montreal Avenue and Mount Curve Boulevard/Highland Parkway intersections operate under all-way stop control. The remaining study intersections are unsignalized with side-street stop control. Existing geometrics, traffic controls, and volumes are shown in Figure 3. Average daily traffic (ADT) volumes are included in the Appendix.



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Existing Conditions

Ford Site AUAR Transportation Analysis

City of Saint Paul

Figure 3

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Pedestrian and Bicycle Characteristics

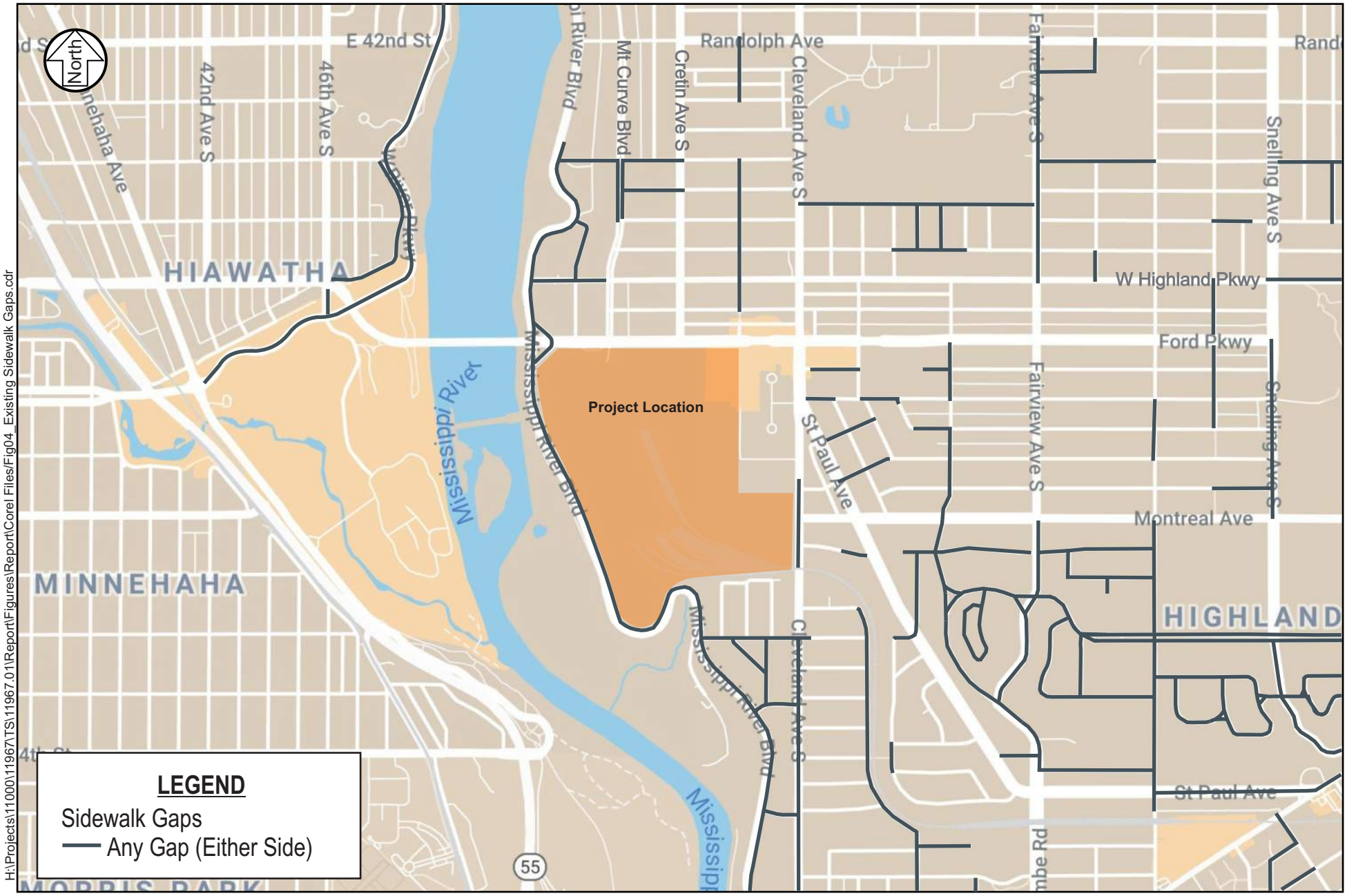
The City of Saint Paul provided their pedestrian and bicycle network database to help understand current facilities within the transportation system study area and identify potential gaps within the current system. Summaries of the existing sidewalk gaps and bicycle facilities within the transportation system study area are illustrated in Figure 4 and Figure 5, respectively. Note that pedestrian and bicycles facilities and connections internal to the Ford Site are discussed later in this document.

In general, the area surrounding the Ford Site is well served with sidewalks, with the primary exception being the neighborhood east of St Paul Avenue and south of Montreal Avenue. Although the area is generally well served by pedestrian facilities there are still a number of sidewalk gaps in the surrounding area as shown in Figure 4. The City of Saint Paul has a policy of constructing sidewalks on both sides of every street as part of street construction projects, so over time it is expected that these gaps will be filled.

From a bicycle perspective, there are facilities within the area of varying types, including off-street paths, dedicated bike lanes, bike boulevards, striped shoulders and enhanced shared lanes as shown in Figure 5. The *City of Saint Paul Bicycle Plan* identifies a bicycle facilities plan for the City including the roadways in and around the Ford Site. Although a portion of the proposed bicycle network surrounding the Ford Site is in-place, there are other bicycle facilities planned that have yet to be implemented. A summary of the existing and planned bicycle facilities is provided in Table 2. Further discussion regarding the future pedestrian and bicycle networks and their relation to the Ford Site is provided later in this document.

Table 2. Existing and Planned Bicycle Facilities

Roadway	Existing Facility	Planned Facility (per Saint Paul Bicycle Plan)
Ford Parkway	Bike Lanes (east of Kenneth/Howell)	Enhanced Shared/In-Street Lanes
Cleveland Avenue	Bike Lanes (north of Eleanor Avenue)	Enhanced Shared/In-Street Lanes
St Paul Avenue	None	In-Street Lanes
Edgcumbe Road	None	In-Street Lanes
Highland Parkway	None	Enhanced Shared Lanes
Montreal Avenue	Bike Lanes (East of Fairview); Enhanced Shared Lanes (West of Fairview)	Enhanced Shared/In-Street Lanes
Mississippi River Boulevard	Bike Lane (Southbound); Shared Use Path	Off-Street Path/In-Street Lanes
Fairview Avenue	Striped Shoulders	In-Street Lanes



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Existing Sidewalk Gaps

Ford Site AUAR Transportation Analysis
City of Saint Paul

Figure 4

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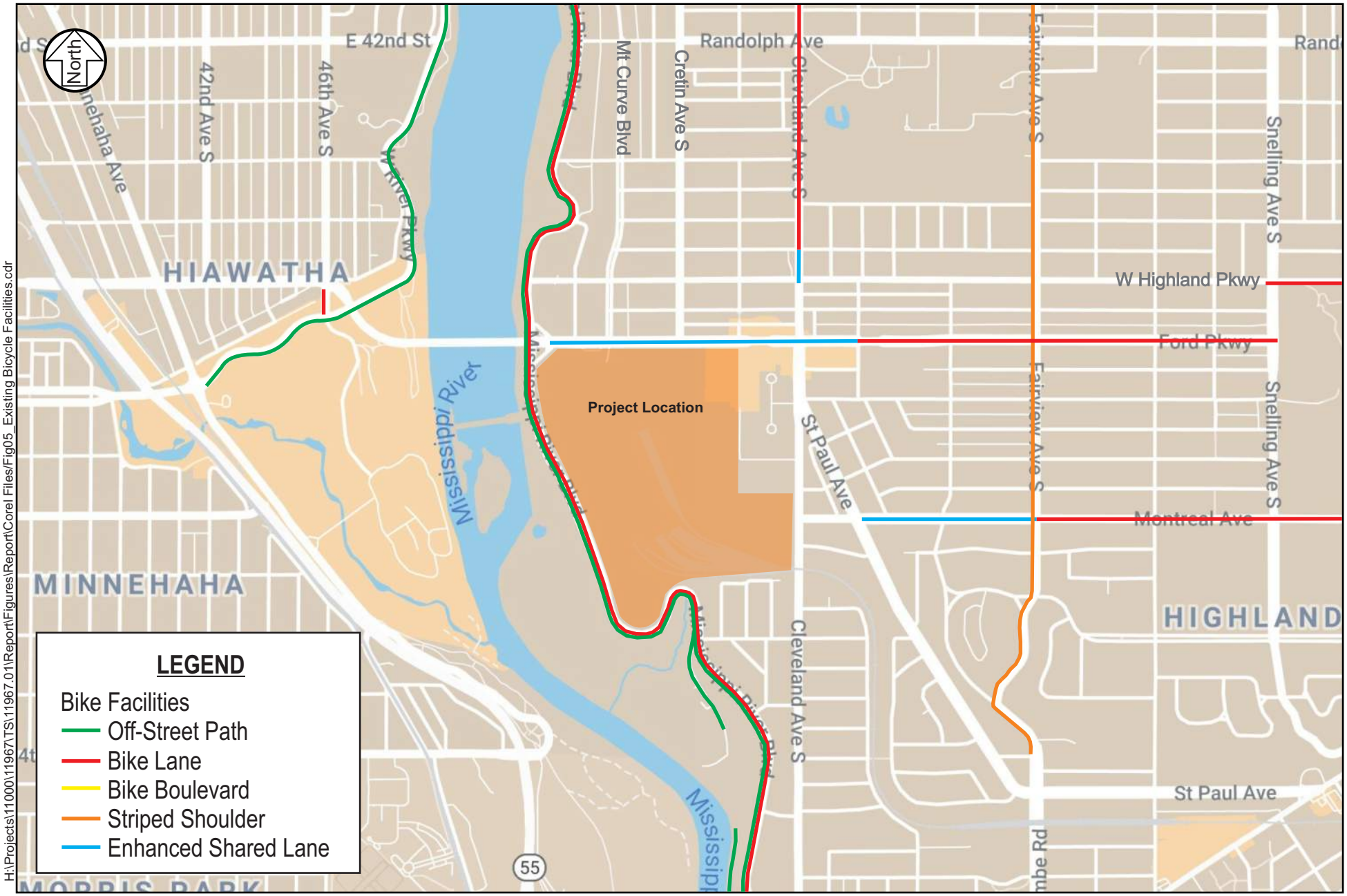

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Existing Bicycle Facilities

Ford Site AUAR Transportation Analysis

City of Saint Paul

Figure 5

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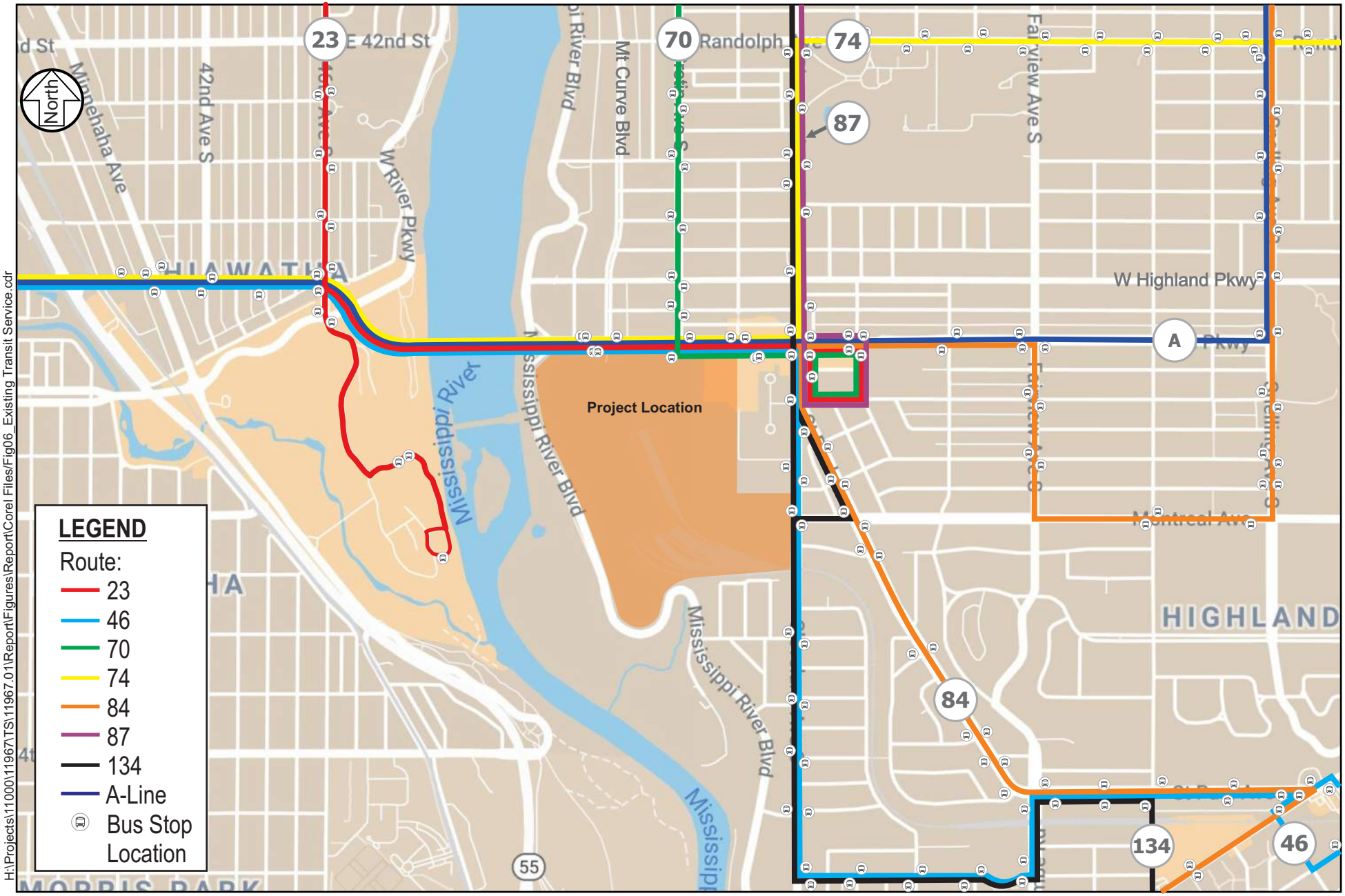
Transit Characteristics

The Ford Site is well served from existing transit, including the Metro Bus Rapid Transit (BRT) A-Line, as well as Routes 23, 46, 70, 74, 84, and 134 in varying frequencies and destinations. The A-Line BRT includes enhanced transit service such as limited stop service, high customer amenity stations, and transit signal priority capabilities. The current transit service and future planning is summarized in the *Draft Highland Park Transit Service Study*. This study includes information on the state of the existing transit service and future considerations/route concepts. The current transit routes within the transportation system study area are illustrated in Figure 6 and summarized in Table 3. Specific ridership data is documented within the *Draft Highland Park Transit Service Study*. Note that there are transit stops nearly every block along Ford Parkway and Cleveland Avenue bordering the site. There is also an existing on-street layover area along Kenneth Street, south of Ford Parkway. Further discussion regarding future transit service is provided later in this document.

Table 3. Existing Transit Service Frequency and Span

Route	Weekday					Saturday			Sunday		
	AM Peak	Midday	PM Peak	Evening	Span	Midday	Evening	Span	Midday	Evening	Span
23	60	60	30-60	60	7a-8p	20-40	60	8a-8p	60	60-90	8a-8p
46	30	30	30	30-60	6a-11p	30	60	7a-p	30	60	8a-8p
54	15	15	13	15-30	3a-1a	15	15-30	3a-1a	20	20-30	3a-1a
70	30	60	30	NA	6a-7p	NA	NA	NA	NA	NA	NA
74	15	15-20	15	30	5a-1a	20	30	5a-1a	30	30	5a-12a
83	30	30	30	30-60	6a-10p	30	30-60	7a-10p	30	30-60	7a-10p
84	30	30	30	30	5a-9p	30	NA	6a-8p	30	NA	9a-8p
87	20	30	20	30-60	4a-12p	30	60	6a-12p	30	60	6a-12p
134	15	NA	15	NA	6a-7p	NA	NA	NA	NA	NA	NA
A Line	10	10	10	15	4a-1a	10	15-30	4a-1a	10	15-30	4a-1a

Source: *Draft Saint Paul Highland Park Transit Service Study*, Metro Transit, June 2019



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Existing Transit Service

Ford Site AUAR Transportation Analysis
City of Saint Paul

0011967
August 2019

Figure 6

Intersection Capacity Analysis

An intersection capacity analysis was conducted to determine how traffic is currently operating at the study intersections during typical weekday a.m. and p.m. peak hour conditions. All intersections were analyzed using Synchro/SimTraffic software, which is an industry standard. Capacity analysis results identify a Level of Service (LOS) which indicates how well an intersection is operating. Intersections are graded from LOS A through LOS F. The LOS results are based on average delay per vehicle, which corresponds to the delay threshold values shown in Table 4. LOS A indicates the best traffic operation and LOS F indicates an intersection where demand exceeds capacity. Overall intersection LOS A through D is generally considered acceptable within the Twin Cities Metropolitan Area, although longer delays for short periods of time and/or for specific movements are often considered acceptable as well. In urban areas, it is common for intersections to operate at LOS E or LOS F for short periods of time, particularly when balancing other transportation modal priorities.

Table 4. Level of Service Criteria for Signalized and Unsignalized Intersections

LOS Designation	Signalized Intersection Average Delay/Vehicle (seconds)	Unsignalized Intersection Average Delay/Vehicle (seconds)
A	≤ 10	≤ 10
B	> 10 - 20	> 10 - 15
C	> 20 - 35	> 15 - 25
D	> 35 - 55	> 25 - 35
E	> 55 - 80	> 35 - 50
F	> 80	> 50

For side-street stop-controlled intersections, special emphasis is given to providing an estimate for the level of service of the side-street approach. Traffic operations at an unsignalized intersection with side-street stop control can be described in two ways. First, consideration is given to the overall intersection level of service. This takes into account the total number of vehicles entering the intersection and the capability of the intersection to support these volumes. Second, it is important to consider the delay on the minor approach. Since the mainline does not have to stop, the majority of delay is experienced on the side-street approaches. It is typical of intersections with higher mainline traffic volumes to experience high levels of delay (poor levels of service) on the side-street approaches, but an acceptable overall intersection level of service during peak hour conditions.

Results of the existing intersection capacity analysis, shown in Table 5, indicate that except for the Ford Parkway/Cleveland Avenue intersection, all study intersections currently operate at an acceptable overall LOS D or better during the weekday a.m. and p.m. peak hours. During the p.m. peak hour, the Ford Parkway/Cleveland Avenue intersection currently operates at LOS E, which results in southbound queues that can extend beyond Pinehurst Avenue and also extend to Highland Parkway approximately 15 percent of the p.m. peak hour. There are several other issues that were identified as part of the capacity analysis, which are summarized in the following issues and mitigation section. An illustrative summary of the existing p.m. peak hour operations is shown in Figure 7, which represents the worst-case condition within the transportation system study area. Existing intersection capacity results, including with mitigation, are shown in Table 5, while detailed analysis results are shown in the Appendix.

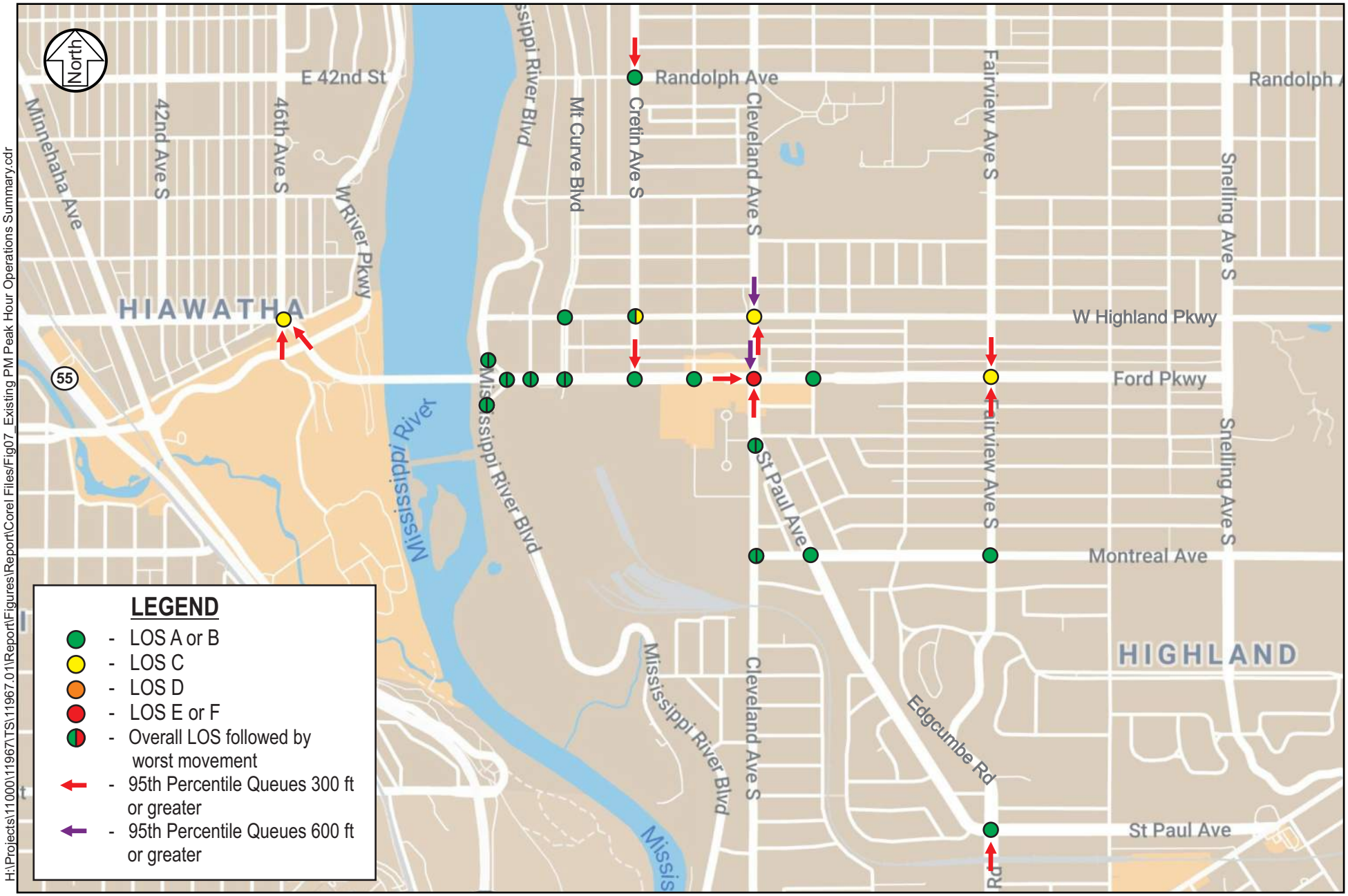
Table 5. Existing Intersection Capacity Analysis (with Mitigation*)

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	Existing	With Mitigation	Existing	With Mitigation
46th Street/46th Avenue	B (17 sec.)	B (17 sec.)	C (23 sec.)	C (23 sec.)
Ford Parkway/Ford Parkway Ramps (1)	A/A (5 sec.)	A/A (5 sec.)	A/A (7 sec.)	A/A (7 sec.)
Ford Parkway/Woodlawn Avenue (1)	A/A (5 sec.)	A/A (5 sec.)	A/B (14 sec.)	A/B (14 sec.)
Ford Parkway/Mount Curve Boulevard (1)	A/A (8 sec.)	A/A (8 sec.)	A/A (10 sec.)	A/A (10 sec.)
Ford Parkway/Cretin Avenue	B (11 sec.)	B (11 sec.)	B (15 sec.)	B (15 sec.)
Ford Parkway/Finn Street	B (11 sec.)	B (11 sec.)	B (15 sec.)	B (15 sec.)
Ford Parkway/Cleveland Avenue	C (27 sec.)	C (24 sec.)	E (61 sec.)	D (44 sec.)
Ford Parkway/Kenneth Street	A (9 sec.)	A (9 sec.)	B (11 sec.)	B (11 sec.)
Ford Parkway/Fairview Avenue	B (18 sec.)	B (18 sec.)	C (27 sec.)	C (28 sec.)
Cleveland Avenue/Highland Parkway	A (10 sec.)	A (10 sec.)	C (28 sec.)	B (16 sec.)
Cleveland Ave/St Paul Ave/Bohland Ave (1)	A/C (23 sec.)	A/C (23 sec.)	A/C (24 sec.)	A/C (24 sec.)
St Paul Avenue/Montreal Avenue (2)	B (11 sec.)	B (11 sec.)	B (12 sec.)	B (12 sec.)
St Paul Avenue/Edgcumbe Road	B (17 sec.)	B (17 sec.)	B (19 sec.)	B (19 sec.)
Montreal Avenue/Cleveland Avenue (1)	A/A (6 sec.)	A/A (6 sec.)	A/A (7 sec.)	A/A (7 sec.)
Montreal Avenue/Fairview Avenue	B (16 sec.)	B (16 sec.)	B (16 sec.)	B (16 sec.)
Mississippi River Blvd/Ford Pkwy North (1)	A/A (4 sec.)	A/A (4 sec.)	A/A (6 sec.)	A/A (6 sec.)
Mississippi River Blvd/South Ford Pkwy South (1)	A/A (5 sec.)	A/A (5 sec.)	A/A (6 sec.)	A/A (6 sec.)
Mount Curve Boulevard/Highland Parkway (2)	A (6 sec.)	A (6 sec.)	A (6 sec.)	A (6 sec.)
Cretin Avenue/Randolph Avenue	B (13 sec.)	B (13 sec.)	B (16 sec.)	B (16 sec.)
Cretin Avenue/Highland Parkway (1)	A/A (10 sec.)	A/A (10 sec.)	A/C (16 sec.)	A/C (16 sec.)

(1) Indicates an unsignalized intersection with side-street stop control where the overall LOS is shown followed by the worst approach LOS.

(2) Indicates an unsignalized intersection with all-way stop control.

* Mitigation is summarized in Table 6.



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Existing P.M. Peak Hour Operations Summary

Ford Site AUAR Transportation Analysis

City of Saint Paul

Figure 7

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August 2019

Issues and Mitigation

The following existing capacity and/or queuing issues were identified as part of the existing conditions analysis. Potential improvements are classified in the following categories:

- **Considerations** - improvements that are expected to help the identified issue (i.e. generally acceptable overall intersection operations but there are queues that impact operations or are greater than 300 feet) but may result in impacts to right-of-way or be in conflict with access, pedestrian, bicyclist, or transit priorities.
- **Mitigation** - improvements that are considered necessary, due to either an intersection capacity issue (i.e. overall LOS E or LOS F) or a queuing issue (i.e. greater than 600 feet).

The existing issues, considerations, and mitigation identified are summarized in Table 6. Note that intersection volumes and operations at the 46th Street/46th Avenue intersection can be heavily influenced by weather and park activity at Minnehaha Regional Park; operations and analysis in this report represent a typical weekday day condition.

Table 6. Existing Issue, Consideration, and Mitigation Summary

Issue	Consideration (C) / Mitigation (M)
46th Street/46th Avenue	
• The northbound right-turn movement is blocked approximately 30 percent of the a.m. peak hour and 60 percent of the p.m. peak hour; this results in queues that extend to the 46th Avenue/Godfrey Parkway intersection (i.e. approximately 300 feet) all-way stop 5-10 percent of the p.m. peak hour.	• C - Provide a northbound right-turn lane to reduce queuing.
• Westbound left-turn queues extend beyond the available storage (i.e. 100 feet) 5-10 percent of the p.m. peak hour.	• C - Remove the median on the east side of the intersection to provide more westbound left-turn lane storage (~ 50 feet of additional full-width turn lane storage). • C - Modify signal timing and phasing (such as a twice per cycle westbound left-turn phasing) to provide more green time for the westbound left-turn movement to better manage queues.
• The 5-leg intersection configuration limits the operational efficiency and creates pedestrian/ bicyclist conflicts.	• C - Remove the northeast leg of the 5-leg intersection (i.e. the Edmund Boulevard approach) to simplify the signal timing/phasing and improve overall intersection operations.

Issue	Consideration (C) / Mitigation (M)
Ford Parkway/Cretin Avenue	
• When vehicles are parked along the west side of Cretin Avenue (Pinehurst Avenue and Ford Parkway), southbound queues extend to Pinehurst Avenue (i.e. approximately 300 feet) during the p.m. peak hour. • Eastbound left-turn queues extend beyond the available storage (i.e. 100 feet) approximately five (5) percent of the p.m. peak hour.	• C - Restrict on-street parking along the west side of Cretin Avenue from Ford Parkway to Pinehurst Avenue and restripe the segment to accommodate an extended southbound left-turn lane to provide adequate storage for southbound queues. • C - Extend eastbound left-turn lane.
Ford Parkway/Cleveland Avenue	
• Operates at an overall LOS E during the p.m. peak hour. • Southbound queues extend to Highland Parkway (i.e. greater than 600 feet) approximately 15 percent of the p.m. peak hour and queue beyond Pinehurst Avenue (i.e. 300 feet). • Northbound queues are 300 feet or greater during the p.m. peak hour.	• M - Remove parking on the west side of Cleveland Avenue from Ford Parkway to the alley and provide a southbound right-turn lane to reduce southbound queues and improve operations.
• Eastbound queues extend to Finn Avenue (i.e. 575 feet) approximately 5-10 percent of the p.m. peak hour and block the left-turn lane storage (i.e. 100 feet) approximately 60 percent of the p.m. peak hour.	• M - Extend the eastbound left-turn lane approximately 75 feet by removing part of the center median along Ford Parkway to provide additional turn lane storage, while maintaining the right-in/right-out access at the access 225 feet west of Cleveland Avenue (i.e. the Walgreens/ Shuler Shoes access).
Ford Parkway/Fairview Avenue	
• Northbound queues are 300 feet or greater during the a.m. peak hour, and the northbound and southbound queues are greater than 300 feet during the p.m. peak hour. • Eastbound left-turn and northbound left-turn movements operate at a LOS E and LOS F during the p.m. peak hour, respectively.	• C - Install left-turn signal phasing capability for all approaches to improve operations.
Cretin Avenue/Randolph Avenue	
• Southbound queues are greater than 300 feet during the p.m. peak hour due to the lack of southbound left-turn lane storage.	• C - Provide northbound and southbound left-turn lanes to reduce queues; this may require widening of the roadway, but not right-of-way impacts.

Issue	Consideration (C) / Mitigation (M)
Cleveland Avenue/St Paul Avenue/Bohland Avenue	
• Vehicles were observed to make prohibited movements (i.e. a southbound u-turn on St Paul Avenue and northbound right-turn at Bohland Avenue); this movement occurred 15 times during the a.m. peak hour and six (6) times in the p.m. peak hour. • Vehicles making a northeast left-turn maneuver will often use the middle island as a two-stage crossing; when buses do this maneuver, they block southbound-thru traffic. • The skewed intersection configuration results in difficulty for motorists to identify on-coming vehicles, which creates a potential safety issue.	• C - Reconfigure intersection and provide a traffic control change to simplify the intersection geometry.
St Paul Avenue/Edgcumbe Road	
• Northbound left-turn movement extends beyond the available storage (i.e. 175 feet) approximately 15 percent of the p.m. peak hour and has queues greater than 300 feet.	• C - Provide an eastbound right-turn overlap phase to improve operations and reduce queues.

AUAR Scenarios and Assumptions

Build out of the Ford site is expected to take approximately 10 to 15 years and is dependent on market conditions. As part of the AUAR process, two future build scenarios were reviewed. The first scenario reviewed, referred to as the "Ryan Proposal", includes a mixture of Civic, Office, Retail, and Residential land uses. This scenario is consistent with Ryan Companies' current development proposal and the amended *Ford Site Zoning and Public Realm Master Plan* as approved by the City Council in April of 2019. The second scenario reviewed, referred to as "Max Build" also includes similar land uses, but at a higher density. This scenario is consistent with the highest development density permitted by the amended *Ford Site Zoning and Public Realm Master Plan* as approved by the City Council in April of 2019. A summary of the overall AUAR land use scenarios is illustrated in Table 7. Note that for analysis purposes, Civic was classified as general office space.

Table 7. AUAR Land Use Scenarios

Ryan Proposal		Max Build	
Civic	50,000 Square Feet	Civic	150,000 Square Feet
Employment (Office)	265,000 Square Feet	Employment (Office)	450,000 Square Feet
Retail	150,000 Square Feet	Retail	300,000 Square Feet
Residential	3,800 Units	Residential	4,000 Units

In addition to the land use scenario assumptions outlined in Table 7, the Max Build scenario includes additional redevelopment/development based on current zoning, including:

- Lund's & Byerly's Site Redevelopment: 330 Residential Units, 13,000 SF Retail
  - Note that these are assumed to be in addition to the current site land uses
- CP Rail Site Development: 55 Residential Units, 100,000 SF Office
- Partial Ford Site Ballfield Redevelopment: 115,000 SF Office

A block-by-block breakdown of the assumed land uses for the Ryan Proposal and Max Build AUAR land use scenarios is provided in Figure 8 and Figure 10, respectively.

The roadway and access assumptions used as the basis for the future intersection capacity analysis for the Ryan Proposal and Max Build AUAR scenarios is provided in Figure 8 and Figure 10, respectively. These assumptions were used to identify any potential issues and help guide future roadway configurations, traffic controls, and access. However, these are assumptions and as development occurs, each access should be reviewed on an individual basis. Note that the Max Build scenario includes the following roadway connections not included as part of the Ryan Proposal scenario:

- Extension of Finn Street from Ford Parkway to Bohland Avenue
- Extension of Saunders Avenue from Finn Street to Cleveland Avenue
- Extension of Cretin Avenue into the CP Rail Site

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Ryan Proposal Scenario Land Use Assumptions

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Figure 8

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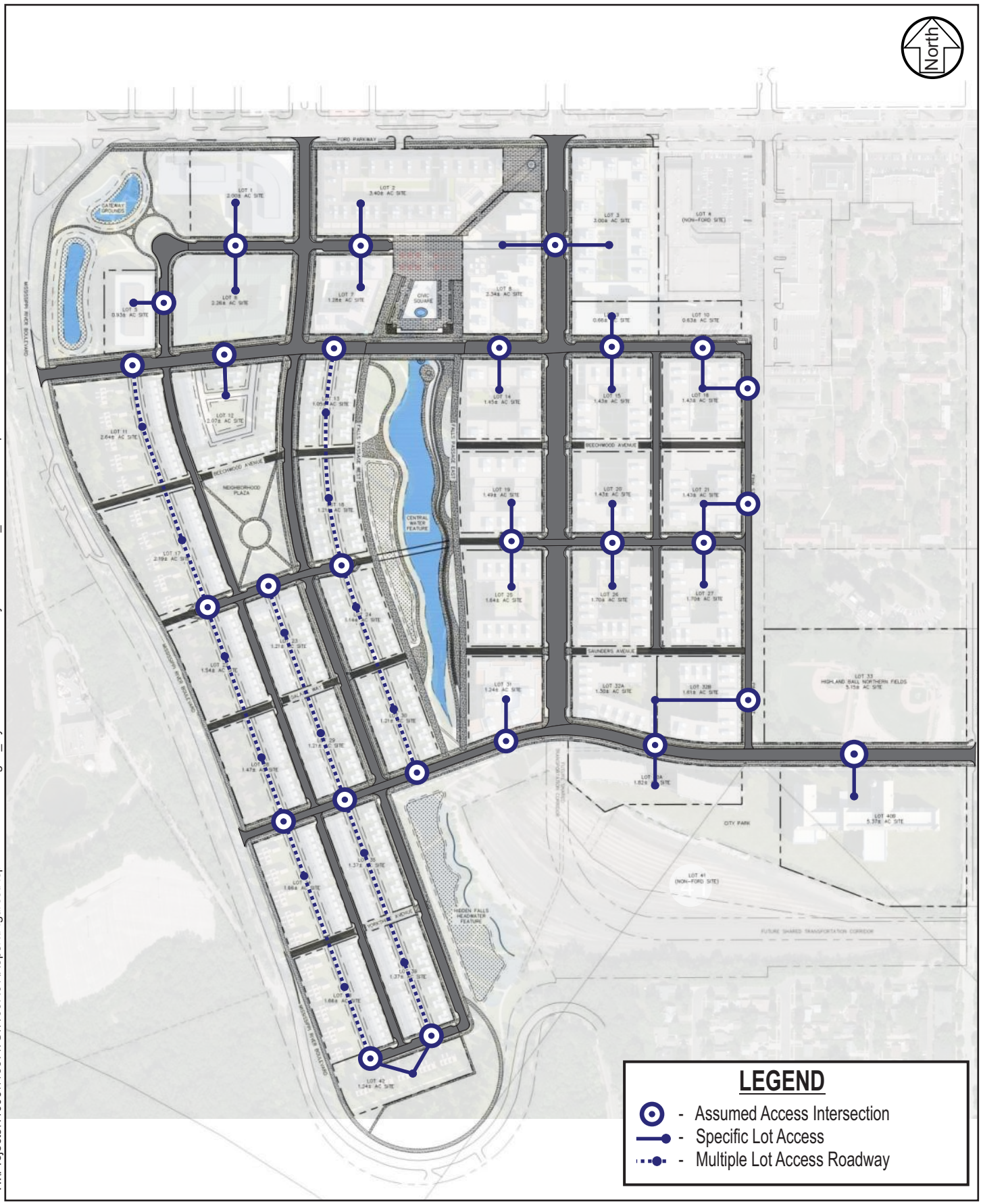

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Ryan Proposal Scenario Roadway and Access Assumptions

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Figure 9

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Max Build Scenario Land Use Assumptions

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Figure 10

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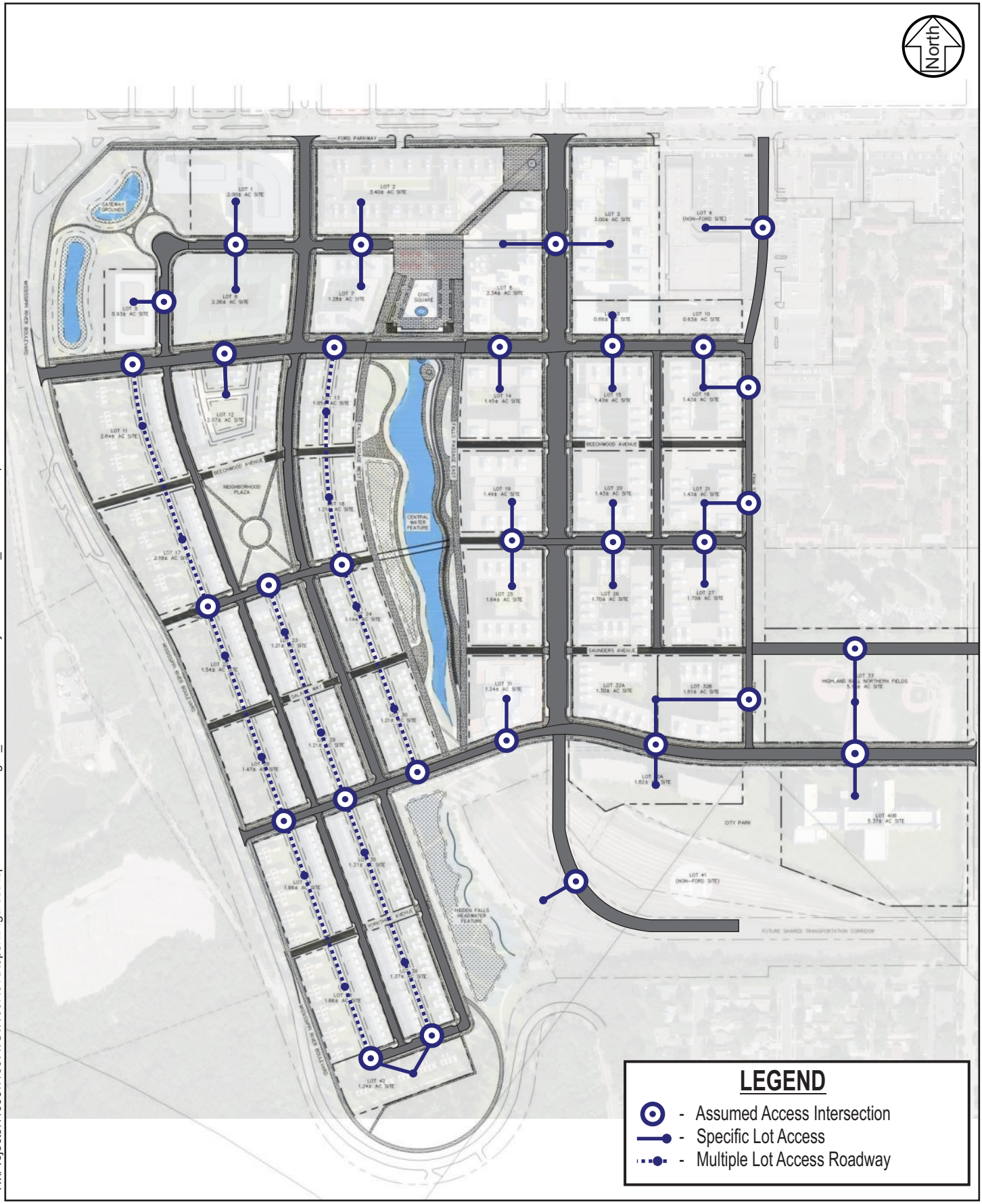

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Max Build Scenario Roadway and Access Assumptions

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Figure 11

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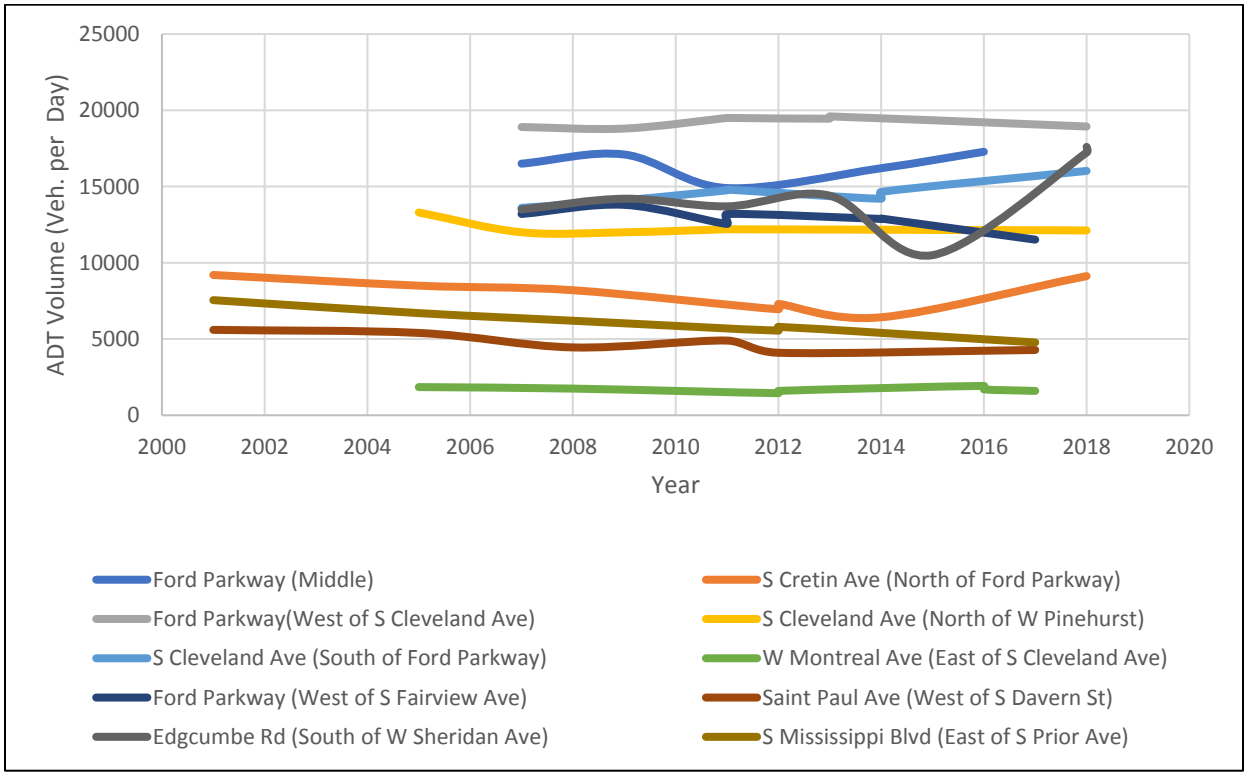
Traffic Forecasts

As previously mentioned, the build out of the Ford Site is expected to take approximately 10 to 15 years, depending on market conditions. For purposes of developing traffic forecasts and evaluating future conditions, a horizon year of 2040 was used. Traffic forecasts were developed for three future conditions; year 2040 no build, year 2040 Ryan Proposal, and year 2040 Max Build conditions. The following information summarizes the year 2040 traffic forecast development process.

General Background Growth

To estimate future area traffic, pedestrian, and bicycle volumes, assuming no Ford Site development, a combination of resources were reviewed, including historical average daily traffic (ADT) volumes on area roadways, the Twin Cities regional 4-step model, and previous traffic studies in the area. In general, historical ADT volumes have been flat or decreasing over the past 10 to 15-years, as illustrated in Figure 12. In addition, annual growth rates from the Twin Cities regional 4-step model were approximately one-quarter percent (0.25) or less and previous area traffic studies ranged from 0.1 to 0.5 percent growth annually, depending on the area. Therefore, an annual background growth rate of one-quarter percent (0.25) was applied to the existing intersection turning movement and pedestrian/bicyclist counts to develop year 2040 base conditions. This growth rate is consistent with historical traffic volumes, the Twin Cities regional 4-step model, and previous traffic studies assumptions in the area. Note that the Ford Plant closed in year 2011 and area traffic volumes have continued to be relatively stable since that time.

Figure 12. Historical Average Daily Traffic Volumes

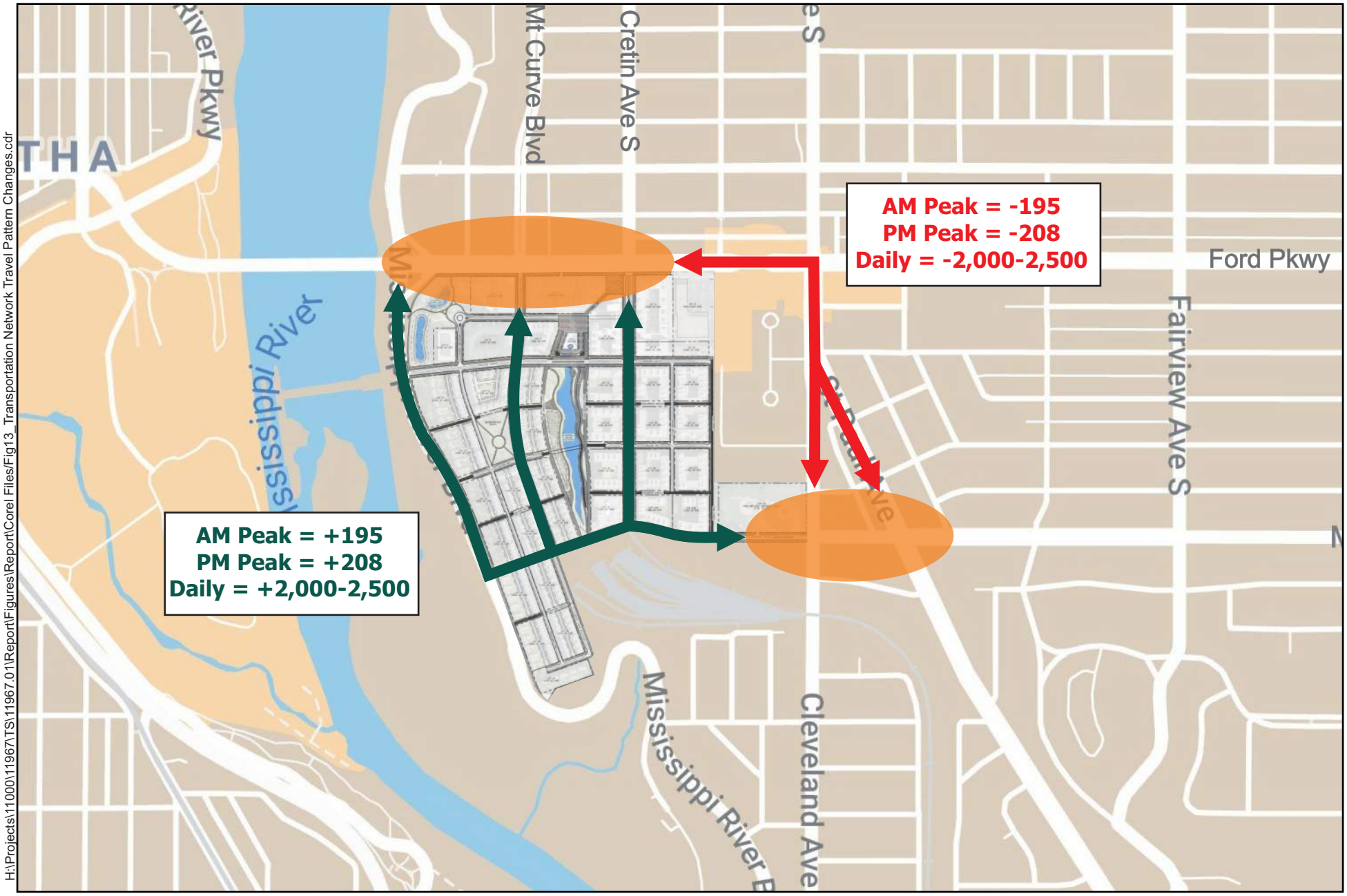


Travel Pattern Changes

Under future build conditions when the public roadway system in connected through the Ford Site, including Montreal Avenue, Cretin Avenue, and Mount Curve Boulevard amongst others, area travel patterns are expected to change as motorists have new route options. Therefore, intersection turning movement counts were adjusted to reflect this expected travel pattern shift based on data provided by the Metropolitan Council's Regional Travel Demand Model and engineering judgment. In particular, the build out of the transportation network through the Ford Site is expected to reduce the traffic volume traveling through the Ford Parkway/Cleveland Avenue intersection. The following information summarizes the travel pattern changes expected as a result of the build-out of the transportation network through the Ford Site (excluding any Ford Site development traffic), which are also illustrated in Figure 13.

Note that it was assumed that 50 percent of vehicles that are currently making an eastbound right-turn or northbound left-turn at the Ford Parkway/Cleveland Avenue intersection would change their travel pattern to use Cretin Avenue and Montreal Avenue (through the Ford Site) to reach their ultimate destination. The percent of vehicles was based on the expected travel times between the two routes, which are likely to be similar and therefore traffic volumes would be expected to be evenly distributed to each route. This equates to approximately 55 eastbound right-turning vehicles and 140 northbound left-turning vehicles during the a.m. peak hour. During the p.m. peak hour, this equates to approximately 70 eastbound right-turning vehicles and 140 northbound left-turning vehicles that would be rerouted through the Ford Site. In total, it is estimated that 2,000 to 2,500 vehicles per day that would no longer travel through the Ford Parkway/Cleveland Avenue intersection, and instead route through the Ford Site transportation network.

A sensitivity test was completed to determine the operational impact of completing the transportation network through the Ford Site before the addition of any Ford Site related traffic. This sensitivity test was conducted comparing the base year 2040 traffic forecasts (before any Ford Site generated traffic) with and without the completed transportation network through the Ford Site. From an intersection capacity perspective, the Ford Parkway/Cleveland Avenue intersection operations are expected to improve from LOS E to LOS D as a result of the travel pattern changes associated with completing the transportation network through the Ford Site (i.e. less volume traveling through the Ford Parkway/Cleveland Avenue intersection due to the travel pattern changes). Queues are expected to extend to Highland Parkway approximately five (5) percent of the p.m. peak hour, as compared to between 15 and 30 percent before completion of the transportation network. This does not include any of the mitigation identified as part of the existing conditions or Ford Site development traffic other than the travel pattern changes identified. Note that under future build conditions, these travel patterns were incorporated into the year 2040 build condition traffic forecasts.



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Transportation Network Travel Pattern Changes

Ford Site AUAR Transportation Analysis

City of Saint Paul

Figure 13

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AUAR Scenario Trip Generation

To determine the level of traffic, walk/bike, and transit trip generation for each of the AUAR land use scenarios, a detailed trip generation estimate was developed. The trip generation estimates were developed using the *ITE Trip Generation Manual, 10th Edition* and account for multi-use trip reductions based on a combination of the internal capture rate methodology in the *ITE Trip Generation Handbook* and the *Traffic Generated by Mixed-Use Developments - Thirteen-Region Study Using Consistent Measures of Built Environment, (2015)* published by the Transportation Research Board (No. 2500). In addition, various trip reductions were applied to the trip generation estimates to account for area transit service, walking/bicyclist facilities and environment, jobs and housing balance, amount of below market rate housing, and Travel Demand Management (TDM) Programs. These various reductions were identified leveraging data from multiple resources and case-studies locally and throughout the country.

The specific land use assumptions for both the Ryan Proposal and Max Build AUAR scenarios previously outlined were also leveraged to identify the future site trip generation potential. A summary of all external trips by transportation mode is summarized in Table 8, while vehicular trip generation estimates for the Ryan Proposal and Max Build AUAR scenarios are illustrated in Table 9 and Table 10, respectively. Detailed information regarding the base trip generation estimate assumptions are provided in the Appendix, including person trips by transportation mode.

Table 8. External Trip Generation Summary by Transportation Mode

Scenario	A.M. Peak Hour External Trips	P.M. Peak Hour External Trips	Weekday Daily External Trips
Ryan Proposal			
Vehicular Trips	1,440	1,854	21,791
Transit Trips	296	382	4,486
Walk/Bike Trips	362	466	5,473
Max Build			
Vehicular Trips	1,769	2,362	27,573
Transit Trips	380	508	5,928
Walk/Bike Trips	464	620	7,232

Table 9. Ryan Proposal Scenario Trip Generation Estimate

Land Use Type *(ITE Code)*	Size	A.M. Peak Hour Trips		P.M. Peak Hour Trips		Weekday Daily Trips
		In	Out	In	Out	
Ryan Proposal Scenario						
General Office (710)	203 KSF	203	33	37	196	1,977
Medical-Dental Office (720)	112 KSF	243	68	109	279	3,898
Retail (820)	136 KSF	79	49	249	269	5,134
Fast Casual Restaurant (930) (1)	6 KSF	8	4	47	38	1,891
High-Turnover Sit-Down Restaurant (932) (1)	6 KSF	33	27	36	22	673
Coffee Shop without Drive-Thru (936) (1)	2 KSF	103	99	36	36	1,641
Single Family Detached Housing (210) (2)	37 DU	7	21	23	14	349
Low-Rise Multifamily Housing (220)	271 DU	29	96	96	56	1,984
Mid-Rise Multifamily Housing (221)	3,272 DU	306	872	878	561	17,800
Senior Adult Housing-Attached (252)	220 DU	15	29	31	26	814
Ryan Proposal Subtotal (Before Reductions)		1,026	1,298	1,542	1,497	36,161
Multi-Use Reduction (16.4% AM, 17.7% PM, 18.7 % Daily) (3)		*(-168)*	*(-213)*	*(-273)*	*(-265)*	*(-6,762)*
Various Reductions (25.9%)		*(-222)*	*(-281)*	*(-329)*	*(-318)*	*(-7,608)*
Ryan Proposal Vehicle Trips		636	804	940	914	21,791

(1) Although not stated in the AUAR land use, restaurant/coffee space is anticipated as part of the retail space and is a permitted land use as part of the Master Plan. Estimations for restaurant/coffee space is approximately 14,000 sf, which would generally equal between 4-6 restaurants and one (1) coffee shop and be less than 10 percent of all retail space

(2) Assumed to be one-unit residential buildings at Lots 11, 17, 22, 28, 34, 38, and 42.

(3) Multi-use trip reductions were applied to all proposed land use trip generation estimates based on a combination of the internal capture rate methodology in the ITE Trip Generation Handbook and the Traffic Generated by Mixed-Use Developments – Thirteen-Region Study Using Consistent Measures of Built Environment, (2015).

General Table Nomenclature: KSF : 1,000 square feet DU : Dwelling Units

Table 10. Max Build Scenario Trip Generation Estimate

Land Use Type *(ITE Code)*	Size	A.M. Peak Hour Trips		P.M. Peak Hour Trips		Weekday Daily Trips
		In	Out	In	Out	
Max Build Scenario						
General Office (710) (1)	464 KSF	463	75	85	448	4,519
Medical-Dental Office (720)	136 KSF	295	83	132	339	4,733
Retail (820)	286 KSF	167	102	523	567	10,797
Fast Casual Restaurant (930) (2)	6 KSF	8	4	47	38	1,891
High-Turnover Sit-Down Restaurant (932) (2)	6 KSF	33	27	36	22	673
Coffee Shop without Drive-Thru (936) (2)	2 KSF	103	99	36	36	1,641
Single Family Detached Housing (210) (3)	37 DU	7	21	23	14	349
Low-Rise Multifamily Housing (220)	326 DU	34	115	115	68	2,386
Mid-Rise Multifamily Housing (221)	3,417 DU	320	910	917	586	18,588
Senior Adult Housing-Attached (252)	220 DU	15	29	31	26	814
Max Build Subtotal (Before Reductions)		**1,445**	**1,465**	**1,945**	**2,144**	**46,391**
Multi-Use Reduction (16.9% AM, 21.0% PM, 18.7 % Daily) (4)		*(-244)*	*(-248)*	*(-408)*	*(-450)*	*(-8,675)*
Various Reductions (26.9%)		*(-323)*	*(-326)*	*(-413)*	*(-456)*	*(-10,143)*
Max Build Vehicle Trips		**878**	**891**	**1,124**	**1,238**	**27,573**

(1) Civic Space is analyzed as General Office.

(2) Although not stated in the AUAR land use, restaurant/coffee space is anticipated as part of the retail space and is a permitted land use as part of the Master Plan. Estimations for restaurant/coffee space is approximately 14,000 sf, which would generally equal between 4-6 restaurants and one (1) coffee shop and be less than 10 percent of all retail space

(3) Assumed to be one-unit residential buildings at Lots 11, 17, 22, 28, 34, 38, and 42.

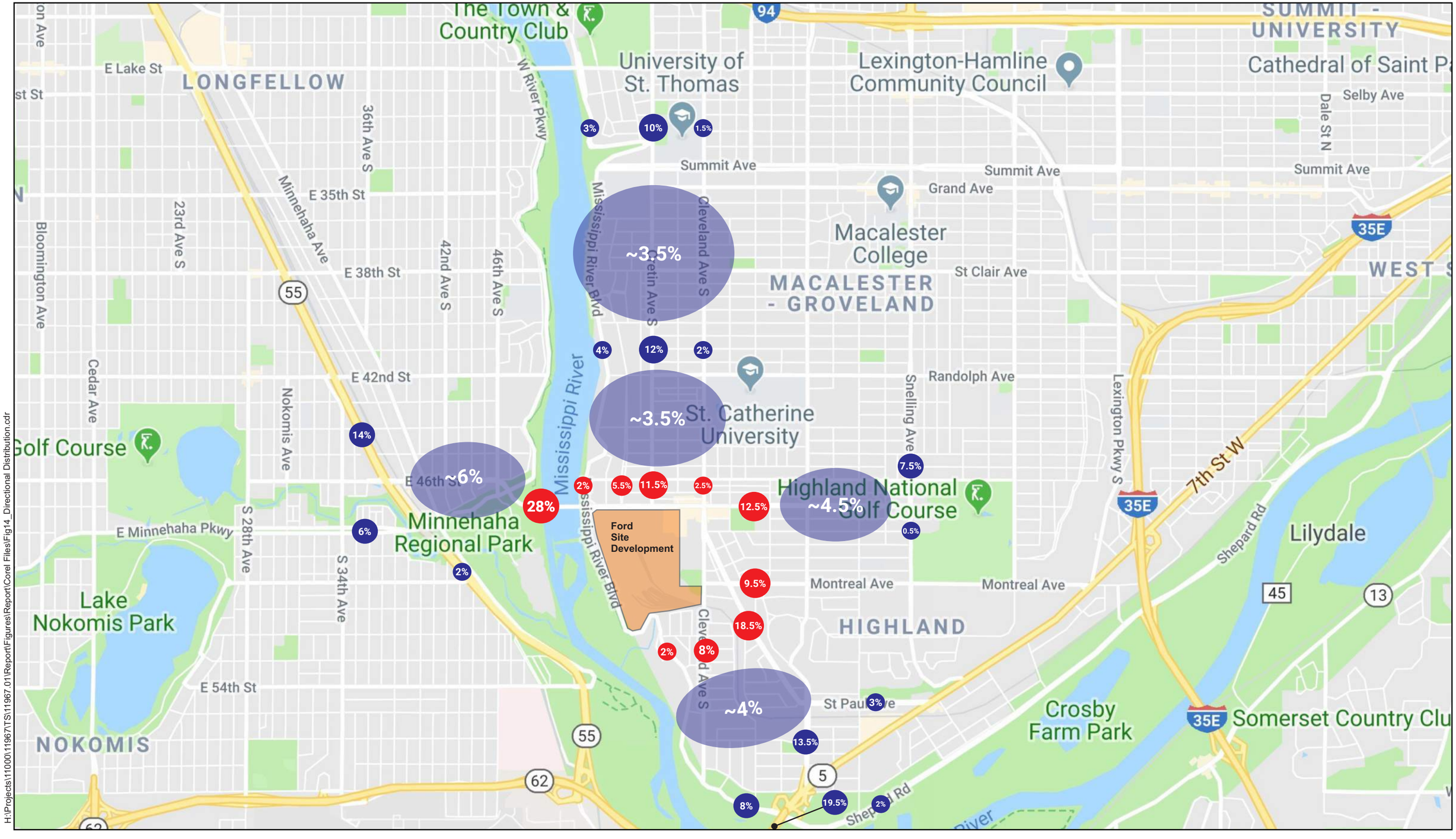
(4) Multi-use trip reductions were applied to all proposed land use trip generation estimates based on a combination of the internal capture rate methodology in the ITE Trip Generation Handbook and the *Traffic Generated by Mixed-Use Developments – Thirteen-Region Study Using Consistent Measures of Built Environment, (2015).*

General Table Nomenclature: KSF : 1,000 square feet DU : Dwelling Units

Directional Distribution

To determine future travel patterns associated with Ford Site development vehicular trips, various resources were leveraged. These resources included the Twin Cities regional 4-step model, existing traffic volumes and intersection turning movement patterns, and engineering judgement. Based on this information, the directional distribution for Ford Site development vehicular trips was developed as illustrated in Figure 14. Note that the directional distribution was developed for areas beyond the study intersections to help with the regional planning-level review previously mentioned and discussed later in this memorandum.

The development related vehicular and walk/bike trips were distributed throughout the transportation system study area and intersections based on the distribution as well as the roadway and access assumptions previously identified. The trip routing considered development location within the site, travel time estimates, land use types, access, and the overall walking and biking environment, considering a one-half mile walking and 2-mile biking buffer area. The year 2040 no build, year 2040 Ryan Proposal, and year 2040 Max Build traffic forecasts are illustrated in Figure 15, Figure 16, and Figure 17, respectively. Note that all future traffic forecasts include the general background growth rate, while the two AUAR scenarios include the travel pattern changes associated with the build-out of the transportation network within the Ford Site in addition to development related trips.



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Directional Distribution

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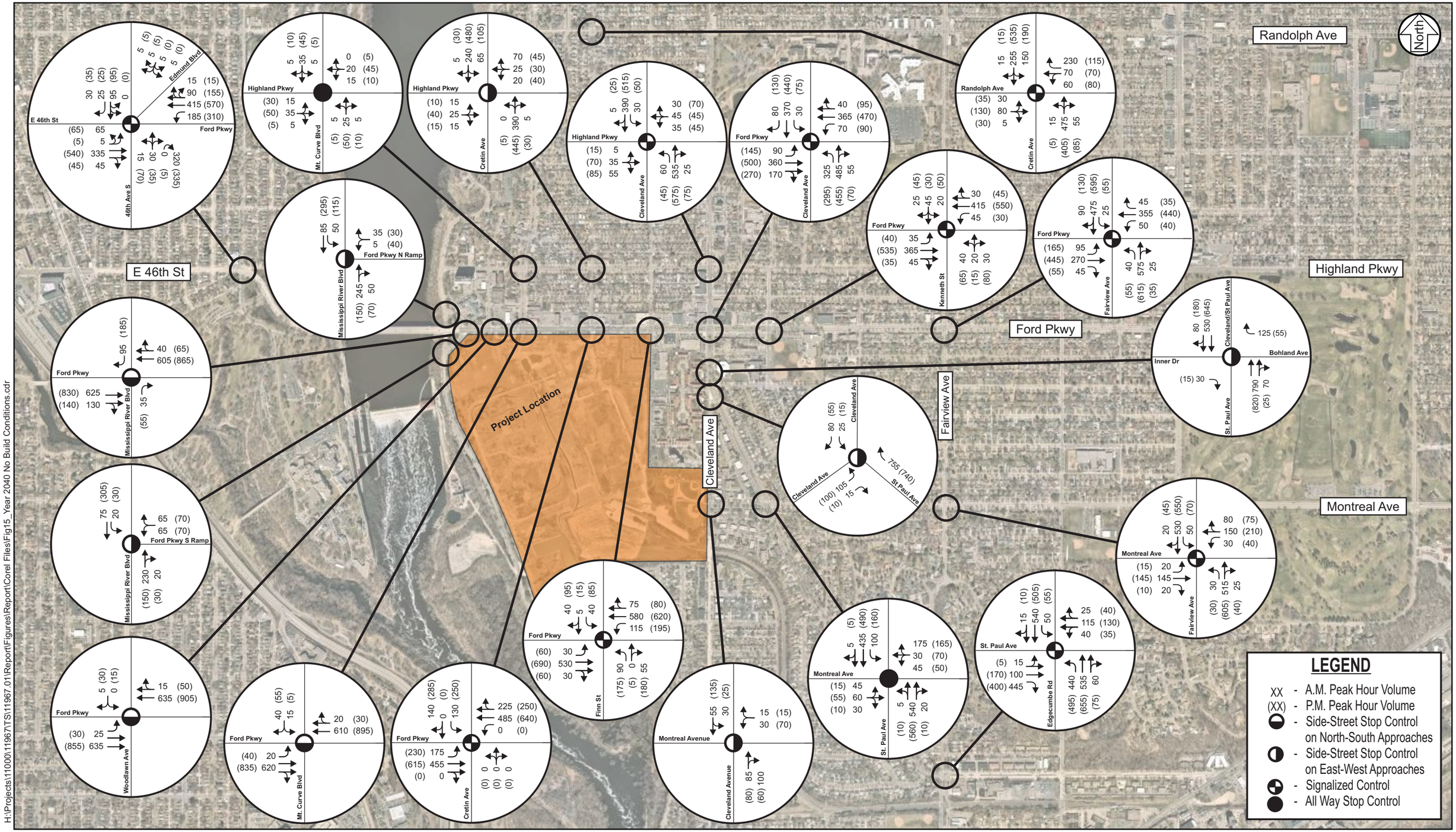
August 2019

Figure 14



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Year 2040 No Build Conditions

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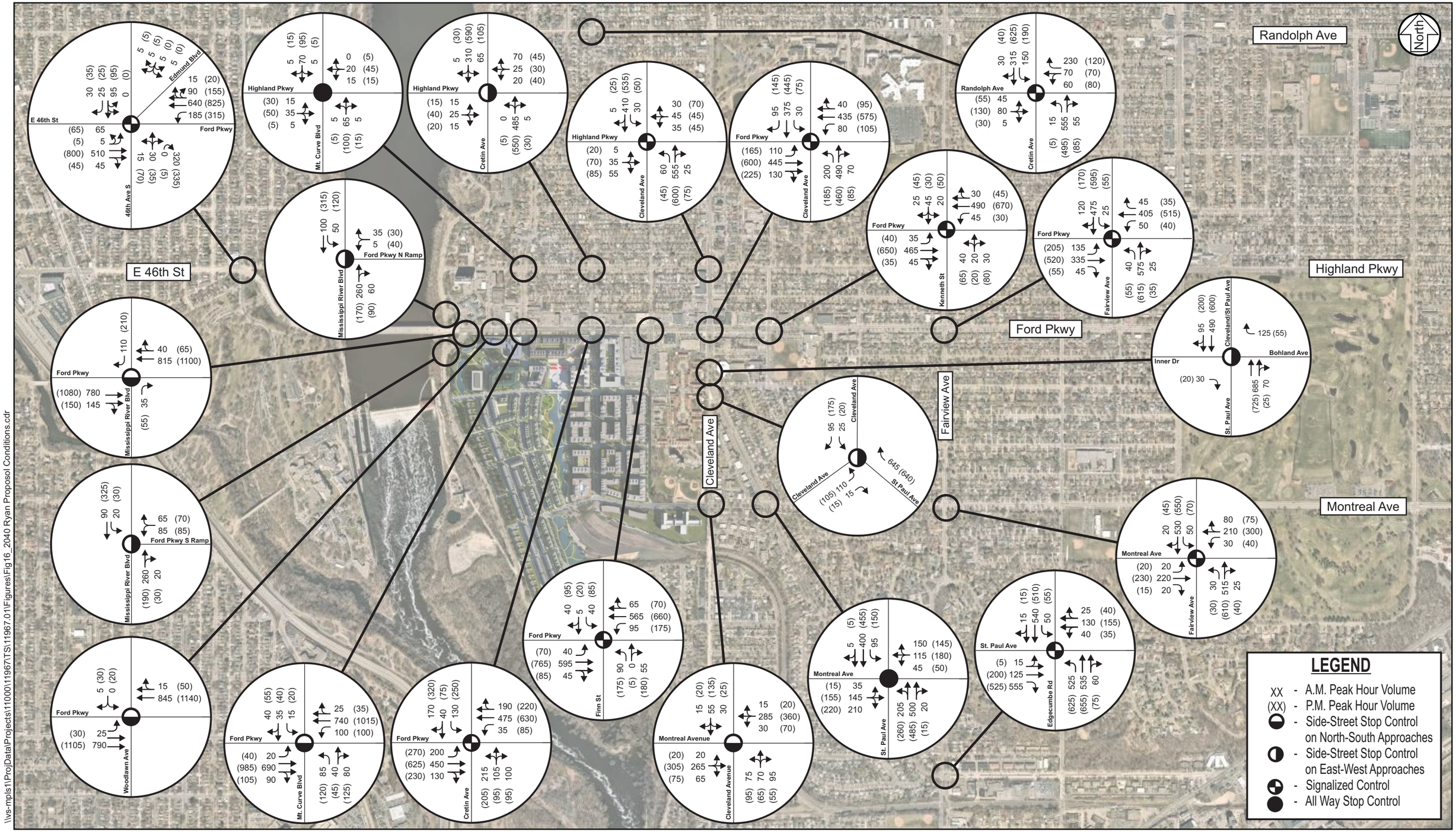
City of Saint Paul

Figure 15



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Year 2040 Ryan Proposal Conditions

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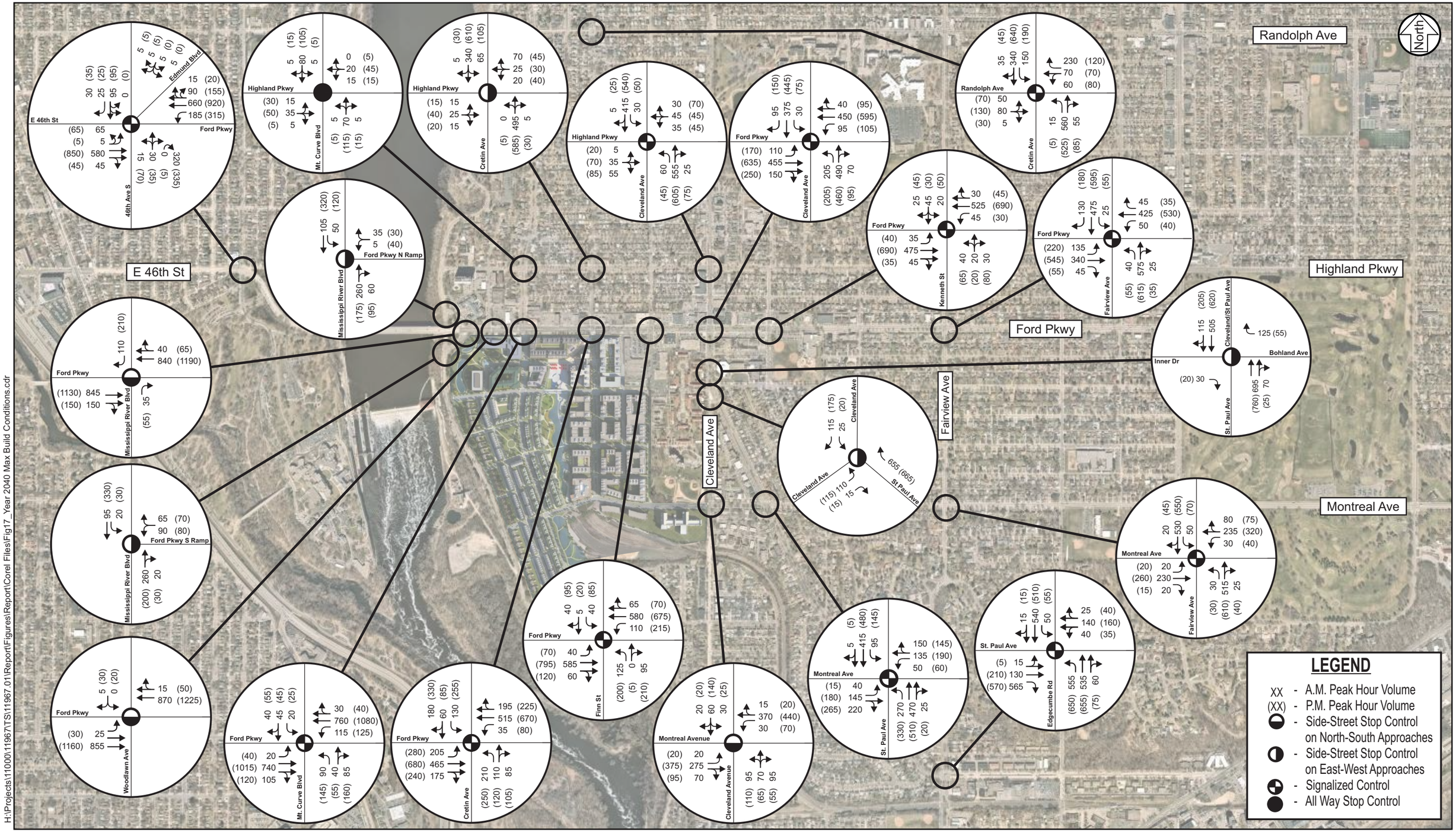
City of Saint Paul

Figure 16



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Year 2040 Max Build Conditions

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City of Saint Paul

Figure 17

Year 2040 No Build Conditions

Year 2040 no build conditions were reviewed to understand how the transportation system study area would be expected to operate absent of any redevelopment within the Ford Site. The following information summarizes the year 2040 no build conditions.

Assumptions

The following assumptions were included as part of the intersection capacity analysis:

- Traffic forecasts account for the annual background growth rate, which was applied to the existing peak hour intersection turning movement counts to develop the year 2040 no build conditions.
- At the Ford Parkway/Cleveland Avenue intersection, a southbound right-turn lane was included, as well as an extended eastbound left-turn lane, which were identified as mitigation under existing conditions.
- Signal timing was optimized within the transportation system study area.
- The roadway network within the Ford Site was not included as part of this analysis.

Intersection Capacity Analysis

Results of the year 2040 no build intersection capacity analysis, shown in Table 11, indicates that all study intersections are expected to operate at an acceptable overall LOS D or better during the weekday a.m. and p.m. peak hours based on the assumptions identified. However, there are a couple areas where queues are expected during the p.m. peak hour. The issues and mitigation for the year 2040 no build conditions are summarized in the following section. An illustrative summary of the year 2040 no build condition p.m. peak hour operations in shown in Figure 18, which represents the worst-case condition within the transportation system study area. Year 2040 no build condition intersection capacity results, including with mitigation, are shown in Table 11, while detailed analysis results are shown in the Appendix.

Issues and Mitigation

The following capacity and/or queuing issues were identified as part of the year 2040 no build conditions analysis. As previously noted, potential improvements are classified in the following categories:

- **Considerations** - improvements that are expected to help the identified issue (i.e. generally acceptable overall intersection operations but there are queues that impact operations or are greater than 300 feet) but may result in impacts to right-of-way or be in conflict with access, pedestrian, bicyclist, or transit priorities.
- **Mitigation** - improvements that are considered necessary, due to either an intersection capacity issue (i.e. overall LOS E or LOS F) or a queuing issue (i.e. greater than 600 feet).

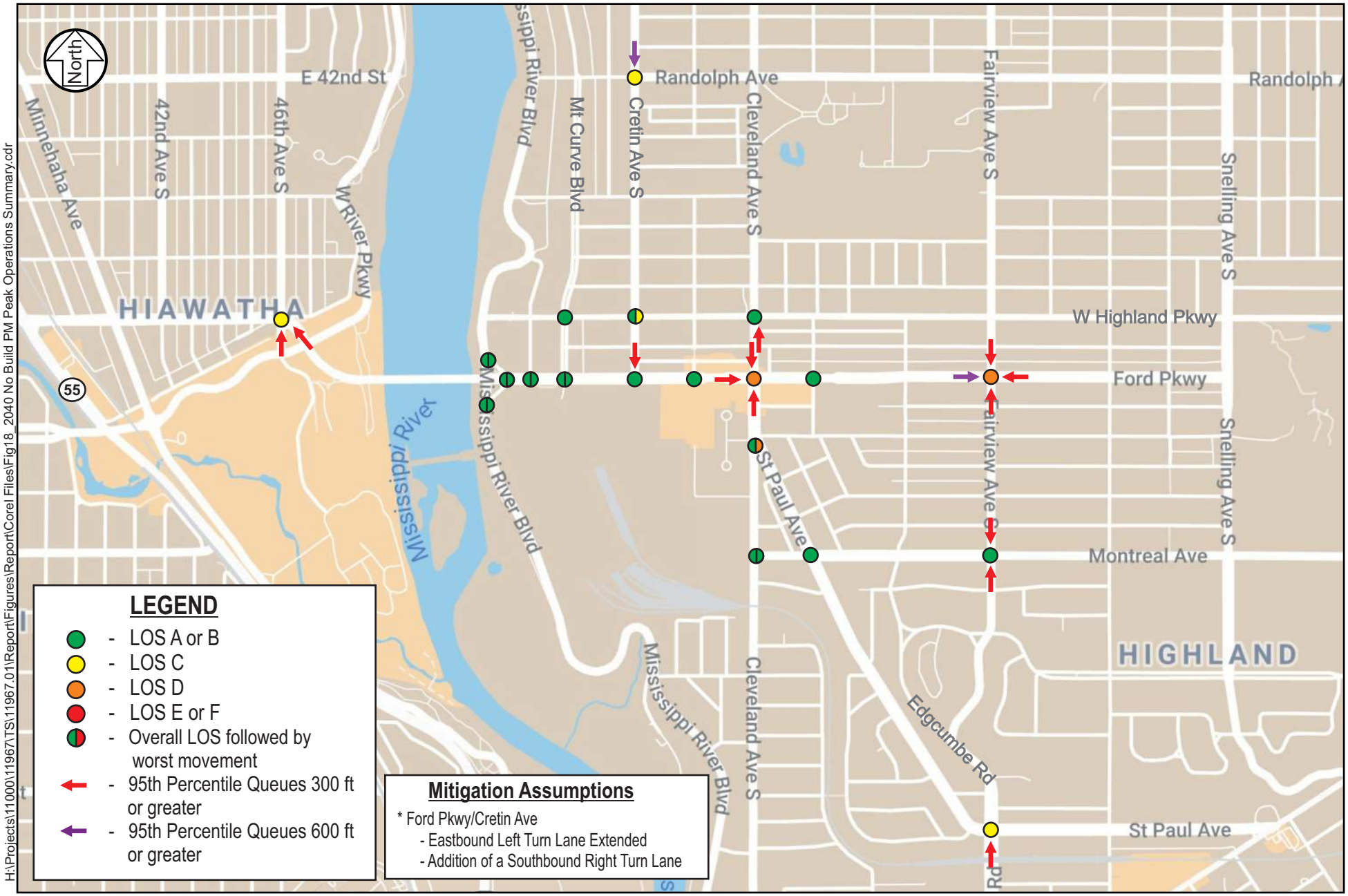
The year 2040 no build issues, considerations, and mitigation identified are summarized in Table 12, which are in addition to the previously identified items as part of the existing conditions.

Table 11. Year 2040 No Build Intersection Capacity Analysis (with Mitigation)

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	Year 2040 No Build	With Mitigation	Year 2040 No Build	With Mitigation
46th Street/46th Avenue	B (17 sec.)	B (16 sec.)	C (25 sec.)	C (25 sec.)
Ford Parkway/Ford Parkway Ramps (1)	A/A (5 sec.)	A/A (5 sec.)	A/A (8 sec.)	A/A (8 sec.)
Ford Parkway/Woodlawn Avenue (1)	A/A (4 sec.)	A/A (4 sec.)	A/B (14 sec.)	A/C (16 sec.)
Ford Parkway/Mount Curve Boulevard (1)	A/A (9 sec.)	A/A (9 sec.)	A/B (11 sec.)	A/B (11 sec.)
Ford Parkway/Cretin Avenue	B (11 sec.)	B (11 sec.)	B (16 sec.)	B (16 sec.)
Ford Parkway/Finn Street	B (12 sec.)	B (12 sec.)	B (16 sec.)	B (16 sec.)
Ford Parkway/Cleveland Avenue	C (25 sec.)	C (25 sec.)	D (39 sec.)	D (40 sec.)
Ford Parkway/Kenneth Street	A (9 sec.)	A (9 sec.)	B (12 sec.)	B (12 sec.)
Ford Parkway/Fairview Avenue	B (20 sec.)	B (20 sec.)	D (38 sec.)	D (47 sec.)
Cleveland Avenue/Highland Parkway	B (11 sec.)	B (11 sec.)	B (17 sec.)	B (17 sec.)
Cleveland Ave/St Paul Ave/Bohland Ave (1)	A/C (24 sec.)	A/C (24 sec.)	A/C (25 sec.)	A/C (25 sec.)
St Paul Avenue/Montreal Avenue (2)	B (11 sec.)	B (11 sec.)	B (13 sec.)	B (13 sec.)
St Paul Avenue/Edgcumbe Road	B (18 sec.)	B (18 sec.)	C (21 sec.)	C (21 sec.)
Montreal Avenue/Cleveland Avenue (1)	A/A (7 sec.)	A/A (7 sec.)	A/A (8 sec.)	A/A (8 sec.)
Montreal Avenue/Fairview Avenue	B (16 sec.)	B (16 sec.)	B (18 sec.)	B (18 sec.)
Mississippi River Blvd/Ford Pkwy North (1)	A/A (4 sec)	A/A (4 sec.)	A/A (7 sec.)	A/A (7 sec.)
Mississippi River Blvd/South Ford Pkwy South (1)	A/A (5 sec)	A/A (5 sec.)	A/A (6 sec.)	A/A (6 sec.)
Mount Curve Boulevard/Highland Parkway (2)	A (6 sec.)	A (6 sec.)	A (6 sec.)	A (6 sec.)
Cretin Avenue/Randolph Avenue	B (13 sec.)	B (13 sec.)	C (21 sec.)	B (14 sec.)
Cretin Avenue/Highland Parkway (1)	A/A (10 sec.)	A/A (10 sec.)	A/C (20 sec.)	A/C (19 sec.)

(1) Indicates an unsignalized intersection with side-street stop control where the overall LOS is shown followed by the worst approach LOS.

(2) Indicates an unsignalized intersection with all-way stop control.



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2040 No Build P.M Peak Hour Operations Summary

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Figure 18

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Table 12. Year 2040 No Build Issue, Consideration, and Mitigation Summary

Issue	Consideration (C) / Mitigation (M)
Ford Parkway/Fairview Avenue	
• Northbound queues are 300 feet or greater during the a.m. peak hour, and the northbound and southbound queues are greater than 300 feet during the p.m. peak hour. • Eastbound left-turn and northbound left-turn movements are expected to operate at LOS F, with delays of 90 seconds or greater during the p.m. peak hour. • Eastbound queues are expected to be greater than 700 feet during the p.m. peak hour.	• M - Install left-turn signal phasing capability for all approaches to improve left turn operations and balance queues.
Cretin Avenue/Randolph Avenue	
• Southbound queues are expected to be 600 feet during the p.m. peak hour.	• M - Restripe and/or widen to provide northbound and southbound left-turn lanes to reduce queues.
Montreal Avenue/Fairview Avenue	
• Northbound and southbound queues are 300 feet or greater during the a.m. and p.m. peak hours	• C - Install left-turn signal phasing capability for all approaches to improve left turn operations and balance queues.

** Note that the issues, considerations, and mitigation shown are in addition to the previously identified items as part of the existing conditions.*

Year 2040 Build Conditions - Ryan Proposal Scenario

Year 2040 build conditions were reviewed to understand how the transportation system study area would be expected to operate based on the Ryan Proposal development scenario. The following information summarizes the year 2040 Build Ryan Proposal conditions.

Assumptions

The following assumptions were included as part of the intersection capacity analysis:

- Traffic forecasts account for the annual background growth rate, travel pattern changes associated with the build out of the Ford Site transportation network, and the Ryan Proposal AUAR scenario trip generation.
- At the Ford Parkway/Cleveland Avenue intersection, a southbound right-turn lane was included, as well as an extended eastbound left-turn lane, which were identified as mitigation under existing conditions.
- At the Ford Parkway/Fairview Avenue intersection, left-turn signal phasing capability for all approaches was included and at the Cretin Avenue/Randolph Avenue intersection, northbound and southbound left-turn lanes were included, which were both identified as mitigation under year 2040 no build conditions.
- Signal timing was optimized within the transportation system study area.

Intersection Capacity Analysis

Results of the year 2040 Build Ryan Proposal intersection capacity analysis, shown in Table 13, indicates that the majority of the study intersections are expected to operate at an acceptable overall LOS D or better during the weekday a.m. and p.m. peak hours based on the assumptions identified. In addition, there are a couple areas where queues are expected during the p.m. peak hour. The issues and mitigation for the year 2040 Build Ryan Proposal conditions are summarized in the following section.

An illustrative summary of the year 2040 Build Ryan Proposal condition p.m. peak hour operations in shown in Figure 19, which represents the worst-case condition within the transportation system study area. Note that the future capacity analysis includes the a.m. peak hour conditions, however given the proposed development generates more traffic during the p.m. peak hour and area traffic volumes are generally higher during the p.m. peak hour, the issues and mitigation are based on the p.m. peak hour conditions. Year 2040 Build Ryan Proposal condition intersection capacity results, including with mitigation, are shown in Table 13, while detailed analysis results are shown in the Appendix.

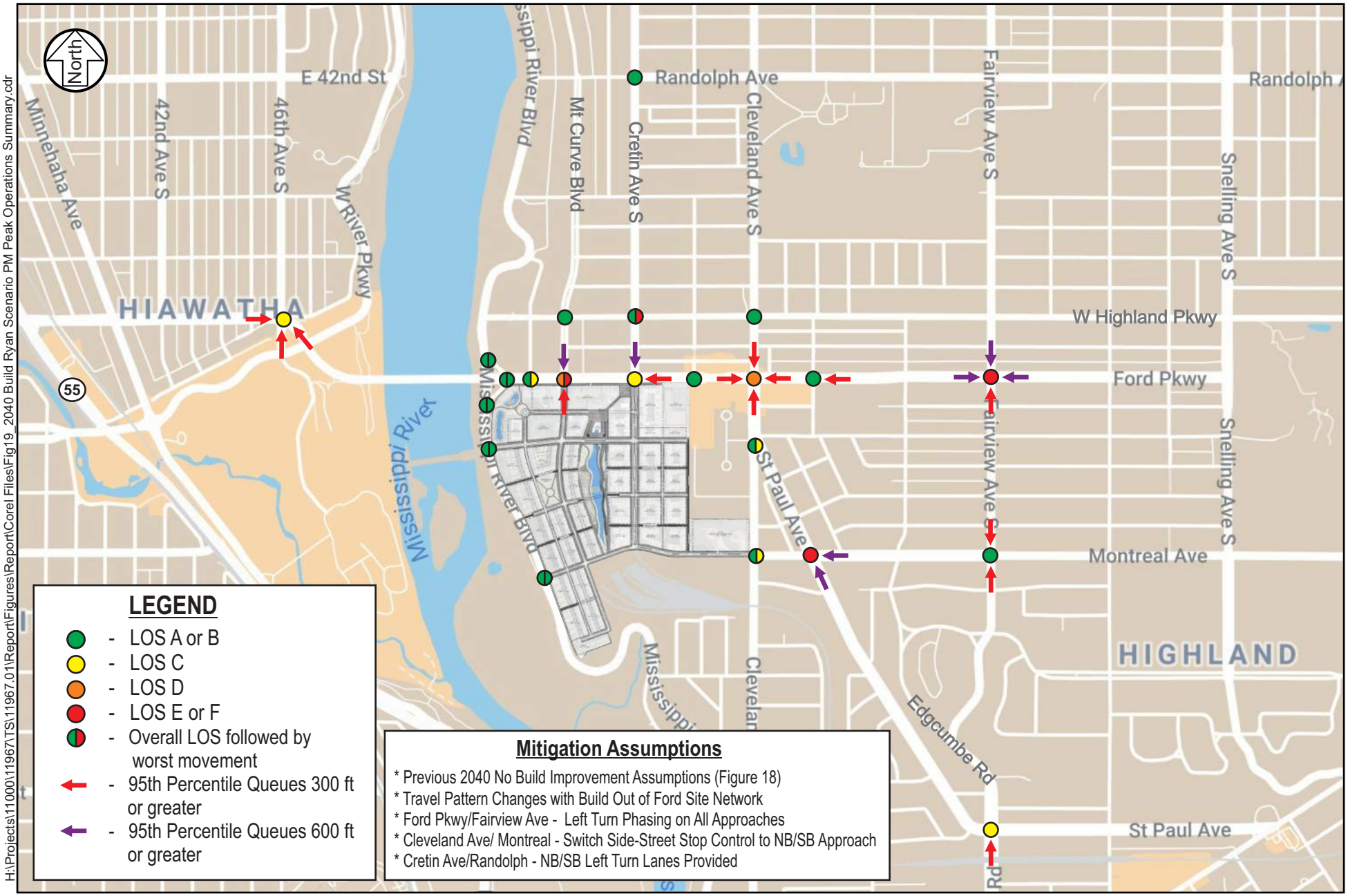
Table 13. Year 2040 Ryan Proposal Build Intersection Capacity Analysis (with Mitigation)

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	Year 2040 Ryan Build	With Mitigation	Year 2040 Ryan Build	With Mitigation
46th Street/46th Avenue	B (17 sec.)	B (18 sec.)	C (26 sec.)	C (29 sec.)
Ford Parkway/Ford Parkway Ramps (1)	A/A (6 sec.)	A/A (6 sec.)	A/A (10 sec)	A/A (10 sec.)
Ford Parkway/Woodlawn Avenue (1)	A/A (4 sec.)	A/A (4 sec.)	A/C (21 sec.)	A/C (21 sec.)
Ford Parkway/Mount Curve Boulevard (1)	A/D (30 sec.)	A (9 sec.)	D/F (224 sec.)	B (13 sec.)
Ford Parkway/Cretin Avenue	B (17 sec.)	B (17 sec.)	C (30 sec.)	C (30 sec.)
Ford Parkway/Finn Street	A (10 sec.)	B (11 sec.)	B (16 sec.)	B (17 sec.)
Ford Parkway/Cleveland Avenue	C (22 sec.)	C (22 sec.)	D (39 sec.)	D (43 sec.)
Ford Parkway/Kenneth Street	A (9 sec.)	A (9 sec.)	B (14 sec.)	B (14 sec.)
Ford Parkway/Fairview Avenue	C (22 sec.)	C (27 sec.)	F (92 sec.)	D (52 sec.)
Cleveland Avenue/Highland Parkway	A (9 sec.)	A (9 sec.)	B (14 sec.)	B (14 sec.)
Cleveland Ave/St Paul Ave/Bohland Ave (1)	A/C (19 sec.)	A/C (19 sec.)	A/C (19 sec.)	A/C (20 sec.)
St Paul Avenue/Montreal Avenue (2)	C (24 sec.)	B (17 sec.)	F (65 sec.)	B (18 sec.)
St Paul Avenue/Edgcumbe Road	C (24 sec.)	C (24 sec.)	C (24 sec.)	C (24 sec.)
Montreal Avenue/Cleveland Avenue (1)	A/B (12 sec.)	A/B (12 sec.)	A/B (14 sec.)	A/C (17 sec.)
Montreal Avenue/Fairview Avenue	B (18 sec.)	B (18 sec.)	B (20 sec.)	C (21 sec.)
Mississippi River Blvd/Ford Pkwy North (1)	A/A (4 sec.)	A/A (4 sec.)	A/A (6 sec.)	A/A (6 sec.)
Mississippi River Blvd/South Ford Pkwy South (1)	A/A (6 sec.)	A/A (6 sec.)	A/A (7 sec.)	A/A (7 sec.)
Mississippi River Blvd/Bohland Avenue (1)	A/A (4 sec.)	A/A (4 sec.)	A/A (4 sec.)	A/A (4 sec.)
Mississippi River Blvd/Montreal Avenue (1)	A/A (6 sec.)	A/A (6 sec.)	A/A (6 sec.)	A/A (6 sec.)
Mount Curve Boulevard/Highland Parkway (2)	A (6 sec.)	A (6 sec.)	B (12 sec.)	A (6 sec.)
Cretin Avenue/Randolph Avenue	B (15 sec.)	B (16 sec.)	B (16 sec.)	B (16 sec.)
Cretin Avenue/Highland Parkway (1)	A/B (13 sec.)	A/B (13 sec.)	A/E (39 sec.)*	A/C (24 sec.)*

(1) Indicates an unsignalized intersection with side-street stop control where the overall LOS is shown followed by the worst approach LOS.

(2) Indicates an unsignalized intersection with all-way stop control.

** Note that no mitigation is identified at this location; the improvement in operations is the result of the mitigation identified for the Ford Parkway/Cretin Avenue intersection, which minimizes southbound queues along Cretin Avenue from impacting Highland Parkway.*



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2040 Build Ryan Proposal Scenario P.M. Peak Hour Operations Summary

Ford Site AUAR Transportation Analysis

City of Saint Paul

0011967
August 2019

Figure 19

Issues and Mitigation

The following capacity and/or queuing issues were identified as part of the year 2040 Build Ryan Proposal conditions analysis. As previously noted, potential improvements are classified in the following categories:

- **Considerations** - improvements that are expected to help the identified issue (i.e. generally acceptable overall intersection operations but there are queues that impact operations or are greater than 300 feet) but may result in impacts to right-of-way or be in conflict with access, pedestrian, bicyclist, or transit priorities.
- **Mitigation** - improvements that are considered necessary, due to either an intersection capacity issue (i.e. overall LOS E or LOS F) or a queuing issue (i.e. greater than 600 feet).

The year 2040 Build Ryan Proposal issues, considerations, and mitigation identified are summarized in Table 14, which are in addition to the existing and year 2040 no build condition mitigation previously identified.

Table 14. Year 2040 Build Ryan Proposal Issue, Consideration, and Mitigation Summary

Issue	Consideration (C) / Mitigation (M)
Ford Parkway/Mount Curve Boulevard	
• Side-street approaches are expected to operate at LOS F, with queues of 300 feet and 600 feet in the northbound and southbound directions, respectively, during the p.m. peak hour.	• M - Install a traffic signal and construct northbound and southbound left-turn lanes to accommodate the Ford Site approach; the traffic signal should include left-turn signal phasing on all approaches. • M - Extend the eastbound left-turn lane about 50 feet to accommodate turn lane queues. • C - Extend the westbound left-turn lane about 50 feet to accommodate queues; this may have access impacts that need to be reviewed.
Ford Parkway/Cretin Avenue	
• Southbound queues are expected to extend into Highland Parkway during the p.m. peak hour and cause operational issues at the Cretin Avenue/ Highland Parkway intersection; all left-turn movements are expected to extend beyond the available storage during 20 percent or more of the p.m. peak hour, particularly when a vehicle is parked on-street.	• M - Install northbound, southbound, and westbound left-turn signal phasing (eastbound left-turn signal phasing exists today) to improve intersection operations. • M - Extend the eastbound left-turn lane to maximize the storage as much as possible. • M - Extend the westbound left-turn lane about 75 feet to accommodate turn lane queues. • M - Restrict on-street parking along the west side of Cretin Avenue from Ford Parkway to Highland Parkway to accommodate the restripe of the segment to provide adequate storage for southbound queues. • C - Construct a 150-foot southbound right-turn lane to prevent queues from extending back to Pinehurst Avenue during the p.m. peak hour.

Issue	Consideration (C) / Mitigation (M)
Ford Parkway/Fairview Avenue	
• Intersection is expected to operate at an overall LOS F, with queues expected to be 600 feet or longer for all approaches; the southbound approach is expected to have queues greater than 1,500 feet.	• M - Construct a southbound right-turn lane to improve operations and reduce queues.
Cleveland Avenue/Montreal Avenue	
• Upon full-build out of the Ryan Proposal scenario for the Ford Site, Montreal Avenue is expected to serve more volume than Cleveland Avenue, which is opposite from current conditions.	• M - Switch the stop control from the Montreal Avenue approaches to stop control for the Cleveland Avenue approaches to better support future travel patterns or install all-way stop control. • M - Construct the intersection such that a potential future traffic signal could be installed without having to reconstruct the intersection.
St Paul Avenue/Montreal Avenue	
• Intersection is expected to operate at an overall LOS F, with 95th percentile queues expected to be 600 feet or longer on the westbound and northbound approaches.	• M - Install a traffic signal or hybrid roundabout to improve operations. If a traffic signal is selected, install a northbound left-turn lane as well as left-turn lanes along the east and west approaches to reduce potential conflicts.

** Note that the issues, considerations, and mitigation shown are in addition to the previously identified items as part of the existing and year 2040 no build conditions.*

Year 2040 Build Conditions - Max Build Scenario

Year 2040 build conditions were reviewed to understand how the transportation system study area would be expected to operate based on the Max Build development scenario. The following information summarizes the year 2040 Max Build conditions.

Assumptions

The following assumptions were included as part of the intersection capacity analysis:

- Traffic forecasts account for the annual background growth rate, travel pattern changes associated with the build out of the Ford Site transportation network, and the Max Build AUAR scenario trip generation.
- At the Ford Parkway/Cleveland Avenue intersection, a southbound right-turn lane was included, as well as an extended eastbound left-turn lane, which were identified as mitigation under existing conditions.
- At the Ford Parkway/Fairview Avenue intersection, left-turn signal phasing capability for all approaches was included and at the Cretin Avenue/Randolph Avenue intersection, northbound and southbound left-turn lanes were included, which were both identified as mitigation under year 2040 no build conditions.
- The following year 2040 Build Ryan Proposal mitigation was assumed as part of the year 2040 Max Build Conditions:
    - At the Ford Parkway/Mount Curve Boulevard intersection, a traffic signal and northbound and southbound left-turn lanes was included, as well as an extended eastbound left-turn lane.
    - At the Ford Parkway/Cretin Avenue intersection, northbound, southbound, and westbound left-turn signal phasing was included, as well as extended eastbound, westbound, and southbound left-turn lanes.
    - At the Ford Parkway/Fairview Avenue intersection, a southbound right-turn lane was included in addition to the year 2040 no build mitigation identified above.
    - At the Cleveland Avenue/Montreal Avenue intersection, the Cleveland Avenue approaches were stop controlled and the Montreal Avenue approaches were uncontrolled.
    - At the St Paul Avenue/Montreal Avenue intersection, a traffic signal and a northbound left-turn lane was included.
- Signal timing was optimized within the transportation system study area.

Intersection Capacity Analysis

Results of the year 2040 Max Build intersection capacity analysis, shown in Table 15, indicate that the majority of the study intersections are expected to operate at an acceptable overall LOS D or better during the weekday a.m. and p.m. peak hours. The results also identified locations where longer queues are expected during the p.m. peak hour. The issues and mitigation for the year 2040 Max Build conditions are summarized in the following section.

An illustrative summary of the year 2040 Max Build condition p.m. peak hour operations in shown in Figure 20, which represents the worst-case condition within the transportation system study area as previously noted. Year 2040 Max Build condition intersection capacity results, including previously identified mitigation, are shown in Table 15, while detailed analysis results are shown in the Appendix.

Issues and Mitigation

The following capacity and/or queuing issues were identified as part of the year 2040 Max Build conditions analysis. As previously noted, potential improvements are classified in the following categories:

- **Considerations** - improvements that are expected to help the identified issue (i.e. generally acceptable overall intersection operations but there are queues that impact operations or are greater than 300 feet) but may result in impacts to right-of-way or be in conflict with access, pedestrian, bicyclist, or transit priorities.
- **Mitigation** - improvements that are considered necessary, due to either an intersection capacity issue (i.e. overall LOS E or LOS F) or a queuing issue (i.e. greater than 600 feet).

The year 2040 Max Build issues, considerations, and mitigation identified are summarized in Table 16, which are in addition to the existing, year 2040 no build, and year 2040 Ryan Proposal condition mitigation previously identified.

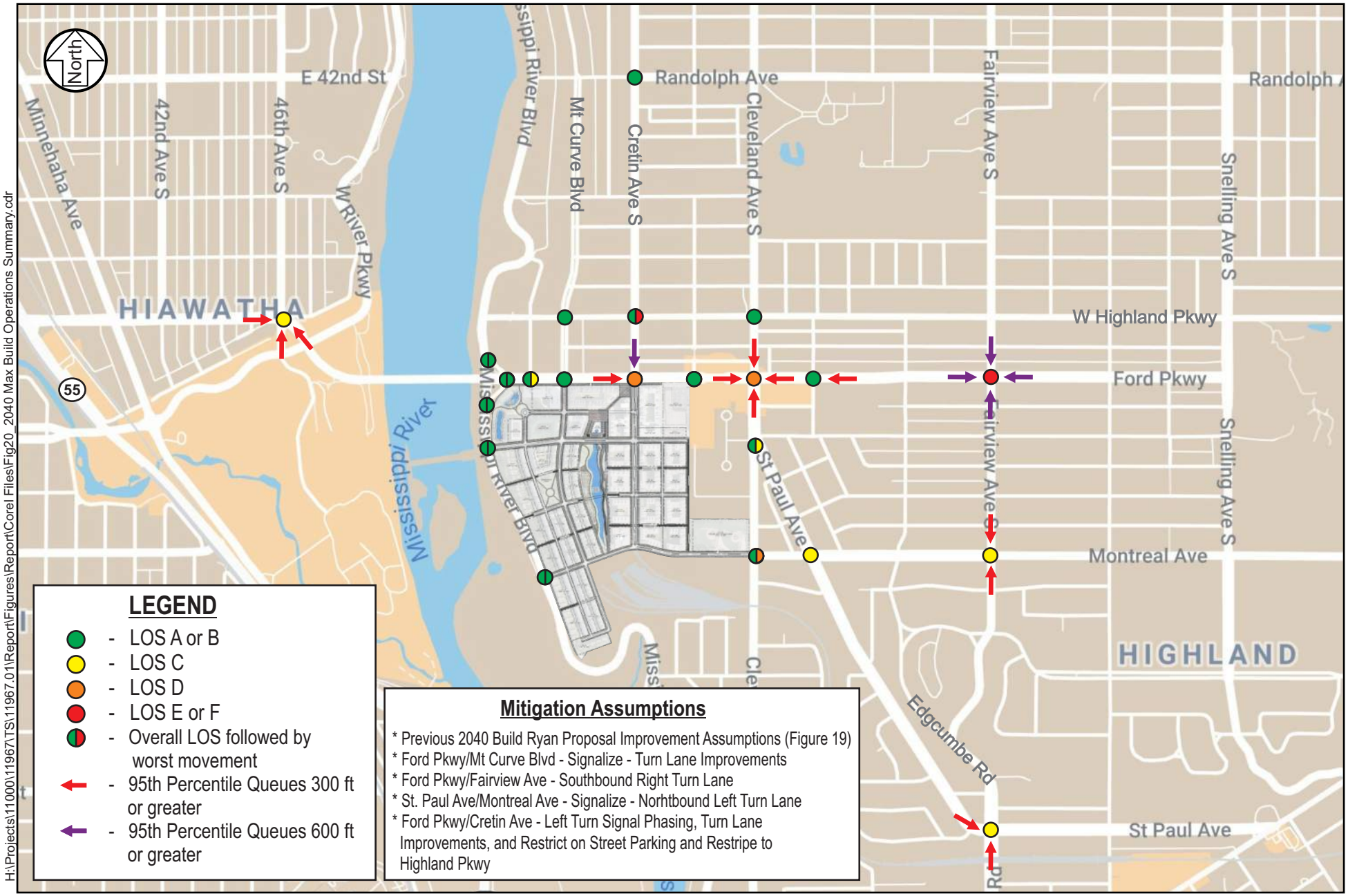
Note that the Ford Parkway/Fairview Avenue intersection with the previously identified mitigation is not expected to be able to provide acceptable intersection operations under the Max Build scenario. One potential mitigation strategy to resolve this issue is the reconstruction of Ford Parkway from Kenneth Street to Snelling Avenue as a four-lane facility. However, discussion with Saint Paul and Ramsey County staff indicated this level of mitigation is not supported at this time. Therefore, strategies aimed at reducing vehicular trips to reduce the vehicular impact along Ford Parkway (east of Kenneth Street) are recommended. Note that as part of the AUAR update process, intersections may be reevaluated depending on the level of development that has occurred to determine any necessary changes to the identified mitigation.

Table 15. Year 2040 Max Build Intersection Capacity Analysis

Intersection	A.M. Peak Hour	P.M. Peak Hour
	Year 2040 Max Build	Year 2040 Max Build
46th Street/46th Avenue	B (15 sec.)	C (31 sec.)
Ford Parkway/Ford Parkway Ramps (1)	A/A (6 sec.)	A/B (11 sec.)
Ford Parkway/Woodlawn Avenue (1)	A/A (5 sec.)	A/C (25 sec.)
Ford Parkway/Mount Curve Boulevard (1)	A (10 sec.)	B (15 sec.)
Ford Parkway/Cretin Avenue	B (18 sec.)	D (37 sec.)
Ford Parkway/Finn Street	B (13 sec.)	B (19 sec.)
Ford Parkway/Cleveland Avenue	C (23 sec.)	D (48 sec.)
Ford Parkway/Kenneth Street	A (9 sec.)	B (14 sec.)
Ford Parkway/Fairview Avenue	C (30 sec.)	E (57 sec.)
Cleveland Avenue/Highland Parkway	A (9 sec)	B (14 sec.)
Cleveland Ave/St Paul Ave/Bohland Ave (1)	A/C (20 sec.)	A/C (22 sec.)
St Paul Avenue/Montreal Avenue (2)	B (18 sec.)	C (21 sec.)
St Paul Avenue/Edgcumbe Road	C (24 sec.)	C (26 sec.)
Montreal Avenue/Cleveland Avenue (1)	A/B (14 sec.)	A/D (27 sec.)
Montreal Avenue/Fairview Avenue	B (19 sec.)	C (21 sec.)
Mississippi River Blvd/Ford Pkwy North (1)	A/A (4 sec.)	A/A (7 sec.)
Mississippi River Blvd/South Ford Pkwy South (1)	A/A (6 sec.)	A/A (7 sec.)
Mississippi River Blvd/Bohland Avenue (1)	A/A (4 sec.)	A/A (4 sec.)
Mississippi River Blvd/Montreal Avenue (1)	A/A (6 sec.)	A/A (6 sec.)
Mount Curve Boulevard/Highland Parkway (2)	A (6 sec.)	A (6 sec.)
Cretin Avenue/Randolph Avenue	B (14 sec.)	B (16 sec.)
Cretin Avenue/Highland Parkway (1)	A/B (12 sec.)	A/E (39 sec.)

(1) Indicates an unsignalized intersection with side-street stop control where the overall LOS is shown followed by the worst approach LOS.

(2) Indicates an unsignalized intersection with all-way stop control.



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2040 Max Build P.M Peak Hour Operations Summary

Ford Site AUAR Transportation Analysis

City of Saint Paul

Figure 20

0011967
August 2019

Table 16. Year 2040 Max Build Issue, Consideration, and Mitigation Summary

Issue	Consideration (C) / Mitigation (M)
Ford Parkway/Cretin Avenue	
• The southbound shared thru-right lane is expected to operate at LOS F during the p.m. peak hour, and queues are expected to extend into Highland Parkway during the p.m. peak hour, causing operational issues at the Cretin Avenue/Highland Parkway intersection.	• M - Construct a southbound right-turn lane that is approximately 150 feet to reduce southbound queues. • C - Preserve the right-of-way to provide a future 100-foot northbound right-turn lane if needed, which depends on the future extension of Finn Street into the Ford Site.
Ford Parkway/Fairview Avenue	
• Intersection is expected to operate at an overall LOS E during the p.m. peak hour; all approaches are expected to have a 600-foot queue or greater.	• M - Implement Travel Demand Management (TDM) strategies to reduce vehicular trips; example strategies that could provide benefit (i.e. a reduction in vehicular trips) not listed within the Ford Site Master Plan include: - Provide indoor secure bike parking for commercial, office, and residential land uses. - Require residents, employees, and customers to pay for parking. - Provide a Free Transit Pass Program to residents and employees. - Provide a ride/carpooling/vanpooling and/or guaranteed ride home program. • M - Refine land use guidance/assumptions to move more density to the southern and southeastern portions of the site to better balance traffic volumes throughout the area and reduce traffic volume impacts to Ford Parkway (east of Kenneth Street).

** Note that the issues, considerations, and mitigation shown are in addition to the previously identified items as part of the existing, year 2040 no build, and year 2040 build Ryan Proposal conditions.*

Mitigation Summary

A summary of the identified mitigation for each condition (i.e. existing, year 2040 no build, year 2040 Build Ryan Proposal, and year 2040 Max Build) is illustrated in Table 17. This table includes columns to indicate under which condition or scenario a particular mitigation is expected to be needed. Note that some mitigation is necessary based on current or future conditions, regardless of the proposed development, while others are only contingent upon the level of Ford Site development. Furthermore, the mitigation is intended to ensure overall intersection LOS D or better operations and queues less than 600 feet during the a.m. and p.m. peak hours. However, consideration should be given to accepting higher levels of delay or congestion for limited periods of time to balance and preserve other priorities, such as providing enhanced pedestrian, bicycle, and/or transit networks and environments. The mitigation identified is intended to provide discretion to stakeholders with respect to transportation priorities and implementation.

Table 17. Mitigation Summary

Issue	Considerations and Mitigation	Condition / Scenario			
		Existing	2040 No Build	2040 Ryan Proposal	2040 Max Build
46th Street/46th Avenue					
WB Left Turn Queues NB Right Turn Queues	1) Provide Northbound Right Turn Lane 2) Extend Westbound Left Turn Lane 3) Modify Signal Timing/Phasing 4) Remove Northeast Approach (Edmund Boulevard)	Consideration	Consideration	Consideration	Consideration
Ford Parkway/Mount Curve Boulevard					
Side-Street Delays	1) Signalize/Turn Lane Improvements			Mitigation	Mitigation Assumed
	2) Extend the westbound left-turn lane			Consideration	Consideration
Ford Parkway/Cretin Avenue					
SB Queues	1) Modify Signal Timing and Phasing 2) Extend eastbound and westbound left-turn lanes 3) Restrict Parking to Pinehurst/Highland and restripe segment	Consideration	Consideration	Mitigation	Mitigation Assumed
	4) Construct Southbound Right Turn Lane			Consideration	Mitigation
NB Queues	5) Preserve the ability to add a northbound right-turn lane if the Finn Street Connection to the Ford Site is not implemented				Consideration
Ford Parkway/Cleveland Avenue					
Intersection Operations and Queues	1) Extend Eastbound Left Turn Lane 2) Remove Parking and Provide a Southbound Right Turn Lane	Mitigation	Mitigation Assumed		
Ford Parkway/Fairview Avenue					
Left Turn Operations and Queues	1) Provide Left Turn Signal Phasing	Consideration	Mitigation	Mitigation Assumed	
Intersection Operations and Queues	2) Construct Southbound Right Turn Lane			Mitigation	Mitigation Assumed
	3) Implement TDM Strategies and Refine Land Use Guidance**				Mitigation
Cleveland Avenue/Montreal Avenue					
Travel Pattern Changes	1) Switch Side-Street Stop Control to North/South Approach or Install All-Way Stop Control 2) Construct Intersection for Potential Future Signal **			Mitigation	Mitigation Assumed
St Paul Avenue/Montreal Avenue					
Intersection Operations and Queues	1) Install Traffic Signal/Turn Lanes or Hybrid Roundabout			Mitigation	Mitigation Assumed
St Paul Avenue/Edgcumbe Road					
Intersection Queues	1) Provide Eastbound Right Turn Overlap Phase	Consideration	Consideration	Consideration	Consideration
Cretin Avenue/Randolph Avenue					
Intersection Queues	1) Provide Northbound/Southbound Left Turn Lanes	Consideration	Mitigation	Mitigation Assumed	
Montreal Avenue/Fairview Avenue					
Intersection Queues	1) Provide Left Turn Signal Phasing		Consideration	Consideration	Consideration
Cleveland Avenue/St Paul Avenue/Bohland Avenue					
Illegal Movements and Potential Safety Issue	1) Reconfigure intersection and provide traffic control change	Consideration	Consideration	Consideration	Consideration

Legend:
▒ = Mitigation assumed in scenario
** = Land use guidance/more density in southern portion of site could impact need of a potential signal at Cleveland Avenue/Montreal Avenue intersection.

Extended Roadway Network Review

A planning-level review was completed to understand potential impacts associated with a wider geographic area, including Mn TH 55 (Hiawatha Avenue) to the West, Mn TH 5 (7th Street) to the South, Mn Highway 51 (Snelling Avenue/Montreal Avenue) to the east, Cretin Avenue near Marshall Avenue (County Road 35), and Saint Paul Avenue near Mn TH 5 (7th Street). This review focused on existing and development related traffic volume impacts for various roadway segments surrounding the Ford Site during the a.m. and p.m. peak hours. This information was shared with multiple agencies, including MnDOT, Metro Transit, Hennepin County, Ramsey County, Minneapolis, and Saint Paul representatives. A summary of the existing a.m. and p.m. peak hour volumes and development related trip impacts are illustrated in Figure 21 and Figure 22, respectively.

The primary roadways within the area and their expected future average daily traffic volumes under each scenario are summarized in Table 18, along with the estimated roadway capacities. Although traffic volumes on these roadways are expected to increase, they are within or below the estimated capacity of the roadway facilities. It is important to note that traffic volumes are expected to gradually increase as development occurs, which is expected to take approximately 10 to 15 years. Furthermore, the central location of the Ford Site lessens the impact to any one particular roadway since development related traffic volumes are dispersed relatively evenly to the west, east, north, and south.

Table 18. Extended Roadway Network Traffic Volume Changes

Roadway	Average Daily Traffic Volume (vehicles per day)			
	Existing*	Year 2040 Ryan Proposal	Year 2040 Max Build	Estimated Roadway Capacity
MN TH 55 (Hiawatha Avenue) North of 46th Avenue	17,400	21,400	22,250	30,000 to 36,000
MN TH 5 (7th Street) At MN River Bridge	56,000	63,400	64,500	55,000 to 70,000
MN TH 51 (Snelling Avenue) North of Ford Parkway	15,600	18,100	18,600	18,000 to 22,000
MN TH 51 (Montreal Avenue) East of Snelling Avenue	11,800	14,500	15,100	12,000 to 17,000
Cretin Avenue North of Summit Avenue	15,100	18,100	18,700	18,000 to 22,000
St Paul Avenue East of Edgcumbe Road	3,600	4,450	4,600	30,000 to 36,000
CR 46 (Edgcumbe Road) South of St Paul Avenue	16,600	20,500	21,300	30,000 to 36,000

*Source: *MnDOT Traffic Mapping Application; Data represents the most recent ADT information available as of June 19, 2019.*

LEGEND:		
Direction of Travel		
Existing		
AUAR Scenario	Ryan Proposal	Max Build
Direction of Travel		
Existing		
AUAR Scenario	Ryan Proposal	Max Build

Northbound		
Existing	1000	
Development	80	90
Southbound		
Existing	570	
Development	65	85

Northbound		
Existing	555	
Development	60	65
Southbound		
Existing	630	
Development	50	65

Northbound		
Existing	830	
Development	115	130
Southbound		
Existing	600	
Development	90	125

Eastbound		
Existing	420	
Development	180	245
Westbound		
Existing	430	
Development	225	250

Eastbound		
Existing	295	
Development	65	70
Westbound		
Existing	420	
Development	50	70

Northbound		
Existing	415	
Development	5	5
Southbound		
Existing	490	
Development	5	5

Eastbound		
Existing	390	
Development	40	55
Westbound		
Existing	300	
Development	50	55

Northbound		
Existing	900	
Development	15	20
Southbound		
Existing	715	
Development	15	20

Northbound		
Existing	970	
Development	90	120
Southbound		
Existing	990	
Development	110	125

Eastbound		
Existing	200	
Development	25	30
Westbound		
Existing	160	
Development	20	25

Eastbound		
Existing	245	
Development	65	75
Westbound		
Existing	205	
Development	55	70

Northbound		
Existing	2800	
Development	130	170
Southbound		
Existing	3200	
Development	160	180

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A.M. Peak Hour Regional Trip Comparison (Segments)

Ford Site AUAR Transportation Analysis

City of Saint Paul

Figure 21

LEGEND:

Direction of Travel		
Existing		
AUAR Scenario	Ryan Proposal	Max Build
Direction of Travel		
Existing		
AUAR Scenario	Ryan Proposal	Max Build

Northbound		
Existing	600	
Development	95	125
Southbound		
Existing	930	
Development	100	115

Northbound		
Existing	900	
Development	140	180
Southbound		
Existing	800	
Development	140	170

Eastbound		
Existing	490	
Development	60	70
Westbound		
Existing	700	
Development	60	80

Eastbound		
Existing	615	
Development	265	315
Westbound		
Existing	640	
Development	260	345

Eastbound		
Existing	500	
Development	75	100
Westbound		
Existing	480	
Development	75	90

Northbound		
Existing	750	
Development	70	95
Southbound		
Existing	750	
Development	70	85

Northbound		
Existing	550	
Development	5	5
Southbound		
Existing	565	
Development	5	5

Northbound		
Existing	1050	
Development	20	25
Southbound		
Existing	875	
Development	20	25

Northbound		
Existing	1175	
Development	130	150
Southbound		
Existing	915	
Development	125	165

Eastbound		
Existing	275	
Development	30	40
Westbound		
Existing	195	
Development	30	35

Eastbound		
Existing	390	
Development	80	105
Westbound		
Existing	350	
Development	80	95

Northbound		
Existing	3300	
Development	190	225
Southbound		
Existing	3300	
Development	190	245

Ford Site Development

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P.M. Peak Hour Regional Trip Comparison (Segments)

Ford Site AUAR Transportation Analysis

City of Saint Paul

00011967
August 2019

Figure 22

Transportation System Study Area Roadway Network Review

The study intersections were identified based on the roadways and facilities most likely to be impacted as a result of the Ford Site redevelopment. However, it is important to note that traffic volume changes may occur on other streets near the Ford Site within the study area. A summary of the existing, year 2040 no build, year 2040 Ryan Proposal, and year 2040 Max Build average daily traffic volumes for area roadways are included in the Appendix. Select roadways adjacent to and connected to the Ford Site that are expected to experience higher levels of traffic volume increases (based on daily traffic volumes) are summarized in Table 19, along with the estimated roadway capacities. Although traffic volumes on these roadways are expected to increase, they are within the estimated capacity of the roadway facilities, which are functionally classified as collector roadways except Mount Curve Boulevard and portions of Mississippi River Boulevard, which are classified as local roadways.

Table 19. Transportation System Study Area Roadway Network Traffic Volume Changes

Roadway	Average Daily Traffic Volume (vehicles per day)			
	Existing	Year 2040 Ryan Proposal	Year 2040 Max Build	Estimated Roadway Capacity
Mississippi River Boulevard (North of Ford Parkway)	4,700	5,400	5,550	8,000 to 10,000
Mount Curve Boulevard (North of Ford Parkway)	1,000	2,300	2,600	8,000 to 10,000
Cleveland Avenue (South of Montreal Avenue)	2,300	4,200	4,600	8,000 to 10,000
Montreal Avenue (East of St Paul Avenue)	3,200	5,500	6,000	8,000 to 10,000

Note that traffic volumes are expected to gradually increase as development occurs, which is expected to take approximately 10 to 15 years. In general, an increase in 1,000 vehicles per day equates to an additional two (2) vehicles per minute during peak times. Although some traffic volume changes on other roadways not identified within Table 19 are expected because of the Ford Site development and associated roadway network additions, any changes are expected to be relatively minimal as they do not directly connect to the site and/or are within the realm of a typical residential street.

However, given the change in volumes on some of the roadways, improvements could be considered to manage increases in traffic volumes and/or speeds on these roadways. Potential improvements, which are consistent with City policies and practices and would likely be included as part of a future street reconstruction, include installing curb bump-outs at the Cretin Avenue/Highland Parkway intersection, along Mount Curve Boulevard (at Highland Parkway, Scheffer Avenue, and Hartford Avenue) and along Montreal Avenue (at Wilder Street and Howell Street). Note that as part of the City's 2019 mill and overlay program, curb bump-outs are planned along Cleveland Avenue (at Elsie Lane/Worcester Avenue, Ramlow Place, Itasca Avenue, and Magoffin Avenue).

Internal Roadway Network Considerations

In addition to the external study intersection and roadway evaluations, the roadway network within the Ford Site was evaluated from a capacity perspective to ensure facilities are appropriately sized, provide guidance on access and traffic controls, and better understand impacts associated with other potential roadway connections such as Saunders Avenue, Village Way, and Finn Street. This evaluation was completed using Synchro/SimTraffic software and engineering judgement; focusing on future build conditions.

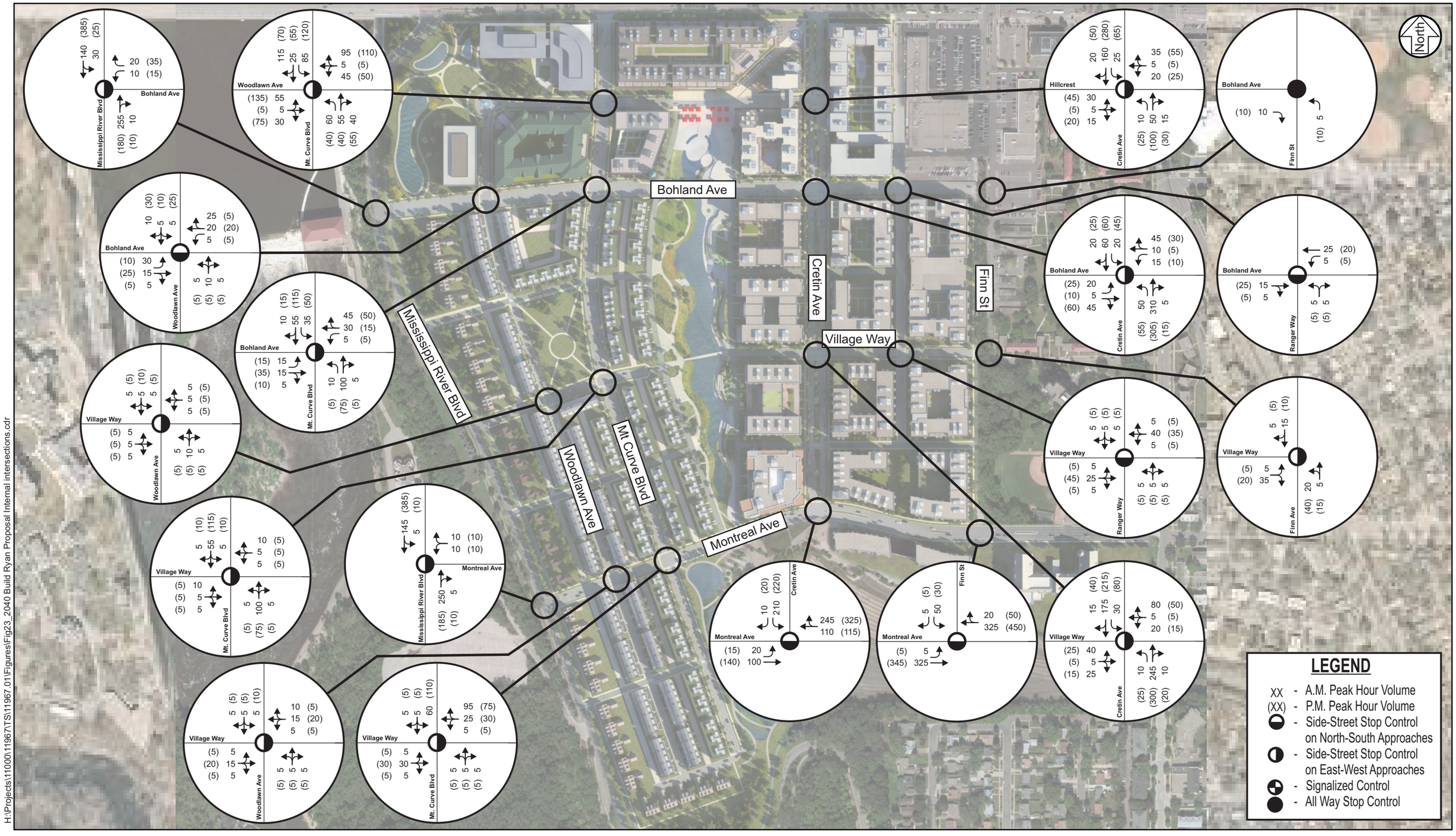
Intersection Capacity Analysis

All internal intersections were assumed to be side-street stop control for analysis purposes. Roadways were assumed to be either two-lane or three-lane two-way facilities, as described in the Ford Site Master Plan. The assumed traffic forecasts, roadway geometry, and traffic control types for the Ryan Proposal and Max Build scenarios are illustrated in Figure 23 and Figure 24, respectively. Results of the internal roadway network evaluation indicate that in general, all internal roadways and intersections are all expected to operate acceptably under future year 2040 conditions during the a.m. and p.m. peak hours. A summary of the year 2040 internal intersection capacity analysis is provided in Table 20.

Table 20. Internal Roadway Intersection Capacity Analysis Summary

Intersection	Condition			
	A.M. Peak Hour		P.M. Peak Hour	
	Year 2040 Ryan Build	Year 2040 Max Build	Year 2040 Ryan Build	Year 2040 Max Build
Woodlawn Avenue/Bohland Avenue (1)	A/A (6 sec.)	A/A (6 sec.)	A/A (5 sec.)	A/A (6 sec.)
Woodlawn Avenue/Village Way (1)	A/A (4 sec.)	A/A (7 sec.)	A/A (5 sec.)	A/A (5 sec.)
Woodlawn Avenue/Montreal Avenue (1)	A/A (5 sec.)	A/A (6 sec.)	A/A (6 sec.)	A/A (6 sec.)
Mount Curve Boulevard/Woodlawn Avenue (1)	A/A (6 sec.)	A/A (6 sec.)	A/A (8 sec.)	A/A (9 sec.)
Mount Curve Boulevard/Bohland Avenue (1)	A/A (6 sec.)	A/A (6 sec.)	A/A (6 sec.)	A/A (6 sec.)
Mount Curve Boulevard/Village Way (1)	A/A (5 sec.)	A/A (5 sec.)	A/A (6 sec.)	A/A (5 sec.)
Mount Curve Boulevard/Montreal Avenue (1)	A/A (6 sec.)	A/A (6 sec.)	A/A (7 sec.)	A/A (6 sec.)
Cretin Avenue/Hillcrest (1)	A/A (7 sec.)	A/A (7 sec.)	A/A (9 sec.)	A/A (10 sec.)
Cretin Avenue/Bohland Avenue (1)	A/A (6 sec.)	A/A (6 sec.)	A/A (7 sec.)	A/A (8 sec.)
Cretin Avenue/Village Way (1)	A/A (7 sec.)	A/A (6 sec.)	A/A (7 sec.)	A/A (8 sec.)
Cretin Avenue/Montreal Avenue (1)	A/A (8 sec.)	A/A (9 sec.)	A/A (9 sec.)	A/B (11 sec.)
Ranger Way/Bohland Avenue (1)	A/A (1 sec.)	A/A (1 sec.)	A/A (1 sec.)	A/A (1 sec.)
Ranger Way/Village Way (1)	A/A (5 sec.)	A/A (5 sec.)	A/A (4 sec.)	A/A (2 sec.)
Finn Street/Bohland Avenue (1)	A/A (3 sec.)	A/A (6 sec.)	A/A (2 sec.)	A/A (5 sec.)
Finn Street/Village Way (1)	A/A (4 sec.)	A/A (4 sec.)	A/A (4 sec.)	A/A (5 sec.)
Finn Street/Saunders Avenue (1)	A/A (1 sec.)	A/A (1 sec.)	A/A (1 sec.)	A/A (3 sec.)
Finn Street/Montreal Avenue (1)	A/A (8 sec.)	A/A (10 sec.)	A/A (10 sec.)	A/B (12 sec.)
Cleveland Avenue/Saunders Avenue (1)	A/A (1 sec.)	A/A (2 sec.)	A/A (3 sec.)	A/A (1 sec.)

(1) Indicates an unsignalized intersection with side-street stop control where the overall LOS is shown followed by the worst approach LOS.



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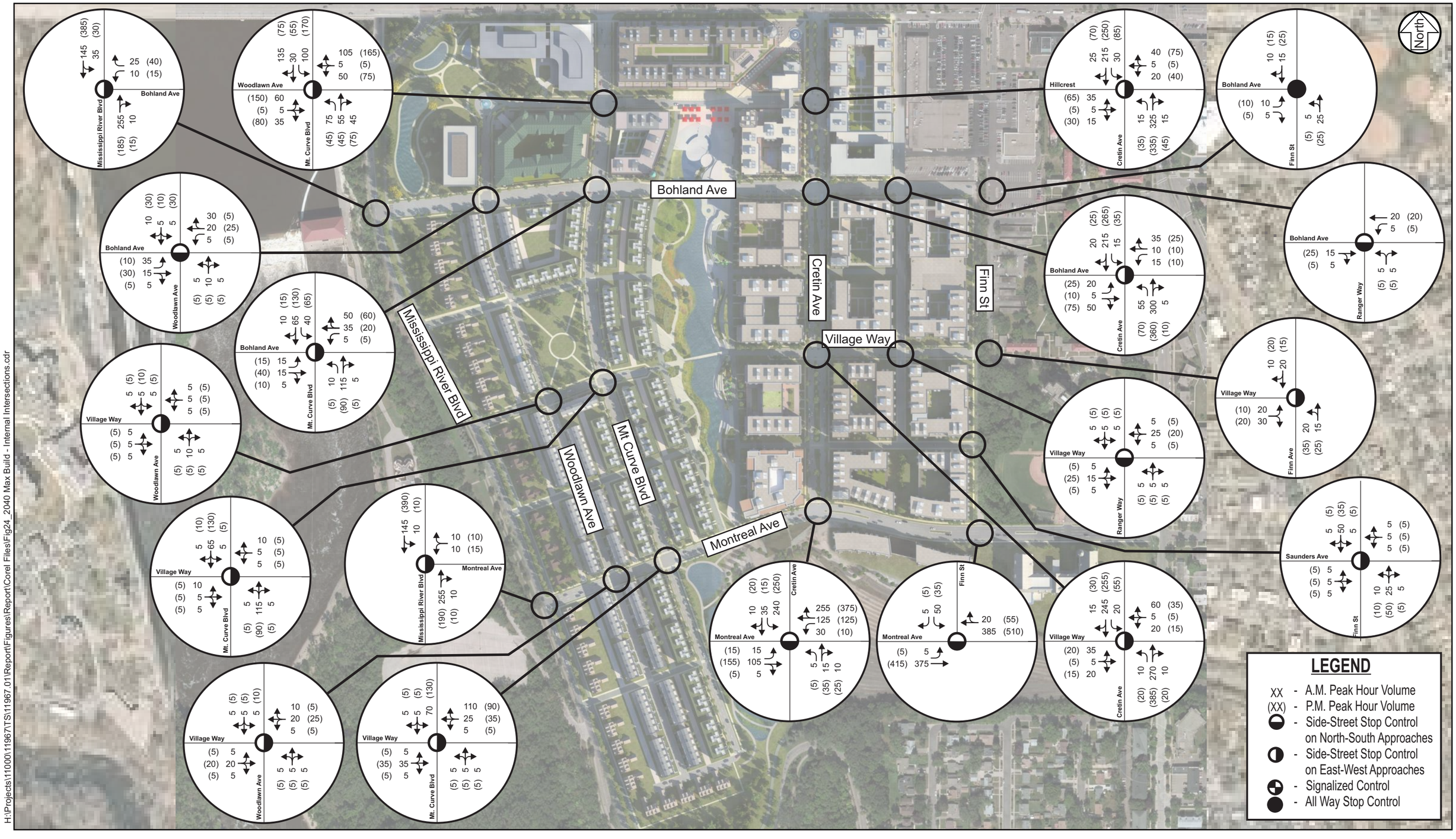
Year 2040 Ryan Proposal Conditions - Internal Intersections

Ford Site AUAR Transportation Analysis

City of Saint Paul

01911967
August 2019

Figure 23



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Year 2040 Max Build Conditions - Internal Intersections

Ford Site AUAR Transportation Analysis
City of Saint Paul

Figure 24

Access, Traffic Controls, and Connections

Based on the results of the internal roadway capacity analysis, the following information is offered for consideration:

- Private access should be limited, if possible, along the following segments to reduce potential conflicts with pedestrians and bicyclists and to ensure acceptable traffic operations are maintained (unless located across from a public roadway):
  - Ford Parkway
  - Mount Curve Boulevard (from Ford Parkway to Bohland Avenue)
  - Cretin Avenue (from Ford Parkway to Montreal Avenue)
  - Montreal Avenue (from Cretin Avenue to Cleveland Avenue)

  Note that access will be evaluated individually for each development as there are potential constraints that may need to be considered.
- Further discussion with the project team should occur to determine how the roadways transition between a two-lane and three-lane facility at the following intersections:
  - Mount Curve Boulevard at Bohland Avenue
  - Montreal Avenue at Cretin Avenue
- The traffic control at the Cretin Avenue/Montreal Avenue intersection is expected to operate adequately as a side-street stop control intersection; other traffic controls such as an all-way stop control or single-lane roundabout could be considered. A traffic signal is not expected to be warranted under future build condition at this location.
- A future extension of Finn Street into the Ford Site was evaluated and is expected to provide a benefit to area circulation and help balance traffic volumes at the various access points along Ford Parkway (i.e. Mount Curve Boulevard, Cretin Avenue, and Finn Street). Without a future Finn Street connection, there may be a need to construct a northbound right-turn lane at the Ford Parkway/Cretin Avenue intersection to minimize queuing along Cretin Avenue.
- The extension of Saunders Avenue and/or Village Way between Finn Street and Cleveland Avenue would provide additional circulation and access options for all modes. However, neither connection is expected to provide a significant operational benefit from an intersection capacity perspective and would not result in any change in the mitigation identified.

Ford Site Zoning and Public Realm Master Plan Transportation Network Changes

The *Ford Site Zoning and Public Realm Master Plan* identified a transportation network for the Ford Site, which was used as the basis for the roadway network assumptions included in the Ryan Proposal and Max Build AUAR scenarios. Results of the intersection capacity analysis are generally consistent with the guidance within the Ford Site Master Plan. However, the following roadway network changes are offered for City review and consideration.

- Montreal Avenue - Mississippi River Boulevard to Cretin Avenue
    - Current Design - a two-lane roadway with single direction, dedicated bicycle lanes next to traffic lanes. There are no on-street parking lanes. A six-foot tree-lined boulevard and six-foot sidewalks line the edges.
    - Design Consideration - to provide continuity with other segments of Montreal Avenue to the east, this segment could be expanded to a two-lane facility with a median or a three-lane facility to provide route continuity with the rest of Montreal Avenue and eliminate the intersection transition issue at Cretin Avenue.
- Bohland Avenue - Mississippi River Boulevard to Finn Street
    - Current Design - one of the main east-west roadways on the site. Street parking is allowed on one side of the street for access to the square, retail district, and stormwater feature. There are dedicated bike lanes in each direction. A turn lane allows access to parking. A four-foot tree lined boulevard and six-foot sidewalk line the edges.
    - Design Consideration - from a vehicular capacity perspective, this segment does not need to be a three-lane configuration. Removal of the center two-way left-turn lane would allow for additional on-street parking, enhancement of other facilities (i.e. bike lanes or sidewalk space), and/or a reduction in overall cross-section/right-of-way need.

Pedestrian and Bicycle Facilities

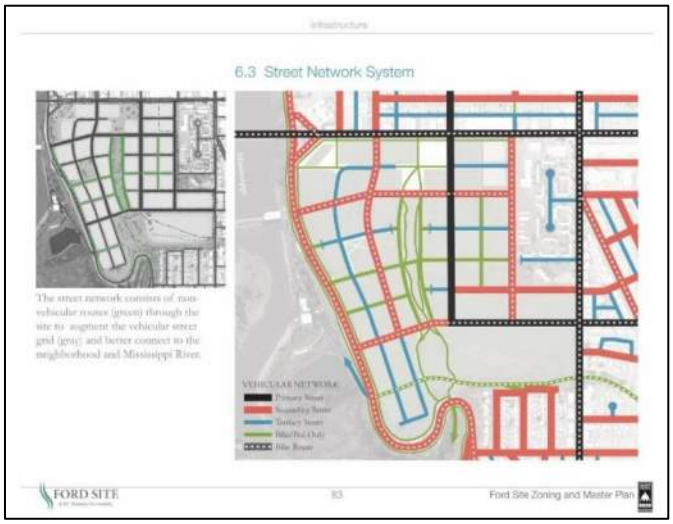
The *Saint Paul Ford Site: Multimodal Transportation Study and Report* reviewed transit service quality and pedestrian/bicyclist level of service to identify various improvements to the pedestrian and bicyclist environments, which are incorporated in the overall Ford Site Master Plan. The following information summarizes pedestrian and bicycle activity expected within the area and potential enhancements for consideration.

Based on the AUAR transportation analysis, the Ford Site is expected to generate between 5,400 and 7,200 walk/bike trips per day, depending on the AUAR build scenario. From a peak hour perspective, this equates to approximately 350 to 450 a.m. peak hour and 450 to 600 p.m. peak hour walk/bike trips to/from the Ford Site. A summary of the existing and future pedestrian and bicycle volumes during the p.m. peak hour at the key intersections entering/exiting the Ford Site is illustrated in Table 21, which were included in the future capacity analysis previously discussed. Note that some pedestrians and bicycles are expected to cross only one approach of a particular intersection, while others are expected to travel through multiple intersections.

Table 21. Pedestrian and Bicycle Volume Changes

Intersection	P.M. Peak Hour Ped/Bike Intersection Volumes		
	Existing	Year 2040 Ryan Proposal	Year 2040 Max Build
Ford Parkway / Mount Curve Boulevard	38	245	265
Ford Parkway / Cretin Avenue	56	255	270
Ford Parkway / Cleveland Avenue	352	460	470
Mississippi River Boulevard / Montreal Avenue	N/A	50	50
Montreal Avenue / Cleveland Avenue	22	180	195

The Ford Site Master Plan identifies a future street network system that is designed to accommodate all modes of transportation and the expected magnitude of users of each. Based on a preliminary review of the proposed roadway cross-sections, there appears to be sufficient capacity to accommodate the projected pedestrian and bicycle activity within the Ford Site transportation network.



Bicycle Considerations

The existing conditions section documented the bicycle facility network adjacent to the Ford Site. In addition, the *City of Saint Paul Bicycle Plan* identifies a proposed bicycle network for the area surrounding the Ford Site. This section reviews both the existing and proposed bicycle network and offers considerations for enhancements to the bicycle network.

- Ford Parkway Bicycle Facility
    - There are existing bike lanes along Ford Parkway, east of Kenneth Street, as well as shared-bike lane accommodations from Mississippi River Boulevard to Kenneth Street. As part of the Ford Site development, a trail is planned along the south side of Ford Parkway along the limits of the Ford Site. With the projected bicycle demand from the Ford Site, connectivity to Mississippi River Boulevard, and the expected traffic volumes on Ford Parkway, consideration should be given to providing a higher level of bicycle facility on Ford Parkway between the planned trail facility and the existing bike lanes east of Kenneth Street. Consideration should also be given to how these facilities are connected to each other and the adjacent bicycle network.
- Montreal Avenue Bicycle Facility
    - Construction of the Ford Site infrastructure will create a gap in the bicycle facility network along Montreal Avenue between Cleveland Avenue and St Paul Avenue. To facilitate bicycle access to/from the Ford Site, removing this gap should be prioritized. The existing bicycle facility on Montreal Avenue, east of St Paul Avenue, is a shared-lane facility. With the projected bicycle demand from the Ford Site, connectivity to Mississippi River Blvd, and the expected traffic volumes on Montreal Avenue, consideration should be given to providing a higher level of bicycle facility on this segment of Montreal Avenue and further to the east.
- Cleveland Avenue Bicycle Facility
    - There are bike lanes along Cleveland Avenue, north of Eleanor Avenue and a shared-bike lane accommodation between Eleanor Avenue and Highland Parkway, but there is an existing bicycle facility gap along Cleveland Avenue between Highland Parkway and Mississippi River Boulevard. The City's bicycle plan identifies Cleveland Avenue as a shared-lane facility between St Paul Avenue and Mississippi River Boulevard and in-street lanes between Eleanor Avenue and St Paul Avenue. However, with the projected bicycle demand from the Ford Site, the expected traffic volumes on Cleveland Avenue, and potential implementation of a bicycle facility along St Paul Avenue, consideration should be given to providing a higher level of bicycle facility on these roadway segments, in addition to how these facilities are connected and fit within the adjacent bicycle network.
- Mount Curve Boulevard Bicycle Facility
    - Given that Mount Curve Boulevard within the Ford Site is expected to have a bicycle facility, extending a bicycle facility along Mount Curve Boulevard, north of Ford Parkway up to Highland Parkway and/or Jefferson Avenue should be considered.

- Mississippi River Boulevard Bicycle Facility
    - There is currently an on-street bicycle lane in the southbound direction along Mississippi River Boulevard, in addition to the adjacent multi-use trail. There is no existing northbound bike lane. The existing facilities are popular, and the Ford Site is expected to increase the use of these facilities. Given the use of the corridor by pedestrians and bicycles and the current shared facility design, consideration should be given to reviewing the planned pedestrian and bicycle facilities on Mississippi River Boulevard.
- St Paul Avenue (County Road 46) Bicycle Facility
    - There are currently no bicycle facilities along St Paul Avenue. However, Ramsey County is considering implementation of a bicycle facility along St Paul Avenue as part of an upcoming mill and overlay project, which could result in the elimination of a vehicular travel lane in each direction. A bicycle facility along St Paul Avenue, which is consistent with the City's bicycle plan, would help support the Ford Site and should be considered. Additional discussion regarding potential operational impacts of this type of facility is noted later in this study.
- CP Rail Spur Bicycle Facility
    - The Ford Site is expected to create more demand for the CP Rail Spur trail shown on the *City's Planned Bicycle Network Map*. This corridor would provide an off-street trail facility separated from motor vehicles that would support the Ford Site development by providing a high-quality bicycle and pedestrian connection to area job centers, such as downtown and the West 7th Street corridor.

These enhancements to the bicycle network can help to further reduce dependence on vehicles, provide improved connectivity to existing facilities, and reduce overall vehicular impacts associated with redevelopment of the Ford Site.

Pedestrian Considerations

As discussed in the existing condition section and as shown previously in Figure 4, there are several gaps within the existing sidewalk network within the transportation system study area. Therefore, the following pedestrian facility enhancements are offered for consideration, which focus on higher priority connections and facilities in the area.

- Cleveland Avenue Sidewalk Gaps
    - There is an existing sidewalk gap along the west side of Cleveland Avenue from Saunders Avenue to south of Yorkshire Avenue, as well as from Magoffin Avenue to Mississippi River Boulevard. There is also a short sidewalk gap along the east side of Cleveland Avenue from Mississippi River Boulevard to Norfolk Avenue, which is planned for construction in 2019. Given the proximity and connectivity to the Ford Site, filling this sidewalk gap between Saunders Avenue and Yorkshire Avenue should be prioritized.

- Mount Curve Boulevard Sidewalk Gap (from Hartford Avenue to Scheffer Avenue)
    - There is an existing sidewalk gap along both sides of Mount Curve Boulevard in this area that limits accessibly on the north side of the Ford Site.
- Mississippi River Boulevard Sidewalk Gap (from 175 feet north of Hartford Avenue to the South)
    - There is an existing sidewalk gap along the east side of Mississippi River Boulevard in this area that limits accessibly to the west side of the Ford Site. However, a portion of this sidewalk gap is expected to be filled as part of the Ford Site development.
- Hartford Avenue Sidewalk Gap (from Mississippi River Boulevard to Mount Curve Boulevard)
    - There is an existing sidewalk gap along both sides of Hartford Avenue in this area that limits accessibility to the north side of the Ford Site and access to Mississippi River Boulevard.
- Magoffin Avenue Sidewalk Gap (from Mississippi River Boulevard to Colby Avenue)
    - There is an existing sidewalk gap along the north side of Magoffin Avenue in this area that limits accessibility to the south side of the Ford Site and access to Mississippi River Boulevard.
- Traffic Signal Enhancements
    - Consideration should be given to modifying the existing traffic signal infrastructure at the Ford Parkway intersections at Finn Street and Cleveland Avenue to include flashing yellow arrow left-turn capabilities. This configuration provides additional traffic signal timing opportunities for accommodating pedestrians at the intersections.

Freight

Truck activity within the Ford Site is expected to be related to deliveries serving the site, garbage/ recycling services, and school buses. There is not expected to be any businesses or uses within the Ford Site that would generate a significant amount of truck or freight activity that would warrant additional infrastructure considerations. The City is not planning any changes to the current established truck routes within the area. However, it is important to note that there will be some truck activity within the site (e.g. delivery trucks, garbage/recycling, school buses, etc.). This truck activity is expected to be directed to Cretin Avenue (between Ford Parkway to Montreal Avenue) and Montreal Avenue (between Cretin Avenue to St Paul Avenue) within the Ford Site when possible.

Freight activity should be limited during the peak traffic periods to avoid potential conflicts. This can be accomplished through communication with area package services (i.e. UPS, FedEx, etc.) and refuse haulers. If not possible, there is the potential that on-street loading areas could be identified to accommodate some freight activity. Trucks and freight activity should be limited and discouraged on all other roadways within the Ford Site, if possible, although truck activity may need to occur occasionally. Area roadways should be designed accordingly to accommodate the expected level of freight activity within the area based on the proposed development.

Transit Facilities

The Ford Site is well served from existing transit, including the Metro Bus Rapid Transit (BRT) A-Line and Routes 23, 46, 70, 74, 84, and 134 in varying frequencies and destinations. Based on the AUAR transportation analysis, the Ford Site is expected to generate between 4,400 and 6,000 transit riders per day, depending on the AUAR build scenario. From a peak hour perspective, this equates to approximately 300 to 400 a.m. peak hour and 400 to 500 p.m. peak hour transit riders to/from the Ford Site. This would represent a significant increase in area transit ridership relative to the current Highland Park area ridership, which was identified within the *Draft Saint Paul Highland Park Transit Service Study*. If these levels of transit ridership are achieved, there is the potential that the capacity of area transit routes may need to be increased, such as more buses (reduced headways) and/or larger buses, to service the area, which were accounted for within the transportation analysis. However, any increase in transit use is expected to occur over time as development occurs, which would allow for corresponding changes to area transit service to accommodate demand as needed.

Preliminary discussions with Metro Transit indicate the future potential to reroute some bus routes through the Ford Site, primarily along Cretin Avenue and Montreal Avenue. However, there are no plans in place to modify the existing routes. The *Draft Saint Paul Highland Park Transit Service Study* identifies a number of future considerations for the area, and in particular for the Ford Site. This includes a potential bus layover/turnaround facility along Cretin Avenue, south of Montreal Avenue. This type of facility could replace the current on-street layover operations along Kenneth Street south of Ford Parkway and would help promote transit as an alternative transportation mode. However, because this is currently not a programmed project, the transportation analysis does not assume this type of transit facility is provided within the Ford Site.

As previously noted, Cretin Avenue is a primary north-south roadway planned within the Ford Site, extending from Ford Parkway and connecting to the planned extension of Montreal Avenue. Within the Ford Site Master Plan, space has been allocated on each side of this segment of Cretin Avenue to accommodate future enhanced transit service, including the potential for dedicated transit lanes. The Ford Site Master Plan also envisions the potential for a multi-modal shared transportation corridor south of Montreal Avenue, connecting to Cretin Avenue through the Canadian Pacific Railway Property (herein referred to as the Riverview Corridor transit spur). Note that there have been discussions regarding a future Riverview Corridor transit spur that could serve the Ford Site. However, because this is currently not a programmed project, the transportation analysis does not assume this type of transit access will be provided. If a Riverview Corridor transit spur is implemented, it would be expected to reduce the overall vehicular impact associated with the Ford Site redevelopment.

Other Considerations

St Paul Avenue Reconfiguration

Discussion with Ramsey County staff indicates they are considering implementation of a bicycle facility along St Paul Avenue (and possibly Edgcumbe Road as well), which could result in the elimination of a vehicular travel lane in each direction. Given that this is within the transportation system study area, a preliminary evaluation was conducted.

Results of this preliminary evaluation indicate that the St Paul Avenue/Montreal Avenue intersection is expected to operate at LOS C or better during the peak hours under future year 2040 build conditions. This assumes a shared thru/right-turn lane and a dedicated left-turn lane on each approach, in addition to a traffic signal. Dedicated right-turn lanes could be included to improve side-street operations. At the St Paul Avenue/Edgcumbe Road intersection, a reduced St Paul Avenue is not anticipated to impact operations as long as 300 feet of eastbound right-turn lane storage can be provided. A short eastbound left-turn lane should also be considered, as well as a potential eastbound right-turn overlap phase.

Based on these preliminary findings, a reconfiguration of St Paul Avenue appears feasible, although further analysis should be conducted as development occurs. Note that Ramsey County staff, which has jurisdictional authority of this segment of St Paul Avenue, is expected to continue discussions and evaluations in the future.

Highland Village Expansion

City staff identified the potential expansion of the current Highland Village development (located west of Cleveland Avenue near Bohland Avenue). There are no definitive plans, therefore this expansion was not included as part of the future operations analysis. However, a preliminary evaluation was conducted to understand potential impacts associated with this project.

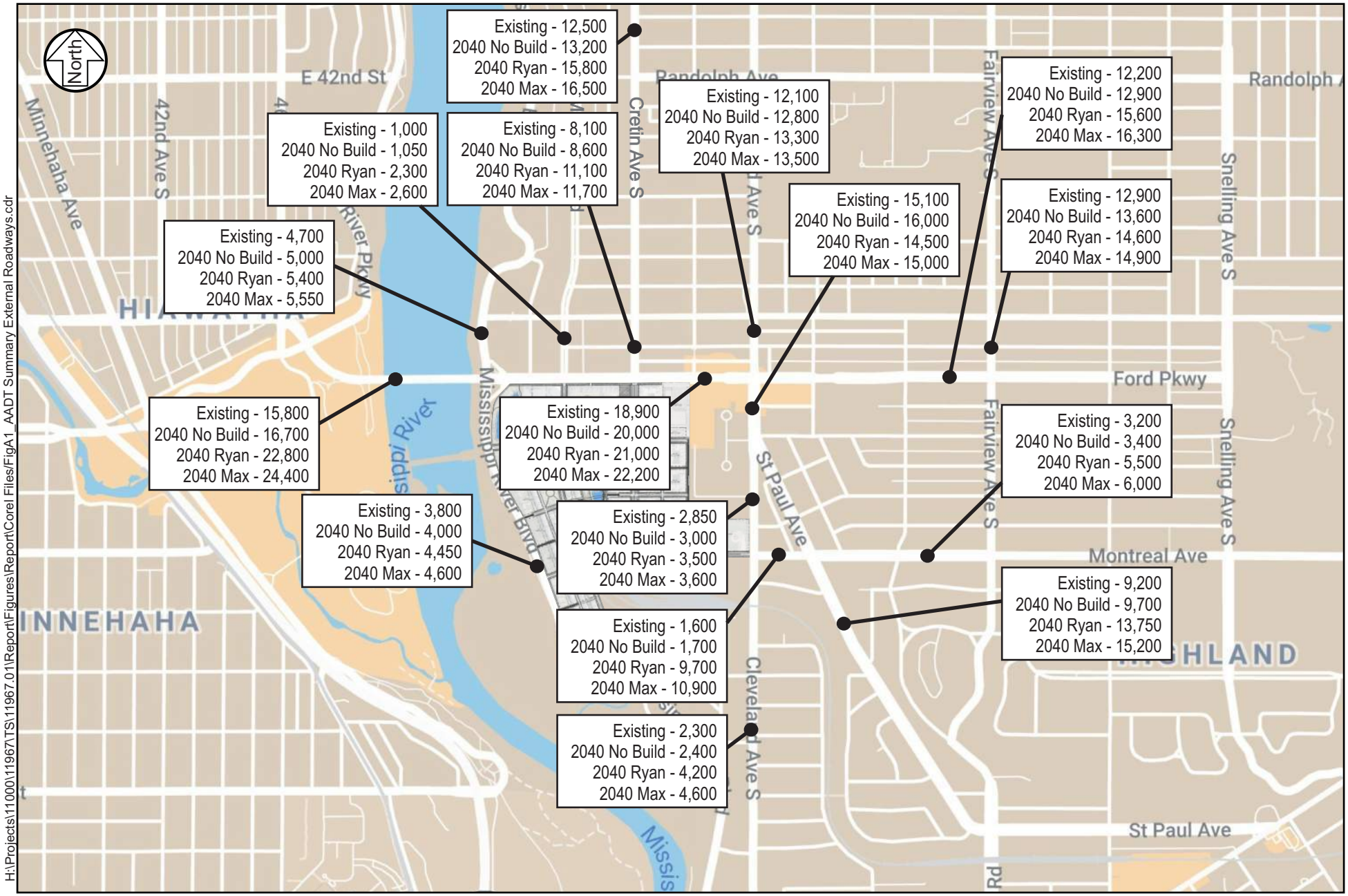
To conduct this evaluation, a trip generation estimate was conducted for the Highland Village apartment expansion, which is assumed to be between 120 and 180 multifamily residential units. For purposes of this evaluation, the Highland Village expansion is expected to generate approximately 80 a.m. peak hour, 100 p.m. peak hour, and 1,300 daily trips based on the 180 residential units. Incorporating these trips into the year 2040 Max Build analysis adds approximately 25 northbound left-turns at the St Paul Avenue/Cleveland Avenue/Bohland Avenue intersection during the a.m. and p.m. peak hours. This is a similar level of trip generation that the Max Build Ford Site trips contribute to this location.

With this additional expansion, the St Paul Avenue/Cleveland Avenue/Bohland Avenue intersection is expected to operate at an overall LOS A with side-street delays in the LOS C range during the peak hours. However, the overall intersection reconfiguration and traffic control changes previously discussed should still be considered given the current configuration.

Summary

Based on the findings within this study, the area transportation network is expected to be able to support the redevelopment of the Ford Site with the implementation of the mitigation identified for the respective AUAR scenarios. The AUAR transportation analysis also reviewed the existing and planned pedestrian, bicycle, and transit systems and presents opportunities for potential improvements to these networks. It is important to recognize that certain mitigation and enhancements may conflict with other transportation modal priorities and therefore are offered for consideration. The mitigation and enhancements identified are intended to support the redevelopment of the Ford Site and adjacent transportation system and provide discretion to stakeholders with respect to transportation priorities and implementation.

Appendix



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Average Daily Traffic Volume Summary - External Roadways

Ford Site AUAR Transportation Analysis

City of Saint Paul

Figure A1

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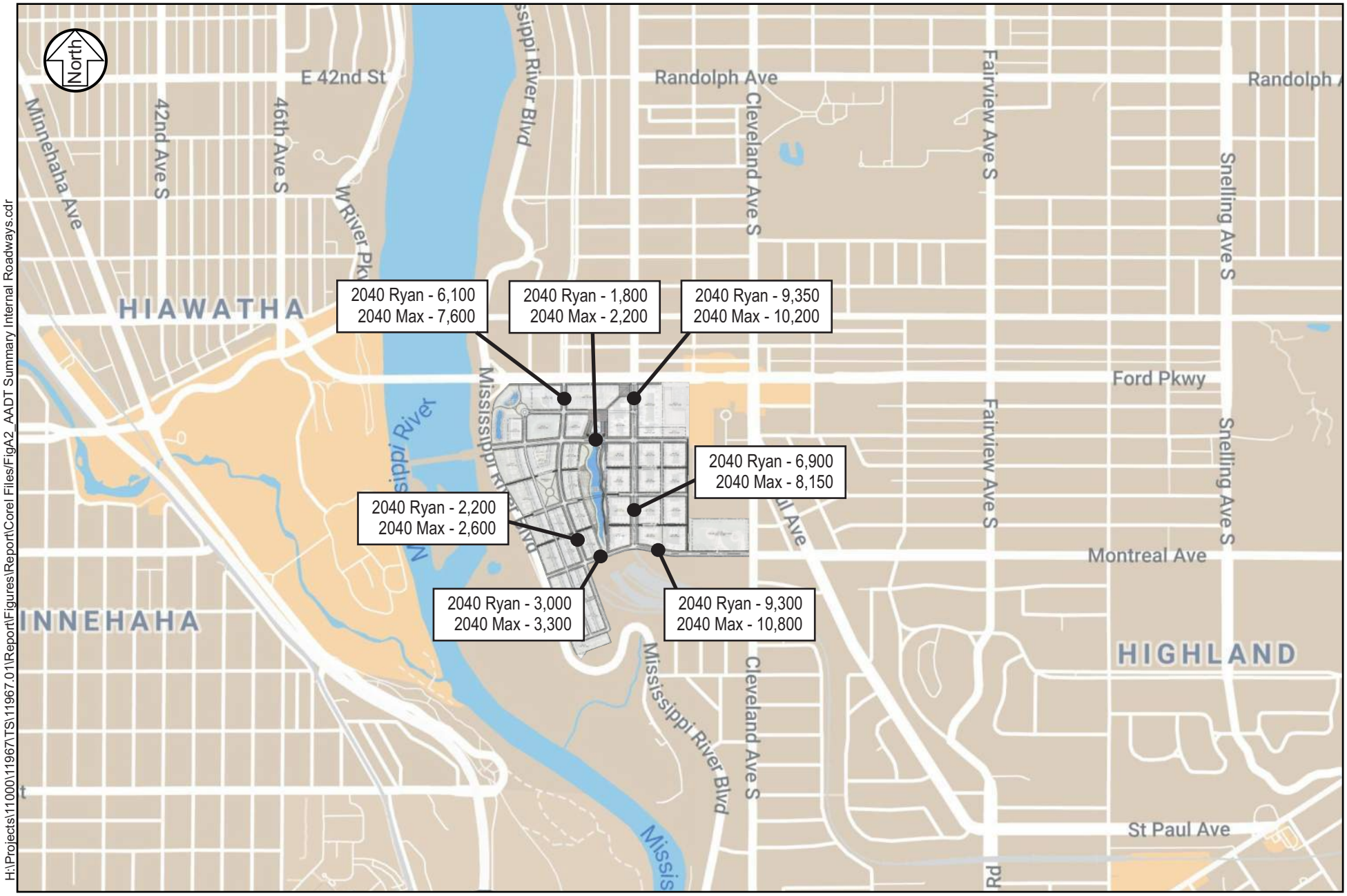
July 2019



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Average Daily Traffic Volume Summary - Internal Roadways

Ford Site AUAR Traffic Analysis

City of Saint Paul

Figure A2

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July 2019

TRIP GENERATION ANALYSIS - Ryan Proposal

Standard ITE Vehicular Trip Generation

TOTAL Vehicle Trips		Total	Entering	Exiting
Weekday	Residential	20,947	10,473	10,473
	Non-Residential	15,214	7,607	7,607
	Total	36,160	18,080	18,080
AM Peak Hour*	Residential	1,374	357	1,017
	Non-Residential	949	669	280
	Total	2,323	1,026	1,297
PM Peak Hour*	Residential	1,685	1,028	657
	Non-Residential	1,355	514	841
	Total	3,040	1,542	1,498

Context Input

Average vehicle occupancy for Saint Paul (4 Census block groups, 2000 data)	1.08
Vehicular Mode Split	77.7%
Transit Mode Split	10.0%
Nonmotorized (Walk/Bike) Mode Split	12.2%

Trip Gen Reduction Factors

		Reduction
Internal Capture Reduction	*Weekday*	18.7%
	AM Peak	16.4%
	PM Peak	17.7%
		Reduct
Residential Reduction Factors combined		25.9%
Non-residential Reduction Factors combined		25.9%

Trip Gen Adjustments and Reductions

		Daily	AM Entering	AM Exiting	PM Entering	PM Exiting
ITE Vehicle Trips (Average of Min and Max)	Residential	20,947	357	1,017	1,028	657
	Non-Residential	15,214	669	280	514	841
	Total	36,160	1,026	1,297	1,542	1,498
Person-Trips (Average Vehicle Occupancy applied)	Residential	22,622	386	1,098	1,111	709
	Non-Residential	16,431	722	303	555	909
	Total	39,053	1,108	1,401	1,666	1,618
Person Trips (with Internal Capture)	Residential	18,392	323	918	914	584
	Non-Residential	13,358	604	253	457	747
	Total	31,750	927	1,171	1,370	1,331
Vehicle Trips (Divide by AVO)	Residential	17,030	299	850	846	540
	Non-Residential	12,369	559	234	423	692
	Total	29,398	858	1,085	1,269	1,232
		Daily	AM Entering	AM Exiting	PM Entering	PM Exiting
		With Reductions				
Reduced Vehicle Trips (with reduction factors)	Residential	12,623	221	630	627	401
	Non-Residential	9,168	415	174	313	513
	Total	21,791	636	804	940	914
TOTAL EXTERNAL VEHICLE TRIPS		**21,791**	**636**	**804**	**940**	**914**
	Total Reduction	*40%*	*38%*	*38%*	*39%*	*39%*	*39%*

Trip Gen Outputs: Vehicular Trips

	Reduced
Total External Daily Vehicular Trips	21,791
Total External AM Peak Vehicular Trips	1,440
Total External PM Peak Vehicular Trips	1,854

Transit Trips

	Reduced
External Daily Trips	4,486
External	296
External	382

Walk/Bike Trips

	Reduced
External Daily Trips	5,473
External AM	362
External PM	466

Appendix Table 1B - Ryan Proposal Reduction Factor Inputs

INPUTS (Reduction Factors) - Ryan Proposal				
Category	**Factors**	**Input**	**Information**	**Source**
Jobs & Housing Balance	Housing units within ½ mile of the site	4,590	Measured from center of the project site	GIS, ACS 2014-2015
	Jobs within ½ mile of the site	2,392	Measured from center of the project site	GIS, ACS 2014-2015
	Jobs expected in project	1,691	Assumption of 1 employee per 275 sf of retail/office	Site Plan/Development Spreadsheet
	Proposed housing units in project	3,800		Site Plan/Development Spreadsheet
Local Serving Retail	Local retail presence (yes/no)	Yes	If there is local serving retail within walking distance or the project includes local serving retail, select "Yes"	Site Plan
Below Market Rate Housing	% of affordable housing	19%	726 Affordable Housing/3798 Total Proposed Housing Units	Site Plan/Development Spreadsheet
Transit Service Frequency	Average daily weekday buses stopped within ¼ mile	298	Bus Routes 23, 46, 70, 74, 84, and 134	Metro Transit Route Schedules
	Average daily weekday trains / rapid transit within ½ mile	216	A-Line Transit	Metro Transit Route Schedules
	Dedicated daily shuttles that serve the project	0	Currently no dedicated shuttle that serves the project	
Walking Environment	Mix of uses within 1/2 mile	Yes	Is there a mix of land uses within 1/2 mile of the project site for walking environment analysis	
	Intersection legs per square mile	571	Determined by site plan. Intersection legs (120) on the project site covering .21 sq miles	Site Plan
	% of sidewalks on both sides	80%	Does not include Woodlawn Ave or Ranger Way	Site Plan
	% of sidewalks on one side	0%		Site Plan
	Existing average block size (mile)	0.41	Existing Block Size (Ford Site as one block)	Google Map
	Future average block size (mile)	0.11	Average of 600 ft block size	Site Plan
Bicycle Facilities	Additional (separate) bike lane mileage per square mile (a)	14	3 miles of in-street separate lane and off-street path on project site, covering .21 sq miles	Site Plan
	Outdoor bike parking	Yes	Required bicycle spaces per Master Plan	
	Indoor secure bike parking	No	Master Plan states the timing that indoor parking should be accessible for commerical and residential uses, but does not state a required amount of indoor bicycle parking.	
	Indoor secure bike parking with showers/lockers/changing facilities	Yes	Master Plan States "Office and production/processing uses shall proivde 1 shower per 50 employees".	
	Bike share infrastructure (c)	Yes	Currently Lime Scooters, Previous Lime Bike Share. Assumed bike share next summer.	
	Winter maintenance of bicycle lanes/paths and sidewalks (d)	Yes	Assumption is that the bicycle facilities will be maintained in the winter.	
	Months w. average temperature below freezing in Saint Paul	3	3 months below 32F on average	http://www.areavibes.com/st.+paul-mn/weather/
Parking Supply	*Parking supply allocation*	Fully dedicated	Master plan states "Shared parking facilities are allowed and encouraged, but uses sharing facilities are not eligible for reductions to minimum parking requirementsas a result of sharing, per 63.206 (d), since off-street parking requirements already anticipate lower parking space demand due to sharing" Dedicated parking is assumed and no shared parking reductions will be applied	
	ITE required parking supply for the project	6,164		
	Project parking supply	5,890		
	Shared parking supply	274		
Parking Pricing	Resident daily parking price	$ -	Not enough data/information to assume price for parking. Assumption is all parking is free.	
	Employee daily parking price	$ -		
	Customer daily parking price	$ -		
	Parking unbundling from housing	No		
	Employee parking cash-out program	No		
Free Transit Passes	Resident Free Transit Pass Program	No	Not enough data/information to assume free transit passes	
	Employee Free Transit Pass Program	No		
TDM Programs	Car sharing/short-term car rental	Yes	Master plan ammendment states "Car share parking requirement shall be revised based on the number of residential units and stalls in non-residential areas as follows:" Car Sharing will be provided.	
	Carpooling/vanpooling	No	Assuming program exists for all uses within the site	
	Ride/carpool matching programs	No	Assuming program doesn't exist	
	Preferred carpool/vanpool parking	No	Assuming program exists for all uses within the site	
	Telecommuting/alternative work schedule	Yes	Assumption is that working from home capability/mobile work places are common in todays society	
	Guaranteed Ride Home	No	Assuming program doesn't exist	
	Transportation/commuter informational materials	Yes	Assumption that transit information will be provided to residents, employees, etc.	
	Dedicated employee transportation coordinator	No	Assuming program doesn't exist	

Appendix Table 1C - Ryan Proposal Reduction Calculations

JOBS & HOUSING BALANCE	Reduct
Included in analysis	Yes
Housing Units within a half mile	4,590
Housing Units in project	3,800
Employees within a half mile	2,392
Employees in project	1,691
Job/Household Ratio	0.49
IDEAL Job/Household Ratio	1.50
Reduction Credit	2.88%

Calculation

Trip Reduction Credit =

$$\frac{1-\left(\frac{ABS(1.5\times(h-e))}{1.5\times(h+e)}\right)-0.25}{0.25}\times 0.03$$

Where:

h = study area households (or housing units)

e = study area employment

Source: Ewing, R. & Cervero, R., 2010. Travel and the Built Environment: A Meta-Analysis. Journal of the American Planning Association, 76(3), pp. 265-294.
Criterion Planner/Engineers and Fehr & Peers Associates, 2001. Index 4D Method. A Quick-Response Method of Estimating Travel Impacts from Land-Use Changes, s.l.: US EPA.

LOCAL SERVING RETAIL	Reduct
Included in analysis	Yes
Local Serving Retail Presence	Yes
Reduction Credit	2%

Calculation

Trip Reduction Credit =

2% (low) 5%(high)

Source: Parsons Brinckerhoff Quade & Douglas, I., Cervero, R., Howard Stein-Hudson Associates & Zupan, J., 1996. Influence of Land Use Mix and Neighborhood Design on Transit Demand, Washington, DC: TRB
National Transit Institute, 2000. Coordinating Transportation and Land Use Course Manual, New Brunswick, NJ: Rutgers University.

Appendix Table 1C - Ryan Proposal Reduction Calculations

BELOW MARKET RATE HOUSING	Reduct
Included in analysis	Yes
Percent of housing units below market rate	19%
Reduction Credit	1.0%

Calculation

Residential Trip Reduction Credit = $\%\ units\ that\ are\ BMR \times 0.05$

Where:

BMR = Below Market Rate

Source: Holtzclaw, J. et al., 2002. Location Efficiency: Neighborhood and Socio-Economic Characteristics Determine Auto Ownership and Use – Studies in Chicago, Los Angeles and San Francisco. Transportation Planning and Technology, 25(1), pp. 1-27.

$$Maximum\ Trip\ Reduction\ for\ Affordable\ Housing = (-0.0565 \times \$41{,}663) \times \left(\frac{0.25}{11.915}\right) = 5\%$$

TRANSIT SERVICE FREQUENCY	Reduct
Included in analysis	Yes
Average daily weekday buses within 1/4 mile	298
Average daily weekday trains / rapid transit within 1/2 mile	216
Dedicated daily shuttles that serve the project	0
Transit Service Index	0.81
Reduction Credit	6.08%

Calculation

Tip Rate Reduction = $t \times 0.075$

Where: t = Transit service index

Transit Service Index = $\frac{b + 2 \times (r + s)}{900}$

Where:

b = average daily weekday Buses stopping within ¼ mile

r = average daily weekday Rail or rapid transit trips stopping within ½ mile

s = average daily weekday dedicated Shuttle trips

Notes: Transit trips should be based on bus stops located within a 1/4 mile and rapid transit stopping at stations within 1/2 mile.

The number of transit trips must include both directions to calculate the average daily buses, rapid service, shuttles, etc. (e.g., 1 northbound route A + 2 southbound route A buses = 3 bus trips)

A "transit trip" is one route traveling in one direction, counting as 1 trip.

Developments larger than 1/2 mile across must be broken into smaller units for determining the average transit service index.

Appendix Table 1C - Ryan Proposal Reduction Calculations

WALKING ENVIRONMENT - Connectivity and	Reduct
Included in analysis	Yes
Mix of uses within 1/2 mile	Yes
Intersections legs per square mile	571
Sidewalk completeness	80%
Sidewalks on both sides	80%
Sidewalks on one side	0%
Existing average block size (mile)	0.41
Future average block size (mile)	0.11
Block Size Reduction	-73%
Walking Environment Index	0.66
Reduction Credit	5.91%

Calculation

Tip Rate Reduction = $9\% * \frac{i + s + b}{3}$

Where:

i = Intersection density

s = Sidewalk completeness

b = (-1)*block size reduction

Intersection density = intersection legs per square mile / 1300 (or 1.0, whichever is less) - including alleys

Sidewalk completeness = % streets with sidewalks on both sides + 0.5 * % streets with sidewalk on one side, Trails and walkways should be included in the intersection measure.

BICYCLE FACILITY	Reduct
Included in analysis	Yes
Additional (separate) bike lane mileage per square mile (a)	14
Bike parking (b) *outdoor bike parking*	Yes
indoor secure bike parking	No
Indoor secure bike parking with showers/lockers/changing facilities	Yes
Bike share infrastructure (c)	Yes
Winter maintenance of bicycle lanes/paths and sidewalks (d)	Yes
Months w. average temperature below freezing in Saint Paul	3
*Additional increase in bike+walk trips**	8%
Bike Mode Share Increase	12.28%
Reduction Credit	6.14%

Calculation

Tip Rate Reduction = bike mode share increase/2 assuming bike mode share increase shifts from transit and driving equally

Notes: (a) TRIA- Bicycle network – 1% increase in bicycle mode share for each additional mile of bike lane per square mile.

(b) Outdoor bike parking - 8.6% increase; Indoor secure bike parking - 13.8% increase; indoor with amenities - 22.4% increase SOURCE: Wardman, Tight, and Page – 2007 as summarized in Pucher, Dill, and Handy (2010) (Referenced in TCRP Report 95, Traveler Response to Transportation

(c) bike share will increase bike mode share by 5~8% SOURCE: Victoria Transport Policy Institute (2008), Public Bike Systems: Automated Bike Rentals for Short Utilitarian Trips, http://www.vtpi.org/tdm/tdm126.htm. Note: this research does not state if the shift from automobile trips to bicycle trips is for commute or non-commute trips, nor does the research state at what time of day these trips occur, i.e. peak or non peak trips.

(d) Based on Tahoe's model (baseline 7 months) SOURCE: Tahoe Region Bicycle and Pedestrian Use Model, developed by LSC Transportation Consultants and Alta Planning as part of the Tahoe Basin Bicycle/Pedestrian Master Plan (2009)

Appendix Table 1C - Ryan Proposal Reduction Calculations

PARKING SUPPLY	Reduct
Included in analysis	Yes
Parking supply allocation	Fully dedicated
ITE required parking supply	6,164
Project parking supply	5,890
Shared parking supply	274
Parking supply reduction	4%
All non-parking supply reduction combined	
Residential	22%
Non-residential	22%
Reduction Credit	
Residential	0.00%
Non-residential	0.00%

if "fully dedicated", credit only applied to the uses with a supply below ITE

if "fully shared', credit applied to all land uses

Calculation

Tip Rate Reduction = $\frac{p-(m+t+b)}{2}$

Where: p=parking supply reduction

m+t+b=all non-parking supply reduction combined

Note: residential counted density reduction from single family housing type (baseline rate 9.57)

PARKING PRICING	Reduct
Included in analysis	Yes
Residents pay	No
Average Daily parking price	$ -
Parking unbundling	No
Resident Parking Price Reduction Credit	0.00%
Resident Unbundling Bonus Credit	0.00%
Employees pay	No
Daily parking price	$ -
Parking cash-out	No
Employee Parking Price Reduction Credit	0.00%
Employee Cash-out Bonus Credit	0.00%
Customers pay	No
Daily parking price	$ -
Customer Parking Price Credit	0.00%
Residential Parking Cost Reduction Credit	0.00%
Non-Residential Parking Cost Reduction Credit	0.00%

Calculation

Cash-Out Bonus

$Employee\ Trip\ Reduction = (parking\ pricing\ reduction) \times 50\%$

Parking Pricing

$Employee\ and\ /\ or\ Customer\ Trip\ Reduction = \left(\left(\frac{daily\ parking\ charge}{\$7.50}\right) * 25\%\right)$

Appendix Table 1C - Ryan Proposal Reduction Calculations

FREE TRANSIT PASSES	Reduct
Included in analysis	Yes
Resident Free Transit Pass Program	No
Employee Free Transit Pass Program	No
Free Transit Pass Reduction Credit	
Residential	0.00%
Non-residential	0.00%

Calculation

$$Resident\ and\ /\ or\ Employee\ Trip\ Reduction = (t) \times 25\%$$

Where: t = Transit reduction impact

TDM PROGRAMS	Reduct
Included in analysis	Yes
Car sharing/short-term car rental	Yes
Carpooling/vanpooling	No
Ride/carpool matching programs	No
Preferred carpool/vanpool parking	No
Telecommuting/alternative work schedule	Yes
Guaranteed Ride Home	No
Transportation/commuter informational materials	Yes
Dedicated employee transportation coordinator	No
# of TDM Programs	3
TDM Program Reduction Credit	1.91%

Assuming that half the people that bike/walk would otherwise have driven, and the other half would have taken transit

Calculation

Major TDM Program (5 or more elements)

$$Employee\ Trip\ Reduction = (2\% + (10\% \times t) + (10\% \times b))$$

Minor TDM Program (3 to 4 elements)

$$Employee\ Trip\ Reduction = (1\% + (5\% \times t) + (5\% \times b))$$

Where: t = Transit reduction impact

b = Bicycle & pedestrian reduction impact

TRIP GENERATION ANALYSIS - Max Build

Standard ITE Vehicular Trip Generation

TOTAL Vehicle Trips		Total	Entering	Exiting
Weekday	Residential	22,138	11,069	11,069
	Non-Residential	24,254	12,127	12,127
	Total	46,392	23,196	23,196
AM Peak Hour*	Residential	1,451	377	1,075
	Non-Residential	1,460	1,069	391
	Total	2,911	1,445	1,466
PM Peak Hour*	Residential	1,780	1,087	693
	Non-Residential	2,310	859	1,450
	Total	4,090	1,946	2,144

Context Input

Average vehicle occupancy for Saint Paul (4 Census block groups, 2000 data)	1.08
Vehicular Mode Split	77.7%
Transit Mode Split	10.0%
Nonmotorized (Walk/Bike) Mode Split	12.2%

Trip Gen Reduction Factors

		NEW
Internal Capture Reduction	*Weekday*	18.7%
	AM Peak	16.9%
	PM Peak	21.0%
		Reduct
Residential Reduction Factors combined		26.9%
Non-residential Reduction Factors combined		26.9%

Trip Gen Adjustments and Reductions

		Daily	AM Entering	AM Exiting	PM Entering	PM Exiting
ITE Vehicle Trips (Average of Min and Max)	Residential	22,138	377	1,075	1,087	693
	Non-Residential	24,254	1,069	391	859	1,450
	Total	46,392	1,445	1,466	1,946	2,144
Person-Trips (Average Vehicle Occupancy applied)	Residential	23,909	407	1,161	1,174	749
	Non-Residential	26,194	1,154	422	928	1,566
	Total	50,103	1,561	1,583	2,102	2,315
Person Trips (with Internal Capture)	Residential	19,438	338	965	927	591
	Non-Residential	21,296	959	351	733	1,237
	Total	40,734	1,297	1,316	1,660	1,829
Vehicle Trips (Divide by AVO)	Residential	17,998	313	893	858	548
	Non-Residential	19,718	888	325	679	1,146
	Total	37,716	1,201	1,218	1,537	1,693
		Daily	AM Entering	AM Exiting	PM Entering	PM Exiting
		With Reductions				
Reduced Vehicle Trips (with reduction factors)	Residential	13,158	229	653	628	400
	Non-Residential	14,415	649	237	496	838
	Total	27,573	878	891	1,124	1,238
TOTAL EXTERNAL VEHICLE TRIPS		**27,573**	**878**	**891**	**1,124**	**1,238**
Total Reduction		*41%*	*39%*	*39%*	*42%*	*42%*

41%

Trip Gen Outputs: Vehicular Trips

	Reduct
Total External Daily Vehicular Trips	27,573
Total External AM Peak Vehicular Trips	1,769
Total External PM Peak Vehicular Trips	2,362

Transit Trips

	Reduct
External Daily Trips	5,928
External	380
External	508

Walk/Bike Trips

	Reduct
External Daily Trips	7,232
External AM	464
External PM	620

Appendix Table 2B - Max Build Reduction Factor Inputs

INPUTS (Reduction Factors) - Max Build				
Category	**Factors**	**Input**	**Information**	**Source**
Jobs & Housing Balance	Housing units within ½ mile of the site	4,590	Measured from center of the project site	GIS, ACS 2014-2015
	Jobs within ½ mile of the site	2,392	Measured from center of the project site	GIS, ACS 2014-2015
	Jobs expected in project	2,855	Assumption of 1 employee per 275 sf of retail/office	Site Plan/Development Spreadsheet
	Proposed housing units in project	4,000		Site Plan/Development Spreadsheet
Local Serving Retail	Local retail presence (yes/no)	Yes	If there is local serving retail within walking distance or the project includes local serving retail, select "Yes"	Site Plan
Below Market Rate Housing	% of affordable housing	18%	726 Affordable Housing/4000 Total Proposed Housing Units	Site Plan/Development Spreadsheet
Transit Service Frequency	Average daily weekday buses stopped within ¼ mile	298	Bus Routes 23, 46, 70, 74, 84, and 134	Metro Transit Route Schedules
	Average daily weekday trains / rapid transit within ½ mile	216	A-Line Transit	Metro Transit Route Schedules
	Dedicated daily shuttles that serve the project	0	Currently no dedicated shuttle that serves the project	
Walking Environment	Mix of uses within 1/2 mile	Yes	Is there a mix of land uses within 1/2 mile of the project site for walking environment analysis	
	Intersection legs per square mile	571	Determined by site plan. Intersection legs (120) on the project site covering .21 sq miles	Site Plan
	% of sidewalks on both sides	80%	Does not include Woodlawn Ave or Ranger Way	Site Plan
	% of sidewalks on one side	0%		Site Plan
	Existing average block size (mile)	0.41	Existing Block Size (Ford Site as one block)	Google Map
	Future average block size (mile)	0.11	Average of 600 ft block size	Site Plan
Bicycle Facilities	Additional (separate) bike lane mileage per square mile (a)	14	3 miles of in-street separate lane and off-street path on project site, covering .21 sq miles	Site Plan
	Outdoor bike parking	Yes	Required bicycle spaces per Master Plan	
	Indoor secure bike parking	No	Master Plan states the timing that indoor parking should be accessible for commerical and residential uses, but does not state a required amount of indoor bicycle parking.	
	Indoor secure bike parking with showers/lockers/changing facilities	Yes	Master Plan States "Office and production/processing uses shall proivde 1 shower per 50 employees".	
	Bike share infrastructure (c)	Yes	Currently Lime Scooters, Previous Lime Bike Share. Assumed bike share next summer.	
	Winter maintenance of bicycle lanes/paths and sidewalks (d)	Yes	Assumption is that the bicycle facilities will be maintained in the winter.	
	Months w. average temperature below freezing in Saint Paul	3	3 months below 32F on average	http://www.areavibes.com/st.+paul-mn/weather/
Parking Supply	*Parking supply allocation*	Fully dedicated	Master plan states "Shared parking facilities are allowed and encouraged, but uses sharing facilities are not eligible for reductions to minimum parking requirementsas a result of sharing, per 63.206 (d), since off-street parking requirements already anticipate lower parking space demand due to sharing" Dedicated parking is assumed and no shared parking reductions will be applied	
	ITE required parking supply for the project	6,164		
	Project parking supply	5,890		
	Shared parking supply	274		
Parking Pricing	Resident daily parking price	$ -	Not enough data/information to assume price for parking. Assumption is all parking is free.	
	Employee daily parking price	$ -		
	Customer daily parking price	$ -		
	Parking unbundling from housing	No		
	Employee parking cash-out program	No		
Free Transit Passes	Resident Free Transit Pass Program	No	Not enough data/information to assume free transit passes	
	Employee Free Transit Pass Program	No		
TDM Programs	Car sharing/short-term car rental	Yes	Master plan ammendment states "Car share parking requirement shall be revised based on the number of residential units and stalls in non-residential areas as follows:" Car Sharing will be provided.	
	Carpooling/vanpooling	No	Assuming program exists for all uses within the site	
	Ride/carpool matching programs	No	Assuming program doesn't exist	
	Preferred carpool/vanpool parking	No	Assuming program exists for all uses within the site	
	Telecommuting/alternative work schedule	Yes	Assumption is that working from home capability/mobile work places are common in todays society	
	Guaranteed Ride Home	No	Assuming program doesn't exist	
	Transportation/commuter informational materials	Yes	Assumption that transit information will be provided to residents, employees, etc.	
	Dedicated employee transportation coordinator	No	Assuming program doesn't exist	

Appendix Table 2C - Max Build Reduction Calculations

JOBS & HOUSING BALANCE	Reduct
Included in analysis	Yes
Housing Units within a half mile	4,590
Housing Units in project	4,000
Employees within a half mile	2,392
Employees in project	2,855
Job/Household Ratio	0.61
IDEAL Job/Household Ratio	1.50
Reduction Credit	3.94%

Calculation

Trip Reduction Credit =

$$\frac{1-\left(\frac{ABS(1.5\times(h-e))}{1.5\times(h+e)}\right)-0.25}{0.25}\times 0.03$$

Where:

h = study area households (or housing units)

e = study area employment

Source: Ewing, R. & Cervero, R., 2010. Travel and the Built Environment: A Meta-Analysis. Journal of the American Planning Association, 76(3), pp. 265-294.
Criterion Planner/Engineers and Fehr & Peers Associates, 2001. Index 4D Method. A Quick-Response Method of Estimating Travel Impacts from Land-Use Changes, s.l.: US EPA.

LOCAL SERVING RETAIL	Reduct
Included in analysis	Yes
Local Serving Retail Presence	Yes
Reduction Credit	2%

Calculation

Trip Reduction Credit =

2% (low) 5%(high)

Source: Parsons Brinckerhoff Quade & Douglas, I., Cervero, R., Howard Stein-Hudson Associates & Zupan, J., 1996. Influence of Land Use Mix and Neighborhood Design on Transit Demand, Washington, DC: TRB
National Transit Institute, 2000. Coordinating Transportation and Land Use Course Manual, New Brunswick, NJ: Rutgers University.

Appendix Table 2C - Max Build Reduction Calculations

BELOW MARKET RATE HOUSING	Reduct
Included in analysis	Yes
Percent of housing units below market rate	18%
Reduction Credit	0.9%

Calculation

Residential Trip Reduction Credit = $\%\ units\ that\ are\ BMR \times 0.05$

Where:

BMR = Below Market Rate

Source: Holtzclaw, J. et al., 2002. Location Efficiency: Neighborhood and Socio-Economic Characteristics Determine Auto Ownership and Use – Studies in Chicago, Los Angeles and San Francisco. Transportation Planning and Technology, 25(1), pp. 1-27.

$$Maximum\ Trip\ Reduction\ for\ Affordable\ Housing = (-0.0565 \times \$41{,}663) \times \left(\frac{0.25}{11.915}\right) = 5\%$$

TRANSIT SERVICE FREQUENCY	Reduct
Included in analysis	Yes
Average daily weekday buses within 1/4 mile	298
Average daily weekday trains / rapid transit within 1/2 mile	216
Dedicated daily shuttles that serve the project	0
Transit Service Index	0.81
Reduction Credit	6.08%

Calculation

Tip Rate Reduction = $t \times 0.075$

Where: t = Transit service index

Transit Service Index = $\frac{b + 2 \times (r + s)}{900}$

Where:

b = average daily weekday Buses stopping within ¼ mile

r = average daily weekday Rail or rapid transit trips stopping within ½ mile

s = average daily weekday dedicated Shuttle trips

Notes: Transit trips should be based on bus stops located within a 1/4 mile and rapid transit stopping at stations within 1/2 mile.

The number of transit trips must include both directions to calculate the average daily buses, rapid service, shuttles, etc. (e.g., 1 northbound route A + 2 southbound route A buses = 3 bus trips)

A "transit trip" is one route traveling in one direction, counting as 1 trip.

Developments larger than 1/2 mile across must be broken into smaller units for determining the average transit service index.

WALKING ENVIRONMENT - Connectivity and	Reduct
Included in analysis	Yes
Mix of uses within 1/2 mile	Yes
Intersections legs per square mile	571
Sidewalk completeness	80%
Sidewalks on both sides	80%
Sidewalks on one side	0%
Existing average block size (mile)	0.41
Future average block size (mile)	0.11
Block Size Reduction	-73%
Walking Environment Index	0.66
Reduction Credit	5.91%

Calculation

Tip Rate Reduction = $9\% * \frac{i + s + b}{3}$

Where:

i = Intersection density

s = Sidewalk completeness

b = (-1)*block size reduction

Intersection density = intersection legs per square mile / 1300 (or 1.0, whichever is less) - including alleys

Sidewalk completeness = % streets with sidewalks on both sides + 0.5 * % streets with sidewalk on one side, Trails and walkways should be included in the intersection measure.

BICYCLE FACILITY		Reduct
Included in analysis		Yes
Additional (separate) bike lane mileage per square mile (a)		14
Bike parking (b)	*outdoor bike parking*	Yes
	indoor secure bike parking	No
	Indoor secure bike parking with showers/lockers/changing facilities	Yes
Bike share infrastructure (c)		Yes
Winter maintenance of bicycle lanes/paths and sidewalks (d)		Yes
	Months w. average temperature below freezing in Saint Paul	3
	*Additional increase in bike+walk trips**	8%
	Bike Mode Share Increase	12.28%
	Reduction Credit	6.14%

Calculation

Tip Rate Reduction = bike mode share increase/2 assuming bike mode share increase shifts from transit and driving equally

Notes: (a) TRIA- Bicycle network – 1% increase in bicycle mode share for each additional mile of bike lane per square mile.

(b) Outdoor bike parking - 8.6% increase; Indoor secure bike parking - 13.8% increase; indoor with amenities - 22.4% increase SOURCE: Wardman, Tight, and Page – 2007 as summarized in Pucher, Dill, and Handy (2010) (Referenced in TCRP Report 95, Traveler Response to Transportation

(c) bike share will increase bike mode share by 5~8% SOURCE: Victoria Transport Policy Institute (2008), Public Bike Systems: Automated Bike Rentals for Short Utilitarian Trips, http://www.vtpi.org/tdm/tdm126.htm. Note: this research does not state if the shift from automobile trips to bicycle trips is for commute or non-commute trips, nor does the research state at what time of day these trips occur, i.e. peak or non peak trips.

(d) Based on Tahoe's model (baseline 7 months) SOURCE: Tahoe Region Bicycle and Pedestrian Use Model, developed by LSC Transportation Consultants and Alta Planning as part of the Tahoe Basin Bicycle/Pedestrian Master Plan (2009)

Appendix Table 2C - Max Build Reduction Calculations

PARKING SUPPLY	Reduct
Included in analysis	Yes
Parking supply allocation	Fully dedicated
ITE required parking supply	6,164
Project parking supply	5,890
Shared parking supply	274
Parking supply reduction	4%
All non-parking supply reduction combined	
Residential	22%
Non-residential	22%
Reduction Credit	
Residential	0.00%
Non-residential	0.00%

if "fully dedicated", credit only applied to the uses with a supply below ITE

if "fully shared', credit applied to all land uses

Calculation

Tip Rate Reduction = $\frac{p-(m+t+b)}{2}$

Where: p=parking supply reduction

m+t+b=all non-parking supply reduction combined

Note: residential counted density reduction from single family housing type (baseline rate 9.57)

PARKING PRICING	Reduct
Included in analysis	Yes
Residents pay	No
Average Daily parking price	$ -
Parking unbundling	No
Resident Parking Price Reduction Credit	0.00%
Resident Unbundling Bonus Credit	0.00%
Employees pay	No
Daily parking price	$ -
Parking cash-out	No
Employee Parking Price Reduction Credit	0.00%
Employee Cash-out Bonus Credit	0.00%
Customers pay	No
Daily parking price	$ -
Customer Parking Price Credit	0.00%
Residential Parking Cost Reduction Credit	0.00%
Non-Residential Parking Cost Reduction Credit	0.00%

Calculation

Cash-Out Bonus

$Employee\ Trip\ Reduction = (parking\ pricing\ reduction) \times 50\%$

Parking Pricing

$Employee\ and\ /\ or\ Customer\ Trip\ Reduction = \left(\left(\frac{daily\ parking\ charge}{\$7.50}\right) * 25\%\right)$

FREE TRANSIT PASSES	Reduct
Included in analysis	Yes
Resident Free Transit Pass Program	No
Employee Free Transit Pass Program	No
Free Transit Pass Reduction Credit	
Residential	0.00%
Non-residential	0.00%

Calculation

$$Resident\ and\ /\ or\ Employee\ Trip\ Reduction = (t) \times 25\%$$

Where: t = Transit reduction impact

TDM PROGRAMS	Reduct
Included in analysis	Yes
Car sharing/short-term car rental	Yes
Carpooling/vanpooling	No
Ride/carpool matching programs	No
Preferred carpool/vanpool parking	No
Telecommuting/alternative work schedule	Yes
Guaranteed Ride Home	No
Transportation/commuter informational materials	Yes
Dedicated employee transportation coordinator	No
# of TDM Programs	3
TDM Program Reduction Credit	1.91%

Assuming that half the people that bike/walk would otherwise have driven, and the other half would have taken transit

Calculation

Major TDM Program (5 or more elements)

$$Employee\ Trip\ Reduction = (2\% + (10\% \times t) + (10\% \times b))$$

Minor TDM Program (3 to 4 elements)

$$Employee\ Trip\ Reduction = (1\% + (5\% \times t) + (5\% \times b))$$

Where: t = Transit reduction impact

b = Bicycle & pedestrian reduction impact

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
10	**S Ford Ramp/N Ford Ramp & Ford Ave (Unsignalized)**													
	Lanes		↑↑>			↑↑>				→			→	
	SimTraffic Delay		1.9			0.4				4.3			4.4	1.5
	SimTraffic LOS		A			A				A			A	A
	SimTraffic 95th Queue		8							47			54	
	Queue Block Time (%)													
	Denied Entry													
20	**Ford Ave & Woodlawn Ave (Unsignalized)**													
	Lanes	←	↑↑			↑↑>						0		
	SimTraffic Delay	4.2	0.4			0.4						-		0.5
	SimTraffic LOS	A	A			A						A		A
	SimTraffic 95th Queue	31				7								
	Queue Block Time (%)	1												
	Denied Entry													
30	**Mt Curve Blvd & Ford Ave (Unsignalized)**													
	Lanes	←	↑↑>			↑↑>					←		→	
	SimTraffic Delay	5.0	0.4			1.6					14.3		6.3	1.3
	SimTraffic LOS	A	A			A					B		A	A
	SimTraffic 95th Queue	30				2					34		51	
	Queue Block Time (%)										1		2	
	Denied Entry													
40	**Cretin Ave & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>			↑↑>					←		→	
	SimTraffic Delay	10.3	4.1			12.9					32.2		5.0	10.5
	SimTraffic LOS	B	A			B					C		A	B
	SimTraffic 95th Queue	96	85			192					124		85	
	Queue Block Time (%)	1				19					1			
	Denied Entry													
50	**Finn St & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>		←	0		<↑		→	
	SimTraffic Delay	23.0	12.0		11.6	7.4		31.2	-		26.7		5.6	11.3
	SimTraffic LOS	C	B		B	A		C	A		C		A	B
	SimTraffic 95th Queue	48	159		70	117		97			70		54	
	Queue Block Time (%)	1	10								1			
	Denied Entry													
60	**Cleveland Ave & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑↑>		
	SimTraffic Delay	41.8	26.2		40.8	27.3		28.8	14.0		40.7	34.9		26.9
	SimTraffic LOS	D	C		D	C		C	B		D	C		C
	SimTraffic 95th Queue	132	213		90	168		239	248		118	338		
	Queue Block Time (%)	3	11			1						52		
	Denied Entry													
61	**Kenneth St & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>		<↑>			<↑>			
	SimTraffic Delay	9.6	5.0		14.7	8.4		24.8			25.0			9.2
	SimTraffic LOS	A	A		B	A		C			C			A
	SimTraffic 95th Queue	39	67		52	129		84			86			
	Queue Block Time (%)	3	10			4								
	Denied Entry													
62	**Fairview Ave & Ford Ave (Signalized -- Cycle Length: 65)**													
	Lanes	←	↑	→	←	↑	→	←	↑>		←	↑>		
	SimTraffic Delay	30.7	15.6	8.0	23.0	15.8	7.9	35.4	19.7		33.4	17.1		18.1
	SimTraffic LOS	C	B	A	C	B	A	D	B		C	B		B
	SimTraffic 95th Queue	110	209	84	61	186	63	100	300		63	253		
	Queue Block Time (%)		8			10			11			11		
	Denied Entry													
65	**Cleveland Ave & Highland Pkwy (Signalized -- Cycle Length: 80)**													
	Lanes	<↑		→	<↑		→	←	↑>		←	↑>		
	SimTraffic Delay	33.8		8.5	33.6		10.2	11.9	8.4		17.9	5.8		10.0
	SimTraffic LOS	C		A	C		B	B	A		B	A		A

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	SimTraffic 95th Queue	79		66	96		58	65	204		41	133		
	Queue Block Time (%)	22		7	35		4		5			4		
	Denied Entry													
75	**St Paul Ave & Montreal Ave (All-way stop)**													
	Lanes	<↑		→	<↑>			<↑↑>			←	↑↑>		
	SimTraffic Delay	9.7		4.0	14.3			13.0			8.0	8.9		10.6
	SimTraffic LOS	A		A	B			B			A	A		B
	SimTraffic 95th Queue	41		25	93			99			49	89		
	Queue Block Time (%)	2												
	Denied Entry													
80	**Edgcumbe Rd & St Paul Ave (Signalized -- Cycle Length: 84)**													
	Lanes	<↑↑		→	<↑↑>			←	↑↑>		←	↑↑>		
	SimTraffic Delay	27.0		15.3	27.7			20.0	8.2		19.9	19.2		16.6
	SimTraffic LOS	C		B	C			B	A		B	B		B
	SimTraffic 95th Queue	177		141	117			217	183		71	187		
	Queue Block Time (%)	1		21				4				2		
	Denied Entry													
90	**Cleveland Ave & Montreal Ave (Unsignalized)**													
	Lanes				←>	0			↑>		<↑			
	SimTraffic Delay				6.7	-			1.1		0.3			1.6
	SimTraffic LOS				A	A			A		A			A
	SimTraffic 95th Queue				45						25			
	Queue Block Time (%)													
	Denied Entry													
100	**Fairview Ave & Montreal Ave (Signalized -- Cycle Length: 65)**													
	Lanes	←	↑	→	←	↑>		←	↑>		←	↑>		
	SimTraffic Delay	28.8	21.4	12.2	25.4	23.2		19.9	9.9		23.7	14.9		15.1
	SimTraffic LOS	C	C	B	C	C		B	A		C	B		B
	SimTraffic 95th Queue	49	116	50	63	168		61	208		95	261		
	Queue Block Time (%)		34	2		9			11			13		
	Denied Entry													
120	**Mississippi River Blvd & N Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				6.3	-			1.1		2.6	0.2		1.2
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				45						34			
	Queue Block Time (%)													
	Denied Entry													
130	**Mississippi River Blvd & S Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				5.9	-			1.1		2.4	0.2		2.0
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				63				2		18			
	Queue Block Time (%)													
	Denied Entry													
400	**Mt Curve Blvd & Highland Pkwy (All-way stop)**													
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	5.9			7.6			5.6			5.9			5.5
	SimTraffic LOS	A			A			A			A			A
	SimTraffic 95th Queue	47			40			44			48			
	Queue Block Time (%)													
	Denied Entry													
500	**Cretin Ave & Randolph Ave (Signalized -- Cycle Length: 65)**													
	Lanes	<↑>			<↑	→		<↑>			←	↑>		
	SimTraffic Delay	26.2			28.0	13.8		7.2			18.6	9.4		13.1
	SimTraffic LOS	C			C	B		A			B	A		B
	SimTraffic 95th Queue	104			196	58		178			179	80		
	Queue Block Time (%)				41	28					16	8		
	Denied Entry													
501	**Cretin Ave & Highland Pkwy (Unsignalized)**													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Lanes	<↑>			<↑>				<↑>		<↑>			
	SimTraffic Delay	10.6			10.6				0.9		1.3			2.5
	SimTraffic LOS	B			B				A		A			A
	SimTraffic 95th Queue	47			65				3		64			
	Queue Block Time (%)													
	Denied Entry													

70: Cleveland Ave & St Paul Ave & Bohland Ave Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.0
Total Del/Veh (s)	5.7	0.6	1.6	1.4

71: St Paul Ave Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0
Total Del/Veh (s)	14.6	2.7	0.2	2.7

72: Cleveland Ave & St Paul Ave Performance by approach

Approach	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	8.2	0.8	4.3

73: Cleveland Ave & Inner Drive Performance by approach

Approach	EB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.0
Total Del/Veh (s)	2.6	0.1	0.8

140: 46th Ave & E 46th St/Ford Pkwy Performance by approach

Approach	EB	WB	NB	SB	SW	All
Denied Del/Veh (s)	0.5	0.0	2.8	0.6	0.1	0.8
Total Del/Veh (s)	13.1	10.1	15.9	53.0	67.8	16.7

Total Zone Performance

Denied Del/Veh (s)	1.2
Total Del/Veh (s)	768.9

Intersection: 70: Cleveland Ave & St Paul Ave & Bohland Ave

Movement	WB	NB	SB
Directions Served	R	TR	TR
Maximum Queue (ft)	69	17	3
Average Queue (ft)	29	1	0
95th Queue (ft)	54	10	0
Link Distance (ft)	762	168	556
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 71: St Paul Ave

Movement	EB	NB
Directions Served	LR	T
Maximum Queue (ft)	58	3
Average Queue (ft)	40	0
95th Queue (ft)	62	4
Link Distance (ft)	51	1142
Upstream Blk Time (%)	12	
Queuing Penalty (veh)	13	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 72: Cleveland Ave & St Paul Ave

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	99	42
Average Queue (ft)	38	3
95th Queue (ft)	72	24
Link Distance (ft)	651	99
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 73: Cleveland Ave & Inner Drive

Movement	EB	SB
Directions Served	R	TR
Maximum Queue (ft)	39	6
Average Queue (ft)	18	0
95th Queue (ft)	42	4
Link Distance (ft)	285	58
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 140: 46th Ave & E 46th St/Ford Pkwy

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SW
Directions Served	<L	T	TR	L	T	TR>	LT	>	LT	R	<LR>
Maximum Queue (ft)	99	140	132	124	137	155	302	62	262	56	51
Average Queue (ft)	31	65	43	30	36	68	86	44	106	23	8
95th Queue (ft)	73	125	103	78	96	133	246	59	212	61	33
Link Distance (ft)		1464	1464		1080	1080	1320		1520		627
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	75			110				25		25	
Storage Blk Time (%)	1	6		0	0		33	8	60	2	
Queuing Penalty (veh)	2	4		1	1		101	3	15	2	

Zone Summary

Zone wide Queuing Penalty: 141

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
10	**S Ford Ramp/N Ford Ramp & Ford Ave (Unsignalized)**													
	Lanes		↑↑>			↑↑>				→			→	
	SimTraffic Delay		2.4			0.7				5.8			7.0	2.1
	SimTraffic LOS		A			A				A			A	A
	SimTraffic 95th Queue		7			7				57			87	
	Queue Block Time (%)													
	Denied Entry													
20	**Ford Ave & Woodlawn Ave (Unsignalized)**													
	Lanes	←	↑↑			↑↑>					<>	0		
	SimTraffic Delay	6.7	0.5			0.7					24.6	-		1.0
	SimTraffic LOS	A	A			A					C	A		A
	SimTraffic 95th Queue	41				4					57			
	Queue Block Time (%)	3												
	Denied Entry													
30	**Mt Curve Blvd & Ford Ave (Unsignalized)**													
	Lanes	←	↑↑>			↑↑>					←		→	
	SimTraffic Delay	8.0	0.5			1.9					29.8		8.1	1.6
	SimTraffic LOS	A	A			A					D		A	A
	SimTraffic 95th Queue	44	28			3					21		51	
	Queue Block Time (%)	1											3	
	Denied Entry													
40	**Cretin Ave & Ford Ave (Signalized -- Cycle Length: 110)**													
	Lanes	←	↑↑>			↑↑>					←		→	
	SimTraffic Delay	18.0	6.4			13.8					43.4		9.7	14.6
	SimTraffic LOS	B	A			B					D		A	B
	SimTraffic 95th Queue	135	129			256					191		261	
	Queue Block Time (%)	3	1			21					15		1	
	Denied Entry													
50	**Finn St & Ford Ave (Signalized -- Cycle Length: 110)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		<↑		→	
	SimTraffic Delay	21.6	11.8		18.6	6.6		37.6	32.8		40.7		11.5	14.6
	SimTraffic LOS	C	B		B	A		D	C		D		B	B
	SimTraffic 95th Queue	67	171		121	110		177	139		155		99	
	Queue Block Time (%)	5	12								15			
	Denied Entry													
60	**Cleveland Ave & Ford Ave (Signalized -- Cycle Length: 110)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑↑>		
	SimTraffic Delay	87.1	72.1		42.4	44.4		46.3	23.9		72.2	75.3		60.9
	SimTraffic LOS	F	E		D	D		D	C		E	E		E
	SimTraffic 95th Queue	211	593		154	285		281	357		189	738		
	Queue Block Time (%)	14	56			15					1	50		
	Denied Entry													
61	**Kenneth St & Ford Ave (Signalized -- Cycle Length: 55)**													
	Lanes	←	↑↑>		←	↑↑>		<↑>			<↑>			
	SimTraffic Delay	20.7	10.3		20.2	11.0		20.0			15.7			11.2
	SimTraffic LOS	C	B		C	B		B			B			B
	SimTraffic 95th Queue	67	157		59	191		100			95			
	Queue Block Time (%)	10	27			7								
	Denied Entry													
62	**Fairview Ave & Ford Ave (Signalized -- Cycle Length: 65)**													
	Lanes	←	↑	→	←	↑	→	←	↑>		←	↑>		
	SimTraffic Delay	57.5	19.1	12.4	27.5	18.6	10.2	110.5	23.1		52.7	27.4		27.0
	SimTraffic LOS	E	B	B	C	B	B	F	C		D	C		C
	SimTraffic 95th Queue	209	280	104	60	230	88	158	374		155	438		
	Queue Block Time (%)	2	18			19		3	15			28		
	Denied Entry													
65	**Cleveland Ave & Highland Pkwy (Signalized -- Cycle Length: 110)**													
	Lanes	<↑		→	<↑		→	←	↑>		←	↑>		
	SimTraffic Delay	39.2		16.5	38.1		14.8	24.8	15.5		46.7	41.1		27.8
	SimTraffic LOS	D		B	D		B	C	B		D	D		C

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	SimTraffic 95th Queue	154		70	148		71	83	318		114	663		
	Queue Block Time (%)	43		13	46		10		19			31		
	Denied Entry													
75	**St Paul Ave & Montreal Ave (All-way stop)**													
	Lanes	<↑		→	<↑>			<↑↑>			←	↑↑>		
	SimTraffic Delay	9.7		3.9	18.5			13.4			9.8	8.9		11.6
	SimTraffic LOS	A		A	C			B			A	A		B
	SimTraffic 95th Queue	34		5	115			103			66	84		
	Queue Block Time (%)	1												
	Denied Entry													
80	**Edgcumbe Rd & St Paul Ave (Signalized -- Cycle Length: 85)**													
	Lanes	<↑↑		→	<↑↑>			←	↑↑>		←	↑↑>		
	SimTraffic Delay	28.0		13.8	27.0			28.1	10.9		24.7	20.8		18.9
	SimTraffic LOS	C		B	C			C	B		C	C		B
	SimTraffic 95th Queue	119		132	106			257	307		67	178		
	Queue Block Time (%)	4		14				12				2		
	Denied Entry													
90	**Cleveland Ave & Montreal Ave (Unsignalized)**													
	Lanes				←>	0			↑>		<↑			
	SimTraffic Delay				7.6	-			0.8		0.3			2.1
	SimTraffic LOS				A	A			A		A			A
	SimTraffic 95th Queue				51						21			
	Queue Block Time (%)													
	Denied Entry													
100	**Fairview Ave & Montreal Ave (Signalized -- Cycle Length: 66)**													
	Lanes	←	↑	→	←	↑>		←	↑>		←	↑>		
	SimTraffic Delay	26.2	14.0	12.1	23.4	20.3		22.0	12.7		30.8	15.9		15.8
	SimTraffic LOS	C	B	B	C	C		C	B		C	B		B
	SimTraffic 95th Queue	45	109	38	68	169		54	256		118	265		
	Queue Block Time (%)		31	1		11			18		1	16		
	Denied Entry													
120	**Mississippi River Blvd & N Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				7.8	-			1.0		2.7	0.5		1.5
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				51				2		52			
	Queue Block Time (%)													
	Denied Entry													
130	**Mississippi River Blvd & S Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				7.3	-			1.0		2.3	0.4		1.8
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				68						17			
	Queue Block Time (%)													
	Denied Entry													
400	**Mt Curve Blvd & Highland Pkwy (All-way stop)**													
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	6.1			6.8			6.1			5.8			5.7
	SimTraffic LOS	A			A			A			A			A
	SimTraffic 95th Queue	49			46			50			48			
	Queue Block Time (%)													
	Denied Entry													
500	**Cretin Ave & Randolph Ave (Signalized -- Cycle Length: 65)**													
	Lanes	<↑>			<↑	→		<↑>			←	↑>		
	SimTraffic Delay	25.3			30.9	13.3		7.5			22.5	15.8		15.9
	SimTraffic LOS	C			C	B		A			C	B		B
	SimTraffic 95th Queue	142			179	63		167			341	70		
	Queue Block Time (%)				48	14					20	20		
	Denied Entry													
501	**Cretin Ave & Highland Pkwy (Unsignalized)**													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	17.4			19.8			1.4			2.7			4.1
	SimTraffic LOS	C			C			A			A			A
	SimTraffic 95th Queue	62			82			32			105			
	Queue Block Time (%)													
	Denied Entry													

70: Cleveland Ave & St Paul Ave & Bohland Ave Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0
Total Del/Veh (s)	5.0	0.4	1.5	1.1

71: St Paul Ave Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	15.4	2.6	0.2	2.6

72: Cleveland Ave & St Paul Ave Performance by approach

Approach	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	8.7	0.4	3.5

73: Cleveland Ave & Inner Drive Performance by approach

Approach	EB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.0
Total Del/Veh (s)	2.6	0.1	0.4

140: 46th Ave & E 46th St/Ford Pkwy Performance by approach

Approach	EB	WB	NB	SB	SW	All
Denied Del/Veh (s)	0.4	0.0	2.7	1.0	0.1	0.7
Total Del/Veh (s)	19.9	16.9	38.3	33.6	67.8	23.2

Total Zone Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	1400.4

Intersection: 70: Cleveland Ave & St Paul Ave & Bohland Ave

Movement	WB
Directions Served	R
Maximum Queue (ft)	50
Average Queue (ft)	18
95th Queue (ft)	39
Link Distance (ft)	762
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 71: St Paul Ave

Movement	EB
Directions Served	LR
Maximum Queue (ft)	59
Average Queue (ft)	42
95th Queue (ft)	62
Link Distance (ft)	51
Upstream Blk Time (%)	14
Queuing Penalty (veh)	14
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 72: Cleveland Ave & St Paul Ave

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	94	44
Average Queue (ft)	40	2
95th Queue (ft)	75	21
Link Distance (ft)	651	99
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 73: Cleveland Ave & Inner Drive

Movement	EB	SB
Directions Served	R	TR
Maximum Queue (ft)	31	2
Average Queue (ft)	13	0
95th Queue (ft)	37	2
Link Distance (ft)	285	58
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 140: 46th Ave & E 46th St/Ford Pkwy

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SW
Directions Served	<	LT	TR	L	T	TR>	LTR	>	LT	R	<LR>
Maximum Queue (ft)	141	234	216	159	237	245	536	67	185	58	26
Average Queue (ft)	38	123	105	81	96	130	211	48	85	27	3
95th Queue (ft)	101	200	187	161	201	224	447	58	153	66	13
Link Distance (ft)		1464	1464		1094	1094	1212		1083		272
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	75			110				25		25	
Storage Blk Time (%)	0	22		5	4		56	10	52	4	
Queuing Penalty (veh)	1	13		13	11		172	9	15	4	

Zone Summary

Zone wide Queuing Penalty: 253

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
10	**S Ford Ramp/N Ford Ramp & Ford Ave (Unsignalized)**													
	Lanes		↑↑>			↑↑>				→			→	
	SimTraffic Delay		2.0			0.4				3.8			4.8	1.5
	SimTraffic LOS		A			A				A			A	A
	SimTraffic 95th Queue		2			4				47			60	
	Queue Block Time (%)													
	Denied Entry													
20	**Ford Ave & Woodlawn Ave (Unsignalized)**													
	Lanes	←	↑↑			↑↑>						0		
	SimTraffic Delay	4.6	0.4			0.4						-		0.5
	SimTraffic LOS	A	A			A						A		A
	SimTraffic 95th Queue	31												
	Queue Block Time (%)	1												
	Denied Entry													
30	**Mt Curve Blvd & Ford Ave (Unsignalized)**													
	Lanes	←	↑↑>			↑↑>					←		→	
	SimTraffic Delay	6.1	0.4			1.7					13.8		5.8	1.3
	SimTraffic LOS	A	A			A					B		A	A
	SimTraffic 95th Queue	28	6			3					32		50	
	Queue Block Time (%)										1		2	
	Denied Entry													
40	**Cretin Ave & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>			↑↑>					←		→	
	SimTraffic Delay	10.0	3.7			12.2					31.7		5.3	10.2
	SimTraffic LOS	A	A			B					C		A	B
	SimTraffic 95th Queue	83	82			195					118		80	
	Queue Block Time (%)					20					1			
	Denied Entry													
50	**Finn St & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>		←	0		<↑		→	
	SimTraffic Delay	19.5	11.7		10.6	7.6		30.2	-		27.5		6.1	11.0
	SimTraffic LOS	B	B		B	A		C	A		C		A	B
	SimTraffic 95th Queue	48	161		69	122		98			66		54	
	Queue Block Time (%)	1	10								1			
	Denied Entry													
60	**Cleveland Ave & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑↑>		
	SimTraffic Delay	38.9	25.8		43.2	27.4		21.7	13.4		35.7	25.9		23.9
	SimTraffic LOS	D	C		D	C		C	B		D	C		C
	SimTraffic 95th Queue	106	209		87	178		203	258		64	194		
	Queue Block Time (%)		2			1						13		
	Denied Entry													
61	**Kenneth St & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>		<↑>			<↑>			
	SimTraffic Delay	9.1	5.1		14.8	8.3		23.8			23.0			8.9
	SimTraffic LOS	A	A		B	A		C			C			A
	SimTraffic 95th Queue	41	69		57	145		82			84			
	Queue Block Time (%)	3	10			4								
	Denied Entry													
62	**Fairview Ave & Ford Ave (Signalized -- Cycle Length: 65)**													
	Lanes	←	↑	→	←	↑	→	←	↑>		←	↑>		
	SimTraffic Delay	28.8	15.4	8.2	20.6	15.3	9.4	38.2	19.6		32.7	17.9		18.0
	SimTraffic LOS	C	B	A	C	B	A	D	B		C	B		B
	SimTraffic 95th Queue	99	184	86	63	193	82	94	307		64	268		
	Queue Block Time (%)		8			10			11			12		
	Denied Entry													
65	**Cleveland Ave & Highland Pkwy (Signalized -- Cycle Length: 80)**													
	Lanes	<↑		→	<↑		→	←	↑>		←	↑>		
	SimTraffic Delay	32.1		7.9	32.2		10.0	12.1	7.9		14.2	6.0		9.9
	SimTraffic LOS	C		A	C		A	B	A		B	A		A

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	SimTraffic 95th Queue	74		67	96		62	65	195		36	140		
	Queue Block Time (%)	25		6	38		5		4			3		
	Denied Entry													
75	**St Paul Ave & Montreal Ave (All-way stop)**													
	Lanes	<↑		→	<↑>			<↑↑>			←	↑↑>		
	SimTraffic Delay	9.3		4.2	13.9			13.0			8.5	9.1		10.7
	SimTraffic LOS	A		A	B			B			A	A		B
	SimTraffic 95th Queue	39		17	106			102			54	90		
	Queue Block Time (%)	1												
	Denied Entry													
80	**Edgcumbe Rd & St Paul Ave (Signalized -- Cycle Length: 84)**													
	Lanes	<↑↑		→	<↑↑>			←	↑↑>		←	↑↑>		
	SimTraffic Delay	27.6		14.7	28.1			19.7	8.0		19.9	19.0		16.4
	SimTraffic LOS	C		B	C			B	A		B	B		B
	SimTraffic 95th Queue	152		137	115			225	160		67	183		
	Queue Block Time (%)	1		19				4				2		
	Denied Entry													
90	**Cleveland Ave & Montreal Ave (Unsignalized)**													
	Lanes				←>	0			↑>		<↑			
	SimTraffic Delay				6.9	-			1.1		0.2			1.6
	SimTraffic LOS				A	A			A		A			A
	SimTraffic 95th Queue				47				2		25			
	Queue Block Time (%)													
	Denied Entry													
100	**Fairview Ave & Montreal Ave (Signalized -- Cycle Length: 65)**													
	Lanes	←	↑	→	←	↑>		←	↑>		←	↑>		
	SimTraffic Delay	32.4	22.7	13.2	29.0	24.2		18.9	10.3		26.4	14.5		15.5
	SimTraffic LOS	C	C	B	C	C		B	B		C	B		B
	SimTraffic 95th Queue	51	128	45	57	172		53	236		112	255		
	Queue Block Time (%)		39	3		11			12			12		
	Denied Entry													
120	**Mississippi River Blvd & N Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				5.3	-			1.1		2.5	0.2		1.3
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				46						35			
	Queue Block Time (%)													
	Denied Entry													
130	**Mississippi River Blvd & S Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				5.8	-			1.1		2.2	0.2		2.0
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				62						18			
	Queue Block Time (%)													
	Denied Entry													
400	**Mt Curve Blvd & Highland Pkwy (All-way stop)**													
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	5.8			7.5			5.7			5.8			5.4
	SimTraffic LOS	A			A			A			A			A
	SimTraffic 95th Queue	46			41			44			47			
	Queue Block Time (%)													
	Denied Entry													
500	**Cretin Ave & Randolph Ave (Signalized -- Cycle Length: 65)**													
	Lanes	<↑>			<↑	→		<↑>			←	↑>		
	SimTraffic Delay	25.2			28.8	13.8		7.7			17.7	9.6		13.3
	SimTraffic LOS	C			C	B		A			B	A		B
	SimTraffic 95th Queue	105			191	57		188			165	81		
	Queue Block Time (%)				43	29					17	8		
	Denied Entry													
501	**Cretin Ave & Highland Pkwy (Unsignalized)**													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Lanes	<↑>			<↑>				<↑>		<↑>			
	SimTraffic Delay	10.3			10.9				0.9		1.1			2.4
	SimTraffic LOS	B			B				A		A			A
	SimTraffic 95th Queue	48			63						53			
	Queue Block Time (%)													
	Denied Entry													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
10	**S Ford Ramp/N Ford Ramp & Ford Ave (Unsignalized)**													
	Lanes		↑↑>			↑↑>				→			→	
	SimTraffic Delay		2.6			0.6				5.0			6.8	2.1
	SimTraffic LOS		A			A				A			A	A
	SimTraffic 95th Queue		12			12				52			80	
	Queue Block Time (%)													
	Denied Entry													
20	**Ford Ave & Woodlawn Ave (Unsignalized)**													
	Lanes	←	↑↑			↑↑>					<->	0		
	SimTraffic Delay	7.3	0.5			0.7					23.7	-		1.0
	SimTraffic LOS	A	A			A					C	A		A
	SimTraffic 95th Queue	40				4					56			
	Queue Block Time (%)	3												
	Denied Entry													
30	**Mt Curve Blvd & Ford Ave (Unsignalized)**													
	Lanes	←	↑↑>			↑↑>					←		→	
	SimTraffic Delay	7.3	0.5			2.0					25.2		8.2	1.7
	SimTraffic LOS	A	A			A					D		A	A
	SimTraffic 95th Queue	43				3					24		52	
	Queue Block Time (%)	1											2	
	Denied Entry													
40	**Cretin Ave & Ford Ave (Signalized -- Cycle Length: 110)**													
	Lanes	←	↑↑>			↑↑>					←		→	
	SimTraffic Delay	18.5	6.6			14.8					43.5		9.8	15.1
	SimTraffic LOS	B	A			B					D		A	B
	SimTraffic 95th Queue	139	137			260					187		261	
	Queue Block Time (%)	4	1			22					14			
	Denied Entry													
50	**Finn St & Ford Ave (Signalized -- Cycle Length: 110)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		<↑		→	
	SimTraffic Delay	21.1	12.0		18.6	7.7		39.1	22.1		38.6		9.0	14.1
	SimTraffic LOS	C	B		B	A		D	C		D		A	B
	SimTraffic 95th Queue	68	169		126	132		171	103		125		94	
	Queue Block Time (%)	4	14								10		1	
	Denied Entry													
60	**Cleveland Ave & Ford Ave (Signalized -- Cycle Length: 110)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑↑>		
	SimTraffic Delay	60.5	59.5		39.1	44.2		25.9	24.0		24.4	25.9		44.3
	SimTraffic LOS	E	E		D	D		C	C		C	C		D
	SimTraffic 95th Queue	273	515		161	283		203	356		120	320		
	Queue Block Time (%)	2	38			13						16		
	Denied Entry													
61	**Kenneth St & Ford Ave (Signalized -- Cycle Length: 55)**													
	Lanes	←	↑↑>		←	↑↑>		<↑>			<↑>			
	SimTraffic Delay	22.0	10.0		18.3	11.0		16.3			16.6			11.2
	SimTraffic LOS	C	A		B	B		B			B			B
	SimTraffic 95th Queue	65	151		51	182		102			89			
	Queue Block Time (%)	11	27			8								
	Denied Entry													
62	**Fairview Ave & Ford Ave (Signalized -- Cycle Length: 65)**													
	Lanes	←	↑	→	←	↑	→	←	↑>		←	↑>		
	SimTraffic Delay	82.9	23.0	15.3	34.5	17.9	10.5	103.2	22.4		50.0	25.2		28.2
	SimTraffic LOS	F	C	B	C	B	B	F	C		D	C		C
	SimTraffic 95th Queue	272	476	126	59	218	93	169	336		133	407		
	Queue Block Time (%)	11	18			17		2	15			25		
	Denied Entry													
65	**Cleveland Ave & Highland Pkwy (Signalized -- Cycle Length: 110)**													
	Lanes	<↑		→	<↑		→	←	↑>		←	↑>		
	SimTraffic Delay	35.7		13.7	39.6		14.3	24.7	15.3		22.4	9.3		16.0
	SimTraffic LOS	D		B	D		B	C	B		C	A		B

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	SimTraffic 95th Queue	135		70	139		70	104	331		89	213		
	Queue Block Time (%)	42		11	49		10		18			10		
	Denied Entry													
75	**St Paul Ave & Montreal Ave (All-way stop)**													
	Lanes	<↑		→	<↑>			<↑↑>			←	↑↑>		
	SimTraffic Delay	9.6		4.0	18.1			13.4			10.2	9.3		11.8
	SimTraffic LOS	A		A	C			B			B	A		B
	SimTraffic 95th Queue	33		6	126			106			68	91		
	Queue Block Time (%)	1												
	Denied Entry													
80	**Edgcumbe Rd & St Paul Ave (Signalized -- Cycle Length: 85)**													
	Lanes	<↑↑		→	<↑↑>			←	↑↑>		←	↑↑>		
	SimTraffic Delay	27.8		14.6	28.5			28.7	10.7		24.7	21.3		19.3
	SimTraffic LOS	C		B	C			C	B		C	C		B
	SimTraffic 95th Queue	151		135	120			257	325		78	182		
	Queue Block Time (%)	3		16				12				2		
	Denied Entry													
90	**Cleveland Ave & Montreal Ave (Unsignalized)**													
	Lanes				←>		0		↑>		<↑			
	SimTraffic Delay				7.8		-		0.7		0.3			2.1
	SimTraffic LOS				A		A		A		A			A
	SimTraffic 95th Queue				46				3		22			
	Queue Block Time (%)													
	Denied Entry													
100	**Fairview Ave & Montreal Ave (Signalized -- Cycle Length: 66)**													
	Lanes	←	↑	→	←	↑>		←	↑>		←	↑>		
	SimTraffic Delay	29.3	14.1	10.5	22.3	20.2		24.9	12.7		31.2	15.8		15.7
	SimTraffic LOS	C	B	B	C	C		C	B		C	B		B
	SimTraffic 95th Queue	45	107	40	67	176		66	259		116	262		
	Queue Block Time (%)		33	2		11			18			15		
	Denied Entry													
120	**Mississippi River Blvd & N Ford Ramp (Unsignalized)**													
	Lanes				←>		0		↑>		←	↑		
	SimTraffic Delay				8.4		-		0.9		2.8	0.5		1.5
	SimTraffic LOS				A		A		A		A	A		A
	SimTraffic 95th Queue				50				5		48			
	Queue Block Time (%)													
	Denied Entry													
130	**Mississippi River Blvd & S Ford Ramp (Unsignalized)**													
	Lanes				←>		0		↑>		←	↑		
	SimTraffic Delay				7.7		-		0.9		2.1	0.4		1.9
	SimTraffic LOS				A		A		A		A	A		A
	SimTraffic 95th Queue				73						15			
	Queue Block Time (%)													
	Denied Entry													
400	**Mt Curve Blvd & Highland Pkwy (All-way stop)**													
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	6.1			7.1			6.2			6.0			5.6
	SimTraffic LOS	A			A			A			A			A
	SimTraffic 95th Queue	49			50			49			46			
	Queue Block Time (%)													
	Denied Entry													
500	**Cretin Ave & Randolph Ave (Signalized -- Cycle Length: 65)**													
	Lanes	<↑>			<↑		→	<↑>			←	↑>		
	SimTraffic Delay	26.4			29.1		12.7	7.8			22.4	15.7		15.9
	SimTraffic LOS	C			C		B	A			C	B		B
	SimTraffic 95th Queue	136			165		65	177			336	73		
	Queue Block Time (%)				49		15				20	18		
	Denied Entry											1		1
501	**Cretin Ave & Highland Pkwy (Unsignalized)**													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	16.2			17.1			1.3			2.4			3.8
	SimTraffic LOS	C			C			A			A			A
	SimTraffic 95th Queue	60			81			18			104			
	Queue Block Time (%)													
	Denied Entry													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
10	**S Ford Ramp/N Ford Ramp & Ford Ave (Unsignalized)**													
	Lanes		↑↑>			↑↑>				→			→	
	SimTraffic Delay		1.9			0.5				4.6			4.9	1.5
	SimTraffic LOS		A			A				A			A	A
	SimTraffic 95th Queue		8							46			61	
	Queue Block Time (%)													
	Denied Entry													
20	**Ford Ave & Woodlawn Ave (Unsignalized)**													
	Lanes	←	↑↑			↑↑>						0		
	SimTraffic Delay	4.7	0.4			0.4						-		0.5
	SimTraffic LOS	A	A			A						A		A
	SimTraffic 95th Queue	32												
	Queue Block Time (%)	1												
	Denied Entry													
30	**Mt Curve Blvd & Ford Ave (Unsignalized)**													
	Lanes	←	↑↑>			↑↑>					←		→	
	SimTraffic Delay	5.0	0.4			1.7					14.7		6.3	1.4
	SimTraffic LOS	A	A			A					B		A	A
	SimTraffic 95th Queue	31				3					35		54	
	Queue Block Time (%)												2	
	Denied Entry													
40	**Cretin Ave & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>			↑↑>					←		→	
	SimTraffic Delay	11.2	4.0			13.3					31.0		5.3	10.9
	SimTraffic LOS	B	A			B					C		A	B
	SimTraffic 95th Queue	101	92			214					129		84	
	Queue Block Time (%)	1				21					1			
	Denied Entry													
50	**Finn St & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>		←	0		<↑		→	
	SimTraffic Delay	23.0	12.3		12.0	7.8		31.6	-		24.2		6.2	11.5
	SimTraffic LOS	C	B		B	A		C	A		C		A	B
	SimTraffic 95th Queue	51	157		81	131		103			63		54	
	Queue Block Time (%)	2	12								1			
	Denied Entry													
60	**Cleveland Ave & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑↑>		
	SimTraffic Delay	41.1	27.0		43.7	27.8		24.3	15.4		38.1	27.0		25.4
	SimTraffic LOS	D	C		D	C		C	B		D	C		C
	SimTraffic 95th Queue	130	217		97	183		238	290		70	208		
	Queue Block Time (%)		2			2						13		
	Denied Entry													
61	**Kenneth St & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>		<↑>			<↑>			
	SimTraffic Delay	10.8	5.4		14.1	9.2		23.3			23.1			9.3
	SimTraffic LOS	B	A		B	A		C			C			A
	SimTraffic 95th Queue	47	78		62	154		88			81			
	Queue Block Time (%)	4	12			5								
	Denied Entry													
62	**Fairview Ave & Ford Ave (Signalized -- Cycle Length: 65)**													
	Lanes	←	↑	→	←	↑	→	←	↑>		←	↑>		
	SimTraffic Delay	34.7	15.3	8.4	23.9	16.7	8.5	45.7	20.8		37.9	18.6		19.3
	SimTraffic LOS	C	B	A	C	B	A	D	C		D	B		B
	SimTraffic 95th Queue	118	197	95	65	203	90	110	311		51	288		
	Queue Block Time (%)		9			12			13			14		
	Denied Entry													
65	**Cleveland Ave & Highland Pkwy (Signalized -- Cycle Length: 80)**													
	Lanes	<↑		→	<↑		→	←	↑>		←	↑>		
	SimTraffic Delay	35.1		8.2	30.1		11.2	14.0	9.2		18.6	7.0		10.9
	SimTraffic LOS	D		A	C		B	B	A		B	A		B

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	SimTraffic 95th Queue	79		67	105		60	89	219		45	154		
	Queue Block Time (%)	24		7	38		4		6			5		
	Denied Entry													
75	**St Paul Ave & Montreal Ave (All-way stop)**													
	Lanes	<↑		→	<↑>			<↑↑>			←	↑↑>		
	SimTraffic Delay	9.7		4.1	14.4			13.7			8.6	9.3		11.1
	SimTraffic LOS	A		A	B			B			A	A		B
	SimTraffic 95th Queue	44		32	101			103			51	93		
	Queue Block Time (%)	1												
	Denied Entry													
80	**Edgcumbe Rd & St Paul Ave (Signalized -- Cycle Length: 84)**													
	Lanes	<↑↑		→	<↑↑>			←	↑↑>		←	↑↑>		
	SimTraffic Delay	26.8		15.8	26.5			26.7	9.1		23.6	21.4		18.7
	SimTraffic LOS	C		B	C			C	A		C	C		B
	SimTraffic 95th Queue	194		142	120			256	282		68	198		
	Queue Block Time (%)	1		22				11				4		
	Denied Entry													
90	**Cleveland Ave & Montreal Ave (Unsignalized)**													
	Lanes				←>		0		↑>		<↑			
	SimTraffic Delay				7.2		-		1.2		0.3			1.6
	SimTraffic LOS				A		A		A		A			A
	SimTraffic 95th Queue				46						29			
	Queue Block Time (%)													
	Denied Entry													
100	**Fairview Ave & Montreal Ave (Signalized -- Cycle Length: 65)**													
	Lanes	←	↑	→	←	↑>		←	↑>		←	↑>		
	SimTraffic Delay	33.0	22.5	12.4	28.0	22.1		21.5	12.3		26.9	14.7		16.1
	SimTraffic LOS	C	C	B	C	C		C	B		C	B		B
	SimTraffic 95th Queue	46	130	49	70	168		79	251		93	267		
	Queue Block Time (%)		39	3		10			14			12		
	Denied Entry													
120	**Mississippi River Blvd & N Ford Ramp (Unsignalized)**													
	Lanes				←>		0		↑>		←	↑		
	SimTraffic Delay				7.4		-		1.2		2.9	0.2		1.4
	SimTraffic LOS				A		A		A		A	A		A
	SimTraffic 95th Queue				47				2		36			
	Queue Block Time (%)													
	Denied Entry													
130	**Mississippi River Blvd & S Ford Ramp (Unsignalized)**													
	Lanes				←>		0		↑>		←	↑		
	SimTraffic Delay				6.4		-		1.2		2.2	0.2		2.2
	SimTraffic LOS				A		A		A		A	A		A
	SimTraffic 95th Queue				67						14			
	Queue Block Time (%)													
	Denied Entry													
400	**Mt Curve Blvd & Highland Pkwy (All-way stop)**													
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	5.9			7.4			5.4			5.8			5.6
	SimTraffic LOS	A			A			A			A			A
	SimTraffic 95th Queue	46			42			45			49			
	Queue Block Time (%)													
	Denied Entry													
500	**Cretin Ave & Randolph Ave (Signalized -- Cycle Length: 65)**													
	Lanes	<↑>			<↑		→	<↑>			←	↑>		
	SimTraffic Delay	24.3			29.1		15.1	7.7			19.3	9.8		13.7
	SimTraffic LOS	C			C		B	A			B	A		B
	SimTraffic 95th Queue	113			215		58	182			180	79		
	Queue Block Time (%)				44		31				18	8		
	Denied Entry													
501	**Cretin Ave & Highland Pkwy (Unsignalized)**													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Lanes	<↑>			<↑>				<↑>		<↑>			
	SimTraffic Delay	10.7			11.8				1.0		1.2			2.7
	SimTraffic LOS	B			B				A		A			A
	SimTraffic 95th Queue	52			68				2		63			
	Queue Block Time (%)													
	Denied Entry													

70: Cleveland Ave & St Paul Ave & Bohland Ave Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.0
Total Del/Veh (s)	7.1	0.6	2.0	1.6

71: St Paul Ave Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	15.7	2.7	0.3	2.9

72: Cleveland Ave & St Paul Ave Performance by approach

Approach	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	8.6	1.3	4.7

73: Cleveland Ave & Inner Drive Performance by approach

Approach	EB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.0
Total Del/Veh (s)	2.5	0.2	0.8

140: 46th Ave & E 46th St/Ford Pkwy Performance by approach

Approach	EB	WB	NB	SB	SW	All
Denied Del/Veh (s)	0.5	0.0	0.0	0.9	0.1	0.2
Total Del/Veh (s)	13.8	10.1	18.1	56.9	70.8	17.6

Total Zone Performance

Denied Del/Veh (s)	0.5
Total Del/Veh (s)	751.2

Intersection: 70: Cleveland Ave & St Paul Ave & Bohland Ave

Movement	WB	NB	SB
Directions Served	R	TR	TR
Maximum Queue (ft)	75	18	6
Average Queue (ft)	32	1	0
95th Queue (ft)	61	9	6
Link Distance (ft)	762	168	556
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 71: St Paul Ave

Movement	EB
Directions Served	LR
Maximum Queue (ft)	59
Average Queue (ft)	44
95th Queue (ft)	63
Link Distance (ft)	51
Upstream Blk Time (%)	15
Queuing Penalty (veh)	17
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 72: Cleveland Ave & St Paul Ave

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	91	59
Average Queue (ft)	37	5
95th Queue (ft)	67	30
Link Distance (ft)	651	99
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 73: Cleveland Ave & Inner Drive

Movement	EB	SB
Directions Served	R	TR
Maximum Queue (ft)	51	6
Average Queue (ft)	18	0
95th Queue (ft)	45	4
Link Distance (ft)	285	58
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 140: 46th Ave & E 46th St/Ford Pkwy

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SW
Directions Served	<L	T	TR	L	T	TR>	LT	>	LT	R	<LR>
Maximum Queue (ft)	116	160	142	120	114	161	313	62	274	58	40
Average Queue (ft)	33	70	50	37	34	70	84	43	115	25	5
95th Queue (ft)	78	135	111	91	88	135	251	59	240	64	26
Link Distance (ft)		1464	1464		1080	1080	319		656		627
Upstream Blk Time (%)							3				
Queuing Penalty (veh)							12				
Storage Bay Dist (ft)	75			110				25		25	
Storage Blk Time (%)	1	7		0	0		35	8	61	2	
Queuing Penalty (veh)	1	5		1	0		110	3	16	3	

Zone Summary

Zone wide Queuing Penalty: 168

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
10	**S Ford Ramp/N Ford Ramp & Ford Ave (Unsignalized)**													
	Lanes		↑↑>			↑↑>				→			→	
	SimTraffic Delay		2.6			0.7				5.3			7.4	2.2
	SimTraffic LOS		A			A				A			A	A
	SimTraffic 95th Queue		11			2				54			83	
	Queue Block Time (%)													
	Denied Entry													
20	**Ford Ave & Woodlawn Ave (Unsignalized)**													
	Lanes	←	↑↑			↑↑>					←>	0		
	SimTraffic Delay	7.0	0.5			0.7					22.7	-		1.0
	SimTraffic LOS	A	A			A					C	A		A
	SimTraffic 95th Queue	40				6					61			
	Queue Block Time (%)	3												
	Denied Entry													
30	**Mt Curve Blvd & Ford Ave (Unsignalized)**													
	Lanes	←	↑↑>			↑↑>					←		→	
	SimTraffic Delay	7.7	0.5			2.0					38.7		8.9	1.7
	SimTraffic LOS	A	A			A					E		A	A
	SimTraffic 95th Queue	46				6					21		53	
	Queue Block Time (%)												3	
	Denied Entry													
40	**Cretin Ave & Ford Ave (Signalized -- Cycle Length: 110)**													
	Lanes	←	↑↑>			↑↑>					←		→	
	SimTraffic Delay	19.9	6.1			16.6					42.9		10.3	16.1
	SimTraffic LOS	B	A			B					D		B	B
	SimTraffic 95th Queue	141	142			286					192		302	
	Queue Block Time (%)	5	1			25					17		1	
	Denied Entry													
50	**Finn St & Ford Ave (Signalized -- Cycle Length: 110)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		<↑		→	
	SimTraffic Delay	21.3	13.8		18.2	12.1		38.6	28.4		36.3		9.5	16.3
	SimTraffic LOS	C	B		B	B		D	C		D		A	B
	SimTraffic 95th Queue	71	204		134	189		185	112		136		96	
	Queue Block Time (%)	4	17		1						12		1	
	Denied Entry													
60	**Cleveland Ave & Ford Ave (Signalized -- Cycle Length: 110)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑↑>		
	SimTraffic Delay	39.1	30.8		33.5	34.6		39.5	39.7		38.8	37.8		38.4
	SimTraffic LOS	D	C		C	C		D	D		D	D		D
	SimTraffic 95th Queue	189	354		129	257		327	494		130	452		
	Queue Block Time (%)	1	9			10			1		1	25		
	Denied Entry													
61	**Kenneth St & Ford Ave (Signalized -- Cycle Length: 55)**													
	Lanes	←	↑↑>		←	↑↑>		<↑>			<↑>			
	SimTraffic Delay	22.5	11.9		21.0	12.5		18.8			16.7			12.4
	SimTraffic LOS	C	B		C	B		B			B			B
	SimTraffic 95th Queue	72	204		62	224		98			85			
	Queue Block Time (%)	11	30			10								
	Denied Entry													
62	**Fairview Ave & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑	→	←	↑	→	←	↑>		←	↑>		
	SimTraffic Delay	160.8	42.3	27.7	43.7	24.3	12.3	97.6	22.4		51.3	24.5		37.8
	SimTraffic LOS	F	D	C	D	C	B	F	C		D	C		D
	SimTraffic 95th Queue	364	765	156	83	292	108	168	358		143	423		
	Queue Block Time (%)	31	30			28		4	17		1	26		
	Denied Entry													
65	**Cleveland Ave & Highland Pkwy (Signalized -- Cycle Length: 110)**													
	Lanes	<↑		→	<↑		→	←	↑>		←	↑>		
	SimTraffic Delay	36.2		15.3	40.2		14.6	26.8	17.0		30.1	11.7		17.7
	SimTraffic LOS	D		B	D		B	C	B		C	B		B

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	SimTraffic 95th Queue	152		70	141		70	104	328		85	267		
	Queue Block Time (%)	43		13	47		11		22		1	12		
	Denied Entry													
75	**St Paul Ave & Montreal Ave (All-way stop)**													
	Lanes	<↑		→	<↑>			<↑↑>			←	↑↑>		
	SimTraffic Delay	10.5		4.4	19.6			13.9			11.5	9.9		12.7
	SimTraffic LOS	B		A	C			B			B	A		B
	SimTraffic 95th Queue	42		12	139			105			77	94		
	Queue Block Time (%)	1												
	Denied Entry													
80	**Edgcumbe Rd & St Paul Ave (Signalized -- Cycle Length: 85)**													
	Lanes	<↑↑		→	<↑↑>			←	↑↑>		←	↑↑>		
	SimTraffic Delay	27.3		15.2	25.2			36.9	11.5		24.4	22.8		21.5
	SimTraffic LOS	C		B	C			D	B		C	C		C
	SimTraffic 95th Queue	158		138	113			279	439		72	183		
	Queue Block Time (%)	4		17				21				2		
	Denied Entry													
90	**Cleveland Ave & Montreal Ave (Unsignalized)**													
	Lanes				←>	0			↑>		<↑			
	SimTraffic Delay				7.9	-			0.8		0.3			2.2
	SimTraffic LOS				A	A			A		A			A
	SimTraffic 95th Queue				48						21			
	Queue Block Time (%)													
	Denied Entry													
100	**Fairview Ave & Montreal Ave (Signalized -- Cycle Length: 70)**													
	Lanes	←	↑	→	←	↑>		←	↑>		←	↑>		
	SimTraffic Delay	27.9	14.5	11.1	23.1	21.2		24.9	15.9		37.1	17.3		17.7
	SimTraffic LOS	C	B	B	C	C		C	B		D	B		B
	SimTraffic 95th Queue	46	112	39	64	192		99	316		134	311		
	Queue Block Time (%)		35	1		13			21		2	18		
	Denied Entry													
120	**Mississippi River Blvd & N Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				7.8	-			1.0		2.6	0.5		1.5
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				55				7		48			
	Queue Block Time (%)													
	Denied Entry													
130	**Mississippi River Blvd & S Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				7.4	-			1.0		2.5	0.4		1.8
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				71						21			
	Queue Block Time (%)													
	Denied Entry													
400	**Mt Curve Blvd & Highland Pkwy (All-way stop)**													
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	6.2			6.8			6.2			6.0			5.7
	SimTraffic LOS	A			A			A			A			A
	SimTraffic 95th Queue	52			45			51			50			
	Queue Block Time (%)													
	Denied Entry													
500	**Cretin Ave & Randolph Ave (Signalized -- Cycle Length: 65)**													
	Lanes	<↑>			<↑	→		<↑>			←	↑>		
	SimTraffic Delay	25.0			30.1	13.6		7.7			32.7	25.4		20.3
	SimTraffic LOS	C			C	B		A			C	C		C
	SimTraffic 95th Queue	138			174	61		169			555	72		
	Queue Block Time (%)				51	15					22	22		
	Denied Entry													
501	**Cretin Ave & Highland Pkwy (Unsignalized)**													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	20.9			22.6			1.4			2.7			4.7
	SimTraffic LOS	C			C			A			A			A
	SimTraffic 95th Queue	70			98			23			108			
	Queue Block Time (%)													
	Denied Entry													

70: Cleveland Ave & St Paul Ave & Bohland Ave Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0
Total Del/Veh (s)	8.5	0.7	2.1	1.6

71: St Paul Ave Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0
Total Del/Veh (s)	17.2	2.7	0.3	2.7

72: Cleveland Ave & St Paul Ave Performance by approach

Approach	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	8.3	0.8	3.4

73: Cleveland Ave & Inner Drive Performance by approach

Approach	EB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.0
Total Del/Veh (s)	2.8	0.3	0.5

140: 46th Ave & E 46th St/Ford Pkwy Performance by approach

Approach	EB	WB	NB	SB	SW	All
Denied Del/Veh (s)	0.3	0.0	2.9	1.1	0.1	0.7
Total Del/Veh (s)	20.3	17.5	42.2	33.5	66.8	24.3

Total Zone Performance

Denied Del/Veh (s)	1.3
Total Del/Veh (s)	1316.2

Intersection: 70: Cleveland Ave & St Paul Ave & Bohland Ave

Movement	WB	NB	NB	SB
Directions Served	R	T	TR	TR
Maximum Queue (ft)	64	36	58	8
Average Queue (ft)	19	2	5	0
95th Queue (ft)	45	26	46	8
Link Distance (ft)	762	168	168	556
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			1	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 71: St Paul Ave

Movement	EB	NB
Directions Served	LR	T
Maximum Queue (ft)	59	8
Average Queue (ft)	42	0
95th Queue (ft)	62	8
Link Distance (ft)	51	1142
Upstream Blk Time (%)	14	
Queuing Penalty (veh)	15	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 72: Cleveland Ave & St Paul Ave

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	87	47
Average Queue (ft)	37	3
95th Queue (ft)	66	27
Link Distance (ft)	651	99
Upstream Blk Time (%)		0
Queuing Penalty (veh)		1
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 73: Cleveland Ave & Inner Drive

Movement	EB	SB
Directions Served	R	TR
Maximum Queue (ft)	31	14
Average Queue (ft)	11	1
95th Queue (ft)	34	11
Link Distance (ft)	285	58
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 140: 46th Ave & E 46th St/Ford Pkwy

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SW
Directions Served	<	LT	TR	L	T	TR>	LTR	>	LT	R	<LR>
Maximum Queue (ft)	149	222	200	159	255	260	546	70	169	56	19
Average Queue (ft)	45	128	110	89	103	135	235	49	82	25	2
95th Queue (ft)	119	201	187	165	218	230	507	60	150	64	12
Link Distance (ft)		1464	1464		1094	1094	1029		656		272
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	75			110				25		25	
Storage Blk Time (%)	0	23		7	5		58	11	50	4	
Queuing Penalty (veh)	1	14		18	15		187	11	15	5	

Zone Summary

Zone wide Queuing Penalty: 282

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
10	**S Ford Ramp/N Ford Ramp & Ford Ave (Unsignalized)**													
	Lanes		↑↑>			↑↑>				→			→	
	SimTraffic Delay		2.0			0.5				4.4			4.8	1.5
	SimTraffic LOS		A			A				A			A	A
	SimTraffic 95th Queue		9							46			56	
	Queue Block Time (%)													
	Denied Entry													
20	**Ford Ave & Woodlawn Ave (Unsignalized)**													
	Lanes	←	↑↑			↑↑>						0		
	SimTraffic Delay	4.6	0.4			0.4						-		0.5
	SimTraffic LOS	A	A			A						A		A
	SimTraffic 95th Queue	31				2								
	Queue Block Time (%)	1												
	Denied Entry													
30	**Mt Curve Blvd & Ford Ave (Unsignalized)**													
	Lanes	←	↑↑>			↑↑>					←		→	
	SimTraffic Delay	5.2	0.4			1.7					15.5		6.5	1.4
	SimTraffic LOS	A	A			A					C		A	A
	SimTraffic 95th Queue	30									37		52	
	Queue Block Time (%)										1		2	
	Denied Entry													
40	**Cretin Ave & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>			↑↑>					←		→	
	SimTraffic Delay	11.4	4.0			13.3					32.0		5.4	10.9
	SimTraffic LOS	B	A			B					C		A	B
	SimTraffic 95th Queue	96	81			214					125		82	
	Queue Block Time (%)	1				21					2			
	Denied Entry													
50	**Finn St & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>		←	0		<↑		→	
	SimTraffic Delay	19.0	12.7		11.2	7.6		31.9	-		28.1		6.0	11.5
	SimTraffic LOS	B	B		B	A		C	A		C		A	B
	SimTraffic 95th Queue	47	167		73	135		107			70		60	
	Queue Block Time (%)	1	12								1			
	Denied Entry													
60	**Cleveland Ave & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑↑>		
	SimTraffic Delay	42.8	26.7		41.9	27.3		24.7	14.7		34.1	26.5		25.1
	SimTraffic LOS	D	C		D	C		C	B		C	C		C
	SimTraffic 95th Queue	121	219		101	211		227	271		64	215		
	Queue Block Time (%)		3		1	2						13		
	Denied Entry													
61	**Kenneth St & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>		<↑>			<↑>			
	SimTraffic Delay	10.5	5.1		14.6	8.7		25.3			22.5			9.2
	SimTraffic LOS	B	A		B	A		C			C			A
	SimTraffic 95th Queue	44	72		59	149		88			83			
	Queue Block Time (%)	5	10			5								
	Denied Entry													
62	**Fairview Ave & Ford Ave (Signalized -- Cycle Length: 65)**													
	Lanes	←	↑	→	←	↑	→	←	↑>		←	↑>		
	SimTraffic Delay	33.3	15.4	8.8	21.7	16.5	11.0	50.9	22.3		33.2	19.4		20.0
	SimTraffic LOS	C	B	A	C	B	B	D	C		C	B		B
	SimTraffic 95th Queue	111	190	91	77	227	86	69	332		92	298		
	Queue Block Time (%)		8			13			3			2		
	Denied Entry													
65	**Cleveland Ave & Highland Pkwy (Signalized -- Cycle Length: 80)**													
	Lanes	<↑		→	<↑		→	←	↑>		←	↑>		
	SimTraffic Delay	36.2		8.5	32.3		12.2	13.8	8.5		16.7	6.4		10.4
	SimTraffic LOS	D		A	C		B	B	A		B	A		B

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	SimTraffic 95th Queue	80		66	111		61	75	210		45	148		
	Queue Block Time (%)	23		8	37		4		5			4		
	Denied Entry													
75	**St Paul Ave & Montreal Ave (All-way stop)**													
	Lanes	<↑		→	<↑>			<↑↑>			←	↑↑>		
	SimTraffic Delay	10.0		4.2	16.2			13.4			9.2	9.3		11.1
	SimTraffic LOS	A		A	C			B			A	A		B
	SimTraffic 95th Queue	50		29	103			106			53	91		
	Queue Block Time (%)	2												
	Denied Entry													
80	**Edgcumbe Rd & St Paul Ave (Signalized -- Cycle Length: 84)**													
	Lanes	<↑↑		→	<↑↑>			←	↑↑>		←	↑↑>		
	SimTraffic Delay	26.8		16.5	26.4			23.7	9.1		22.7	20.7		18.0
	SimTraffic LOS	C		B	C			C	A		C	C		B
	SimTraffic 95th Queue	204		142	120			243	224		69	199		
	Queue Block Time (%)	1		24				7				4		
	Denied Entry													
90	**Cleveland Ave & Montreal Ave (Unsignalized)**													
	Lanes				←>	0			↑>		<↑			
	SimTraffic Delay				7.4	-			1.3		0.4			1.6
	SimTraffic LOS				A	A			A		A			A
	SimTraffic 95th Queue				48				5		28			
	Queue Block Time (%)													
	Denied Entry													
100	**Fairview Ave & Montreal Ave (Signalized -- Cycle Length: 65)**													
	Lanes	←	↑	→	←	↑>		←	↑>		←	↑>		
	SimTraffic Delay	29.4	22.9	13.1	25.9	21.5		19.1	12.0		25.3	14.5		15.7
	SimTraffic LOS	C	C	B	C	C		B	B		C	B		B
	SimTraffic 95th Queue	51	133	50	50	155		69	238		86	247		
	Queue Block Time (%)		38	2		9			13			13		
	Denied Entry													
120	**Mississippi River Blvd & N Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				6.4	-			1.1		2.9	0.2		1.3
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				47						36			
	Queue Block Time (%)													
	Denied Entry													
130	**Mississippi River Blvd & S Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				5.9	-			1.2		2.3	0.2		2.1
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				64						18			
	Queue Block Time (%)													
	Denied Entry													
400	**Mt Curve Blvd & Highland Pkwy (All-way stop)**													
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	6.0			7.1			5.5			5.8			5.5
	SimTraffic LOS	A			A			A			A			A
	SimTraffic 95th Queue	49			43			46			49			
	Queue Block Time (%)													
	Denied Entry													
500	**Cretin Ave & Randolph Ave (Signalized -- Cycle Length: 65)**													
	Lanes	<↑>			<↑	→		←	↑>		←	↑>		
	SimTraffic Delay	26.0			28.8	15.1		9.3	7.8		18.4	5.9		12.8
	SimTraffic LOS	C			C	B		A	A		B	A		B
	SimTraffic 95th Queue	110			206	57		41	189		101	109		
	Queue Block Time (%)				43	30			10		2	1		
	Denied Entry													
501	**Cretin Ave & Highland Pkwy (Unsignalized)**													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Lanes	<↑>			<↑>				<↑>		<↑>			
	SimTraffic Delay	11.2			12.0				1.0		1.3			2.6
	SimTraffic LOS	B			B				A		A			A
	SimTraffic 95th Queue	50			66						60			
	Queue Block Time (%)													
	Denied Entry													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
10	**S Ford Ramp/N Ford Ramp & Ford Ave (Unsignalized)**													
	Lanes		↑↑>			↑↑>				→			→	
	SimTraffic Delay		2.6			0.7				5.4			8.0	2.3
	SimTraffic LOS		A			A				A			A	A
	SimTraffic 95th Queue		9			3				49			92	
	Queue Block Time (%)													
	Denied Entry													
20	**Ford Ave & Woodlawn Ave (Unsignalized)**													
	Lanes	←	↑↑			↑↑>					←>	0		
	SimTraffic Delay	7.2	0.5			0.7					29.5	-		1.0
	SimTraffic LOS	A	A			A					D	A		A
	SimTraffic 95th Queue	39				7					61			
	Queue Block Time (%)	3												
	Denied Entry													
30	**Mt Curve Blvd & Ford Ave (Unsignalized)**													
	Lanes	←	↑↑>			↑↑>					←		→	
	SimTraffic Delay	8.1	0.5			2.1					30.0		8.7	1.8
	SimTraffic LOS	A	A			A					D		A	A
	SimTraffic 95th Queue	47	14			10					28		54	
	Queue Block Time (%)	1									1		3	
	Denied Entry													
40	**Cretin Ave & Ford Ave (Signalized -- Cycle Length: 110)**													
	Lanes	←	↑↑>			↑↑>					←		→	
	SimTraffic Delay	21.0	6.1			17.2					43.8		10.7	16.5
	SimTraffic LOS	C	A			B					D		B	B
	SimTraffic 95th Queue	146	128			284					193		298	
	Queue Block Time (%)	6				27					18		1	
	Denied Entry													
50	**Finn St & Ford Ave (Signalized -- Cycle Length: 110)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		<↑		→	
	SimTraffic Delay	20.5	13.1		18.2	12.3		37.4	40.3		38.5		8.9	16.0
	SimTraffic LOS	C	B		B	B		D	D		D		A	B
	SimTraffic 95th Queue	69	197		134	197		181	123		129		96	
	Queue Block Time (%)	5	15		1	1					12		1	
	Denied Entry													
60	**Cleveland Ave & Ford Ave (Signalized -- Cycle Length: 110)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑↑>		
	SimTraffic Delay	39.7	30.2		41.3	40.5		48.9	38.0		42.7	38.4		40.3
	SimTraffic LOS	D	C		D	D		D	D		D	D		D
	SimTraffic 95th Queue	180	363		123	236		370	472		135	470		
	Queue Block Time (%)	1	8			13					1	24		
	Denied Entry													
61	**Kenneth St & Ford Ave (Signalized -- Cycle Length: 55)**													
	Lanes	←	↑↑>		←	↑↑>		<↑>			<↑>			
	SimTraffic Delay	21.4	11.4		21.0	9.7		18.5			17.3			11.5
	SimTraffic LOS	C	B		C	A		B			B			B
	SimTraffic 95th Queue	75	194		51	157		116			90			
	Queue Block Time (%)	10	28			4								
	Denied Entry													
62	**Fairview Ave & Ford Ave (Signalized -- Cycle Length: 110)**													
	Lanes	←	↑	→	←	↑	→	←	↑>		←	↑>		
	SimTraffic Delay	64.2	43.6	26.6	61.7	68.2	42.9	43.1	33.7		35.6	48.7		47.4
	SimTraffic LOS	E	D	C	E	E	D	D	C		D	D		D
	SimTraffic 95th Queue	285	458	146	201	601	124	226	492		276	730		
	Queue Block Time (%)		46			60			12			27		
	Denied Entry													
65	**Cleveland Ave & Highland Pkwy (Signalized -- Cycle Length: 110)**													
	Lanes	<↑		→	<↑		→	←	↑>		←	↑>		
	SimTraffic Delay	35.6		14.8	42.8		16.5	25.9	16.6		26.7	10.3		17.2
	SimTraffic LOS	D		B	D		B	C	B		C	B		B

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	SimTraffic 95th Queue	149		71	154		72	108	331		88	228		
	Queue Block Time (%)	41		13	48		10		21			11		
	Denied Entry													
75	**St Paul Ave & Montreal Ave (All-way stop)**													
	Lanes	<↑		→	<↑>			<↑↑>			←	↑↑>		
	SimTraffic Delay	10.1		4.5	21.2			13.8			10.8	9.9		12.8
	SimTraffic LOS	B		A	C			B			B	A		B
	SimTraffic 95th Queue	39		18	150			107			72	95		
	Queue Block Time (%)	1												
	Denied Entry													
80	**Edgcumbe Rd & St Paul Ave (Signalized -- Cycle Length: 85)**													
	Lanes	<↑↑		→	<↑↑>			←	↑↑>		←	↑↑>		
	SimTraffic Delay	27.9		15.6	26.1			32.6	11.5		23.9	22.5		20.5
	SimTraffic LOS	C		B	C			C	B		C	C		C
	SimTraffic 95th Queue	169		141	120			272	371		78	184		
	Queue Block Time (%)	4		19				17				2		
	Denied Entry													
90	**Cleveland Ave & Montreal Ave (Unsignalized)**													
	Lanes				←>	0			↑>		<↑			
	SimTraffic Delay				7.6	-			0.8		0.4			2.1
	SimTraffic LOS				A	A			A		A			A
	SimTraffic 95th Queue				49						20			
	Queue Block Time (%)													
	Denied Entry													
100	**Fairview Ave & Montreal Ave (Signalized -- Cycle Length: 70)**													
	Lanes	←	↑	→	←	↑>		←	↑>		←	↑>		
	SimTraffic Delay	30.3	14.4	12.3	25.5	22.6		29.1	16.0		37.6	19.0		18.7
	SimTraffic LOS	C	B	B	C	C		C	B		D	B		B
	SimTraffic 95th Queue	46	111	36	64	194		75	313		134	368		
	Queue Block Time (%)		34	2		15			22		1	17		
	Denied Entry													
120	**Mississippi River Blvd & N Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				8.8	-			1.0		2.6	0.5		1.5
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				49				4		50			
	Queue Block Time (%)													
	Denied Entry													
130	**Mississippi River Blvd & S Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				7.3	-			1.1		2.5	0.4		1.8
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				59						23			
	Queue Block Time (%)													
	Denied Entry													
400	**Mt Curve Blvd & Highland Pkwy (All-way stop)**													
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	6.1			6.9			6.0			6.0			5.7
	SimTraffic LOS	A			A			A			A			A
	SimTraffic 95th Queue	53			46			50			48			
	Queue Block Time (%)													
	Denied Entry													
500	**Cretin Ave & Randolph Ave (Signalized -- Cycle Length: 65)**													
	Lanes	<↑>			<↑		→	←	↑>		←	↑>		
	SimTraffic Delay	25.3			30.3		14.8	15.7	7.8		20.2	10.1		14.2
	SimTraffic LOS	C			C		B	B	A		C	B		B
	SimTraffic 95th Queue	150			188		64	24	173		127	206		
	Queue Block Time (%)				51		15		9		2	6		
	Denied Entry													
501	**Cretin Ave & Highland Pkwy (Unsignalized)**													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	18.0			18.8			1.4			2.5			4.4
	SimTraffic LOS	C			C			A			A			A
	SimTraffic 95th Queue	68			90			20			99			
	Queue Block Time (%)													
	Denied Entry													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
10	**S Ford Ramp/N Ford Ramp & Ford Ave (Unsignalized)**													
	Lanes		↑↑>			↑↑>				→			→	
	SimTraffic Delay		2.7			0.4				5.5			5.7	1.9
	SimTraffic LOS		A			A				A			A	A
	SimTraffic 95th Queue		10							51			63	
	Queue Block Time (%)													
	Denied Entry													
20	**Ford Ave & Woodlawn Ave (Unsignalized)**													
	Lanes	←	↑↑			↑↑>						0		
	SimTraffic Delay	6.2	0.5			0.5						-		0.6
	SimTraffic LOS	A	A			A						A		A
	SimTraffic 95th Queue	35				4								
	Queue Block Time (%)	2												
	Denied Entry													
30	**Mt Curve Blvd & Ford Ave (Unsignalized)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑>		
	SimTraffic Delay	5.8	0.9		8.7	1.9		42.0	33.5		29.5	34.3		5.7
	SimTraffic LOS	A	A		A	A		E	D		D	D		A
	SimTraffic 95th Queue	31	17		68	13		108	139		64	66		
	Queue Block Time (%)							5	4		1	12		
	Denied Entry													
40	**Cretin Ave & Ford Ave (Signalized -- Cycle Length: 90)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑>		
	SimTraffic Delay	18.7	10.0		21.7	17.3		32.8	24.4		32.3	22.5		17.3
	SimTraffic LOS	B	A		C	B		C	C		C	C		B
	SimTraffic 95th Queue	142	162		65	209		180	196		126	140		
	Queue Block Time (%)	4	1		2	28		17	8		1	2		
	Denied Entry													
50	**Finn St & Ford Ave (Signalized -- Cycle Length: 90)**													
	Lanes	←	↑↑>		←	↑↑>		←	0		<↑		→	
	SimTraffic Delay	16.0	7.4		11.9	6.3		35.2	-		33.7		5.9	9.3
	SimTraffic LOS	B	A		B	A		D	A		C		A	A
	SimTraffic 95th Queue	50	118		74	118		114			64		52	
	Queue Block Time (%)	1	6								1			
	Denied Entry													
60	**Cleveland Ave & Ford Ave (Signalized -- Cycle Length: 90)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑↑>		
	SimTraffic Delay	46.0	23.8		53.3	22.0		16.8	15.0		35.2	20.7		22.5
	SimTraffic LOS	D	C		D	C		B	B		D	C		C
	SimTraffic 95th Queue	132	193		117	167		133	274		55	183		
	Queue Block Time (%)		2		1	2						8		
	Denied Entry													
61	**Kenneth St & Ford Ave (Signalized -- Cycle Length: 90)**													
	Lanes	←	↑↑>		←	↑↑>			<↑>			<↑>		
	SimTraffic Delay	9.8	4.7		14.5	8.9			24.0			29.1		9.1
	SimTraffic LOS	A	A		B	A			C			C		A
	SimTraffic 95th Queue	43	77		63	178			89			91		
	Queue Block Time (%)	4	13			7								
	Denied Entry													
62	**Fairview Ave & Ford Ave (Signalized -- Cycle Length: 65)**													
	Lanes	←	↑	→	←	↑	→	←	↑>		←	↑>		
	SimTraffic Delay	43.7	17.5	10.3	27.5	18.3	10.3	59.7	21.9		37.2	20.4		21.7
	SimTraffic LOS	D	B	B	C	B	B	E	C		D	C		C
	SimTraffic 95th Queue	168	259	105	73	246	111	87	328		70	301		
	Queue Block Time (%)		13			18			3			2		
	Denied Entry													
65	**Cleveland Ave & Highland Pkwy (Signalized -- Cycle Length: 90)**													
	Lanes	<↑		→	<↑		→	←	↑>		←	↑>		
	SimTraffic Delay	37.1		8.8	34.2		13.7	10.7	5.9		14.9	6.4		9.4
	SimTraffic LOS	D		A	C		B	B	A		B	A		A

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	SimTraffic 95th Queue	81		67	123		63	54	108		48	145		
	Queue Block Time (%)	25		8	42		4		2			4		
	Denied Entry													
75	**St Paul Ave & Montreal Ave (All-way stop)**													
	Lanes	<↑		→	<↑>			<↑↑>			←	↑↑>		
	SimTraffic Delay	25.9		17.8	31.8			26.1			12.6	17.0		23.7
	SimTraffic LOS	D		C	D			D			B	C		C
	SimTraffic 95th Queue	200		80	198			206			57	118		
	Queue Block Time (%)	19		8										
	Denied Entry													
80	**Edgcumbe Rd & St Paul Ave (Signalized -- Cycle Length: 95)**													
	Lanes	<↑↑		→	<↑↑>			←	↑↑>		←	↑↑>		
	SimTraffic Delay	30.7		21.2	29.1			34.4	11.0		28.0	27.0		23.8
	SimTraffic LOS	C		C	C			C	B		C	C		C
	SimTraffic 95th Queue	303		144	137			277	452		103	229		
	Queue Block Time (%)	2		36				22				6		
	Denied Entry													
90	**Cleveland Ave & Montreal Ave (Unsignalized)**													
	Lanes	←	↑>		←	↑>		<↑>			<↑>			
	SimTraffic Delay	10.7	12.5		8.8	9.9		2.8			1.3			8.3
	SimTraffic LOS	B	B		A	A		A			A			A
	SimTraffic 95th Queue	38	160		46	81		52			34			
	Queue Block Time (%)		4											
	Denied Entry													
100	**Fairview Ave & Montreal Ave (Signalized -- Cycle Length: 65)**													
	Lanes	←	↑	→	←	↑>		←	↑>		←	↑>		
	SimTraffic Delay	32.4	22.3	12.4	26.2	22.0		25.9	13.8		28.4	16.2		17.6
	SimTraffic LOS	C	C	B	C	C		C	B		C	B		B
	SimTraffic 95th Queue	54	166	51	69	199		76	247		110	280		
	Queue Block Time (%)		44	2		14			16			15		
	Denied Entry													
120	**Mississippi River Blvd & N Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				6.7	-			1.1		3.2	0.2		1.3
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				45				3		39			
	Queue Block Time (%)													
	Denied Entry													
130	**Mississippi River Blvd & S Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				7.0	-			1.1		2.7	0.2		2.4
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				71						22			
	Queue Block Time (%)													
	Denied Entry													
205	**Mississippi River Blvd & Bohland Ave (Unsignalized)**													
	Lanes				←		→		↑>		<↑			
	SimTraffic Delay				6.3		3.0		2.4		0.7			2.0
	SimTraffic LOS				A		A		A		A			A
	SimTraffic 95th Queue				23		34				36			
	Queue Block Time (%)													
	Denied Entry													
215	**Mississippi River Blvd & Montreal Ave (Unsignalized)**													
	Lanes				←>	0			↑>		<↑			
	SimTraffic Delay				7.2	-			1.1		0.9			1.2
	SimTraffic LOS				A	A			A		A			A
	SimTraffic 95th Queue				38						8			
	Queue Block Time (%)													
	Denied Entry													
400	**Mt Curve Blvd & Highland Pkwy (All-way stop)**													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	6.0			7.7			7.1			6.1			6.1
	SimTraffic LOS	A			A			A			A			A
	SimTraffic 95th Queue	47			41			45			49			
	Queue Block Time (%)													
	Denied Entry													
500	**Cretin Ave & Randolph Ave (Signalized -- Cycle Length: 65)**													
	Lanes	<↑>			<↑		→	←	↑>		←	↑>		
	SimTraffic Delay	26.6			28.3		17.1	11.0	9.0		28.0	8.0		14.8
	SimTraffic LOS	C			C		B	B	A		C	A		B
	SimTraffic 95th Queue	126			221		60	32	217		121	200		
	Queue Block Time (%)				44		34		13		6	1		
	Denied Entry													
501	**Cretin Ave & Highland Pkwy (Unsignalized)**													
	Lanes	<↑>			<↑>				<↑>		<↑>			
	SimTraffic Delay	14.0			14.9				1.4		1.5			3.2
	SimTraffic LOS	B			B				A		A			A
	SimTraffic 95th Queue	55			77				2		78			
	Queue Block Time (%)													
	Denied Entry													

70: Cleveland Ave & St Paul Ave & Bohland Ave Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.0
Total Del/Veh (s)	6.2	0.6	1.8	1.6

71: St Paul Ave Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0
Total Del/Veh (s)	12.8	2.8	0.3	2.7

72: Cleveland Ave & St Paul Ave Performance by approach

Approach	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	5.5	0.5	2.6

73: Cleveland Ave & Inner Drive Performance by approach

Approach	EB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.0
Total Del/Veh (s)	2.6	0.1	0.7

140: 46th Ave & E 46th St/Ford Pkwy Performance by approach

Approach	EB	WB	NB	SB	SW	All
Denied Del/Veh (s)	0.4	0.0	0.0	1.0	0.1	0.2
Total Del/Veh (s)	16.0	10.9	17.6	50.7	74.7	16.9

Total Zone Performance

Denied Del/Veh (s)	0.4
Total Del/Veh (s)	786.8

Intersection: 70: Cleveland Ave & St Paul Ave & Bohland Ave

Movement	WB	NB	NB
Directions Served	R	T	TR
Maximum Queue (ft)	75	7	11
Average Queue (ft)	32	0	0
95th Queue (ft)	60	7	7
Link Distance (ft)	762	168	168
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 71: St Paul Ave

Movement	EB
Directions Served	LR
Maximum Queue (ft)	61
Average Queue (ft)	41
95th Queue (ft)	62
Link Distance (ft)	51
Upstream Blk Time (%)	11
Queuing Penalty (veh)	13
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 72: Cleveland Ave & St Paul Ave

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	81	38
Average Queue (ft)	36	3
95th Queue (ft)	63	20
Link Distance (ft)	651	99
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 73: Cleveland Ave & Inner Drive

Movement	EB	SB
Directions Served	R	TR
Maximum Queue (ft)	49	7
Average Queue (ft)	20	0
95th Queue (ft)	46	4
Link Distance (ft)	285	58
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 140: 46th Ave & E 46th St/Ford Pkwy

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SW
Directions Served	<L	T	TR	L	T	TR>	LT	>	LT	R	<LR>
Maximum Queue (ft)	149	242	201	140	198	217	331	59	239	63	41
Average Queue (ft)	43	103	86	38	69	99	96	44	104	24	5
95th Queue (ft)	99	192	172	101	149	185	265	58	201	65	24
Link Distance (ft)		1464	1464		1080	1080	319		656		627
Upstream Blk Time (%)							2				
Queuing Penalty (veh)							8				
Storage Bay Dist (ft)	75			110				25		25	
Storage Blk Time (%)	2	15		0	2		36	10	61	3	
Queuing Penalty (veh)	6	10		1	3		113	4	16	4	

Zone Summary

Zone wide Queuing Penalty: 177

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
305	**Woodlawn Ave & Bohland Ave (Unsignalized)**													
	Lanes	←	↑>			↑>		<↑>			<↑>			
	SimTraffic Delay	2.1	0.2			1.6		5.8			0.2			0.9
	SimTraffic LOS	A	A			A		A			A			A
	SimTraffic 95th Queue	11						29			28			
	Queue Block Time (%)													
	Denied Entry													
310	**Woodlawn Ave & Village Way (Unsignalized)**													
	Lanes	<↑>				<↑>		<↑>				<↑>		
	SimTraffic Delay	5.3				3.9		0.2				0.5		1.9
	SimTraffic LOS	A				A		A				A		A
	SimTraffic 95th Queue	29				10								
	Queue Block Time (%)													
	Denied Entry													
315	**Woodlawn Ave & Montreal Ave (Unsignalized)**													
	Lanes		<↑>			<↑>		0						
	SimTraffic Delay		4.9			6.5		-						4.4
	SimTraffic LOS		A			A		A						A
	SimTraffic 95th Queue		34			42								
	Queue Block Time (%)													
	Denied Entry													
401	**Mt Curve Blvd & Woodlawn Ave (Unsignalized)**													
	Lanes	0			0			←	↑>		←	↑>		
	SimTraffic Delay	-			-			2.5	0.6		2.7	1.3		2.8
	SimTraffic LOS	A			A			A	A		A	A		A
	SimTraffic 95th Queue							34	4		32			
	Queue Block Time (%)													
	Denied Entry													
405	**Mt Curve Blvd & Bohland Ave (Unsignalized)**													
	Lanes	←	↑>		←	↑>		←	↑>		←	↑>		
	SimTraffic Delay	5.2	6.4		4.0	6.6		2.0	0.3		2.2	0.5		2.1
	SimTraffic LOS	A	A		A	A		A	A		A	A		A
	SimTraffic 95th Queue	25	34		7	50		5			17			
	Queue Block Time (%)													
	Denied Entry													
410	**Mt Curve Blvd & Village Way (Unsignalized)**													
	Lanes	0			0				<↑>		<↑>			
	SimTraffic Delay	-			-				0.3		0.1			0.6
	SimTraffic LOS	A			A				A		A			A
	SimTraffic 95th Queue													
	Queue Block Time (%)													
	Denied Entry													
415	**Mt Curve Blvd & Montreal Ave (Unsignalized)**													
	Lanes	<↑>			<↑>				<↑>		<↑>			
	SimTraffic Delay	5.6			5.6				0.3		0.2			3.3
	SimTraffic LOS	A			A				A		A			A
	SimTraffic 95th Queue	48			53						13			
	Queue Block Time (%)													
	Denied Entry													
502	**Cretin Ave & Hillcrest (Unsignalized)**													
	Lanes	0			0			←	↑>		←	↑>		
	SimTraffic Delay	-			-			2.5	0.5		3.5	0.9		1.6
	SimTraffic LOS	A			A			A	A		A	A		A
	SimTraffic 95th Queue							13	8		30			
	Queue Block Time (%)													
	Denied Entry													
505	**Cretin Ave & Bohland Ave (Unsignalized)**													
	Lanes	←	↑>		←	↑>		←	↑>		←	↑>		
	SimTraffic Delay	9.0	10.5		7.8	6.8		2.7	0.6		3.0	0.4		1.6
	SimTraffic LOS	A	B		A	A		A	A		A	A		A

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	SimTraffic 95th Queue	41	49		34	55		32			23	2		
	Queue Block Time (%)													
	Denied Entry													
510	**Cretin Ave & Village Way (Unsignalized)**													
	Lanes	0			0			←	↑>		←	↑>		
	SimTraffic Delay	-			-			2.3	0.5		2.9	0.4		2.0
	SimTraffic LOS	A			A			A	A		A	A		A
	SimTraffic 95th Queue							7			28			
	Queue Block Time (%)													
	Denied Entry													
515	**Montreal Ave & Cretin Ave (Unsignalized)**													
	Lanes	←	↑			↑>					←		→	
	SimTraffic Delay	4.6	0.8			1.7					7.4		3.3	3.0
	SimTraffic LOS	A	A			A					A		A	A
	SimTraffic 95th Queue	29				4					81		31	
	Queue Block Time (%)													
	Denied Entry													
605	**Ranger Way & Bohland Ave (Unsignalized)**													
	Lanes		↑>			↑								
	SimTraffic Delay		0.4			0.5								0.4
	SimTraffic LOS		A			A								A
	SimTraffic 95th Queue													
	Queue Block Time (%)													
	Denied Entry													
610	**Ranger Way & Village Way (Unsignalized)**													
	Lanes		<↑>			<↑>								
	SimTraffic Delay		3.4			5.0								4.3
	SimTraffic LOS		A			A								A
	SimTraffic 95th Queue		41			50								
	Queue Block Time (%)													
	Denied Entry													
705	**Finn St & Bohland Ave (All-way stop)**													
	Lanes			→										
	SimTraffic Delay			2.2										0.7
	SimTraffic LOS			A										A
	SimTraffic 95th Queue			23										
	Queue Block Time (%)													
	Denied Entry													
710	**Finn St & Village Way (Unsignalized)**													
	Lanes	<>	0					<↑				↑>		
	SimTraffic Delay	3.8	-					0.1				0.1		2.4
	SimTraffic LOS	A	A					A				A		A
	SimTraffic 95th Queue	47												
	Queue Block Time (%)													
	Denied Entry													
711	**Finn St & Saunders Ave (Unsignalized)**													
	Lanes							<↑>				<↑>		
	SimTraffic Delay							0.2				0.2		0.3
	SimTraffic LOS							A				A		A
	SimTraffic 95th Queue													
	Queue Block Time (%)													
	Denied Entry													
715	**Montreal Ave & Finn St (Unsignalized)**													
	Lanes		↑			↑>					<>	0		
	SimTraffic Delay		0.7			2.1					7.6	-		1.8
	SimTraffic LOS		A			A					A	A		A
	SimTraffic 95th Queue										52			
	Queue Block Time (%)													
	Denied Entry													
716	**Cleveland Ave & Saunders Ave (Unsignalized)**													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Lanes								<↑>			<↑>		
	SimTraffic Delay								0.5			0.2		0.3
	SimTraffic LOS								A			A		A
	SimTraffic 95th Queue													
	Queue Block Time (%)													
	Denied Entry													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
10	**S Ford Ramp/N Ford Ramp & Ford Ave (Unsignalized)**													
	Lanes		↑↑>			↑↑>				→			→	
	SimTraffic Delay		3.9			0.6				7.3			10.2	3.0
	SimTraffic LOS		A			A				A			B	A
	SimTraffic 95th Queue		14			10				53			101	
	Queue Block Time (%)													
	Denied Entry													
20	**Ford Ave & Woodlawn Ave (Unsignalized)**													
	Lanes	←	↑↑			↑↑>					<->	0		
	SimTraffic Delay	8.2	0.7			0.7					36.5	-		1.2
	SimTraffic LOS	A	A			A					E	B		A
	SimTraffic 95th Queue	42	10			7					72			
	Queue Block Time (%)	4												
	Denied Entry													
30	**Mt Curve Blvd & Ford Ave (Unsignalized)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑>		
	SimTraffic Delay	9.3	1.3		12.3	2.3		330.7	165.8		200.6	261.2		29.9
	SimTraffic LOS	A	A		B	A		F	F		F	F		D
	SimTraffic 95th Queue	48	18		72	27		143	306		456	80		
	Queue Block Time (%)	1			2			91	70		7	72		
	Denied Entry													
40	**Cretin Ave & Ford Ave (Signalized -- Cycle Length: 120)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑>		
	SimTraffic Delay	34.6	13.9		54.4	33.5		50.1	27.8		53.0	40.8		30.3
	SimTraffic LOS	C	B		D	C		D	C		D	D		C
	SimTraffic 95th Queue	186	241		115	349		204	244		206	494		
	Queue Block Time (%)	17	4		22	46		27	9		20	20		
	Denied Entry													
50	**Finn St & Ford Ave (Signalized -- Cycle Length: 120)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		<↑	→		
	SimTraffic Delay	19.6	11.2		21.2	9.6		45.6	31.0		39.3	10.3		15.5
	SimTraffic LOS	B	B		C	A		D	C		D	B		B
	SimTraffic 95th Queue	70	197		126	150		218	121		153	106		
	Queue Block Time (%)	4	14		1						14	1		
	Denied Entry													
60	**Cleveland Ave & Ford Ave (Signalized -- Cycle Length: 120)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑↑>		
	SimTraffic Delay	43.8	34.3		42.1	37.5		28.9	39.7		41.3	37.1		38.2
	SimTraffic LOS	D	C		D	D		C	D		D	D		D
	SimTraffic 95th Queue	215	380		177	300		224	483		129	383		
	Queue Block Time (%)	1	12		1	20			1		1	28		
	Denied Entry													
61	**Kenneth St & Ford Ave (Signalized -- Cycle Length: 60)**													
	Lanes	←	↑↑>		←	↑↑>			<↑>			<↑>		
	SimTraffic Delay	26.7	11.6		28.9	14.9			18.5			17.6		13.7
	SimTraffic LOS	C	B		C	B			B			B		B
	SimTraffic 95th Queue	70	215		88	341			109			88		
	Queue Block Time (%)	14	30			13								
	Denied Entry													
62	**Fairview Ave & Ford Ave (Signalized -- Cycle Length: 140)**													
	Lanes	←	↑	→	←	↑	→	←	↑>		←	↑>		
	SimTraffic Delay	117.6	51.8	38.3	91.7	108.8	83.9	54.9	34.1		127.5	152.8		91.7
	SimTraffic LOS	F	D	D	F	F	F	D	C		F	F		F
	SimTraffic 95th Queue	383	751	148	240	980	114	211	512		411	1,641		
	Queue Block Time (%)	23	47			65			14			55		
	Denied Entry										1	10	2	13
65	**Cleveland Ave & Highland Pkwy (Signalized -- Cycle Length: 120)**													
	Lanes	<↑		→	<↑		→	←	↑>		←	↑>		
	SimTraffic Delay	45.1		18.7	46.7		19.5	15.4	8.7		23.4	8.5		14.0
	SimTraffic LOS	D		B	D		B	B	A		C	A		B

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	SimTraffic 95th Queue	163		71	162		71	48	170		78	210		
	Queue Block Time (%)	51		11	51		10		7		1	9		
	Denied Entry													
75	**St Paul Ave & Montreal Ave (All-way stop)**													
	Lanes	<↑		→	<↑>			<↑↑>			←	↑↑>		
	SimTraffic Delay	23.7		12.3	112.8			82.9			16.2	22.0		64.2
	SimTraffic LOS	C		B	F			F			C	C		F
	SimTraffic 95th Queue	130		78	592			643			80	132		
	Queue Block Time (%)	16		5								1		
	Denied Entry													
80	**Edgcumbe Rd & St Paul Ave (Signalized -- Cycle Length: 105)**													
	Lanes	<↑↑		→	<↑↑>			←	↑↑>		←	↑↑>		
	SimTraffic Delay	34.6		19.5	33.5			30.3	11.0		33.0	30.5		23.7
	SimTraffic LOS	C		B	C			C	B		C	C		C
	SimTraffic 95th Queue	245		143	141			284	450		103	225		
	Queue Block Time (%)	7		33				19				7		
	Denied Entry													
90	**Cleveland Ave & Montreal Ave (Unsignalized)**													
	Lanes	←	↑>		<↑>			<↑>			<↑>			
	SimTraffic Delay	9.7	14.7		12.9			1.9			0.7			9.5
	SimTraffic LOS	A	B		B			A			A			A
	SimTraffic 95th Queue	52	166		132			48			27			
	Queue Block Time (%)		8											
	Denied Entry													
100	**Fairview Ave & Montreal Ave (Signalized -- Cycle Length: 70)**													
	Lanes	←	↑	→	←	↑>		←	↑>		←	↑>		
	SimTraffic Delay	33.1	16.3	11.9	24.4	22.2		29.6	17.3		39.4	18.8		19.3
	SimTraffic LOS	C	B	B	C	C		C	B		D	B		B
	SimTraffic 95th Queue	47	140	41	92	227		93	302		142	317		
	Queue Block Time (%)		41	1		22			25		1	19		
	Denied Entry													
120	**Mississippi River Blvd & N Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				8.6	-			1.0		3.0	0.6		1.5
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				51				5		54			
	Queue Block Time (%)													
	Denied Entry													
130	**Mississippi River Blvd & S Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				8.9	-			0.9		2.4	0.5		2.0
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				78						20			
	Queue Block Time (%)													
	Denied Entry													
205	**Mississippi River Blvd & Bohland Ave (Unsignalized)**													
	Lanes				←		→		↑>		<↑			
	SimTraffic Delay				7.2		2.9		1.8		0.7			1.3
	SimTraffic LOS				A		A		A		A			A
	SimTraffic 95th Queue				28		39				19			
	Queue Block Time (%)													
	Denied Entry													
215	**Mississippi River Blvd & Montreal Ave (Unsignalized)**													
	Lanes				←>	0			↑>		<↑			
	SimTraffic Delay				8.6	-			0.9		2.3			2.0
	SimTraffic LOS				A	A			A		A			A
	SimTraffic 95th Queue				36						17			
	Queue Block Time (%)													
	Denied Entry													
400	**Mt Curve Blvd & Highland Pkwy (All-way stop)**													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	6.4			8.2			6.9			16.9			11.5
	SimTraffic LOS	A			A			A			C			B
	SimTraffic 95th Queue	50			55			48			131			
	Queue Block Time (%)													
	Denied Entry													
500	**Cretin Ave & Randolph Ave (Signalized -- Cycle Length: 65)**													
	Lanes	<↑>			<↑		→	←		↑>	←		↑>	
	SimTraffic Delay	28.4			31.4		16.6	25.8		8.6	27.4		12.5	16.0
	SimTraffic LOS	C			C		B	C		A	C		B	B
	SimTraffic 95th Queue	175			186		65	31		198	146		252	
	Queue Block Time (%)				51		17			12	5		9	
	Denied Entry													
501	**Cretin Ave & Highland Pkwy (Unsignalized)**													
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	30.8			42.2			1.9			4.2			6.9
	SimTraffic LOS	D			E			A			A			A
	SimTraffic 95th Queue	79			133			45			167			
	Queue Block Time (%)													
	Denied Entry													

70: Cleveland Ave & St Paul Ave & Bohland Ave Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0
Total Del/Veh (s)	4.8	0.5	1.9	1.3

71: St Paul Ave Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	13.1	2.7	0.3	2.6

72: Cleveland Ave & St Paul Ave Performance by approach

Approach	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	5.9	0.2	2.2

73: Cleveland Ave & Inner Drive Performance by approach

Approach	EB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.0
Total Del/Veh (s)	2.6	0.2	0.3

140: 46th Ave & E 46th St/Ford Pkwy Performance by approach

Approach	EB	WB	NB	SB	SW	All
Denied Del/Veh (s)	0.3	0.0	2.9	1.1	0.1	0.6
Total Del/Veh (s)	25.4	19.5	37.4	35.9	58.8	25.3

Total Zone Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	1648.8

Intersection: 70: Cleveland Ave & St Paul Ave & Bohland Ave

Movement	WB	NB	NB
Directions Served	R	T	TR
Maximum Queue (ft)	42	3	30
Average Queue (ft)	17	0	2
95th Queue (ft)	33	3	20
Link Distance (ft)	762	168	168
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 71: St Paul Ave

Movement	EB
Directions Served	LR
Maximum Queue (ft)	57
Average Queue (ft)	42
95th Queue (ft)	61
Link Distance (ft)	51
Upstream Blk Time (%)	11
Queuing Penalty (veh)	12
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 72: Cleveland Ave & St Paul Ave

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	84	30
Average Queue (ft)	37	1
95th Queue (ft)	63	13
Link Distance (ft)	651	99
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 73: Cleveland Ave & Inner Drive

Movement	EB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	11
95th Queue (ft)	34
Link Distance (ft)	285
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 140: 46th Ave & E 46th St/Ford Pkwy

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SW
Directions Served	<	LT	TR	L	T	TR>	LTR	>	LT	R	<LR>
Maximum Queue (ft)	149	344	340	160	304	303	441	63	186	58	30
Average Queue (ft)	53	195	180	104	141	161	217	49	91	27	3
95th Queue (ft)	136	305	297	177	274	269	421	58	166	64	15
Link Distance (ft)		1464	1464		1094	1094	1029		656		272
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	75			110				25		25	
Storage Blk Time (%)	1	36		12	7		57	14	54	5	
Queuing Penalty (veh)	4	22		48	22		183	14	17	6	

Zone Summary

Zone wide Queuing Penalty: 328

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
305	**Woodlawn Ave & Bohland Ave (Unsignalized)**													
	Lanes	←	↑>			↑>		<↑>			<↑>			
	SimTraffic Delay	2.0	0.2			1.4		5.2			0.8			1.7
	SimTraffic LOS	A	A			A		A			A			A
	SimTraffic 95th Queue	3						15			45			
	Queue Block Time (%)													
	Denied Entry													
310	**Woodlawn Ave & Village Way (Unsignalized)**													
	Lanes	<↑>				<↑>		<↑>				<↑>		
	SimTraffic Delay	4.4				2.3		0.3				1.4		2.2
	SimTraffic LOS	A				A		A				A		A
	SimTraffic 95th Queue	22				19								
	Queue Block Time (%)													
	Denied Entry													
315	**Woodlawn Ave & Montreal Ave (Unsignalized)**													
	Lanes		<↑>			<↑>		0						
	SimTraffic Delay		5.1			5.5		-						4.5
	SimTraffic LOS		A			A		A						A
	SimTraffic 95th Queue		40			43								
	Queue Block Time (%)													
	Denied Entry													
401	**Mt Curve Blvd & Woodlawn Ave (Unsignalized)**													
	Lanes	0			0			←	↑>		←	↑>		
	SimTraffic Delay	-			-			3.9	37.9		2.9	1.1		131.8
	SimTraffic LOS	F			F			A	E		A	A		F
	SimTraffic 95th Queue							53	126		35	2		
	Queue Block Time (%)								6					
	Denied Entry	39		17	12		28							96
405	**Mt Curve Blvd & Bohland Ave (Unsignalized)**													
	Lanes	←	↑>		←	↑>		←	↑>		←	↑>		
	SimTraffic Delay	5.9	6.9		7.5	4.0		2.3	0.2		2.4	0.7		2.2
	SimTraffic LOS	A	A		A	A		A	A		A	A		A
	SimTraffic 95th Queue	25	44		14	44		7	1		17	2		
	Queue Block Time (%)													
	Denied Entry													
410	**Mt Curve Blvd & Village Way (Unsignalized)**													
	Lanes	0			0			<↑>			<↑>			
	SimTraffic Delay	-			-			0.3			0.3			0.6
	SimTraffic LOS	A			A			A			A			A
	SimTraffic 95th Queue							5			5			
	Queue Block Time (%)													
	Denied Entry													
415	**Mt Curve Blvd & Montreal Ave (Unsignalized)**													
	Lanes	<↑>			<↑>				<↑>		<↑>			
	SimTraffic Delay	6.3			4.4				0.1		0.7			3.4
	SimTraffic LOS	A			A				A		A			A
	SimTraffic 95th Queue	48			51						11			
	Queue Block Time (%)													
	Denied Entry													
502	**Cretin Ave & Hillcrest (Unsignalized)**													
	Lanes	0			0			←	↑>		←	↑>		
	SimTraffic Delay	-			-			2.9	1.7		3.8	1.3		3.1
	SimTraffic LOS	A			A			A	A		A	A		A
	SimTraffic 95th Queue							28	62		42			
	Queue Block Time (%)								1					
	Denied Entry													
505	**Cretin Ave & Bohland Ave (Unsignalized)**													
	Lanes	←	↑>		←	↑>		←	↑>		←	↑>		
	SimTraffic Delay	9.6	9.8		8.1	7.5		3.1	0.6		3.1	0.5		1.6
	SimTraffic LOS	A	A		A	A		A	A		A	A		A

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	SimTraffic 95th Queue	40	51		27	48		40	9		32	3		
	Queue Block Time (%)													
	Denied Entry													
510	**Cretin Ave & Village Way (Unsignalized)**													
	Lanes	0			0			←	↑>		←	↑>		
	SimTraffic Delay	-			-			3.1	0.6		3.3	0.7		1.7
	SimTraffic LOS	A			A			A	A		A	A		A
	SimTraffic 95th Queue							21	3		44			
	Queue Block Time (%)													
	Denied Entry													
515	**Montreal Ave & Cretin Ave (Unsignalized)**													
	Lanes	←	↑			↑>					←		→	
	SimTraffic Delay	4.9	0.9			2.1					7.5		3.2	3.0
	SimTraffic LOS	A	A			A					A		A	A
	SimTraffic 95th Queue	28				11					84		39	
	Queue Block Time (%)													
	Denied Entry													
605	**Ranger Way & Bohland Ave (Unsignalized)**													
	Lanes		↑>			↑								
	SimTraffic Delay		0.5			0.5								0.5
	SimTraffic LOS		A			A								A
	SimTraffic 95th Queue													
	Queue Block Time (%)													
	Denied Entry													
610	**Ranger Way & Village Way (Unsignalized)**													
	Lanes		<↑>			<↑>								
	SimTraffic Delay		2.5			3.6								2.9
	SimTraffic LOS		A			A								A
	SimTraffic 95th Queue		46			46								
	Queue Block Time (%)													
	Denied Entry													
705	**Finn St & Bohland Ave (All-way stop)**													
	Lanes			→										
	SimTraffic Delay			2.5										0.8
	SimTraffic LOS			A										A
	SimTraffic 95th Queue			21										
	Queue Block Time (%)													
	Denied Entry													
710	**Finn St & Village Way (Unsignalized)**													
	Lanes	←>	0					<↑				↑>		
	SimTraffic Delay	8.0	-					0.2				0.2		2.1
	SimTraffic LOS	A	A					A				A		A
	SimTraffic 95th Queue	41						6						
	Queue Block Time (%)													
	Denied Entry													
711	**Finn St & Saunders Ave (Unsignalized)**													
	Lanes							<↑>				<↑>		
	SimTraffic Delay							0.2				0.2		0.3
	SimTraffic LOS							A				A		A
	SimTraffic 95th Queue							4						
	Queue Block Time (%)													
	Denied Entry													
715	**Montreal Ave & Finn St (Unsignalized)**													
	Lanes	←	↑			↑>					←>	0		
	SimTraffic Delay	-	0.7			2.3					9.4	-		1.9
	SimTraffic LOS	A	A			A					A	A		A
	SimTraffic 95th Queue	3									49			
	Queue Block Time (%)													
	Denied Entry													
716	**Cleveland Ave & Saunders Ave (Unsignalized)**													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Lanes								<↑>			<↑>		
	SimTraffic Delay								0.5			0.2		0.3
	SimTraffic LOS								A			A		A
	SimTraffic 95th Queue													
	Queue Block Time (%)													
	Denied Entry													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
10	**S Ford Ramp/N Ford Ramp & Ford Ave (Unsignalized)**													
	Lanes		↑↑>			↑↑>				→			→	
	SimTraffic Delay		2.7			0.5				5.6			5.9	2.0
	SimTraffic LOS		A			A				A			A	A
	SimTraffic 95th Queue		9			8				48			62	
	Queue Block Time (%)													
	Denied Entry													
20	**Ford Ave & Woodlawn Ave (Unsignalized)**													
	Lanes	←	↑↑			↑↑>						0		
	SimTraffic Delay	5.0	0.5			1.0						-		0.8
	SimTraffic LOS	A	A			A						A		A
	SimTraffic 95th Queue	35												
	Queue Block Time (%)	2												
	Denied Entry													
30	**Mt Curve Blvd & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑>		
	SimTraffic Delay	15.4	5.4		17.7	6.1		28.5	26.4		31.4	27.9		8.7
	SimTraffic LOS	B	A		B	A		C	C		C	C		A
	SimTraffic 95th Queue	34	152		87	132		100	102		66	69		
	Queue Block Time (%)		3		3	4		2	1		2	9		
	Denied Entry													
40	**Cretin Ave & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑>		
	SimTraffic Delay	18.5	8.7		24.2	18.5		30.8	22.4		31.3	20.2		16.7
	SimTraffic LOS	B	A		C	B		C	C		C	C		B
	SimTraffic 95th Queue	134	124		69	213		181	179		140	131		
	Queue Block Time (%)	1				2		15	6					
	Denied Entry													
50	**Finn St & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>		←	0		<↑		→	
	SimTraffic Delay	19.3	11.8		11.6	8.0		31.7	-		28.9		6.5	11.5
	SimTraffic LOS	B	B		B	A		C	A		C		A	B
	SimTraffic 95th Queue	63	193		76	152		101			67		56	
	Queue Block Time (%)	2	13								1			
	Denied Entry													
60	**Cleveland Ave & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑	→	
	SimTraffic Delay	37.0	17.9		44.2	20.2		19.6	16.0		40.1	27.5	24.3	21.7
	SimTraffic LOS	D	B		D	C		B	B		D	C	C	C
	SimTraffic 95th Queue	124	191		103	160		139	307		105	315	160	
	Queue Block Time (%)		1		1	1						29		
	Denied Entry													
61	**Kenneth St & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>			<↑>			<↑>		
	SimTraffic Delay	13.3	5.1		14.8	9.5			22.3			26.2		9.3
	SimTraffic LOS	B	A		B	A			C			C		A
	SimTraffic 95th Queue	49	79		77	193			87			91		
	Queue Block Time (%)	7	13			7								
	Denied Entry													
62	**Fairview Ave & Ford Ave (Signalized -- Cycle Length: 75)**													
	Lanes	←	↑	→	←	↑	→	←	↑>		←	↑	→	
	SimTraffic Delay	28.1	22.5	11.8	23.3	31.0	17.8	26.2	35.7		24.1	24.2	11.9	27.4
	SimTraffic LOS	C	C	B	C	C	B	C	D		C	C	B	C
	SimTraffic 95th Queue	127	261	112	81	326	140	159	470		40	331	173	
	Queue Block Time (%)		17			33			11			25		
	Denied Entry													
65	**Cleveland Ave & Highland Pkwy (Signalized -- Cycle Length: 80)**													
	Lanes	<↑		→	<↑		→	←	↑>		←	↑>		
	SimTraffic Delay	35.2		9.9	33.2		11.4	11.4	6.3		16.1	7.3		9.7
	SimTraffic LOS	D		A	C		B	B	A		B	A		A

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	SimTraffic 95th Queue	92		68	101		66	52	120		39	172		
	Queue Block Time (%)	28		8	39		5		2			5		
	Denied Entry													
75	**St Paul Ave & Montreal Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑>		←	↑>		←	↑↑>		←	↑↑>		
	SimTraffic Delay	23.1	17.9		26.2	19.4		19.2	18.5		15.0	18.9		17.3
	SimTraffic LOS	C	B		C	B		B	B		B	B		B
	SimTraffic 95th Queue	59	164		62	146		114	147		72	144		
	Queue Block Time (%)	1	18		1	12		1	1			1		
	Denied Entry													
80	**Edgcumbe Rd & St Paul Ave (Signalized -- Cycle Length: 105)**													
	Lanes	<↑↑		→	<↑↑>			←	↑↑>		←	↑↑>		
	SimTraffic Delay	34.9		23.6	33.5			31.3	10.1		31.1	30.1		24.6
	SimTraffic LOS	C		C	C			C	B		C	C		C
	SimTraffic 95th Queue	328		142	152			273	517		91	238		
	Queue Block Time (%)	2		39				16				9		
	Denied Entry													
90	**Cleveland Ave & Montreal Ave (Unsignalized)**													
	Lanes	←	↑>		←	↑>		<↑>			<↑>			
	SimTraffic Delay	3.5	1.0		4.5	1.9		13.6			11.6			4.7
	SimTraffic LOS	A	A		A	A		B			B			A
	SimTraffic 95th Queue	22	6		28	4		119			68			
	Queue Block Time (%)													
	Denied Entry													
100	**Fairview Ave & Montreal Ave (Signalized -- Cycle Length: 65)**													
	Lanes	←	↑	→	←	↑>		←	↑>		←	↑>		
	SimTraffic Delay	29.8	21.4	17.2	26.3	23.4		26.6	13.7		29.8	19.3		18.7
	SimTraffic LOS	C	C	B	C	C		C	B		C	B		B
	SimTraffic 95th Queue	58	169	49	63	223		73	245		118	335		
	Queue Block Time (%)		41	3		16			17			18		
	Denied Entry													
120	**Mississippi River Blvd & N Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				5.7	-			1.1		3.0	0.2		1.3
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				48						38			
	Queue Block Time (%)													
	Denied Entry													
130	**Mississippi River Blvd & S Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				6.8	-			1.1		2.9	0.2		2.4
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				75						21			
	Queue Block Time (%)													
	Denied Entry													
205	**Mississippi River Blvd & Bohland Ave (Unsignalized)**													
	Lanes				←>	0			↑>		<↑			
	SimTraffic Delay				7.1	-			2.5		0.7			2.1
	SimTraffic LOS				A	A			A		A			A
	SimTraffic 95th Queue				38						31			
	Queue Block Time (%)													
	Denied Entry													
215	**Mississippi River Blvd & Montreal Ave (Unsignalized)**													
	Lanes				←>	0			↑>		<↑			
	SimTraffic Delay				7.7	-			1.1		0.9			1.3
	SimTraffic LOS				A	A			A		A			A
	SimTraffic 95th Queue				42						6			
	Queue Block Time (%)													
	Denied Entry													
400	**Mt Curve Blvd & Highland Pkwy (All-way stop)**													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	6.0			7.8			7.0			6.1			6.2
	SimTraffic LOS	A			A			A			A			A
	SimTraffic 95th Queue	49			42			51			52			
	Queue Block Time (%)													
	Denied Entry													
500	**Cretin Ave & Randolph Ave (Signalized -- Cycle Length: 65)**													
	Lanes	<↑>			<↑		→	←	↑>		←	↑>		
	SimTraffic Delay	29.6			34.2		20.0	12.9	9.0		31.6	8.9		16.3
	SimTraffic LOS	C			C		B	B	A		C	A		B
	SimTraffic 95th Queue	129			243		57	33	218		129	255		
	Queue Block Time (%)				45		38		13		8	1		
	Denied Entry													
501	**Cretin Ave & Highland Pkwy (Unsignalized)**													
	Lanes	<↑>			<↑>				<↑>		<↑>			
	SimTraffic Delay	13.4			13.5				1.4		1.6			3.1
	SimTraffic LOS	B			B				A		A			A
	SimTraffic 95th Queue	50			74				5		80			
	Queue Block Time (%)													
	Denied Entry													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
305	**Woodlawn Ave & Bohland Ave (Unsignalized)**													
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	0.3			1.6			5.8			0.2			1.0
	SimTraffic LOS	A			A			A			A			A
	SimTraffic 95th Queue	9			2			28			33			
	Queue Block Time (%)													
	Denied Entry													
310	**Woodlawn Ave & Village Way (Unsignalized)**													
	Lanes	<↑>			<↑>			<↑>				<↑>		
	SimTraffic Delay	5.0			2.5			0.2				0.8		1.8
	SimTraffic LOS	A			A			A				A		A
	SimTraffic 95th Queue	27			7									
	Queue Block Time (%)													
	Denied Entry													
315	**Woodlawn Ave & Montreal Ave (Unsignalized)**													
	Lanes		<↑>			<↑>			0					
	SimTraffic Delay		5.0			6.4			-					4.5
	SimTraffic LOS		A			A			A					A
	SimTraffic 95th Queue		33			43								
	Queue Block Time (%)													
	Denied Entry													
401	**Mt Curve Blvd & Woodlawn Ave (Unsignalized)**													
	Lanes	0			0			←	↑>		←	↑>		
	SimTraffic Delay	-			-			2.6	0.6		2.7	1.8		2.9
	SimTraffic LOS	A			A			A	A		A	A		A
	SimTraffic 95th Queue							31	2		34	5		
	Queue Block Time (%)													
	Denied Entry													
405	**Mt Curve Blvd & Bohland Ave (Unsignalized)**													
	Lanes	<↑>			<↑>			←	↑>		←	↑>		
	SimTraffic Delay	6.2			6.5			1.9	0.3		2.3	0.6		2.2
	SimTraffic LOS	A			A			A	A		A	A		A
	SimTraffic 95th Queue	41			52			6			19	2		
	Queue Block Time (%)													
	Denied Entry													
410	**Mt Curve Blvd & Village Way (Unsignalized)**													
	Lanes	0			0				<↑>		<↑>			
	SimTraffic Delay	-			-				0.3		0.1			0.6
	SimTraffic LOS	A			A				A		A			A
	SimTraffic 95th Queue										5			
	Queue Block Time (%)													
	Denied Entry													
415	**Mt Curve Blvd & Montreal Ave (Unsignalized)**													
	Lanes	<↑>			<↑>				<↑>		<↑>			
	SimTraffic Delay	5.9			5.5				0.2		0.3			3.6
	SimTraffic LOS	A			A				A		A			A
	SimTraffic 95th Queue	46			59						11			
	Queue Block Time (%)													
	Denied Entry													
502	**Cretin Ave & Hillcrest (Unsignalized)**													
	Lanes	0			0			←	↑>		←	↑>		
	SimTraffic Delay	-			-			2.3	0.5		3.3	0.9		1.6
	SimTraffic LOS	A			A			A	A		A	A		A
	SimTraffic 95th Queue							14	8		24			
	Queue Block Time (%)													
	Denied Entry													
505	**Cretin Ave & Bohland Ave (Unsignalized)**													
	Lanes	<↑>			<↑>			←	↑>		←	↑>		
	SimTraffic Delay	9.5			8.0			2.9	0.6		3.1	0.4		1.6
	SimTraffic LOS	A			A			A	A		A	A		A

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	SimTraffic 95th Queue	50			55			36			22	6		
	Queue Block Time (%)													
	Denied Entry													
510	**Cretin Ave & Village Way (Unsignalized)**													
	Lanes	0			0			←	↑>		←	↑>		
	SimTraffic Delay	-			-			2.6	0.6		2.8	0.5		1.9
	SimTraffic LOS	A			A			A	A		A	A		A
	SimTraffic 95th Queue							16			28			
	Queue Block Time (%)													
	Denied Entry													
515	**Montreal Ave & Cretin Ave (Unsignalized)**													
	Lanes	←	↑>			↑>					←	0		
	SimTraffic Delay	5.0	0.9			2.4					7.9	-		3.4
	SimTraffic LOS	A	A			A					A	A		A
	SimTraffic 95th Queue	27				6					81			
	Queue Block Time (%)													
	Denied Entry													
605	**Ranger Way & Bohland Ave (Unsignalized)**													
	Lanes		↑>			<↑								
	SimTraffic Delay		0.4			0.5								0.4
	SimTraffic LOS		A			A								A
	SimTraffic 95th Queue													
	Queue Block Time (%)													
	Denied Entry													
610	**Ranger Way & Village Way (Unsignalized)**													
	Lanes		<↑>			<↑>								
	SimTraffic Delay		3.1			5.0								4.2
	SimTraffic LOS		A			A								A
	SimTraffic 95th Queue		42			52								
	Queue Block Time (%)													
	Denied Entry													
705	**Finn St & Bohland Ave (All-way stop)**													
	Lanes		0											
	SimTraffic Delay		-											0.7
	SimTraffic LOS		A											A
	SimTraffic 95th Queue													
	Queue Block Time (%)													
	Denied Entry													
710	**Finn St & Village Way (Unsignalized)**													
	Lanes	<>	0						<↑			↑>		
	SimTraffic Delay	4.7	-						0.2			0.1		2.5
	SimTraffic LOS	A	A						A			A		A
	SimTraffic 95th Queue	47							3					
	Queue Block Time (%)													
	Denied Entry													
711	**Finn St & Saunders Ave (Unsignalized)**													
	Lanes								<↑>			<↑>		
	SimTraffic Delay								0.2			0.2		0.3
	SimTraffic LOS								A			A		A
	SimTraffic 95th Queue								8					
	Queue Block Time (%)													
	Denied Entry													
715	**Montreal Ave & Finn St (Unsignalized)**													
	Lanes		↑			↑>					<>	0		
	SimTraffic Delay		0.7			0.8					8.3	-		1.2
	SimTraffic LOS		A			A					A	A		A
	SimTraffic 95th Queue										52			
	Queue Block Time (%)													
	Denied Entry													
716	**Cleveland Ave & Saunders Ave (Unsignalized)**													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Lanes								<↑>			<↑>		
	SimTraffic Delay								1.8			0.1		1.0
	SimTraffic LOS								A			A		A
	SimTraffic 95th Queue													
	Queue Block Time (%)													
	Denied Entry													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
10	**S Ford Ramp/N Ford Ramp & Ford Ave (Unsignalized)**													
	Lanes		↑↑>			↑↑>				→			→	
	SimTraffic Delay		3.9			0.7				8.0			9.6	3.0
	SimTraffic LOS		A			A				A			A	A
	SimTraffic 95th Queue		9			5				51			106	
	Queue Block Time (%)													
	Denied Entry													
20	**Ford Ave & Woodlawn Ave (Unsignalized)**													
	Lanes	←	↑↑			↑↑>					←>	0		
	SimTraffic Delay	8.1	0.8			1.3					33.4	-		1.4
	SimTraffic LOS	A	A			A					D	B		A
	SimTraffic 95th Queue	42				6					65			
	Queue Block Time (%)	4												
	Denied Entry													
30	**Mt Curve Blvd & Ford Ave (Signalized -- Cycle Length: 120)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑>		
	SimTraffic Delay	20.3	8.1		18.4	7.3		50.4	48.0		45.3	50.4		12.6
	SimTraffic LOS	C	A		B	A		D	D		D	D		B
	SimTraffic 95th Queue	79	200		99	179		156	171		117	73		
	Queue Block Time (%)		8		3	8		1	1		2	25		
	Denied Entry													
40	**Cretin Ave & Ford Ave (Signalized -- Cycle Length: 120)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑>		
	SimTraffic Delay	56.1	20.8		32.6	21.9		35.7	43.4		34.3	59.9		30.2
	SimTraffic LOS	E	C		C	C		D	D		C	E		C
	SimTraffic 95th Queue	253	294		123	249		200	206		212	425		
	Queue Block Time (%)	18	2			5		3	2					
	Denied Entry													
50	**Finn St & Ford Ave (Signalized -- Cycle Length: 120)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		<↑		→	
	SimTraffic Delay	21.8	15.0		18.7	12.4		44.5	36.9		40.4		11.1	17.4
	SimTraffic LOS	C	B		B	B		D	D		D		B	B
	SimTraffic 95th Queue	74	239		148	236		196	123		152		104	
	Queue Block Time (%)	5	19			1					15		1	
	Denied Entry													
60	**Cleveland Ave & Ford Ave (Signalized -- Cycle Length: 120)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑	→	
	SimTraffic Delay	46.1	42.8		48.2	39.1		36.9	43.6		52.1	44.0	47.3	43.9
	SimTraffic LOS	D	D		D	D		D	D		D	D	D	D
	SimTraffic 95th Queue	294	447		197	322		278	550		164	545	204	
	Queue Block Time (%)	2	28		1	20			2		2	45	3	
	Denied Entry													
61	**Kenneth St & Ford Ave (Signalized -- Cycle Length: 60)**													
	Lanes	←	↑↑>		←	↑↑>		<↑>			<↑>			
	SimTraffic Delay	19.6	12.1		26.6	13.9		20.1			17.3			13.3
	SimTraffic LOS	B	B		C	B		C			B			B
	SimTraffic 95th Queue	67	218		76	304		106			90			
	Queue Block Time (%)	8	30			14								
	Denied Entry													
62	**Fairview Ave & Ford Ave (Signalized -- Cycle Length: 120)**													
	Lanes	←	↑	→	←	↑	→	←	↑>		←	↑	→	
	SimTraffic Delay	89.5	43.7	30.0	34.6	55.6	36.0	45.8	53.2		43.1	50.8	40.5	52.0
	SimTraffic LOS	F	D	C	C	E	D	D	D		D	D	D	D
	SimTraffic 95th Queue	347	622	136	235	588	134	282	652		314	819	197	
	Queue Block Time (%)	11	44			54			28			46	1	
	Denied Entry													
65	**Cleveland Ave & Highland Pkwy (Signalized -- Cycle Length: 120)**													
	Lanes	<↑		→	<↑		→	←	↑>		←	↑>		
	SimTraffic Delay	40.8		15.8	47.1		21.4	16.2	8.9		22.8	9.6		14.1
	SimTraffic LOS	D		B	D		C	B	A		C	A		B

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	SimTraffic 95th Queue	144		71	168		71	64	184		78	230		
	Queue Block Time (%)	44		14	52		14		6			10		
	Denied Entry													
75	**St Paul Ave & Montreal Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑>		←	↑>		←	↑↑>		←	↑↑>		
	SimTraffic Delay	26.8	19.1		28.0	21.3		20.6	18.4		15.9	20.0		18.3
	SimTraffic LOS	C	B		C	C		C	B		B	B		B
	SimTraffic 95th Queue	37	176		72	186		135	156		89	149		
	Queue Block Time (%)		20		2	18		2	1			1		
	Denied Entry													
80	**Edgcumbe Rd & St Paul Ave (Signalized -- Cycle Length: 120)**													
	Lanes	<↑↑		→	<↑↑>			←	↑↑>		←	↑↑>		
	SimTraffic Delay	41.3		22.5	37.5			27.7	11.0		34.5	32.9		24.9
	SimTraffic LOS	D		C	D			C	B		C	C		C
	SimTraffic 95th Queue	283		142	148			277	444		110	233		
	Queue Block Time (%)	12		35				16				9		
	Denied Entry													
90	**Cleveland Ave & Montreal Ave (Unsignalized)**													
	Lanes	←	↑>		←	↑>		<↑>			<↑>			
	SimTraffic Delay	3.6	1.1		5.9	2.3		16.6			17.4			6.4
	SimTraffic LOS	A	A		A	A		C			C			A
	SimTraffic 95th Queue	25	11		51	2		120			107			
	Queue Block Time (%)													
	Denied Entry													
100	**Fairview Ave & Montreal Ave (Signalized -- Cycle Length: 70)**													
	Lanes	←	↑	→	←	↑>		←	↑>		←	↑>		
	SimTraffic Delay	34.2	16.4	13.3	26.0	21.6		33.7	17.6		44.1	23.5		21.0
	SimTraffic LOS	C	B	B	C	C		C	B		D	C		C
	SimTraffic 95th Queue	51	147	39	98	236		95	322		139	449		
	Queue Block Time (%)		39	2		22			25		2	22		
	Denied Entry													
120	**Mississippi River Blvd & N Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				8.3	-			1.0		3.0	0.6		1.5
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				52				5		52			
	Queue Block Time (%)													
	Denied Entry													
130	**Mississippi River Blvd & S Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				8.5	-			1.0		2.6	0.5		1.9
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				72				2		26			
	Queue Block Time (%)													
	Denied Entry													
205	**Mississippi River Blvd & Bohland Ave (Unsignalized)**													
	Lanes				←>	0			↑>		<↑			
	SimTraffic Delay				6.6	-			1.9		0.7			1.3
	SimTraffic LOS				A	A			A		A			A
	SimTraffic 95th Queue				42						23			
	Queue Block Time (%)													
	Denied Entry													
215	**Mississippi River Blvd & Montreal Ave (Unsignalized)**													
	Lanes				←>	0			↑>		<↑			
	SimTraffic Delay				8.8	-			0.9		2.2			1.9
	SimTraffic LOS				A	A			A		A			A
	SimTraffic 95th Queue				34						26			
	Queue Block Time (%)													
	Denied Entry													
400	**Mt Curve Blvd & Highland Pkwy (All-way stop)**													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	6.3			7.0			7.3			6.4			6.3
	SimTraffic LOS	A			A			A			A			A
	SimTraffic 95th Queue	53			48			58			55			
	Queue Block Time (%)													
	Denied Entry													
500	**Cretin Ave & Randolph Ave (Signalized -- Cycle Length: 60)**													
	Lanes	<↑>			<↑		→	←	↑>		←	↑>		
	SimTraffic Delay	24.9			28.5		15.4	20.4	9.5		32.9	14.4		16.8
	SimTraffic LOS	C			C		B	C	A		C	B		B
	SimTraffic 95th Queue	148			181		60	25	221		155	431		
	Queue Block Time (%)				48		18		13		8	9		
	Denied Entry													
501	**Cretin Ave & Highland Pkwy (Unsignalized)**													
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	26.3			26.8			1.9			3.3			5.3
	SimTraffic LOS	D			D			A			A			A
	SimTraffic 95th Queue	68			249			37			142			
	Queue Block Time (%)													
	Denied Entry													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
305	**Woodlawn Ave & Bohland Ave (Unsignalized)**													
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	0.2			1.2			4.6			0.9			1.7
	SimTraffic LOS	A			A			A			A			A
	SimTraffic 95th Queue							16			46			
	Queue Block Time (%)													
	Denied Entry													
310	**Woodlawn Ave & Village Way (Unsignalized)**													
	Lanes	<↑>			<↑>			<↑>				<↑>		
	SimTraffic Delay	5.3			2.1			0.2				1.5		2.4
	SimTraffic LOS	A			A			A				A		A
	SimTraffic 95th Queue	26			18									
	Queue Block Time (%)													
	Denied Entry													
315	**Woodlawn Ave & Montreal Ave (Unsignalized)**													
	Lanes		<↑>		<↑>			0						
	SimTraffic Delay		4.8		5.7			-						4.3
	SimTraffic LOS		A		A			A						A
	SimTraffic 95th Queue		39		43									
	Queue Block Time (%)													
	Denied Entry													
401	**Mt Curve Blvd & Woodlawn Ave (Unsignalized)**													
	Lanes	0			0			←	↑>		←	↑>		
	SimTraffic Delay	-			-			2.3	0.9		2.9	1.5		4.3
	SimTraffic LOS	A			A			A	A		A	A		A
	SimTraffic 95th Queue							24	9		35			
	Queue Block Time (%)													
	Denied Entry													
405	**Mt Curve Blvd & Bohland Ave (Unsignalized)**													
	Lanes	<↑>			<↑>			←	↑>		←	↑>		
	SimTraffic Delay	6.8			3.8			1.9	0.2		2.2	0.5		2.0
	SimTraffic LOS	A			A			A	A		A	A		A
	SimTraffic 95th Queue	49			46			7	1		20	2		
	Queue Block Time (%)													
	Denied Entry													
410	**Mt Curve Blvd & Village Way (Unsignalized)**													
	Lanes	0			0			<↑>			<↑>			
	SimTraffic Delay	-			-			0.3			0.2			0.6
	SimTraffic LOS	A			A			A			A			A
	SimTraffic 95th Queue							6			7			
	Queue Block Time (%)													
	Denied Entry													
415	**Mt Curve Blvd & Montreal Ave (Unsignalized)**													
	Lanes	<↑>			<↑>				<↑>		<↑>			
	SimTraffic Delay	6.1			4.4				0.1		0.7			3.4
	SimTraffic LOS	A			A				A		A			A
	SimTraffic 95th Queue	49			52						14			
	Queue Block Time (%)													
	Denied Entry													
502	**Cretin Ave & Hillcrest (Unsignalized)**													
	Lanes	0			0			←	↑>		←	↑>		
	SimTraffic Delay	-			-			3.1	0.8		3.8	1.3		2.3
	SimTraffic LOS	A			A			A	A		A	A		A
	SimTraffic 95th Queue							29	6		44			
	Queue Block Time (%)													
	Denied Entry													
505	**Cretin Ave & Bohland Ave (Unsignalized)**													
	Lanes	<↑>			<↑>			←	↑>		←	↑>		
	SimTraffic Delay	7.9			10.9			3.2	0.6		3.0	0.6		1.7
	SimTraffic LOS	A			B			A	A		A	A		A

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	SimTraffic 95th Queue	53			52			40			36	2		
	Queue Block Time (%)													
	Denied Entry													
510	**Cretin Ave & Village Way (Unsignalized)**													
	Lanes	0			0			←	↑>		←	↑>		
	SimTraffic Delay	-			-			2.8	0.6		3.5	0.7		1.7
	SimTraffic LOS	A			A			A	A		A	A		A
	SimTraffic 95th Queue							21			45			
	Queue Block Time (%)													
	Denied Entry													
515	**Montreal Ave & Cretin Ave (Unsignalized)**													
	Lanes	←	↑>			↑>					←	0		
	SimTraffic Delay	5.9	0.8			2.6					8.5	-		3.5
	SimTraffic LOS	A	A			A					A	A		A
	SimTraffic 95th Queue	29				7					88			
	Queue Block Time (%)										1			
	Denied Entry													
605	**Ranger Way & Bohland Ave (Unsignalized)**													
	Lanes		↑>			<↑								
	SimTraffic Delay		0.5			0.4								0.5
	SimTraffic LOS		A			A								A
	SimTraffic 95th Queue													
	Queue Block Time (%)													
	Denied Entry													
610	**Ranger Way & Village Way (Unsignalized)**													
	Lanes		<↑>			<↑>								
	SimTraffic Delay		2.4			3.8								2.8
	SimTraffic LOS		A			A								A
	SimTraffic 95th Queue		47			48								
	Queue Block Time (%)													
	Denied Entry													
705	**Finn St & Bohland Ave (All-way stop)**													
	Lanes		0											
	SimTraffic Delay		-											0.8
	SimTraffic LOS		A											A
	SimTraffic 95th Queue													
	Queue Block Time (%)													
	Denied Entry													
710	**Finn St & Village Way (Unsignalized)**													
	Lanes	←>	0					<↑				↑>		
	SimTraffic Delay	6.4	-					0.3				0.2		2.1
	SimTraffic LOS	A	A					A				A		A
	SimTraffic 95th Queue	40						14						
	Queue Block Time (%)													
	Denied Entry													
711	**Finn St & Saunders Ave (Unsignalized)**													
	Lanes							<↑>				<↑>		
	SimTraffic Delay							0.2				0.2		0.3
	SimTraffic LOS							A				A		A
	SimTraffic 95th Queue													
	Queue Block Time (%)													
	Denied Entry													
715	**Montreal Ave & Finn St (Unsignalized)**													
	Lanes	←	↑			↑>					←>	0		
	SimTraffic Delay	5.9	0.7			1.2					9.6	-		1.2
	SimTraffic LOS	A	A			A					A	A		A
	SimTraffic 95th Queue	9				2					48			
	Queue Block Time (%)													
	Denied Entry													
716	**Cleveland Ave & Saunders Ave (Unsignalized)**													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Lanes								<↑>			<↑>		
	SimTraffic Delay								1.7			0.2		0.7
	SimTraffic LOS								A			A		A
	SimTraffic 95th Queue													
	Queue Block Time (%)													
	Denied Entry													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
10	**S Ford Ramp/N Ford Ramp & Ford Ave (Unsignalized)**													
	Lanes		↑↑>			↑↑>				→			→	
	SimTraffic Delay		3.0			0.5				5.5			6.3	2.1
	SimTraffic LOS		A			A				A			A	A
	SimTraffic 95th Queue		14			5				50			66	
	Queue Block Time (%)													
	Denied Entry													
20	**Ford Ave & Woodlawn Ave (Unsignalized)**													
	Lanes	←	↑↑			↑↑>						0		
	SimTraffic Delay	5.7	0.6			1.0						-		0.9
	SimTraffic LOS	A	A			A						A		A
	SimTraffic 95th Queue	35				2								
	Queue Block Time (%)	2												
	Denied Entry													
30	**Mt Curve Blvd & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑>		
	SimTraffic Delay	14.4	6.0		21.8	6.9		30.4	27.9		34.4	30.4		9.7
	SimTraffic LOS	B	A		C	A		C	C		C	C		A
	SimTraffic 95th Queue	53	173		105	158		101	107		63	69		
	Queue Block Time (%)		4		6	4		2	2		2	11		
	Denied Entry													
40	**Cretin Ave & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑>		
	SimTraffic Delay	20.0	9.4		30.6	20.5		30.2	21.3		28.7	21.7		17.5
	SimTraffic LOS	B	A		C	C		C	C		C	C		B
	SimTraffic 95th Queue	136	139		74	233		172	146		133	154		
	Queue Block Time (%)					3		13	5					
	Denied Entry													
50	**Finn St & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>		←	0		<↑		→	
	SimTraffic Delay	19.2	13.6		12.0	9.0		30.4	-		24.4		6.0	12.7
	SimTraffic LOS	B	B		B	A		C	A		C		A	B
	SimTraffic 95th Queue	63	191		74	156		124			73		54	
	Queue Block Time (%)	2	15								2			
	Denied Entry													
60	**Cleveland Ave & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑	→	
	SimTraffic Delay	45.7	19.0		59.6	19.6		19.4	16.5		44.5	28.7	25.7	23.1
	SimTraffic LOS	D	B		E	B		B	B		D	C	C	C
	SimTraffic 95th Queue	150	200		138	155		140	308		100	330	163	
	Queue Block Time (%)	1	1		4	1						29		
	Denied Entry													
61	**Kenneth St & Ford Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑↑>		←	↑↑>			<↑>			<↑>		
	SimTraffic Delay	11.8	5.3		15.0	9.3			24.6			23.8		9.1
	SimTraffic LOS	B	A		B	A			C			C		A
	SimTraffic 95th Queue	47	87		74	204			82			83		
	Queue Block Time (%)	5	14			8								
	Denied Entry													
62	**Fairview Ave & Ford Ave (Signalized -- Cycle Length: 75)**													
	Lanes	←	↑	→	←	↑	→	←	↑>		←	↑	→	
	SimTraffic Delay	21.3	13.4	8.2	24.2	23.6	14.9	78.5	47.8		107.8	30.3	15.5	30.4
	SimTraffic LOS	C	B	A	C	C	B	E	D		F	C	B	C
	SimTraffic 95th Queue	115	201	74	97	292	124	253	567		113	435	182	
	Queue Block Time (%)		8			24			20			31		
	Denied Entry													
65	**Cleveland Ave & Highland Pkwy (Signalized -- Cycle Length: 80)**													
	Lanes	<↑		→	<↑		→	←	↑>		←	↑>		
	SimTraffic Delay	34.5		8.5	33.0		11.2	9.8	6.1		16.3	6.8		9.3
	SimTraffic LOS	C		A	C		B	A	A		B	A		A

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	SimTraffic 95th Queue	82		67	113		63	51	125		44	156		
	Queue Block Time (%)	25		8	39		4		2			5		
	Denied Entry													
75	**St Paul Ave & Montreal Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑>		←	↑>		←	↑↑>		←	↑↑>		
	SimTraffic Delay	23.4	18.5		29.8	19.8		21.4	18.0		14.3	20.0		17.9
	SimTraffic LOS	C	B		C	B		C	B		B	B		B
	SimTraffic 95th Queue	58	173		78	167		143	148		63	147		
	Queue Block Time (%)		19		2	14		2	1			1		
	Denied Entry													
80	**Edgcumbe Rd & St Paul Ave (Signalized -- Cycle Length: 105)**													
	Lanes	<↑↑		→	<↑↑>			←	↑↑>		←	↑↑>		
	SimTraffic Delay	35.1		22.8	33.0			27.2	10.1		33.4	29.1		23.7
	SimTraffic LOS	D		C	C			C	B		C	C		C
	SimTraffic 95th Queue	320		139	139			275	376		112	231		
	Queue Block Time (%)	4		39				14				9		
	Denied Entry													
90	**Cleveland Ave & Montreal Ave (Unsignalized)**													
	Lanes	←	↑>		←	↑>		<↑>			<↑>			
	SimTraffic Delay	3.6	1.0		5.0	1.9		15.8			12.6			5.1
	SimTraffic LOS	A	A		A	A		C			B			A
	SimTraffic 95th Queue	21	9		31	3		134			75			
	Queue Block Time (%)													
	Denied Entry													
100	**Fairview Ave & Montreal Ave (Signalized -- Cycle Length: 65)**													
	Lanes	←	↑	→	←	↑>		←	↑>		←	↑>		
	SimTraffic Delay	34.1	20.5	14.0	27.1	22.8		26.2	14.5		31.2	18.3		18.6
	SimTraffic LOS	C	C	B	C	C		C	B		C	B		B
	SimTraffic 95th Queue	61	172	48	77	238		76	261		111	315		
	Queue Block Time (%)		38	3		17			17			17		
	Denied Entry													
120	**Mississippi River Blvd & N Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				5.8	-			1.1		3.2	0.2		1.3
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				46						39			
	Queue Block Time (%)													
	Denied Entry													
130	**Mississippi River Blvd & S Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				7.0	-			1.1		2.5	0.2		2.4
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				73						21			
	Queue Block Time (%)													
	Denied Entry													
205	**Mississippi River Blvd & Bohland Ave (Unsignalized)**													
	Lanes				←>	0			↑>		<↑			
	SimTraffic Delay				6.6	-			2.5		0.7			2.0
	SimTraffic LOS				A	A			A		A			A
	SimTraffic 95th Queue				39						33			
	Queue Block Time (%)													
	Denied Entry													
215	**Mississippi River Blvd & Montreal Ave (Unsignalized)**													
	Lanes				←>	0			↑>		<↑			
	SimTraffic Delay				7.2	-			1.2		1.0			1.3
	SimTraffic LOS				A	A			A		A			A
	SimTraffic 95th Queue				37						18			
	Queue Block Time (%)													
	Denied Entry													
400	**Mt Curve Blvd & Highland Pkwy (All-way stop)**													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	5.9			7.8			7.0			6.2			6.2
	SimTraffic LOS	A			A			A			A			A
	SimTraffic 95th Queue	47			42			53			52			
	Queue Block Time (%)													
	Denied Entry													
500	**Cretin Ave & Randolph Ave (Signalized -- Cycle Length: 65)**													
	Lanes	<↑>			<↑		→	←	↑>		←	↑>		
	SimTraffic Delay	28.5			28.1		17.2	13.3	8.5		22.8	6.9		13.7
	SimTraffic LOS	C			C		B	B	A		C	A		B
	SimTraffic 95th Queue	126			216		58	35	204		111	147		
	Queue Block Time (%)				39		35		12		3	1		
	Denied Entry													
501	**Cretin Ave & Highland Pkwy (Unsignalized)**													
	Lanes	<↑>			<↑>				<↑>		<↑>			
	SimTraffic Delay	12.8			15.1				1.4		1.6			3.0
	SimTraffic LOS	B			C				A		A			A
	SimTraffic 95th Queue	47			78				2		77			
	Queue Block Time (%)													
	Denied Entry													

70: Cleveland Ave & St Paul Ave & Bohland Ave Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.0
Total Del/Veh (s)	6.5	0.8	1.5	1.6

71: St Paul Ave Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	13.3	2.7	0.2	2.7

72: Cleveland Ave & St Paul Ave Performance by approach

Approach	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	5.9	0.6	2.8

73: Cleveland Ave & Inner Drive Performance by approach

Approach	EB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.0
Total Del/Veh (s)	2.8	0.1	0.7

140: 46th Ave & E 46th St/Ford Pkwy Performance by approach

Approach	EB	WB	NB	SB	SW	All
Denied Del/Veh (s)	0.4	0.0	0.0	1.0	0.1	0.2
Total Del/Veh (s)	15.5	11.3	7.7	55.9	71.7	14.4

Total Zone Performance

Denied Del/Veh (s)	0.4
Total Del/Veh (s)	113.0

Intersection: 70: Cleveland Ave & St Paul Ave & Bohland Ave

Movement	WB	NB	NB	SB
Directions Served	R	T	TR	T
Maximum Queue (ft)	81	6	32	8
Average Queue (ft)	32	0	1	0
95th Queue (ft)	63	6	14	5
Link Distance (ft)	762	168	168	556
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 71: St Paul Ave

Movement	EB
Directions Served	LR
Maximum Queue (ft)	57
Average Queue (ft)	41
95th Queue (ft)	61
Link Distance (ft)	51
Upstream Blk Time (%)	10
Queuing Penalty (veh)	12
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 72: Cleveland Ave & St Paul Ave

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	80	51
Average Queue (ft)	34	3
95th Queue (ft)	58	24
Link Distance (ft)	651	99
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 73: Cleveland Ave & Inner Drive

Movement	EB	SB
Directions Served	R	TR
Maximum Queue (ft)	53	3
Average Queue (ft)	19	0
95th Queue (ft)	47	3
Link Distance (ft)	285	58
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 140: 46th Ave & E 46th St/Ford Pkwy

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SW
Directions Served	<L	T	TR	L	T	TR>	LT	>	LT	R	<LR>
Maximum Queue (ft)	149	218	222	141	212	227	328	63	264	60	42
Average Queue (ft)	41	111	94	39	70	96	86	45	109	26	6
95th Queue (ft)	101	200	186	102	162	185	238	58	221	67	25
Link Distance (ft)		1464	1464		1080	1080	319		656		627
Upstream Blk Time (%)							1				
Queuing Penalty (veh)							8				
Storage Bay Dist (ft)	75			110				25		25	
Storage Blk Time (%)	1	17		1	3		32	11	61	4	
Queuing Penalty (veh)	3	11		2	5		102	4	16	4	

Zone Summary

Zone wide Queuing Penalty: 168

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
305	**Woodlawn Ave & Bohland Ave (Unsignalized)**													
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	0.4			1.7			6.2			0.3			1.0
	SimTraffic LOS	A			A			A			A			A
	SimTraffic 95th Queue	17						30			34			
	Queue Block Time (%)													
	Denied Entry													
310	**Woodlawn Ave & Village Way (Unsignalized)**													
	Lanes	<↑>			<↑>			<↑>				<↑>		
	SimTraffic Delay	5.1			6.5			0.2				0.8		2.0
	SimTraffic LOS	A			A			A				A		A
	SimTraffic 95th Queue	28			11									
	Queue Block Time (%)													
	Denied Entry													
315	**Woodlawn Ave & Montreal Ave (Unsignalized)**													
	Lanes		<↑>			<↑>			0					
	SimTraffic Delay		5.2			6.4			-					4.6
	SimTraffic LOS		A			A			A					A
	SimTraffic 95th Queue		39			42								
	Queue Block Time (%)													
	Denied Entry													
401	**Mt Curve Blvd & Woodlawn Ave (Unsignalized)**													
	Lanes	0			0			←	↑>		←	↑>		
	SimTraffic Delay	-			-			2.7	0.7		3.1	1.8		3.0
	SimTraffic LOS	A			A			A	A		A	A		A
	SimTraffic 95th Queue							39	6		42	6		
	Queue Block Time (%)													
	Denied Entry													
405	**Mt Curve Blvd & Bohland Ave (Unsignalized)**													
	Lanes	<↑>			<↑>			←	↑>		←	↑>		
	SimTraffic Delay	6.3			7.3			1.8	0.3		2.5	0.6		2.2
	SimTraffic LOS	A			A			A	A		A	A		A
	SimTraffic 95th Queue	41			54			5			19	2		
	Queue Block Time (%)													
	Denied Entry													
410	**Mt Curve Blvd & Village Way (Unsignalized)**													
	Lanes	0			0				<↑>			<↑>		
	SimTraffic Delay	-			-				0.3			0.1		0.6
	SimTraffic LOS	A			A				A			A		A
	SimTraffic 95th Queue													
	Queue Block Time (%)													
	Denied Entry													
415	**Mt Curve Blvd & Montreal Ave (Unsignalized)**													
	Lanes	<↑>			<↑>				<↑>			<↑>		
	SimTraffic Delay	6.0			6.5				0.3			0.7		3.6
	SimTraffic LOS	A			A				A			A		A
	SimTraffic 95th Queue	49			60							9		
	Queue Block Time (%)													
	Denied Entry													
502	**Cretin Ave & Hillcrest (Unsignalized)**													
	Lanes	0			0			←	↑>		←	↑>		
	SimTraffic Delay	-			-			2.8	0.5		3.5	1.0		1.6
	SimTraffic LOS	A			A			A	A		A	A		A
	SimTraffic 95th Queue							15	2		30			
	Queue Block Time (%)													
	Denied Entry													
505	**Cretin Ave & Bohland Ave (Unsignalized)**													
	Lanes	<↑>			<↑>			←	↑>		←	↑>		
	SimTraffic Delay	10.3			8.4			2.7	0.5		2.9	0.4		1.5
	SimTraffic LOS	B			A			A	A		A	A		A

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	SimTraffic 95th Queue	55			54			31			20			
	Queue Block Time (%)													
	Denied Entry													
510	**Cretin Ave & Village Way (Unsignalized)**													
	Lanes	0			0			←	↑>		←	↑>		
	SimTraffic Delay	-			-			3.0	0.6		3.1	0.5		1.5
	SimTraffic LOS	A			A			A	A		A	A		A
	SimTraffic 95th Queue							13			23			
	Queue Block Time (%)													
	Denied Entry													
515	**Montreal Ave & Cretin Ave (Unsignalized)**													
	Lanes	←	↑>		←	↑>		←	↑>		←	↑>		
	SimTraffic Delay	4.5	1.0		2.7	2.3		4.7	12.7		9.3	7.8		4.2
	SimTraffic LOS	A	A		A	A		A	B		A	A		A
	SimTraffic 95th Queue	25			17	5		8	43		96	50		
	Queue Block Time (%)										1			
	Denied Entry													
605	**Ranger Way & Bohland Ave (Unsignalized)**													
	Lanes		↑>			<↑								
	SimTraffic Delay		0.6			0.4								0.5
	SimTraffic LOS		A			A								A
	SimTraffic 95th Queue													
	Queue Block Time (%)													
	Denied Entry													
610	**Ranger Way & Village Way (Unsignalized)**													
	Lanes		<↑>			<↑>								
	SimTraffic Delay		3.0			4.7								3.8
	SimTraffic LOS		A			A								A
	SimTraffic 95th Queue		34			42								
	Queue Block Time (%)													
	Denied Entry													
705	**Finn St & Bohland Ave (All-way stop)**													
	Lanes	<>	0					<↑				↑>		
	SimTraffic Delay	4.0	-					5.2				1.1		1.9
	SimTraffic LOS	A	A					A				A		A
	SimTraffic 95th Queue	36						44				43		
	Queue Block Time (%)													
	Denied Entry													
710	**Finn St & Village Way (Unsignalized)**													
	Lanes	<>	0					<↑				↑>		
	SimTraffic Delay	4.6	-					0.2				1.3		2.3
	SimTraffic LOS	A	A					A				A		A
	SimTraffic 95th Queue	52						7						
	Queue Block Time (%)													
	Denied Entry													
711	**Finn St & Saunders Ave (Unsignalized)**													
	Lanes							<↑>				<↑>		
	SimTraffic Delay							0.2				0.2		0.3
	SimTraffic LOS							A				A		A
	SimTraffic 95th Queue							3						
	Queue Block Time (%)													
	Denied Entry													
715	**Montreal Ave & Finn St (Unsignalized)**													
	Lanes	←	↑			↑>					<>	0		
	SimTraffic Delay	-	0.8			0.9					10.2	-		1.4
	SimTraffic LOS	A	A			A					B	A		A
	SimTraffic 95th Queue										55			
	Queue Block Time (%)													
	Denied Entry													
716	**Cleveland Ave & Saunders Ave (Unsignalized)**													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Lanes								<↑>			<↑>		
	SimTraffic Delay								1.8			0.3		1.0
	SimTraffic LOS								A			A		A
	SimTraffic 95th Queue													
	Queue Block Time (%)													
	Denied Entry													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
10	**S Ford Ramp/N Ford Ramp & Ford Ave (Unsignalized)**													
	Lanes		↑↑>			↑↑>				→			→	
	SimTraffic Delay		4.2			0.8				8.4			10.8	3.3
	SimTraffic LOS		A			A				A			B	A
	SimTraffic 95th Queue		16			10				59			118	
	Queue Block Time (%)													
	Denied Entry													
20	**Ford Ave & Woodlawn Ave (Unsignalized)**													
	Lanes	←	↑↑			↑↑>					<->	0		
	SimTraffic Delay	8.9	0.9			1.4					41.3	-		1.6
	SimTraffic LOS	A	A			A					E	B		A
	SimTraffic 95th Queue	42	9			10					63			
	Queue Block Time (%)	5												
	Denied Entry													
30	**Mt Curve Blvd & Ford Ave (Signalized -- Cycle Length: 120)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑>		
	SimTraffic Delay	22.8	9.6		21.7	8.8		52.9	47.6		49.7	51.0		14.9
	SimTraffic LOS	C	A		C	A		D	D		D	D		B
	SimTraffic 95th Queue	76	221		108	199		191	210		125	75		
	Queue Block Time (%)		10		5	12		2	2		4	27		
	Denied Entry													
40	**Cretin Ave & Ford Ave (Signalized -- Cycle Length: 120)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑>		
	SimTraffic Delay	62.7	23.4		34.7	24.3		38.1	43.6		36.0	92.5		36.8
	SimTraffic LOS	E	C		C	C		D	D		D	F		D
	SimTraffic 95th Queue	257	367		134	285		219	237		240	601		
	Queue Block Time (%)	23	4			7		6	3			2		
	Denied Entry													
50	**Finn St & Ford Ave (Signalized -- Cycle Length: 120)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		<↑		→	
	SimTraffic Delay	23.8	17.3		22.4	12.2		43.9	40.2		40.6		9.9	19.0
	SimTraffic LOS	C	B		C	B		D	D		D		A	B
	SimTraffic 95th Queue	73	288		172	253		223	138		153		104	
	Queue Block Time (%)	5	22		2	1					17			
	Denied Entry													
60	**Cleveland Ave & Ford Ave (Signalized -- Cycle Length: 120)**													
	Lanes	←	↑↑>		←	↑↑>		←	↑>		←	↑	→	
	SimTraffic Delay	57.1	52.1		53.1	41.3		43.6	43.9		50.3	42.8	48.2	48.3
	SimTraffic LOS	E	D		D	D		D	D		D	D	D	D
	SimTraffic 95th Queue	298	567		206	337		317	551		166	504	214	
	Queue Block Time (%)	3	35		2	24			1		2	45	5	
	Denied Entry													
61	**Kenneth St & Ford Ave (Signalized -- Cycle Length: 60)**													
	Lanes	←	↑↑>		←	↑↑>		<↑>			<↑>			
	SimTraffic Delay	25.0	12.7		26.6	14.0		17.1			17.6			13.7
	SimTraffic LOS	C	B		C	B		B			B			B
	SimTraffic 95th Queue	68	229		83	311		105			87			
	Queue Block Time (%)	12	31			15								
	Denied Entry													
62	**Fairview Ave & Ford Ave (Signalized -- Cycle Length: 120)**													
	Lanes	←	↑	→	←	↑	→	←	↑>		←	↑	→	
	SimTraffic Delay	119.9	52.3	39.0	42.5	60.7	40.0	47.6	55.1		42.6	47.8	36.9	56.9
	SimTraffic LOS	F	D	D	D	E	D	D	E		D	D	D	E
	SimTraffic 95th Queue	386	811	130	234	633	142	292	711		293	751	186	
	Queue Block Time (%)	24	44			57			28			44	1	
	Denied Entry													
65	**Cleveland Ave & Highland Pkwy (Signalized -- Cycle Length: 120)**													
	Lanes	<↑		→	<↑		→	←	↑>		←	↑>		
	SimTraffic Delay	38.9		17.3	43.4		19.2	16.9	8.7		22.8	9.0		13.6
	SimTraffic LOS	D		B	D		B	B	A		C	A		B

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	SimTraffic 95th Queue	161		70	149		71	48	170		82	208		
	Queue Block Time (%)	45		13	48		11		5			10		
	Denied Entry													
75	**St Paul Ave & Montreal Ave (Signalized -- Cycle Length: 80)**													
	Lanes	←	↑>		←	↑>		←	↑↑>		←	↑↑>		
	SimTraffic Delay	30.5	21.4		43.8	21.8		25.2	20.2		16.2	20.7		20.6
	SimTraffic LOS	C	C		D	C		C	C		B	C		C
	SimTraffic 95th Queue	40	219		88	198		186	143		84	148		
	Queue Block Time (%)		27		7	19		7	1			1		
	Denied Entry													
80	**Edgcumbe Rd & St Paul Ave (Signalized -- Cycle Length: 120)**													
	Lanes	<↑↑		→	<↑↑>			←	↑↑>		←	↑↑>		
	SimTraffic Delay	40.0		24.5	39.8			27.8	11.0		37.2	34.7		25.7
	SimTraffic LOS	D		C	D			C	B		D	C		C
	SimTraffic 95th Queue	311		140	151			277	451		122	234		
	Queue Block Time (%)	10		41				18				10		
	Denied Entry							1						1
90	**Cleveland Ave & Montreal Ave (Unsignalized)**													
	Lanes	←	↑>		←	↑>		<↑>			<↑>			
	SimTraffic Delay	4.1	1.5		6.3	2.2		27.7			23.6			8.6
	SimTraffic LOS	A	A		A	A		D			C			A
	SimTraffic 95th Queue	29	16		51	5		179			122			
	Queue Block Time (%)													
	Denied Entry													
100	**Fairview Ave & Montreal Ave (Signalized -- Cycle Length: 70)**													
	Lanes	←	↑	→	←	↑>		←	↑>		←	↑>		
	SimTraffic Delay	34.4	17.5	16.0	27.6	21.8		33.6	17.5		42.9	22.9		20.8
	SimTraffic LOS	C	B	B	C	C		C	B		D	C		C
	SimTraffic 95th Queue	59	175	41	95	226		90	329		143	432		
	Queue Block Time (%)		41	2		22			24		2	21		
	Denied Entry													
120	**Mississippi River Blvd & N Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				8.4	-			1.0		3.1	0.6		1.6
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				50				6		54			
	Queue Block Time (%)													
	Denied Entry													
130	**Mississippi River Blvd & S Ford Ramp (Unsignalized)**													
	Lanes				←>	0			↑>		←	↑		
	SimTraffic Delay				8.8	-			1.0		2.6	0.5		2.1
	SimTraffic LOS				A	A			A		A	A		A
	SimTraffic 95th Queue				75						24			
	Queue Block Time (%)													
	Denied Entry													
205	**Mississippi River Blvd & Bohland Ave (Unsignalized)**													
	Lanes				←>	0			↑>		<↑			
	SimTraffic Delay				7.4	-			2.0		0.8			1.5
	SimTraffic LOS				A	A			A		A			A
	SimTraffic 95th Queue				48						35			
	Queue Block Time (%)													
	Denied Entry													
215	**Mississippi River Blvd & Montreal Ave (Unsignalized)**													
	Lanes				←>	0			↑>		<↑			
	SimTraffic Delay				8.5	-			0.9		2.1			1.9
	SimTraffic LOS				A	A			A		A			A
	SimTraffic 95th Queue				38						23			
	Queue Block Time (%)													
	Denied Entry													
400	**Mt Curve Blvd & Highland Pkwy (All-way stop)**													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	6.3			6.9			7.5			6.5			6.4
	SimTraffic LOS	A			A			A			A			A
	SimTraffic 95th Queue	48			45			59			53			
	Queue Block Time (%)													
	Denied Entry													
500	**Cretin Ave & Randolph Ave (Signalized -- Cycle Length: 60)**													
	Lanes	<↑>			<↑		→	←		↑>	←		↑>	
	SimTraffic Delay	26.5			29.2		15.0	22.9		9.6	31.5		11.6	15.6
	SimTraffic LOS	C			C		B	C		A	C		B	B
	SimTraffic 95th Queue	154			177		60	32		228	151		274	
	Queue Block Time (%)				47		18			14	9		8	
	Denied Entry													
501	**Cretin Ave & Highland Pkwy (Unsignalized)**													
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	30.3			45.1			1.9			5.0			7.3
	SimTraffic LOS	D			E			A			A			A
	SimTraffic 95th Queue	78			141			42			202			
	Queue Block Time (%)													
	Denied Entry													

70: Cleveland Ave & St Paul Ave & Bohland Ave Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0
Total Del/Veh (s)	6.6	1.0	1.5	1.4

71: St Paul Ave Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	13.8	2.8	0.2	2.7

72: Cleveland Ave & St Paul Ave Performance by approach

Approach	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	7.3	0.3	2.9

73: Cleveland Ave & Inner Drive Performance by approach

Approach	EB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.0
Total Del/Veh (s)	2.8	0.2	0.4

140: 46th Ave & E 46th St/Ford Pkwy Performance by approach

Approach	EB	WB	NB	SB	SW	All
Denied Del/Veh (s)	0.3	0.0	2.7	1.0	0.1	0.6
Total Del/Veh (s)	31.0	23.0	56.7	36.8	58.8	31.5

Total Zone Performance

Denied Del/Veh (s)	1.0
Total Del/Veh (s)	1929.6

Intersection: 70: Cleveland Ave & St Paul Ave & Bohland Ave

Movement	WB	NB	NB	SB	SB
Directions Served	R	T	TR	T	TR
Maximum Queue (ft)	54	46	84	6	3
Average Queue (ft)	20	3	6	0	0
95th Queue (ft)	41	32	48	7	3
Link Distance (ft)	762	168	168	556	556
Upstream Blk Time (%)		0	0		
Queuing Penalty (veh)		0	0		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 71: St Paul Ave

Movement	EB	NB	NB
Directions Served	LR	T	T
Maximum Queue (ft)	58	6	6
Average Queue (ft)	42	0	0
95th Queue (ft)	62	6	8
Link Distance (ft)	51	1141	1141
Upstream Blk Time (%)	13		
Queuing Penalty (veh)	16		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 72: Cleveland Ave & St Paul Ave

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	97	22
Average Queue (ft)	38	2
95th Queue (ft)	73	15
Link Distance (ft)	651	99
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 73: Cleveland Ave & Inner Drive

Movement	EB	SB
Directions Served	R	TR
Maximum Queue (ft)	33	3
Average Queue (ft)	13	0
95th Queue (ft)	37	3
Link Distance (ft)	285	58
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 140: 46th Ave & E 46th St/Ford Pkwy

Movement	EB	EB	EB	WB	WB	WB	B29	NB	NB	SB	SB	SW
Directions Served	<	LT	TR	L	T	TR>	T	LTR	>	LT	R	<LR>
Maximum Queue (ft)	150	428	417	160	394	396	177	633	65	183	56	28
Average Queue (ft)	69	230	216	120	206	222	6	291	49	87	26	3
95th Queue (ft)	164	373	361	196	363	356	171	583	58	162	65	15
Link Distance (ft)		1464	1464		1094	1094	1515	1043		656		272
Upstream Blk Time (%)							0					
Queuing Penalty (veh)							0					
Storage Bay Dist (ft)	75			110					25		25	
Storage Blk Time (%)	2	42		15	13			59	14	54	6	
Queuing Penalty (veh)	10	26		66	40			191	14	17	7	

Zone Summary

Zone wide Queuing Penalty: 387

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
305	**Woodlawn Ave & Bohland Ave (Unsignalized)**													
	Lanes	<↑>			<↑>			<↑>			<↑>			
	SimTraffic Delay	0.3			1.1			5.8			1.1			1.9
	SimTraffic LOS	A			A			A			A			A
	SimTraffic 95th Queue	7						20			48			
	Queue Block Time (%)													
	Denied Entry													
310	**Woodlawn Ave & Village Way (Unsignalized)**													
	Lanes	<↑>			<↑>			<↑>				<↑>		
	SimTraffic Delay	5.4			2.8			0.2				1.6		2.1
	SimTraffic LOS	A			A			A				A		A
	SimTraffic 95th Queue	22			23									
	Queue Block Time (%)													
	Denied Entry													
315	**Woodlawn Ave & Montreal Ave (Unsignalized)**													
	Lanes		<↑>		<↑>			0						
	SimTraffic Delay		5.1		6.1			-						4.4
	SimTraffic LOS		A		A			A						A
	SimTraffic 95th Queue		39		44									
	Queue Block Time (%)													
	Denied Entry													
401	**Mt Curve Blvd & Woodlawn Ave (Unsignalized)**													
	Lanes	0			0			←	↑>		←	↑>		
	SimTraffic Delay	-			-			2.4	1.0		3.2	1.5		4.8
	SimTraffic LOS	A			A			A	A		A	A		A
	SimTraffic 95th Queue							24	7		48	2		
	Queue Block Time (%)													
	Denied Entry													
405	**Mt Curve Blvd & Bohland Ave (Unsignalized)**													
	Lanes	<↑>			<↑>			←	↑>		←	↑>		
	SimTraffic Delay	7.1			4.5			2.1	0.2		2.3	0.6		2.2
	SimTraffic LOS	A			A			A	A		A	A		A
	SimTraffic 95th Queue	47			48			4			23	2		
	Queue Block Time (%)													
	Denied Entry													
410	**Mt Curve Blvd & Village Way (Unsignalized)**													
	Lanes	0			0			<↑>			<↑>			
	SimTraffic Delay	-			-			0.3			0.3			0.5
	SimTraffic LOS	A			A			A			A			A
	SimTraffic 95th Queue										6			
	Queue Block Time (%)													
	Denied Entry													
415	**Mt Curve Blvd & Montreal Ave (Unsignalized)**													
	Lanes	<↑>			<↑>				<↑>		<↑>			
	SimTraffic Delay	6.0			4.8				0.1		0.6			3.3
	SimTraffic LOS	A			A				A		A			A
	SimTraffic 95th Queue	48			56						13			
	Queue Block Time (%)													
	Denied Entry													
502	**Cretin Ave & Hillcrest (Unsignalized)**													
	Lanes	0			0			←	↑>		←	↑>		
	SimTraffic Delay	-			-			3.1	0.9		4.1	1.5		3.0
	SimTraffic LOS	A			A			A	A		A	A		A
	SimTraffic 95th Queue							34	22		48			
	Queue Block Time (%)													
	Denied Entry													
505	**Cretin Ave & Bohland Ave (Unsignalized)**													
	Lanes	<↑>			<↑>			←	↑>		←	↑>		
	SimTraffic Delay	10.8			8.9			3.2	0.6		3.0	0.6		1.8
	SimTraffic LOS	B			A			A	A		A	A		A

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	SimTraffic 95th Queue	59			47			42			31	2		
	Queue Block Time (%)													
	Denied Entry													
510	**Cretin Ave & Village Way (Unsignalized)**													
	Lanes	0			0			←	↑>		←	↑>		
	SimTraffic Delay	-			-			3.1	0.8		3.8	0.7		1.5
	SimTraffic LOS	A			A			A	A		A	A		A
	SimTraffic 95th Queue							21			42			
	Queue Block Time (%)													
	Denied Entry													
515	**Montreal Ave & Cretin Ave (Unsignalized)**													
	Lanes	←	↑>		←	↑>		←	↑>		←	↑>		
	SimTraffic Delay	6.0	0.9		3.4	3.0		6.9	13.5		10.3	8.1		4.5
	SimTraffic LOS	A	A		A	A		A	B		B	A		A
	SimTraffic 95th Queue	25	2		11	14		19	56		100	54		
	Queue Block Time (%)										1			
	Denied Entry													
605	**Ranger Way & Bohland Ave (Unsignalized)**													
	Lanes		↑>			<↑								
	SimTraffic Delay		0.6			0.3								0.5
	SimTraffic LOS		A			A								A
	SimTraffic 95th Queue													
	Queue Block Time (%)													
	Denied Entry													
610	**Ranger Way & Village Way (Unsignalized)**													
	Lanes		<↑>			<↑>								
	SimTraffic Delay		1.9			1.7								1.8
	SimTraffic LOS		A			A								A
	SimTraffic 95th Queue		41			38								
	Queue Block Time (%)													
	Denied Entry													
705	**Finn St & Bohland Ave (All-way stop)**													
	Lanes	<>	0					<↑				↑>		
	SimTraffic Delay	4.4	-					4.6				1.1		1.6
	SimTraffic LOS	A	A					A				A		A
	SimTraffic 95th Queue	34						44				46		
	Queue Block Time (%)													
	Denied Entry													
710	**Finn St & Village Way (Unsignalized)**													
	Lanes	<>	0					<↑				↑>		
	SimTraffic Delay	5.8	-					0.2				1.6		2.1
	SimTraffic LOS	A	A					A				A		A
	SimTraffic 95th Queue	45						11						
	Queue Block Time (%)													
	Denied Entry													
711	**Finn St & Saunders Ave (Unsignalized)**													
	Lanes					0			<↑>			<↑>		
	SimTraffic Delay					-			0.2			0.2		0.3
	SimTraffic LOS					A			A			A		A
	SimTraffic 95th Queue													
	Queue Block Time (%)													
	Denied Entry													
715	**Montreal Ave & Finn St (Unsignalized)**													
	Lanes	←	↑			↑>					<>	0		
	SimTraffic Delay	5.9	0.8			1.3					12.0	-		1.4
	SimTraffic LOS	A	A			A					B	A		A
	SimTraffic 95th Queue	11									54			
	Queue Block Time (%)													
	Denied Entry													
716	**Cleveland Ave & Saunders Ave (Unsignalized)**													

Node	Intersection	Eastbound			Westbound			Northbound			Southbound			Overall
	Lanes								<↑>			<↑>		
	SimTraffic Delay								1.7			0.2		0.9
	SimTraffic LOS								A			A		A
	SimTraffic 95th Queue													
	Queue Block Time (%)													
	Denied Entry													