DRAFT ALTERNATIVE URBAN AREAWIDE REVIEW

HILLCREST GOLF COURSE STUDY AREA

FOR

SAINT PAUL
MINNESOTA

IN COOPERATION WITH

Saint Paul
PORT AUTHORITY

JUNE 28, 2022

PREPARED BY: wsb

DRAFT ALTERNATIVE URBAN AREAWIDE REVIEW
HILLCREST GOLF COURSE REDEVELOPMENT STUDY AREA

For:

City of St. Paul

DATE

June 28, 2022

By:

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I. EXECUTIVE SUMMARY

INTRODUCTION / BACKGROUND

The Hillcrest Golf Course (Study Area) is located in the northeast portion of St. Paul, on the boundary with Maplewood. The site is five miles northeast of downtown St. Paul in the Greater East Side neighborhood.

The Golf Course was designed and opened in 1921 and remained an active golf course until 2017. Its current landscape reflects this past use in its unique features such as mature trees, wetlands, and hills interspersed with remnants of the golf course (i.e., cleared fairways and once manicured putting greens [now overgrown]). Upon its closure in 2017, it was deemed a brownfield site due to the decades of mercury fungicide spray use to maintain the manicured appearance of the golf course. Due to the current mercury contamination, it is currently unsuitable for development and will require remediation prior to re-development. In 2019, the site was purchased by the St. Paul Port Authority (SPPA) using bonding authorized by the St. Paul City Council via Ordinance 19-39. In the 2040 Comprehensive Plan, the City of St. Paul identified the 113-acre study area as one of 35 opportunity sites located with the City. These sites were selected for their development potential and will have a significant impact on St. Paul's vitality, tax base, and livability.

Three development scenarios are analyzed within this AUAR and include varying ranges of intensity of light industrial, commercial, and residential **(Table i)**. Additionally, the goal is to pursue carbon neutrality, integration with the ecology of the site, responsible material and waste stream management, and effective, integrated, and visible stormwater treatment.

Table i - Overview of Development Scenarios.

Land Use	Scenario 1 – Comprehensive Plan	Scenario 2 – Master Plan	Scenario 3 – Master Plan Max Intensity
Light Industrial	708,000 sf	840,000 sf	1,000,000 sf
Multi-family residential (includes low, medium, and high densities)	960 units	960 units	2,615 units
Low Density	*180 units*	*180 units*	*315 units*
Medium Density	*360 units*	*360 units*	*900 units*
High Density	*420 units*	*420 units*	*1,400 units*

INFRASTRUCTURE PLANNED TO SERVE THE DEVELOPMENT

Water, sewer, storm sewer, and transportation improvements are anticipated to serve development of the site.

Water: The existing 16-inch trunk watermain (Ferndale Tower) can provide sufficient fire flows to the study area. The Hayden Heights pressure zone, west of the study area, will be connected to and absorbed into the Ferndale pressure zone. The existing St. Paul Regional Water Services (SPRWS) water supply system has the ability to provide adequate water pressures and available fire flows to the site. However, these parameters depend on final grading and the determination of needed fire flow for individual buildings. Therefore, the pressures and available fire flows at specific locations and elevations with particular land uses will need to be further studied and modeled as the design progresses.

Sanitary Sewer: The entire study area is served by the St. Paul municipal sanitary sewer collection system. The system conveys flow via gravity sewer lines to the Metropolitan Council interceptor system then to the Metropolitan Wastewater Treatment Plant (Metro WWTP).

Stormwater: The study area will be designed to meet the stormwater requirements of the City of St. Paul, Ramsey-Washington Metro Watershed District (RWMWD), and the National Pollutant Discharge Elimination System (NPDES) stormwater permit. Public ROW and select private residential stormwater are anticipated to be treated through district stormwater BMPs along Howard St., Montana Ave, and Arlington Ave. Other residential and light industrial sites will collect and manage stormwater using private underground storage methods. Majority of treated site runoff will be directed towards three existing wetlands along the east side of the site with outlets under McKnight Road. Areas which can't be routed to the east will be treated and directed west into the City of St. Paul storm sewer system.

Transportation: The development impact on vehicle, freight, bicycle, and pedestrian transportation modes was evaluated. Several mitigation measures were identified for traffic infrastructure within the study area. This included roadway improvements at several intersections around the study area, internal roadway mitigation measures, and methods to reduce impacts to surrounding neighborhoods. The study area is also connected to local bike and pedestrian facilities. The three development scenarios will provide trail connections for bicycle and pedestrian access.

ANTICIPATED DEVELOPMENT STAGING

Mass grading of the study area is anticipated to occur between September/October 2022 and July 2023. Infrastructure construction is anticipated to occur from Spring 2023 to July 2026, and development of individual lots is expected to begin in the Fall of 2023 and last until the year 2030.

II. SUMMARY OF MITIGATION MEASURES

A summary of mitigation measures by AUAR section is provided below.

COMPATIBILITY WITH LAND USE REGULATIONS MITIGATION PLAN

9.1	If Scenario 2 or 3 are selected, a Comprehensive Plan amendment that addresses the longer block lengths will be needed.
9.2	A rezoning ordinance will accompany the Hillcrest Master Plan (MP) to allow for diverse and more intense uses that align with the St. Paul 2040 Comprehensive Plan's designated land uses.
9.3	Development in the study area will need to conform with the City's stormwater management program as well as the Ramsey-Washington Metro Watershed District plan and policies.
9.4	As part of park planning and outdoor/ natural area planning for the open space within the proposed development, the developer will engage with St. Paul Department of Parks and Recreation (as applicable) and the community in design and programming of outdoor spaces so that these spaces reflect and incorporate the diverse community in the neighborhood and region.

WATER, WASTEWATER, AND STORMWATER MITIGATION PLAN

11.1	Upsize existing St. Paul or Maplewood sanitary sewers in Winthrop Street and Larpenteur Avenue as necessary to accommodate the final site, grading, and utility plans.
11.2	A segment of gravity sewer downstream from the study area is being considered for replacement – a 52-foot-long segment of 15-inch vitrified clay pipe (VCP) located at the intersection of Maryland Avenue and Kennard Street where the St. Paul trunk sewer discharges to MCES Interceptor 1-SP-214.
11.3	Fire flows will continue to be studied as the design is advanced for the approved scenario.
11.4	Stormwater treatment will meet the City of St. Paul, Ramsey-Washington Metro Watershed District (RWMWD), and the National Pollution Discharge Elimination System (NPDES) stormwater permit requirements.
11.5	The stormwater management system will consist of combinations of continuous, linear treatment systems within the right-of-way, underground treatment systems, and ponding to meet stormwater requirements. Water reuse or filtration may also be incorporated if infiltration is not possible.
11.6	Stormwater runoff underground storage measures from industrial sites within the study area will be designed and maintained by the industrial site owners.
11.7	Wetland impacts will be minimized and avoided to the extent practical.
11.8	Jurisdictional status of wetlands will be determined through U.S. Corps of Engineers.
11.9	Wetland impacts will be replaced at a 2:1 ratio with 1:1 being obtained through the purchase of wetland banking credits and 1:1 being obtained through on-site replacement.
11.10	Wetland buffers will conform with the RWMWD's buffer rule.
11.11	Wetlands within the study area may be used to assist with achieving rate control to the existing discharge points for rainfall events greater than a 10-year event.
11.12	Temporary erosion and sediment control measures will be implemented during construction that meet the City of St. Paul, RWMWD, and NPDES permit requirements.
11.13	Improve Ivy Avenue to provide better capture and conveyance of stormwater from both the Hillcrest development and the adjacent right-of-way.

CONTAMINATION/HAZARDOUS MATERIALS/ WASTES MITIGATION PLAN

12.1	A Response Action Plan (RAP) has been prepared by the site owner and approved by the MPCA and MDA. The RAP guides how contaminated soils will be remediated and handled to facilitate redevelopment. The RAP implementation will be approved by the MPCA and MDA. The MPCA and MDA will issue a site closure environmental assurance when RAP implementation is approved. If the on-site placement option allowed by the approved RAP is utilized, it may be necessary to record restrictive covenants for certain portions of the site based on potential requirements of the MPCA and/or MDA.

FISH, WILDLIFE, PLANT COMMUNITIES, AND SENSITIVE ECOLOGICAL RESOURCES

13.1	Remove contaminated soils across the study area and from within wetlands.
13.2	Compensate wetland impacts with a ratio of 2:1 with a 1:1 ratio onsite.
13.3	Develop or preserve approximately 20 acres of open space.
13.4	Maintain many mature trees that are currently established where feasible. Develop a mitigation plan as part of the site plan review.
13.5	Avoid aquatic habitat impacts during Blanding's turtle hibernation season between October 15 and April 15, unless the area is unsuitable for hibernation.
13.6	Areas where construction will occur will be checked for turtles before the use of heavy equipment or any ground disturbance. The DNR's Blanding's turtle flyer will be provided to the construction contractor.
13.7	Establish rain gardens with native plant species which will provide foraging habitat for pollinators. The establishment of native plant species within the rain gardens will provide habitat for pollinating species, including monarch butterflies and rusty patched bumble bees.
13.8	Mature tree removal will occur outside of the northern long-eared bat (NLEB) active season (April 1 to October 31) and peak nesting season for birds protected by the Migratory Bird Treaty Act (April 1 to June 15) when possible. Surveys for potentially suitable NLEB roost trees and active bird nests will be conducted if tree removal occurs during the NLEB active season or during the peak nesting period for birds. Potentially suitable NLEB roost trees will be flagged and will be removed from November 1 to March 31. If an active bird nest is observed, the tree will be flagged, and an appropriate no disturbance buffer will be established surrounding the nest until the young have fledged or the nest is abandoned.
13.9	Construction best management practices (BMPs) will be used to minimize impacts to wildlife or their habitats including wildlife friendly erosion mesh and sediment control measures.

HISTORICAL PROPERTIES MITIGATION PLAN

14.1	Complete a Phase 1 archaeological survey and a Phase I architecture-history survey of the study area prior to construction and review results with the SHPO and Office of the State Archaeologist. The need for a Phase II survey will be evaluated in conjunction with SHPO based on the results of these studies.
14.2	If development becomes a federal undertaking subject to review under Section 106 of the National Historic Preservation Act, further identification and evaluation efforts may be needed and coordination with the State Historic Preservation office will be required.

VISUAL IMPACT MITIGATION PLAN

15.1	A lighting plan will be developed and submitted to the City of St. Paul during the site planning review and approval stage.

NOISE MITIGATION PLAN

17.1	Construction activities will be conducted in compliance with the City of St. Paul noise ordinances (Chapter 293) to minimize noise levels and disturbances, and construction activities will cease from 10:00 pm to 7:00 am.
17.2	The study area will be constructed so that noise sensitive areas (i.e., residential units) will have sufficient setbacks from noise sources to limit noise disturbances.

TRANSPORTATION MITIGATION PLAN

18.1	Lengthen the left turn lanes to 300 ft at McKnight Road and Larpenteur Avenue. Monitor the intersection for additional improvements. All development scenarios
18.2	Provide two exit lanes (left/thru lane and right turn lane) on all the site access streets (northbound Howard Street, eastbound Montana Avenue, and eastbound Arlington Avenue). All development scenarios.
18.3	Monitor the intersection of McKnight Road at Montana Avenue as traffic volumes increase for lane configuration and/or traffic control improvements. Development scenario 1 and 2
18.4	Improve the intersection of McKnight Road at Montana Avenue as traffic increases to include either traffic signal or roundabout control. Provide additional right-of-way to accommodate the improvements if necessary. Development scenario 3
18.5	Monitor the intersection of McKnight Road at Arlington Avenue as traffic volumes increase for lane configuration and/or traffic control improvements. Provide additional right-of-way to accommodate future improvements if necessary. Development scenario 3.
18.6	Internal Street System Improvements (All development scenarios): 1. All internal streets should be two lanes (one lane in each direction) conforming to the requirements in the City of St Paul Street Design Manual. 2. All internal intersections should have side street stop control. • Idaho Avenue stops at Street A • Idaho Avenue stops at Howard Street • Street A stops at Howard Street • Hoyt Avenue/Montana Avenue stops at Howard Street • Nebraska Avenue stops at Howard Street • Arlington Avenue W stops at Howard Street • Arlington Avenue E stops at Howard Street • Cottage Avenue stops at Howard Street 3. Private access should be evaluated individually with each development proposal to ensure that all potential constraints are considered. Pedestrian facilities should be provided adjacent to each internal street with connections to external pedestrian facilities (see Bike / Pedestrian recommendations).
18.7	Bike / Pedestrian Improvements (All development scenarios): 1. A trail connection north of Hoyt Ave to the Furness Trail on the west side of the study area with a direct connection through the site to the trail on McKnight Road. 2. An off-road trail on the south side of Larpenteur Avenue from McKnight Road to the west. 3. A trail connection from the site on Howard Street at Ivy Street.

	4. An extension of the future enhanced bike lane on Arlington Avenue through the site to the trail on McKnight Road. 5. A pedestrian connection on the north side of Ivy Avenue from Winthrop Street to the existing pedestrian trail on McKnight Road with the reconstruction of Ivy Avenue. 6. An extension of the future enhanced bike lane on Arlington Avenue through the site to the trail on McKnight Road. 7. Sidewalks along all roadways throughout the Hillcrest development Site. 8. Sidewalks to the Hayden Heights neighborhood from the site on Nebraska Avenue, Arlington Avenue and Cottage Avenue. 9. Reconstruct the existing pedestrian refuge islands on McKnight Road at Montana Avenue and Arlington Avenue as part of the construction of new left turn lanes for the site. The design will include a raised concrete median with signing and pavement markings. The detailed design will be completed as part of the final design for the site improvements and will be coordinated, reviewed and approved by Ramsey County. 10. Design internal roadways to accommodate safe pedestrian crossings including bump-outs at intersections, tabled concrete crosswalks, and a tabled intersection at Howard Street and Idaho Avenue. 11. Ensure that the pedestrian connectivity across McKnight Road to the City of Maplewood is maintained. Any changes or modification in the existing infrastructure resulting from the development will be reviewed and approved by Ramsey County and the City of Maplewood. 12. Provide a pedestrian crossing of Larpenteur Avenue from the development site at Howard Street.
18.8	Transit Service Improvements (All development scenarios) ○ Coordinate with Metro Transit the possible alteration of the existing transit routes to pass through or pass adjacent to the site to promote increased transit use. Which route and where bus stops are located, will be analyzed once a site development scenario is selected and Metro Transit reanalyzes the local bus routes in the area.
18.9	Freight Service Considerations (All development scenarios) 1. Design internal roadways to accommodate the expected level of freight activity within the area based on the proposed development, including: • Provide bump-outs at intersections to eliminate/discourage large vehicle turning. • Any industrial land use's access to Howard Street should not line up with Nebraska Avenue, Arlington Avenue, or Cottage Avenue to the west. Rather, any such access to Howard Street should be mid-block to discourage direct traffic access to the neighborhoods. 2. Freight activity should be limited during the peak traffic periods to avoid potential conflicts through communication with the identified industrial business, area package services (i.e., UPS, FedEx, etc.) and refuse haulers.

	3. Evaluation of the need for on-street loading areas should be completed to accommodate some freight activity as actual development proposals are identified.
18.10	Neighborhood Improvements (All development scenarios) 1. Any industrial land use's access to Howard Street should not line up with Nebraska Avenue, Arlington Avenue, or Cottage Avenue to the west. Rather, any such access to Howard Street should be mid-block to discourage direct traffic access to the neighborhoods. 2. No direct access from the multi-family residential land uses should be provided to Howard Street or Winthrop Street. 3. Provide off road pedestrian accommodations on the streets accessing the neighborhoods, including extension/connection of sidewalks. 4. Provide the recommended improvements at the site access locations on Larpenteur Avenue at Howard Street, McKnight Road at Montana Avenue and McKnight Road at Arlington Avenue to discourage traffic from using neighborhood streets. 5. Implement the recommendations in the Freight Service section to discourage heavy vehicle traffic from using the neighborhood streets. 6. As traffic in the area increases over time, especially on streets such as Ivy Avenue, traffic calming measures will be required to manage vehicle speed and public safety. The type of traffic calming measures that could be installed will be consistent with city policies and practices. It should be noted that installation of some traffic calming measures will result in a diversion of traffic to other neighborhood roadways. The determination of what type of traffic calming measure, the implementation, and financial responsibilities will be outlined in the developer's agreement between the St. Paul Port Authority and the City.

OTHER POTENTIAL ENVIRONMENTAL EFFECTS

20.1	The development plans will be evaluated for the goal to pursue carbon neutrality.

III. DRAFT AUAR

1. PROJECT TITLE

Hillcrest Golf Course Redevelopment

2. PROPOSER

Proposer: St. Paul Port Authority
Contact Person: Monte Hillman
Title: Sr. Vice President – Real Estate Development
Address: 400 N Wabasha Street
City, Sate, Zip: St. Paul, MN 55102
Phone: 651-204-6237
Email: mmh@sppa.com

3. RGU

RGU: City of St. Paul
Contact Person: Bill Dermody
Title: Principal City Planner
Address: 25 W. 4th Street – 14th Floor
City, Sate, Zip: St. Paul, MN 55102
Phone: 651-266-6617
Email: Bill.Dermody@stpaul.gov

4. REASON FOR EAW PREPARATION

AUAR Guidance: Not applicable to AUAR
Not applicable.

5. PROJECT LOCATION

County: Ramsey
City/Township: City of St. Paul
PLS Location (¼, ¼, Section, Township, Range): NE ¼ and SE ¼ of S23, T29N, R22W
Watershed (81 major watershed scale): No. 2 - Upper Mississippi River Basin
GPS Coordinates: X: -93.007664, Y: 44.986588
Tax Parcel Number(s): 232922120003, 232922120004, 232922120006, 232922410002, 232922410001, 232922140002
At minimum, attach each of the following to the AUAR:

- A map clearly depicting the boundaries of the AUAR and any subdistricts used the AUAR analysis (**Figure 1**)
- US Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (**Figure 2**)
- A cover type map as required for Item 7 (**Figure 3**)
- Land use and planning and zoning maps as required in conjunction with Item 9 (**Figure 4 and 5**)

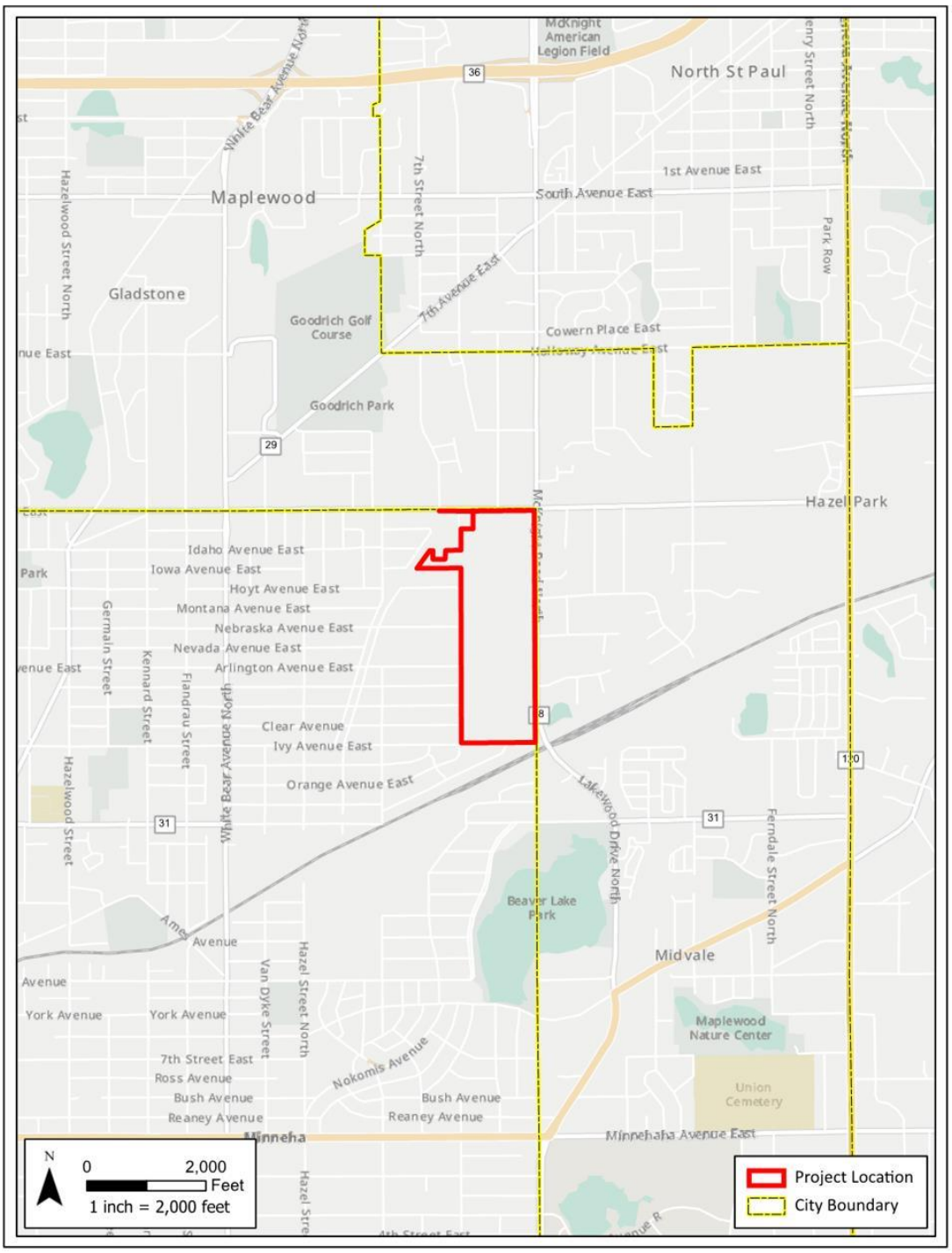


Figure 1 - Project Location Map

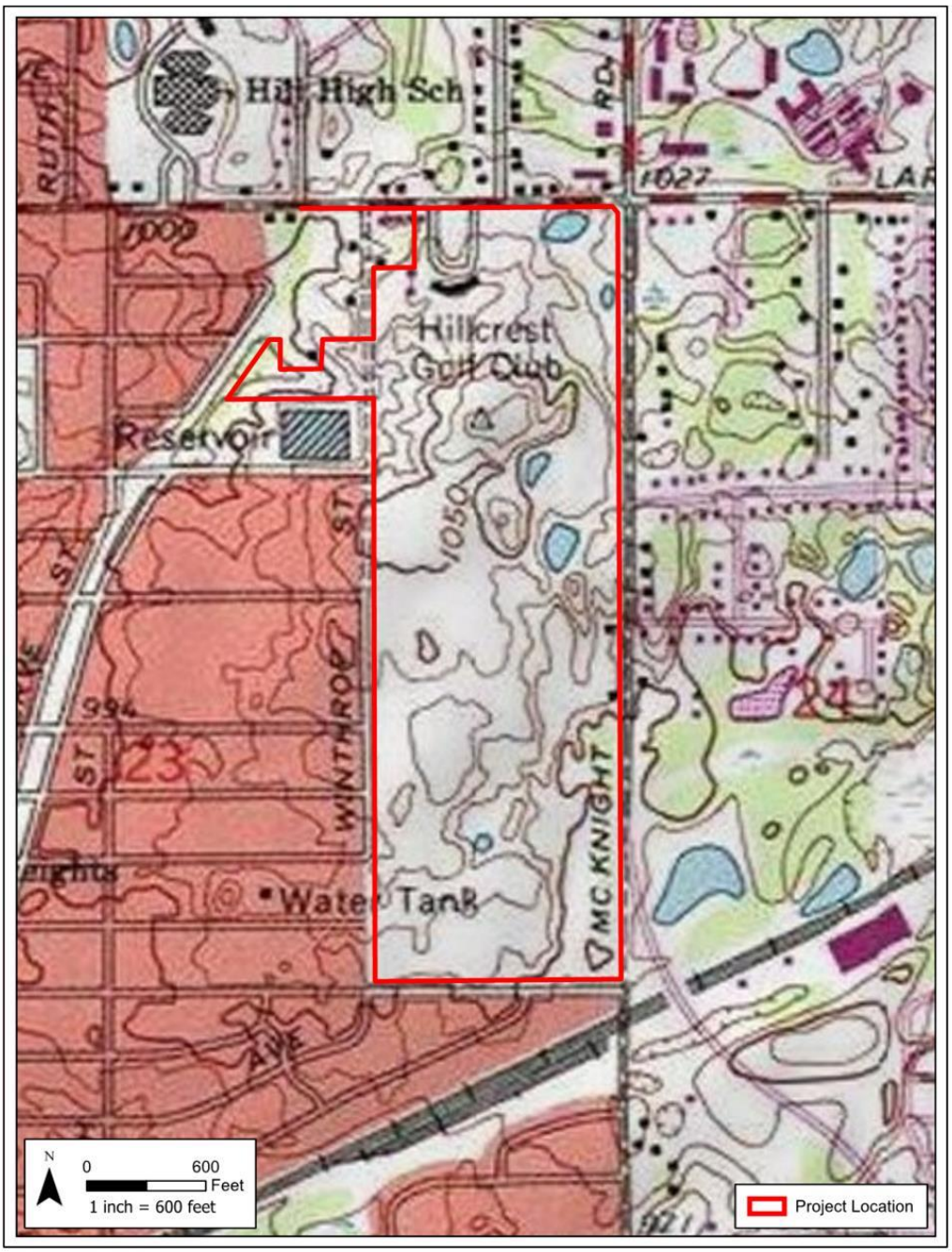


Figure 2 - USGS Map

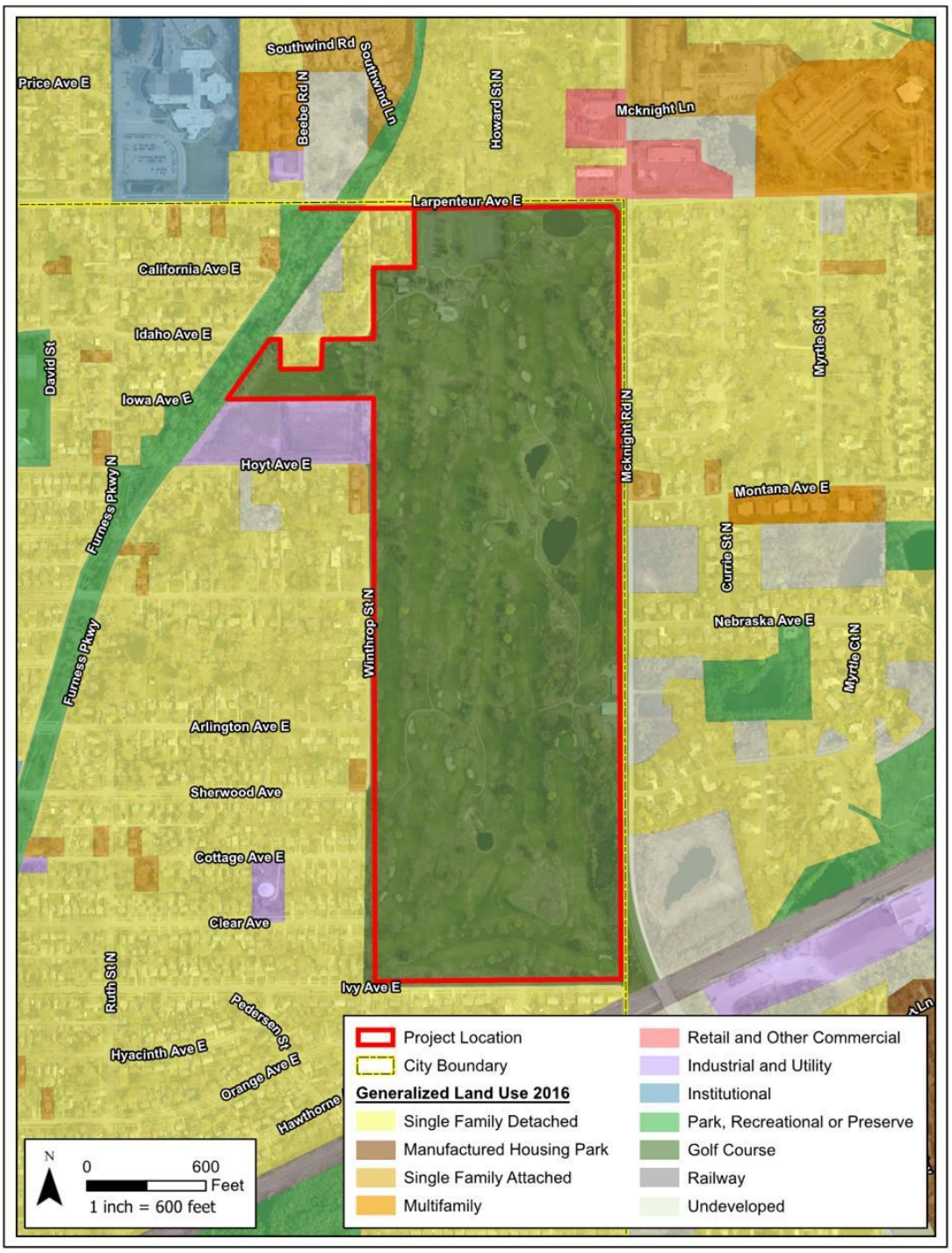


Figure 3 - Existing Land Use Map

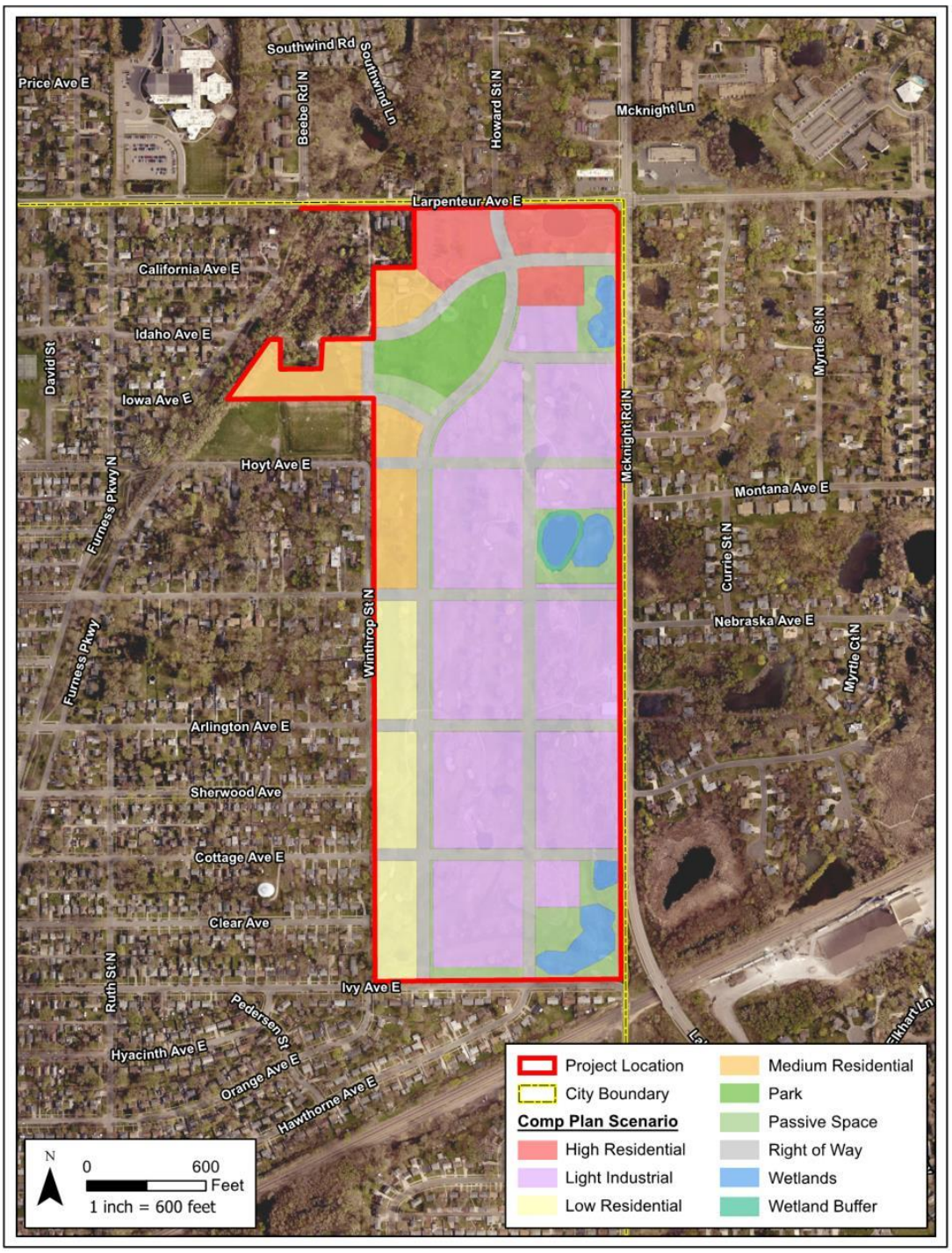


Figure 4 - Comprehensive Plan Development Scenario 1

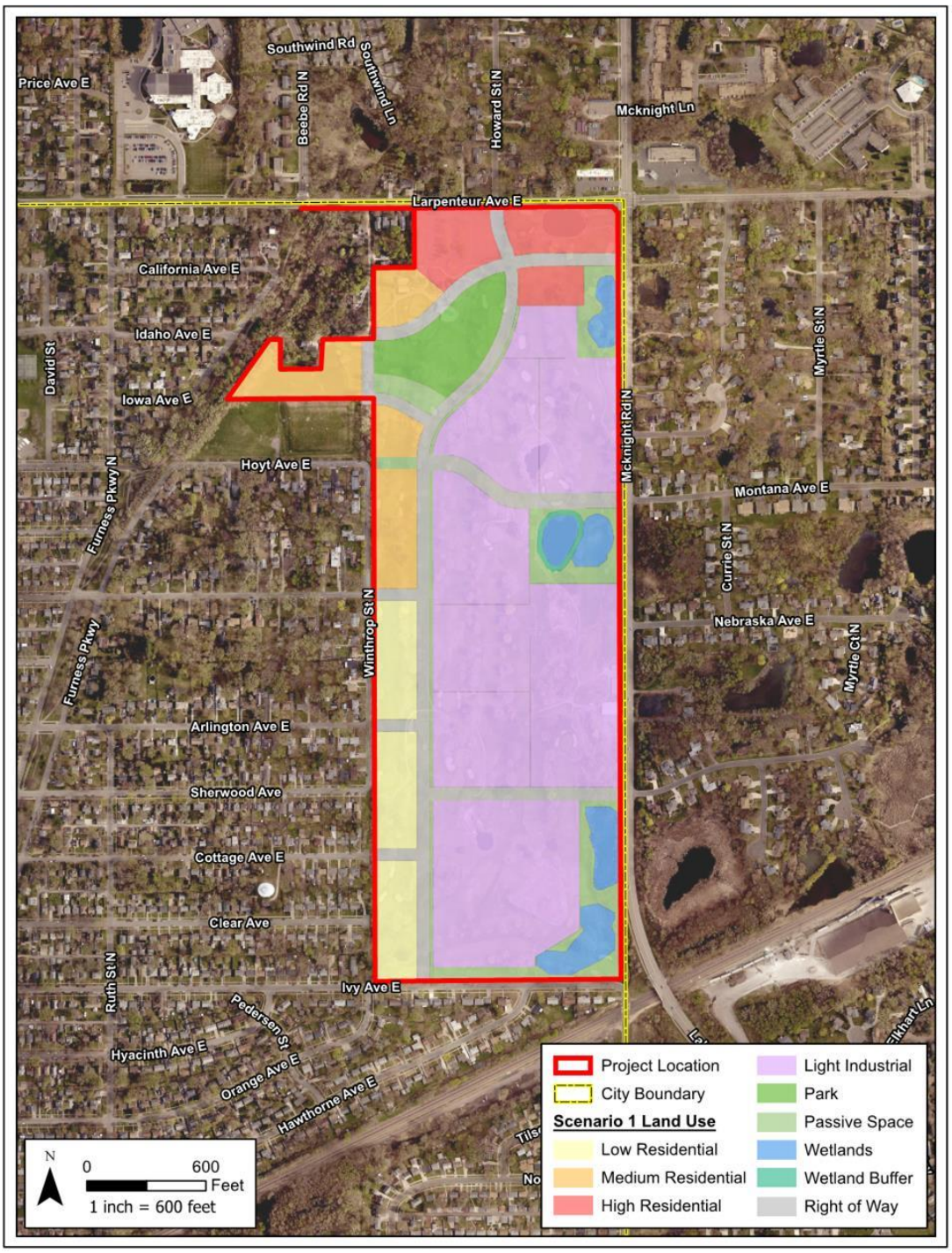


Figure 5 - Scenarios 2 and 3

6. 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.*

Important Note: Every AUAR document MUST review one or more development scenarios based on and consistent with the RGU's Comprehensive Plan in effect when the AUAR is officially ordered. (This is equivalent to reviewing the "no-build" alternative in an EIS.) If an RGU expects to amend its existing Comprehensive Plan, it has the options of deferring the start of the AUAR until after adopting the amended plan or reviewing developments based on both the existing and amended comprehensive plans; however, it cannot review only a development based on an expected amendment to the existing plan. Also, the rules require that one or more development scenarios analyzed must be consistent with known development plans of property owners within the AUAR area.

The AUAR study area is the former Hillcrest Golf Course located in northeastern St. Paul along the border with the City of Maplewood **(Figure 1)**. The study area encompasses approximately 113 acres, which are covered in the draft Hillcrest Master Plan (Hillcrest MP) which is currently under review by the St. Paul City Council.

The City of St. Paul identified the Hillcrest site as a major opportunity site in the St. Paul 2040 Comprehensive Plan (Comprehensive Plan). An opportunity site is guided by the Comprehensive Plan for redevelopment into a mix of uses including jobs, housing, commercial, and open space. The purpose of opportunity sites is to create areas of greater density, better transit service, more jobs, and needed social and community infrastructure.

The St. Paul Port Authority (SPPA) is proposing to develop the former Hillcrest Golf Course into a mixed residential, light industrial, and commercial development. Three development scenarios have been evaluated in this AUAR **(Table 1 and Figures 4 and 5)**. All three scenarios have similar land uses but contemplate different development intensities or block lengths.

During the Scoping Environmental Assessment Worksheet (EAW) process, an alternative development scenario was proposed showing less development intensity on the site. This alternative development scenario was reviewed pursuant to Minnesota Rule 4410.2300 and determined not to meet the underlying needs or purposes of the project identified through the Hillcrest MP process. Additionally, the alternative development scenario would fall within the range of impacts to be studied in the other scenarios proposed in the AUAR Order. If less dense development is ultimately approved for the site, it would be covered by this AUAR since it would not exceed the density or impacts studied in this AUAR.

Scenario 1 is consistent with the Comprehensive Plan. It includes mixed residential, light industrial, and commercial developments. These land uses are in conformance with the Comprehensive Plan. Scenario 1 follows the Comprehensive Plan related to establishing the right-of-way grid with block lengths of 600 feet as depicted in **Figure 4.**

Scenarios 2 and 3 are consistent with the Hillcrest MP and have similar land uses to Scenario 1. However, Scenarios 2 and 3 accommodate the light industrial development with longer block lengths. Scenario 3 evaluates a maximum intensity development design for purposes of this environmental review.

Table 1 - Overview of Development Scenarios

Land Use	Scenario 1 – Comprehensive Plan	Scenario 2 – Master Plan	Scenario 3 – Master Plan Max Intensity
Light Industrial	708,000 sf	840,000 sf	1,000,000 sf
Multi-family residential (includes low, medium, and high densities) *	960 units	960 units	2,615 units
Low Density	*180 units*	*180 units*	*315 units*
Medium Density	*360 units*	*360 units*	*900 units*
High Density	*420 units*	*420 units*	*1,400 units*

sf = square feet

** Note: The neighborhood nodes contemplated in the MP and Comprehensive Plan allow for mixed-use areas that provide shops, services, and neighborhood-scale civic and institutional uses. These potential commercial uses are enveloped into the overall analysis and do not result in a significant enough difference in use to identify an intensity of development as compared to the residential and industrial uses analyzed for purposes of the AUAR.*

Improvements to infrastructure within the study area will serve the needs of the proposed developments in all scenarios. Ten main access points are proposed including Howard Street, Arlington Avenue, Cottage Avenue, Idaho Avenue, Montana Avenue, and Nebraska Avenue. A concept level depiction of the internal road network is depicted in **Figures 4 and 5**. Off-site roadway improvements under consideration for all scenarios are provided in Section 18.

Any of the development scenarios will require several utility services (i.e., water, sanitary sewer, electric, gas, and telecommunications). The SPPA will work with the City of St. Paul to construct the public utilities including the roadways for the proposed actions. Most of these services will be constructed along the proposed road network. All utilities will be constructed underground per St. Paul ordinances. Stormwater management will be developed to manage run-off and treatment (please see **Section 11**).

Improvements to infrastructure or new infrastructure will be consistent with St. Paul requirements and all applicable standards. New infrastructure construction includes new watermain, sanitary sewer, and stormwater piping, stormwater basins, public roadways, trails, and sidewalks.

Mass grading of the study area is anticipated to occur between August 2022 and July 2023. Infrastructure construction is anticipated to occur from Spring 2023 to July 2026, and development of individual lots is expected to begin in the Fall of 2023 and last until the year 2030.

In any scenario, the goal is to pursue carbon neutrality, responsible material and waste stream management, and effective, integrated, and visible stormwater treatment. The carbon neutrality aim for this site will help the City reach its goals to reduce carbon emissions citywide by 50 percent from 2019 to 2030, and to achieve carbon neutrality by 2050. The development plans will be evaluated for the goal to pursue carbon neutrality.

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.*

The study area encompasses approximately 113 acres of a former golf course. The existing and proposed land cover types and their respective acreages are provided in **Table 2** and **Figures 3** and **4**.

Table 2 - Overview of Existing and Proposed Land Uses

Land Use	Existing Conditions (acres)	Scenario 1 – Comprehensive Plan (acres)	Scenario 2 – Master Plan (acres)	Scenario 3 – Max Intensity (acres)
Light Industrial	--	45.5	54.0	54.0
Multi-family residential	--	25.0	25.0	25.0*
Low Density	--	*9.0*	*9.0*	*9.0*
Medium Density	--	*9.0*	*9.0*	*9.0*
High Density	--	*7.0*	*7.0*	*7.0*
Golf Course	107.7	--	--	--
Public Park	--	5.0	5.0	5.0
Passive Open Space	--	7.0	7.0	7.0
Trail and Right-of-Way	--	22.8	14.3	14.3
Wetlands	5.6	6.0	6.0	6.0
Stormwater ponds	--	2.0	2.0	2.0
Total	**113.3**	**113.3**	**113.3**	**113.3**

*T1 zoning allows for first floor commercial along with the high density residential. The commercial component of the mixed use in this area is small with no discernable impact as compared to the underlying residential use that is contemplated for this area.

8. PERMITS AND APPROVALS

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.

The anticipated government permits and approvals required for the proposed actions are provided in **Table 3.**

Table 3 - Anticipated Permits and Approvals

Unit of Government	Type of Application	Status
Federal		
US Army Corps of Engineers	Section 404 Permit	To be applied for
US Army Corps of Engineers	Wetland delineation concurrence	In process
State		
Pollution Control Agency	National Pollutant Discharge Elimination System Storm Water Permit	To be applied for
Pollution Control Agency	Sanitary Sewer Permit	To be applied for
Pollution Control Agency	Section 401 Water Quality Certification Permit	To be applied for if Section 404 permit is needed
Pollution Control Agency	Approval of remediation and cleanup plans, as applicable	To be applied for
Pollution Control Agency	Antidegradation Assessment	To be applied for, if needed
Department of Agriculture	Approval of remediation and cleanup plans, as applicable	To be applied for
Department of Natural Resources	Temporary dewatering for construction (Public Works Permit)	To be applied for
Department of Health	Well sealing / abandonment permit	To be applied for
Department of Health	Review of geothermal plans	To be obtained, if needed
Department of Health	Watermain plan review	To be applied for
Department of Health	Public Water Supply Certification	To be applied for
Department of Health	Asbestos abatement/removal	To be applied for
State Historic Preservation Office	Coordination, if federal permits are needed with development	To be applied for, as needed

Regional/ County/ Local		
Ramsey County	Right-of-Way Permits	To be applied for
State Historic Preservation Office Ramsey County	Road access permit	To be applied for
City of St. Paul	Alternative Urban Areawide Review	In process
	Site plan review	To be applied for
	Rezoning ordinance	To be applied for
	Preliminary and final plat approvals	To be applied for
	Development agreements	To be applied for
	Signage and striping permits	To be applied for
	Sidewalk permits	To be applied for
	Bridge permits	To be applied for, as needed
	Building permits	To be applied for
	Retaining wall permit	To be applied for, as needed
	Excavation and grading permits	To be applied for
	Roads and road base 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
	Sanitary sewer utility connection permits	To be applied for
	Storm sewer connection permit	To be applied for
	Wetland Conservation Act approval	In process
	Conditional use permit for wetland impacts	To be applied for
City of Maplewood	Right-of-way permit	To be applied for
	Excavation permit	To be applied for
	Sanitary sewer utility connection permit	To be applied for
	Storm sewer connection permit	To be applied for
Watershed District	Permit for stormwater management, erosion and sediment control, wetland management	To be applied for
Metropolitan Council	Sanitary sewer extension permit	To be applied for
	Sanitary sewer permit to connect	To be applied for
St. Paul Regional Water Services	Plumbing permits	To be applied for
	Watermain installation	To be applied for

9. LAND USE

a. Existing and Planned Land Uses and Zoning

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

The study area is the former Hillcrest Golf Course that operated from 1921 to 2017. The current landscape reflects this past use including mature trees, wetlands, and hills interspersed with remnants of the golf course – flat areas where the tee boxes were positioned in front of cleared fairways (now overgrown) and formerly manicured putting greens. Upon its closure, in 2017, the site was deemed a brownfield due to decades of mercury containing fungicide spray that was used to keep the manicured appearance of the golf course. Due to the current mercury contamination, the site will require remediation prior to any development.

The study area is in St. Paul's Greater East Side adjacent to the City of Maplewood. St. Paul's Greater East Side and the City of Maplewood are primarily comprised of single-family residences (**Figure 1**). There are also small commercial properties at the northwest and northeast corners of McKnight Road and Larpenteur Avenue, which the City of Maplewood has designated for business and medium density development in their 2040 Comprehensive Plan.

There is a range of local and regional parks nearby including Nebraska Park, Sterling Oaks Park, Hayden Heights Recreation Center, Maryland Avenue Open Space, Furness Parkway, Phalen Regional Park, and Maplewood Nature Center **(Figure 6)**. There are also bikeway facilities designated along Larpenteur Avenue, Furness Parkway, and Arlington Avenue. There is no farmland within or adjacent to the study area.

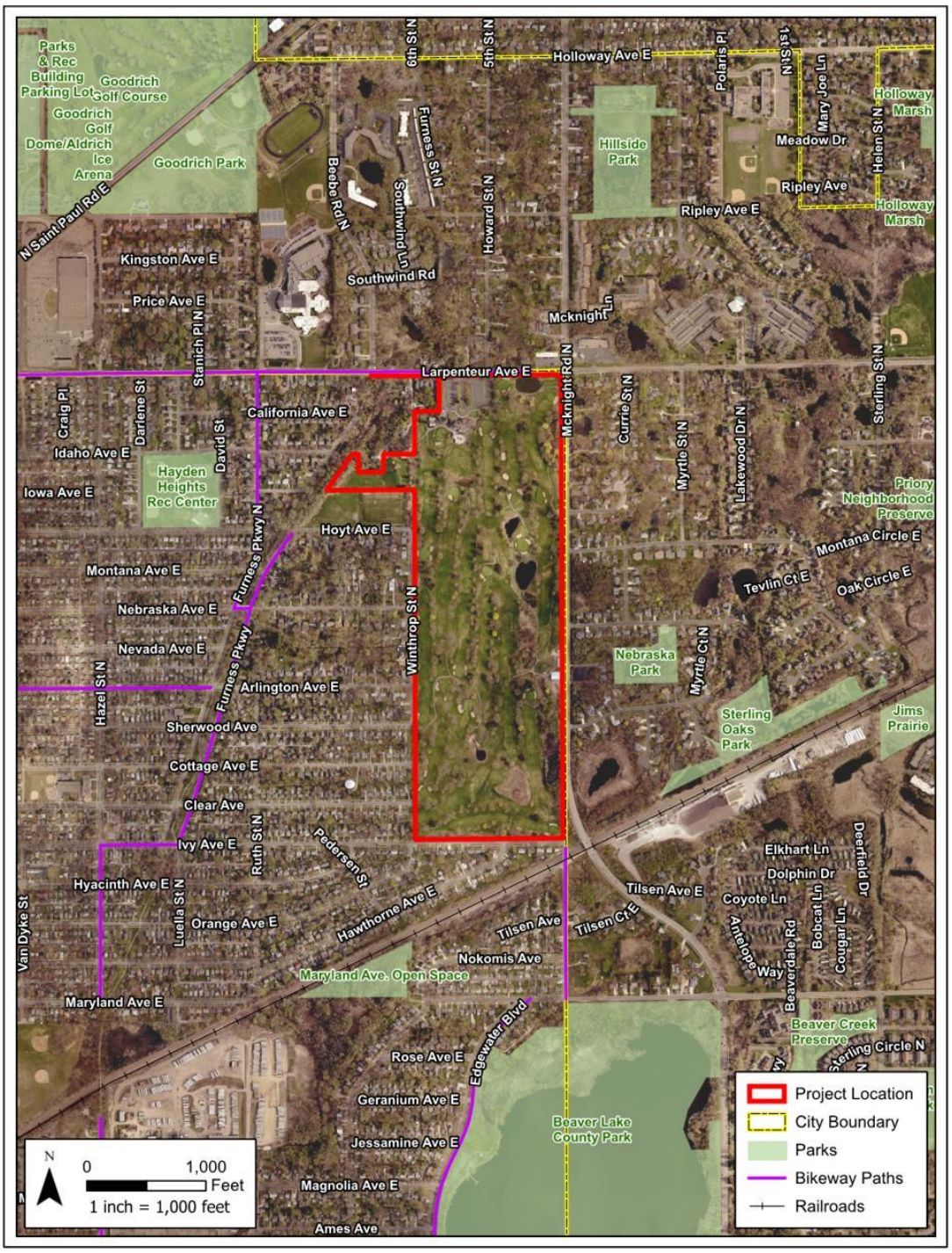


Figure 6 - Parks and Bikeway Facilities

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

The scenarios proposed within the study area provide a new five-acre city park in the northern portion of the study area, surrounded by a mix of dense housing and light industrial use. Lower or medium density housing is located along the western edge of the site, adjacent to the Hayden Heights neighborhood. Select streets are extended into the site and the blocks are reoriented north south to create a narrow series of blocks with medium or lower density housing that face onto Winthrop and Howard Street (the main north - south street).

Higher density housing is located around the neighborhood node, where there is nearby access to transit, adjacent to a new park. Light industrial uses are the other main component of the Hillcrest MP.

Development in the study area will conform with the City's stormwater management program as well as the Ramsey-Washington Metro Watershed District (RWMWD) plan and policies.

The scenarios are consistent with the Comprehensive Plan's designated future land uses, which include Mixed Use and Neighborhood Node for the northern portion and Urban Neighborhood for the southern portion of the study area. The Comprehensive Plan also designates the site as an Opportunity Site with higher-density mixed-use development or employment centers. Neighborhood Nodes are compact, mixed-use areas that provide shops, services, neighborhood-scale civic and institutional uses, recreational facilities such as parks, and employment close to residences. Comprehensive Plan Policy LU-2 calls for the redevelopment of designated Opportunity Sites including the Hillcrest area for higher-density mixed-use development or employment centers with increased full-time living wage job intensity. These scenarios plan for both higher-density mixed-use and employment centers.

Scenario 1 fully conforms with the Comprehensive Plan due to the 600-foot block lengths while Scenarios 2 and 3 consider longer block lengths to better accommodate light industrial usage.

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

The study area is zoned R2 One-Family Residential. A rezoning ordinance will accompany the Hillcrest MP to allow for more intense light industrial uses, residential and mixed residential-commercial uses that align with the Comprehensive Plan's designated land uses.

The area is not within any shoreland, floodplain, or other special overlay zoning districts.

b. Compatibility with Plans

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.

Scenario 1 is in conformance with the Comprehensive Plan. Scenarios 2 and 3 are consistent with the land use, but not the block lengths in the Comprehensive Plan. The proposed land uses in all scenarios are compatible with the adjacent land uses.

c. Measures to Mitigate Incompatibility

Any zoning inconsistencies for any of the development scenarios will be addressed through the City's variance or conditional use permit modification process. Mitigation will be regulated through

the City's development review process. Proposed project plans will address relevant mitigation measures before final approval by the City.

Item No.	Mitigation Description
9.1	If Scenario 2 or 3 are selected, a Comprehensive Plan amendment that addresses the longer block lengths will be needed.
9.2	A rezoning ordinance will accompany the Hillcrest MP to allow for diverse and more intense uses that align with the St. Paul 2040 Comprehensive Plan's designated land uses.
9.3	Development in the study area will need to conform with the City's stormwater management program as well as the Ramsey-Washington Metro Watershed District plan and policies.
9.4	As part of park planning and outdoor/ natural area planning for the open space within the proposed development, the developer will engage with St. Paul Department of Parks and Recreation (as applicable) and the community in design and programming of outdoor spaces so that these spaces reflect and incorporate the diverse community in the neighborhood and region.

10. GEOLOGY, SOILS, AND TOPOGRAPHY

AUAR Guidance: A map should be included to show any groundwater hazards identified. A standard soils map for the area should be included.

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

Information from the Ramsey County Geologic Atlas, the Ramsey Council Soil Survey, and the Minnesota Well Index were used for this analysis.

The study area is underlain by till and collapsed till and supraglacial sediment. The deposits within the study area are mostly sandy loam and clay loam to silty clay or sand in some areas. The upper layer of sediment within the study area is hummocky from the site previously being used as a golf course and consists of loam, sandy loam, clay loam and mucky loam. Bedrock was encountered at varying depths below ground surface (bgs) within the study area. The depth to bedrock in the site vicinity ranges from 100 to 150 feet bgs and is comprised of middle and upper Ordovician, and Decorah shale in the western portions of the site, Platteville and Glenwood formations in the central and northern portions of the site, and St. Peter sandstone in the southern portions of the site. The upper most aquifer is the Platteville aquifer and groundwater is approximately 5 to15 feet bgs.

Based on the geologic atlas, there are no known sinkholes, unconfined/shallow aquifers, or karst conditions located within the study area.

b. Soils and Topography: Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability, or other soil limitations, such as steep slopes or highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections, or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 11.b.ii.

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

The site soil information was retrieved from the U.S. Department of Agriculture Web Soil Survey database. According to the Web soil survey, the study area is comprised of 11 soil types and open water **(Table 4)**. The hydric soils rating indicates that most (96.2 percent) of the study area is comprised of non-hydric or predominantly non-hydric soils **(Figure 7)**. The erosion hazard rating indicates that most of the study area is comprised of non-highly erodible soils (93.4 percent) meaning that some erosion is not likely, but erosion-control measures may be needed. Approximately 4.1 percent of the area is comprised of highly erodible soils, and 1.0 percent of the project area is comprised of potentially erodible soils meaning erosion is likely and that erosion control measures are advised **(Figure 8).**

Table 4 - Soil Types and Respective Coverages

Map unit symbol	Map unit name	Acres within study area	Percent of study area	Percent hydric	Erosion hazard rating
342C	Kingsley sandy loam, 6 to 12 percent slopes	67.9	59.9	0	Non-Highly Erodible
153B	Santiago silt loam, 2 to 6 percent slopes	18.9	16.7	0	Non-Highly Erodible
342B	Kingsley sandy loam, 2 to 6 percent slopes	9.8	8.6	3	Non-Highly Erodible
342D	Kingsley sandy loam, 12 to 18 percent slopes	4.8	4.2	0	Highly Erodible
266	Freer silt loam	3.6	3.2	5	Non-Highly Erodible
189	Auburndale silt loam	1.8	1.6	95	Non-Highly Erodible
W	Water	1.7	1.5	0	Unknown
544	Cathro muck	1.2	1.1	97	Non-Highly Erodible
1055	Aquolls and histosols, ponded	1.2	1.1	100	Non-Highly Erodible
153C	Santiago silt loam, 6 to 15 percent slopes	1.1	1.0	0	Potentially Erodible
1027	Udorthents, wet substratum	0.9	0.8	0	Non-Highly Erodible
861C	Urban land-Kingsley complex, 3 to 15 percent slopes	0.4	0.3	0	Non-Highly Erodible
Total	**--**	**113.3**	**100.0**		**--**

Figure 7 - Hydric Soils

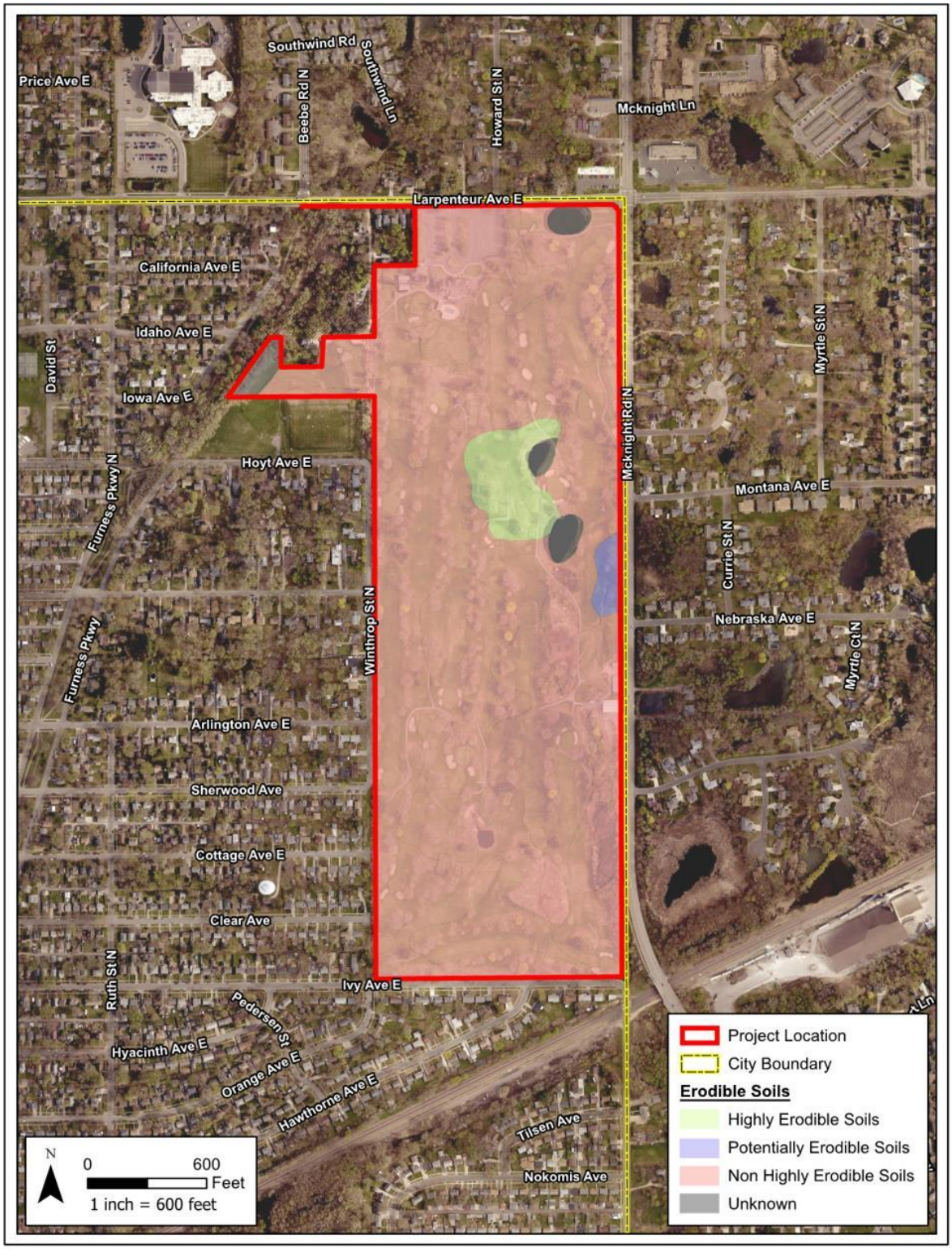


Figure 8 - Highly Erodible Soils

A geotechnical evaluation for the study area began in 2019 which determined that the soil profile is conducive for encountering perched water conditions. Geotechnical studies are currently ongoing, with a final report expected in 2022. The existing grades of the site ranges from 994 to 1061 feet above mean sea level. Generally, the elevations are highest in the west-central portion with gradual slopes downward toward the north and south and steeper downward slopes towards the east.

It is estimated that 110 acres will be excavated or graded for any of the proposed developments. Raw cut estimates are 800,000 cubic yards (CY), raw fill estimates are 700,000 CY, and net cut estimates are 100,000 CY.

The proposed developments within the study area will be required to adhere to the Ramsey-Washington Watershed District and the City of St. Paul's erosion and sediments control standards.

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. Surface Water and Groundwater Features:

i. Surface Water: Lakes, streams, wetlands, intermittent channels, and county/judicial ditches. All surface water features should be described and identified on a map of the project area. 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.

A Level 2 wetland field delineation was completed in spring of 2020. Based on the delineation, there are 11 water resources (i.e., 10 wetlands and one wet ditch) comprising approximately 5.6 acres of the study area **(Figure 9) (Table 5)**.

Figure 9 - USFWS NWI and MNDNR Public Waters

Table 5 - Wetlands within the Study Area

ID	Eggers and Reed	Circular 39 (Cowardin)	NWI *	DNR PWI**	County Soil Survey (Hydric/Non-Hydric)***	Wetland Size (acres)
Wetland A	Shallow open water	Type 5 PUBG	Yes	NA	**W**	0.69 ac
Wetland B	Shallow Marsh	Type 3 PEMC	Yes	NA	342C	0.44 ac
Wetland C	Shallow Marsh	Type 3 PEMC	Yes	NA	**1055**	0.93 ac
Wetland D	Shallow open water	Type 5 PUBG	Yes	NA	**W**	0.79 ac
Wetland E	Wet Meadow/ Shrub Carr	Type 2/7 PEMB/PSSA	No	NA	**189**	0.49 ac
Wetland F	Shallow Marsh / Shrub Carr	Type 3/6 PEMC/PSSA	Yes	NA	342C	0.13 ac
Wetland G	Shallow open water	Type 5 PUBG	No	NA	**W**	0.39 ac
Wetland H	Deep Marsh	Type 4 PEMF	Yes	NA	**544**	1.44 ac
Wetland I	Shallow open water	Type 5 PUBG	**Yes**	NA	266**/544**	0.26 ac
Wetland J	Seasonally flooded Basin	Type 1 PEMA	No	NA	1027	0.05 ac
Wet Ditch 1	NA	NA	No	NA	342C	0.04 ac
** "Yes" indicates wetland is mapped in the NWI and "No" indicates the wetland is not mapped in the NWI.*		*** "NA" indicates the wetland is not mapped in the PWI. Numbers listed are the DNR ID, indicating the wetland is mapped in the PWI.*			****Bolded numbers indicate hydric soils.*	

There are no MNDNR Public Waters within the study area; however, there are three unnamed Public Water Wetlands (62022600, 62022700, and 62024200) within one mile of the AUAR study area **(Figure 9)**.

There are no Minnesota Pollution Control Agency (MPCA) 303d impaired waters within the project area or within a mile of the study area. The study area is not within a Federal Emergency Management Agency (FEMA) floodplain.

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 Preliminary Geotechnical Evaluation Report by Braun Intertec dated August 2019 indicates that the groundwater elevation within the study area varies from 979 ft to 1028 ft, or 5 ft to 15 ft below the surface. The depth of groundwater used for potable water sources within the study area is 200 ft to over 500 ft below the surface in the St. Peter and Prairie Du Chien-Jordan aquifers.

According to the Minnesota Department of Health Minnesota Well Index, there are five wells located in the study area. One commercial well is sealed, and one irrigation and three monitoring wells are active. There is also one sealed domestic well within 150 feet of the study area. These wells are listed in **Table 6**, and the well logs are attached in **Appendix A.**

Table 6 - Wells Located within the Study Area

No.	Unique Well ID	Aquifer Name	Depth (ft)	Type	Status
1	208231	Jordan	550	Commercial	Sealed
2	272001	St. Peter	256	Domestic	Sealed
3	603061	Jordan	486	Irrigation	Active
4	849084	Quaternary	25	Monitoring	Active
5	849085	Quaternary	20	Monitoring	Active
6	849086	Quaternary	30	Monitoring	Active

The northern two-thirds of the study area falls within the Moderate Vulnerability portion of the North St. Paul Drinking Water Supply Management Area (DWSMA). Any light industrial occupants with a higher probability of potential contaminant sources, such as chemical storage tanks, should be prioritized for the southern one-third of the study area.

b. Project Effects on Water Resources and Measures to Minimize or Mitigate the Effects

AUAR Guidance: Observe the following points of guidance on 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.*

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

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

The entire study area is served by the St. Paul municipal sanitary sewer collection system. The system conveys flow via gravity sewer lines to the Metropolitan Council interceptor system and eventually to the Metropolitan Wastewater Treatment Plant (Metro WWTP). The Metro WWTP is an advanced secondary treatment plant with chlorination/dechlorination which discharges treated effluent to the Mississippi River. As of September 2021, the Metro WWTP treats an average of 161 million gallons of wastewater per day and has a capacity of 314 million gallons per day.

The estimated existing wastewater flows for the study area based on land use are provided in **Table 7**. The study area currently generates an estimated average flow of 10,770 gallons per day (gpd) and a peak hourly flow of 43,080 gpd.

Table 7 - Existing Wastewater Flows

Land Use	Area (acres)	Unit Flow (gpd/acre)	Average Flow (gpd)	Peak Factor	Peak Hourly Flow (gpd)
Light Industrial	0	2,000	0		
Lower Density Residential	0	274	0		
Medium Density Residential	0	274	0		
High Density Residential	0	274	0		
Golf Course	107.7	100	10,770		
Public Park	0	100	0		
Passive Open Space	0	0	0		
Right-of-Way	0	0	0		
Wetlands	5.6	0	0		
Total	**113.3**		**10,770**	**4.0**	**43,080**

gpd = gallons per day

Three scenarios were considered in this analysis: Scenario 1 Comprehensive Plan, Scenario 2 Master Plan, and Scenario 3 Maximum Intensity.

The Scenario 1 Comprehensive Plan would increase the average flow by 342,770 gpd and the peak hourly flow by 1,229,664 gpd. The projected additional average flow equates to approximately 0.22 percent of the remaining treatment capacity at the Metro WWTP. No land uses are identified that would generate wastewater requiring pretreatment. The proposed development scenario is consistent with the City's planned sanitary sewer usage as identified in the Comprehensive Plan. Existing off site sanitary sewers will require upsizing in some locations to accommodate the additional flows. The upsizing will entail increasing some sections of 8-inch or 10-inch pipe to 12-inch pipe. The projected flows for Scenario 1 Comprehensive Plan are provided in **Table 8**.

Table 8 - Scenario 1 Comprehensive Plan Wastewater Flows

Land Use	Area (acres)	Residential Units	Unit Flow (gpd/acre, gpd/unit)	Estimated SAC Units	Average Flow (gpd)	Peak Factor	Peak Hourly Flow (gpd)
Light Industrial	45		2,000	328	90,000		
Lower Density Residential	9	180	274	180	49,320		
Medium Density Residential	9	360	274	360	98,640		
High Density Residential	7	420	274	420	115,080		
Golf Course	0		100		0		
Public Park	5		100	2	500		
Open Space	9		0		0		
Right-of-Way	23		0		0		
Wetlands	6		0		0		
Total	**113**	**960**		**1,290**	**353,540**	**3.6**	**1,272,744**

gpd = gallons per day

The projected wastewater flows were calculated for each scenario to identify the additional sanitary sewer flows. The projected flows for Scenario 2 Master Plan are provided in **(Table 9)**.

Table 9 - Scenario 2 Master Plan Wastewater Flows

Land Use	Area (acres)	Residential Units	Unit Flow (gpd/acre, gpd/unit)	Estimated SAC Units	Average Flow (gpd)	Peak Factor	Peak Hourly Flow (gpd)
Light Industrial	54		2,000	394	108,000		
Lower Density Residential	9	180	274	180	49,320		
Medium Density Residential	9	360	274	360	98,640		
High Density Residential	7	420	274	420	115,080		
Golf Course	0		100		0		
Public Park	5		100		500		
Open Space	9		0	2	0		
Right-of-Way	14		0		0		
Wetlands	6		0		0		
Total	**113.3**	**960**		**1,356**	**371,540**	**3.6**	**1,337,544**

gpd = gallons per day

The Master Plan scenario would increase the average flow by 360,770 gpd and the peak hourly flow by 1,294,464 gpd. The projected additional average flow equates to approximately 0.2 percent of the remaining treatment capacity at the Metro WWTP. No land uses are identified that would generate wastewater requiring pretreatment. The proposed development scenario is consistent with the City's planned sanitary sewer usage as identified in the Comprehensive Plan. Existing off site sanitary sewers will require upsizing in some locations to accommodate the additional flows. The projected flows for Scenario 3 Maximum Intensity are provided in **Table 10**.

Table 10 - Scenario 3 Maximum Intensity Wastewater Flows

Land Use	Area (acres)	Residential Units	Unit Flow (gpd/acre, gpd/unit)	Estimated SAC Units	Average Flow (gpd)	Peak Factor	Peak Hourly Flow (gpd)
Light Industrial	54		2,000	394	108,000		
Lower Density Residential	9	315	274	315	86,310		
Medium Density Residential	9	900	274	900	246,600		
High Density Residential	7	1,400	274	1,400	383,600		
Golf Course	0		100		0		
Public Park	5		100	2	500		
Open Space	9		0		0		
Right-of-Way	14		0		0		
Wetlands	6		0		0		
Total	**113.3**	**2,615**		**3,011**	**825,010**	**3.2**	**2,640,032**

gpd = gallons per day

The Maximum Intensity scenario would increase the average flow by 814,240 gpd and the peak hourly flow by 2,596,952 gpd. The projected additional average flow equates to approximately 0.45 percent of the remaining treatment capacity at the Metro WWTP. No land uses are identified that would generate wastewater requiring pretreatment. The proposed development scenario is consistent with the City's planned sanitary sewer usage as identified in the Comprehensive Plan. Existing off site sanitary sewers will require upsizing in some locations to accommodate the additional flows.

Per the City of St. Paul sewer design standards, sanitary sewers are at full design capacity as summarized below:

- 8-inch to 15-inch sanitary sewer pipes are considered full if flow depth is half (½) of the total pipe depth during peak flow conditions,
- Sewer pipes greater than 15-inch are considered full if flow depth is three quarters (¾) of the total pipe depth during peak flow conditions,

The definitions for full flow that are currently used by the City of St. Paul are referenced from the Clay Pipe Engineering Manual and Standard Handbook for Civil Engineers. Any projected hydraulic deficiencies in existing sanitary sewers will be addressed in the initial infrastructure design.

One segment of gravity sewer downstream of the study area was previously identified for consideration for replacement – the 52-foot-long segment of 15-inch vitrified clay pipe (VCP) at the intersection of Maryland Avenue and Kennard Street where the St. Paul trunk sewer discharges to MCES Interceptor 1-SP-214. This sewer is projected to have sufficient capacity for any scenario and replacement is not necessary at this time, but it is a candidate for future replacement given its material and its size relative to neighboring upstream and downstream sewers.

2) Wastewater Discharge to Surface Water (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.*

Existing Conditions

The area is currently serviced by a network of wetlands with four discharge points from the study area **(Figure 10)**. The east and northeast portions of the site drain to existing wetlands and ponds that outlet through existing culverts and storm sewer at McKnight Road and Larpenteur Avenue. Runoff from the west side of the site sheet flows either to the adjacent neighborhoods off Winthrop Street into a storm sewer along the existing residential roadways, or a storm sewer along Furness Parkway. The southern portion of the site sheet flows to existing storm sewer along Ivy Avenue. There is an existing drainage issue at the discharge point on Ivy Avenue east of Hawthorne Avenue. Stormwater directed to this area is collected by two catch basins at the east end of Ivy and discharges into the north ditch of the railroad right-of-way. The discharge into an unmaintained and inaccessible ditch section on railroad property has causes intermittent right-of-way flooding on Ivy Avenue and reported impacts to railroad signal systems.

Figure 10 - Existing Stormwater Discharge Points

Storm sewer at the western discharge point connects into the Beltline Interceptor System which outlets to the Mississippi River. The rest of the site drains through a storm sewer that reaches Beaver Lake. Beaver Lake also outflows to the Beltline Interceptor System; therefore, the entire site's ultimate discharge location is the Mississippi River. Beaver Lake was delisted as impaired for nutrients by the MPCA in 2014. Water quality at the outlets of the Beltline Interceptor is monitored by the RWMWD in collaboration with the Metropolitan Council.

The total stormwater discharge to each of the four points was used to determine rate control for each of the storm events modeled **Table 11**.

Table 11 - Existing Conditions Modeled Stormwater Discharge Rates at Discharge Points

Outfall Direction	**Atlas-14 2-year 24-hour discharge rate (cfs)**	**Atlas-14 10-year 24-hour discharge rate (cfs)**	**Atlas-14 100-year 24-hour discharge rate (cfs)**	**5.9-inch, 24-hour discharge rate (cfs)**	**1.64 cfs/acre discharge requirement (cfs)***
West (Furness Parkway	60.7	97.9	207.7	151.5	45.2
Northeast (Larpenteur Ave)	19.8	25.6	64.8	38.4	33.3
East (McKnight Ave)	40.9	55.5	92.0	67.7	85.0
South (Ivy Lane)	27.3	50.8	106.1	80.7	20.1

*Under existing conditions, the site does not meet the City of St. Paul rate control requirement of a maximum discharge less than or equal to 1.64 cfs/acre. cfs = cubic feet per second

Proposed Conditions

The study area will be designed to meet the most restrictive requirements of the City of St. Paul, RWMWD, and the National Pollutant Discharge Elimination System (NPDES) that are in place at the time of redevelopment. The following results considers the most restrictive of current stormwater requirements.

Rate Control:

The City of St. Paul stormwater management rules state that proposed site designs must have a discharge to the City storm sewer of less than 1.64 cubic feet per second (cfs) per acre of site area, for the 5.9 inch, 24-hour 100-year storm estimate. This rate control requirement does not apply to public ROW. Downstream, off-site stormwater facilities cannot be negatively impacted by development.

The RWMWD requires that developments demonstrate that runoff rates for the site will not exceed existing runoff rates for the 2-year, 10-year, and 100-year critical storm events using Atlas 14 precipitation depths and the National Resources Conservation Service's (NRCS's) MSE 3 rainfall distribution. The MSE 3 rainfall distribution graphs the intensity of a rainfall event over a given period of time.

Water Quality:

RWMWD Stormwater Rules stipulate that runoff must be retained onsite equivalent to 1.1 inches of runoff over the new and reconstructed impervious surfaces of the development. In some locations, there may be site constraints which limit the ability to infiltrate stormwater. Retention via infiltration may not be possible onsite due to constraints such as high groundwater, soils with low

infiltration capacity, and contamination. In areas where infiltration is not possible, other volume reduction options may be considered or the RWMWD's alternative compliance sequencing will be followed which allows for enhanced filtration or filtration. If enhanced filtration or filtration is used, the RWMWD's filtration credit factors will need to be applied to calculate the additional treatment volume required. These factors range from 1.25" to 1.82". The proposed development scenarios will also be required to incorporate best management practices (BMPs) to remove 90 percent of total suspended solids from the runoff generated by a 2.5-inch rainfall event.

The NPDES permit requires treatment of 1-inch of runoff for the new impervious area as more than one acre of disturbance will occur. Infiltration is required to be considered first under the NPDES permit; however other stormwater BMPs can be used if site conditions make infiltration infeasible. RWMWD rules are more stringent than NPDES regarding water quality treatment of new impervious surfaces and alternative sequencing for when infiltration is not feasible onsite.

Potential Infiltration Limitations:
Most soils within the study area are Hydrologic Soil Group (HSG) C and C/D. The northern portion of the study area is primarily comprised of D soils. Type D soils infiltrate poorly and may not allow infiltration over the long term. The RWMWD allows Alternative Compliance Sequencing for Type D soils due to their low capacity for infiltration. There is a Drinking Water Supply Management Area (DWSMA) in the northern portion of the study area with a moderate vulnerability, but it is located outside the Emergency Response Area (ERA). It is not anticipated that the DWSMA will limit infiltration within the study area based on the MPCA guidance. Efforts will be made to maximize infiltration; however, it is likely that infiltration will only be achievable in the southern portion of the study area.

Stormwater Management Concepts:
Stormwater management infrastructure will be built within the study area to help achieve the appropriate rate control and water quality treatment. All development scenarios include a continuous, linear stormwater management system along the north-south main roadway (Howard Street) as well as east-west systems along Montana Avenue and Arlington Avenue. This system is proposed to collect and manage stormwater from the adjacent public right-of-way and from some private residential parcels. This system will be an above-ground roadside system that will also function as urban habitat. It is anticipated that the stormwater systems within the public right of way will be owned and maintained by the City of St. Paul and will comply with all City and RWMWD design standards and maintenance requirements.

To manage stormwater runoff from the industrial sites within the study area, it is expected that industrial site owners will design and maintain underground storage methods.

Existing wetlands within the study area may be used to assist with achieving rate control to the existing discharge points for rainfall events larger than a 10-year event provided water quality treatment is provide prior to discharge to wetlands.

Temporary erosion and sediment control measures will be implemented during construction meeting the City, RWMWD, and NPDES permit requirements.

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
Construction dewatering will likely be required for development of the study area because groundwater is present 5 ft to 15 ft below the ground surface in some areas based on soil borings. Any temporary dewatering will require a MNDNR 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.

Water Supply
The entire study area is served by the St. Paul Regional Water Services (SPRWS). The SPRWS system is supplied by the Mississippi River, Vadnais Lake Watershed, and several reserve sources including 10 production wells. The raw water is treated at the McCarron's Water Treatment Plant. From 2015 to 2019, the SPRWS system delivered an average of 14.3 billion gallons per year. Based on the projected water demands below, all of the scenarios will increase demand on the SPRWS system by approximately one to two percent depending on development intensity.

The SPRWS system has existing 16-inch trunk water distribution mains in Larpenteur Avenue and McKnight Road, as well as smaller 6-inch and 8-inch mains on the western and southern boundaries of the development site in different pressure zones. The SPRWS storage facility associated with the pressure zone of the 16-inch trunk watermain is the Ferndale Tower to the southeast. SPRWS staff conducted hydrant flow tests and computer modeling in 2019 which suggested that the existing 16-inch trunk watermain can provide sufficient available fire flows to the study area. However, these parameters depend on final grading and the determination of needed fire flow for individual buildings. Therefore, the pressures and available fire flows at specific locations and elevations with particular land uses will need to be further studied and modeled as the design progresses. The Hayden Heights pressure zone on the western boundary of the site will be connected to and absorbed into the Ferndale pressure zone. Valved connections with the Hazel Park pressure zone on the southern boundary of the site are also being studied.

The existing water demand estimates for the study area based on land use are provided in **Table 12**. The study area currently generates an estimated average day demand (ADD) of 13,463 gallons per day (gpd) and a maximum day demand (MDD) of 26,925 gpd.

Table 12 - Existing Water Demand

Land Use	Area (acres)	Unit Demand (gpd/acre)	Average Day Demand (gpd)	Max Day Demand Factor	Max Day Demand (gpd)
Light Industrial	0	2,500	0		
Lower Density Residential	0	274	0		
Medium Density Residential	0	274			
High Density Residential	0	274			
Golf Course	107.7	125	13,463		
Public Park	0	125	0		
Passive Open Space	0	0	0		
Right-of-Way	0	0	0		
Wetlands	5.6	0	0		
Total	**113.3**		**13,463**	**2.0**	**26,925**

gpd = gallons per day

Three scenarios were considered in this analysis: Scenario 1 Comprehensive Plan, Scenario 2 Master Plan, and Scenario 3 Maximum Intensity. The projected water demands were calculated for each scenario to identify the additional water demands. The portion of the irrigation water demand that will be provided by the SPRWS system is yet to be determined. To be conservative in this analysis, it was assumed that all irrigation water demand would be provided by the SPRWS system. Stormwater reuse may be considered and studied to determine whether it can sustain part or all of the irrigation water demand.

The Scenario 1 Comprehensive Plan water demands are provided in **Table 13**.

Table 13 - Scenario 1 Comprehensive Plan Water Demand

Land Use	Area (acres)	Residential Units	Unit Demand (gpd/acre, gpd/unit)	Average Day Demand (gpd)	Max Day Demand Factor	Max Day Demand (gpd)
Light Industrial	45		1,000	45,000	2.0	90,000
Lower Density Residential	9	180	150	27,000	2.0	54,000
Medium Density Residential	9	360	150	54,000	2.0	108,000
High Density Residential	7	420	150	63,000	2.0	126,000
Irrigation	38		3,879*	147,402	1.0	147,402
Golf Course	0		0	0	2.0	0
Public Park	5		125	625	2.0	1,250
Passive Open Space	9		0	0	2.0	0
Right-of-Way	23		0	0	2.0	0
Wetlands	6		0	0	2.0	0
Total	**113**	**960**		**337,027**		**526,652**

gpd = gallons per day; *Per Hillcrest Redevelopment TAC Presentation dated January 27, 2021

The Scenario 1 Comprehensive Plan would increase the Average Daily Demand (ADD) by 323,565 gpd and the Maximum Day Demand (MDD) by 499,727 gpd. As described above, the existing SPRWS water supply infrastructure has adequate capacity to accommodate this additional water demand.

The Scenario 2 Master Plan water demands are provided in **Table 14**.

Table 14 - Scenario 2 Master Plan Water Demand

Land Use	Area (acres)	Residential Units	Unit Demand (gpd/acre, gpd/unit)	Average Day Demand (gpd)	Max Day Demand Factor	Max Day Demand (gpd)
Light Industrial	54		1,000	54,000	2.0	108,000
Lower Density Residential	9	180	150	27,000	2.0	54,000
Medium Density Residential	9	360	150	54,000	2.0	108,000
High Density Residential	7	420	150	63,000	2.0	126,000
Irrigation	38		3,879*	147,402	1.0	147,402
Golf Course	0		0	0	2.0	0
Public Park	5		125	625	2.0	1,250
Passive Open Space	9		0	0	2.0	0
Right-of-Way	14		0	0	2.0	0
Wetlands	6		0	0	2.0	0
Total	**113**	**960**		**346,027**		**544,652**

gpd = gallons per day; *Per Hillcrest Redevelopment TAC Presentation dated January 27, 2021

The Master Plan scenario would increase the ADD by 332,565 gpd and the MDD by 517,727 gpd. As described above, the existing SPRWS water supply infrastructure has adequate capacity to accommodate this additional water demand.

The Scenario 3 Maximum Intensity water demands are provided in **Table 15.**

Table 15 - Scenario 3 Maximum Intensity Water Demand

Land Use	Area (acres)	Residential Units	Unit Demand (gpd/acre, gpd/unit)	Average Day Demand (gpd)	Max Day Demand Factor	Max Day Demand (gpd)
Light Industrial	54		1,000	54,000	2.0	108,000
Lower Density Residential	9	315	150	47,250	2.0	94,500
Medium Density Residential	9	900	150	135,000	2.0	270,000
High Density Residential	7	1,400	150	210,000	2.0	420,000
Irrigation	38		3,879*	147,402	1.0	147,402
Golf Course	0		0	0	2.0	0
Public Park	5		125	625	2.0	1,250
Passive Open Space	9		0	0	2.0	0
Right-of-Way	14		0	0	2.0	0
Wetlands	6		0	0	2.0	0
Total	**113**	**2,615**		**594,277**		**1,041,152**

gpd = gallons per day; *Per Hillcrest Redevelopment TAC Presentation dated January 27, 2021

The Maximum Intensity scenario would increase the ADD by 580,815 gpd and the MDD by 1,014,227 gpd. As described above, the existing SPRWS water supply infrastructure has adequate capacity to accommodate this additional water demand.

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.

The City of St. Paul is the local governmental unit (LGU) that administers the Wetland Conservation Act (WCA). Wetlands will also be regulated through the US Army Corps of Engineers (USACE), Minnesota Pollution Control Agency (MPCA), and RWMWD. The proposed scenarios will result in some temporary and permanent impacts to wetlands **(Figure 11)**. The anticipated impacts include:

- Wetland H will be impacted in part to connect the stormwater system to Arlington Avenue.
- Wetlands A, B, E, F, G, and I will be filled or converted to primary stormwater treatment areas, resulting in approximately 2.4 acres of wetland impact.
- Contaminated soils will be removed from Wetlands C, D, and H.

Figure 11 - Wetland Delineation

Wetland jurisdictional status and impacts will continue to be evaluated and refined through the permitting process. All wetland impacts will be minimized to the extent practicable; the intent of all scenarios is to replace wetland impacts with 1:1 onsite mitigation and 1:1 via wetland bank credits. Use of wetland bank credits within the RWMWD will be prioritized, if available.

The proposed redevelopment will need to meet the wetland requirements of RWMWD's Wetland Management rules. RWMWD governs wetland buffers. This RWMWD rule is in addition to the WCA rules.

Wetland assessments were completed for all on-site wetlands by RWMWD or the project proposer, and the assessment values will be used during project planning. The current plan for all development scenarios is to maintain the same wetland acreage as currently exists on-site.

Due to the contaminated soils on the site from past golf course management practices (see **Item 12** in the AUAR), all development scenarios propose to remove contaminated soils within wetlands. The removal of contaminated soils to meet current pollution control standards is anticipated to qualify as a No Loss and therefore mitigation of those impacted wetlands will not be required for contaminated soil removal in wetlands.

Some stormwaters will be directed to wetlands that remain on site. Stormwater that is directed to on-site wetlands will be treated prior to discharge into the wetlands. State and local water quality treatment and flood attenuation requirements will be achieved prior to discharge to any of the site's wetlands. Wetlands will serve to attenuate flood water and augment water quality treatment beyond what is required.

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.

No other surface waters exist within the study area.

Item No.	Mitigation Description
11.1	Upsize existing St. Paul or Maplewood sanitary sewers in Winthrop Street and Larpenteur Avenue as necessary to accommodate the final site, grading, and utility plans.
11.2	A segment of gravity sewer downstream from the study area is being considered for replacement – a 52-foot-long segment of 15-inch vitrified clay pipe (VCP) located at the intersection of Maryland Avenue and Kennard Street where the St. Paul trunk sewer discharges to MCES Interceptor 1-SP-214.
11.3	Fire flows will continue to be studied as the design is advanced for the approved scenario.
11.4	Stormwater treatment will meet the City of St. Paul, RWMWD, and the NPDES permit requirements.
11.5	The stormwater management system will consist of combinations of continuous, linear treatment systems within the right-of-way, underground treatment systems, and ponding to meet stormwater requirements. Water reuse or filtration may also be incorporated if infiltration is not possible.
11.6	Stormwater runoff underground storage measures from industrial sites within the study area will be designed and maintained by the industrial site owners.
11.7	Wetland impacts will be minimized and avoided to the extent practical.
11.8	Jurisdictional status of wetlands will be determined through U.S. Corps of Engineers.
11.9	Wetland impacts will be replaced at a 2:1 ratio with 1:1 being obtained through the purchase of wetland banking credits and 1:1 being obtained through on-site replacement.
11.10	Wetland buffers will conform with the RWMWD's buffer rule.
11.11	Wetlands within the study area may be used to assist with achieving rate control to the existing discharge points for rainfall events greater than a 10-year event.
11.12	Temporary erosion and sediment control measures will be implemented during construction that meet the City of St. Paul, RWMWD, and NPDES permit requirements.
11.13	Improve Ivy Avenue to provide better capture and conveyance of stormwater from both the Hillcrest development and the adjacent right-of-way.

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.

A Phase I ESA conducted within the study area in 2019 identified the following recognized environmental conditions (RECs) on-site:

- Petroleum products (i.e., heating oil, gasoline, and diesel) stored in above ground and underground tanks.
- Lubricants, hydraulic fluid, and other oils stored in containers ranging in size from one pint to 55-gallons.
- Contamination from historic petroleum tank leaks is likely. Potential for identified and unidentified petroleum contamination on-site.
- Agricultural chemicals were stored, mixed, and applied on-site. Potential for soil or groundwater contamination from agricultural chemicals.
- Mercury contamination in the soil from the use and storage of mercury-based fungicide products.

Addendums to the Phase I ESA identified 10 high risk areas (HRAs) within the study area including:

- Agricultural chemical storage buildings loading areas.
- Damaged floors in the three agricultural chemical storage buildings.
- Agricultural chemical mixing/washout area.
- Drainage area adjacent to mixing/washout area.
- Berms on eastern portion of the study area.
- Golf greens and practice greens constructed before 1994.
- Tee boxes.
- Fairways.
- The primary pesticide/fertilizer storage building.
- The loading area associated with the pesticide/fertilizer building.

Based on the results of completed environmental studies, there are areas within the study area that are contaminated from golf course operations caused by the storage and use of petroleum products, other hazardous substances related to golf course management, and fertilizer and fungicides. Mercury is the main contamination issue at the site and is associated with past use of fungicides from the 1950's to 1997, when mercury was banned from use in fungicides.

Mercury contaminated soil at the site is widespread; mercury concentrations exceeding health risk cleanup standards have been primarily identified on former tee boxes, fairways, and greens. Approximately 40-50% of the former golf course site is affected by mercury. The contamination is shallow at most locations (approximately 1-2.5 feet below ground surface) and will require remedial excavation to complete cleanup at the site.

The Hillcrest Site is enrolled in the Minnesota Pollution Control Agency (MPCA) and Minnesota Department of Agriculture (MDA) Voluntary Investigation and Cleanup programs to obtain regulatory oversight and agency approvals.

The Response Action Plan will be tailored to the site development and the future land uses. To avoid exacerbating or spreading contamination, mitigation will involve site cleanup completed in accordance with a Response Action Plan (RAP) approved by the MPCA and MDA voluntary programs. The requirements for site cleanup established in the RAP are specific to proposed end uses of the site (i.e. commercial/industrial and residential/recreational). Site soils exceeding the cleanup standards established in the RAP will require off-site disposal at a permitted landfill. For soils with moderate levels of contamination (i.e. above detection but below cleanup standards), the RAP allows on-site placement (i.e. reuse) of the soils at locations approved by MPCA and MDA. If the on-site placement option is used for soils with moderate levels of contamination, restrictive covenants may be needed for portions of the property.

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

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

Construction-related waste materials (i.e., wood, concrete, metals, plastics, etc.) will be generated under both development scenarios. Construction-related waste will be recycled or disposed of in approved facilities, as appropriate. Toxic or hazardous substances used during project construction or operations (i.e., petroleum products, hydraulic fluid, and other chemical products) will be stored and disposed of following local and state guidelines. The 2018 Ramsey County Solid Waste Management Master Plan ensures that Ramsey County will comply with applicable laws, rules, and ordinances related to the management of solid and hazardous wastes per Minnesota Statutes, section 473.811. Recycling for residential units and commercial buildings in the study area will be in accordance with the 2016 Recycling Law (Minnesota Statutes Chapter 115A, Section 115A.151 and Section 115A.552), and City Leg. Code § 357.09 that requires source separation and curbside pick-up within the City.

The proposed development scenarios will generate new solid waste management and sanitation services demands within the study area. Based on the U.S. Environmental Protection Agency's (EPA) 2018 Municipal Solid Waste (MSW) in the United States report, it is estimated that 4.91 pounds of MSW are generated per person daily. The U.S. Census Bureau's 2015 – 2019 estimate of average household size was 2.62. Based on these values, conservative estimates for annual residential MSW generation for Scenarios 1 and 2 are 2,254 tons and for Scenario 3 is 6,139 tons. Conservative annual estimates of non-residential (commercial/industrial) municipal solid waste ranges from 391 tons (Scenario 1), 464 tons (Scenario 2), to 551 tons (Scenario 3).

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).

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 industrial, commercial, or residential buildings. The actual location of these tanks will be determined as design progresses and the location and use of storage tanks will comply will all state and location 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.

Not applicable.

Item No.	Mitigation Description
12.1	A Response Action Plan (RAP) has been prepared by the site owner and approved by the MPCA and MDA. The RAP guides how contaminated soils will be remediated and handled to facilitate redevelopment. The RAP implementation will be approved by the MPCA and MDA. The MPCA and MDA will issue a site closure environmental assurance when RAP implementation is approved. If the on-site placement option allowed by the approved RAP is utilized, it may be necessary to record restrictive covenants for certain portions of the site based on potential requirements of the MPCA and/or MDA.

13. FISH, WILDLIFE, PLANT COMMUNITIES, AND SENSITIVE ECOLOGICAL RESOURCES (RARE FEATURES)

a. Fish and Wildlife Resources

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

Vegetation within the study area includes herbaceous areas interspersed with elm (*Ulmus* spp.), oak (*Quercus* spp.), maple (*Acer* spp.), willow (*Salix* spp.), and ash (*Fraxinus* spp.) trees. The results of a tree inventory for the site are shown on **Figure 12.** Based on the water resources available within the study area it is unlikely that they are inhabited by fish species. Wildlife species that may occur within the study area include those known to use human-disturbed habitats, such as the Canada goose (*Branta canadensis*), American robin (*Turdus migratorius*), gray squirrel (*Sciurus niger*), white-tailed deer (*Odocoileus virginianus*), and coyote (*Canis latrans*).

Current land use within the study area is predominately overgrown fairways interspersed with wetlands and some wooded areas. The three development scenarios aim to maintain many of the mature trees that are currently on-site and include rain garden plantings. Wetlands within the study area are expected to be temporarily or permanently impacted (this includes the decontamination process) during project construction. Please see **Item 11** for further discussion of wetland impacts and mitigation plans. As such, the primary differences between

the current land use and the proposed land uses will be the conversion of the current vegetated areas to residential development, industrial buildings, roadways, sidewalks.

b. Rare Features

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.

Information from the MNDNR (Correspondence # MCE 2022-00297) Natural Heritage Inventory (NHI) is included in **Appendix B.** WSB also reviewed the MNDNR NHI data (License Agreement 1003, September 2022). This information indicates there are records of the state threatened Blanding's turtle (*Emydoidea blandingii*) and the federally endangered and state watchlist rusty patched bumble bee (RPBB; *Bombus affinis*) within the vicinity of the study area or within a one-mile radius around the study area.

The U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) service indicated that the federally threatened northern long-eared bat (NLEB; *Myotis septentrionalis*), federally endangered rusty patched bumble bee, and candidate species for listing monarch butterfly (*Danaus plexippus*) may occur within or near the study area **(Appendix B)**.

Blanding's Turtle

Blanding's turtles use upland area up to and over a mile distant from wetlands, waterbodies, and watercourses. Uplands are used for nesting, basking, periods of dormancy, and traveling between wetlands.

Northern Long Eared Bat

Suitable NLEB summer habitat consists of a variety of forested or wooded habitats where they roost, forage, and travel and may also include some adjacent non-forested habitats such as emergent wetlands, edges of agricultural fields, old fields, or pastures. Summer habitat includes forests and woodlots containing potential roosts (i.e., live trees or snags greater than or equal to three inches diameter at breast height (dbh) that have exfoliating bark, cracks, crevices, or cavities), as well as linear features such as fencerows, riparian forests, and other wooded corridors. During winter months NLEB hibernate in caves or abandoned mines and tend to be found in deep crevices. Males and non-reproductive females may also roost in caves or mines. The nearest known NLEB hibernacula is more than 2.3 miles south of the study area in T28 22W, there are no known maternity roost trees in Ramsey County.

Rusty Patched Bumblebee

RPBB occur in a variety of habitats including prairies, woodlands, marshes, agricultural landscapes, and residential parks and gardens. RPBB require areas that support sufficient food (nectar and pollen from diverse and abundant flowers), undisturbed nesting sites in proximity to floral resources, and overwintering sites for hibernating queens. Nesting sites include underground and abandoned rodent cavities or clumps of grass (i.e., bunchgrasses), and overwintering sites include patches of undisturbed soil along woodland edges. The USFWS adapted a habitat connectivity model to identify the zones around current (2007-2017) records where there is a high potential for RPBB to occur. The zones are referred to as High Potential Zones or Low Potential Zones. High Potential Zones contain known locations and the surrounding area and are considered to have the greatest potential for species presence. RPBB presence is assumed within High Potential Zones where suitable habitat is present. The entire study area is within the RPBB High Potential Zone. Based on

current land cover, there may be suitable overwintering habitat for RPBB near the wooded wetlands within the study area.

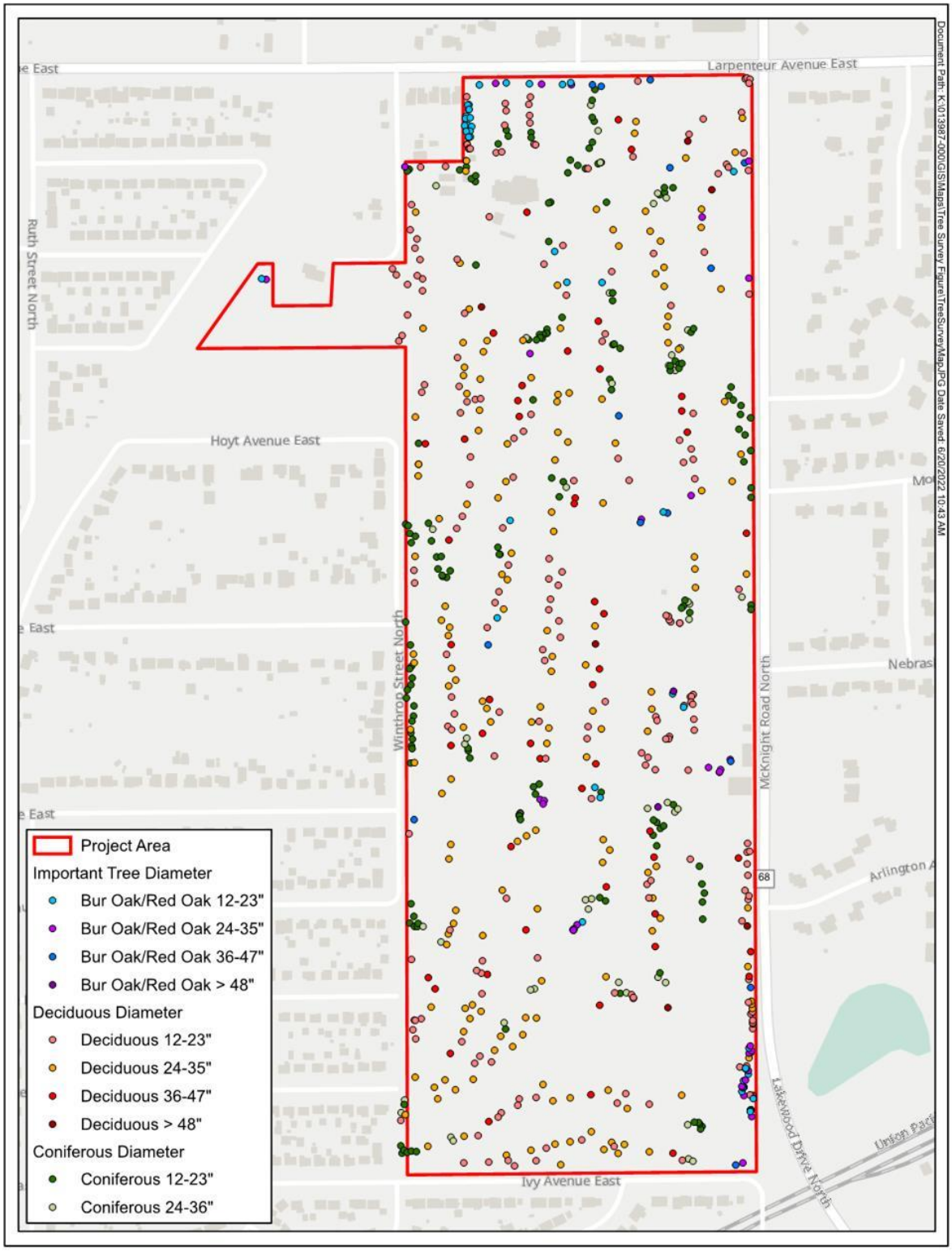


Figure 12–Tree Survey

Monarch Butterfly

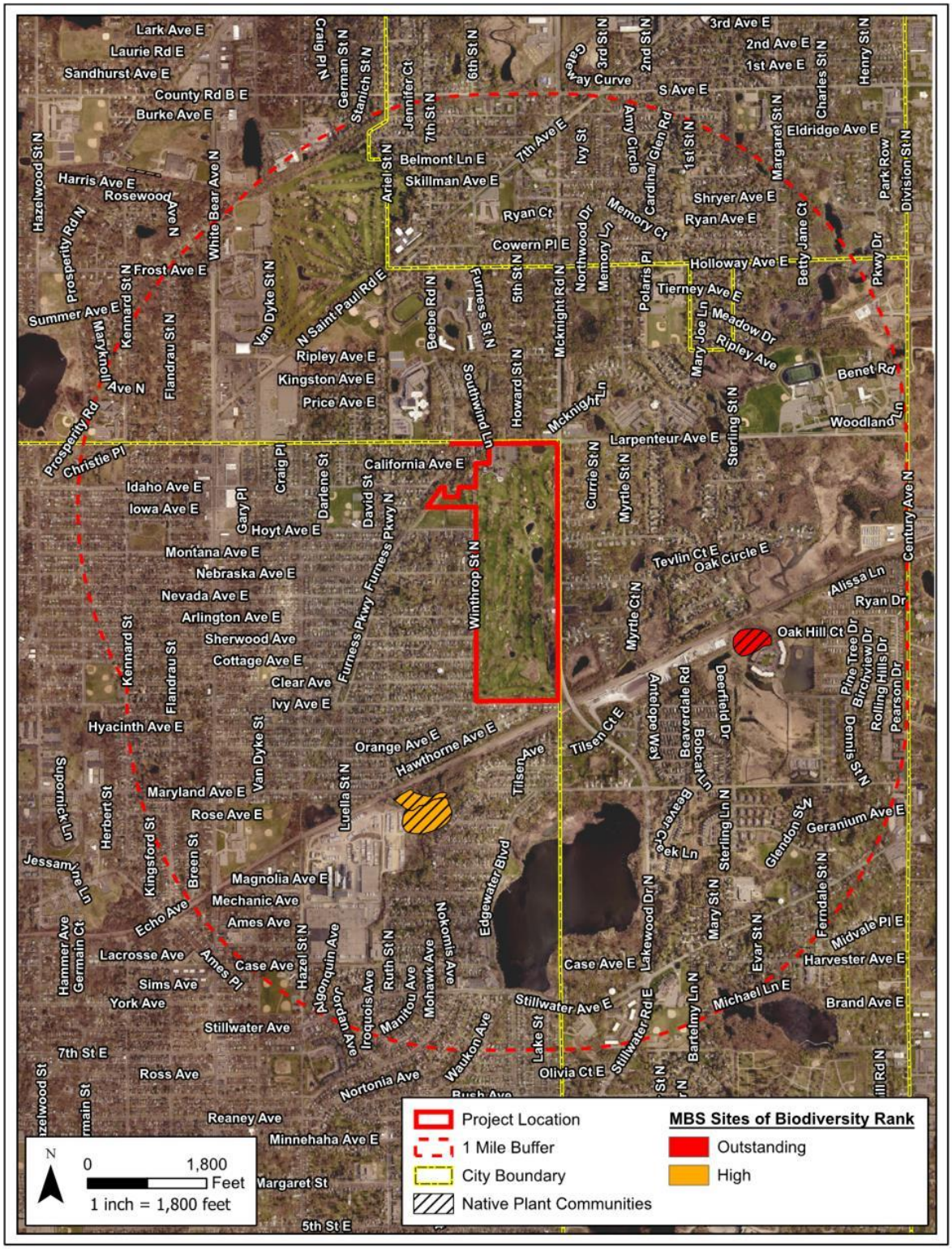
Monarch butterflies use fields and parks where native milkweed (*Asclepias* spp.) and other plant species are common. Monarch larvae are milkweed obligates, however adults feed on a variety of flowering plants.

c. Effects on Fish, Wildlife, Plant Communities, Rare Features, and Ecosystems

There are no Minnesota Biological Survey (MBS) sites of biodiversity significance or MNDNR native plant communities (NPCs) within the study area. There are three NPCs and two MBS sites of biodiversity within one mile of the study area **(Figure 13)**. There is an NPC identified as a wet southern prairie that is associated with an MBS site of biodiversity that is ranked as outstanding approximately 0.49 miles east of the study area. The other two NPCs are located approximately 0.25 miles southwest of the study area. One of the NPCs is a mesic southern prairie and the other is a willow-dogwood (*Cornus* spp.) shrub swamp. The two NPCs are associated with an MBS site of biodiversity significance that is rated as high. The construction activities associated with the proposed redevelopments should not impact the MBS sites of biodiversity or the NPCs that are within one mile of the study area.

Although there are records of special status species within or near the study area, state and federal guidelines will be followed to prevent adverse impacts to special status species. Mitigation measures will include avoiding impacting habitat during certain times of the year or conducting a species study of the area. The wildlife species that currently use the study area are likely to continue to use the study area after the area is redeveloped as they are common, ubiquitous, and are associated with human-disturbed habitats. Although it is unlikely that fish occur within the water resources on-site, if they are present, it is unlikely that they will be more impacted by construction activities or the proposed redevelopments than they are currently impacted by historic golf course land management practices.

Because of the existing on-site contamination that is proposed to be remediated through soil removal and the proposed industrial land use that will result in longer buildings, impacts to trees are anticipated. This will continue to be reviewed and evaluated as part of the site plan review. As part of the design and site plan review, grading will be adjusted where possible to reduce or eliminate impacts to trees. The future landscaping plan will also include tree replacement pursuant to the site review and permitting process with the City of St. Paul.


Project Location
1 Mile Buffer
City Boundary
Native Plant Communities
MBS Sites of Biodiversity Rank
Outstanding
High
N
0
1,800
Feet
1 inch = 1,800 feet
Lark Ave E
Laurie Rd E
Sandhurst Ave E
County Rd B E
Burke Ave E
Harris Ave E
Rosewood Ave N
Frost Ave E
Summer Ave E
Ripley Ave E
Kingston Ave E
Price Ave E
Prosperity Rd
Christie Pl
Idaho Ave E
Iowa Ave E
Hoyt Ave E
Montana Ave E
Nebraska Ave E
Nevada Ave E
Arlington Ave E
Sherwood Ave
Cottage Ave E
Clear Ave
Ivy Ave E
Hyacinth Ave E
Maryland Ave E
Rose Ave E
Magnolia Ave E
Mechanic Ave
Ames Ave
Case Ave
Lacrosse Ave
Sims Ave
York Ave
Stillwater Ave
7th St E
Ross Ave
Reaney Ave
Minnehaha Ave E
Margaret St
5th St E
Nortonia Ave
Olivia Ct E
Stillwater Ave E
Michael Ln E
Brand Ave E
Harvester Ave E
Midvale Pl E
Geranium Ave E
Orange Ave E
Hawthorne Ave E
Tilsen Ave
Tilsen Ct E
California Ave E
Larpenteur Ave E
Tevlin Ct E
Oak Circle E
Oak Hill Ct E
Alissa Ln
Ryan Dr
Century Ave N
Benet Rd
Woodland Ln
Meadow Dr
Ripley Ave
Holloway Ave E
Tierney Ave E
Ryan Ct
Ryan Ave E
Shryer Ave E
Cowern Pl E
Belmont Ln E
Skillman Ave E
Eldridge Ave E
S Ave E
3rd Ave E
2nd Ave E
1st Ave E
Lexington Pkwy N
Snelling Ave N
Hamline Ave N
Pascal St N
Dale St N
Victoria St N
Rice St
Arundel St
Galtier St
Western Ave N
Capp Rd
Pierce Butler Rte
Minnesota St
Jackson St
Wabasha St
Cedar St
Robert St
Wacouta St
Eagle Pkwy
Kellogg Blvd W
Shepard Rd
Water St
Smith Ave
Concord St
Bidwell St
Fillmore Ave
Isabel St
Dodd Rd
Lexington Pkwy S
Cleveland Ave S
Fairview Ave S
Snelling Ave S
Hamline Ave S
Pascal St S
Dale St S
Victoria St S
Rice St
Arundel St
Galtier St
Western Ave S

d. Measures to Avoid, Minimize, or Mitigate Adverse Effects (to fish, wildlife, plant communities, and sensitive ecological resources)

The three development scenarios propose to:

- Remove contaminated soils across the study area and from within wetlands.
- Compensate wetland impacts with an overall ratio of 2:1 with a 1:1 compensation ratio onsite.
- Develop or preserve approximately 20 acres of open space,
- Maintain many mature trees that are currently established where feasible. Develop a mitigation plan as part of the site plan review.
- Establish rain gardens with native plant species which will provide foraging habitat for pollinators. The establishment of native plant species within the rain gardens will provide habitat for pollinating species, including monarch butterflies and RPBBs.
- Avoid aquatic habitat impacts during Blanding's turtle hibernation season between October 15 and April 15, unless the area is unsuitable for hibernation.
- Areas where construction will occur will be checked for turtles before the use of heavy equipment or any ground disturbance. The DNR's Blanding's turtle flyer will be provided to the construction contract.
- The removal of mature trees will occur outside of the Northern Long Eared Bat (NLEB) active season (April 1 to October 31) and peak nesting season for birds protected by the Migratory Bird Treaty Act (April 1 to June 15) when possible.
- Surveys for potentially suitable NLEB roost trees and active bird nests will be conducted if tree removal occurs during the NLEB active season or during the peak nesting period for birds. Potentially suitable NLEB roost trees will be flagged and will be removed from November 1 to March 31. If an active bird nest is observed, the tree will be flagged, and an appropriate no disturbance buffer will be established surrounding the nest until the young have fledged or the nest is abandoned.
- Construction best management practices (BMPs) will be used to minimize impacts to wildlife or their habitats including wildlife friendly erosion mesh and sediment control measures.

Item No.	Mitigation Description
13.1	Remove contaminated soils across the study area and from within wetlands.
13.2	Compensate wetland impacts with a ratio of 2:1 with a 1:1 ratio onsite.
13.3	Develop or preserve approximately 20 acres of open space.
13.4	Maintain many mature trees that are currently established where feasible. Develop a mitigation plan as part of the site plan review.
13.5	Avoid aquatic habitat impacts during Blanding's turtle hibernation season between October 15 and April 15, unless the area is unsuitable for hibernation.
13.6	Areas where construction will occur will be checked for turtles before the use of heavy equipment or any ground disturbance. The DNR's Blanding's turtle flyer will be provided to the construction contractor.
13.7	Establish rain gardens with native plant species which will provide foraging habitat for pollinators. The establishment of native plant species within the rain gardens will provide habitat for pollinating species, including monarch butterflies and RPBBs.
13.8	Mature tree removal will occur outside of the NLEB active season (April 1 to October 31) and peak nesting season for birds protected by the Migratory Bird Treaty Act (April 1 to June 15) when possible. Surveys for potentially suitable NLEB roost trees and active bird nests will be conducted if tree removal occurs during the NLEB active season or during the peak nesting period for birds. Potentially suitable NLEB roost trees will be flagged and will be removed from November 1 to March 31. If an active bird nest is observed, the tree will be flagged, and an appropriate no disturbance buffer will be established surrounding the nest until the young have fledged or the nest is abandoned.
13.9	Construction BMPs will be used to minimize impacts to wildlife or their habitats including wildlife friendly erosion mesh and sediment control measures.

14. HISTORICAL 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: Contact with the State Historic Preservation Office and State Archaeologist 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.

Procedures and Methods Followed
A Phase IA Cultural Resource Assessment for the study area was completed in August 2021 (**Appendix C)**. A literature search was completed in October 2020 and a database request was submitted to the Minnesota State Historic Preservation Office (SHPO) and was received on September 13, 2021 (**Appendix C)**.

Existing Conditions
No archaeologic sites or historic structures were identified within the study area based on the Phase IA Cultural Resource study.

One previously recorded archaeological site was identified approximately 0.6 miles from the study area **(Table 16)**. The archaeological site was discovered in 1992 and is called Hillcrest (Site Number: 21RA0016). Hillcrest (Site Number: 21RA0016) is described as an unevaluated, precontact isolated find of unknown cultural affiliation consisting of one lithic artifact.

Table 16 - Previously Recorded Archeological Sites

Site Number	Site Name	Cultural Affiliation	Description	NR Status	Distance from Site (Miles)
21RA0016	Hillcrest	Precontact	Single Artifact	Unevaluated	0.59

Eight previously inventoried historic properties were identified within one-half mile of the study area, including one National Register of Historic Places (NRHP) eligible historic property, the St. Paul-Minneapolis, and Manitoba Railway **(Table 17)**.

Table 17 - Previously Inventoried Historic Properties

Site Number	Address	Name/Description	NR Status	Distance from Site (Miles)
HE-MPC-5615	---	St. Paul-Minneapolis and Manitoba Railway	Eligible	0.04
RA-MWC-0027	2300 Larpenteur Ave E	House	Unevaluated	0.11
RA-MWC-0028	1709 McKnight Rd. N	Community Corrections	Unevaluated	0.09
RA-SPC-1736	1350 Hazel St. N	Hayden Heights School	Unevaluated	0.50
RA-SPC-1737	1435 Hazel St N	House	Unevaluated	0.50
RA-SPC-4781	1971 Orange Ave. E	House	Unevaluated	0.36
RA-SPC-4782	1879 Orange Ave.	House	Unevaluated	0.37
RA-SPC-5751	2095 Clear Ave.	Water Tank	Unevaluated	0.10

An evaluation of the Hillcrest Golf Course revealed that it is not eligible for NHRP registration due to the loss of the original clubhouse, and it does not appear to have social or community significance based on the SHPO review.

Proposed Conditions

The three scenarios would redesign the Hillcrest Golf Course into a mixed industrial, residential, and commercial use development interspersed with passive and active open spaces. No impacts to the identified archaeological or historical resources would occur as they are outside of the study area.

The development may receive funding from the Environmental Protection Agency and therefore compliance with Section 106 of the National Historic Preservation Act will be required if this funding is obtained. Additionally, the Phase IA study was reviewed with the SHPO (see section below) and a Phase 1 archaeological survey is recommended prior to construction activities. The Phase 1 archaeological survey must meet the Secretary of Interior's Standards for Identification and Evaluation. The Phase 1 archaeological survey and a Phase I architecture-history survey is included as a mitigation measure. These additional studies will determine if a Phase II (subsurface) study will be needed.

State Historic Preservation Office Review Summary

In summary the SHPO response **(Appendix C)** indicated that the Hillcrest Golf Course was not eligible for listing under the NRHP and that the St. Paul-Minneapolis and Manitoba Railway located just south of the study area is eligible for listing. The remaining seven historic or architectural properties located within one-half mile of the study area have not been evaluated but will not be impacted by development in the study area. The SHPO recommends that a Phase I archeological survey that meets the requirements of the Secretary of Interior Standards for Identification and Evaluation be conducted prior to construction activities.

Item No.	Mitigation Description
14.1	Complete a Phase 1 archaeological survey and a Phase I architecture-history Survey of the study area prior to construction and review results with the SHPO and Office of the State Archaeologist. The need for a Phase II survey will be evaluated in conjunction with SHPO based on the results of these studies.
14.2	If development becomes a federal undertaking subject to review under Section 106 of the National Historic Preservation Act, further identification and evaluation efforts may be needed and coordination with the State Historic Preservation office will be required.

15. VISUAL

Scenic views or vistas may include spectacular viewing points along lakes, rivers or bluffs; virgin timber tracts; prairie remnants; geological features; waterfalls; specimen trees; or plots of wildflowers. 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. If any non-routine visual impacts would occur from the anticipated development this should be discussed here along with appropriate mitigation.

No significant views as identified by the Comprehensive Plan are within or near the study area.

Site lighting under each scenario will be consistent with the Hillcrest MP. A lighting plan will be developed and submitted to the City of St. Paul during the site planning review and approval stage.

The St. Paul Minneapolis and Manitoba Railway which is eligible for listing in the NRHP is located immediately south of the study area. Site lighting is not expected to impact this eligible historical property. No other eligible or listed historical properties are located within or near the study area.

Item No.	Mitigation Description
15.1	A lighting plan will be developed and submitted to the City of St. Paul during the site planning review and approval stage.

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.

Not applicable.

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.

Motor vehicles emit airborne pollutants (such as mobile source air toxics [MSATs]), thereby affecting air quality. The Environmental Protection Agency (EPA) regulates air pollutants including ozone, particulate matter, carbon monoxide, nitrogen dioxide, lead, and sulfur dioxide. Potential impacts resulting from these pollutants are assessed by comparing estimated concentrations to National Ambient Air Quality Standards (NAAQS). Advances in vehicle technology and fuel regulations will result in reduced vehicle emissions.

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 orders.

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.

Fugitive dust will be generated during the construction phase of all proposed development scenarios. Dust emissions will be controlled by watering, sprinkling, or calcium chloride applications, as necessary. Contractors will maintain streets, alleys, sidewalks, and other public spaces adjacent to construction activities to keep them free from dust, litter, and other debris in accordance with St. Paul City Ordinance (Section 221.02). Dust emissions are not expected during the operational phase of any of the proposed development scenarios.

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. 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.*

Per the AUAR guidelines, construction noise does not need to be addressed unless there are unusual circumstances that warrant it. No unusual circumstances are anticipated that would warrant a detailed noise analysis. Construction activities will be conducted in compliance with the City of St. Paul noise ordinances (Chapter 293) to minimize noise levels and disturbances, and construction activities will cease from 10:00 pm to 7:00 am. The study area will be constructed so that noise sensitive areas (i.e., residential units) will have sufficient setbacks from noise sources to limit noise disturbances. Specifics regarding setback distances will be determined as the project develops. Permits related to construction noise will be obtained prior to the start of construction.

A sound level increase of 3 dBA is barely discernible to the human ear, a 5 dBA increase is clearly discernible, and a 10 dBA increase is perceived as being twice as loud. For example, if the sound level of light traffic is 60 dBA and the sound level of heavy traffic is 70 dBA, the heavy traffic will be perceived as twice as loud as the light traffic.

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

Item No.	**Mitigation Description**
17.1	Construction activities will be conducted in compliance with the City of St. Paul noise ordinances (Chapter 293) to minimize noise levels and disturbances, and construction activities will cease from 10:00 pm to 7:00 am.
17.2	The study area will be constructed so that noise sensitive areas (i.e., residential units) will have sufficient setbacks from noise sources to limit noise disturbances.

18. TRANSPORTATION

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

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 regional transportation system.

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

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

A Traffic Analysis has been completed for the proposed Hillcrest Golf Course Redevelopment site. The following sections provides a summary of the Traffic Study. The full Traffic Study can be found in **Appendix D.**

The Hillcrest Study area is a former golf course with no roadway, bike or pedestrian flow through the site. The redevelopment of the study area will integrate the site into the transportation network and provide multi-modal transportation access. Parking will be provided for the proposed land uses within the study area. This Transportation Analysis was completed in conjunction with the ***Hillcrest MP***.

EXISTING ROADWAY, BICYCLE, PEDESTRIAN, AND TRANSIT CONDITIONS

Existing Roadways

The two primary roadways providing access to the site are Larpenteur Avenue (CSAH 30) and McKnight Road (CSAH 68). Each is discussed below:

Larpenteur Avenue (CSAH 30): Larpenteur Avenue is a two lane east-west Ramsey County roadway. It is classified as an A-Minor Augmenter. Larpenteur Avenue was recently upgraded to include striped bike lanes in both directions between Hazel Street and McKnight Road. The existing Average Daily Traffic (ADT) on Larpenteur Avenue is 8,500 vehicles per day (vpd) within the study area. The roadway has a posted speed limit of 30mph.

McKnight Road (CSAH 68): McKnight Road is a north/south Ramsey County with a three-lane cross section with paved shoulders designated for biking. It is classified as an A-Minor Augmenter roadway. The existing ADT on McKnight Road is 12,600vpd within the study area. The roadway has a posted speed limit of 45mph.

Other local roadways are further discussed in **Appendix D.**

Existing Traffic Volumes

Weekday peak hour tuning movement traffic volumes were collected as part of the Transportation Planning Analysis for the ***Hillcrest MP***. The AM peak hour was determined to be 7:15 AM to 8:15 AM and the PM peak hour was determined to be 4:30 PM to 5:30 PM. **Appendix D** contains the detailed information about existing traffic volumes.

Existing Transit Routes

The current transit routes and the proposed Rush Line Bus Rapid Transit (BRT) route are provided in **Figure 14**. Transit service in the project area is provided by Metro Transit. However, there is no bus service provided directly adjacent to the site along either Larpenteur Avenue or McKnight Road. The routes in the area closest to the site include:

- Route 64 is a local bus route from Downtown St. Paul to the Maplewood Mall via Payne Avenue, Maryland Avenue, White Bear Avenue, and continuing through North St. Paul and Maplewood. The route splits to Route 64N which passes closest to the site. The route operates during the weekdays and the weekend with 30-minute headway during the peak hours and 15 to 60-minute headways outside of peak hours. The current ridership (2019) for the bus stop closest to the site was 14 riders per day.

- Route 74 is a local bus route from the 46th Street Station in Minneapolis to the Sun Ray Shopping Center in St. Paul via Ford Parkway, W 7th Street, Downtown St. Paul, and continuing through St. Paul to Maplewood. The route operates during the weekdays and the weekend with weekday 15 to 20-minute headways during the peak hours and 20 to 30-minute headways during the midday and evening hours. Service runs on a 20 to 30-minute headway on the weekends. The current ridership (2019) for the bus stops closest to the site was 3 riders per day.

Existing Bicycle and Pedestrian Facilities
In the study area there are several pedestrian and bike facilities that would provide access to the site including:

- Sidewalks on some of the streets in the neighborhood to the west. These sidewalks currently dead-end at the site.
- Sidewalk on the west side of McKnight Road north of Larpenteur Avenue.
- Trail on the west side of McKnight Road south of Larpenteur Avenue.
- Furness Parkway Trail west of the site.
- On road striped bike lane on Larpenteur Avenue in both directions west of McKnight Road.
- Striped shoulder on McKnight Road.
- Striped shoulder on Larpenteur Avenue east of McKnight Road
- Signed and striped pedestrian crossings across McKnight Road with raised concrete medians at Arlington Avenue, Nebraska Avenue, Montana Avenue and Hoyt Avenue.
- Signed and striped pedestrian crossing across Larpenteur Avenue at Beebe Road.

The primary destinations for pedestrians in the area are local businesses located at McKnight Road and Larpenteur Avenue and along White Bear Avenue approximately ¾ mile west of the site. Larpenteur Avenue does not have sidewalk or trail facilities except for a short stretch near Mounds Park Academy. The neighborhoods to the west of the site do have sidewalks on some of the blocks. These sidewalks currently dead-end at the site and do not connect to the trail along McKnight Road.

The site is well connected to promote bicycling as a viable mode of transportation to the east and south. However, there are gaps in the existing facilities for trips to/from the north and west of the site. Larpenteur Avenue was recently restriped to provide bike lanes, but the lanes end at Hazel Street resulting in a gap to the White Bear Avenue area.

Figure 15 shows the existing pedestrian and bike facilities including existing sidewalk gaps.

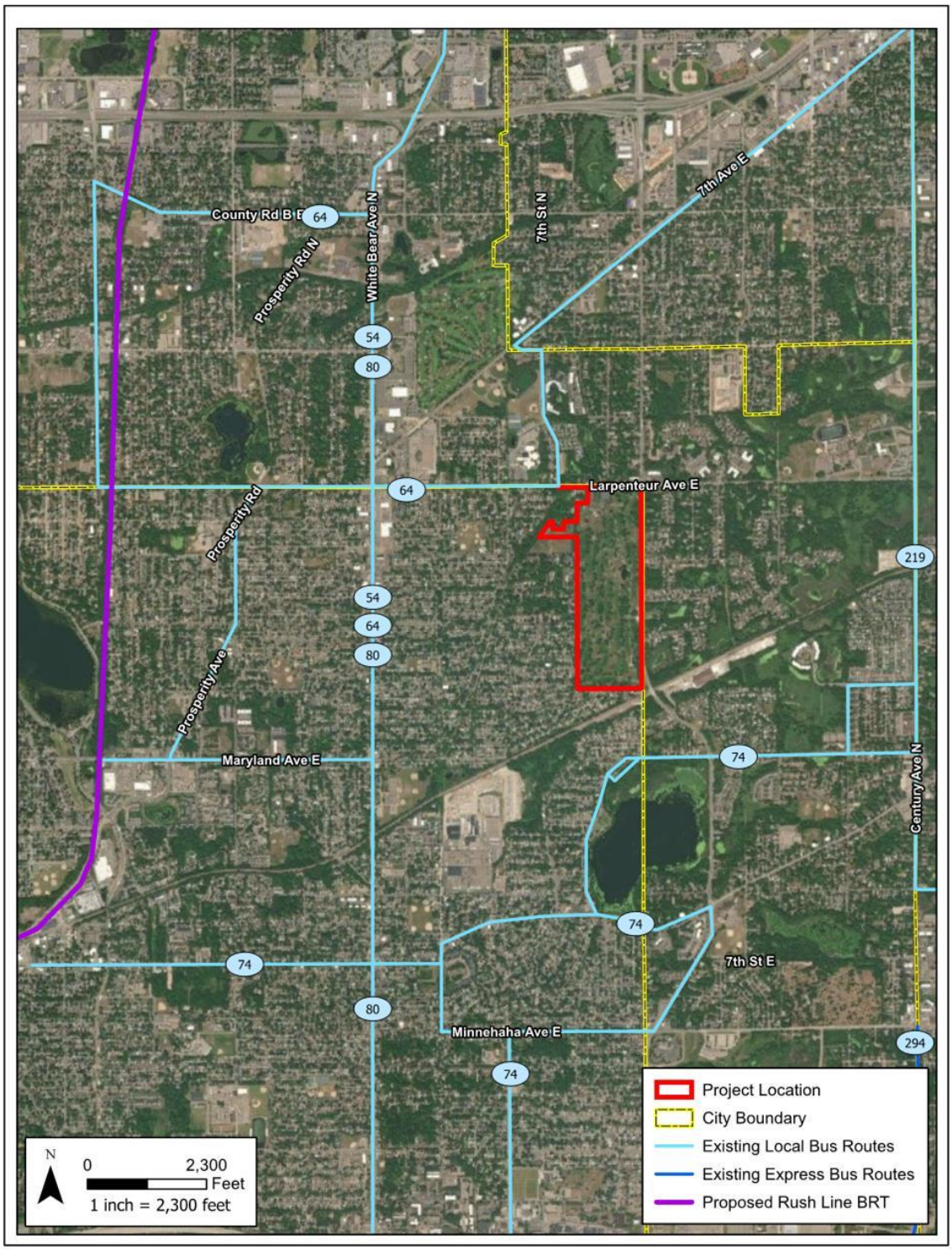


Figure 14 - Existing and Proposed Transit Features

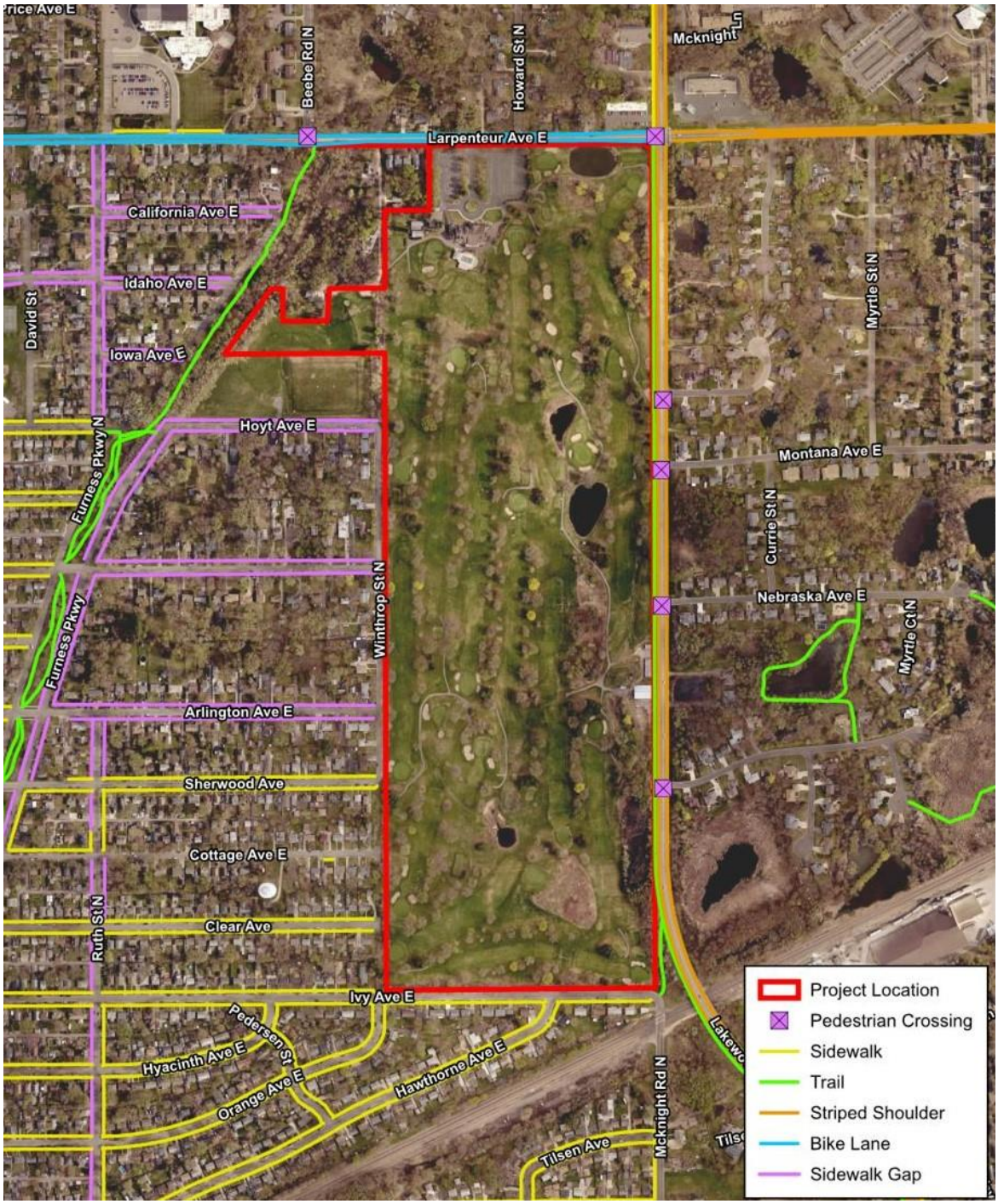


Figure 15 - Existing Pedestrian and Bike Facilities

PROPOSED CONDITIONS

Three development land use scenarios have been included in the AUAR. The redevelopment is anticipated to include a mix of residential, light industrial, and commercial uses.

Proposed Bike / Pedestrian Facilities

With each land use scenario, trail and sidewalk connections to the surrounding network will be provided.

As discussed, the indicated study area is connected to nearby bike facilities, with the most extensive network located to the east and south with gaps in the existing infrastructure for travel to/from the northern and western portion of the study area. Per the City of St. Paul Bike Plan, Ivy Avenue will provide an enhanced shared lane in the future that will run from the trail on McKnight Road to Prosperity Avenue. Arlington Avenue will also provide an enhanced shared lane in the future that will connect the Bruce Vento Trail to the Furness Trail.

The neighborhood to the west of the site has sidewalks on some of the blocks. The city's goal is to provide sidewalks on the remaining city streets; however, there is no immediate plan to provide these improvements. Any sidewalk that currently dead ends at the site will be connected to the site development. With the conversion of McKnight Road from 4 lanes to 3 lanes, pedestrian refuge islands were installed at Hoyt Avenue, Montana Avenue, Nebraska Avenue, and Arlington Avenue to improve pedestrian crossings.

With each of the development scenarios the following bike and sidewalk connections should be provided:

- A trail connection north of Hoyt Ave to the Furness Trail on the west side of the study area with a direct connection through the site to the trail on McKnight Road.
- An off-road trail on the south side of Larpenteur Avenue from McKnight Road to west.
- A trail connection from the site on Howard Drive to Ivy Avenue.
- A pedestrian connection on the north side of Ivy Avenue from Winthrop Street to the existing pedestrian trail on McKnight Road with the reconstruction of Ivy Avenue.
- An extension of the future enhanced bike lane on Arlington Avenue through the site to the trail on McKnight Road
- Sidewalks along all roadways throughout the Hillcrest development Site.
- Sidewalks to the Hayden Heights neighborhood from the site on Nebraska Avenue, Arlington Avenue and Cottage Avenue.
- Reconstruction of the existing pedestrian refuge islands on McKnight Road at Montana Avenue and Arlington Avenue as part of the construction of new left turn lanes for the site. The design will include a raised concrete median with signing and pavement markings. The detailed design will be completed as part of the final design for the site improvements and will be coordinated, reviewed, and approved by Ramsey County.
- Design internal roadways to accommodate safe pedestrian crossing including bump-outs at intersections, tabled concrete crosswalks, and a tabled intersection at Howard Street and Idaho Avenue.
- Ensure that the pedestrian connectivity across McKnight Road to the City of Maplewood is maintained. Any changes or modifications in the existing infrastructure resulting from the development will be reviewed and approved by Ramsey County and the City of Maplewood.
- Provide a pedestrian crossing of Larpenteur Avenue from the development site at Howard Street.

Transit Connections
Currently the transit service adjacent to the site is limited with no existing bus service provided along either Larpenteur Avenue or McKnight Road. To promote increased transit use, it is recommended to work with Metro Transit, to alter the existing route 64 or route 74 to pass through or pass adjacent to the site. Which of these routes, the length of the route extended and where bus stops are located, will be analyzed once a site development scenario is selected and Metro Transit reanalyzes the local bus routes in the area.

Freight Service
Truck activity within the Hillcrest Site is expected to be related to potential industrial truck traffic including, deliveries serving the site, garbage/recycling services, and school buses. Depending on the actual use on the industrial properties within the site, a large amount of truck or freight activity could occur. These uses are planned for the areas adjacent to McKnight Road and all truck access should be directed to McKnight Road. Trucks and freight activity should be limited and discouraged on all other roadways within the site by using methods such as:

- Design internal roadways to accommodate the expected level of freight activity within the area based on the proposed development, including:
    - Provide bump-outs at intersections to elimination/discourage large vehicle turning.
    - Any industrial land use's access to Howard Street should not line up with Nebraska Avenue, Arlington Avenue, or Cottage Avenue to the west. Rather, any such access to Howard Street should be mid-block to discourage direct traffic access to the neighborhoods.
- Freight activity should be limited during the peak traffic periods to avoid potential conflicts. This can be accomplished through communication with the identified industrial business, area package services (i.e., UPS, FedEx, etc.) and refuse haulers.
- Evaluation of the need for on-street loading areas should be completed to accommodate some freight activity as actual development proposals are identified.

Traffic Projections
In order to analyze the land use scenarios and determine the appropriate lane configuration and traffic control needs on the area roadways and intersections, projected traffic volumes were determined. Projections were prepared for the 2040 horizon year. The following sections outline the projected background traffic growth, traffic generation from the study area, as well as the traffic distribution and projected traffic volumes.

The estimated trip generation for each of the proposed development scenarios is shown in **Tables 18 - 20**. The trip generation rates used to estimate the proposed area traffic is based on similar land uses as documented in the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 11*th Edition. Additional information about the methods used in this analysis is included in **Appendix D.**

Table 18 - Scenario 1 Trip Generation

Land Use Scenario 1 - Comp Plan																
Planned Use	Size	Unit	ITE				ADT		Weekday AM Peak of Adjacent Street Traffic				Weekday PM Peak of Adjacent Street Traffic			
			Code	Discription	Setting/ Location	Variable	Rate	Total	Rate	Total	In	Out	Rate	Total	In	Out
Industrial	708,000	Sq Ft	130	Industrial Park	Urban/ Suburban	per 1000sf	3.37	2,386	0.34	241	195	46	0.34	241	53	188
Multi-Family (Low Density)	180	Unit	220	Multi Family Low Riise	Urban/ Suburban	per unit	6.74	1,213	0.40	72	17	55	0.51	92	58	34
Multi-Family (Medium Density)	360	Unit	220	Multi Family Low Rise	Urban/ Suburban	per unit	6.74	2,426	0.40	144	35	109	0.51	184	116	68
Multi-Family (High Density)	420	Unit	221	Multi Family Mid Rise	Urban/ Suburban	per unit	4.54	1,907	0.37	155	36	120	0.39	164	100	64
Total Site Trips								7,932		612	283	330		680	326	354
Internal Capture & Multimodal Reduction (10%)								793		61	28	33		68	33	35
Total Scenario 1 Trips								**7,139**		**612**	**283**	**330**		**680**	**326**	**354**

Source: Institute of Transportation Engineers; Trip Generation Manual, 11th Edition

Table 19 - Scenario 2 Trip Generation

Land Use Scenario 2 - Master Plan																
Planned Use	Size	Unit	ITE				ADT		Weekday AM Peak of Adjacent Street Traffic				Weekday PM Peak of Adjacent Street Traffic			
			Code	Discription	Setting/ Location	Variable	Rate	Total	Rate	Total	In	Out	Rate	Total	In	Out
Industrial	840,000	Sq Ft	130	Industrial Park	Urban/ Suburban	per 1000sf	3.37	2,831	0.34	286	231	54	0.34	286	63	223
Multi-Family (Low Density)	180	Unit	220	Multi Family Low Riise	Urban/ Suburban	per unit	6.74	1,213	0.40	72	17	55	0.51	92	58	34
Multi-Family (Medium Density)	360	Unit	220	Multi Family Low Rise	Urban/ Suburban	per unit	6.74	2,426	0.40	144	35	109	0.51	184	116	68
Multi-Family (High Density)	420	Unit	221	Multi Family Mid Rise	Urban/ Suburban	per unit	4.54	1,907	0.37	155	36	120	0.39	164	100	64
Total Site Trips								8,377		657	319	338		725	336	389
Internal Capture & Multimodal Reduction (10%)								838		66	32	34		72	34	39
Total Scenario 2 Trips								**7,539**		**657**	**319**	**338**		**725**	**336**	**389**

Source: Institute of Transportation Engineers; Trip Generation Manual, 11th Edition

Table 20 - Scenario 3 Trip Generation

Land Use Scenario 3 - Max Density																
Planned Use	Size	Unit	ITE				ADT		Weekday AM Peak of Adjacent Street Traffic				Weekday PM Peak of Adjacent Street Traffic			
			Code	Discription	Setting/ Location	Variable	Rate	Total	Rate	Total	In	Out	Rate	Total	In	Out
Industrial	1,000,000	Sq Ft	130	Industrial Park	Urban/ Suburban	per 1000sf	3.37	3,370	0.34	340	275	65	0.34	340	75	265
Multi-Family (Low Density)	315	Unit	220	Multi Family Low Riise	Urban/ Suburban	per unit	6.74	2,123	0.40	126	30	96	0.51	161	101	59
Multi-Family (Medium Density)	900	Unit	220	Multi Family Low Rise	Urban/ Suburban	per unit	6.74	6,066	0.40	360	86	274	0.51	459	289	170
Multi-Family (High Density)	1,400	Unit	221	Multi Family Mid Rise	Urban/ Suburban	per unit	4.54	6,356	0.37	518	119	399	0.39	546	333	213
Total Site Trips								17,915		1,344	511	833		1,506	798	707
Internal Capture & Multimodal Reduction (10%)								1,792		134	51	83		151	80	71
Total Scenario 3 Trips								**16,124**		**1,344**	**511**	**833**		**1,506**	**798**	**707**

Source: Institute of Transportation Engineers; Trip Generation Manual, 11th Edition

Proposed Development Area Traffic Distribution
Area generated trips were distributed to the adjacent roadway system based on several factors including the information in the Transportation Planning Analysis for the ***Hillcrest MP***; the City's current Transportation Plan; anticipated origins and destinations for the residential land use, and existing travel patterns and future roadway connections. Based on these parameters the following general traffic distribution was used to distribute the projected traffic volumes to the area roadway network:

- 20% to/from the west on Larpenteur Avenue towards White Bear Avenue
- 25% to/from the north on McKnight Road
- 10% to/from the east on Larpenteur Avenue
- 25% to/from the south on McKnight Road
- 10% to/from the west/southwest on Ivy Avenue, Orange Avenue, and Hawthorne Avenue
- 10% to/from the west on various roadways in the Hayden Heights Neighborhood

Projected Traffic Volumes
Traffic forecasts were prepared for the 2040 no-build and build conditions. The traffic forecasts were prepared by adding the projected annual background traffic growth to the existing adjusted traffic volumes to determine the 2040 no-build condition and, by adding the projected annual background traffic growth to the existing adjusted traffic volumes and the anticipated area development site traffic generation to determine the 2040 build conditions for each Build Scenario.

Neighborhood Traffic Impacts
The neighborhoods adjacent to the proposed Hillcrest development were evaluated based on the future traffic conditions. The projected 2040 traffic volumes on the streets through the Hyden Heights neighborhood west and south of the site were determined to evaluate the anticipated traffic impacts on the existing street system. The neighborhood streets that were included with the analysis are:

- Nebraska Avenue
- Arlington Avenue
- Sherwood Avenue
- Cottage Avenue
- Clear Avenue
- Ivy Avenue
- Orange Avenue
- Hawthorne Avenue

The 2040 No-Build traffic volume was estimated based on ITE trip generation rates for the number of houses on each block. The traffic conditions for each scenario were developed by adding the anticipated Hillcrest Development site traffic to the No-Build volumes to get the 2040 Build condition.

The traffic analysis discussed previously concluded that the 10% of the site traffic would be destined to/from the streets to the west and 10% of the site traffic would be destined to/from the streets to the south. **Table 21** below shows the projected 2040 traffic volumes on the adjacent streets for the No-build and each Build Scenario.

Table 21 - 2040 Neighborhood Street Traffic Conditions (vehicles per day)

Street	2040 No-Build	2040 Build Scenario 1	2040 Build Scenario 2	2040 Build Scenario 3
Nebraska Avenue	400	550	570	730
Arlington Avenue	400	550	570	730
Sherwood Avenue	400	550	570	730
Cottage Avenue	400	550	570	730
Clear Avenue	400	550	570	730
Ivy Avenue	1,550	2,000	2,060	2,570
Orange Avenue	700	850	870	1,030
Hawthorne Avenue	700	850	870	1,030

All streets within the area are considered local residential streets with low expected traffic volumes providing access to residences, parks, and schools. Based on accepted guidelines from Metropolitan Council, typical residential streets will carry less 1,000 vpd. The only street in the area not classified as a local street is Ivy Avenue which is classified as a Major Collector in the City's Comprehensive Plan. Major Collectors are streets that are anticipated to carry higher volumes of traffic, typically up to 8,000 vpd.

Based on the 2040 projected traffic volumes for each scenario outlined in **Table 22**, all the streets within the study area would meet the typical traffic thresholds for a local residential street or Major Collector Street (Ivy Avenue). However, to discourage vehicle traffic through the neighborhood from the proposed site, the following should be considered with the proposed Hillcrest development:

- Any industrial land use's access to Howard Street should not line up with Nebraska Avenue, Arlington Avenue, or Cottage Avenue to the west. Rather, any such access to Howard Street should be mid-block to discourage direct traffic access to the neighborhoods.
- No direct access from the multi-family residential land uses should be provided to Howard Street or Winthrop Street.
- Provide off road pedestrian accommodations on the streets accessing the neighborhoods, including extension / connection of sidewalks.
- Provide the recommended improvements at the site access locations on Larpenteur Avenue at Howard Street, McKnight Road at Montana Avenue and McKnight Road at Arlington Avenue to discourage traffic from using the neighborhood streets.
- Implement the recommendations in the Freight Service section to discourage heavy vehicle traffic from using the neighborhood streets.
- As traffic in the area increases over time, especially on streets such as Ivy Avenue, traffic calming measures will be required to manage vehicle speed and public safety. The type of traffic calming measures that could be installed will be consistent with city policies and practices. It should be noted that installation of some traffic calming measures will result in a diversion of traffic to other neighborhood roadways. The determination of what type of traffic calming measure, the implementation, and financial responsibilities will be outlined in the developer's agreement between the St. Paul Port Authority and the City.

TRAFFIC OPERATIONS ANALYSIS

Existing and/or forecasted traffic operations were evaluated at the impacted area intersections in the study area. The analysis was conducted for the following scenarios.

1. Existing Conditions
2. Projected 2040 No-Build
3. Projected 2040 Build Scenario 1 – Comp Plan
4. Projected 2040 Build Scenario 2 – Master Plan
5. Projected 2040 Build Scenario 3 – Max Density

The methodology and more information for this analysis is included in **Appendix D.**

2040 No-Build Analysis

Table 22 summarizes the LOS and delays at the primary intersections in the study area based on the current lane geometry, traffic control and projected 2040 traffic volumes without any area development. The traffic signal timing was optimized for the analysis at the Larpenteur Avenue at McKnight Road intersection.

Table 22 - 2040 No-Build Traffic Operations Summary

Control	Intersection	AM Peak Hour		PM Peak Hour	
		LOS	Delay (1) (sec/veh)	LOS	Delay (1) (sec/veh)
Thru-Stop	Larpenteur Ave at Howard St	(A)	9	(B)	13
Signal	McKnight Rd at Larpenteur Ave (2)	D (F)	35	D (F)	43
Thru-Stop	McKnight Rd at Montana Ave	(C)	17	(C)	18
Thru- Stop	McKnight Rd at Nebraska Ave	(C)	18	(C)	19
Thru- Stop	McKnight Rd at Arlington Ave	(C)	22	(C)	22
Thru-Stop	Ivy Ave at Hawthorne Ave	(A)	4	(A)	4

C = Overall LOS, (D) = Worst movement LOS, (1) = Overall Delay (worst movement for thru-stop intersections)
(2) = Optimized signal timing

The analysis results show that all intersections would be operating at an acceptable overall LOS D or better during both the weekday AM and PM peak hours with slight delay increase from existing conditions. All movements will be operating at LOS D or better except at the Larpenteur Avenue and McKnight Road intersection where the following movements would be operating at LOS E/F:

Larpenteur Avenue at McKnight Road

AM Peak Hour

- Northbound left LOS F

PM Peak Hour

- Southbound left LOS F
- Northbound left LOS E

Discussion with Ramsey County concluded that any need for improvements at the Larpenteur Avenue at McKnight Road intersection would be well into the future and the existing operation is adequate at this time. The intersection should continue to be monitored as the area develops.

2040 Build Analysis – Scenario 1 (Comp Plan)

Table 23 summarizes the LOS and delays at the primary intersections in the study area based on the existing lane geometry, traffic control and projected 2040 traffic volumes with full development of the area assuming Land Use Scenario 1 (Comp Plan). The lane configuration on all site access streets included a single lane of approach. The traffic signal timing was optimized for the analysis at the Larpenteur Avenue at McKnight Road intersection.

Table 23 - 2040 Build Traffic Operations Summary - Scenario 1

Control	Intersection	AM Peak Hour		PM Peak Hour	
		LOS	Delay (1) (sec/veh)	LOS	Delay (1) (sec/veh)
Thru-Stop	Larpenteur Ave at Howard St	(B)	12	(B)	21
Signal	McKnight Rd at Larpenteur Ave (2)	D (F)	45	D (F)	46
Thru-Stop	McKnight Rd at Montana Ave	(E)	36	(E)	47
Thru- Stop	McKnight Rd at Nebraska Ave	(C)	19	(C)	21
Thru- Stop	McKnight Rd at Arlington Ave	(D)	29	(D)	25
Thru-Stop	Ivy Ave at Hawthorne Ave	(A)	4	(A)	6
Thru-Stop	Larpenteur Ave at Winthrop St	(B)	9	(B)	13
Thru- Stop	McKnight Rd at North Site Access	(B)	11	(A)	11

C = Overall LOS, (D) = Worst movement LOS, (1) = Overall Delay (worst movement for thru-stop intersections)
(2) = Optimized signal timing

The analysis results show that all intersections would be operating at an acceptable overall LOS D or better during both the weekday AM and PM peak hours with all movements operating at LOS D or better except the following movements operating at LOS E / F:

McKnight Road at Larpenteur Avenue

AM Peak Hour

- Northbound left LOS F
- Westbound left/thru LOS E
- Southbound left LOS F
- Eastbound left LOS E

PM Peak Hour

- Northbound left LOS F
- Westbound left/thru LOS E
- Southbound left LOS F

- Eastbound left/thru LOS E

McKnight Road at Montana Avenue

AM Peak Hour

- Eastbound left LOS E

PM Peak Hour

- Eastbound left LOS E

To improve the delay and level of service at the intersections with movements at LOS E or F mitigation improvements were analyzed. The mitigation included lengthening of the left turn lanes at the McKnight Road and Larpenteur Avenue and addition of two exit lanes (left/thru lane and right turn lane) on all the site access streets (northbound Howard Street, eastbound Montana Avenue, and eastbound Arlington Avenue). The results of the analysis are included in **Table 24** and show that all intersections and movements would be operating at LOS D or better except the movements:

McKnight Road at Larpenteur Avenue

AM Peak Hour

- Northbound left LOS E

PM Peak Hour

- Northbound left LOS E

McKnight Road at Montana Avenue

PM Peak Hour

- Eastbound left LOS E

Table 24 - 2040 Build Traffic Operations Summary - Scenario 1 with Mitigation

Control	Intersection	AM Peak Hour		PM Peak Hour	
		LOS	Delay (1) (sec/veh)	LOS	Delay (1) (sec/veh)
Thru-Stop	Larpenteur Ave at Howard St	(B)	12	(B)	13
Signal	McKnight Rd at Larpenteur Ave (2)	C (E)	29	C (D)	28
Thru-Stop	McKnight Rd at Montana Ave	(D)	34	(E)	37
Thru- Stop	McKnight Rd at Nebraska Ave	(C)	18	(C)	21
Thru- Stop	McKnight Rd at Arlington Ave	(C)	22	(C)	20
Thru-Stop	Ivy Ave at Hawthorne Ave	(A)	4	(A)	6
Thru-Stop	Larpenteur Ave at Winthrop St	(B)	11	(B)	13
Thru- Stop	McKnight Rd at North Site Access	(B)	13	(A)	8

C=Overall LOS, (D) = Worst movement LOS, (1) = Overall Delay (worst movement for thru-stop intersections)
(2) = Optimized signal timing

As the mitigation analysis indicates, two intersections would continue to have movements with LOS E. As indicated with the 2040 No-Build conditions Ramsey County concluded that any need for improvements at the Larpenteur Avenue at McKnight Road intersection would be well into the future and the existing operation is adequate at this time. The intersection would continue to be monitored as the area develops.

The other intersection that would continue to have movements with operations at LOS E is McKnight Road at Montana Avenue which is side street stop controlled. Even though this access is one of the main entrances to the development, the only movement at LOS E is the eastbound left turn from Montana Avenue to McKnight Road. This is not uncommon for side street stop-controlled intersections on higher volume roadways like McKnight Road. With no side street queuing issues in either peak hour or the fact that this intersection would not meet warrants for signalization, no mitigation is recommended with this proposed Land Use Scenario. This intersection should however be monitored as the area develops

2040 Build Analysis – Scenario 2 (Master Plan)

Table 25 summarizes the LOS and delays at the primary intersections in the study area based on the existing lane geometry, traffic control and projected 2040 traffic volumes with full development of the area assuming Land Use Scenario 2 (Master Plan). The lane configuration on all site access streets included a single lane of approach. The traffic signal timing was optimized for the analysis at the Larpenteur Avenue at McKnight Road intersection.

Table 25 - 2040 Build Traffic Operations Summary – Scenario 2

Control	Intersection	AM Peak Hour		PM Peak Hour	
		LOS	Delay (1) (sec/veh)	LOS	Delay (1) (sec/veh)
Thru-Stop	Larpenteur Ave at Howard St	(B)	12	(B)	14
Signal	McKnight Rd at Larpenteur Ave (2)	D (F)	48	D (F)	49
Thru-Stop	McKnight Rd at Montana Ave	(E)	48	(F)	100+
Thru- Stop	McKnight Rd at Nebraska Ave	(C)	20	(C)	25
Thru- Stop	McKnight Rd at Arlington Ave	(D)	30	(D)	26
Thru-Stop	Ivy Ave at Hawthorne Ave	(A)	4	(A)	6
Thru-Stop	Larpenteur Ave at Winthrop St	(A)	10	(B)	11
Thru- Stop	McKnight Rd at North Site Access	(B)	11	(B)	11

C = Overall LOS, (D) = Worst movement LOS, (1) = Overall Delay (worst movement for thru-stop intersections)
(2) = Optimized signal timing

The analysis results show that all intersections would be operating at an acceptable overall LOS D or better during both the weekday AM and PM peak hours with all movements operating at LOS D or better except the following movements:

McKnight Road at Larpenteur Avenue

AM Peak Hour

- Northbound left LOS E
- Southbound left LOS F
- Southbound right LOS E

PM Peak Hour

- Northbound left LOS E

- Southbound left LOS F

McKnight Road at Montana Avenue

AM Peak Hour

- Eastbound left LOS E

PM Peak Hour

- Westbound left and right LOS F
- Eastbound left and right LOS F

To improve the delay and level of service at the intersections with movements at LOS E or F, mitigation improvements were analyzed. The mitigation included, lengthening of the left turn lanes at the McKnight Road and Larpenteur Avenue and addition of two exit lanes (left/thru lane and right turn lane) on all the site access streets (northbound Howard Street, eastbound Montana Avenue, and eastbound Arlington Avenue). The results of the analysis are included in **Table 26** and show that all intersections and movements would be operating at LOS D or better except the movements:

McKnight Road at Larpenteur Avenue

AM Peak Hour

- Southbound left LOS E

PM Peak Hour

- Southbound left LOS F

McKnight Road at Montana Avenue

AM Peak Hour

- Eastbound left LOS E

PM Peak Hour

- Eastbound left LOS E

Table 26 - 2040 Build Traffic Operations Summary – Scenario 2 Mitigation

Control	Intersection	AM Peak Hour		PM Peak Hour	
		LOS	Delay (1) (sec/veh)	LOS	Delay (1) (sec/veh)
Thru-Stop	Larpenteur Ave at Howard St	(B)	12	(B)	13
Signal	McKnight Rd at Larpenteur Ave (2)	C (E)	29	C (F)	33
Thru-Stop	McKnight Rd at Montana Ave	(E)	37	(E)	43
Thru- Stop	McKnight Rd at Nebraska Ave	(C)	19	(C)	23
Thru- Stop	McKnight Rd at Arlington Ave	(D)	29	(C)	21
Thru-Stop	Ivy Ave at Hawthorne Ave	(A)	4	(A)	6
Thru-Stop	Larpenteur Ave at Winthrop St	(A)	9	(B)	11
Thru- Stop	McKnight Rd at North Site Access	(C)	15	(B)	10

C = Overall LOS, (D) = Worst movement LOS, (1) = Overall Delay (worst movement for thru-stop intersections)
(2) = Optimized signal timing

Similar to Scenario 1 the mitigation analysis for Scenario 2 indicates that two intersections would continue to have movements with unsatisfactory levels of service with slightly longer delays.

Based on the analysis, no additional improvements would be recommended at either the Larpenteur Avenue at McKnight Road or McKnight Road at Montana Avenue intersections. However, both should be monitored as the area develops.

2040 Build Analysis – Scenario 3 (Max Build)

Table 27 summarizes the LOS and delays at the primary intersections in the study area based on the existing lane geometry, traffic control and projected 2040 traffic volumes full development of the area assuming Land Use Scenario 3 (Max Build). The lane configuration on all site access streets included a single lane of approach. The traffic signal timing was optimized for the analysis at the Larpenteur Avenue at McKnight Road intersection.

Table 27 - 2040 Build Traffic Operation Summary – Scenario 3

Control	Intersection	AM Peak Hour		PM Peak Hour	
		LOS	Delay (1) (sec/veh)	LOS	Delay (1) (sec/veh)
Thru-Stop	Larpenteur Ave at Howard St	(B)	13	(C)	38
Signal	McKnight Rd at Larpenteur Ave (2)	D (F)	49	C (D)	54
Thru-Stop	McKnight Rd at Montana Ave	(F)	100+	(F)	100+
Thru- Stop	McKnight Rd at Nebraska Ave	(C)	22	(C)	27
Thru- Stop	McKnight Rd at Arlington Ave	(E)	44	(E)	55
Thru-Stop	Ivy Ave at Hawthorne Ave	(A)	4	(A)	6
Thru-Stop	Larpenteur Ave at Winthrop St	(B)	10	(B)	14
Thru- Stop	McKnight Rd at North Site Access	(C)	15	(B)	11

C = Overall LOS, (D) = Worst movement LOS, (1) = Overall Delay (worst movement for thru-stop intersections)
(2) = Optimized signal timing

The analysis results show that similar to 2040 Build Scenario 2, all intersections would be operating at an acceptable overall LOS D or better during both the AM and PM peak hours except at the McKnight Road at Montana Avenue intersection which would operate at LOS F in the PM peak hour. In addition, all movements would operate at LOS D or better except the following movements operating at LOS E / F:

Larpenteur Avenue at Howard Street
PM Peak Hour
- Northbound left LOS E
- Southbound left LOS E

McKnight Road at Larpenteur Avenue
AM Peak Hour
- Westbound approach LOS F
- Eastbound left LOS E

PM Peak Hour
- Westbound approach LOS F
- Eastbound approach LOS F

McKnight Road at Montana Avenue
AM Peak Hour
- Westbound left LOS E
- Eastbound left and right LOS F

PM Peak Hour
- Westbound left LOS E
- Eastbound left and right LOS F

McKnight Road at Arlington Avenue
AM Peak Hour
- Eastbound left LOS E

PM Peak Hour
- Eastbound left LOS F

To improve the delay and level of service at the intersections with movements at LOS E or F mitigation improvements were analyzed. The mitigation included, lengthening of the left turn lanes at the McKnight Road and Larpenteur Avenue and addition of two exit lanes (left/thru lane and right turn lane) on all the site access streets (northbound Howard Street, eastbound Montana Avenue, and eastbound Arlington Avenue). The results of the analysis are included in **Table 28** and show that all intersections and movements would be operating at LOS D or better except the movements:

McKnight Road at Larpenteur Avenue
AM Peak Hour
- Southbound left LOS F

PM Peak Hour
- Southbound left LOS F

McKnight Road at Montana Avenue
AM Peak Hour
- Westbound left LOS E
- Eastbound left and right LOS F

PM Peak Hour
- Eastbound left and right LOS F

McKnight Road at Arlington Avenue
PM Peak Hour
- Eastbound left LOS E

Table 28 - 2040 Build Traffic Operations Summary - Scenario 3 with Mitigation

Control	Intersection	AM Peak Hour		PM Peak Hour	
		LOS	Delay (1) (sec/veh)	LOS	Delay (1) (sec/veh)
1Thru-Stop	Larpenteur Ave at Howard St	(B)	12	(C)	19
Signal	McKnight Rd at Larpenteur Ave (2)	C (E)	31	D (F)	36
Thru-Stop	McKnight Rd at Montana Ave	(F)	100+	(F)	100+
Thru- Stop	McKnight Rd at Nebraska Ave	(C)	23	(D)	27
Thru- Stop	McKnight Rd at Arlington Ave	(D)	34	(E)	46
Thru-Stop	Ivy Ave at Hawthorne Ave	(A)	4	(A)	6
Thru-Stop	Larpenteur Ave at Winthrop St	(B)	10	(B)	14
Thru- Stop	McKnight Rd at North Site Access	(B)	15	(B)	13

C=Overall LOS, (D) = Worst movement LOS, (1) = Overall Delay (worst movement for thru-stop intersections)
(2) = Optimized signal timing

With the addition of the site traffic for Scenario 3 (Max Density) and even including the proposed improvement mitigation, three intersections would have movements with increased delays and level of service over the other Build Scenarios.

Larpenteur Avenue at McKnight Road – Similar to the 2040 No-Build and other Build Scenarios it was concluded that any need for improvements at the intersection would be well into the future and the existing operation is adequate at this time. The intersection would continue to be monitored as the area develops.

McKnight Road at Montana Avenue – This intersection would continue to have significant delays for the Montana Avenue traffic with side street stop control. With this access as one of the main entrances to the development, delays of this magnitude will result in site traffic diverting to other site intersection. Other mitigation improvements should be considered including signalization or a roundabout. With either of these improvements the overall intersection would improve to a LOS B in the AM peak hour and LOS C in the PM peak hour with all movements at LOS C or better.

McKnight Road at Arlington Avenue – This intersection is also one of the main entrances to the development. For this intersection, the eastbound left turn would be operating at a LOS E in only the PM peak hour. Similar to the other Build Scenarios this is not uncommon for side street stop-controlled intersections on higher volume roadways like McKnight Road. With no side street queuing issues or the fact that this intersection would not meet warrants for signalization, no mitigation would be recommended with this proposed Land Use Scenario. This intersection should however be monitored as the area develops.

EXTENDED ROADWAY ANALYSIS

A review of the potential traffic impacts from the proposed Hillcrest study area was completed for the extended area roadway network including McKnight Road to the north and south; Larpenteur Avenue to the east and west, White Bear Avenue west of the site, Century Avenue east of the site, and Maryland Street south of the site. This review focused on the Average Daily Traffic (ADT) volumes for existing conditions, 2040 No-Build and 2040 Build conditions with the site related traffic volumes on the various roadway segments surrounding the Hillcrest study area.

The primary roadways within the area and their expected future ADT traffic volumes under each scenario along with the estimated roadway capacities is summarized in **Table 29**. The planning level roadway capacities are based on the Highway Capacity Manual (HCM) standards. Although traffic volumes on these roadways are expected to increase, they are within or below the estimated capacity of the roadway facilities.

Table 29 - Extended Roadway Network Traffic Volume Change

Roadway	Existing[(1)] (year)	2040 No-Build	2040 Build Scenario 1	2040 Build Scenario 2	2040 Build Scenario 3	Roadway Capacity
McKnight Road North of Larpenteur Ave	14,800 (2019)	16,350	18,150	18,250	20,350	14,000 – 18,500
McKnight Road South of Larpenteur Ave	11,900 (2019)	13,200	15,000	15,100	17,200	14,000 – 18,500
McKnight Road South of Maryland Ave	12,800 (2019)	14,200	15,600	15,700	17,400	14,000 – 18,500
Larpenteur Avenue West of White Bear Ave	5,700 (2018)	6,350	6,700	6,750	7,150	8,000 – 10,000
Larpenteur Avenue West of McKnight Rd	8,500 (2018)	9,400	10,800	10,900	12,600	8,000 – 10,000
Larpenteur Avenue East of McKnight Rd	6,900 (2018)	7,650	8,350	8,400	9,250	8,000 – 10,000
White Bear Avenue North of Larpenteur Ave	22,800 (2019)	25,300	26,350	26,450	27,700	28,000 – 32,000
White Bear Avenue South of Larpenteur Ave	21,300 (2019)	23,650	24,700	24,800	26,050	28,000 – 32,000
White Bear Avenue South of Maryland Ave	22,000 (2019)	24,450	25,300	25,400	26,450	28,000 – 32,000
Century Avenue North of Larpenteur Ave	11,400 (2017)	12,800	13,500	13,550	14,400	14,000 – 18,500
Century Avenue South of Larpenteur Ave	13,000 (2019)	14,450	14,450	14,450	14,450	14,000 – 18,500
Century Avenue South of Maryland Ave	13,600 (2017)	15,250	15,600	15,650	16,050	14,000 – 18,500
Maryland Avenue West of White Bear Ave	11,100 (2018)	12,400	12,950	13,000	13,700	8,000 – 10,000
Maryland Avenue East of White Bear Ave	3,300 (2018)	3,700	4,050	4,100	4,500	8,000 – 10,000
Maryland Avenue East of McKnight Road	3,750 (2018)	4,200	4,550	4,600	5,000	8,000 – 10,000

(1) = Source: MnDOT Traffic Mapping Application

INTERNAL ROADWAY ANALYSIS

In addition to the external study intersection analysis, the proposed roadway network within the Hillcrest study area was evaluated to ensure the facilities are appropriately sized and to provide guidance on access and traffic controls. This evaluation was completed using Synchro/SimTraffic software and engineering judgement, focusing on the future 2040 conditions for each build scenario.

As discussed previously, Scenario 1 shows a “grid” internal roadway system, where Scenarios 2 and 3 include only the primary streets within the development area. The Scenario 1 roadway system shows direct access to McKnight Road at six locations, none of which line up with the existing street network on the east side of McKnight Road. These

access locations would not meet Ramsey County access spacing guidelines. The additional north/south street shown in Scenario 1 would represent similar driveway access that would be assumed for Scenarios 2 or 3. Therefore, the internal roadway system shown for Scenario 2 and 3 was used for the internal roadway analysis.

All internal roadways were assumed to be two-lanes with side-street stop control at all internal intersections. Traffic forecasts were prepared assuming that traffic from each specific land use scenario was distributed to the internal roadway system based on the traffic distribution outline previously from the assumed access locations.

Results of the internal roadway system analysis indicates that in general, all internal roadways and intersections are all expected to operate acceptably under future year 2040 conditions during both the AM and PM peak hours with any of the 2040 build scenarios. **Table 30** provides a summary of the year 2040 internal intersection capacity analysis for each scenario.

Based on the results of the internal roadway capacity analysis and engineering judgement, the following should be considered:

- All internal streets should be two lanes (one lane in each direction) conforming to the requirements in the City of St. Paul Street Design Manual.
- All internal intersections should have side street stop control.
    - Idaho Avenue stops at Street A
    - Idaho Avenue stops at Howard Street
    - Street A stops Howard Street
    - Hoyt Avenue/Montana Avenue stops at Howard Street
    - Nebraska Avenue stops at Howard Street
    - Arlington Avenue W stops at Howard Street
    - Arlington Avenue E stops at Howard Street
    - Cottage Avenue stops at Howard Street
- Private access should be evaluated individually with each development proposal to ensure that all potential constraints are considered, including providing for truck traffic.
- Pedestrian facilities should be provided adjacent to each internal roadway with connections to external pedestrian facilities (see Bike / Pedestrian Facilities recommendations)

Table 30 - 2040 Build Internal Roadways Traffic Operations Summary

Control	Intersection	Scenario 1		Scenario 2		Scenario 3	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Thru- Stop	Street A at Idaho Ave	A (6 sec)	A (6 sec)	A (5 sec)	A (4 sec)	A (5 sec)	A (4 sec)
Thru- Stop	Howard St at Idaho Ave	A (7 sec)	A (6 sec)	A (6 sec)	A (6 sec)	A (8 sec)	A (8 sec)
Thru- Stop	Howard St at Street A	A (5 sec)	A (4 sec)	A (7 sec)	A (5 sec)	A (7 sec)	A (6 sec)
Thru- Stop	Howard St at Hoyt Ave/Montana Ave	A (7 sec)	A (7 sec)	A (7 sec)	A (5 sec)	A (7 sec)	A (7 sec)
Thru- Stop	Howard St at Nebraska Ave	A (5 sec)	A (5 sec)	A (6 sec)	A (5 sec)	A (7 sec)	A (6 sec)
Thru- Stop	Howard St at Arlington Ave W	A (4 sec)	A (5 sec)	A (6 sec)	A (5 sec)	A (7 sec)	A (7 sec)
Thru- Stop	Howard St at Arlington Ave E	A (7 sec)	A (7 sec)	A (6 sec)	A (6 sec)	A (7 sec)	A (6 sec)
Thru- Stop	Howard St at Cottage Ave	A (5 sec)	A (5 sec)	A (4 sec)	A (5 sec)	A (6 sec)	A (5 sec)

A = Worst movement LOS, (6 sec) = Worst movement delay for thru-stop intersections

Item No.	Mitigation Description
18.1	Lengthen the left turn lanes to 300 ft at McKnight Road and Larpenteur Avenue. Monitor the intersection for additional improvements. All development scenarios
18.2	Provide two exit lanes (left/thru lane and right turn lane) on all the site access streets (northbound Howard Street, eastbound Montana Avenue, and eastbound Arlington Avenue). All development scenarios.
18.3	Monitor the intersection of McKnight Road at Montana Avenue as traffic volumes increase for lane configuration and/or traffic control improvements. Development scenario 1 and 2
18.4	Improve the intersection of McKnight Road at Montana Avenue as traffic increases to include either traffic signal or roundabout control. Provide additional right-of-way to accommodate the improvements if necessary. Development scenario 3
18.5	Monitor the intersection of McKnight Road at Arlington Avenue as traffic volumes increase for lane configuration and/or traffic control improvements. Provide additional right-of-way to accommodate future improvements if necessary. Development scenario 3.
18.6	Internal Street System Improvements (All development scenarios): 1. All internal streets should be two lanes (one lane in each direction) conforming to the requirements in the City of St Paul Street Design Manual.

Item No.	Mitigation Description
	2. All internal intersections should have side street stop control. • Idaho Avenue stops at Street A • Idaho Avenue stops at Howard Street • Street A stops at Howard Street • Hoyt Avenue/Montana Avenue stops at Howard Street • Nebraska Avenue stops at Howard Street • Arlington Avenue W stops at Howard Street • Arlington Avenue E stops at Howard Street • Cottage Avenue stops at Howard Street 3. Private access should be evaluated individually with each development proposal to ensure that all potential constraints are considered. 4. Pedestrian facilities should be provided adjacent to each internal street with connections to external pedestrian facilities (see Bike / Pedestrian recommendations).
18.7	Bike / Pedestrian Improvements (All development scenarios): 1. A trail connection north of Hoyt Ave to the Furness Trail on the west side of the study area with a direct connection through the site to the trail on McKnight Road. 2. An off-road trail on the south side of Larpenteur Avenue from McKnight Road to the west. 3. A trail connection from the site on Howard Street at Ivy Street. 4. An extension of the future enhanced bike lane on Arlington Avenue through the site to the trail on McKnight Road. 5. A pedestrian connection on the north side of Ivy Avenue from Winthrop Street to the existing pedestrian trail on McKnight Road with the reconstruction of Ivy Avenue. 6. An extension of the future enhanced bike lane on Arlington Avenue through the site to the trail on McKnight Road. 7. Sidewalks along all roadways throughout the Hillcrest development Site. 8. Sidewalks to the Hayden Heights neighborhood from the site on Nebraska Avenue, Arlington Avenue and Cottage Avenue. 9. Reconstruct the existing pedestrian refuge islands on McKnight Road at Montana Avenue and Arlington Avenue as part of the construction of new left turn lanes for the site. The design will include a raised concrete median with signing and pavement markings. The detailed design will be completed as part of the final design for the site improvements and will be coordinated, reviewed and approved by Ramsey County. 10. Design internal roadways to accommodate safe pedestrian crossings including bump-outs at intersections, tabled concrete crosswalks, and a tabled intersection at Howard Street and Idaho Avenue. 11. Ensure that the pedestrian connectivity across McKnight Road to the City of Maplewood is maintained. Any changes or modification in the existing infrastructure resulting from the development will be reviewed and approved by Ramsey County and the City of Maplewood.

Item No.	Mitigation Description
	12. Provide a pedestrian crossing of Larpenteur Avenue from the development site at Howard Street.
18.8	Transit Service Improvements (All development scenarios) 1. Coordinate with Metro Transit the possible alteration of the existing transit routes to pass through or pass adjacent to the site to promote increased transit use. Which route and where bus stops are located, will be analyzed once a site development scenario is selected and Metro Transit reanalyzes the local bus routes in the area.
18.9	Freight Service Considerations (All development scenarios) 2. Design internal roadways to accommodate the expected level of freight activity within the area based on the proposed development, including: • Provide bump-outs at intersections to eliminate/discourage large vehicle turning. Any industrial land use's access to Howard Street should not line up with Nebraska Avenue, Arlington Avenue, or Cottage Avenue to the west. Rather, any such access to Howard Street should be mid-block to discourage direct traffic access to the neighborhoods. 4. Freight activity should be limited during the peak traffic periods to avoid potential conflicts through communication with the identified industrial business, area package services (i.e., UPS, FedEx, etc.) and refuse haulers. 5. Evaluation of the need for on-street loading areas should be completed to accommodate some freight activity as actual development proposals are identified.
18.10	Neighborhood Improvements (All development scenarios) 1. Any industrial land use's access to Howard Street should not line up with Nebraska Avenue, Arlington Avenue, or Cottage Avenue to the west. Rather, any such access to Howard Street should be mid-block to discourage direct traffic access to the neighborhoods. 2. No direct access from the multi-family residential land uses should be provided to Howard Street or Winthrop Street. Provide off road pedestrian accommodations on the streets accessing the neighborhoods, including extension/connection of sidewalks. 3. Provide the recommended improvements at the site access locations on Larpenteur Avenue at Howard Street, McKnight Road at Montana Avenue and McKnight Road at Arlington Avenue to discourage traffic from using neighborhood streets. 4. Implement the recommendations in the Freight Service section to discourage heavy vehicle traffic from using the neighborhood streets. 5. As traffic in the area increases over time, especially on streets such as Ivy Avenue, traffic calming measures will be required to manage vehicle speed and public safety. The type of traffic calming measures that could be installed will be consistent with city policies and practices. It should be noted that installation of some traffic calming measures will result in a diversion of traffic to other neighborhood roadways. The determination of what type of traffic calming measure, the implementation, and financial responsibilities will be outlined in the developer's agreement between the St. Paul Port Authority and the City.

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.

Cumulative effects are impacts on the environment resulting from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of whom undertakes said actions. Areas considered for cumulative effects are those that are adjacent to the study area and considers projects that would be constructed in the foreseeable future.

No known foreseeable future projects that may cumulate with the actions proposed in this AUAR have been identified. As such, there is no known potential for cumulative effects. Impacts from future developments adjacent to the study area will be addressed through permitting and approval processes and will be independently mitigated to minimize cumulative impacts.

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.

In all scenarios the goal is to pursue carbon neutrality, responsible material and waste stream management, and effective, integrated, and visible stormwater treatment. The carbon neutrality aim for the proposed scenarios will help the City reach its goals to reduce carbon emissions citywide by 50 percent from 2019 to 2030, and to achieve carbon neutrality by 2050. The development plans will be evaluated for the goal to pursue carbon neutrality.

No other potential environmental effects are anticipated as a result of the construction and operation of any of the proposed development scenarios.

Item No.	Mitigation Description
20.1	The development plans will be evaluated for the goal to pursue carbon neutrality.