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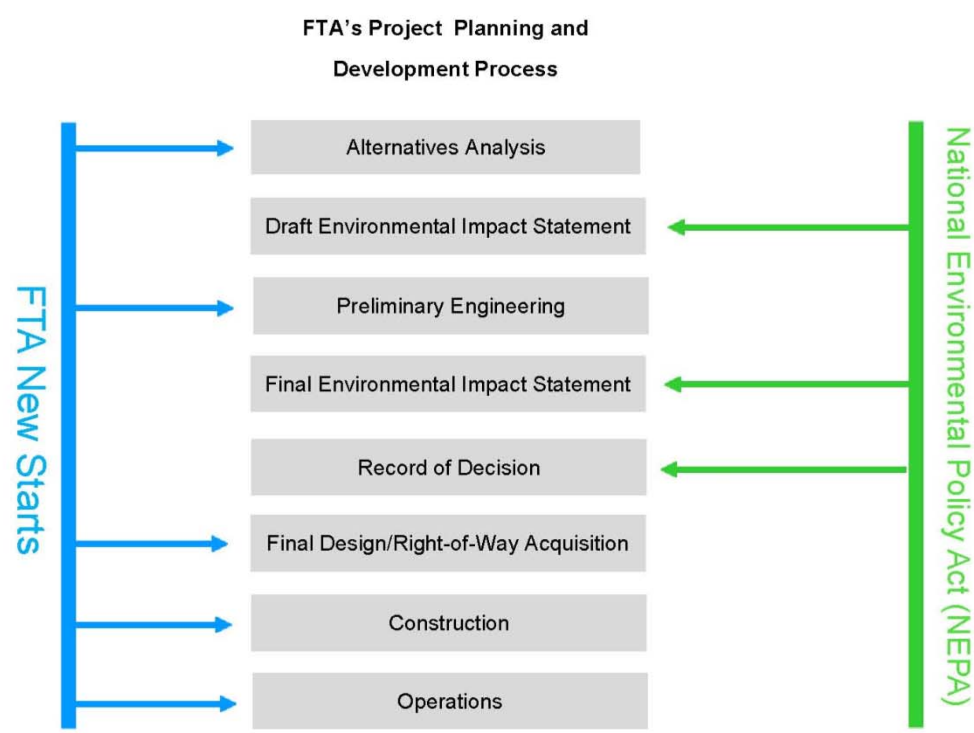
Section 5309 - New Starts Program Information

Section 5309 New Starts Program

The Section 5309 “New Starts” program is the federal government’s primary program for providing financial support to locally-planned, implemented, and operated fixed-guideway-transit major capital investments. Projects eligible for New Starts (49 USC §5309) funding include any fixed guideway system which uses and occupies a separate right-of-way, or rail line, for the exclusive use of mass transportation and other high occupancy vehicles, or uses a fixed catenary system and a right-of-way usable by other forms of transportation. This includes, but is not limited to, rapid rail, light rail, commuter rail, automated guideway transit, people movers, and exclusive facilities for buses (such as bus rapid transit) and other high occupancy vehicles. The law directs FTA to evaluate and rate candidate New Starts projects as an input to federal funding decisions and at specific milestones throughout each project’s planning and development.

As a proposed project progresses through development, it must proceed through both the planning/project development process guided by the FTA’s New Starts program, and the environmental review process guided by NEPA/MEPA requirements. The Southwest Transitway is being advanced in accordance with the federal project development process. The project development process contains the phases shown in the figure below. Information on the New Starts program, as it applies to the SWLRT project, they can go to: http://www.fta.dot.gov/grants/12304.html .



APPENDIX H - Land Use and Socioeconomic Analysis Methodology

American Community Survey Data

In the mid-1990s, the Census Bureau began to develop and implement the American Community Survey (ACS), a continuous nationwide survey of addresses conducted monthly. While initial data collection began in the mid-1990s, full implementation of ACS across the United States and Puerto Rico did not begin until 2005. Where the decennial (done every ten years) census provides official counts of all persons, households, and other selected subjects, and serves as the basis for Congressional seat redistricting, the ACS is intended to measure changing socioeconomic characteristics and conditions of the population on a recurring basis.

The ACS does not provide official counts of the population between decennial censuses, but instead provides weighted population estimates. The ACS is intended to replace the "Long Form" of the decennial census and allow more continuous data collection and reporting of socioeconomic information. U.S. Census Bureau officials have indicated that the ACS is still in the initial rollout phase, and while data reporting has begun, an additional two to three years will be necessary before results are considered reliable and reported at lower census geographic levels. ACS data currently available are considered reliable sources of information, but are reported with a margin of error. According to the Census, "All published margins of error for the American Community Survey are based on a 90 percent confidence level."

For the cities of Eden Prairie, Minnetonka, and St. Louis Park, 3-year average estimates are available between 2006 and 2008. However, because ACS data are only available at the city-wide geographic level, they do not provide the level of detail necessary to conduct corridor-specific scale analyses. Also, the Census Bureau has advised that "Multiyear estimates cannot be used to say what is going on in any particular year in the period, only what the average value is over the full period." (U.S. Census Bureau 2006-2008)

Additional population projection data were prepared by and obtained from the Metropolitan Council. In 2008, metropolitan communities were required to update their comprehensive plans pursuant to the Metropolitan Land Planning Act (MLPA) of 1995 (Minn. Stat. 473.851 to 473.871). As part of the comprehensive plans submitted to the Metropolitan Council, communities develop and allocate population projections for the year 2030 in the form of Transportation Analysis Zones (TAZ). A TAZ is a special geographic area demarcated by transportation planners helping to determine regional travel patterns to help plan for future transportation needs. These zones vary in size, but typically include one or more census tracts or block groups.

Land Use Plans

APPENDIX H - Land Use Plans

The Metropolitan Council Plans and Studies

2030 Regional Development Framework
http://www.metrocouncil.org/planning/framework/documents.htm

In anticipation of accommodating 1 million additional people by the year 2030, the Metropolitan Council adopted the 2030 Regional Development Framework (RDF) in 2004. The RDF addresses four primary policies:

1. Working with local communities to accommodate growth in a flexible, connected and efficient manner;
2. Planning and investing in multi-modal transportation choices, based on the full range of costs and benefits, to slow the growth of congestion and serve the region's economic needs;
3. Encouraging expanded choices in housing location and types, and improved access to jobs and opportunities; and
4. Working with local and regional partners to reclaim, conserve, protect, and enhance the region's vital natural resources.

The Southwest Transitway is identified as the locally preferred alternative (LPA) transitway corridor in the plan.

2030 Transportation Policy Plan
http://www.metrocouncil.org/planning/transportation/TPP/2008/index.htm

The Metropolitan Council's 2030 Transportation Policy Plan to coordinate transportation systems in the Twin Cities metropolitan region. The plan specifies goals and objectives for regional transportation systems, and outlines policies and priority investments to help achieve these objectives.. A discussion of this plan and an analysis of the Southwest Transitway project's compatibility with the policies of the plan are located in Chapter 6, Section 6.1.

2030 Regional Parks Policy Plan
http://www.metrocouncil.org/planning/parks/2010/2030ParksPolicyPlan.pdf

The Regional Parks Policy Plan lays out the goals for the expansion and management of the Twin Cities regional park system, and the strategies designed to meet those goals. Of particular note for the Southwest Transitway is the policy on regional trails, New trails, or trail segments, that serve regional users are considered a significant priority for the regional parks system. The plan states that selection, development and operation of bicycle transportation arteries are covered as a component of the Council's transportation plan. Examples of existing regional trails that provide multiple benefits include the Southwest LRT Regional Trails, Cedar Lake Regional Trail, the Mississippi River Regional Trail, the Big Rivers Regional Trail and the Bruce Vento Regional Trail.

The plan notes that lands in the regional parks system may be subject to use-conversion proposals, so it also contains policies for the conversion of parks and recreation land. Before releasing a restrictive covenant that protects the property, the Metropolitan Council will make findings that consider the following factor: Whether the proposed project of greater benefit to the region than continuance of the regional parks system unit. As an example, the plan states that "A well-designed transit waiting station or a properly located and operated yard waste compost site could be of positive value to the regional system and can be worked out between the proposing parties, the implementing agencies and the Council in accordance with the system management guidelines." The covenants used by the Council to protect the regional parks system ensures nondiscriminatory use of the land is continued in the future. The plan also has the following provision:

> However, where either the linkage or natural resources criterion or both are met, two potential problem situations occur. First is a situation where the surplus corridor is wide enough to accommodate permanent use both as a light-rail/busway transit right-of-way and for trail recreational purposes. Such areas are of substantial interest to the regional parks system. It is hoped that differences between the transportation use and the recreation use can be resolved so that both types of activity can become permanent, valuable additions to the metropolitan area. Planning, development and management arrangements, however, will have to be worked out among the various interests involved (page 2-26).

Hennepin County Plans and Studies

Hennepin County Transportation Systems Plan
http://www.hennepin.us/portal/site/HennepinUS/menuitem.b1ab75471750e40fa01dfb47ccf06498/?vgnextoid=57fa353ea19c4210VgnVCM10000049114689RCRD

The Hennepin County Transportation Systems Plan provides policy guidance on future County transportation investments and strategies,, and it specifically addresses transportation improvements, including transit improvements.

Hennepin County Sustainable Development Strategy 2011
http://www.hennepin.us/files/HennepinUS/Housing%20Community%20Works%20and%20Transit/Department/Sustainable%20Development%20Strategy%20for%20Web.pdf

The County Housing, Community Works and Transit Department's Sustainable Development Strategy aims to integrate multi-modal transportation, economic development, housing, and community choices.

Southwest LRT Community Works, in collaboration with the Metropolitan Council and its Southwest LRT Project Office, will integrate LRT engineering and land use planning from the outset of the preliminary engineering process. This coordinated work, which also engages the cities and many other stakeholders along the corridor, seeks to maximize economic and community benefits of public transit investments and stimulate private investment within the corridor.

Downtown Minneapolis Intermodal Station Siting and Feasibility Study
http://www.hennepin.us/files/HennepinUS/Housing%20Community%20Works%20and%20Transit/Transportation/Transit%20Planning/Intermodal%20Station%20Final%20Report%202006.pdf

The *Downtown Minneapolis Intermodal Station Siting and Feasibility Study* includes plans for an intermodal station in downtown Minneapolis that would provide access to intercity commuter rail, buses serving the downtown area, the Central Corridor and Hiawatha LRT lines, and potentially, through the extension of the existing Hiawatha LRT line, to the Southwest Transitway and Bottineau Corridor service. The study indicates that the Southwest Transitway would likely enter the Intermodal Station site from the west, possibly via Royalston Avenue, 6th Avenue, and 5th Street where service could be integrated with existing and planned LRT service.

The Interchange Environmental Assessment
http://www.theinterchange.net/index.php?option=com_phocadownload&view=category&id=4&Itemid=217

The FTA, with Met Council and HCRRA prepared the EA with Met Council as the project sponsor and federal grant applicant working in partnership with the HCRRA. The proposed action, the Interchange Project ("Project"), includes six main elements:

- Two sets of new light rail transit (LRT) trackwork including tail and storage tracks at-grade and on structure
- A new station platform located approximately 100 feet west of the existing Target Field Station platform
- Two new pedestrian open spaces including an upper plaza and a street-level open space
- A new two-level parking structure located below the upper pedestrian plaza and east of the street-level pedestrian open space
- Reconfigured 5th Street North/6th Avenue North intersection
- Relocated Hennepin Energy Recovery Center (HERC) Administration Building (HAB) within the project site

HCRRA Staff report on Freight Rail Relocation
http://www.hennepin.us/files/HennepinUS/Housing%20Community%20Works%20and%20Transit/Regional%20Railroad%20Authority/Authority/Freight%20Rail%20Presentation%20Aug%2016%202011.pdf http://www.hennepin.us/freightrail

Conclusions: the most viable and therefore preferred route for freight rail is the MN&S line in St. Louis Park and the preferred location of LRT is in the Kenilworth corridor along with the Kenilworth Bike Trail– absent freight rail.

City of Eden Prairie Plans and Studies

City of Eden Prairie Comprehensive Guide Plan
http://www.edenprairie.org/index.aspx?page=123

https://gis.edenprairie.org/City/CityMap/PublicCityMapMainPage.aspx

The *City of Eden Prairie Comprehensive Guide Plan* contains several elements that pertain to the Southwest Transitway project, outlines goals for land use and transportation, and specifies policy implementation measures intended to promote development around the project.

Included in the transportation chapter is a specific plan for transit service in Eden Prairie, where the city also specifies their support for the Build Alternatives that would serve the Major Center Area (MCA) and Golden Triangle Area (GTA) regions. "The City of Eden Prairie has passed a resolution supporting the recommendations of the Alternatives Analysis Study while maintaining a strong preference for the routing options that serve the Major Center Area and the Golden Triangle Area. In addition, the City supports efforts to fund and construct the project in a timely manner and understands that the project is considered a priority project for the region. In further support of LRT in the transit corridor, the City has planned for transit supportive uses and densities within one-half mile of the stations proposed for the Major Center Area's Town Center and the Golden Triangle Area." (Eden Prairie 2009)

Eden Prairie Major Center Area Study
http://www.edenprairie.org/vCurrent/live/article.asp?r=2283

http://www.edenprairie.org/modules/showdocument.aspx?documentid=330

http://www.edenprairie.org/index.aspx?page=121

The *Eden Prairie Major Center Area Study*'s goal was to establish a vision for the Major Center Area (MCA) region for the next 25 years, and provide a land use policy tool to guide growth and redevelopment. Part of the vision statement asserts that "Bus and light rail transit service should be completely integrated into the street network and development pattern to take advantage of concentrations of people who will choose to use transit to get around the area." (Eden Prairie 2006) Key land use recommendations include the creation of a Town Center area bordered by Flying Cloud Drive, Singletree Lane, and Technology Drive in the center of the MCA that would include a compact, appropriately scaled mix of land uses.

Implementation of the Southwest Transitway is a key recommendation of the MCA study as a catalyst for future land use changes and private development. "As congestion increases, LRT will bring a highly reliable and convenient mode of travel to this area, connecting workplaces and residences in the southwest to other significant regional destinations such as downtown Minneapolis." The study clearly indicates future land use and transportation planning support for the project, stating "LRT service is highly recommended in the future MCA plan." (Eden Prairie 2006)

As a follow-up report to the MCA study, the city published the *Town Center Design Guidelines* in 2007. The design specifications included in this report provide additional guidance on urban design features for the MCA and Town Center area, including public spaces, context-sensitive streetscape solutions, and integration of the built environment with transit facilities, including the proposed LRT stations.

Golden Triangle Land Use/Multi-Modal Transportation Evaluation
http://www.edenprairie.org/vCurrent/live/

The *Golden Triangle Land Use/Multi-Modal Transportation Evaluation* evaluated the potential for increased mixed land use patterns, and identified four objectives : 1) Reduce peak period traffic congestion, 2) Maintain or improve property tax benefits, 3) Increase transit use and alternative transportation modes use in a suburban location, and 4) Explore the possibility of creating additional development opportunities in Eden Prairie for regional commercial development. The study supports redevelopment within one-half mile of the Southwest Transitway project, including the proposed Golden Triangle Station located along LRT 3A (LPA), LRT 3A-1 (co-location alternative), LRT 3C-1 (Nicollet Mall), and LRT 3C-2 (11^{th}/12^{th} Street) alternatives.

City of Minnetonka Plans and Studies

2030 Minnetonka Comprehensive Guide Plan
http://www.eminnetonka.com/community_development/planning/comprehensive_guide_plan.cfm

The Southwest Transitway project is prominently discussed in the *2030 Minnetonka Comprehensive Guide Plan* as a priority for the city. The plan states: "The Southwest Corridor LRT includes a preferred alignment that directly serves the Opus area, as well as Hopkins and the Golden Triangle, offering significant transit improvements for Minnetonka-area residents, employees, and employers as well as the communities of Eden Prairie, St. Louis Park, and Minneapolis." (Minnetonka 2009)

Minnetonka has several distinct regional business centers, including Opus Business Park and Minnetonka Corporate Center. Both of these centers are located in the southeastern corner of the city, and the 2030 plan specifies continued planning for LRT and land uses supportive of transit-oriented development (TOD) principles and transit ridership. The plan states: "The planned Southwest LRT route will bisect Opus in the north/south direction as it extends between the cities of Hopkins and Eden Prairie. The City of Minnetonka and Hennepin County will shortly begin a study to review LRT station area locations and potential TOD techniques that can be utilized in station area planning efforts.

City of Hopkins Plans and Studies

Hopkins Comprehensive Plan
http://www.hopkinsmn.com/development/plan/index.php

"Infrastructure" is defined as the fundamental facilities and systems serving a country, state, or city. Transportation infrastructure includes things like roads, bridges, highways, bus systems, LRT systems, etc.

The *Hopkins Comprehensive Plan* The plan provides a vision for the city's future that includes strengthening city neighborhoods and quality of life, enhancing the character of downtown Hopkins, redeveloping transportation corridors, protecting open spaces, and making informed decisions regarding transportation **infrastructure** investments. The plan recognizes the Southwest Transitway project as an integral part of the updated comprehensive plan, and emphasizes the project as an important transportation corridor for the redevelopment efforts within the city. The plan does not identify a preference for a specific alignment or LRT alternative, but focuses the discussion of the project in relation to Segment 4 between the Shady Oak Station and West Lake Station, which is common to each of the four LRT alternatives. (Hopkins 2009)

The plan also outlines policies for other transportation modes, including bus transit, bicycle, and pedestrian facilities. "The city will ensure that there is good public transit service and LRT-feeder bus connectivity at each LRT station." Additionally, the plan states: "Hopkins will strive to create excellent pedestrian environments in and around its future LRT stations and TOD areas." (Hopkins 2009)

East Hopkins Land Use and Market Study
http://www.hopkinsmn.com/development/current/eastend/index.php

The *East Hopkins Land Use and Market Study* was developed to "take a more proactive look at future land use and market opportunities" on the east side of the city, an area bounded generally by TH 7 to the north, U.S. Highway 169 to the west, Excelsior Boulevard to the south, and the Blake Road "corridor" to the east. The Southwest Transitway project was a catalyst for the study, which stated "Potential for transit-oriented development was a contributing factor that impacted plan concepts throughout this study." The study specifically addresses the "regional rail corridor" owned by HCRRA. The study discusses the future development potential resulting from implementation of the Southwest Transitway, stating, "Construction of a transit line passing through the study area could significantly enhance the attractiveness of the area as a business and residential setting." The study examines potential station locations and impacts on surrounding land use. (Hopkins 2003)

Blake Road Corridor Small Area Plan
http://www.hopkinsmn.com/development/current/blake/index.php

The *Blake Road Corridor Small Area Plan* (BRCP) was serves as a policy document for the Blake Road Corridor within which an LRT station for the Southwest Transitway is proposed. The affected area includes Blake Road north of the HCRRA ROW and south of TH 7, and the blocks adjacent to Blake Road along Cambridge Street, Cottageville Park, Lake Street NE, 2nd Street NE, and Minnehaha Creek. "The primary ideas behind the plan include focusing development near the future LRT station while creating an extension of 2nd Street east of Blake Road that becomes the 'front door' to future redevelopment of that site." (Hennepin County 2009)

City of St. Louis Park Plans and Studies

City of St. Louis Park Comprehensive Plan, December 2009
http://www.stlouispark.org/comprehensive-plan.html

The Southwest Transitway project is discussed at length in the *City of Saint Louis Park Comprehensive Plan*, and the city has focused future land use planning efforts around the three stations located in St. Louis Park. While the plan does not indicate a preference for a specific alternative, it acknowledges the proposed alignment through the city along the ROW owned by HCRRA. According to the plan, three stations are planned in St. Louis Park, to be located at Beltline Boulevard, Wooddale Avenue, and Louisiana Avenue.

The plan references study of the MN&S alignment: "Consideration of the TC&W traffic moving to the north/south CP lines has been a possibility. The physical options of various routing of trains are being studied by HCRRA at this time. Impacts to traffic circulation and neighborhoods need to be considered before a decision is made." Plan goals regarding freight rail include: 1) Minimize impacts of railroad operations in St. Louis Park (eliminate all blocking and switching operations; address noise and vibration impacts) 2) Work with government entities to address the potential rerouting of freight rail in St. Louis Park (participate in study). The plan has a "Railroad" land use category (RRR) that includes approximately 162 acres of right-of-way used for railroad and trail purposes.

See additional studies concerning the Freight Rail Relocation under Hennepin County (3.1.3.2).

Elmwood Land Use, Transit & Transportation Study
http://www.stlouispark.org/pdf/ElmwoodReport.pdf

Results of the *Elmwood Land Use, Transit & Transportation Study* were incorporated into the St. Louis Park Comprehensive Plan. The study was developed to guide decisions on land use redevelopment, infill development, and infrastructure changes in the Elmwood neighborhood.

City of Minneapolis Plans and Studies

The Minneapolis Plan for Sustainable Growth
http://www.ci.minneapolis.mn.us/cped/plans.asp

The *Minneapolis Plan for Sustainable Growth* (MPSG) was unanimously adopted by the Minneapolis City Council in October 2009, and approved by the Metropolitan Council in the same year. This plan updates *The Minneapolis Plan* of 2000 as the new comprehensive plan for the city. The plan contains a map of future city transitways, which identifies two of the alternative alignments for the Southwest Transitway in Minneapolis: Segment A and Segment C-1. At the time the plan was originally written, Segment C-2 had not been developed.

The plan does not discuss the Southwest Transitway project specifically, nor does the plan endorse any of the Build Alternatives considered. The plan outlines policy objectives for current and future growth.

The plan outlines the creation of Transit Station Areas (TSAs); a land use policy feature intended to promote growth specifically around transit stations along fixed-route transitways. Capitalizing on community development benefits and transit-supportive public policies, development in or around TSAs would be designed with pedestrian, bicyclist, and transit patrons in mind, to serve individuals who are more likely to use transit (such as residents of higher density housing and office or retail workers), and would include small-scale retail services.

Access Minneapolis
http://www.minneapolismn.gov/publicworks/transplan/

From 2005 to 2009, the City of Minneapolis developed and implemented the Access Minneapolis – Ten-Year Transportation Action Plan specifying transportation improvements and policies the city intends to take for the coming decade. This plan makes a series of policy recommendations for all modes of transportation, prioritizes city infrastructure investments, and provides design guidelines for selected infrastructure improvements, such as sidewalks. The plan is divided into multiple sections, and specifies city-wide actions and actions in the downtown core area. The applicable contents of this plan, along with the findings regarding compatibility of the Build Alternatives considered with the plan, are discussed in Chapter 6, Section 6.1.

Bassett Creek Valley Master Plan
http://www.minneapolismn.gov/cped/planning/plans/cped_basset-creek

The *Bassett Creek Valley Master Plan* was approved by the Minneapolis City Council in January 2007, and envisions a system of existing and proposed parks and open space integrated with a revitalized mixed-use urban village. The Bassett Creek area is located immediately west of downtown Minneapolis, and is considered a sub-area. The plan advocates the redevelopment of industrial land areas to a compact, mixed-use development of residential, commercial, and open space land uses.

Bryn Mawr Neighborhood Land Use Plan
http://www.minneapolismn.gov/www/groups/public/@cped/documents/webcontent/wcms1p-085291.pdf

The *Bryn Mawr Neighborhood Land Use Plan* was adopted by the Minneapolis City Council in September 2005. The plan addresses issues and opportunities for future land uses, transportation, housing, commercial development, and natural resource management in the neighborhood revolving around land use, transportation, housing, and natural resource management. Planning for the neighborhood has been structured, in part, around improvements to transit service.

The plan specifies the location of the corridor by stating "Southwest Corridor Light Rail Transport (LRT) will run through the southern segment of the neighborhood." While the plan provides limited references to the project, it acknowledges the project as having several potential benefits to the neighborhood. "An LRT station and commuter rail operations could present opportunities to the neighborhood, such as offering residents an alternative means of travel around the Twin Cities. The LRT would also bring people to the neighborhood and increase opportunities for the neighborhood commercial nodes." The plan identifies the proposed Penn Avenue Station, on Segment A, near the interchange of Penn Avenue and I-394, along with the development potential for additional residential and commercial space to neighborhood residents. (Minneapolis 2005a)

Nicollet Avenue: The Revitalization of Minneapolis' Main Street
http://www.ci.minneapolis.mn.us/cped/plans.asp

The *Nicollet Avenue Task Force Report* was adopted by the Minneapolis City Council in May 2000. In 1998 the Minneapolis City Council established the Nicollet Avenue Task Force to develop recommendations regarding redevelopment opportunities, locations for streetscape improvements, and transportation/roadway improvements. The report's study area extends to both sides of Nicollet Avenue between Grant Street and 62nd Street for a total length of 6 miles. The four main strategies presented in the study are:

- Invest in well-defined commercial nodes and corridors to encourage increased compatibility of adjacent uses
- Redevelop under-utilized commercial areas to encourage increased compatibility of adjacent uses
- Encourage quality urban design and pedestrian-friendly environments
- Manage traffic flow and reduce traffic speed

Downtown East/North Loop Master Plan
http://www.minneapolismn.gov/cped/planning/plans/master-plans_downtown-east-north-loop_index

Adopted by the City of Minneapolis in 2003, the *Downtown East/North Loop Master Plan* was developed to guide future land use development of the Downtown East and North Loop neighborhoods, particularly around improved mass transit service, including bus and rail transit. The plan includes discussions of market potential, future land use plans, and an urban design plan for the **streetscape** character within the study area. While the plan does not discuss the Southwest Transitway project specifically, a critical element of the plan is **redevelopment** and **infill development** surrounding the proposed Target Field Station and the new Minnesota Twins baseball stadium, Target Field. Generally, the plan is very supportive of transit-oriented development and places particular emphasis on transit services being coordinated to connect with the Target Field Station.

A "streetscape" is the appearance or view of a street.

"Redevelopment" is a tool created by state law to assist local governments in eliminating blight from a designated area, as well as to achieve the goals of development, reconstruction, and rehabilitation of residential, commercial, industrial and retail districts.

"Infill development" involves building and developing in vacant areas in city centers or urban settings.

North Loop Small Area Plan
http://www.ci.minneapolis.mn.us/cped/plans.asp

In 2010, the City of Minneapolis completed an update to the Downtown East/North Loop Master Plan, originally developed in 2003. "The purpose of the North Loop Small Area Plan is to be a complementary piece to the Downtown East/North Loop Master Plan. The update is meant to encapsulate the remainder of the North Loop neighborhood that has not been the beneficiary of small-area planning in the past. The original plan continues to be relevant and this update will transfer its recommendations to the rest of the North Loop while providing more detail." (Minneapolis 2010) The North Loop Small Area Plan is a land use, transportation, and infrastructure investment policy plan, based on the policy direction of The Minneapolis Plan for Sustainable Growth, developed for the North Loop neighborhood area immediately west of downtown Minneapolis. The study area was defined generally as Plymouth Avenue to the north, Lyndale Avenue/I-94 to the west, I-394/2nd Avenue and Hennepin Avenue to the southeast, and the Mississippi River to the northeast.

The Southwest Transitway project is identified as a potential transit improvement to the North Loop neighborhood area, and while the plan recognizes that a final alignment for the Southwest Transitway project has not be selected at this time, it does provide the foundation for supportive land uses and transportation improvements associated with implementation of the project through the North Loop neighborhood. "The North Loop neighborhood stands to benefit from its proximity to a variety of major public investments in the coming years. Southwest Light Rail Transit is one such investment that can help to make the neighborhood a destination of choice long into the future" (Minneapolis, 2010).

Warehouse District Heritage Streets Plan
http://www.minneapolismn.gov/cped/projects/cped_heritage_street_plan

The *Warehouse District Heritage Street Plan* builds upon the information and guidance developed in the *Minneapolis Warehouse Historic District Designation*, *Minneapolis Warehouse Historic District Design Guidelines,* and the *North Loop Small Area Plan*.

The purpose of the plan is to provide clear direction on the pressing issue of how to protect the historic infrastructure of the District while promoting an accessible and pedestrian friendly environment. The plan will improve the decision-making process for the adaptive reuse of streets in the historic district. The geographic scope of the project is the twenty-three blocks of streets and numerous alleys that retain original paving materials and the industrial infrastructure.

The document is a detailed street by street plan with specific methods for preserving the remaining historic materials and industrial infrastructure, while accommodating the Americans with Disabilities Act (ADA) requirements and the need for street and sewer repairs. The plan will be used to inform the individual site decisions that property owners, design professionals, and the City will need to make when buildings in the District are rehabilitated. It will also be used as the guiding document for the design and development of City capital improvement projects for the reconstruction and repair of the streets and alleys.

The Warehouse District Heritage Street Plan was approved by the North Loop Neighborhood Association on July 27, 2011 and the Minneapolis Heritage Preservation Commission on August 23, 2011.

The Lyn-Lake Small Area Plan
http://www.minneapolismn.gov/www/groups/public/@cped/documents/webcontent/convert_273408.pdf

Adopted by the Minneapolis City Council in 2009, the Lyn-Lake Small Area Plan is focused on community and economic development of the Lyn-Lake region. The study area of the plan encircled Lyndale Avenue from Ridgewood Avenue to 34th Street West, and also included a portion between Dupont Avenue and Blaisdell Avenue, surrounding the Midtown Corridor and West Lake Street. The Lyn-Lake region of Minneapolis is a rapidly changing urban area. New mixed-use residential and retail developments are sprouting on previously abandoned sites and former industrial buildings are being refurbished for residential, office, retail, and studio space use.

"The plan builds on the existing land use policies in the *Minneapolis Plan for Sustainable Growth*, *the Uptown Small Area Plan* and the *Midtown Greenway Land Use and Development Plan*."

A "historic district" is a related group of buildings, properties, or sites that have been designated as historically or architecturally significant.

Midtown Minneapolis Land Use and Development Plan
http://www.minneapolismn.gov/www/groups/public/@cped/documents/webcontent/wcms1p-085287.pdf

The *Midtown Minneapolis Land Use and Development Plan*, adopted in December 2005, sets out guidelines for future development and infrastructure improvements along Lake Street in Minneapolis. The study area is located between the Midtown Corridor and 31st Street between Blaisdell and 11th avenues with Lake Street running down the center. Identified as a primary commercial corridor of the city, the plan also recognizes Lake Street as a major crosstown transportation corridor, and suggests that transportation aspects of the corridor have both positive and negative implications. (Minneapolis 2005b) The higher traffic volumes, coupled with the Midtown Greenway multi-use trail and other pedestrian amenities, help establish the corridor as a vibrant economic region of the city.

Midtown Greenway Land Use and Development Plan
http://www.minneapolismn.gov/www/groups/public/@cped/documents/webcontent/convert_266361.pdf

The Midtown Greenway Land Use and Development Plan was adopted by the City of Minneapolis in February 2007, and provides policy guidance and recommendations for future land use development along the Midtown Corridor (referred to as the Midtown Greenway). The plan evaluates the long-term viability of existing land uses adjacent to the Midtown Corridor and provides guidance for future land uses.

Midtown Corridor Historic Bridge Study
http://www.minneapolismn.gov/www/groups/public/@council/documents/webcontent/convert_255440.pdf

The *Midtown Corridor Historic Bridge Study* was prepared in 2007 for the Public Works Department of the City of Minneapolis to assess potential repair and rehabilitation limitations, present the original construction methods, and identify potential effects of bridge removal on the corridor's status as a **historic district**. The Midtown Corridor is located between Hennepin Avenue and Cedar Avenue and includes twenty-six historic bridges. Results of the evaluation showed structural and functional deficiencies with virtually every bridge and therefore recommended eventual removal of all of the bridges. Because the bridges are one of the only characteristic features defining the area as a historic district, their removal could instigate the loss of the area's status on the National Register of Historic Places and it could be delisted. The Study indicates that the city intends to apply for federal funds to assist in the preservation of the bridge structures and that the city, the HCRRA, and Hennepin County will work together to derive agency agreements dealing with future bridge maintenance, programming for any reclassification or replacement programs, financial partnering, and long-term ownership of the structures. (Minneapolis 2007b)

Uptown Small Area Plan
http://www.minneapolismn.gov/www/groups/public/@cped/documents/webcontent/convert_267686.pdf

The *Uptown Small Area Plan* provides guidance on the future development of the Uptown region, a densely populated urban, commercial-retail, and residential center of the Twin Cities metropolitan area. The Uptown region of Minneapolis is located southwest of downtown Minneapolis and is made up of several neighborhoods including East Isles, Lowry Hill East, East Calhoun, and Calhoun Area Residents Action Group (CARAG). Future land use planning promotes higher residential and employment densities, urban design specifications, and enhancing connections between the Midtown Corridor, the surrounding lakes area, and urban core.

Minneapolis Parks and Recreation Board Comprehensive Plan

http://www.minneapolisparks.org/documents/about/compplan/ComprehensivePlan.pdf

In 1883, the Minneapolis Park and Recreation Board was created by an act of the Minnesota State Legislature and a vote of Minneapolis residents. It serves as an independently elected, semi-autonomous body responsible for governing, maintaining, and developing the Minneapolis park system. Its stated mission is to" … permanently preserve, protect, maintain, improve, and enhance its natural resources, parkland, and recreational opportunities for current and future generations." One of the comprehensive plan's goals is "Focused land management supports current and future generations." Among the objectives supporting this goals is to: "Ensure parcels considered for disposition meet one or more of the following criteria:
a) removing the parcel does not diminish recreation or environmental function of the park system,
b) the parcel is not accessible by the public,
c) the parcel does not serve the needs of individuals within a growth area of the city or is not part of an adopted park plan, and
d) the parcel is too small for future park or natural area development."

This plan is further discussed in Section 3.5.

Minnesota Department of Transportation Comprehensive Statewide Freight and Passenger Rail Plan

http://www.dot.state.mn.us/planning/railplan/finalreport/MNRailPlanFinalReportFeb2010.pdf

The State Rail Plan addresses future freight rail and passenger rail needs throughout the state. Section 4.2.8 of the plan specifically addresses potential freight rail relocations, including the proposed Kenilworth freight rail relocation project. The plan recommends that the Kenilworth project should proceed through further study development and evaluation, led by a locally responsible public agency, in cooperation with the State of Minnesota.

The State Rail Plan indicates that a successful, viable rail industry that meets the future needs of the Minnesota economy requires continued investment and improvement to its infrastructure. Key improvements elements defined in the plan include: Continue to make improvements to the condition and capacity of Minnesota's primary railroad arterials to accommodate existing and future demand; address critical network bottlenecks; upgrade main line track (all Class I-III railroads) to 25 mph minimum speed, as warranted; improve the network (all Class I-III railroads) to support the use of 286,000 pound railcars throughout; implement state of the art traffic control and safety systems, and expand intermodal service access options throughout the State.

Socioeconomics Data

Appendix H – Socioeconomics Data

Table 1. Southwest Transitway Employment by Build Alternative

Build Alternative	2010	2020	Percent Change 2010 to 2020	2030	Percent Change 2010 to 2030
LRT 1A	205,342	223,345	8.8	239,907	16.8
LRT 3A	255,896	280,974	9.8	301,420	17.8
LRT 3A-1	240,666	264,324	9.8	284,145	18.1
LRT 3C-1	303,289	334,201	10.2	355,556	17.2
LRT 3C-2	290,542	318,113	9.5	339,341	16.8

Source: Metropolitan Council

In addition to considering employment statistics from the year 2000 census, the U.S. Census Bureau publishes the Longitudinal Employer-Household Dynamic (LEHD) and Local Employment Dynamics (LED) dataset(s). These data provide an approximate count of workers for states, counties, Metropolitan Statistical Areas (MSA), and census tracts and blocks. The counts of workers are derived from employer surveys, and are intended to provide basic information on the approximate number of workers, where workers reside, and commuting to work information. Because the data are unavailable at the block group level, the tract level data were reviewed for the study area. According to the 2008 LEHD/LED data, the number of employees working in the study area census tracts from the entire seven county Twin Cities metropolitan area was approximately 319,050. It is important to note that the census tracts are larger in total land area as compared to the block groups, and therefore portions of some census tracts may be outside the actual study area boundary.

American Community Survey Population, Household, and Employment Estimates

In the mid-1990s, the Census Bureau began to develop and implement the American Community Survey (ACS), a continuous nationwide survey of addresses conducted monthly. While initial data collection began in the mid-1990s, full implementation of ACS across the United States and Puerto Rico did not begin until 2005. Where the decennial (done every ten years) census provides official counts of all persons, households, and other selected subjects, and serves as the basis for Congressional seat redistricting, the ACS is intended to measure changing socioeconomic characteristics and conditions of the population on a recurring basis.

The ACS does not provide official counts of the population between decennial censuses, but instead provides weighted population estimates. The ACS is intended to replace the "Long Form" of the decennial census and allow more continuous data collection and reporting of socioeconomic information. U.S. Census Bureau officials have indicated that the ACS is still in the initial rollout phase, and while data reporting has begun, an additional two to three years will be necessary before results are considered reliable and reported at lower census geographic levels. ACS data currently available are considered reliable sources of information, but are reported with a margin of error. According to the Census, "All published margins of error for the American Community Survey are based on a 90 percent confidence level."

For the cities of Eden Prairie, Minnetonka, and St. Louis Park, 3-year average estimates are available between 2006 and 2008. However, because ACS data are only available at the city-wide geographic level, they do not provide the level of detail necessary to conduct corridor-specific scale analyses. Also, the Census Bureau has advised that "Multiyear estimates cannot be used to say what is going on in any particular year in the period, only what the average value is over the full period." (U.S. Census Bureau 2006-2008)

Additional population projection data were prepared by and obtained from the Metropolitan Council. In 2008, metropolitan communities were required to update their comprehensive plans pursuant to the Metropolitan Land Planning Act (MLPA) of 1995 (Minn. Stat. 473.851 to 473.871). As part of the comprehensive plans submitted to the Metropolitan Council, communities develop and allocate population projections for the year 2030 in the form of Transportation Analysis Zones (TAZ). A TAZ is a special geographic area demarcated by transportation planners helping to determine regional travel patterns to help plan for future transportation needs. These zones vary in size, but typically include one or more census tracts or block groups.

Table 2 provides recent population, household, and employment estimates for the five cities through which the Build Alternatives pass. These estimates use 2010 census counts as a base year. Data from the State of Minnesota were retrieved from the State Demographic Center and the Minnesota Department of Employment and Economic Development. Estimate data provided by the Minnesota State Demographic Center and the U.S. Census Bureau's ACS are reported for the entire city, and are not available at refined geographic levels. Therefore, insufficient information is available to determine population, household, or employment estimates for the study area specifically. However, these data can provide insight into the changing nature of the five cities through which the Build Alternatives pass.

Table 2. City Population, Household, and Employment Estimates

Data Source & Characteristic		City				
		Eden Prairie	Hopkins[a]	Minneapolis[b]	Minnetonka	St. Louis Park
Census 2010	Population	60,797	17,591	382,578	49,734	45,250
	Households	23,930	8,366	163,540	21,901	21,743
	Employment[d]	45,526	14,159	310,412	40,419	37,287
2008 State of Minnesota Estimates	Population	62,610	17,481	390,131	51,756	47,221
	Households	24,166	8,523	168,669	22,256	22,347
	Employment	N/A	N/A	N/A	N/A	N/A
2008-2010 ACS 3-Year Estimates[c]	Population	60,108	N/A	381,401	49,654	45,012
	Margin of Error	+/-52	N/A	+/-111	+/-63	+/-49

Data Source & Characteristic		City				
		Eden Prairie	Hopkins[a]	Minneapolis[b]	Minnetonka	St. Louis Park
& Margins of Error	Households	24,215	N/A	183,196	23,168	22,954
	Margin of Error	+/-710	N/A	+/-1,764	+/-534	+/-668
	Employment	45,921	N/A	313,858	40,620	37,430
	Margin of Error	+/-629	N/A	+/-1,722	+/-630	+/-461

Sources: Minnesota State Demographic Center, 2008; U.S. Census Bureau, Census 2010, and American Community Survey, 2010

[a] Annual ACS data are currently only reported for cities or urban areas with populations greater than 20,000. In 2008, the Metropolitan Council estimated Hopkins population to be 17,481, and estimated the number of households in Hopkins at 8,523. These estimates were based on year 2000 census counts reported to the Minnesota State Demographic Center, which publishes these results.

[b] Annual estimates of population are only available for areas with populations greater than 65,000. In Minnesota, annual estimates are only available for the cities of Minneapolis, St. Paul, Duluth, St. Cloud, Rochester, Bloomington, Brooklyn Park, and Plymouth. The figures shown for Minneapolis reflect the latest annual estimates of the demographic characteristics considered.

[c] The ACS 3-year estimate data are based on 3-year averages of an area's socioeconomic characteristics, and are available for cities with populations greater than 20,000. Multiyear estimates are incapable of identifying socioeconomic or demographic changes in any one year during the time period shown, and represent only the average value of the characteristic measured (total population, households, or employment) for the identified time period.

[d] The employment figure shown for the 2010 census refers to the number of persons16 years and older living in the specified community, which the census (ACS 2010 5-year estimates) considers working age. This number is for all employees, regardless of employment status.

Similar to the 2000 census, the ACS provides detailed tables on a variety of socioeconomic characteristics. Table 3 provides an estimate of race and ethnicity. The margins of error are provided below each estimate.

Table 3. 2008–2010 3-Year ACS Race and Ethnicity Population Estimates

Characteristic	City				
	Eden Prairie	Hopkins[a]	Minneapolis[b]	Minnetonka	St. Louis Park
White (Non-Hispanic)	48,483 (+/-1,395)	N/A	272,941 (+/-2,952)	46,064 (+/-847)	39,502 (+/-805)
Black or African-American	5,066 (+/-1,207)	N/A	75,274 (+/-2,431)	1,860 (+/-555)	4,292 (+/-802)
Asian	5,899 (+/-1,110)	N/A	23,872 (+/-1,569)	1,812 (+/-595)	1,695 (+/-564)
All Others	1,637 (+/-913)	N/A	23,364 (+/-3,320)	747 (+/-477)	1,332 (+/-733)
Hispanic or Latino[c]	2,293 (+/- 796)	N/A	36,728 (+/-2,304)	1,109 (+/-394)	1,243 (+/-323)
Total	60,108 (+/-52)	N/A	381,401 (+/-111)	49,654 (+/-63)	45,012 (+/-49)

[a] Population estimates are not available for the City of Hopkins.

[b] Annual population estimates are available for the City of Minneapolis. The population estimates shown are for year 2008, the most recent year estimates are published by the Census Bureau.

[c] By Census Bureau definition, the ethnic category "Hispanic or Latino" includes persons of any race, and are a subset of the overall population (the numbers do not contribute to the total population since those persons are already counted in other categories).

Community Facilities and Resources Data

APPENDIX H - Community Facilities and Resources Data

This section identifies the community facilities and resources in the study area. Eighty-six community facilities and resources have been identified, including libraries, police and fire stations, parks, recreation centers, theatres, ice rinks, post offices, and a court house. Some of these facilities serve the study area neighborhoods in which they are located, but many serve the greater metropolitan area. Table 1 lists the community facilities and resources within the study area and Figure 1 shows their locations.

Table 1. Community Facilities in the Study Area

Name	Address
Eden Prairie	
Eden Prairie Station 1 - Headquarters	14800 Scenic Heights Road
Eden Prairie City Center & Police Department	8080 Mitchell Road
The Eden Prairie Art Center	7650 Equitable Drive
Fairview Eden Center Clinic	830 Prairie Center Drive
Minnetonka	
Minnetonka Fire Station 3	5700 Rowland Road
Shady Oak Beach	5200 Shady Oak Road
Glen Moor Park	5700 Glen Moor Road West
Hopkins	
Aspen Medical Group Clinic	715 2nd Avenue South
Hopkins Pavilion - Central Park	101 16th Avenue South
Hopkins Fire Station 1	101 17th Avenue South
Valley Park	801 7th Avenue South
Hilltop Park & Ice Rink	2014 4th Street North
Hopkins Activity Center	33 14th Avenue North
Hopkins Center for the Arts	1111 Mainstreet
Hopkins Police Station	1010 1st Street South
Hopkins City Hall	1010 1st Street South
Hopkins Library	22 11th Avenue North
Burnes Park Ice Skating Rink	301 2nd Street North
Overpass Skate Park	
Harley Hopkins Ice Rink	108 Jackson Avenue South
Interlachen Park	262 Homedale Road
Oakes Park	900 Lake Street NE
St. Louis Park	
Dakota Park	
Keystone Park	
Roxbury Park	

Name	Address
Park Nicollet Methodist Hospital	6500 Excelsior Blvd.
Park Nicollet Clinic - St. Louis Park	3800 Park Nicollet Blvd.
St. Louis Park Police Substation	4072 Meadowbrook Lane
St. Louis Park Fire Station 1	3750 Wooddale Avenue
St. Louis Park Fire Station 2	2262 Louisiana Avenue
St. Louis Park Police Station	5005 Minnetonka Boulevard
The St. Louis Park Recreation Center	3700 Monterey Drive
Veterans Memorial Amphitheater	3700 Monterey Drive
St. Louis Park Police Substation	4717 Park Commons Drive
St. Louis Park City Hall	5005 Minnetonka Boulevard
St. Louis Park Library	3240 Library Lane
Minneapolis	
Cedar Lake Park	
Kenwood Park & Community Center	2101 Franklin Avenue West
Minneapolis Chain of Lakes Regional Park*	
Levin Park	
Bryn Mawr Meadows	
Mueller Park	
Bryant Square Park & Recreation Center	3101 Bryant Avenue South
Painter Park & Recreation Center	620 34th Street W
Whittier Park	425 26th Street W
Washburn Fair Oaks Park	
Franklin Steele Park	
The Bakken Museum	3537 Zenith Avenue South
Minneapolis Fire Station 22	3025 Market Plaza
Granada Theater	3022 Hennepin Avenue
Uptown Theater	2900 Hennepin Avenue
Walker Public Library	2880 Hennepin Avenue
The Jungle Theater	2951 Lyndale Avenue South
Minneapolis 5th Precinct Police Station	3101 Nicollet Avenue
Minneapolis Fire Station 8	2749 Blaisdell Avenue South
Whittier Neighborhood Center	425 West 26th Street
Minneapolis Fire Station 16	1600 Glenwood Avenue North
The Minneapolis Institute of Arts	2400 Third Avenue South
The Hennepin History Museum	2303 Third Avenue South
Walker Art Center	1750 Hennepin Avenue
Allina Hospitals & Clinics - Uptown	2800 Hennepin Avenue

Name	**Address**
Family Medical Center HCMC Clinic	5 West Lake Street
Park Nicollet Clinic - Minneapolis	2001 Blaisdell Ave. S.
Fairview Uptown Clinic	3033 Excelsior Blvd.
Allina Medical Clinic - Nicollet Mall	825 Nicollet Mall
Allina Medical Clinic- The Doctors Uptown	1221 West Lake Street
Minneapolis Sculpture Garden	
Loring Park	1382 Willow Street
Minneapolis Fire Station 6	121 East 15th Street
Minneapolis Convention Center	1301 Second Avenue South
Orchestra Hall	1111 Nicollet Mall
U.S. Post Office	110 8th Street South
Orpheum Theater	824 Hennepin Avenue
State Theater	805 Hennepin Avenue
Pantages Theater	710 Hennepin Avenue
First Avenue/7th Street Entry	701 1st Avenue North
Minneapolis Farmers Market	312 East Lyndale Avenue
Target Field	
Target Center	600 1st Avenue North
Illusion Theater	528 Hennepin Avenue
Minneapolis 1st Precinct Police Station	29 S 5th Street South
Hennepin County Government Center	300 S 6th Street South
Minneapolis City Hall	350 5th Street South
Minneapolis City Hall Police Station	350 5th Street South
Minneapolis Public Library	300 Nicollet Mall
U.S. District Court	300 4th Street South
U.S. Post Office	307 4th Avenue South
Minneapolis Fire Station 1	530 3rd Street South
Milwaukee Road Depot and Freight House	300 Washington Avenue South
U.S. Post Office	100 1st Street South
Minneapolis Fire Station 4	1101 6th Street North

*The Minneapolis Chain of Lakes Regional Park is not represented by an independent symbol in Figure 3.2-2.

Source: HDR Engineering, Inc., 2009

Figure 1. Community Facilities in the Study Area

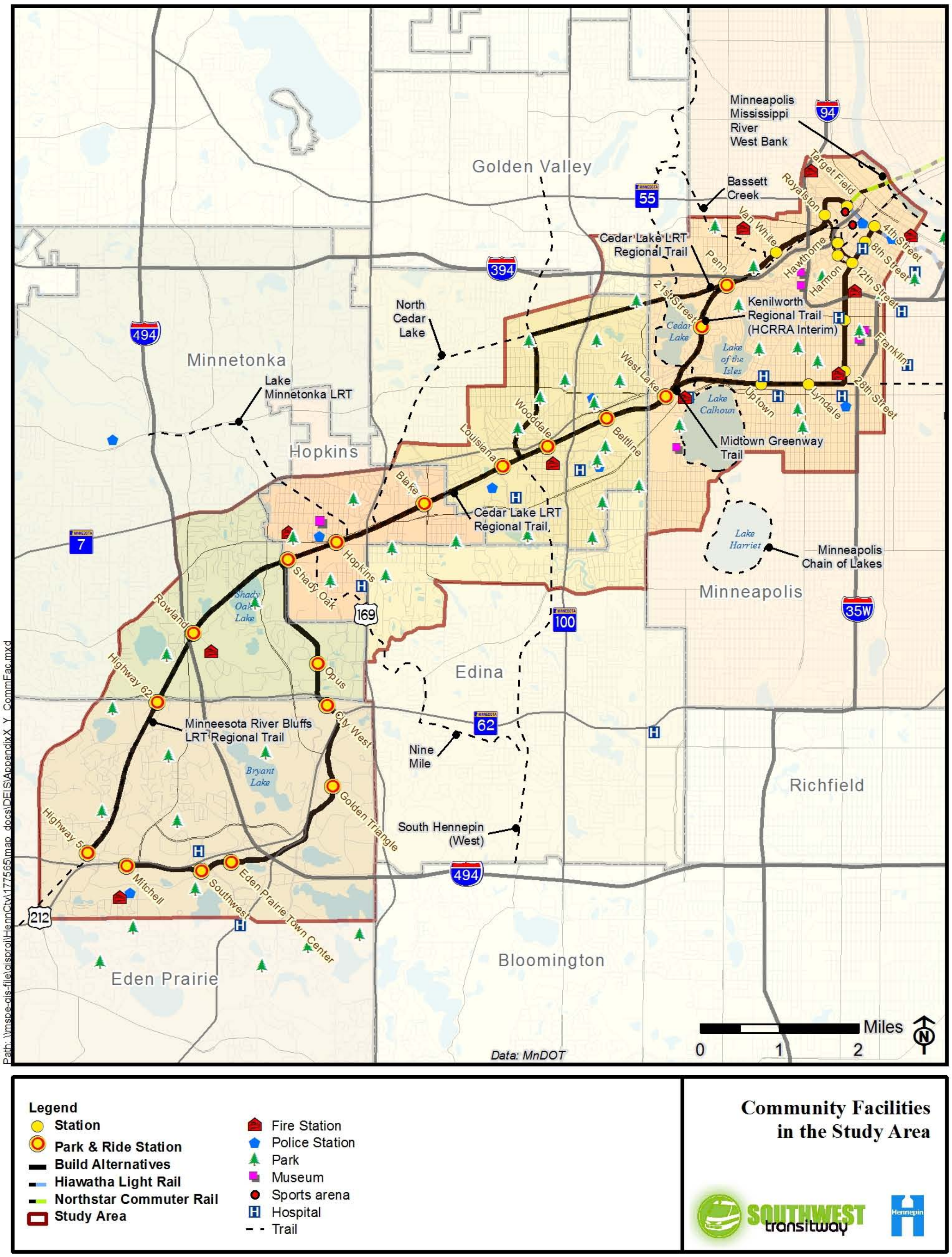


Figure 2 shows the locations of places of worship in the study area, and Table 2 provides a listing.

Table 2. Places of Worship in the Study Area

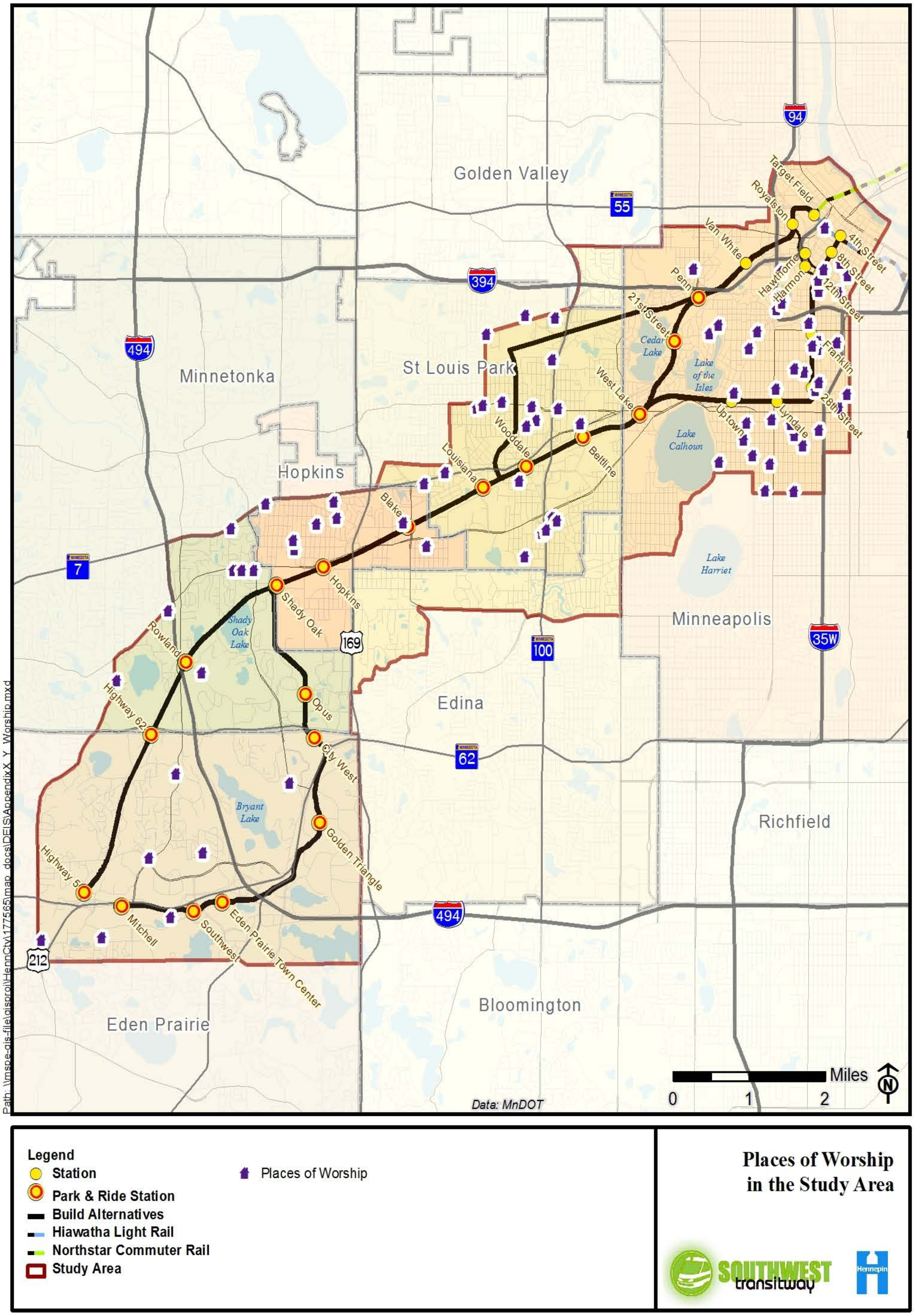
Name	Address
Eden Prairie	
Resurrection Life Church	16397 Glory Lane
Eden Prairie United Methodist Church	15050 Scenic Heights Road
St. Andrew Lutheran Church	13600 Technology Drive
Life Church	14100 Valley View Road
City Hill Fellowship	12901 Roberts Drive
Liberty Baptist Church	6500 Baker Road
Wooddale Church	6630 Shady Oak Road
Minnetonka	
Bethlehem Lutheran Church	5701 Eden Prairie Road
Old Apostolic Lutheran Church	5617 Rowland Road
Immaculate Heart of Mary	13505 Excelsior Boulevard
Faith Presbyterian Church	12007 Excelsior Boulevard
West Oaks Community Church	11901 Excelsior Boulevard
Cross of Glory Baptist Church	4600 Shady Oak Road
Fairview Evangelical Lutheran Church	4215 Fairview Avenue
Lutheran Community of Grace	11400 4th Street North
Hopkins	
St Joseph's Church of Hopkins	1310 Mainstreet
Hope Baptist Church	33 14th Avenue North
Church of the Cross	201 9th Avenue North
Zion Lutheran Church of Hopkins	241 5th Avenue
Mizpan United Church of Christ	412 5th Avenue
Living Waters Christian Church	1002 2nd Street
St. John The Evangelist Catholic Church	6 Interlachen Road
St. Louis Park	
Baha'i Faith	3037 Jersey Ave South
Lutheran Church-Reformation	2544 Highway 100 South
Ascension Lutheran Church	6719 Cedar Lake Road
The Wellness Interfaith Church	5871 Cedar Lake Road
St. Paul Capital	5353 Gamble Dr. #395
Prince of Peace Lutheran Church	8115 TH 7

Name	Address
Knollwood Church of Christ	3639 Quebec Avenue South
Anglican Church-St. Dunstan	4241 Brookside Avenue
First Ukrainian Evangelical Baptist Church of Minnesota	5450 West 41st Street
Wooddale Lutheran Church	4003 Wooddale Avenue South
Most Holy Trinity Catholic Parish	4017 Utica Avenue South
Union Congregational Church	3700 Alabama Avenue South
Holy Family Catholic Church	5900 West Lake Street
Macedonian Evangelical Miss Baptist Church	3208 Xenwood Avenue South
B'Nai Emet Synagogue	3115 Ottawa Avenue South
St. George's Episcopal Church	5224 Minnetonka Boulevard
Spirit of Christ Community Lutheran Church	5801 Minnetonka Boulevard
Sherwood Bible Church	6408 Minnetonka Boulevard
St. Louis Park Evangelical Free Church	6805 Minnetonka Boulevard
Minneapolis	
Basilica of St. Mary	88 17th Street North
St. Paul's Episcopal Church	1917 Logan Avenue South
Grace-Trinity Community Church	1430 West 28th Street
Temple Israel	2324 Emerson Avenue South
Hennepin Ave United Methodist Church	511 Groveland Avenue
Plymouth Church Neighborhood	430 Oak Grove Street
Fowler Methodist Episcopal Church	2011 Dupont Avenue South
Saint Mark's Episcopal Cathedral	519 Oak Grove Street
Lake of the Isles Lutheran Church	2020 West Lake of the Isles Parkway
Central Lutheran Church	333 12th Street South
Westminster Presbyterian Church	1200 Marquette Avenue
Salem English Lutheran Church	2822 Lyndale Avenue
Church of Scientology	1011 Nicollet Mall
St Olaf Catholic Church	215 8th Street South
Gethsemane Episcopal Church	905 4th Avenue South
St Mary's Greek Orthodox Church	3450 Irving Avenue South
First Universalist Church	3400 Dupont Avenue South
Aldrich Ave Presbyterian Church	3501 Aldrich Avenue South
Zion Lutheran Church	128 West 33rd Street
St John's Baptist Church	3232 Fremont Avenue South
Joyce United Methodist Church	3041 Fremont Avenue South
Lyndale Congregational United	810 West 31st Street

Name	Address
Vietnamese Alliance Church	3100 Grand Avenue
Stewart Memorial Presbyterian Church	116 East 32nd Street
Liberal Catholic Church	3201 Pleasant Avenue South
Simpson United Methodist Church	2740 1st Avenue South
Minneapolis Hispanic SDA Church	2700 Stevens Avenue South
Calvary Church	2608 Blaisdell Avenue South
Spirit of St Stephens Catholic Community	106 East 24th Street
Seventh-Day Adventist Church	2315 Nicollet Avenue
First Christian Church	2201 1st Avenue South
Church of St Stephen	2211 Clinton Avenue South
Plymouth Congregational Church	1900 Nicollet Avenue
Open Door Evangelistic World	615 East 28th Street
St Thomas Apostle Church	2914 West 44th Street
Linden Hills Congregational	4200 Upton Avenue South
Loring Nicollet-Bethlehem	2539 Pleasant Avenue South

Source: HDR Engineering, Inc.

Figure 2. Places of Worship in the Study Area



Schools

Twenty three schools are located within the Southwest Transitway study area. Figure 3 illustrates the locations of the schools, and Table 3 provides a listing, along with their addresses and 2011-2012 academic year enrollments.

Table 3. Schools and Enrollments in the Study Area

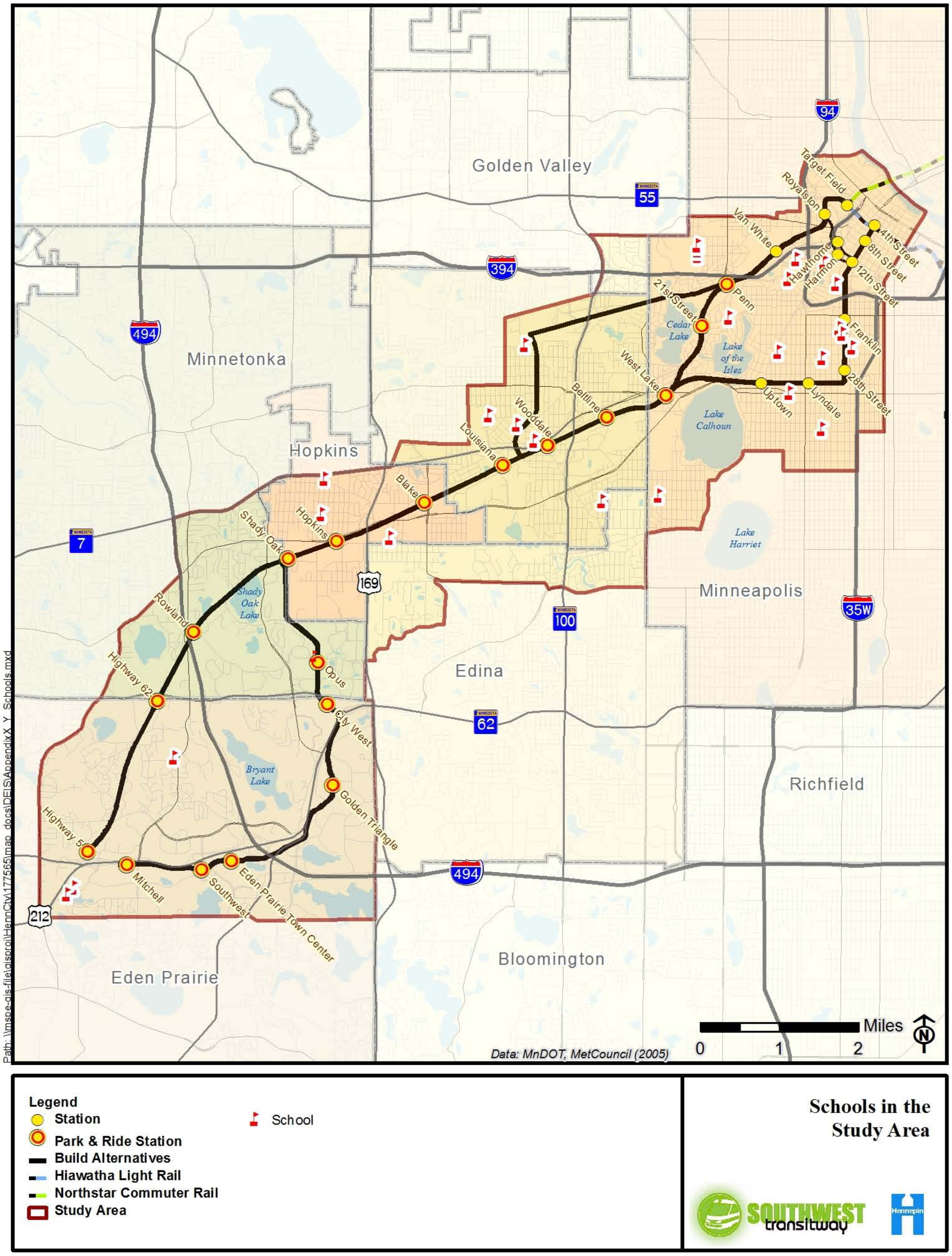
Name	Address	2011-2012 Enrollment
Eden Prairie		
Central Middle School	8025 School Road	1,417
Forest Hills Elementary School	13708 Holly Road	554
Eagle Heights Spanish Immersion School	8100 School Road	810
Minnetonka		
Bren Road Education Center	11140 Bren Road West	
Hopkins		
Alice Smith Elementary School	801 Minnetonka Mills Road	579
Harley Hopkins Family Center	125 Monroe Avenue South	116
Blake School	110 Blake Road South	573
St. Louis Park		
St. Louis Park Senior High School	6425 West 33rd Street	1,370
Park Spanish Immersion (PSI) School	6300 Walker Street	515
Susan Lindgren Intermediate Center	4801 West 41st Street	501
Metropolitan Open School	3390 Library Lane	4
Peter Hobart Elementary School	6500 W. 26th St.	553
Benilde-St. Margaret High School	2501 Highway 100	1,183
Jewish Day School and Community Center	4330 Cedar Lake Road	
Holy Family Academy	5925 West Lake Street	201
Minneapolis		
Kenwood Community/Performing Arts School	2013 Penn Avenue South	451
Anwatin Middle School	256 Upton Avenue South	547
Harrison Education Center	501 Irving Avenue North	65
Bryn Mawr Community School	252 Upton Avenue South	445
Park View Montessori School	252 Upton Avenue South	
Blake School	511 Kenwood Parkway	524
Dunwoody College of Technology	818 Dunwoody Boulevard	1,409[a]
Minneapolis Community and Technical College	1501 Hennepin Avenue	14,609[a]
Lake Harriet Community Lower School	4030 Chowen Avenue South	402
Lyndale Community School	312 West 34th Street	495
Jefferson Community School	1200 West 26th Street	658

Name	Address	2011-2012 Enrollment
Success Academy	1006 West Lake Street	15
Whittier International Elementary School	315 West 26th Street	638
Emerson Spanish Immersion Elementary School	1421 Spruce Place	426

Sources: Minnesota Department of Education, 2010; Minnesota Office of Higher Education, 2010; Minneapolis Community and Technical College, 2010

[a] Student enrollment for the 2010-2011 academic year.

Figure 3. Schools in the Study Area



Community Facilities and Resources, Places of Worship, Schools, and Public Housing by Segment

No Build Alternative

The No Build Alternative represents the planned changes and would not have an impact on community facilities and resources, places of worship, schools, or public housing in the study area.

Enhanced Bus Alternative

The Enhanced Bus Alternative represents improved bus service, which would improve access to community facilities and resources, places of worship, schools, and public housing in the study area. Implementation of the Enhanced Bus Alternative is not anticipated to have any impacts to community facilities or resources. With traffic levels projected to increase in the study area over the next 20 years, more vehicles could result in additional pressures on community facilities and resources such as increased demands for parking, traffic noise levels, or air quality impacts. The construction of bus stops would be largely in the public ROW on the edges of current transportation facilities and transportation ROW easements. The bus route would not require the acquisition of property. Bus stops would be located in existing public ROW, and in the unlikely event a bus stop is required to be located on private property, all necessary ROW acquisition steps would be taken.

Build Alternatives

Table 4 provides an inventory of community facilities and resources, places of worship, schools, and public housing within a half-mile of proposed stations, by project planning segment. Because the half-mile radiuses of some stations overlap, some community facilities are located within a half-mile of two stations, but are listed only once for each segment, according to the station they are closest to. In downtown Minneapolis, several stations would provide access to many of the same community facilities.

Table 4. Community Facilities by Segment and LRT Station

Community Facility	Station	Neighborhood/City	Address
Segment 1 (LRT 1A)			
Central Middle School	TH 5	Eden Prairie	8025 School Road
Minnetonka Fire Station 3	Rowland	Minnetonka	5700 Rowland Road
Old Apostolic Lutheran Church	Rowland	Minnetonka	5617 Rowland Road
Segment 3 (LRT 3A, LRT 3A-1, LRT 3C-1, and LRT 3C-2)			
Eden Prairie United Methodist Church	Mitchell	Eden Prairie	15050 Scenic Heights Road
Eden Prairie Fire Station1	Mitchell	Eden Prairie	14800 Scenic Heights Road
Eden Prairie City Center & Police Department	Mitchell	Eden Prairie	8080 Mitchell Road
The Eden Prairie Art Center	Mitchell	Eden Prairie	7650 Equitable Drive
St. Andrew Lutheran Church	Southwest	Eden Prairie	13600 Technology Drive

Community Facility	Station	Neighborhood/City	Address
Fairview Eden Center Clinic	Southwest	Eden Prairie	830 Prairie Center Drive
Segment 4 (LRT 1A, LRT 3A, LRT 3A-1, LRT 3C-1, and LRT 3C-2)			
West Oaks Community Church	Shady Oak	Minnetonka	11901 Excelsior Boulevard
Cross of Glory Baptist Church	Shady Oak	Minnetonka	4600 Shady Oak Road
Hopkins Fire Station 1	Shady Oak	Hopkins	101 17th Avenue South
Hopkins Pavilion - Central Park	Shady Oak	Hopkins	101 16th Avenue South
St Joseph's Church of Hopkins	Hopkins	Hopkins	1310 Mainstreet
Hopkins Police Station	Hopkins	Hopkins	1010 1st Street South
Hopkins City Hall	Hopkins	Hopkins	1010 1st Street South
Valley Park	Hopkins	Hopkins	801 7th Avenue South
Hopkins Activity Center	Hopkins	Hopkins	33 14th Avenue North
Overpass Skate Park	Hopkins	Hopkins	
Hopkins Center for the Arts	Hopkins	Hopkins	1111 Mainstreet
Hopkins Library	Hopkins	Hopkins	22 11th Avenue North
Interlachen Park	Blake	Hopkins	262 Homedale Road
St. John The Evangelist Catholic Church	Blake	Hopkins	6 Interlachen Road
Living Waters Christian Church	Blake	Hopkins	1002 2nd Street
Oakes Park	Blake	Hopkins	900 Lake Street NE
St. Louis Park Police Substation	Louisiana	Meadowbrook Neighborhood, St. Louis Park	4072 Meadowbrook Lane
Park Nicollet Methodist Hospital	Louisiana	Brooklawns Neighborhood, St. Louis Park	6500 Excelsior Boulevard
Union Congregational Church	Wooddale		3700 Alabama Avenue
St. Louis Park Fire Station 1	Wooddale	Elmwood Neighborhood, St. Louis Park	3750 Wooddale Avenue
Park Spanish Immersion (PSI) School	Wooddale	Sorenson Neighborhood, St. Louis Park	6300 Walker Street
Parkview Park	Wooddale	Lenox Neighborhood, St. Louis Park	

Community Facility	Station	Neighborhood/City	Address
St. Louis Park Senior High School	Wooddale	Lenox Neighborhood, St. Louis Park	6425 West 33rd Street
Holy Family Catholic Church	Wooddale	Sorenson Neighborhood, St. Louis Park	5900 West Lake Street
The St. Louis Park Recreation Center	Beltline	Wolfe Park Neighborhood, St. Louis Park	3700 Monterey Drive
Excelsior & Grand	Beltline	Wolfe Park Neighborhood, St. Louis Park	4630 Excelsior Boulevard
Bass Lake Park	Beltline	Wolfe Park Neighborhood, St. Louis Park	
B'Nai Emet Synagogue	Beltline	Triangle Neighborhood, St. Louis Park	3115 Ottawa Avenue
Wolfe Park	Beltline	Wolfe Park Neighborhood, St. Louis Park	
Carpenter Park	Beltline	Triangle Neighborhood, St. Louis Park	
St. Louis Park Police Station	Beltline	Triangle Neighborhood, St. Louis Park	5005 Minnetonka Boulevard
St. Louis Park City Hall	Beltline	Triangle Neighborhood, St. Louis Park	5005 Minnetonka Boulevard
St. George's Episcopal Church	Beltline	Fern Hill Neighborhood, St. Louis Park	5224 Minnetonka Boulevard
Fern Hill Park	Beltline	Fern Hill Neighborhood, St. Louis Park	
Minneapolis Fire Station 22	West Lake	West Calhoun Neighborhood, Minneapolis	3025 Market Plaza
Fairview Uptown Clinic	West Lake	West Calhoun Neighborhood, Minneapolis	3033 Excelsior Boulevard
Segment A (LRT 1A. LRT 3A and LRT 3A-1)			
Kenwood Community/Performing Arts School	21st Street	Kenwood Neighborhood, Minneapolis	2013 Penn Avenue South
Minneapolis Chain of Lakes Regional Park (portion of)	21st Street	Kenwood Neighborhood, Minneapolis	
Lake of the Isles Lutheran Church	Penn	Kenwood Neighborhood, Minneapolis	2020 West Lake of the Isles Parkway
St. Paul's Episcopal Church	Penn	Lowry Hill Neighborhood, Minneapolis	1917 Logan Avenue South
Kenwood Park	Penn	Kenwood Neighborhood, Minneapolis	

Community Facility	Station	Neighborhood/City	Address
Bryn Mawr Meadows	Van White	Bryn Mawr Neighborhood, Minneapolis	
Blake School Upper	Van White	Lowry Hill Neighborhood, Minneapolis	511 Kenwood Parkway
Minneapolis Sculpture Garden	Van White	Lowry Hill Neighborhood, Minneapolis	
Dunwoody College of Technology	Van White	Lowry Hill Neighborhood, Minneapolis	818 Dunwoody Boulevard
Basilica of St. Mary	Van White	Loring Park Neighborhood, Minneapolis	88 17th Street North
Walker Art Center	Van White	Lowry Hill Neighborhood, Minneapolis	1750 Hennepin Avenue
Minneapolis Farmers Market	Royalston	North Loop Neighborhood, Minneapolis	312 East Lyndale Avenue
Orpheum Theater	Royalston	Downtown West Neighborhood, Minneapolis	824 Hennepin Avenue
Target Field	Target Field	North Loop Neighborhood, Minneapolis	
Northstar Commuter Rail	Target Field	North Loop Neighborhood, Minneapolis	
Target Center	Target Field	Downtown West Neighborhood, Minneapolis	600 1st Avenue North
First Avenue/7th Street Entry	Target Field	Downtown West Neighborhood, Minneapolis	701 1st Avenue North
Pantages Theater	Target Field	Downtown West Neighborhood, Minneapolis	710 Hennepin Avenue
Illusion Theater	Target Field	Downtown West Neighborhood, Minneapolis	528 Hennepin Avenue
3 Degrees Church	Target Field	Downtown West Neighborhood, Minneapolis	113 5th Street North
Minneapolis Police 1st Precinct	Target Field	Downtown West Neighborhood, Minneapolis	29 5th Street South
Minneapolis Public Library	Target Field	Downtown West Neighborhood, Minneapolis	300 Nicollet Mall

Community Facility	Station	Neighborhood/City	Address
Segment C-1 (LRT 3C-1)			
St John's Baptist Church	Uptown	CARAG Neighborhood, Minneapolis	3232 Fremont Avenue
Joyce United Methodist Church	Uptown	CARAG Neighborhood, Minneapolis	3041 Fremont Avenue
Granada Theater	Uptown	ECCO Neighborhood, Minneapolis	3022 Hennepin Avenue
Uptown Theater	Uptown	East Isles Neighborhood, Minneapolis	2900 Hennepin Avenue
Walker Public Library	Uptown	East Isles Neighborhood, Minneapolis	2880 Hennepin Avenue
Allina Medical Clinic	Uptown	CARAG Neighborhood, Minneapolis	1221 West Lake Street
Grace-Trinity Community Church	Uptown	East Isles Neighborhood, Minneapolis	1430 West 28th Street
Levin Park	Uptown	East Isles Neighborhood, Minneapolis	
Jefferson Community School	Uptown	Lowry Hill East Neighborhood, Minneapolis	1200 West 26th Street
Minneapolis Chain of Lakes Regional Park (portion of)	Uptown	ECCO Minneapolis	
Success Academy	Lyndale	Lowry Hill East Neighborhood, Minneapolis	1006 West Lake Street
Bryant Square Park	Lyndale	CARAG Neighborhood, Minneapolis	
Lyndale Congregational United	Lyndale	CARAG Neighborhood, Minneapolis	810 West 31st Street
Vietnamese Alliance Church	Lyndale	CARAG Neighborhood, Minneapolis	3100 Grand Avenue
Liberal Catholic Church	Lyndale	Lyndale Neighborhood, Minneapolis	3201 Pleasant Avenue
The Jungle Theater	Lyndale	Whittier Neighborhood, Minneapolis	2951 Lyndale Avenue
Salem English Lutheran Church	Lyndale	Whittier Neighborhood, Minneapolis	2822 Lyndale Avenue
Mueller Park	Lyndale	Lowry Hill East Neighborhood, Minneapolis	
Whittier Park	Lyndale	Whittier Neighborhood, Minneapolis	

Community Facility	Station	Neighborhood/City	Address
Whittier International School	Lyndale	Whittier Neighborhood, Minneapolis	315 West 26th Street
Whittier Neighborhood Center	Lyndale	Whittier Neighborhood, Minneapolis	425 West 26th Street
Family Medical Center HCMC Clinic	28th Street	Lyndale Neighborhood, Minneapolis	5 West Lake Street
Minneapolis Police 5th Precinct	28th Street	Whittier Neighborhood, Minneapolis	3101 Nicollet Avenue
Simpson United Methodist Church	28th Street	Whittier Neighborhood, Minneapolis	2740 1st Avenue South
Minneapolis Fire Station 8	28th Street	Whittier Neighborhood, Minneapolis	2749 Blaisdell Avenue
Minneapolis Hispanic SDA Church	28th Street	Whittier Neighborhood, Minneapolis	2700 Stevens Avenue
Open Door Evangelistic World	28th Street	Phillips West Neighborhood, Minneapolis	615 East 28th Street
Calvary Church	28th Street	Whittier Neighborhood, Minneapolis	2608 Blaisdell Avenue
Loring Nicollet-Bethlehem	28th Street	Whittier Neighborhood, Minneapolis	2539 Pleasant Avenue
Minneapolis College of Art and Design	Franklin	Whittier Neighborhood, Minneapolis	2400 3rd Avenue South
The Minneapolis Institute of Arts	Franklin	Whittier Neighborhood, Minneapolis	2400 3rd Avenue South
Washburn Fair Oaks	Franklin	Whittier Neighborhood, Minneapolis	
The Hennepin History Museum	Franklin	Whittier Neighborhood, Minneapolis	2303 3rd Avenue South
Church of St. Stephen	Franklin	Whittier Neighborhood, Minneapolis	2211 Clinton Avenue
Spirit of St. Stephens Catholic Community	Franklin	Whittier Neighborhood, Minneapolis	106 East 24th Street
City of Lakes Waldorf School	Franklin	Whittier Neighborhood, Minneapolis	2344 Nicollet Avenue
Seventh-Day Adventist Church	Franklin	Whittier Neighborhood, Minneapolis	2315 Nicollet Avenue
First Christian Church	Franklin	Whittier Neighborhood, Minneapolis	2201 1st Avenue South
Urban League Academy	Franklin	Whittier Neighborhood, Minneapolis	2201 Blaisdell Avenue
Park Nicollet Clinic	Franklin	Whittier Neighborhood, Minneapolis	2001 Blaisdell Avenue

Community Facility	Station	Neighborhood/City	Address
Plymouth Congregational Church	Franklin	Whittier Neighborhood, Minneapolis	1900 Nicollet Avenue
Minneapolis Fire Station 6	12th Street	Downtown West Neighborhood, Minneapolis	121 East 15th Street
Emerson Spanish Immersion School	12th Street	Downtown West Neighborhood, Minneapolis	1421 Spruce Place
Loring Park	12th Street	Downtown West Neighborhood, Minneapolis	1382 Willow Street
Minneapolis Convention Center	12th Street	Downtown West Neighborhood, Minneapolis	1301 2nd Avenue South
Central Lutheran Church	12th Street	Downtown West Neighborhood, Minneapolis	333 12th Street South
Wesley United Methodist Church	12th Street	Downtown West Neighborhood, Minneapolis	101 East Grant Street
Assemblies of God Churches	12th Street	Downtown West Neighborhood, Minneapolis	1315 Portland Avenue
Westminster Presbyterian Church	12th Street	Downtown West Neighborhood, Minneapolis	1200 Marquette Avenue
Orchestra Hall	12th Street	Downtown West Neighborhood, Minneapolis	1111 Nicollet Mall
Minneapolis Community and Technical College	12th Street	Downtown West Neighborhood, Minneapolis	1501 Hennepin Avenue
Basilica of St. Mary	12th Street	Downtown West Neighborhood, Minneapolis	88 17th Street North
Church of Scientology	12th Street	Downtown West Neighborhood, Minneapolis	1011 Nicollet Mall
Gethsemane Episcopal Church	12th Street	Downtown West Neighborhood, Minneapolis	905 4th Avenue South
St. Olaf Catholic Church	8th Street	Downtown West Neighborhood, Minneapolis	215 8th Street South

Community Facility	Station	Neighborhood/City	Address
U.S. Post Office	8th Street	Downtown West Neighborhood, Minneapolis	110 8th Street South
Allina Medical Clinic – Medical Arts Building	8th Street	Downtown West Neighborhood, Minneapolis	825 Nicollet Mall
State Theater	8th Street	Downtown West Neighborhood, Minneapolis	805 Hennepin Avenue
Orpheum Theater	8th Street	Downtown West Neighborhood, Minneapolis	824 Hennepin Avenue
Pantages Theater	8th Street	Downtown West Neighborhood, Minneapolis	710 Hennepin Avenue
First Avenue/7th Street Entry	8th Street	Downtown West Neighborhood, Minneapolis	701 1st Avenue North
Hennepin County Government Center	4th Street	Downtown West Neighborhood, Minneapolis	300 6th Street South
Minneapolis City Hall	4th Street	Downtown West Neighborhood, Minneapolis	350 5th Street South
Illusion Theater	4th Street	Downtown West Neighborhood, Minneapolis	528 Hennepin Avenue
Target Center	4th Street	Downtown West Neighborhood, Minneapolis	600 1st Avenue North
3 Degrees Church	4th Street	Downtown West Neighborhood, Minneapolis	113 5th Street North
Target Field	4th Street	Downtown West Neighborhood, Minneapolis	
Minneapolis Public Library	4th Street	Downtown West Neighborhood, Minneapolis	300 Nicollet Mall
U.S. District Court	4th Street	Downtown West Neighborhood, Minneapolis	300 4th Street South
U.S. Post Office	4th Street	Downtown West Neighborhood, Minneapolis	307 4th Avenue South

Community Facility	Station	Neighborhood/City	Address
Minneapolis Fire Station 1	4th Street	Downtown West Neighborhood, Minneapolis	530 3rd Street South
U.S. Post Office	4th Street	Downtown West Neighborhood, Minneapolis	100 1st Street South
Segment C-2A (LRT 3C-2)			
Loring Park	11th/12th Street	Downtown West Neighborhood, Minneapolis	1382 Willow Street
Emerson Spanish Immersion	11th/12th Street	Downtown West Neighborhood, Minneapolis	1421 Spruce Place
Minneapolis Convention Center	11th/12th Street	Downtown West Neighborhood, Minneapolis	1301 Second Avenue
Wesley United Methodist Church	11th/12th Street	Downtown West Neighborhood, Minneapolis	101 East Grant Street
Westminster Presbyterian Church	11th/12th Street	Downtown West Neighborhood, Minneapolis	1200 Marquette Avenue
Orchestra Hall	11th/12th Street	Downtown West Neighborhood, Minneapolis	1111 Nicollet Mall
Church of Scientology	11th/12th Street	Downtown West Neighborhood, Minneapolis	1011 Nicollet Mall
Minneapolis Community & Technical College	11th/12th Street	Downtown West Neighborhood, Minneapolis	1501 Hennepin Avenue
Orpheum Theater	11th/12th Street	Downtown West Neighborhood, Minneapolis	824 Hennepin Avenue
State Theater	11th/12th Street	Downtown West Neighborhood, Minneapolis	805 Hennepin Avenue
Allina Hospitals & Clinics - Medical Arts Building	11th/12th Street	Downtown West Neighborhood, Minneapolis	825 Nicollet Mall
U.S. Post Office	11th/12th Street	Downtown West Neighborhood, Minneapolis	110 8th Street South

Community Facility	Station	Neighborhood/City	Address
St. Olaf Catholic Church	11th/12th Street	Downtown West Neighborhood, Minneapolis	215 8th Street South
Pantages Theater	11th/12th Street	Downtown West Neighborhood, Minneapolis	710 Hennepin Avenue
Target Center	11th/12th Street	Downtown West Neighborhood, Minneapolis	600 1st Avenue North
Illusion Theater	11th/12th Street	Downtown West Neighborhood, Minneapolis	528 Hennepin Avenue
Minneapolis Police 1st Precinct	11th/12th Street	Downtown West Neighborhood, Minneapolis	29 5th Street South
3 Degrees Church	11th/12th Street	Downtown West Neighborhood, Minneapolis	113 5th Street North
Target Field	11th/12th Street	Downtown West Neighborhood, Minneapolis	

Trails – Federal Funding Information

Project Name (on enhancements.org)	Trail Name	Geographic Description	City	Funding			Year Programmed
				Federal Award	Local Match	Total Cost	
Mpls-Bikeway	Cedar Lake Trail	TH 100 to Royalston Avenue	Minneapolis	$ 648,155	$ 445,746	$ 1,093,901	1995
Kenilworth Trail	Kenilworth Trail		Minneapolis	$ 500,634	$ 125,159	$ 625,793	1999
TH 7 Overpass on SWLRT Regional Trail	Bridge over TH 7	Bridge between Beltline Blvd & TH100	St.Louis Park	$ 353,762	$ 88,440	$ 442,202	2002
Midtown Greenway Safety Elements	Midtown Greenway		Minneapolis	$ 450,000	$ 118,108	$ 568,108	2003
Urban Villlage Midtown Greenway	Midtown Greenway	From Dupont to Colfax	Minneapolis	$ 338,139	$ 84,535	$ 422,674	2006
Cedar Lake Trail-3rd Ave N Connection	Twins Way	Between 7th St N & 12th St N	Minneapolis	$ 484,572	$ -	$ 484,572	2010
At Beltline Blvd in SLP	Bridge over Beltline		St.Louis Park	$ 1,027,200	$ 256,800	$ 1,284,000	2011

Hennepin County Regional Railroad Authority Property Ownership in the Kenilworth Corridor

Technical Memorandum

To: Katie Walker, Transit Manager, Hennepin County Housing Community Works & Transit

From: Adele Hall, Senior Transit Planner
Jessica Galatz, Senior Planning Analyst
Gary Galbavy, Principal Planning Analyst
Hennepin County Housing Community Works & Transit

Date: March 23, 2012

Re: Southwest LRT DEIS – Clarification of Hennepin County Regional Railroad Authority Property Ownership in the Kenilworth Corridor

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Problem Statement
Project mapping using Hennepin County-generated parcel data and aerial photography shows freight rail tracks on Minneapolis Park and Recreation Board (MPRB) property in segments of the Kenilworth Corridor through Minneapolis. See Exhibit A, attached. These freight rail tracks are actually located on Hennepin County Regional Railroad Authority (HCRRA) property.

Background
<u>Parcel Data Generation</u>
In the early 1990s, Hennepin County parcel data was created for use in geographic information systems by digitizing hand-drawn parcel maps. The process used to digitize the maps resulted in parcel data that is of sufficient quality for tax purposes, but is not surveyor quality. When overlaid with aerial photography, the parcel data does not accurately portray the location of parcel boundaries in relation to physical features and thus freight rail tracks appear to be within parcels owned by the Minneapolis Park and Recreation Board.

Hennepin County currently endeavors to improve its parcel data to more accurate standards however improved parcel data has not yet been created for the Kenilworth Corridor. Updated parcel data of survey quality will be generated as the Southwest LRT project progresses into Preliminary Engineering and Final Design.

<u>Rail Corridor Ownership</u>
HCRRA acquired the Chicago and Northwestern Railroad right-of-way, bridges, and other related structures in 1984, and the trackage rights in 1993. The freight railroad tracks were within the 44 foot right-of-way acquired by HCRRA, so by definition HCRRA owns the land under the railroad tracks, as well as the tracks themselves.

Conclusion
Freight rail tracks in the Kenilworth Corridor are located entirely on HCRRA property. Display of freight railroad tracks on Minneapolis Park and Recreation Board property is a result of parcel data inaccuracies only and does not reflect true ownership.

Exhibit A: Mismatch of Aerial Photography & Parcel Data

Data Sources: Hennepin County, Metropolitan Council, MN-DNR, MN-DOT, USDA-FSA, NRCS, USGS

Disclaimer: This map is a compilation of data from various sources and is furnished "AS IS" with no representation or warranty expressed or implied, including fitness for any particular purpose, merchantability, or the accuracy and completeness of the information shown.

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Hennepin County
Department of Housing, Community Works & Transit

Operations and maintenance Facility Site Evaluation

OPERATIONS & MAINTENANCE FACILITY SITE EVALUATION

Background

For purposes of the Draft Environmental Impact Statement (DEIS) document a set of viable operations and maintenance facility (OMF) candidate sites should be identified in order to document their potential impacts and to disclose to the public and agencies that the site will be considered during Preliminary Engineering (PE) as a potential site. During Preliminary Engineering (PE), the project sponsor, the Metropolitan Council, will work with the partner cities to conduct a more in depth analysis to determine the preferred OMF site for the Southwest LRT line. The impacts of the OMF and any mitigation requirements for those impacts will be included in the Final Environmental Impact Statement (FEIS).

The Southwest Transitway DEIS includes four build alternatives, LRT 1A, LRT 3A, LRT 3 C-1 and LRT 3C-2. Each of the four alternatives must be served by at least one candidate OMF site identified in the DEIS, but some of the candidate OMF sites may serve more than one of the build alternatives.

The purpose of this analysis is to identify all candidate sites and then narrow them to those that are the most viable for further consideration during the Preliminary Engineering/FEIS process.

The operations and maintenance facility (OMF) for the Southwest light rail transit (LRT) line will have the following physical requirements:

- 10-15 acre site to store 25 plus light rail vehicles (LRVs) and to conduct heavy maintenance activities (vehicle washing, painting, routine maintenance, etc…)
- The site should be rectangular in shape with the length approximately three (3) times the width
- Ability to move trains in/out both ends of the facility
- Adjacent to a tangent and relatively flat (1% or less grade) section of mainline to accommodate turnouts
- Good roadway access for equipment and employees

In addition, the following are preferred characteristics of an OMF:

- Compatibility with adjacent current and planned land uses
- Land zoned industrial and/or light industrial
- Undeveloped property to minimize acquisition and relocation costs

- Public land
- Preferred location near one end of line (the end with dominant ridership loadings in AM) to minimize deadheading of empty vehicles.

Evaluation Process

The consultant team conducted a field visit and identified 14candidate sites that fulfill Metro Transit's requirements for an OMF. Using feedback from the Southwest TAC, the candidate sites were narrowed and those sites will be included in the DEIS for the purposes of documenting potential impacts and disclosing to the public and agencies the potential use of the property. Agencies and the public are encouraged to provide comments on the candidate OMF sites during the DEIS public comment period. All comments received will be addressed during the PE/FEIS process and will assist in informing the final decision on the OMF site.

Please note: the final OMF site will be determined during the PE/FEIS phase of project development and after a more thorough review and in direction consultation with the partner cities. It is possible that additional candidate OMF sites may be identified during the PE/FEIS phase of project development. If a new site is identified it can be included in the process at that time.

For the purposes of identifying candidates sites for inclusion in the DEIS, the consultant team evaluated the candidate sites and documented their potential benefits and issues. The intent of this evaluation was to narrow the candidate sites to the most promising sites for inclusion in the DEIS. Again, the final OMF site will be determined during the PE/FEIS phase of project development and after a more thorough review and in direct consultation with the partner cities.

Candidate Sites

Eden Prairie 1 (West side of TH 212 site)

Potential Benefits
- End of alignment location minimizes deadheading
- Public land minimizes acquisition costs
- Industrial area/compatible land use
- No adjacent residential properties
- Allows double ended access to shop and storage
- Good roadway access for employees and equipment
- Works for LRT 3A, 3C-1, and 3C-2. Could be modified to work with LRT 1A.

Potential Issues

- MnDOT pond impact requires relocation of pond
- Would cross TH EB 212/Wallace Road off ramp
- Cost of elevated track over TH 212
- Elevations at site may require significant retaining walls
- Would require multiple acquisitions, relocation likely required
- The existing interim use trail may need to be relocated

Eden Prairie 2 (Wallace Road site)

Potential Benefits

- End of alignment location minimizes deadheading
- Industrial area/compatible land use
- No adjacent residential properties
- Good roadway access for employees and equipment
- Excess land my also be available for remote park and ride
- Works for LRT 3A, 3C-1, and 3C-2

Potential Issues

- Site shape results in inefficient use of land
- Layout/train movements are less than desirable. Configuration would require extensive runaround movements to access both sides of the facility.
- Need design evaluation of impacts to TH 212 ramp and Wallace Road (both would need to be relocated)
- Several properties require acquisition, relocation likely required

Eden Prairie 3 (Mitchell Road/TH 5)

Potential Benefits

- A full OMF can be accommodated at this site
- End of line with dominate AM ridership likely to minimize deadhead (non-revenue service miles and hours)
- Bordered by TH 5 and Mitchell Road
- Good roadway access for employees and equipment
- May be possible to combine OMF site with park-ride lot identified for site. Screening of OMF site by parking may be possible on site.
- Works for LRT 3A, LRT 3C-1 and LRT 3C-2

Potential Issues

- Acquisition Costs likely to be substantial
- Private acquisitions, relocation likely required
- Incompatible with future development plans for the Mitchell Rd station area
- Combining the OMF with a large park/ride facility may affect redevelopment potential
- Wetland impact
- Does not work for LRT 1A
- Site topography may prove challenging

<u>Eden Prairie 4 (Costco site)</u>

Potential Benefits

- Full OMF can be accommodated
- Near end of line may minimize deadhead (non-revenue service miles and hours)
- Good roadway access for employees and equipment
- Single ownership
- Works for LRT 3A, LRT 3C-1 and LRT 3C-2

Potential Issues

- Acquisition costs likely to be substantial
- Private acquisitions, relocation required
- Incompatible with the Major Center Area/Town Center Station area plans
- Does not work for LRT 1A

<u>Eden Prairie 5A (City West site)</u>

Potential Benefits

- Full OMF can be accommodated
- Bordered by TH 212 and TH 62
- Good roadway access for employees and equipment
- Single ownership
- Works for LRT 3A, LRT 3C-1 and LRT 3C-2

Potential Issues

- Acquisition costs likely to be substantial
- Incompatible with future development of United Health Group (UHG)campus/City West station
- Development agreement with UHG completed and this may compromise

- Does not work for LRT 1A
- Site topography may prove challenging
- Wetlands would likely be impacted

Eden Prairie 5B (TH 62 r/w site)

Potential Benefits
- With modifications to frontage road and acquisitions a full OMF can be accommodated
- Near the end of line may minimize deadhead (non-revenue service miles and hours)
- Bordered by TH 212 and TH 62
- Good roadway access for employees and equipment
- Some public ownership with private property acquisitions also required
- Works for LRT 3A, LRT 3C-1 and LRT 3C-2

Potential Issues
- Development agreement with UHG completed and this may compromise
- Wetlands would likely be impacted
- Frontage road would need to be realigned
- Does not work for LRT 1A
- Acquisition costs may be substantial

Minnetonka 1/Hopkins 1 (Shady Oak Station site)

Potential Benefits
- Good roadway access for employees and equipment
- Limited ownership
- Works for LRT 1A, 3A, LRT 3C-1 and LRT 3C-2

Potential Issues
- Site configuration is awkward and may only be able to accommodate a modified OMF
- Acquisition costs likely to be substantial
- Private acquisitions, relocation required
- Incompatible with the future development of the Shady Oak station area
- Location on north side of LRT line may impact trail due to additional trail/rail crossings
- Location in center of LRT line may negatively impact deadhead (non-revenue service miles and hours)

Hopkins 2 (Hopkins Honda site)

Potential Benefits
- Full OMF can be accommodated

- Bordered by Excelsior Blvd., CP freight rail line
- Good roadway access for employees and equipment
- Works for LRT 1A, 3A, LRT 3C-1 and LRT 3C-2
- Location on south side of LRT line may minimize impact to trail

Potential Issues
- Location in center of LRT line may negatively impact deadhead (non-revenue service miles)
- Acquisition costs likely to be substantial
- Private acquisitions, relocation required
- Site topography may present challenges
- Relatively new development on site, relocation may be difficult
- Residential uses to north of site is less than desirable
- Impact to tax revenue would be significant

Hopkins 3 (Blake Road Station site)

Potential Benefits
- Full OMF can be accommodated
- Good roadway access for employees and equipment
- Works for LRT 1A, LRT 3A, LRT 3C-1 and LRT 3C-2

Potential Issues
- Location in center of LRT line may negatively impact deadhead (non-revenue service miles and hours)
- Acquisition costs likely to be substantial
- Private acquisitions, relocation required
- Incompatible with future redevelopment plans for the Blake Road Station area
- Residential uses in close proximity to facility is not optimal
- Location on north side of LRT line may impact trail due to additional trail/rail crossings

Minneapolis 1 (Cedar Lake Yards)

Potential Benefits
- Full OMF can be accommodated
- Grade-separated from adjacent residential neighborhood
- Public ownership
- Does not conflict with future redevelopment plans
- Works for LRT 1A and LRT 3A

Potential Issues
- Location may negatively impact deadhead (non-revenue service miles)
- No roadway access and providing access will be difficult and expensive
- Does not work for LRT 3C-1 or LRT 3C-2
- KIAA passed resolution opposing use of site for OM facility
- Location may impact trails in area

Minneapolis 2 (Van While Blvd. Station site)

Potential Benefits
- Public ownership
- Works for LRT 1A and LRT 3A

Potential Impacts
- Location may negatively impact deadhead (non-revenue service miles)
- Limited roadway access
- Does not work for LRT 1A or LRT 3C-1 (Nicollet Mall)
- Modified OM site due to configuration of property
- Incompatible with future redevelopment plans for Bassett Creek Redevelopment area
- Does not work for LRT 3C-1 and LRT 3C-2
- Location may impact trail

Minneapolis 3 (Royalston Station site)

Potential Benefits
- End of line minimized deadhead (non-revenue service miles)
- Full OMF
- Works for LRT 1A, LRT 3A and LRT 3C-2 (see note below regarding grade issue)

Potential Issues
- Acquisition costs likely to be substantial
- Multiple private owners, relocation may be required
- Does not work for LRT 3C-1 (Nicollet Mall)
- Due to grades of mainline Southwest trains may not be able to access site
- Incompatible with North Loop redevelopment plans

Minneapolis 4 (5th Street site)

Potential Benefits
- End of line minimized deadhead (non-revenue service miles)

- Close proximity to Metro Transit Heywood and Heywood 2 facilities
- Good roadway access for employees and equipment
- Full OMF can be accommodated
- Works for LRT 1A, LRT 3A and LRT 3C-2

Potential Issues
- Acquisition costs likely to be substantial
- Multiple private property owners, relocation may be required
- Does not work for LRT 3C-1 (Nicollet Mall)

Minneapolis 5 (Heywood 2 site)

Potential Benefits
- End of line minimized deadhead (non-revenue service miles)
- Public ownership
- Close proximity to Metro Transit Heywood facility
- Consolidation of bus and LRT functions in a centrally located facility
- Good roadway access for employees and equipment
- Works for LRT 1A, LRT 3A and LRT 3C-2

Potential Issues
- Rail access to facility may be difficult
- Does not work for LRT 3C-1 (Nicollet Mall)

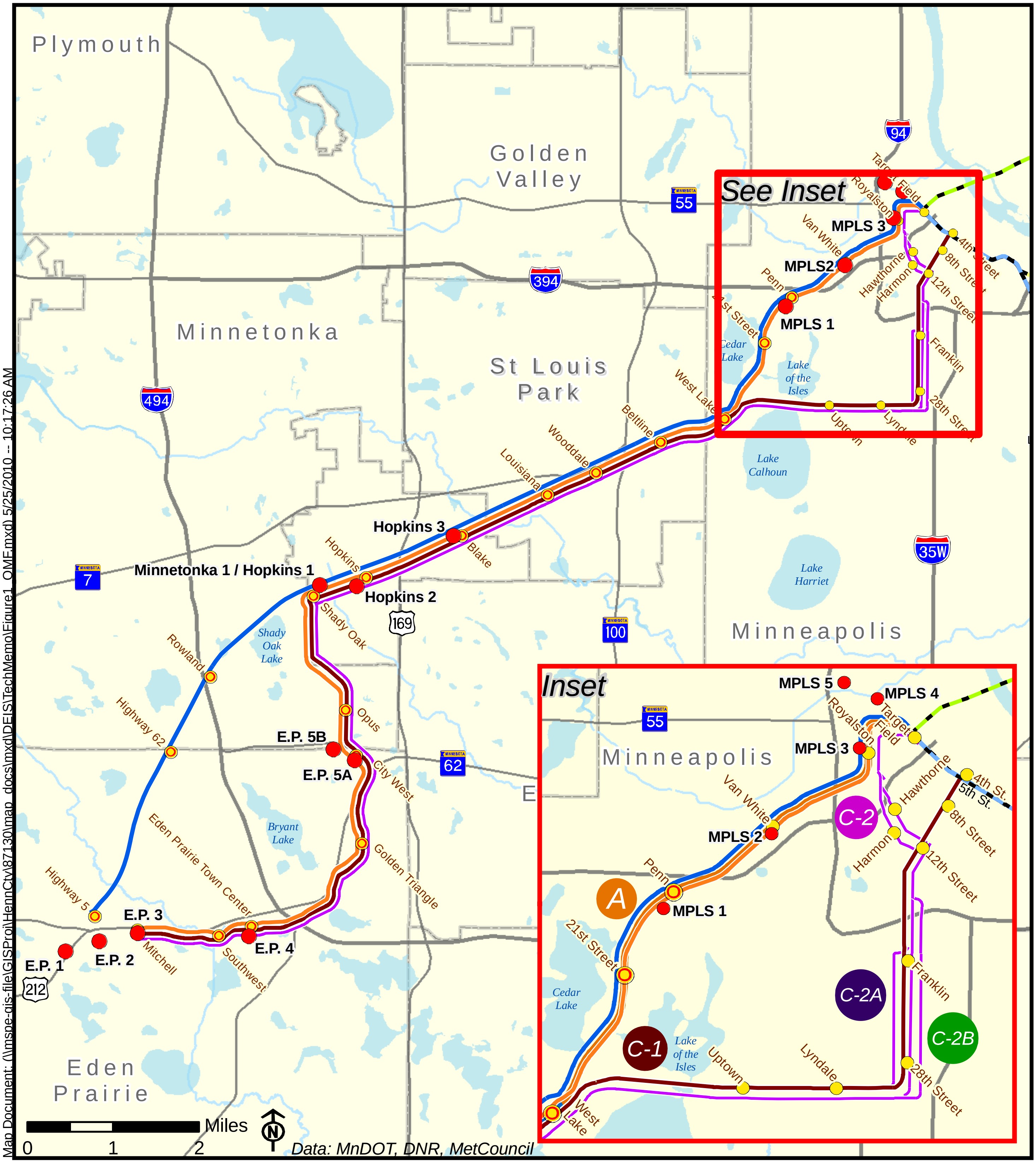
Recommendation

The consultant team recommends that the following candidate OMF sites be included in the DEIS:
- Eden Prairie 1 – This site is located south and southwest of the TH 212/Wallace Road interchange, approximately ¼ mile west of the Mitchell Road station.
- Eden Prairie 2 (Wallace Rd) – This site is located on the west side of TH 212 just south of TH 5.
- Eden Prairie 3 (Mitchell Road) – This site is located on the west side of Mitchell Road south of TH 5.
- Minneapolis 4 – This site is located approximately ¼ mile northwest of Target Field in western downtown Minneapolis. This site is centered on 5th Street North between 6th Avenue North and 10th Avenue North, and is bounded by the 3rd Street/4th Street viaduct to the northeast, and by the Metro Transit Heywood Bus Garage to the southwest.

All of these sites have the physical characteristics necessary for an operations and maintenance facility (OMF). In addition, these sites possess many of the preferred characteristics of an OMF.

As stated previously, the final OMF site will be decided upon during the Preliminary Engineering (PE) process in direct consultation with the Metropolitan Council, the HCRRA, partner cities, and other key stakeholders.

Figures 1 and 2 (attached) present the location of the potential OMF sites.



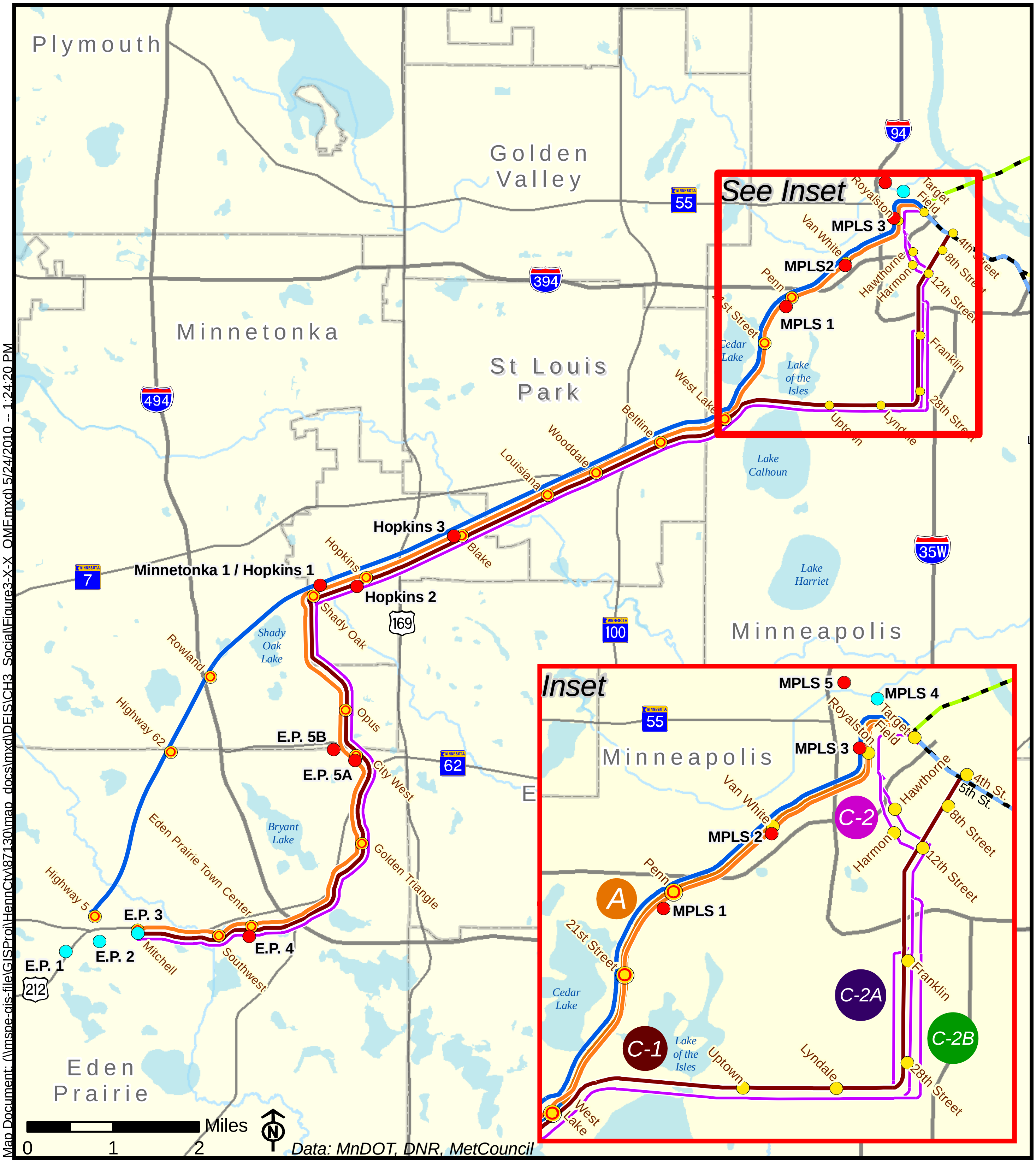
Map Document: (\\mspe-gis-file\GISProj\HennCty\87130\map_docs\mxd\DEIS\TechMemo\Figure1_OMF.mxd) 5/25/2010 -- 10:17:26 AM

Legend

- Potential OMF Location
- Station
- Park & Ride Station
- LRT 1A
- LRT 3A
- LRT 3C-1 (Nicollet Mall)
- LRT 3C-2 (11th/12th Street)
- Hiawatha Light Rail
- Northstar Commuter Rail

Figure 1
Inventory of Potential OMF Sites

SOUTHWEST transitway



Legend

- Potential OMF Site
- OMF Site Carried Forward into the DEIS
- Hiawatha Light Rail
- Northstar Commuter Rail
- Station
- Park & Ride Station
- LRT 1A
- LRT 3A
- LRT 3C-1 (Nicollet Mall)
- LRT 3C-2 (11th/12th Street)

Figure 2
OMF Sites Carried Forward into the DEIS

SOUTHWEST transitway

MN&S Freight Rail Report

MN & S Freight Rail Report

St. Louis Park and Minneapolis
Hennepin County, Minnesota

March 13, 2012

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Proposed Action

Purpose of the Proposed Action

The purpose of the Proposed Action is to study how to provide the TC&W railway with a relocated connection for operational and available freight movement to St. Paul, while minimizing adverse impacts to the surrounding community, and providing a system that is consistent with the State Rail Plan.

Background and Need for the Proposed Action

CP's Bass Lake Spur used to cross the City of Minneapolis along what was known as the 29^{th} Street Corridor and which is now known as the Midtown Greenway. On the east end of the 29^{th} Street Corridor, tracks crossed Hiawatha Avenue at-grade and eventually crossed the Mississippi River. The at-grade crossing at Hiawatha Avenue, also known as State Highway 55, was eliminated during the reconstruction of that roadway in 1998. The freight tracks in the Midtown Greenway were abandoned concurrently.

The main rail carrier on the Bass Lake Spur from St. Louis Park through the Midtown 29th Street Corridor and on to St. Paul was the TC&W. Severing the connection at Hiawatha required an alternate route for TC&W trains. One of the alternatives identified at that time was to provide a new connection to the MN&S Spur and rerouting trains over the BNSF Wayzata Subdivision. The construction of a new connection between the Bass Lake Spur and the MN&S Spur, a new connection between the MN&S Spur and the BNSF Wayzata Subdivision and the upgrading of track on the MN&S Spur (essentially the current Proposed Action) was delayed by the need to effect environmental remediation of a Superfund site that was on the path of the proposed connection. Since the severing of the connection at Hiawatha Avenue, TC&W trains have been using a freight alignment through the Kenilworth Corridor which HCRRA purchased from the Chicago Northwestern Railroad (CNW) to preserve the alignment for future light rail transit (LRT) use. The Superfund site within the study area has now been delisted. This property is located south of Highway 7 and east of Louisiana Avenue. It is commonly referred to as the Golden Auto site. An easement across the property for the proposed freight rail connection is currently held by the City of St. Louis Park.

<u>Existing Rail Service/Operations</u>

The Minneapolis St. Paul metropolitan area is a focal point of the freight railroad system in the North Central region of the United States. Four of North America's Class I railroads, 1) BNSF Railway, 2) Union Pacific Railroad, 3) Canadian Pacific Railway and 4) Canadian National provide service to the Twin Cities. Also operating in the metropolitan area are TC&W and Progressive Rail. Interchange among these carriers is facilitated by the Minnesota Commercial Railroad, classified as a switching and terminal railroad, which is based in Saint Paul. A map of the rail network in the Twin cities is shown in **Figure 4a**.

The TC&W is a regional rail system operating 234 miles of railroad between the Twin Cities to the east and Milbank, South Dakota on the west (**Figure 4b**)[1]. TC&W's operating headquarters is at Glencoe and operating crews are based at Glencoe, Montevideo, Winthrop and Hopkins. Operations commenced July 27, 1991 over what was formerly known as the "Ortonville Line" operated by the Soo Line (now Canadian Pacific Railway) between Minneapolis/St. Paul, MN and Milbank, SD. Prior to TC&W and Soo Line operation of this line, it was part of the Milwaukee Road's Main line to the Pacific Northwest. This main line was originally built in the 1870's by the Hastings & Dakota Railway.[2]

The TC&W also owns and operates the Minnesota Prairie Line, Inc. (MPL) as a wholly owned subsidiary. MPL is the agent/operator of 94 miles of track between Norwood and Hanley Falls, MN, which is owned by the Minnesota Valley Regional Railroad Authority.[3] TC&W and MPL connect at Norwood, MN.

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[1] http://www.aar.org/~/media/AAR/InCongress_RailroadsStates/Minnesota.ashx
[2] http://www.tcwr.net/general-public-2/company-overview/
[3] http://www.tcwr.net/general-public-2/company-overview/

Figure 4a. Twin Cities Metropolitan Area Rail Network

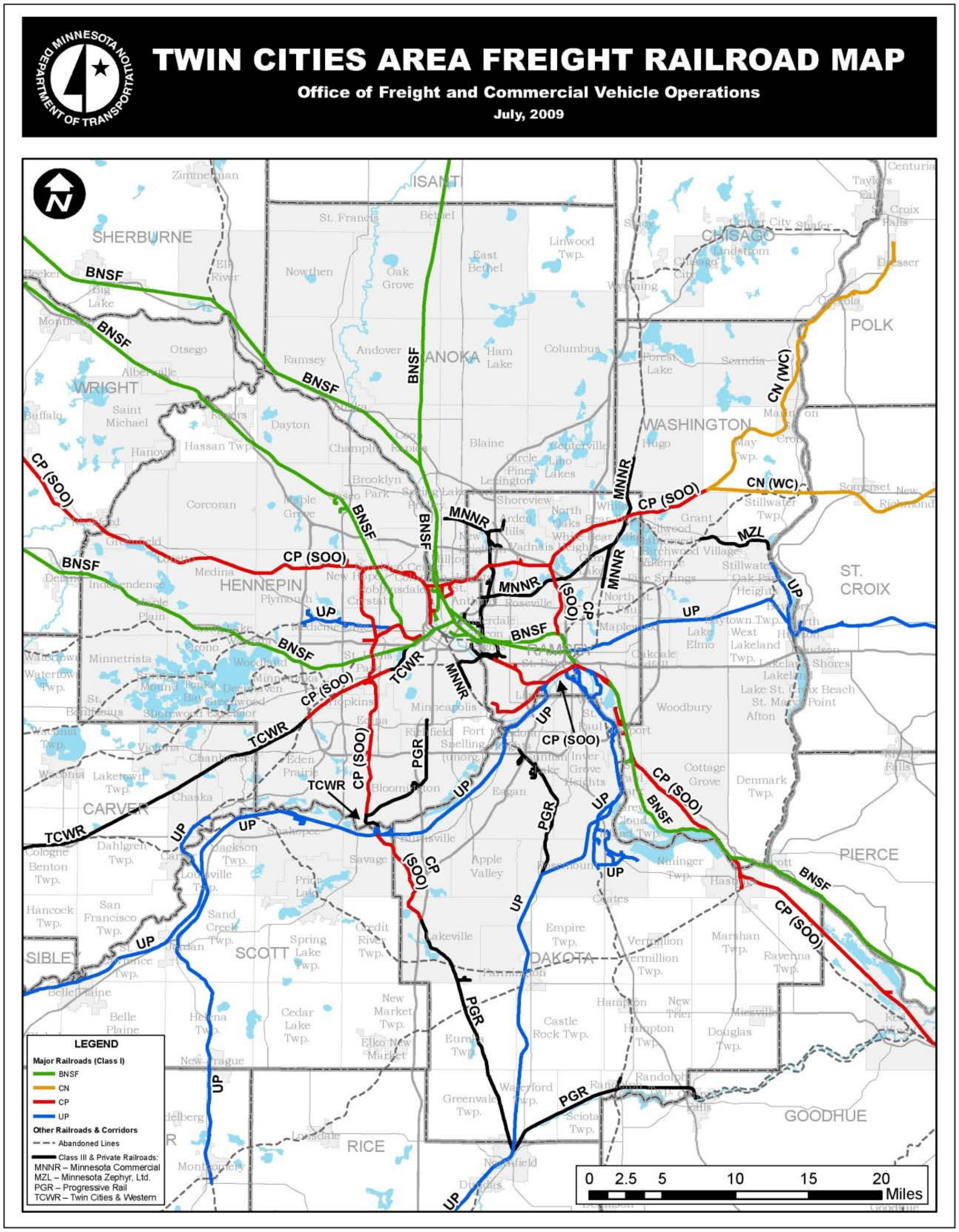
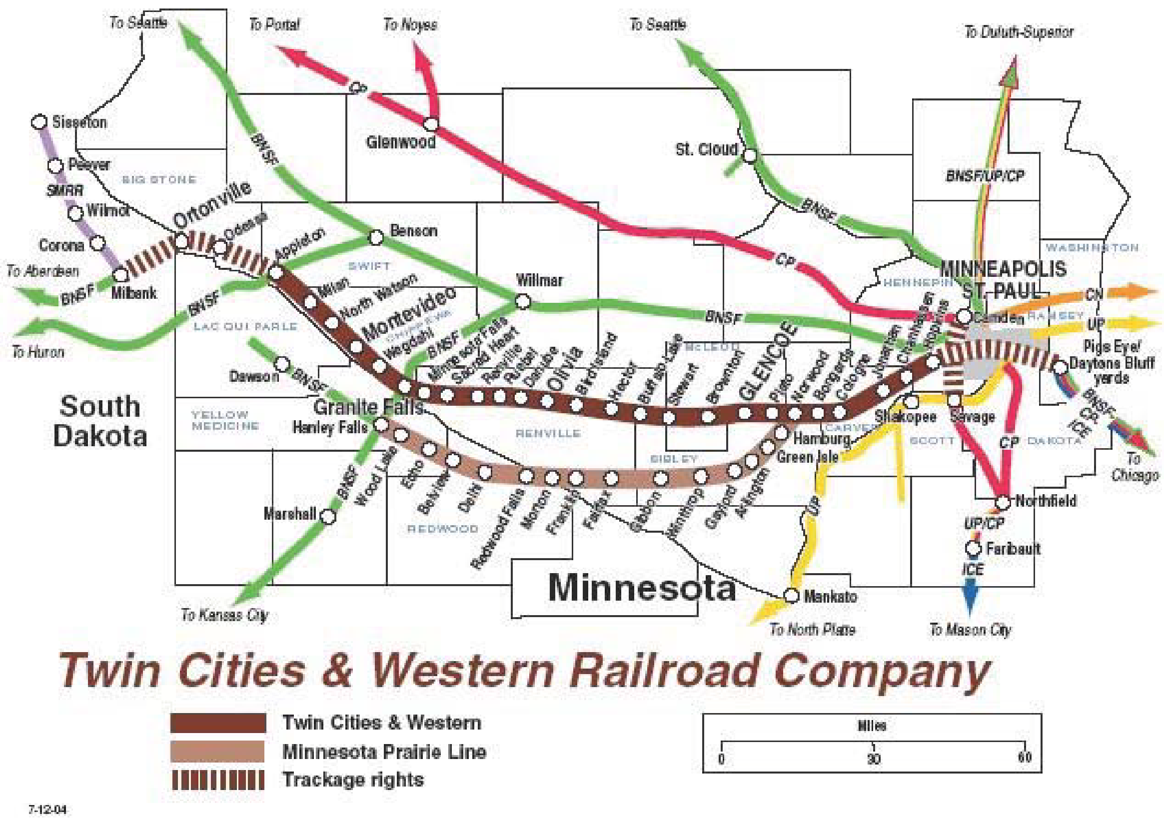


Figure 4b. Twin Cities and Western Railroad System



Existing TC&W Tracks and Connections

The east end of TC&W owned track is located at the border of the Cities of Minnetonka and Eden Prairie at County Road 62, ½ mile west of I-494. TC&W has trackage rights over both CP track and HCRRA track from County Highway 62 to Cedar Lake Junction. East of Cedar Lake Junction, TC&W currently uses the tracks of other railroads via trackage rights agreements to reach interchange yards and other destinations in the Twin Cities.

- Between County Highway 62 and West Lake Street, the TC&W currently operates on track owned by the CP. The CP refers to this track as the ***Bass Lake Spur*** (see **Figure 5**).
- Between Lake Street and Cedar Lake Junction, the TC&W currently operates on track owned by HCRRA. HCRRA refers to this track as ***the Kenilworth Corridor***.

At Cedar Lake Junction, the TC&W currently connects with the ***BNSF Wayzata Subdivision*** (see **Figure 5**). Eastbound TC&W trains entering BNSF track stop at Cedar Lake Junction or Cedar Lake Parkway (depending upon train length and where the train can stop without blocking any grade crossings) until advised over the radio by the BNSF dispatcher that they have permission to enter BNSF trackage and proceed east. BNSF cooperates with TC&W to expedite TC&W's movement but if traffic is heavy on the single-track BNSF line, TC&W crews must wait for this conflicting rail traffic to clear. TC&W uses Cedar Lake Junction to reach most destinations in the Twin Cities.

TC&W currently has trackage rights on the CP MN&S Spur, which runs north-south through St. Louis Park, at a point midway between Louisiana Avenue and Wooddale Avenue. Under current conditions, to transfer to the CP MN&S Spur, TC&W must utilize the steeply graded switchback sidings and wye in what is known as the "Skunk Hollow" area in vicinity of Louisiana Avenue. Longer trains must be broken into shorter sections in order to make this transfer.

The following section provides an overview of the existing TC&W freight traffic/operations that are proposed to be relocated to the MN&S area under the Proposed Action.

Existing Track Alignment and Area

The CP-owned Bass Lake Spur, was originally part of the Milwaukee Road Railway (MILW) mainline from Chicago to the Pacific Northwest. The Bass Lake Spur is geographically oriented, east – west. Railway timetable direction is east - west as well. For CP's operational purposes, the Bass Lake Spur is considered part of CP's Merriam Park Subdivision. TC&W has trackage rights to operate on the Bass Lake Spur between Cedar Lake Junction., which is located about two miles east of the project site, and is where the connecting track alignment ties to the BNSF Wayzata Subdivision, and west of the project site to Tower E 14, where ownership of the line changes from CP to TC&W. Currently, TC&W uses the Bass Lake Spur to move freight between points, along its system west of the project site, and east to the Twin Cities where, TC&W interchanges with four Class I railways, and two regional railways. TC&W operates light and medium tonnage local trains over the alignment, as well as high tonnage unit coal and ethanol trains. Existing Maximum Allowable Speed along the Bass Lake Spur within project limits is 25 mph for regular freight trains, and 10 mph for unit coal trains. The areas referenced below are illustrated in **Figure 5.**

- *Bass Lake Spur/Skunk Hollow Area*

  Within project limits, the Bass Lake Spur is double track, with the south track being the single main track and the north track being the siding track. The existing right of way in this section varies between 54 and 70 feet. Cedar Lake Trail parallels the alignment on the north side, within existing HCRRA right of way. Both track sections consist of 112 lb jointed rail, and 8 foot- 6 inch timber ties, on crushed stone ballast. The alignment locates in an industrial area, with industries located on the south side, and an electrical substation and large retail store block on the north side. At the west end of the project limits, the alignment crosses over Louisiana Ave. on an undergrade (railway over roadway) structure. At the southwest end of the project, there is a rail served customer on the south side of the tracks. At the south east end of the project, a spur track leaves the Bass Lake Spur main track to serve the Skunk Hollow industrial area located on the south side of the railway. This spur forms the north leg of a railway wye that is described in the next paragraph.

  At the south end of the project, the MN&S Spur crosses the Bass Lake Spur via overhead bridge – MN&S Spur over the Bass Lake Spur, in the Skunk Hollow area. While there is no direct connection between the Bass Lake Spur and the MN&S Spur at Skunk Hollow, there is an indirect way through which the two connect. A siding diverges from the Bass Lake Spur, at the south east corner of the overhead bridge crossing. This siding turns south and west to serve the Skunk Hollow industrial area and forms the north leg of the railway wye. On the MN&S Spur, a siding diverges on the west side of the alignment, south of the MN&S Spur bridge over Bass Lake Spur, and turns north and west to serve the Skunk Hollow industrial area. This forms the south leg of the railway wye. These sidings connect in Skunk Hollow. This location is named, Milwaukee Jct., however, it is not identified in CP's Timetable. Using these Skunk Hollow sidings, and the wye that these tracks create, permits the TC&W to connect from the Bass Lake Spur to the MN&S Spur and operate in either direction on the MN&S Spur.

CP has a customer it regularly serves in the Skunk Hollow area.

- *MN&S Spur Area*

  The CP owned MN&S Spur was originally the Minnesota Northfield and Southern Railway (MNSR) mainline from Savage, MN at the south, to MN&S Junction (Jct) in the north. The MN&S Spur is geographically oriented north – south, however the railway timetable direction is east – west, with east being north. Direction along the alignment will be referred to as north – south. For CP's operational purposes, the MN&S Spur is considered part of CP's Paynesville Subdivision. CP operates over the alignment from the connection with the CP Paynesville Subdivision, about 7 - 9 miles north of the project location, south to a location designated Auto Club, which is located about 9 – 11 miles south of the project location. TC&W has trackage rights, but is not currently running trains on the line today. CP operates a daily light tonnage train (10 – 30 car trains) on the alignment to serve local industries. Existing Maximum Allowable Speed is 10 mph for all movements.

  Within project limits, the MN&S Spur is a single track with the track section consisting mainly of 90 lb rail, and 8 foot - 6 inch timber ties, on a mixture of slag and crushed stone ballast. This type of rail and track structure is typical for light tonnage, slow speed industrial and secondary tracks. There are areas where track improvements have been made, specifically within the roadway at-grade crossings at Walker Street, Lake Street, Library Lane and Dakota Blvd. in St. Louis Park, as well as the Minnetonka Blvd. undergrade bridge. In these areas, the track has been upgraded by installation of 112 lb – 115 lb rail, 100% new ties, and crushed stone ballast. Per FRA standards, the tie condition meets and in most cases exceeds the class of track for which the alignment is operated. Within project limits, the MN&S Spur crosses the Bass Lake Spur, Trunk Highway 7 (TH 7) South Frontage Road, TH 7, and Minnetonka Blvd. on undergrade bridges, and Walker Street, Lake Street, Library Lane., Dakota Blvd., Brunswick Ave., West 29th Street and West 28th street, via at-grade crossings. There are no rail customers located within the project limits for any of the railroad companies

  The existing right of way in this section varies as follows:

  - From Brunswick Avenue to TH 7 – irregular right of way, varying from 50 to over 120 feet

- From Brunswick Avenue to Minnetonka Boulevard – majority of right of way is 145 feet, however there are a couple of areas that are 105 feet, and 3 parcels adjacent to rail right of way at 35, 45, and 55 feet.
- From Minnetonka Boulevard to 27th Street – right of way is 66 feet.

- *Iron Triangle Area/BNSF Wayzata Subdivision*
  The BNSF owned Wayzata Subdivision was originally the Great Northern Mainline from the Twin Cities to the Pacific Northwest. The Wayzata Subdivision is geographically oriented, and railway direction is east – west. The Wayzata Subdivision extends approximately 90 miles from Minneapolis, MN at the east, to Willmar, MN to the west. At Willmar, the alignment splits, with one leg heading to north toward the Pacific Northwest, and one leg turning south, running to Kansas City. BNSF operates this as a mainline track, connecting western parts of their system, with connections to various Class I and regional railways in the Twin Cities, as well as the Chicago area. Maximum Allowable Speed is 60 mph for all movements. The track is controlled by a Centralized Traffic Control (CTC) System.

  Within project limits, the Wayzata Subdivision is a single track with the track section consisting of mainly 115 lb rail, 8 foot -6 inch timber ties, on crushed stone ballast. Some rail has been replaced with 132 lb and 141 lb rail. The track appears to be in a condition that exceeds the class of track for which the alignment is operated, including an area on the south side of the alignment, east of the TH 100 overhead bridge, where a railway yard was previously located. The right of way appears to have previously been double tracked. There are no railway structures or railway served customers on the Wayzata Subdivision within project limits. A bike path, North Cedar Lake Trail, runs roughly parallel to the alignment on the south side of the railway. This trail is owned by Three Rivers Park District. The existing BNSF right of way in the BNSF Wayzata Subdivision section varies from 100 to 221 feet.

  At the north end of the project, the CP MN&S Spur crosses the BNSF Wayzata Subdivision via overhead bridge – MN&S Spur over the Wayzata Subdivision. This area is referred to as the Iron Triangle area. While there is no direct connection between the Bass Lake Spur and the Wayzata Subdivision at the Iron Triangle area, at one time there was a connecting track – an east wye leg that connected the two alignments at the southeast corner. The roadbed of this former/abandoned alignment is still intact. This right of way is owned by Canadian Pacific.

Detailed Description of Proposed Action

<u>Action Description</u>

The track modifications and improvements which make up the Proposed Action are located primarily in the City of St. Louis Park, Hennepin County. A portion of the proposed BNSF siding extends into the City of Minneapolis. Overall, the Proposed Action includes:

- The construction of direct northbound track connection from the CP Bass Lake Spur to the CP MN&S Spur;

- The construction of a direct track connection between the CP MN&S Spur and the BNSF Wayzata Subdivision;
- Upgrade of track on the CP MN&S Spur between the new connection to the CP Bass Lake Spur on the south and the new connection to the BNSF Wayzata Subdivision on the north; and
- The construction of an 11,000-foot siding within the existing BNSF Wayzata Subdivision right-of-way.

The referenced track sections are illustrated in **Figure 5**. Plan sheets for the Proposed Action are included in **Appendix A**, which includes improvements to the CP- Bass Lake Spur, CP-MN&S Spur and the BNSF Wayzata Subdivision as noted above.

The physical improvements associated with the Proposed Action in the City of St. Louis Park, consist of required track improvements to the existing CP Bass Lake Spur, CP MN&S Spur, and the BNSF Wayzata Subdivision to accommodate the TC&W freight rail traffic operations to and from St. Paul that currently operate in the Kenilworth Corridor in Minneapolis. The proposed track improvements will primarily be within the City of St. Louis Park, in Hennepin County, Minnesota, with some of the BNSF improvements crossing into the City of Minneapolis. The proposed physical improvements evaluated reflect the specific improvements required to address the existing operation requirements of the TC&W to St. Paul. Hence, the Proposed Action definition, while a part of an overall railway system in the Twin Cities metropolitan area is limited to the specific improvements required to address the defined need.

Under the Proposed Action, coming from the west (see Figure 4b on previous page), TC&W would continue to operate on their own tracks before passing onto the CP-owned tracks of the Bass Lake Spur, then heading north on CP's MN&S Spur through St. Louis Park and then east on BNSF's Wayzata Subdivision into downtown Minneapolis. To accommodate TC&W freight traffic in this corridor, a northbound connection between the CP Bass Lake Spur and the MN&S Spur would be required on the south side of St. Louis Park and a connection between the MN&S Spur and the BNSF Wayzata Subdivision on the north side.

Relative to the BNSF Wayzata Subdivision, an 11,000 foot controlled siding would be required to accommodate the additional freight traffic. Under the Proposed Action, a new mainline track would be constructed north of the existing BNSF track, and the existing track would be utilized as the siding track. The purpose of the siding is to allow trains to move between the Wayzata Subdivision and the MN&S Spur, while simultaneously allowing through movements to occur on the Wayzata Subdivision.

Currently CP runs one local assignment (round trip), five days per week through St. Louis Park on the MN&S Spur. The length of the train is variable, but typically ranges in size between 10 and 30 cars. On the BNSF Wayzata Subdivision section, approximately 8 to 20 trains run per day on track controlled by a centralized traffic control system. Under the Proposed Action, the current CP and BNSF train operations are assumed to be continued.

Under the Proposed Action, the TC&W trains that currently operate in the Kenilworth Corridor would be relocated to the MN&S alignment in St. Louis Park. The freight operations that are assumed to be relocated are as follows:

Regular Trains

- One train (round trip) into St. Paul (CP's St. Paul Yard) 6-7 days per week, with an average of 50 carloads/train (since 2008)
- One train (round trip) 3-4 days per week into the Union Pacific's (UP) Western Avenue Yard, averaging 20 carloads/train.
- Both trains go out of Hopkins around 7 am and return 8 to 10 hours later.

Unit Train Operations

- These trains do not run at a fixed time of day but rather are operated at the convenience of the major connecting railroads.

Coal Unit Trains

- 25-27 trains per year (average one train every two weeks).
- TC&W handles only loaded westbound coal trains. Empty coal trains go out west of study area
- Trains are approximately 120 cars long.

Ethanol Unit Trains

- TC&W handles both empty and loaded trains on east end.
- Currently, TC&W operates an average 3 loaded eastbound trains per month and typically 2 westbound trains return per month.
- Trains are approximately 80 cars long.

As a smaller regional railroad, it is necessary for TC&W to mesh its operations with those of its much larger connecting railroads, especially CP, BNSF and UP. TC&W's current operating pattern is based upon the need to deliver outbound cars to connecting railroads in the morning so that they may be switched and incorporated into the connecting railroads' outbound trains scheduled later in the day. Similarly, inbound cars for TC&W tend to arrive at the connecting railroads' yards at night and are switched and available for TC&W crews to pick up during first shift the next day.

The Proposed Action would include the following key design elements:

- Upgrade of MN&S track to meet FRA Class 2 operations (maximum speed of 25 miles per hour)
- Existing MN&S rail to be replaced and all new construction to be 136 pound continuously welded rail with new ballast, ties and track switches
- All roadway – railroad at grade crossings would be signalized (minimum requirement)
- Implementation of Quiet Zone at grade crossings (see noise and safety sections for more details)
- Closure of 29th Street at-grade crossing

- Maintain access to current CP customers
- Maximum grade of 0.86 percent on the new track alignment
- Maximum curve of 8 degrees
- Track signalization to allow for through movement of trains on the MN&S Spur from the CP Bass Lake Spur to the BNSF Wayzata Subdivision
- Cedar Lake Trail bridge to carry trail over the proposed track Iron Triangle connecting track

Track design for the Proposed Action will comply with requirements set forth by:

- FRA Class 2 Track Standards
- Current CP and BNSF track engineering and design standards
- American Railway Engineering and Maintenance Association (AREMA) Engineering and Design Standards
- Other applicable engineering and design standards

Design Description

At the Skunk Hollow area, the project proposes to connect the Bass Lake Spur to the MN&S Spur, on the west side of the existing crossing. The proposed MN&S connecting track alignment would cross over the Bass Lake Spur with a curved, undergrade aerial bridge structure at a location just west of the in place MN&S crossing over the Bass Lake Spur. The proposed MN&S connecting track would diverge from the south track of the Bass Lake Spur just east of the in place bridge over Minnehaha Creek. This location will be referred to as Louisiana Block Limit Station (BLS). The connecting track would be located on a retained fill structure, and diverge south of the existing Bass Lake Spur to a maximum offset of about 30 feet. The MN&S connecting track alignment would transition from retained fill to bridge structure at a location approximately 600 feet west of Louisiana Avenue. The proposed undergrade bridge structure would extend along the south side of the Bass Lake Spur tracks to provide a new aerial structure crossing over Louisiana Avenue. East of the Louisiana Ave. crossing, the proposed MN&S connecting track alignment runs south of and parallel to the Bass Lake tracks to a location approximately 500 ft. west of the MN&S Spur, where the connecting track alignment would curve left - north, and crossover the Bass Lake Spur, and bike path, on a new aerial structure, and run parallel to the MN&S Spur. In the vicinity of TH 7, the proposed MN&S connecting track would assume the approximate alignment of the in-place MN&S Spur track and continue north to the tie-in point with existing MN&S track, just south of Dakota Ave.

In-place track grades along the MN&S from TH 7 to Walker Street are approximately 1.5%. A similar track grade is required in the proposed configuration in order to retain the crossing over TH 7 and the grade crossing at Walker Street. In-place track grades along the MN&S south of Minnetonka Boulevard are approximately 1.2%. This grade was established by CP when it replaced its bridge over Minnetonka Boulevard. A similar track grade is in the proposed configuration. In-place track grades along the MN&S north of Minnetonka Boulevard are approximately 1.9%. This grade was also established by CP when it replaced its bridge over Minnetonka Boulevard. A track grade of 1.2% is proposed; a reduction from the existing 1.9% grade. This would require the closing of the 29th Street Grade Crossing and retaining the 28th

Street Grade Crossing. The grades in excess of 1% are relatively short in length, in comparison to the long 0.8% grade of the new Bass Lake Spur/MN&S Connection.

In order to accommodate the proposed MN&S connecting track alignment, as described above, MN&S tracks must be realigned and reconstructed south of TH 7. From the proposed turnout at the TH 7 bridge, the MN&S track will be realigned west of the in place location onto a new bridge structure over the Bass Lake tracks. Proposed MN&S south track realignment will extend approximately 1,000 feet south of the Bass Lake tracks, most likely on retained fill, where MN&S realigned tracks tie-into the in place alignment. Existing Bass Lake Spur tracks, including the tail track connection with Skunk Hollow, will remain in place, and undisturbed. Neither the proposed MN&S connecting track nor the MN&S south realignment will necessitate any changes to the Skunk Hollow tail track configuration.

All track material used in construction of the connecting tracks will be new, and in accordance with the current CP standards. The construction methods shall conform to current CP standards as well.

The MN&S Spur serves as the conduit to connect the Bass Lake Spur to the south with the Wayzata Subdivision to the north. The existing track structure is mainly 90 lb jointed rail and 8 foot - 6 inch ties on crushed stone and slag ballast. Under the Proposed Action, it is assumed that all rail within the project limits will be replaced with 136 lb Continuously Welded Rail (CWR). The Proposed Action includes stabilization of the roadbed by introducing a 4 inch nominal raise of the track bed by installing mainline-quality crushed stone ballast and the replacement of approximately 70% of the existing timber ties.

Within the MN&S Spur section, the Minnetonka Boulevard Bridge was replaced within the last 5 years. Staging of that work required that the alignment over the bridge be pushed east about 5 to 10 feet. A series of reverse curves was introduced north and south of the bridge to accommodate the alignment shift. Additionally, the bridge was raised, and the resulting vertical grade north of the bridge was increased to about 1.9% to meet top of rail elevation on the new bridge. Under the Proposed Action, it is assumed that approximately three quarters of a mile of horizontal alignment would be revised to eliminate the reverse curves north and south of the bridge. The proposed design also assumes a reduction of the longitudinal grade on the north side of the Minnetonka Blvd. bridge, such that the maximum grade does not exceed 1.2%. Flattening the longitudinal grade to 1.2% necessitates closing the 29th St. grade crossing.

At the north end of the project, in the Iron Triangle Area, on the MN&S Spur, south of the undergrade bridge over the Wayzata Subdivision, a connecting track previously existed in the southeast corner which connected the MN&S Spur, northbound, with the Wayzata Subdivision eastbound. According to CP property records, this connecting track is located on the CP right of way, to a point about 200 feet south of the proposed connection with the Wayzata Subdivision. As such, the connecting track remains in the MN&S section for the purposes of this study. It is the intent of the project, to re-establish this connecting track for purposes of connecting the MN&S

Spur and Wayzata Subdivisions. On the MN&S Spur, the connection would be made by installing a turnout, in the vicinity of West 28th Street. The existing abandoned connecting track grade would be used as the location for the proposed Iron Triangle connecting track alignment. A field view of the grade reveals that the alignment was on fill and is still intact. However, field measurements indicate that the top of fill width will need to be increased – widened to meet current CP engineering standards. As the fill is substantial in some areas, up to 10 feet, it will likely be necessary to introduce retaining walls to accommodate the proposed section width. At the north end of the connecting track, and CP right of way, the connecting track alignment crosses a bike path at-grade. The Proposed Action/design includes a reconfiguration of the bike path to provide for a grade separated structure carrying the Cedar Lake trail, on aerial bridge structure, over the proposed Iron Triangle connecting track.

For purposes of this study the BNSF area includes the eastern limit of the Iron Triangle connecting track and extends east on the BNSF Wayzata Subdivision, to the Cedar Lake Junction. The Iron Triangle connecting track assumes the alignment of the in-place BNSF mainline track, and will become the proposed siding track. Wherever practical, the proposed siding track, will utilize the in-place BNSF tracks from the Iron Triangle Connection to a location just west of the Cedar Lake Junction. New BNSF mainline tracks will be constructed north of and parallel to the in-place BNSF tracks, from a location just west of the MN&S crossing over BNSF to the east end of the proposed siding track. A full universal interlocked crossover is provided with switches between the proposed mainline track and the proposed siding track at the west end of the new BNSF/Iron Triangle connection and a single interlocked switch is provided at the east end of the proposed BNSF siding. The siding is approximately 11,000 ft. long. The BNSF siding/interlocking is intended to be signalized.

Under the Proposed Action, Quiet Zone upgrades would be implemented at all remaining grade crossings between Walker and 28th Street (see Noise Section). The quiet zone design concept includes improved pedestrian safety at the study area grade crossings, in the form of pedestrian gates at all existing and proposed sidewalk locations.

Construction

Timing and Duration

It is anticipated that implementation of the Proposed Action would occur over the time span of two construction seasons. Bridge and retaining wall piling and foundation work, as well as clearing and grubbing work, can occur during the winter months. Other activities such as placement of subballast and ballast, track welding, and intersection grading and paving would be done during the traditional construction season, where ambient temperatures remain above freezing.

It is anticipated that construction would occur within the available right-of-way (ROW) for most of the alignment. The exception would be the work to be done along the CP Bass Lake Spur, between Minnehaha Creek and the MN&S Spur. Temporary and permanent easements would be required in this area to accommodate construction outside of the in place railroad ROW. This includes the area on the north and south sides of the CP Bass Lake Spur.

Disruption to Rail Operations

Track reconstruction and line/surfacing work along MN&S would likely be done during 8-hour track outages. Grade crossing and Quiet Zone improvements would likely be constructed during 48-hour weekend closures (for road and civil work), with 2- to 8-hour track outages.

It is expected that accelerated construction methods would be utilized to minimize track outages. Precast substructure components may be used to eliminate concrete curing time. It is assumed that a 1-week to 4-week outage would be required to remove and reconstruct the MN&S bridge over TH 7 and the TH 7 South Frontage Rd. A 1- week to 4-week track outage may require temporary re-routing of TC&W freight rail traffic elsewhere within the Twin Cities. If railroads find the duration of the track outage to be unacceptable, it may be necessary to construct a temporary alignment and bridge structure.

It is assumed that TC&W would continue operations on the CP Bass Lake Spur during construction of other elements of the Proposed Action.

Disruption to Roadway and Pedestrian Traffic

It is expected that grade crossing and quiet zone improvements will likely be constructed during 48-hour weekend closures (for road and civil work), with 8-hour track outages. Construction signage and traffic control devices will be provided and vehicular/pedestrian traffic will be detoured around the grade crossing construction zone.

It is assumed that lane closures will be required on Louisiana Avenue to facilitate construction of the proposed MN&S connecting track bridge over Louisiana Avenue. This work will be closely coordinated with city and county. Nighttime lane closures would be required on Highway 7 to facilitate construction of the proposed MN&S bridge over TH 7. This work will be closely coordinated and scheduled with Mn/DOT. All closures would also be coordinated with Methodist Hospital to ensure continued availability of emergency vehicle routes and/or suitable detours.

Temporary trail closure would be anticipated for portions of the Cedar Lake LRT Trail along the CP Bass Lake Spur, due to bridge demolition and construction. Duration would be 8 to 12 hours. The proposed overpass of the North Cedar Lake Trail along the BNSF alignment would require temporary re-routing and potential 48-hour trail closures.

Future Associated Projects

The Proposed Action does not include the removal (abandonment) of the existing wye in the Oxford area (Skunk Hollow), abandonment of the CP Bass Lake Spur track east of the CP MN&S Spur, nor does it include providing a direct southbound connection from the CP Bass Lake Spur to the MN&S Spur; as these actions are not required to meet the defined project need. All of the above defined actions are considered separate actions. As this Proposed Action identifies and evaluates the potential impacts associated with the required improvements to provide the TC&W with a relocated connection for operational and available freight movement to St. Paul, this Proposed Action does not evaluate future southerly movement requirements of the TC&W on the MN&S Spur.

Project Magnitude

Total project acreage : 21.55 acres
Number of residential units: N/A
Commercial, industrial or institutional building area (gross floor space): N/A
Indicate areas of specific uses (in square feet): N/A

Office	Manufacturing
Retail	Other industrial
Warehouse	Institutional
Light industrial	Agricultural
Other commercial (specify)	

Required Permits and Approvals

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

Unit of government	Type of Application/Coordination
Federal Railroad Administration	Quiet Zone
US Army Corps of Engineers	Section 404 Permit
Minnesota Department of Natural Resources	Public Waters Work Permit
Minnesota Pollution Control Agency	NPDES/SWPPP
Minnesota Pollution Control Agency	Section 401 Water Quality Certification
Minnesota Pollution Control Agency	Golden Auto Site Coordination
Minnehaha Creek Watershed District	Erosion Control Permit
Minnehaha Creek Watershed District	Floodplain Alteration Permit
Minnehaha Creek Watershed District	Wetland Protection Permit
Minnehaha Creek Watershed District	Stormwater Management Permit
City of St. Louis Park	Erosion Control Permit

City of St. Louis Park	Right-of-Way/Road Closure Permit
City of St. Louis Park	Conditional Use Permit (CUP)
Three Rivers Park District	Encroachment Permit
Three Rivers Park District	Agreement addressing responsibilities for new trail bridge

In addition, railroads also have approval regarding actions that affect their operations.

Environmental & Social Impacts

Overview

The following sections address the various environmental and social impacts of the Proposed Action. For the purposes of differentiating between the two rail owners (CP and BNSF), the rail sections are discussed separately. Both sections, identified as the MN&S Section and BNSF Section, are part of the overall project and would be constructed concurrently as part of the Proposed Action.

The Project Description outlines the existing TC&W freight traffic that is proposed to be relocated to the CP- Bass Lake Spur, CP- MN&S Spur and BNSF Wayzata Subdivision under the Proposed Action. As predicting future train operations is dependent upon many different variables, accurately predicting future operations would be speculative. Hence, this impact analysis assumes continuance of current BNSF and CP operations in the study area, along with the relocation of the existing TC&W operations currently traveling to the east (St. Paul) through the Kenilworth Corridor.

Each section also discusses the mitigation measures to address defined adverse impacts. There are essentially three areas that mitigation measures can fall under.

- Area A includes measures where there is a regulatory mandate or requirement by law to do the mitigation, i.e. the Proposed Action requires a future permit or approval.
- Area B, includes commitments made for the project . These commitments are not required by law or a regulatory mandate, but are actions that have been committed for inclusion under the Proposed Action based on the defined impact.
- Area C, includes actions that continue to be considered, but do not have a firm commitment for implementation. A list of Area C mitigation measures is included in Appendix D. The list included in Appendix D reflects the suggestions made throughout the MN&S Study process relative to the Proposed Action definition, and mitigation measures. While these measures are not committed to, there will be further coordination with the City of St. Louis Park and local stakeholders to develop community improvements that enhance the surrounding neighborhood area.

Land Use

<u>Existing Conditions: MN&S Section</u>

As described in the Project Description, the Proposed Action would be located primarily on active railroad right of way owned and operated by the CP. The MN&S Section passes through a variety of land uses, including primarily industrial and commercial on the south end; residential, parkland, and community uses along the stretch between Highway 7 and 27th Street; and residential/Dakota Park on the northern end approaching and continuing on the BNSF Wayzata Subdivision line. See **Appendix C** for a link to the City of St. Louis Park Land Use Map.

<u>Existing Conditions: BNSF Section</u>

As described in the Project Description the Proposed Action would be located within active railroad right of way owned and operated by the BNSF. The BNSF Section passes through a variety of land uses, including residential, industrial, parkland, and commercial (See **Appendix C** for a link to the City of St. Louis Park and City of Minneapolis Land Use Maps).

Impacts: MN&S Section

One businesses/industrial use would be removed to accommodate new track on the south end of the alignment, south of the tracks, but the area would remain industrial in nature. Land use is not anticipated to change along the primarily residential areas of the alignment; as improvements are within the existing rail corridor. The proposed track leading into the BNSF Wayzata Subdivision on the north end would be constructed on unused rail right-of-way (ROW). While the track would be constructed within that existing ROW, the use of that land would change from inactive to active railroad use.

The design of the direct northerly connection from the CP Bass Lake Spur to the CP MN&S Spur was developed to minimize right of way impacts in this area, and hence provide optimal developable land. See the *Cumulative Effects* section for additional information relative to the proposed Southwest Light Rail Transit (LRT) project, and the TH 7/Louisiana Avenue project in St. Louis Park.

Impacts: BNSF Section

Improvements would take place within the existing rail right-of-way (north side), and no changes in land use are anticipated as a result of the changes to the BNSF Wayzata Subdivision.

Mitigation: Area "B"

As the Proposed Action would be located primarily in active railroad right of way, it would not significantly change the area land use. Uses at the south end remain industrial in nature, but future redevelopment could be indirectly affected by the proximity and height of the tracks. Trackwork in residential areas would be completed within existing right-of-way. The project proposer will continue to coordinate with the City of St. Louis Park regarding land use planning efforts that enhance development/redevelopment potential in the study area.

Environmental Hazards

Regulatory Context/Methodology

All pollutants, contaminants and hazardous wastes (as defined in Minnesota Statutes, 115B.02) identified during railroad construction projects must be properly handled and treated in accordance with appropriate federal and state regulations.

A records database search was completed in January of 2011, with subsequent search of the BNSF section in February 2011. The assessment included all properties within a 1-mile radius around the existing rail lines. Sites located within the construction limits were ranked as having high, medium, low, or unlikely potential for contamination.

- Sites with **high** potential for contamination include all active and inactive VIC and MERLA sites, all active and inactive dump sites, and all active LUST sites;

- Sites with **medium** potential for contamination include all closed LUST sites, all sites with USTs or ASTs, all sites with vehicle repair activities, and all sites with historical demolitions;
- Sites with **low** potential for contamination include small hazardous waste generators and possibly residences; and
- Sites that are classified as **unlikely** appear to have an unlikely chance of contamination.

Existing Conditions: MN&S Section

Several hazardous waste/hazardous material sites were identified within one mile of the proposed construction limits, with many of those sites located in the southern portion of the project (**Figure 6a and 7a**). The records database search results from the properties within or near the construction limits are listed below:

- Reilly Tar Superfund site. This site is located about 0.35 mile from the MN&S track. According to the United States Environmental Protection Agency (EPA), the physical cleanup at this site is complete, but some groundwater concerns still exist. Currently, a vapor intrusion study is being conducted within the vicinity of the superfund site. This site would be rated as a **high** potential site; however, it is located outside of the construction limits of the proposed project.
- Golden Auto National Lead site. This site is located adjacent to the track, just south of Highway 7. This site was removed from the National Priorities List (NPL) in 1998, which is the list of the most hazardous sites across the U.S. The site is no longer considered to be a threat to human health (http://cfpub.epa.gov/supercpad/cursites/csitinfo.cfm?id=0503817), but is still monitored and subject to some restrictions due to contaminants beneath an existing asphalt cap. In 2004, a developer entered the Site into MPCA's Voluntary Investigation and Cleanup Program. After completing the MPCA-approved investigation, a voluntary response action plan was submitted. The plan provided for the replacement of the existing asphalt cap with a combination of new building footings, foundations and floor, new asphalt parking lot and drive areas and green space with clean soil cover and revegetation. The plan has been implemented for redevelopment of the Highway 7 Business Center, and the City of St. Louis Park has an easement over a portion of this property for rail facilities. On September 18, 2009, U.S. EPA made a determination that the site meets the requirements for Site-Wide Ready for Anticipated Use. This site would be considered a **high** potential site due to its history and the known presence of contaminated soil onsite.
- Vapor Intrusion Study. The discovery of contaminated groundwater in the vicinity of Highway 7 and Wooddale Avenue prompted the EPA to conduct a vapor intrusion study in 2007. Homes and businesses were sampled to determine if any were exceeding the screening values established by the Minnesota Department of Health (MDH). EPA has installed vapor mitigation systems in properties which exceeded screening values. This site would be considered a **low** potential site.
- The property at 7009 Oxford Street was considered a small quantity generator of hazardous waste. The property also was a leaking underground storage tank (LUST) which has since been removed but the database search indicated that contaminated soil was still onsite. This site currently contains an underground storage tank (UST) and above ground storage tank (AST).

Due to the presence of contaminated soil and above and underground storage tanks, this site would be considered **medium** potential for encountering hazardous waste.

- 3400 Dakota Avenue South was identified in the data search as a low quantity generator of hazardous waste. Therefore; this site is considered **low** potential for hazardous materials/waste.

- The properties at 6660, 6831, 6500, 6725, 6780, and 7300 Oxford Street were all identified as small quantity generators of hazardous waste. These sites would be considered **low** potential for encountering hazardous waste.

Existing Conditions: BNSF Section

There are a few identified hazardous waste/hazardous material sites within one mile of the BNSF section, particularly near Highway 100. These are illustrated in **Figure 6b and 7b**. None of these sites are located within or near the proposed construction limits.

Impacts: MN&S Section

One high priority, one medium priority, and numerous low priority sites have been identified within the construction limits of the project. This indicates a strong possibility of encountering hazardous materials during construction.

Although the Golden Auto site has been de-listed from the NPL and is considered to be cleaned up, hazardous contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure. The current site owner monitors the site and it is also reviewed every 5 years by the EPA. The de-listing of the site is largely due to the containment of contaminated materials beneath an asphalt cap. The construction of a rail structure across the eastern corner of the Golden Auto site would alter the asphalt cap and contaminants may be disturbed

Impacts: BNSF Section

No properties containing the potential for hazardous materials were identified within the construction limits of the project. Therefore; there is low potential for hazardous wastes to be impacted within the BNSF section of the project.

Impacts: Total Project

One high potential, one medium potential, and numerous low potential sites have been identified within the overall project area.

Mitigation: Area “A”

If needed, the area(s) of concern for any potentially contaminated site that may be impacted by the project would be further assessed to determine the presence, type, and magnitude of contaminated soil and/or groundwater. The results of the investigation would be used to determine if impacts to contaminated materials can be avoided, or at the very least minimized. A plan would be developed, if necessary, for properly handling and treatment of contaminated soil and/or groundwater during construction.

Activities on the Golden Auto site would require coordination with the EPA and MPCA to review the project and plan for proper safety and containment or removal measures during construction, and any monitoring required after construction.

Land Cover

Land cover types before and after development:

	Before (acres)[1]	**After (acres)**[1]
Wetlands	2.0	0
Wooded/Forest	0	0
Grassland	0	0
Cropland	0	0
Lawn/Landscaping	0	0
Impervious	17.5	19.2
Stormwater Ponds	0	1.1
Railroad Right-of-Way[2]	2.0	1.2
Total	**21.5**	**21.5**

[1]Before and after acreage reflects the total project construction limits, including both the MN&S and BNSF sections.

[2]Vegetation within ROW. Overall ROW limits do not change; but cover types within the ROW would change, i.e. more impervious surface or stormwater ponding.

Fish and Wildlife Resources

Regulatory Context/Methodology

In accordance with Section 7 of the Endangered Species Act, consultation was initiated with the U.S. Fish and Wildlife Services (USFWS) regarding the presence of federally listed threatened and endangered species, candidate species, and designated critical habitat in the study area.

Available information regarding reported occurrences of rare, threatened and endangered (RT&E) species or critical habitats in proximity to the proposed alignment was obtained from the United States Fish and Wildlife Service (USFWS) website (http://www.fws.gov/endangered/) for federally listed species. The federally listed species found in Hennepin County is the *Lampsilis* ***higginsii*** **(**Higgins eye pearlymussel) which is known to occur in the Mississippi River. Since the project location is not in or around the Mississippi River; this project will not impact any federally listed species.

Existing Conditions: Total Project

Vegetation within the study area includes a mix of naturally occurring and landscaped plant species. Land use primarily consists of residential and industrial areas, railroad ROW, and open space with manicured lawns, sporadic tree cover, and some wetland area located in the northern portion of the MN&S section and lake shore area along Cedar and Brownie Lakes adjacent to the BNSF section of the project.

Residential, industrial, railroad ROW, and open space do support wildlife; though the habitat is considered relatively low quality. Wildlife in these areas generally includes songbirds, small mammals and reptiles; but may also include raptors, woodpeckers, waterfowl, deer, raccoon, fox, skunk, and amphibians.

There are three wetland areas within or adjacent to the proposed construction limits. Two of these are identified on the DNR's Public Waters Inventory (PWI), noted as #658W and #659W, and the other is under the jurisdiction of the Wetland Conservation Act (WCA). These wetlands are in the northern part of the MN&S section, crossing into the BNSF section. Two water bodies were also identified on the DNR PWI and are located within the project vicinity – Brownie Lake (#38P) and Cedar Lake (#39P). See **Figures 6a and 6b**.

The wetland areas in the project study area generally consist of two different types; Type 2 – Fresh (wet) Meadow, and Type 3 – Shallow Marsh. Type 2 wetlands usually have grasses, and other emergent vegetation. Type 3 wetlands usually have emergent vegetation including cattails along with the potential to have some areas of open water. These wetlands provide habitat for turtles, geese, amphibians, snakes, birds, and some small mammals.

The two lake areas provide habitat for generally the same species as the wetland areas except the lake areas can support fish species. Fish species have been identified in both Brownie and Cedar Lake.

Impacts: MN&S Section
Based on the proposed construction limits for the MN&S section alignment, DNR wetland #659W would be impacted (see **Figure 7b**).

Impacts: BNSF Section
Based on the proposed construction limits for the BNSF section alignment, a portion of the same wetland #659W would be impacted (see **Figure 7b**). Impacts to Brownie Lake and Cedar Lake are not anticipated.

Impacts: Total Project
The construction limits for the Proposed Action have been defined to minimize impacts to the wetlands within the project study area. No other impacts are anticipated to other identified water bodies.

Wildlife resources and habitat impacts are restricted to those within the construction limits. No significant impacts to habitats or wildlife resources are anticipated.

Mitigation: Area "A"
Removal of trees, shrubs, and other habitat components would be limited to only those necessary

to construct the project. Affected areas would be revegetated with similar species.

A DNR Public Waters Work Permit would be required for any work being done within a DNR wetland area (in this case, wetland #659W). Mitigation of unavoidable impact to ecological resources would be achieved through standard erosion control measures and reseeding of impacted areas. Best Management Practices (BMP's) would also be implemented.

Ecologically Sensitive Resources

Existing Conditions: Total Project

The DNR Natural Heritage and Nongame Research Program reviewed the study area for the presence of rare plant and animal species and other significant ecological resources within approximately one mile of the project site. The DNR identified *Emydoidea blandingii* (Blanding's turtles) potentially within the project area (see DNR letter in Appendix B). No other features were indentified that would be affected by the MN&S and BNSF Alignments.

Impacts: Total Project

Under the Proposed Action (both the MN&S and BNSF sections), no USFWS Federally Threatened, Endangered, and Candidate species would be impacted.

The MN&S and BNSF alignments have the potential to impact state-listed Blanding's Turtles due to the wetlands located within the project vicinity.

Mitigation: Area "A" Mitigation

If Blanding's turtles are found on site and are in imminent danger, they should be moved by hand and out of harm's way, otherwise they should be left undisturbed. Specific recommendations for avoiding and/or minimizing impacts to this species are included in Appendix B.

Wetlands

Regulatory Context/Methodology

There are several laws that regulate activity within wetland areas with the intent to preserve wetland areas, water quality and wildlife habitat among other important wetland functions. At the federal level, Section 404 of the Clean Water Act is implemented by the Army Corps of Engineers (ACOE) and requires applicants to document avoidance and minimization of impacts prior to approving a permit to mitigate impacts. At the state level, there is a Public Waters Work permit that is implemented by the Minnesota DNR for activities within waters that are identified in the Public Waters Inventory (PWI). There is also the Wetland Conservation Act, which is implemented by Minnehaha Creek Watershed District (MCWD) with oversight and review by the Board of Water and Soil Resources (BWSR).

Existing Conditions: Total Project

The determination of wetlands within the project vicinity was based on the USFWS National Wetlands Inventory (NWI) and the MN DNR's PWI[4]. A total of three wetland areas were identified

[4] A field review and delineation was not completed as a part of this project. The wetland areas identified in this document are solely based on mapping conventions.

within the overall project study area. Two of the three wetlands within or adjacent to proposed construction limits were identified on the DNR PWI (#658W and #659W). Ordinary High Water Level (OHW) has been established for these two wetland areas. The OHW for #658W is 878.1 feet and the OHW for #659W was estimated at 877.1 feet. The OHW for wetlands is the DNR regulation boundary for the wetland area. Any wetland area under the OHW is regulated by the MN DNR and any wetland area over of the OHW is regulated by WCA or the watershed district. The ACOE regulates wetland above and below the OHW.

Classification[1]		**Wetland Size**	**DNR #**	**Wetland Impact[2]**
Wetland Type	Plant Community	Acres (ac)		Acres (ac)
2	Fresh (wet) Meadow	22.2	N/A	0
3	Shallow Marsh	15.4	#658 W	0
3	Shallow Marsh	6.1	#659 W	2.0

[1]Classification is based on Eggers and Reed (2007) Wetland Types.

[2]Wetland Impacts are estimates; wetland delineation would be completed to determine actual wetland boundaries as part of final design.

Impacts: MN&S Section

Wetland Impacts have been estimated and based on NWI and the proposed construction limits. Impacts were defined as potential fill or grading activities within the wetland. Worst case impacts were assumed for the construction limits.

The MN&S Section would impact approximately 1.1 acres of wetland. This section would impact DNR identified wetland #659W near the Iron Triangle (see **Figure 7b**).

Impacts: BNSF Section

The BNSF Section would impact approximately 0.9 acre of the same DNR wetland #659W (see **Figure 7b)**.

Impacts: Total Project

The total wetland impact for both sections of the project would be approximately 2.0 acres to DNR wetland #659W.

Mitigation: Area "A"

Based on current wetland regulations, a replacement ratio of 2:1 would be the minimum amount of replacement needed, assuming there are no unique or high quality wetlands impacted. Considering the location and quality of the impacted wetland, withdrawal of credits from a wetland bank is recommended, but specific wetland mitigation would be determined during the wetland permit application process. Wetland #659W would be subject to a permitting process through the Army Corps of Engineers, DNR, and MCWD. The WCA wetland (above the OHW) within the Iron Triangle would be subject to a permitting process through the MCWD and Mn/DOT.

Construction limits have been reviewed and refined throughout the project development process to minimize impacts to wetlands to the extent possible. Due to its location in proximity to the existing railroad tracks, it is not feasible to completely avoid wetland impact and still meet the purpose and need for the project.

Surface Waters

Regulatory Context/Methodology

Various sources were reviewed to identify surface waters, ditches, and watercourses in the study area. These data sources included:

- MN DNR Public Waters Inventory
- Aerial Photography

The DNR Division of Waters maintains maps that show public water bodies, as defined in Minnesota Statutes 103G.201. The types of protected waters that exist under this classification are basins, ditches, and watercourses.

A Public Waters Work Permit must be obtained from the DNR before making any alterations to the waterbodies as defined in Minnesota Statues 103G.245.

Existing Conditions: MN&S Section

Minnehaha Creek crosses the Bass Lake Spur just beyond the western terminus of the MN&S Section.

Existing Conditions: BNSF Section

Two waterbodies have been identified within the study area. Brownie Lake (#38P) and Cedar Lake (#39P) are located on either side of the BNSF section just east of Cedar Lake Parkway.

Impacts: Total Project

Construction in vicinity of Minnehaha Creek, Cedar Lake, and Brownie Lake would occur within existing railroad ROW. No surface water impacts are anticipated under the Proposed Action (MN&S and BNSF sections).

Mitigation: Area "B"

Best Management Practices (BMPs) would be used to control any potential soil erosion and potential discharge to Minnehaha Creek, and Cedar and Brownie Lakes during construction, as discussed Section

Water Use

Regulatory Context/Methodology

Wells are regulated by the Minnesota Department of Health (MDH) Well Management Program. Any wells impacted by the Proposed Action (i.e. within the right-of-way) would need to be abandoned and sealed by a licensed contractor according to MDH standards (Minnesota Rules Chapter 4725). Wells in the project vicinity were searched using the Minnesota County Well Index database. This database includes a variety of well types, including water wells and monitoring wells. Active water wells are not disclosed in this database for security reasons.

Existing Conditions: MN&S Section

Wells identified in vicinity of the MN&S section are illustrated in **Figure 6a**. There are multiple wells located in the southern part of the alignment, in the Skunk Hollow area. These are monitoring wells associated with the contaminated sites in the area. As shown in **Figure 7a**, two of these monitoring wells fall within the proposed construction limits.

Existing Conditions: BNSF Section

Wells identified in vicinity of the BNSF section are illustrated in **Figure 6b**. As shown in **Figure 7b**, none of these wells fall within the proposed construction limits.

Existing Conditions: Total Project

Two monitoring wells fall within the proposed construction limits. Per the City of St. Louis Park Public Works Department, no active water wells have been identified within the limits of the MN&S or BNSF sections of the alignment. The nearest active water well is approximately 800 feet to the east of the MN&S section.

Impacts: MN&S Section

It is not anticipated that the Proposed Action would require the installation or abandonment of the two identified monitoring wells in this section. The proposed construction limits in this area reflect a construction staging area, where equipment and materials would be temporarily stored. This activity is not anticipated to disturb the wells.

Impacts: BNSF Section

No water wells would be impacted in this section.

Impacts: Total Project

It is not anticipated that the Proposed Action would require the installation or abandonment of any wells. Additional freight rail activity along the MN&S and BNSF alignments would not necessitate additional water use. Anticipated earthwork would be mostly fill with minor subcut, so dewatering during construction would be minimal. No impact to the water supply is anticipated.

Mitigation: Area "A"

No mitigation is required.

Water-Related Land Use Management District

Regulatory Context/Methodology

The Federal Emergency Management Agency (FEMA) publishes flood insurance rate maps (FIRM) for each county. These maps identify the different flood zones based on base flood (100 year) elevations. The DNR coordinates revisions and updates to the maps. 2004 was the last year that these maps were published for Hennepin County. Currently, the DNR has available draft maps from data collected in 2006. Updated maps will officially be published in the summer of 2011.

Existing Conditions: Total Project

One floodplain area was identified within the project study area. The floodplain is located in the vicinity of the Iron Triangle or at the separated grade crossing of the MN&S line and the BNSF Wayzata Subdivision line. The floodplain map does not indicate a base flood elevation. A Letter of Map Revision (LOMR) was completed in 2008 for a structure adjacent to this floodplain. The letter indicated that a change in the floodplain had occurred and the new base flood elevation would be 879.3 feet.

Floodplain data is shown on **Figure 6a and 6b**. The letters of map revision can be accessed at the FEMA website (http://www.fema.gov).

Impacts: MN&S Section

Floodplain Impacts have been estimated and based on 2006 FEMA maps and the proposed construction limits. Impacts were defined as potential fill or grading activities within the floodplain. Worst case impacts were assumed for the construction limits based on surface area. Actual storage impacts will need to be calculated once elevations have been obtained in the impact area.

The MN&S Section will impact 1.5 acres of 100-year floodplain in the vicinity of the Iron Triangle and the proposed connection to the BNSF Wayzata Subdivision. Impacts are illustrated in **Figure 7b**.

Impacts: BNSF Section

The BNSF Section will impact floodplains in the vicinity of the Iron Triangle. Impacts are illustrated in **Figure 7b**. Approximately 0.5 acre of floodplain would be impacted for the construction of the BNSF alignment.

Impacts: Total Project

Approximately 2.0 acres of floodplain impact are anticipated for the total project.

Mitigation: Area “A”

Floodplain impacts are anticipated to be mitigated through on-site creation of floodplain storage (cut) greater than or equal to the amount of fill. Retaining walls may also be used to reduce impacts, where appropriate.

Erosion and Sedimentation

Regulatory Context/Methodology

A National Pollutant Discharge Elimination System (NPDES) permit is required for construction activities that disturb one or more acres of total land area, or that disturb less than one acre when combined with a larger common plan of development that ultimately disturbs more than one acre. In Minnesota, the MPCA is responsible for administering NPDES permits. In addition, the Minnehaha Creek Watershed District (MCWD) requires a permit for projects where grading meets or exceeds 5,000 square feet. The City of St. Louis Park also requires an Erosion Control Permit for projects disturbing more than 5,000 square feet of soil or moving more than 50 cubic yards of soil on or off of a construction site; or any construction near a wetland.

Steep slopes and highly erodible soils are identified by reviewing Natural Resources Conservation Service (NRCS) Web Soil Survey information. Steep slopes and/or erodible soils, per NRCS, are identified as soil map units with greater than 12 percent slopes, or map units that have other indications of an erosion hazard in the soil description (such as the word “eroded”). These soils may or may not be associated with steep slopes. Steep slopes or highly erodible soils may indicate a higher propensity for surface water contamination and sedimentation and erosion concerns.

Existing Conditions: MN&S Section
Soil type L55C, located within the residential area along the existing tracks, is characteristic of 8 to 18 percent slopes (*see Table 2 for description of soil type*).

Existing Conditions: BNSF Section
Soil types L52C and L52E (*see Table 2 for description of soil types*), located east of Highway 100 nearing Brownie Lake/Cedar Lake, are characteristic of 2 to 18 percent slopes and 18 to 35 percent slopes, respectively.

Existing Conditions: Total Project
According to NRCS soils mapping, there are three areas along the entire project area which may have slopes greater than 12 percent. No highly erodible soils are present within the MN&S or BNSF sections of the alignment. 21 acres; 84,450 cubic yards of soil to be moved.

Impacts: MN&S Section
The proposed work within the MN&S section of the project would require the movement of approximately 13 acres or 70,400 cubic yards of soil and/or ground cover.

Impacts: BNSF Section
The proposed work within the BNSF section of the project would require the movement of approximately 8 acres or 14,050 cubic yards of soil and/or ground cover.

Impacts: Total Project
Ground disturbance for the entire project would total approximately 21 acres or 84,450 cubic yards.

Mitigation: Area “A”
The project would result in greater than one acre of ground disturbance; therefore, a NPDES

General Stormwater Permit for Construction Activity from the MPCA would be required. The General Permit mandates the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP), which details how stormwater will be controlled through Best Management Practices (BMPs). BMPs and construction sequencing will be employed to limit erosion and sedimentation, with special attention given to slopes and nearby water resources. An Erosion Control Permit from the MCWD and the City along with a Conditional Use Permit (CUP) from the City would also be required, because grading exceeds 5,000 square feet.

All exposed areas would be stabilized as soon as possible to limit soil erosion. Construction phasing would be employed to limit the amount of ground exposed at any given time. Other BMPs may include, but would not be limited to, a combination of the following: silt fence, filter logs, temporary rock construction entrances, horizontal slope grading, erosion control blankets, temporary seeding, stockpile covers, and sediment basins. Areas of steep slopes would use additional stabilization techniques to control erosion.

Water Quality: Surface Water Runoff

<u>Regulatory Context/Methodology</u>

The NPDES program regulates surface water treatment, erosion, and sediment control. The NPDES program requires permanent stormwater treatment BMPs for projects that create new areas of impervious surfaces. This program is administered by the MPCA.

Section 303(d) of the Clean Water Act requires states to publish and update a list of waters that are not meeting one or more water quality standards. The list, known as the 303(d) Total Maximum Daily Load (TMDL) list, is updated every two years. The most recent list for Minnesota was completed in 2010. The U.S. EPA provides final approval of the list. States are required to develop TMDLs for impaired waters, which establishes the allowable loading of pollutants for a water body based on the relationship between pollutant sources and in-stream water quality conditions. Additional stormwater treatment may be required for projects that drain to impaired waters. Impaired waters in vicinity of the proposed project were identified by searching the MPCA's Inventory of All Impaired Waters database.

Both sections of the proposed project lie within the jurisdiction of the MCWD and the City of St. Louis Park. Per MCWD Stormwater Management Rule adopted January 13, 2005, a project that results in a net increase in impervious surface of one (1) acre or more and the total project area is five (5) acres or more requires BMPs, water quantity control provisions, and water quality control provisions (Section 2(e)(3)). The City of St. Louis Park Erosion Control Permit is also designed to improve the quality of post-construction storm water runoff, as well as reduce soil erosion during construction.

<u>Existing Conditions: Total Project</u>

Existing impervious surface in the overall project area totals approximately 763,000 square feet, or 17.5 acres. Most of the MN&S Section drains to the existing the stormwater utility system, which eventually drains to Minnehaha Creek. Most of the BNSF section drains to the existing the stormwater utility system, and may eventually drain to Cedar or Brownie Lakes.

There are 5 MPCA-designated impaired waters that may receive indirect runoff from the project, as summarized in **Table 1**. These are also shown in **Figure 6b**.

Table 1. Impaired Waters in Vicinity of the Proposed Action

Name	**Pollutant**	**TMDL Plan**
Minnehaha Creek	Fish bioassessments Fecal coliform Chloride Oxygen, dissolved	No (target completion 2012)
Twin Lake	Nutrient/Eutrophication Biological Indicators	No (target completion 2016)
Brownie Lake	Nutrient/Eutrophication Biological Indicators Contaminants in fish tissue[1]	Yes (2008)
Cedar Lake	Contaminants in fish tissue[1]	No (target completion 2022)
Lake of the Isles	Contaminants in fish tissue[1]	Yes (2008)

[1]Mercury and Perfluorooctane Sulfonate (PFOS)

Impacts: MN&S Section

The ballasted track proposed to be constructed from Dakota Avenue through the Iron Triangle would be constructed within an existing track section that is in place today, or within an old track bed that is currently used as an access road. Therefore there would be minimal net increase in new track, and this portion of the project would be anticipated to have a minimal net increase in impervious area (0.6 acre).

The new ballasted track proposed to be constructed on the south end of the project for the connection from the CP Bass Lake Spur to the MN&S Spur would make up a majority of net new ballasted track. However, the new track would be built within an area that is already largely impervious. It is anticipated that this portion of the project would actually result in a net decrease in new impervious area (-0.80 acre).

There is an alignment shift required for the existing track near the wye, due to the change in the bridge alignment over Highway 7. This would result in approximately 1.1 acre of net increase in impervious area.

Net increase in impervious area for the total MN&S section would be approximately 0.9 acre.

Impacts: BNSF Section

New track within the BNSF section would be constructed within an existing track section that previously accommodated two tracks. Therefore, there would be minimal net increase in impervious area (0.80 acre).

Impacts: Total Project

An increase in impervious surface would result in an increase in stormwater runoff volumes and peak discharges, which may lead to additional pollutant loading, erosion, and sedimentation if not properly controlled. For the entire proposed project, there would be a net increase of impervious area totaling approximately 1.7 acres. This would be greater than 1.0 acre and an area of disturbance that is greater than 5 acres, triggering the need for treatment requirements through the MCWD.

Mitigation: Area "A"

Stormwater runoff from the project would be directed to existing stormwater pipes and ditches to stormwater treatment ponds sized to meet applicable rate control and water quality requirements per the City of St. Louis Park and the MCWD. Proposed ponds are located in two areas along the MN&S Section. One proposed pond in this section is south of CP- Bass Lake Spur on a parcel acquired to accommodate track alignment. The second pond in the MN&S section is proposed along the CP- MN&S Spur, south of Minnetonka Boulevard within existing CP owned right of way. Within the BNSF section, a pond is proposed within existing BNSF right of way**.** The three ponds provided have a total area of 1.10 acre.

Runoff from the project would not discharge directly to impaired waters, but may indirectly reach these waters through other conveyance systems. Additional BMPs would be implemented as necessary in coordination with the MPCA and the MCWD.

Geologic Hazards

Regulatory Context/Methodology

Data on project area geology is obtained from various database and mapping resources, including the United States Geological Survey (USGS), the Minnesota DNR, and the County Well Index (CWI), as noted below.

Existing Conditions

Bedrock in the project area is from the Middle and Upper Ordovician group, consisting of shale, dolomitic limestone, and sandstone (Geologic Map of Minnesota, Bedrock Geology, 2011 - http://purl.umn.edu/101466). Depth to bedrock, according to CWI records, is a minimum of 50 feet below the surface, with an average of 100 to 150 feet. Approximate depth to groundwater = Minimum: 0 feet; Average: 280 feet. Approximate depth to bedrock = Minimum: 50 feet; Average: 100 to 150 feet

There are no known sinkholes, shallow limestone formations, or near-surface karst conditions within the study area per review of United States Geological Survey (USGS) 7.5-minute quadrangles and DNR data (http://deli.dnr.state.mn.us).

Impacts: Total Project

No impacts to geological features are anticipated as a result of the proposed project.

Mitigation: Area "A"

No mitigation is required.

Soil Conditions

Regulatory Context/Methodology

Data on project area soils is obtained primarily from the Natural Resources Conservation Service (NRCS), as noted below.

Groundwater sensitivity characterizes the surface water/groundwater interface in relation to the effect on groundwater quality, and describes the estimated vertical travel time for water-borne surface contaminants to enter the uppermost bedrock aquifers. High groundwater sensitivity does not indicate that water quality has been or would become degraded, and low groundwater sensitivity does not guarantee that water will remain pristine. Potential for groundwater contamination depends on the following factors: (1) the properties of the contaminant itself, (2) the direction of groundwater movement, (3) permeability of the soils above the water resource, and (4) the presence or absence of a confining layer above the water resource. For this section, the focus is on soil permeability as it relates to potential for groundwater contamination.

Existing Conditions

Topography in the project area is fairly level south of Minnetonka Boulevard, with bedrock overlain by loamy sands and gravel consistent with characteristics of a glacial outwash plain. North of Minnetonka Boulevard, there are more loamy sands and rolling landscapes (City of St. Louis Park Comprehensive Plan, 2009).

Data obtained from the NRCS Soil Data Mart – Soil Survey of Hennepin County (http://soildatamart.mrcs.usda.gov) indicate that soils within the project area are classified as urban lands consisting mainly of residential areas and covered with impervious surfaces. Most areas have been disturbed to some degree by construction activity. Many of the soil associations have been cut for leveling or filled for residential and rail development. **Table 2** lists the soil map units that are located within the study area.

Table 2. Soil Map Units in Vicinity of the Proposed Action

Map Unit	Map Unit Name/Characteristics	General location along alignment
MN&S Section		
U1A	Urban land-Udorthents, wet substratum, complex, 0 to 2 percent slopes	Existing wye area
U2A	Udorthents, wet substratum, 0 to 2 percent slopes	Iron Triangle area
U4A	Urban land-Udipsamments (cut and fill land) complex, 0 to 2 percent slopes	High school area and south of Hwy 7
L55B	Urban land-Malardi complex, 0 to 8 percent slopes	Small area just south of Minnetonka Blvd
L55C	Urban land-Malardi complex, 8 to 18 percent slopes	Residential area along existing tracks
BNSF Section		
U1A	Urban land-Udorthents, wet substratum, complex, 0 to 2 percent slopes	Scattered throughout BNSF alignment
U2A	Udorthents, wet substratum, 0 to 2 percent slopes	Between Iron Triangle and Highway 100; also east of Brownie Lake/Cedar Lake
U4A	Urban land-Udipsamments (cut and fill land) complex, 0 to 2 percent slopes	Very limited; north of Iron Triangle
U6B	Urban land-Udorthents (cut and fill land) complex, 0 to 6 percent slopes	Between Iron Triangle and Highway 100; also east of Brownie Lake/Cedar Lake
L52C	Urban land-Lester complex, 2 to 18 percent slopes	East of Highway 100 nearing Brownie Lake/Cedar Lake
L52E	Urban land-Lester complex, 18 to 35 percent slopes	

As discussed in Section 9, Land Use, the Golden Auto National Lead site is located adjacent to the MN&S section, just south of Highway 7. Soil contamination is present on this site, but the EPA has indicated that "contaminated ground water migration is under control." [5]

Impacts: MN&S Section

According to the NRCS Soil Data Mart – Soil Survey of Hennepin County, the L55B and L55C soils (Urban land – Malardi complex) are classified as having "excessive permeability." This means that contaminants have a high potential of moving very quickly through the soil, and potentially to a groundwater resource (saturated hydraulic conductivity is 42 micrometers per second or more). According to the MDH County Well Index, well logs in this area indicate a sandy, gravelly soil sub base, which would further confirm the data from the soil survey. As such, there is potential for groundwater contamination from construction wastes, chemicals, and/or petroleum products due to high groundwater sensitivity.

Construction of the rail bridge will occur within an existing rail easement over the Golden Auto National Lead site. The soils on this specific parcel are classified as U4A, or Urban Land/cut and fill. It is not identified as a highly permeable soil; however, due to the level of contamination on the site, groundwater contamination could be a possibility if materials are disturbed and not handled properly.

Impacts: BNSF Section

None of the soils in this section are classified as being excessively permeable, nor do they present characteristics indicating a high propensity for supporting contaminants. Groundwater contamination from construction wastes, chemicals, and/or petroleum products is not likely.

Impacts: Total Project

Soils in the project area are urban complexes that have been subject to disturbance from previous and current development. Groundwater impacts are likely limited to areas of highly permeable soils, located near the middle of the MN&S section.

Mitigation: Area "A"

All regulated materials/wastes would be managed on this project in accordance with the appropriate federal and state regulations.

A management plan would be developed for properly handling, treating, storing, and disposing of solid wastes, hazardous materials, petroleum products, and other regulated materials/wastes that are used or generated during construction.

An emergency response and containment plan would be developed for the project to minimize impacts to soils and groundwater in the event a release of hazardous substances occurs during construction. If a release were to occur, the MPCA, MHD, and/or Department of Public Safety

[5] http://cfpub.epa.gov/supercpad/cursites/csitinfo.cfm?id=0503817

(MDPS) would be contacted immediately. Excavation on the Golden Auto National Lead site would be closely coordinated and regulated by the MPCA.

Solid Wastes, Hazardous Wastes, and Storage Tanks

Regulatory Context/Methodology

All pollutants, contaminants and hazardous wastes (as defined in Minnesota Statutes, 115B.02) identified or used during construction projects must be properly handled and treated in accordance with appropriate federal and state regulations.

Existing Conditions

See the Right-of-Way/Relocations Sections for a description of properties that would be purchased as part of the project. Right of way purchase may involve the demolition of structures, and some of these structures are of an age where asbestos, lead, or other contaminants may be present.

Impacts: Total Project

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

No permanent above or below ground storage tanks would be used in conjunction with this project. Temporary ASTs may be utilized on-site to store petroleum products and other materials during construction.

Mitigation: Area “A”

All regulated materials/wastes would be managed on this project in accordance with the appropriate federal and state regulations. A management plan would be developed for properly handling, treating, storing, and disposing of solid wastes, hazardous materials, petroleum products, and other regulated materials/wastes that are used or generated during construction.

Any buildings to be removed for the project will be inspected for hazardous materials prior to demolition. A certified asbestos abatement contractor would be used to remove any asbestos containing materials identified. Any green-treated wood would be documented and disposed of in a MPCA approved Mixed Municipal Solid Waste (sanitary) landfill or Industrial Waste Landfill.

All regulated materials and waste, including hazardous waste, from buildings would be removed and properly disposed of proper to demolition. Demolition debris is inert material such as concrete, brick, bituminous, glass, plastic, untreated wood, and rock. This material must be disposed of in an MPCA-approved demolition landfill, or separated and recycled. Management of this material would be in accordance with state guidelines and regulations.

An emergency response and containment plan would be developed for the project to minimize impacts to soils and groundwater in the event a release of hazardous substances occurs during construction. If a release were to occur, the MPCA, MHD, and/or Department of Public Safety (MDPS) would be contacted immediately. If previously unknown regulated materials/wastes are discovered during construction, the Contractor shall notify the Project Engineer immediately. Any contaminated soil removed on site will be treated as hazardous waste and disposed of in a MPCA approved landfill.

Traffic

Regulatory Context/Methodology

Traffic methodology is woven into the subsequent sections.

Existing Conditions

The conditions at each of the existing grade crossings were documented in terms of traffic volumes, crash history, and control/grade crossing equipment. A map of the at-grade crossings is shown on **Figure 8** and a summary of the data for each crossing is provided in **Table 3** below. CP currently operates one local assignment, round trip, five days per week on the MN&S. The typical size of the current train ranges between 10 and 30 cars per day. Assuming up to 30-cars, operating at 10 miles per hour (mph), each train takes approximately 13.5 minutes to travel from the CP-Bass Lake Spur connection with the CP- MN&S spur, just south of TH 7 to the BNSF Wayzata Subdivision and each of the at-grade crossings is blocked for approximately 2.9 minutes. The existing rail traffic does result in some delay and queuing, most notably at Dakota Avenue, which has the highest traffic volumes of all the at-grade crossings. Neither the crash history nor the current traffic volumes indicated significant traffic operations or safety issues at the existing grade crossings. Some of the crossings have been identified for additional crossing enhancements in the near term based on available Mn/DOT funding, as noted in **Table 3**.

Parking spaces added: N/A

Existing spaces (if project involves expansion): N/A

Estimated total average daily traffic generated: N/A

Estimated maximum peak hour traffic generated and time of occurrence: N/A

Indicate source of trip generation rates used in the estimates. N/A

Table 3. Existing At-Grade Crossing Data

Crossing #	Location	24-Hour Traffic Count	Crash History at Crossing (1999-2008)	Crossing Width	Existing Control	Recent or Planned Improvements	Existing Issues and Concerns
1	28th Street	1,303 (2009)	None	36 feet	Stop Signs with Crossbucks	None	Roadway grades on 28th St
2	29th Street	165 (2011)	None	32 feet	Stop Signs with Crossbucks	None	Roadway grades on 29th St
3	Brunswick Avenue (North)	N/A (pedestrians only)	None	10 feet	None	Roadway crossing closed 2005. Pedestrian crossing constructed 2006.	Uncontrolled pedestrian crossing and access
4	Dakota Avenue	4,583 (2009)	Rear-end collision at gates (2006)	97 feet	Flashers and Gates	Gates and new concrete surface constructed 2005.	Pedestrian crossings and pedestrians on tracks
5	Library Lane	2,052 (2011)	None	142 feet	Flashers	Programmed for gate installation in	Length of time crossing is blocked
6	Lake Street	4,017 (2009)	Collision with train (2002)		Ovehead Flashers		
7	Walker Street	2,805 (2009)	None	66 feet	Flashers	None	

Source: City of St. Louis Park, except Walker Street, which was estimated daily count based on two separate peak hour observations conducted by Kimley-Horn in spring 2011 while school was in session (non spring break periods).

There are two schools located near the MN&S Spur– St. Louis Park Senior High School (grades 9-12) and Park Spanish Immersion (PSI) School (grades K-5). In the morning before school, buses drop off students at the high school and then travel on Dakota Avenue to drop off students at PSI. The drop-off process tends to be staggered because not all buses arrive at the schools at the same time. In the afternoon, approximately 30 buses load at PSI and then all travel northbound via Library Lane and W 33rd Street to the high school to pick up students. Due to the large volume of buses that travel from PSI to the high school in a very short time (observed to be approximately 3 to 4 minutes), a police officer stops traffic at the Library Lane/Lake Street intersection and directs all the buses through the intersection each day after school. In the existing conditions, this was observed to result in queues of approximately six vehicles eastbound on Lake Street, two vehicles westbound on Lake Street, and four vehicles southbound on Library Lane.

The bus operations described above are summarized on **Figure 9**. In addition to bus traffic between the schools, pedestrian traffic is also generated by the high school, including open lunch for grade 12 students, high school students that leave the school during the day to do community service, and after school/evening activities at the football field, which is located across the tracks from the high school.

The high school has a parking lot on the north side of the building, accessed via W 33rd Street that contains approximately 300 parking stalls designated for staff, visitors, and students. This parking lot was observed to be parked at capacity during the school day. There is an a additional parking lot south of the building with vehicles entering from Dakota Avenue and exiting to Library Lane that is designated for parking by Adult Basic Education (ABE) staff and students and was observed to be parked at approximately 50 to 75 percent of capacity during the school day.

<u>Impacts: Total Project</u>
As stated in the Project Description section, the Proposed Action includes the closure of the existing grade crossing at 29th Street. Closure of the 29th Street grade crossing would be expected to result in the diversion of a portion of the 109 vehicles per day from 29th Street to one of the adjacent roadways to cross the railroad tracks. The two adjacent roadways would continue to have crossings, with 28th Street at-grade and Minnetonka Boulevard grade separated. The existing daily traffic volume on 28th Street is 1,303 vehicles per day compared to an estimated capacity for a two-lane roadway of approximately 10,000-15,000 vehicles per day, based on the Highway Capacity Manual per-lane capacities. If all traffic from the 29th Street crossing diverted to the 28th Street crossing, this would be an increase of less than 10 percent in daily traffic on 28th Street, or about 10 to 15 vehicles in each of the peak hours.

The Minnesota Manual on Uniform Traffic Control Devices section 2B.7 requires a minimum of 500 vehicles per hour for at least four hours per day at an intersection in order to meet all-way stop warrants, and the minimum volumes to meet warrants for a traffic signal are higher. Existing hourly counts at the intersection have not been conducted at 28th Street/Blackstone Avenue and 28th Street/Brunswick Avenue, but it is estimated that the peak hour volumes at the intersections would be, at most, approximately 200-250 vehicles/hour assuming traffic volumes of approximately1,000 vehicles per day on both Blackstone Avenue and Brunswick Avenue. Therefore, if all traffic diverted from 29th Street to 28th Street between Blackstone Avenue and Brunswick Avenue, no adverse traffic impacts would be expected on 28th Street, including the 28th Street/Blackstone Avenue and 28th Street/Brunswick Avenue intersections. In addition, the Louisiana Avenue/28th Street intersection is already signalized and has approximately 1,600 entering vehicles during the peak hour compared to an estimated capacity of 3,000-4,000 vehicles per hour based on the Highway Capacity Manual per-lane capacities.

The train travel times from the CP-Bass Lake Spur connection with the CP- MN&S Spur, just south of TH 7 to the BNSF Wayzata Subdivision were calculated based on potential train operating speeds, as shown in **Table 4.** The times in the table are based on the time when the first car enters the corridor until the time when the first car exits the corridor. Then the total time the train is in the corridor would be the time in **Table 4** plus the times shown in **Table 5**, which encompass the time for the first car to the last car to clear a given point and are based on train length and travel speed.

Table 4. Train Travel Time on MN&S

Travel Time on MN&S (minutes) (CP Bass Lake Spur Connecting Point with the MN&S Spur)	Train Speed (miles per hour)			
	10	15	20	25
	13.5	9	6.8	5.4

The impact of increased rail traffic and longer trains on at-grade crossing blockage times was considered relative to various train speeds and lengths and the traffic volumes at each grade crossing. In addition, the number of crossings that would be blocked at any one time was also evaluated, with the results shown in **Table 5**. For a given train length, the operating speed directly impacts how long a crossing will be blocked, while the overall train length (regardless of speed) determines how many crossings will be blocked at any one time. Based on the potential best and worst case scenarios for intersection blocking times, the traffic impacts at each crossing were evaluated for the highest volume 15-minute period of the day. For most locations, this occurred during the PM peak hour. However, on southbound Dakota Avenue and both directions on Library Lane, the highest 15-minute volume was recorded just after school dismissal. The results of the queuing analysis are shown in **Table 6**.

Based on the existing vehicle traffic volumes, traffic at the Lake Street and Walker Street at-grade crossings would not be expected to reach mainline TH 7 (See Cumulative Effects section regarding proposed TH 7/Louisiana Avenue project that would include closure of the existing TH 7/Lake Street access) unless the crossings were both blocked for more than 12.5 minutes, which is equivalent to a 120-car train traveling at 9.3 mph or an 80-car train traveling at 6.3 mph (worst-case scenario). The longest expected queue would occur in a scenario when a 120-car train arrived during school dismissal. The queues on northbound Dakota Avenue would extend through the Dakota Avenue/Lake Street intersection, but would not be expected to reach the TH 7 intersections. The queues on southbound Dakota Avenue could cause increases in delay to traffic leaving the high school at dismissal time. In this case, vehicles would be primarily queued on W 33rd Street and Dakota Avenue, which would impact neighborhood traffic, but not any arterial roadways. Vehicles could choose to divert from southbound Dakota Avenue to Minnetonka Boulevard or Louisiana Avenue. The potential volume of diverted traffic could be higher than from the Lake Street and Walker Street crossings, but still would represent only a small change in traffic volumes on the adjacent roadways. Therefore, the potential impacts of diverted traffic from the at-grade crossings to the surrounding roadway network would not be expected to be significant.

Likewise, if a train arrived during the HS school arrival period (8-8:15 a.m.), vehicles would be expected to queue into and be blocked from exiting the HS parking lot on the south side of the building. However, the high school arrival and dismissal periods were observed to last only about 10 to 15 minutes, so a scenario in which a train arrived during this relatively small window is possible, but would be expected to be a relatively rare occurrence.

Table 5. At-Grade Crossing Times

<table>
<tr><th rowspan="3"></th><th rowspan="3">Operating Conditions</th><th rowspan="3">Maximum Daily Frequency</th><th colspan="6">Estimated Intersection Block Time (Minutes)</th><th rowspan="3">Maximum Number of Crossings Blocked</th><th rowspan="3">Maximum Time that Maximum Number of Crossings Blocked (Minutes)</th></tr>
<tr><th colspan="2">Train Length*</th><th colspan="4">Train Speed (miles per hour)</th></tr>
<tr><th>Cars</th><th>Feet</th><th>10</th><th>15</th><th>20</th><th>25</th></tr>
<tr><td>Existing</td><td>30 cars @ 10 mph</td><td>1 round trip (2 trains)</td><td>30</td><td>2,550</td><td>2.9</td><td>1.9</td><td>1.4</td><td>1.2</td><td>3 (Walker, Lake/Library, Dakota)</td><td>1.1</td></tr>
<tr><td rowspan="3">Proposed TC&W (3-7 Days/Week)</td><td>20 cars @ 25 mph (assumed best case)</td><td rowspan="3">2 round trips (2 trains @ 20 cars + 2 trains @ 50 cars)</td><td>20</td><td>1,700</td><td>1.9</td><td>1.3</td><td>1.0</td><td>0.8</td><td>3 (Walker, Lake/Library, Dakota)</td><td>0.1</td></tr>
<tr><td rowspan="2">50 cars @ 15 mph (assumed worst case)</td><td rowspan="2">50</td><td rowspan="2">4,250</td><td rowspan="2">4.8</td><td rowspan="2">3.2</td><td rowspan="2">2.4</td><td rowspan="2">1.9</td><td>3 (Walker, Lake/Library, Dakota</td><td>2.0</td></tr>
<tr><td>-or- Dakota, 29th, 28th)</td><td>0.02</td></tr>
<tr><td rowspan="2">Proposed Coal and Ethanol (5 Days/Month)</td><td>80 cars @ 15 mph (assumed best case)</td><td rowspan="2">1 round trip + 1 one-way trip (2 trains @ 80 cars + 1 train @ 120 cars)</td><td>80</td><td>6,800</td><td>7.7</td><td>5.2</td><td>3.9</td><td>3.1</td><td>5 (Walker through 28th)</td><td>0.8</td></tr>
<tr><td>120 cars @ 10 mph (assumed worst case)</td><td>120</td><td>10,200</td><td>11.6</td><td>7.7</td><td>5.8</td><td>4.6</td><td>5 (Walker through 28th)</td><td>5.1</td></tr>
</table>

Source: Kimley-Horn and Associates, Inc.

* Estimates reflect 85-foot cars

Table 6. At-Grade Crossing - Queuing Analysis

Crossing #	Location	24-Hour Traffic Count (May 2009	Peak 15-Minute Volumes (May 2009 and March-April 2011 counts)	Estimated Maximum Vehicle Queue at Crossing (Vehicles) Based on Train During Peak 15-Minute Period

			Volume	Time of Day	Direction	**Existing** *Frequency = 2/Day (Max)*	**Proposed 3-7 Days/Week** *Frequency = 4/Day (Max)*		**Proposed 5 Days/Month** *Frequency = 3/Day (Max)*	
						30-car Train @ 10 mph	20-car Train @ 25 mph	50-car Train @ 15 mph	80-car Train @ 15 mph	120-car Train @ 10 mph
1	28th Street	1,303	21 *(estimated)*	*PM Peak (assumed)*	NB	4	1	5	7	16
					SB					
2	29th Street	165	5	5:30-5:45 PM	EB	1	*Crossing Assumed to be Closed in Future Conditions*			
			6	3:00-3:15 PM	WB					
4	Dakota Avenue	4,583	98	5:15-5:30 PM	NB	19	5	21	34	76
			88	3:10-3:25 PM	SB	17	5	19	30	68
5	Library Lane	2,052	43	3:00-3:15 PM	NB	8	2	9	15	33
			101	8:00-8:15 AM	SB	20	5	22	35	78
6	Lake Street	4,017	43	5:30-5:45 PM	EB	8	2	9	15	33

			45	5:45-6:00 PM	WB	9	2	10	15	35
7	Walker Street	1,104 *(estimated)*	22	5:00-5:15 PM	EB	4	1	5	8	17
			14	5:00-5:15 PM	WB	3	1	3	5	11

Mitigation: Area "B" Mitigation

Under the Proposed Action, Quiet Zone upgrades would be implemented at all remaining grade crossings between Walker and 28th Street. The quiet zone design concept includes improved pedestrian safety at the study area grade crossings, in the form of pedestrian gates at all existing and proposed sidewalk locations. Fencing will be included at all quiet zone grade crossings to control pedestrian movements at/around crossing signal gates.

In addition to the quiet zone design (see Figure 12), there will be further discussion with the City of St. Louis Park, St. Louis Park School Board, railroads and other stakeholders regarding additional feasible and effective safety mitigation in the vicinity of the St. Louis Park High School. Additional mitigation could include a grade separated pedestrian crossing, High Intensity Activated Crosswalk (HAWK) signal, or overhead flashers to improve safety of pedestrians traveling between the high school and Park Spanish Immersion or the high school and the football field (see the Safety section).

Vehicle-Related Air Emissions

Regulatory Context/Methodology

Pursuant to the Federal Clean Air Act of 1970 (CAA)[6], the US Environmental Protection Agency (EPA) established National Ambient Air Quality Standards (NAAQS) for major pollutants, called "criteria pollutants." Currently there are six (6) criteria pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter, and lead (Pb). Particulate matter (PM) includes particles with a diameter less than 10 micrometers (PM_{10}) and with a diameter of less than 2.5 micrometers ($PM_{2.5}$).

Table 7 shows the primary and secondary NAAQS for the criteria pollutants. The NAAQS are two-tiered. The first tier (primary) is intended to protect public health. The second tier (secondary) is intended to prevent further degradation of the environment.

[6] 42 U.S.C. §§ 7401 – 7676.

Table 7. National Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Averaging Time	Primary Standards [1,2]	Secondary Standards [1,3]	
CO	8-hour	9 ppm (10 mg/m^3)	None	
	1-hour	30 ppm (40 mg/m^3) [7]	None	
Lead [4]	Quarterly Average	1.5 µg/m^3	Same as Primary	
	Rolling 3-Month Average[5]	0.15 µg/m^3	Same as Primary	
NO_2	Annual Arithmetic Mean	0.053 ppm (100 µg/m^3)	Same as Primary	
	1-hour	100 ppb	None	
PM_{10}	Annual Arithmetic Mean	None	None	
	24-hour	150 µg/m^3	Same as Primary	
PM_{25}	Annual Arithmetic Mean	15 µg/m^3	Same as Primary	
	24-hour	35 µg/m^3	Same as Primary	
O_3	8-hour	0.075 ppm (147 µg/m^3)	Same as Primary	
SO_2	Annual Arithmetic Mean	0.03 ppm (80 µg/m^3)	0.5 ppm	3-hour
	24-hour	0.14 ppm (365 µg/m^3)		
	1-hour	75 ppb [6]	None	

Notes:
National standards (other than ozone, particulate matter, and those based on annual averages) are not to be exceeded more than once per year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or is less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 ug/m^3 is equal to or is less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over three years, are equal to or are less than the standard.
2. Primary Standards: Levels necessary to protect public health with an adequate margin of safety.
3. Secondary Standards: Levels necessary to protect the public from any known or anticipated adverse effects.
Lead is categorized as a “toxic air contaminant” with no threshold exposure level for adverse health effects determined.
5. National lead standard, rolling three-month average: final rule signed October 15, 2008.
Based on the final rule signed June 2, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.
7. Minnesota state standard not to be exceeded more than once per year.

The standards in **Table 7** apply to the concentration of a pollutant in outdoor ambient air. If the air quality in a geographic area meets or exceeds the national standard, it is designated an attainment area. Areas that do not meet the national standard are designated non-attainment areas. Once a non-attainment area meets the standards, the EPA will re-designate the area as a “maintenance area.”

Each state is required to draft a State Implementation Plan (SIP) to further improve the air quality in non-attainment areas and to maintain the air quality in attainment and maintenance areas. The plan outlines the measures that the state will take in order to improve air quality.

As mentioned above, the Proposed Action is located in Hennepin County and is designated a maintenance area for CO and SO_2 and attainment for all the other regulated standards.

Existing Conditions

EPA and local state agencies operate ambient monitoring stations which are used to assess air quality in each state. To characterize the existing conditions of the Hennepin County area, the most recent data obtained from the EPA Aerometric Information Retrieval System (AIRS) database was reviewed for 2008. The analysis consisted of regulated air pollutants contained in the NAAQS; including sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), lead (Pb), and particulate matter (PM_{10} and $PM_{2.5}$). A summary of the background air quality concentrations is presented in **Table 8**. The monitoring data shows that background levels are below the NAAQS for all pollutants and averaging periods.

Table 8. Ambient Background Air Quality Concentrations[3]

County	Carbon Monoxide (CO, ppm)		Nitrogen Dioxide (NO_2,ppm)[1]		Sulfur Dioxide (SO_2, ppm)			Ozone (ppm)[2]	$PM_{2.5}$ (ug/m^3)		PM_{10} (ug/m^3)		Lead (ug/m^3)	
	1-Hr	**8-Hr**	**1-Hr**	**Annual**	**1-Hr**	**24-Hr**	**Annual**	**8-Hr**	**24-Hr**	**Annual**	**24-Hr**	**Annual**	**Quarterly**	**Monthly**
Hennepin	2.0	0.7	0.055	.009	0.042	0.013	0.002	0.064	33.5	9.5	47	24	0.01	0.01
NAAQS	**35**	**9**	**0.100**	**0.053**	**0.075**	**0.14**	**0.03**	**0.075**	**35**	**15**	**150**	**50**	**1.5**	**0.15**

Notes:

1. No monitors in Hennepin Co. Monitor values represent the highest concentrations from Anoka and Dakota counties.
2. No monitors in Hennepin Co. Monitor values represent the highest concentration from Anoka and Scott counties.
3. All short term concentrations represent the second highest values while the annual concentration represents the highest value.

Impacts: Total Project

Conformity Analysis

The 1990 Clean Air Act Amendments (CAAA) requires that State Implementation Plans (SIPs) must demonstrate how states with non attainment and maintenance areas will meet the federal air quality standards. The Proposed Action is located in Hennepin County which the EPA has designated as a maintenance area for CO and SO_2. The air quality analysis typically evaluates the net emissions increase associated with a proposed project.

The EPA issued final rules on transportation conformity (amended as 40 CFR 93 in 2008) which describe the methods required to demonstrate SIP compliance for transportation projects. These guidelines indicate that non-exempt transportation projects (including this project if federal funding is used or a federal action is required) may need to be included in the regional emissions analysis to demonstrate that the project would not increase regional CO emissions and would not increase the frequency or severity of existing violations. The Proposed Action is not included in the Metropolitan Planning Organization's Long Range Transportation Policy Plan (LRTPP) or in the four-year Transportation Improvement Program (TIP).

As defined by MnDOT, a regionally significant project (unless specifically exempted) is a transportation project that is on a facility which serves regional transportation needs (such as access to and from the area outside of the region, major activity centers in the region, major planned developments such as new retail malls, sports complexes, etc., or transportation terminals as well as most terminals themselves) and would normally be included in the modeling of a metropolitan area's transportation network, including at a minimum all principal arterial highways and all fixed guide-way transit facilities that offer an alternative to regional highway travel. The Proposed Action would not result in additional train trips or unforeseen stops or idling compared to the current freight operating scenario for the region (e.g. no net increase in train operations in the region, but rather a relocation of existing operations). Under the MnDOT definition, the Proposed Action is not considered a regionally significant project and conforms to the requirements of the CAAA and to the Conformity Rules, 40 CFR 93.

Air Quality Hot Spot Analysis/Mobile Air Source Toxics

Although the Proposed Action is located in an area where conformity requirements apply, the Proposed Action is not considered to be regionally significant and the scope of the project does not indicate air quality impacts would be expected. Furthermore, the United States Environmental Protection Agency has approved a screening method to determine which intersections need hot-spot analyses. The Proposed Action is not directly adding additional vehicle traffic volume to any local intersection; therefore, air quality localized impacts should be similar with or without the Proposed Action. The analysis demonstrates by the results of the screening procedure that there are no signalized intersections included in this project area that require a hot-spot analysis.

The Proposed Action will improve the operational efficiency of freight through the City of St. Louis Park. The Proposed Action also includes the implementation of quiet zone design at grade crossings to enhance railway safety. This Proposed Action has been determined to generate minimal air quality impacts for CAAA criteria pollutants and has not been linked with any special MSAT concerns. As such, this Proposed Action will not result in changes in traffic volumes, vehicle mix, basic project location, or any other factor that would cause an increase in MSAT impacts of the project from that of a no action option.

Moreover, EPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on regulations now in effect, an analysis of national trends with EPA's MOBILE6.2 model forecasts a combined reduction of 72 percent in the total annual emission rate for the priority MSAT from 1999 to 2050 while vehicle-miles of travel are projected to increase by 145 percent. This will both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from the Proposed Action.

Mitigation: Area "A"
No mitigation is required.

Stationary Source Air Emissions
There would be no stationary source air emissions associated with the Proposed Action.

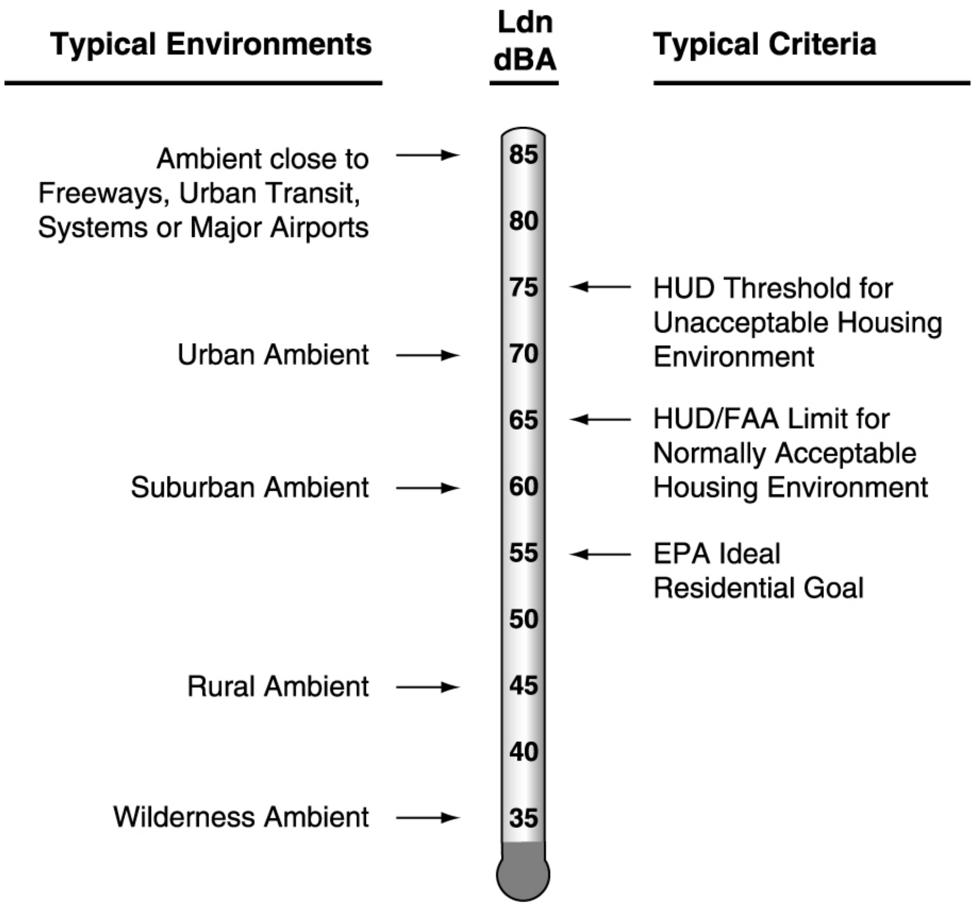
Odors, Noise, and Dust
Regulatory Context/Methodology
Note: The complete noise assessment technical report is included in Appendix C.

Noise Basics
Noise is typically defined as unwanted or undesirable sound, whereas sound is characterized by small air pressure fluctuations above and below the atmospheric pressure. The basic parameters of environmental noise that affect human subjective response are (1) intensity or level, (2) frequency content and (3) variation with time. The first parameter is determined by how greatly the sound pressure fluctuates above and below the atmospheric pressure, and is expressed on a compressed scale in units of decibels. By using this scale, the range of normally encountered sound can be expressed by values between 0 and 120 decibels. On a relative basis, a 3-decibel change in sound level generally represents a barely noticeable change outside the laboratory, whereas a 10-decibel change in sound level would typically be perceived as a doubling (or halving) in the loudness of a sound.

The frequency content of noise is related to the tone or pitch of the sound, and is expressed based on the rate of the air pressure fluctuation in terms of cycles per second (called Hertz and abbreviated as Hz). The human ear can detect a wide range of frequencies from about 20 Hz to 17,000 Hz. However, because the sensitivity of human hearing varies with frequency, the A-weighting system is commonly used when measuring environmental noise to provide a single number descriptor that correlates with human subjective response. Sound levels measured using this weighting system are called "A-weighted" sound levels, and are expressed in decibel notation as "dBA." The A-weighted sound level is widely accepted by acousticians as a proper unit for describing environmental noise.

Because environmental noise fluctuates from moment to moment, it is common practice to condense all of this information into a single number, called the "equivalent" sound level (Leq). Leq can be thought of as the steady sound level that represents the same sound energy as the varying sound levels over a specified time period (typically 1 hour or 24 hours). Often the Leq values over a 24-hour period are used to calculate cumulative noise exposure in terms of the Day-Night Sound Level (Ldn). Ldn is the Aweighed Leq for a 24-hour period with an added 10-decibel penalty imposed on noise that occurs during the nighttime hours (between 10:00 PM and 7:00 AM). Many surveys have shown that Ldn is well correlated with human annoyance, and therefore this descriptor is widely used for environmental noise impact assessment. **Exhibit 1** provides examples of typical noise environments and criteria in terms of Ldn. While the extremes of Ldn are shown to range from 35 dBA in a wilderness environment to 85 dBA in noisy urban environments, Ldn is generally found to range between 55 dBA and 75 dBA in most communities. As shown in **Exhibit 1**, this spans the range between an “ideal” residential environment and the threshold for an unacceptable residential environment according to U.S. Federal agency criteria.

Exhibit 1. Examples of Typical Outdoor Noise Exposure



Noise Impact Criteria

Noise impact for this project is based on the criteria as defined in the U.S. FTA guidance manual *Transit Noise and Vibration Impact Assessment* (FTA-VA-90-1003-06, May 2006). The FRA has adopted the criteria and methodology used in the FTA guidance manual for use on freight rail projects.

FTA noise impact criteria are founded on well-documented research on community reaction to noise and are based on change in noise exposure using a sliding scale. Although higher rail noise levels are allowed in neighborhoods with high levels of existing noise, smaller increases in total noise exposure are allowed with increasing levels of existing noise.

The FTA Noise Impact Criteria group noise sensitive land uses into the following three categories:

- Category 1: Buildings or parks where “quiet” is an essential element of their purpose.
- Category 2: Residences and buildings where people normally sleep. This includes residences, hospitals, and hotels where nighttime sensitivity is assumed to be of utmost importance.
- Category 3: Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, churches and active parks.
  Ldn is used to characterize noise exposure for residential areas (Category 2). For other noise sensitive land uses, such as outdoor amphitheaters and school buildings (Categories 1 and 3), the maximum 1-hour Leq during the facility’s operating period is used.

  There are two levels of impact included in the FTA criteria. The interpretation of these two levels of impact is summarized below:

- Severe Impact: Project-generated noise in the severe impact range can be expected to cause a significant percentage of people to be highly annoyed by the new noise and represents the most compelling need for mitigation. Noise mitigation will normally be specified for severe impact areas unless there are truly extenuating circumstances which prevent it.
- Moderate Impact: In this range of noise impact, the change in the cumulative noise level is noticeable to most people but may not be sufficient to cause strong, adverse reactions from the community. In this transitional area, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation. These factors include the existing level, the predicted level of increase over existing noise levels, the types and numbers of noise-sensitive land uses affected, the noise sensitivity of the properties, the effectiveness of the mitigation measures, community views and the cost of mitigating noise to more acceptable levels.
  Chapter 7030 of the Minnesota Administrative Rules has a series of noise limits that can be applied to projects such as the MN&S Freight Rail Study. The limits are based on the L10 and L50, which are the noise levels exceeded 10% and 50% of the time, respectively. The limits are based on the time of day and the noise area classification, and are shown in **Table 9**. The limits for noise classification area 1, which includes all residences, churches, schools, and other similar land uses, are used in this assessment.

Table 9. Minnesota Noise Pollution Control Limits

Noise Classification Area	Daytime		Nighttime	
	L50	L10	L50	L10
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80
All noise levels are in dBA.				

The following are assumptions used in the analysis for the noise assessment:

- Identify noise-sensitive land use: Noise-sensitive land use along the project corridor was identified based on preliminary alignment drawings, aerial photography and GIS mapping.
- Characterize the existing noise environment: Existing noise levels were measured as described above. Existing operations include one round-trip CP train per weekday traveling at 10 mph over jointed track. Based on observations and data from the noise monitors, the train horns are currently only sounded briefly at each roadway-rail grade crossing.
- Predict future noise from rail operations: Future noise levels were projected based on the project assumptions defined below. . In order to account for trains that have less than one daily operation, the assessment assumed an average number of trains per day over a two-week period. This results in a more conservative estimate of the project noise.

Specific project assumptions include (consistent with key design elements of the Proposed Action):

  - All trains will travel at no more than 25 mph.
  - The track will be continuously welded rail.
  - The CP operations will remain unchanged (one round trip train at up to 30 cars)
  - The TC&W operations include:
    - One freight train with 2-4 locomotives and 50 cars operating six days per week,
    - Another freight train with 2-4 locomotives and 20 cars operating 3-4 days per week,
    - A unit ethanol train with 2 locomotives and 80 cars operating once every 2 weeks, and
    - A unit coal train with 4 locomotives and 120 cars, operating once every 2 weeks in one direction only.
    - The unit coal trains were assumed to be equally likely to operate during the day or night. All other trains were assumed to operate during the day.
  - The train horns were assumed to be sounded at all highway-rail grade-crossings, but not at pedestrian crossings. Based on FRA requirements, the horns are sounded for 20 seconds prior to each grade-crossing, starting 750 feet from the crossings.
- Assess impact based on the criteria: The projections determined the Leq and Ldn values at each sensitive receptor and noise impact was assessed according to the appropriate FTA criteria, depending on the land use category.
- Recommend mitigation measures where required and appropriate: Mitigation measures can include noise barriers, sound insulation, quiet zones and other means to reduce noise from rail operations.

<u>Existing Conditions</u>

Noise-sensitive land use along the project corridor was identified based on preliminary alignment drawings, aerial photographs and GIS data. Areas adjacent to the corridor include single- and multifamily residence in the northern and central portions of the corridor. There are also three parks in this portion of the corridor. The southern portion of the corridor is mixed-use, with some residential along with commercial and industrial land uses. St. Louis Park Senior High School, the Metropolitan Open School, and the Masonic Lodge are also located in this area.

Long-term, ambient noise measurements were conducted at selected sites along the corridor during the period from February 15 through February 17, 2011. Four sites, designated as Sites LT-1 through LT-4, were selected for long-term (24-hour) monitoring. At each of these locations, unattended B&K model 2250 portable, automatic noise monitors were used to continuously sample the A-weighted sound level (with slow response), over one 24-hour period. The noise monitors were programmed to record hourly results, including the maximum sound level (Lmax), the equivalent sound level (Leq) and the statistical percentile sound levels (Ln). The day-night equivalent sound level (Ldn) was subsequently computed from the hourly Leq data.

A summary of the existing noise measurements is provided in **Table 10** and the noise measurement locations are shown in **Figure 10.**

Table 10. Summary of Existing Noise Measurements

Site No.	Measurement Location Description	Start of Measurement		Meas. Time (hrs)	Noise Exposure (dBA)	
		Date	Time		Ldn	Leq
LT-1	St. Louis Park High School	2/15/11	14:00	24	58	58
LT-2	2220 Ridge Dr. (The Willows)	2/15/11	15:00	24	67	63
LT-3	2837 Brunswick Ave.	2/15/11	17:00	24	55	60
LT-4	3225 Blackstone Ave.	2/16/11	13:00	24	56	54

Site LT-1: St. Louis Park High School – St. Louis Park, MN. The Ldn measured over a 24-hour period at the school adjacent to the gymnasium and the faculty parking lot was 58 dBA. The major noise sources in this area included traffic noise from TH 100, airplane flyovers, CP freight train pass-bys (blowing horn), commercial building/vehicle noise from Lake Street, and local traffic noise from Lake Street and the school parking lot.

Site LT-2: 2220 Ridge Drive. (The Willows) – St. Louis Park, MN. The Ldn measured over a 24-hour period adjacent to the swimming pool on the south side of this apartment complex was 67 dBA. The major noise sources in this area included traffic noise from TH 100, airplane flyovers, freight train pass-bys on the BNSF, commercial noise from a nearby industrial facility, and local community noise.

Site LT-3: 2837 Brunswick Avenue. – St. Louis Park, MN. The Ldn measured over a 24-hour period behind this single-family residence was 55 dBA. The major noise sources in this area included traffic noise from TH 100, airplane flyovers, CP freight train pass-bys and local community noise.

Site LT-4: 3225 Blackstone Avenue. – St. Louis Park, MN. The Ldn measured over a 24-hour period in the front yard of this single-family residence was 56 dBA. The major noise sources in this area included distant traffic noise from TH 100, airplane flyovers, CP freight train pass-bys, and local traffic noise.

Impacts: MN&S Section

The assessment of noise impact from train operations is based on a comparison of existing and projected future noise exposure for different land use categories. The following steps were performed to assess train noise impact:

- A detailed land-use survey was conducted along the project corridor to identify and classify all noise-sensitive receptors according to the defined categories. The majority of these receptors are single-family and multi-family residences, falling under FTA Category 2. The remainder are institutional sites falling under FTA Category 3.
- The receptors were clustered based on distance to the tracks, acoustical shielding between the receptors and the tracks, and location relative to crossovers and grade-crossings.
- The existing noise exposure at each cluster of receptors was assigned based on the nearest long-term noise measurement site, and was used to determine the thresholds for impact and severe impact using the FTA criteria.
- Projections of future train noise at each cluster of receptors were developed based on distance from the tracks; train schedule and train speed using the methods described.
- In areas where the projections showed either degree of impact, mitigation options were evaluated and new projections were developed assuming mitigation of all impacts.

For the train noise project, detailed comparisons of the existing and future noise levels are presented in **Table 11** and **Table 12**. **Table 11** includes results for the Category 2 receptors along the alignment with both daytime and nighttime sensitivity to noise (e.g. residences, hotels and hospitals). **Table 12** is a listing of all Category 3 receptors along the alignment, consisting of institutional sites that are not sensitive to noise at night (e.g. schools, churches, parks and medical offices). In addition to distance to the track and train speeds, each table includes the existing and future noise level, the projected noise level increase from train operations and the impact criteria for each receptor or receptor group. Based on a comparison of the increase in noise level with the impact criteria, the impact category is listed, along with the predicted total noise level due to the increase in speed and schedule of train operations. Table 4 also includes an inventory of the number of moderate impacts and severe impacts at each sensitive receptor location. Noise impact locations for Category 2 and 3 land uses are shown in **Figure** 11.

Table 11. Noise Impacts for Category 2 Land Use

Location	Civil Stn.	Side of Track	Dist To Track (ft)	Speed (mph)		Exist. Noise Level[1]	Future Noise Level[2]	Noise Level Increase[1]	Impact Criteria (Increase)		Impact Category	# of Residence Impacts	
				Ex.	Fut.				Mod.	Severe		Mod.	Severe
25 ½ St to 27th St (East)	710	E	110	10	25	55	57	2.5	3.2	7.2	No Impact	0	0
27th St to 28th St (West)	294	W	80	10	25	55	77	22	3.2	7.2	Severe	0	51
27th St to 28th St (East)	294	E	100	10	25	55	76	21	3.2	7.2	Severe	0	47
28th St to 29th St (West)	288	W	85	10	25	55	77	22	3.2	7.2	Severe	0	50
28th St to 29th St (East)	288	E	105	10	25	55	76	21	3.2	7.2	Severe	0	47
29th St to Rt. 5 (West)	282	W	80	10	25	55	75	20	3.2	7.2	Severe	6	6
29th St to Rt. 5 (East)	282	E	85	10	25	55	75	20	3.2	7.2	Severe	8	3
Rt. 5 to 32nd St (West)	273	W	90	10	25	56	58	1.7	2.8	6.4	No Impact	0	0
Rt. 5 to 32nd St (East)	273	E	180	10	25	56	56	-0.1	2.8	6.4	No Impact	0	0
32nd St to 33rd St (West)	265	W	355	10	25	56	66	9.6	2.8	6.4	Severe	1	5
Dakota/Colorado Ave from 33rd to Lake St	255	W	80	10	25	56	77	21	2.8	6.4	Severe	0	26
Alabama/Blackstone Ave from 32nd St to Lake St	264	E	80	10	25	56	58	2.0	2.8	6.4	No Impact	0	0
South of Lake St from Alabama Ave to Wooddale Ave	256	E	300	10	25	56	68	11.2	2.8	6.4	Severe	0	47
Lake St from Wooddale Ave to Walker St	240	E	30	10	25	58	84	26.5	2.5	6.0	Severe	5	7
Library Ln/ Brownlow Ave from 1st St to Lake St	236	W	120	10	25	58	74	16.6	2.5	6.0	Severe	5	38
Dakota Ave from 37th St to Oxford St	528	E	300	10	25	58	56	-1.8	2.5	6.0	No Impact	0	0
Total												**25**	**327**

1. Noise levels are based on Peak Hour Leq and are measured in dBA. Noise levels are rounded to the nearest decibel except for the increase in noise level, which is given to the nearest one-tenth decibel to provide a better resolution for assessing noise impact.
2. The reported noise levels represent the highest noise levels for each location.

Table 12. Noise Impacts for Category 3 Land Uses

Location	Civil Stn	Dist. to Track (ft)	Speed (mph)		Exist. Noise Level[1]	Future Noise Level[2]	Noise Level Increase[1]	Impact Criteria (Increase)		Impact Category
			Exist.	Fut.				Mod.	Severe	
Dakota Park	309	510	10	25	60	56	-4.2	4.7	9.1	No Impact
Roxbury Park	270	155	10	25	54	57	2.9	6.7	11.9	No Impact
Keystone Park	271	130	10	25	54	58	3.4	6.7	11.9	No Impact
St. Louis Park Senior High School	249	75	10	25	58	66	7.9	5.2	9.9	Moderate
Masonic Meeting Hall at 6509 Walker St	233	45	10	25	58	69	11.1	5.2	9.9	Severe
Metropolitan Open School	239	165	10	25	58	62	4.2	5.2	9.9	No Impact

1. Noise levels are based on Peak Hour Leq and are measured in dBA. Noise levels are rounded to the nearest decibel except for the increase in noise level, which is given to the nearest one-tenth decibel to provide a better resolution for assessing noise impact.
2. The reported noise levels represent the highest noise levels for each location.

Impacts: BNSF Section

In addition to the noise assessment for the MN&S Spur, a noise assessment was also conducted for the BNSF siding. In order to provide a conservative assessment, all trains traveling on the MN&S Spur were assumed to use the siding, and to idle for 30 minutes each. ***This idling assumption does not reflect operations defined by the BNSF. It has been assumed for purposes of reflecting a conservative impact analysis only.*** The eastbound trains were assumed to idle at the eastern end of the proposed siding, located approximately 160 feet from the nearest sensitive receptors, and the westbound trains were assumed to idle at the western end of the proposed siding, located approximately 120 feet from the nearest sensitive receptors.

The results of the impact assessment indicate an Ldn of 53 dBA at the east end of the siding and an Ldn of 55 dBA at the west end of the siding due to idling locomotives. Based on an existing Ldn of 67 dBA on the BNSF corridor, the criterion for moderate impact is 62 dBA Ldn, and therefore no impact is projected from activities on the siding.

Minnesota Noise Standards

The results of the noise assessment using the Minnesota Noise Pollution Control limits are shown in **Table 13**. The results show the measured ranges of L10 and L50 levels for both the existing daytime and nighttime hours at each of the four measurement locations. In addition, the table shows the existing measured and future projected L10 and L50 levels for the hours of 4 PM and 4 AM (typical daytime and nighttime hours) at each of the measurement locations. These represent the current noise levels, as measures, along the project corridor over an entire day, and during a specific daytime and nighttime hour.

The future projections assume one train occurring in the daytime or nighttime hour. The analysis added the noise of a train passby to the hourly data for both 4 PM and 4 AM at each location to calculate the L10 and L50 levels. Because the train events are so short in duration (approximately 3 minutes), the train noise has only a small effect on the L10 and L50. This analysis indicates that it is unlikely there would be exceedences of the Minnesota Noise

Pollution Control Limits at any of the four measurement locations. However, under unusual circumstances, such as a very slow train at night, or multiple trains during one hour, there is the possibility that the L10 limit, especially at night, could be exceeded.

Table 13. Minnesota Noise Pollution Control Limits

Time of Day	Measurement Site	Noise Pollution Control Limits		Existing Range		Levels at 4 PM and 4 AM			
						Existing		Future Projected	
		L50	L10	L50	L10	L50	L10	L50	L10
Daytime	Site 1	60	65	47-54	51-64	52	61	52	64
	Site 2			46-53	47-64	50	55	50	58
	Site 3			42-50	43-60	50	60	50	62
	Site 4			46-52	54-61	51	61	51	63
Nighttime	Site 1	50	55	40-52	43-54	45	47	45	47
	Site 2			39-53	46-53	39	42	39	43
	Site 3			37-48	39-50	39	42	40	42
	Site 4			37-46	39-50	39	41	39	43

Mitigation: Area "B"

The results of the noise assessment indicate that all the severe noise impacts in the corridor are due to the horn noise at highway-rail grade-crossings. The implementation of quiet zones (consistent with FRA regulations) would eliminate the horn noise, which is the dominant noise source on the trains. Noise barriers would not be as effective at reducing noise from horns, since there are physical limitations on barriers which would only potentially reduce horn noise by a small amount, rather than eliminating it altogether. The implementation of quiet zones at all grade-crossings in the study area would eliminate all severe noise impacts throughout the corridor. **Tables 14 and 15** show the results of the implementation of quiet zones throughout the corridor. The FRA has issued regulations regarding safety at grade-crossings which would apply to the MN&S Spur. In a quiet zone, because of safety improvements at the at-grade-crossings, train operators would sound warning devices (e.g. horns) only in emergency situations rather than as a standard operational procedure.

Table 14. Noise Levels for Category 2 Land Use with Implementation of Quiet Zones

Location	Civil Stn.	Side of Track	Dist To Track (ft)	Speed (mph)		Exist. Noise Level[1]	Future Noise Level[2]	Noise Level Increase[1]	Impact Criteria (Increase)		Impact Category	# of Residence Impacts	
				Ex.	Fut.				Mod.	Severe		Mod.	Severe
25 ½ St to 27th St (East)	710	E	110	10	25	55	57	2.5	3.2	7.2	No Impact	0	0
27th St to 28th St (West)	294	W	80	10	25	55	58	3.5	3.2	7.2	Moderate	11	0
27th St to 28th St (East)	294	E	100	10	25	55	58	3.4	3.2	7.2	Moderate	4	0
28th St to 29th St (West)	288	W	85	10	25	55	58	3.3	3.2	7.2	Moderate	9	0
28th St to 29th St (East)	288	E	105	10	25	55	58	2.6	3.2	7.2	No Impact	0	0
29th St to Rt. 5 (West)	282	W	80	10	25	55	58	3.4	3.2	7.2	Moderate	10	0
29th St to Rt. 5 (East)	282	E	85	10	25	55	58	3.2	3.2	7.2	Moderate	9	0
Rt. 5 to 32nd St (West)	273	W	90	10	25	56	58	1.7	2.8	6.4	No Impact	0	0
Rt. 5 to 32nd St (East)	273	E	180	10	25	56	56	-0.1	2.8	6.4	No Impact	0	0
32nd St to 33rd St (West)	265	W	355	10	25	56	60	3.5	2.8	6.4	Moderate	1	0
Dakota/Colorado Ave from 33rd to Lake St	255	W	80	10	25	56	58	2.1	2.8	6.4	No Impact	0	0
Alabama/Blackstone Ave from 32nd St to Lake St	264	E	80	10	25	56	58	2.0	2.8	6.4	No Impact	0	0
South of Lake St from Alabama Ave to Wooddale Ave	256	E	300	10	25	56	56	-0.9	2.8	6.4	No Impact	0	0
Lake St from Wooddale Ave to Walker St	240	E	30	10	25	58	63	5.4	2.5	6.0	Moderate	2	0
Library Ln/ Brownlow Ave from 1st St to Lake St	236	W	120	10	25	58	57	-0.3	2.5	6.0	No Impact	0	0
Dakota Ave from 37th St to Oxford St	528	E	300	10	25	58	56	-1.8	2.5	6.0	No Impact	0	0
Total												46	0

1. Noise levels are based on Peak Hour Leq and are measured in dBA. Noise levels are rounded to the nearest decibel except for the increase in noise level, which is given to the nearest one-tenth decibel to provide a better resolution for assessing noise impact.
2. The reported noise levels represent the highest noise levels for each location.

Table 15. Noise Levels for Category 3 Land Use with Implementation of Quiet Zones

Location	Civil Stn	Dist. to Track (ft)	Speed (mph)		Exist. Noise Level[1]	Future Noise Level[2]	Noise Level Increase[1]	Impact Criteria (Increase)		Impact Category
			Exist.	Fut.				Mod.	Severe	
Dakota Park	309	510	10	25	60	56	-4.2	4.7	9.1	No Impact
Roxbury Park	270	155	10	25	54	57	2.9	6.7	11.9	No Impact
Keystone Park	271	130	10	25	54	58	3.4	6.7	11.9	No Impact
St. Louis Park Senior High School	249	75	10	25	58	60	1.5	5.2	9.9	No Impact
Masonic Meeting Hall at 6509 Walker St	233	45	10	25	58	62	4.3	5.2	9.9	No Impact
Metropolitan Open School	239	165	10	25	58	57	-1.1	5.2	9.9	No Impact

1. Noise levels are based on Peak Hour Leq and are measured in dBA. Noise levels are rounded to the nearest decibel except for the increase in noise level, which is given to the nearest one-tenth decibel to provide a better resolution for assessing noise impact.
2. The reported noise levels represent the highest noise levels for each location.

Examples of quiet zone designs include, but are not limited to, (1) four quadrant gates at the crossing, perpendicular to the roadway (not the track) or (2) two quadrant gates with median dividers from the gates and extending 100 feet down the roadway. Roadways entering the crossing areas from the side within 100 feet of the crossing may have to be protected or modified for maximum effect, although the quad gates prevent most possible interference once down. At an installation where track crosses the intersection, such as south of the high school, all four directions would have to be fully protected and synchronized. A sample illustration of a quiet zone is included as **Figure 12**.A generic (non-site specific) quiet zone is provided to illustrate the elements that normally comprise a typical quiet zone. During preliminary and final engineering, the quiet zone for each crossing designated as requiring a quiet zone would be custom designed using these and similar elements to meet the specific requirements of that grade crossing, and surrounding right of way/land use constraints and conditions. Although medians are less expensive to install then four quadrant gates, not all roadways can accommodate medians.

Establishing a quiet zone requires cooperative action among the municipalities along the rail

corridor, Minnesota DOT and FRA. The cities are key participants as they must initiate the request to establish the zone through application to FRA. In addition, to meet safety criteria, improvements are required at grade-crossings; these include modifications to the streets, raised medians, warning lights and other devices.

Odors, Noise, and Dust During Construction

The proposed project would not generate substantial odors during construction. Potential odors would include exhaust from diesel engines and fuel storage. Dust generated during construction would be minimized through standard dust control measures such as applying water to exposed soils and limiting the extent and duration of exposed soil conditions. Construction contractors would be required to control dust and other airborne particulates in accordance with Mn/DOT specifications. After construction is complete, dust levels are anticipated to be minimal because all soil surfaces exposed during construction would be in permanent cover (i.e., paved or revegetated areas).

The construction activities associated with implementation of the proposed project may result in temporary increased noise levels relative to existing conditions. These impacts would primarily be associated with construction equipment and pile driving.

Table 16 shows peak noise levels monitored at 50 feet from various types of construction equipment. This equipment is primarily associated with site grading/site preparation, generally the roadway construction phase associated with the greatest noise levels.

Table 16. Typical Construction Equipment Noise Levels at 50 Feet

Equipment Type	Manufacturers Sampled	Total Number of Models in Sample	Peak Noise Level (dBA)	
			Range	Average
Backhoes	5	6	74-92	83
Front Loaders	5	30	75-96	85
Dozers	8	41	65-95	85
Graders	3	15	72-92	84
Scrapers	2	27	76-98	87
Pile Drivers	N/A	N/A	95-105	101

Source: United States Environmental Protection Agency and Federal Highway Administration

Impacts

Elevated noise levels are to a degree unavoidable for this type of project. Construction equipment would be required to be properly muffled and in proper working order. Contractor(s) would comply with applicable local noise restrictions and ordinances to the extent that it is reasonable. Advance notice would be provided to affected communities for any abnormally loud construction activities. It is anticipated that nighttime construction may sometimes be required to minimize traffic impacts and improve safety. However, construction would be limited to daytime hours as much as possible. Daytime hours are defined as 7:00 a.m. to 10:00 p.m. on weekdays, and 9:00 a.m. to 10:00 p.m. on the weekends, per St. Louis Park City Code (Sec. 12-124). The duration and staging of construction activities would be determined during final design.

Any associated high-impact equipment noise, such as pile driving, pavement sawing or jack hammering, will be unavoidable with construction of the proposed project. Pile driving noise is associated with bridge construction and any sheet piling necessary for retaining wall construction. While pile driving equipment results in the highest peak noise level as shown in **Table 16**, it is limited to the activities (e.g., bridge construction, retaining wall construction) noted above. The use of pile drivers, jack hammers, and pavement sawing equipment would be prohibited during nighttime hours.

Vibration

Regulatory Context/Methodology

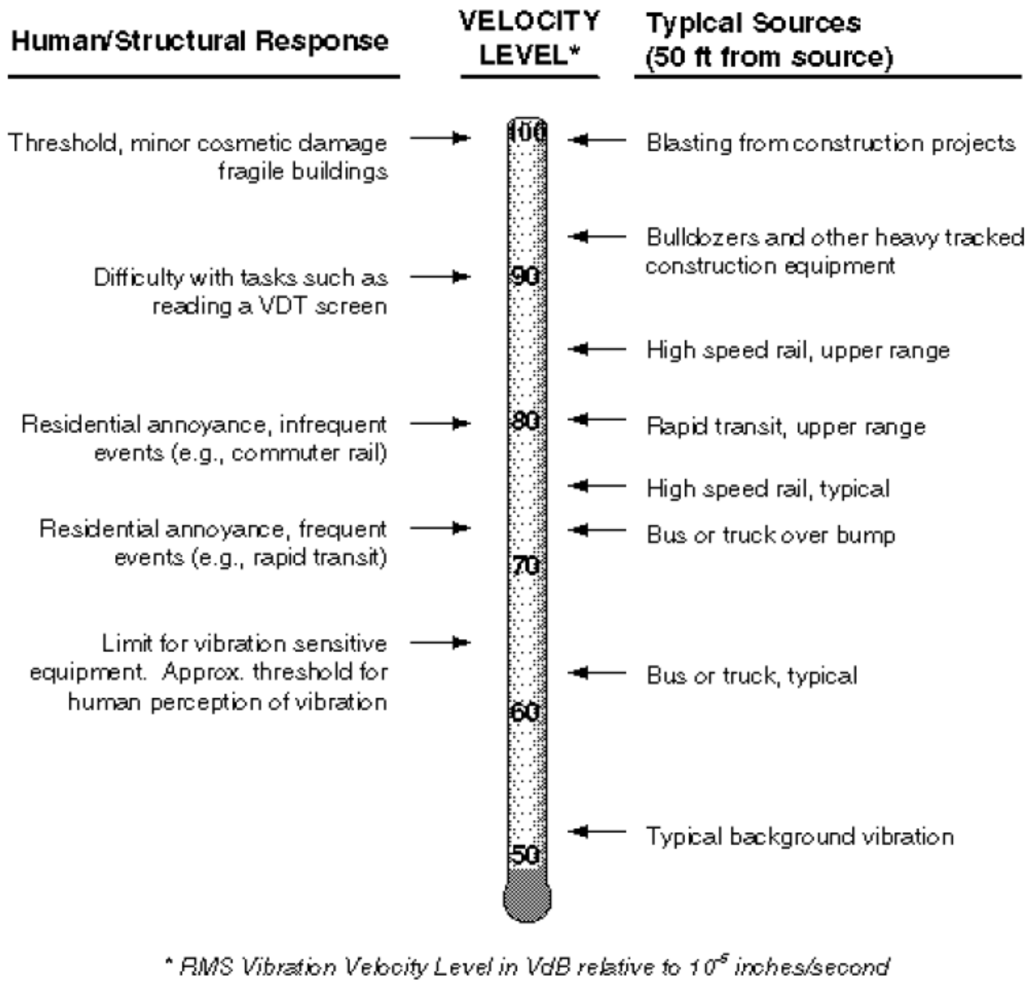
Vibration impact for this project is based on the criteria as defined in the U.S. FTA guidance manual *Transit Noise and Vibration Impact Assessment* (FTA-VA-90-1003-06, May 2006). The FRA has adopted the criteria and methodology used in the FTA guidance manual for use on freight rail projects.

Vibration Basics

Ground-borne vibration is the oscillatory motion of the ground about some equilibrium position that can be described in terms of displacement, velocity or acceleration. Because sensitivity to vibration typically corresponds to the amplitude of vibration velocity within the low-frequency range of most concern for environmental vibration (roughly 5-100 Hz), velocity is the preferred measure for evaluating ground borne vibration from transit projects.

The most common measure used to quantify vibration amplitude is the peak particle velocity (PPV), defined as the maximum instantaneous peak of the vibratory motion. PPV is typically used in monitoring blasting and other types of construction-generated vibration, since it is related to the stresses experienced by building components. Although PPV is appropriate for evaluating building damage, it is less suitable for evaluating human response, which is better related to the average vibration amplitude. Thus, ground borne vibration from transit trains is usually characterized in terms of the "smoothed" root mean square (rms) vibration velocity level, in decibels (VdB), with a reference quantity of one micro-inch per second. VdB is used in place of dB to avoid confusing vibration decibels with sound decibels. **Exhibit 2** illustrates typical ground-borne vibration levels for common sources as well as criteria for human and structural response to ground-borne vibration. As shown, the range of interest is from approximately 50 to 100 VdB, from imperceptible background vibration to the threshold of damage. Although the approximate threshold of human perception to vibration is 65 VdB, annoyance is usually not significant unless the vibration exceeds 70 VdB.

Exhibit 2. Typical Ground Borne Vibration Levels and Criteria



Vibration Impact Criteria

The FTA ground-borne vibration impact criteria are based on land use and train frequency, as shown in **Table 17**. There are some buildings, such as concert halls, recording studios and theaters, which can be very sensitive to vibration but do not fit into any of the three categories listed. However, there are no highly-sensitive locations adjacent to the MN&S Spur, so the criteria are not applied to this project. It should also be noted that **Table 17** includes separate FTA criteria for ground-borne noise, the "rumble" that can be radiated from the motion of room surfaces in buildings due to ground-borne vibration.

Although expressed in dBA, which emphasizes the more audible middle and high frequencies, the criteria are set significantly lower than for airborne noise to account for the annoying low-frequency character of ground-borne noise. Because airborne noise often masks ground-borne noise for above ground (i.e. at grade or elevated) rail systems, ground-borne noise criteria are primarily applied to subway operations where airborne noise is not a factor. For above-grade rail systems, such as the MN&S Spur, ground borne noise criteria are applied only to buildings that have sensitive interior spaces that are well insulated from exterior noise.

The FTA also has vibration criteria for locations with existing vibration, such as the MN&S Spur. For locations where trains will be added where existing trains currently operate, vibration impact must be assessed to determine if there will be additional impacts. For infrequently used rail corridors (less than 5 trains per day), such as the MN&S Spur, vibration impacts are assessed using the criteria in **Table 17**. For this assessment, the locomotive events are considered to be infrequent, and the rail cars are considered to be occasional.

Table 17. Ground-Borne Vibration and Noise Impact Criteria by Land Use Category

Land Use Category	Ground-Borne Vibration Impact Levels (VdB re 1 micro-inch/sec)			Ground-Borne Noise Impact Levels (dB re 20 micro Pascals)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where low ambient vibration is essential for interior operations.	65 VdB[4]	65 VdB[4]	65 VdB[4]	N/A[5]	N/A[5]	N/A[5]
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

Notes:
1. "Frequent Events" is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.
2. "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.
3. "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.
4. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
5. Vibration-sensitive equipment is generally not sensitive to ground-borne noise.

Source: FTA, May 2006.

The vibration impact assessment was carried out in accordance with FTA methodology for a "General Noise Analysis" using project data defined in the Noise Section. The potential vibration impacts of the project are related primarily to the increased in maximum operating design speed in the corridor (10 to 25 mph). The following are project assumptions used in the impact analysis for the vibration assessment:

- Identify vibration-sensitive land use: Vibration-sensitive land use along the project corridor was initially identified based on preliminary alignment drawings, aerial photography and GIS mapping.
- Project freight vibration levels: Vibration levels from freight operations were projected based on measurements of existing trains, as described in below. The only changes relevant to the vibration assessment are the increased speeds from 10 to 25 mph and the upgrade of the track and existing track structure from jointed to continuously welded rail with new ballast sections and ties. Vibration levels increase with increasing speed by a 20 Log relationship, so doubling the speed will increase vibration levels by 6 dB and halving the speed will reduce vibration levels by 6 dB.
- Assess impact based on the criteria: The projections determined the vibration levels at each sensitive receptor and vibration impact was assessed according to the appropriate FTA criteria, depending on the land use category.
- Recommend mitigation measures where required and appropriate: Mitigation can include ballast mats, special fasteners, and other means of reducing vibration levels.

Existing Conditions

The major source of existing vibration in the project corridor is the CP freight trains. Measurements of vibration from existing trains were conducted at two locations as described below:

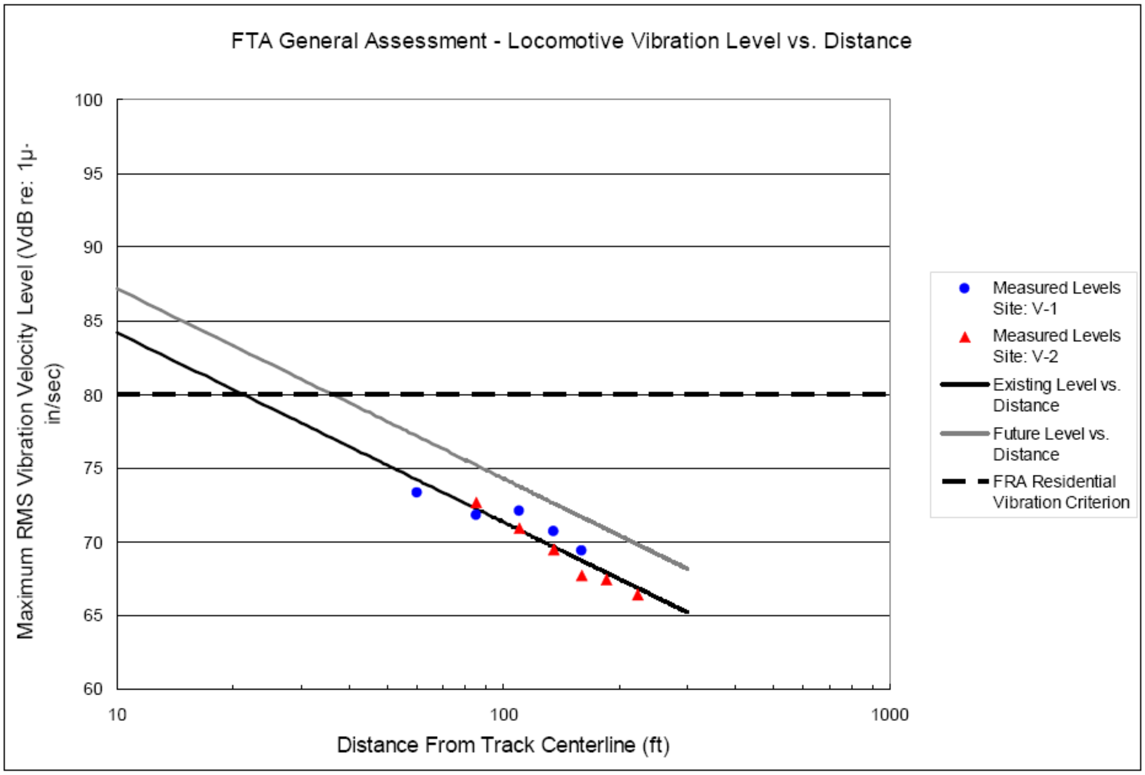
Site V-1: Measurement site V-1 was located adjacent to St. Louis Park High School and residences on Library Lane. The ground-borne vibration levels from a passing freight train were measured at multiple distances ranging from 60 to 160 feet from the track. The measured freight train was traveling in the southbound direction at approximately 10 mph and consisted of two locomotives pulling six cars.

Site V-2: Measurement site V-2 was located in Keystone Park between Blackstone Avenue and Alabama Avenue. The ground-borne vibration levels from a passing freight train were measured at multiple distances ranging from 85 to 225 feet from the track. The track was on an embankment in this location due to the crossing over Minnetonka Boulevard to the north. The measured freight train was traveling in the northbound direction at approximately 10 mph and consisted of two locomotives pulling eleven cars.

The locations of the existing vibration measurements are shown in **Figure 10** and the results of the existing vibration measurements are shown in **Exhibit 3** below, along with projections of future vibration levels from trains with the higher speeds and the continuously welded rail. The results indicate that for the existing trains, locomotive vibration levels of 80 VdB (the criterion for vibration impact for infrequent events) would be experienced up to 30 feet from the tracks. For existing rail cars, which typically have vibration levels 5-8 VdB lower than locomotives, vibration levels of 75 VdB (the criterion for vibration impact for occasional events) would also be experienced up to 30 feet from the tracks.

Based on measurements conducted in Alaska during the summer and winter, there is some variation in vibration levels for efficient soil types, such as peat or clay. This variation results in lower vibration levels in the winter, as compared with the summer. However, for typical soil conditions, which the measurements indicate existing in the MN&S corridor, the vibration levels are the same during the summer and winter.

Exhibit 3. Vibration Measurement Results and Projections



Impacts

The vibration assessment assumed an increase in speed from 10 to 25 mph along with an improvement from jointed rail to continuously welded rail, which will lower vibration levels by 5 VdB. The results of the vibration analysis indicate that locomotive vibration levels of 80 VdB (the impact criterion for infrequent events) would be experienced up to 40 feet from the tracks and that rail car vibration levels of 75 VdB (the impact criterion for occasional events) would also be experienced up to 40 feet from the tracks. There is only one building, an apartment above a business at the southern end of the corridor, which is located within 40 feet of the tracks (**Figure 11**).

Mitigation: Area "B"

There is one location identified with vibration impact on the MN&S Spur. The building identified with impact appears to be a mixed use building with an apartment above a welding shop. A more detailed analysis of this building would need to be conducted to determine if there would be a vibration impact. If impact is identified, potential mitigation measured would be assessed to determine if they would be feasible and cost-effective.

Nearby Resources

Archaeological, historical or architectural resources? X Yes __No
Prime or unique farmlands or land within an agricultural preserve? __Yes X No
Designated parks, recreation areas or trails? X Yes __No
Scenic views and vistas? __Yes X No
Other unique resources? __Yes X No

Archaeological, Historical or Architectural Resources

Regulatory Context/Methodology

A cultural resource assessment was completed for the Proposed Action. . The purpose of the cultural resource assessment was to determine if there are any known, or potential for unknown, archaeological sites within the study area. Pursuant to the Minnesota Historic Sites Act, the assessment also determined whether there are any National or State Register-listed buildings or structures within the study area and documented the current condition of those resources.

The cultural resources assessment for the Proposed Action included background research, a visual reconnaissance of the entire project area, assessment of archaeological potentials within the study area, and photographic documentation of buildings and structures listed or eligible for listing in the National or State Register of Historic Places within one-quarter mile of the study area. The study area includes the proposed construction or reconstruction of the railway corridor, as well as the proposed construction or improvements of railway bridges or at-grade crossings, trail reconstruction, and retaining walls within and adjacent to that same corridor.

Study Area

The study area for both archaeological and architectural history resources included one-quarter mile radius around the proposed study area. This size of the study area was used to encompass all areas of proposed construction or other potential ground disturbing activities associated with construction and account for any potential physical, auditory, or visual impacts to historic properties.

Background Research

In October of 2010, prior to fieldwork, background research was conducted using the Minnesota State Historic Preservation Office (SHPO) site files for information on previously identified archaeological sites and architectural history properties within the one-quarter mile study area and on cultural resources surveys previously conducted within the study area. Previously identified archaeological sites within one mile of the project area were also reviewed to provide a broader archeological context for the study area and aid in assessing archaeological sites potential. In addition, researchers examined historical maps and aerial photographs of the study area.

Field Methods

- Archaeological: During the archaeological field assessment, the project archaeologist visually inspected the entire study area to identify areas with moderate or high archaeological potential. Such areas included but were not limited to the undisturbed portions of the study area:
  - Within 500 ft. of an existing or former water source of 40 acres or greater in extent, or within 500 ft. of a former or existing perennial stream;
  - Located on topographically prominent landscape features;
  - Located within 300 ft. of a previously reported site; or
  - Located within 300 ft. of a former or existing historic structure or feature (such as a building foundation or cellar depression).

In addition, archaeologists compared historical documentation, such as plat maps and aerial photographs, with current field conditions to assess the potential within the survey area for intact historical archaeological sites. Areas defined as having a relatively low potential for containing intact archaeological resources included inundated areas, former or existing wetland areas, poorly drained areas, areas with a 20 percent or greater slope, and areas in which Holocene (less than 10,000 years old) deposits have been significantly disturbed.

- Architectural History: During the field assessment, all buildings and structures listed or eligible for listing in the National or State Register of Historic Places within one-quarter mile of the project area were photo-documented with a digital camera to confirm their current condition.

Existing Conditions: MN&S Section

- Archaeological: The entire study area falls within a highly urbanized area and appears to have at one time or another been impacted by activities associated with the construction of roads, railroads, bike trails, city parks, residential structures, and industrial buildings and lots. No known archaeological sites are present within the MN&S study area.
- Architectural History: The Chicago-Milwaukee-St. Paul & Pacific Railroad St. Louis Park Station building is listed on the National Register of Historic Places (NRHP) and is located within one-quarter mile of the Proposed Action. The building was previously relocated to its current location within Jorvig Park.

  Subsequent to the original cultural resources literature review for the Proposed Action, the City of St. Louis Park indicated that there are five properties within the vicinity of the proposed project that were built before 1900 ; however, a review of the files at the Minnesota SHPO confirms that these properties are not currently listed on or eligible for listing on the NRHP and, therefore, pursuant to the Minnesota Historic Sites Act do not need to be reviewed for the Proposed Action, as currently planned. However, if the Proposed Action should receive federal funding or permitting in the future, additional cultural resources investigation may be required to determine the potential effect on these and other previously unknown yet potentially historic properties.

Existing Conditions: BNSF Section

- Archaeological: No sites have been recorded (confirmed) or reported (not field checked) within the BNSF study area; however, four sites have been recorded and two sites have been reported within one mile of the BNSF study area (see **Table 18**).

Table 18. Previously Identified Archaeological Sites Within One Mile of BNSF Section

Site No.	Site Name	T	R	S	¼ Section	Description	NRHP Eligibility
21HE0312	Mikes Island	29N	24W	33	SW-SW-NW	Precontact Artifact Scatter	Not Evaluated
21HE0313	Raspberry Island	29N	24W	33	NW-NW-SW	Precontact Artifact Scatter	Not Evaluated
21HE0342	Birch Pond I	29N	24W	29	SW-NW-NW	Precontact Artifact Scatter	Not Evaluated
21HE0343	Birch Pond II	29N	24W	29	NW-NW-NW	Precontact Lithic Scatter	Not Evaluated
21HEae	Lake of the Isles	29N	24W	33	SW-SW-NW	Precontact Artifact Scatter	Not Evaluated
21HEai	-	29N	24W	28	NW-NW-SE	Precontact Earthwork	Not Evaluated

- Architectural History: One architectural history study has been conducted within the study area. The *National Register of Historic Places Multiple Property Documentation Form for the Railroads in Minnesota, 1862-1956* was prepared in 2005. The Multiple Property Documentation Form (MPDF) includes the history of 14 major rail carriers in Minnesota, including their predecessors, acquisitions, and associated resources. The study included a history of the Great Northern Railway Company, a portion of whose line appears to be the same as the present day BNSF line located within the study area. No NRHP-listed or eligible properties have been previously inventoried within the expanded project area or within a quarter mile of the study area.

Impacts: MN&S Section

- ***Archaeological:*** Based on the lack of previously identified archaeological resources in the area, as well as disturbances associated with uses in the area, the project area is considered to exhibit low archaeological potential. Therefore, it was recommended that no further archaeological work is needed for the Proposed Action.
- ***Architectural History:*** Proposed Action elements will cause temporary increases in dust, minor vibrations, and noise during construction. Due to mature vegetation and the one-and-a-half to two-story residential structures located between the two sites, the current railroad structures are not visible from the CMStP&P St. Louis Park Station; therefore, the proposed project will not be visible from the station. Noise and vibration from the Proposed Action on the NRHP-listed CMStP&P St. Louis Park Station are not anticipated to adversely affect the

historic character, significant features, or historic integrity of the property or its ability to convey its historical significance.

Impacts: BNSF Section

- ***Archaeological:*** Based on the lack of previously identified archaeological resources in the area, as well as disturbances associated with the construction of roads, railroads, bike trails, city parks, residential structures, and industrial buildings and lots, the study area is considered to exhibit low archaeological potential. Therefore, no further archaeological work is needed for the Proposed Action.
- ***Architectural History:*** No NRHP-listed or previously determined eligible properties have been inventoried within this section of the project area or within a quarter mile of the study area. As a result, the construction of the proposed BNSF siding will not have an adverse affect on any previously NRHP-listed or determined eligible properties.

Impacts: Total Project

No additional archaeological surveys are required for the Proposed Action. No known archaeological resources are known to occur in the study area.

No adverse effects are anticipated to the one NRHP listed property within the study area.

Mitigation: Area "A" Mitigation

- Archaeological: No mitigation is required for either section. No further archaeological work is recommended.
- Architectural History: No further architectural history work is needed prior to project construction of either section.

Designated Parks, Recreation Areas, or Trails

Existing Conditions: MN&S Section

Cedar Lake LRT Trail runs along the CP Bass Lake Spur and continues east, eventually joining the North Cedar Lake Trail, which runs along the BNSF Wayzata sub, crossing the Iron Triangle. The Cedar Lake LRT Trail is located on railroad ROW acquired by HCRRA for future LRT and other future transportation uses. This trail is managed by Three Rivers Park District outside the Minneapolis city limits, and the Minneapolis Park and Recreation Board within the city limits. There are also a number of local trails in the study area, managed by the City of St. Louis Park. Parks adjacent to the MN&S section (south to north) include Jorvig Park, Roxbury Park, Keystone Park, and Dakota Park (see **Figure 13a**).

Existing Conditions: BNSF Section

North Cedar Lake Trail, managed by the Three Rivers Park District, runs along this section and eventually joins the main Cedar Lake LRT Trail alignment. Parks adjacent to the BNSF section (west to east) include South Tyrol Park and Minneapolis Chain of Lakes Park (see **Figure 13b)**.

Impacts: MN&S Section

Temporary trail closure would be anticipated for portions of the Cedar Lake LRT Trail along the CP Bass Lake Spur, due to bridge demolition and construction. Duration would be 8 to 12 hours. The proposed overpass of the North Cedar Lake Trail along the BNSF alignment would require temporary re-routing and potential 48-hour trail closures.

Implementation of new track in the Iron Triangle area, connecting into the BNSF Wayzata sub, would require a new crossing of North Cedar Lake Trail. Trail use would be temporarily impacted while the grade-separated crossing is being constructed (*see **Appendix A** for design of the proposed grade separation and the project description section regarding proposed construction methods/closure periods).*

Three Rivers Park District has studied the feasibility of constructing a regional trail along the alignment in this section. Although there were significant challenges identified to implementing this trail in the short-term, it remains a long-term goal of the District and has been the subject of recent studies.[7]

Part of the area designated as Keystone Park, and the trail within Keystone Park, lies within railroad right-of-way. According to the City of St. Louis Park this trail has been in place within the right-of-way for more than 20 years. No formal easement is known to exist, but the city has been maintaining this area within the railroad ROW. [8] Trail users may be temporarily impacted while construction is taking place. No other trail impacts are anticipated.

Roxbury and Keystone parks are directly across from each other, separated by the railroad tracks. Each has paved trails but there is no formal trail connection to cross the tracks. Park and trail users may trespass across the tracks to access both parks. An increased number of trains could increase the safety risk for trail users.

Impacts: BNSF Section

There are no impacts anticipated to trails or parks within the BNSF section, because construction is anticipated to occur within existing railroad right-of-way. The existing North Cedar Lake Trail runs parallel to the railroad right-of-way and would not be impacted by project construction.

Mitigation: Area "A"

Temporary disruption of trail use, required to construct the North Cedar Lake Trail overpass, would be limited in duration. Alternate crossing locations (detour) will be signed for users during construction. The new crossing would be constructed to match the character and pavement type of the existing trail.

The trail within Keystone Park would be lined with temporary construction fencing to separate trail users from construction activities. No other direct impacts to parks or trails are anticipated.

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[7] Conversation with Jonathan Vlaming, 3 Rivers Park District, 3/29/11
[8] Conversation with Rick Beane, Parks Director, City of St. Louis Park, 3/30/11

Visual Impacts

<u>Existing Conditions: MN&S Section</u>

The visual nature of the area is a largely built/structural environment, with some pockets of green space, including a wetland area near the Iron Triangle. Currently the rail is grade separated at Highway 7 and Highway 5 (Minnetonka Boulevard). Freight rail (CP local assignment) currently makes one daily round trip along the MN&S Spur alignment.

<u>Existing Conditions: BNSF Section</u>

The visual nature of the area is a largely built/structural environment and some green space/wetland areas. Currently freight rail makes 8 to 20 daily trips per day along the BNSF Wayzata Subdivision.

<u>Impacts: MN&S Section</u>

The proposed track alignment, south of Highway 7, which would connect the CP Bass Lake Spur to the MN&S Spur, would be on an embankment set approximately 25 to 30 feet above the existing top of rail, and would require retaining walls and bridge structure. The retaining wall would be constructed on the south side of the Bass Lake Spur track, and possibly also on the west side. A new bridge structure would be constructed to bring the new rail up over the existing tracks and into the existing rail overpass of Highway 7. This would be a visual change at the south end of the corridor, and views from buildings adjacent to the existing railway would be obstructed. Schematic and cross section views of the Proposed Action in this area are included as **Figures 14 through 17.**

Under the Proposed Action, there would be an increase in the number of trains traveling through the area (see Project Description). Therefore, residents and businesses along the alignment would see trains more frequently, but the character of the visual impact would be similar to what is seen with the existing daily train trip.

<u>Impacts: BNSF Section</u>

As the Proposed Action would be located within BNSF's existing Wayzata Subdivision, the overall visual character of the area would not change under the Proposed Action. Residents, businesses, and trail users along the alignment would see trains more frequently, but the character of the visual impact would be similar to what is seen with the existing train activity.

<u>Mitigation: Area "B"</u>

The rail improvements would not obstruct views of any designated scenic areas, and rail use is compatible with the surrounding commercial and industrial land uses. However, as noted above, the general view from existing commercial/industrial buildings in the area south of Highway 7 would be changed.

New track and associated retaining walls would be the property of the railroad, and subject to its requirements or preferences for mitigation. Coordination with the community and the railroad will continue through final design to investigate ways to minimize the visual impact to the surrounding area.

Mitigation to be further evaluated includes decorative wall treatments and landscaping at selected locations. Specific landscaping measures will require close coordination with the owner railroads, as there are space limitations and safety requirements that must be adhered to.

Compatibility with Plans and Land Use Regulations

<u>Existing Conditions</u>

Minnesota Department of Transportation Comprehensive Statewide Freight and Passenger Rail Plan, 2010

The state legislature directed Mn/DOT to develop a statewide rail plan to address future freight rail and passenger rail needs throughout the state. Section 4.2.8 of the Plan specifically addresses potential freight rail relocations currently under consideration, including the proposed Kenilworth freight rail relocation project. The State Rail Plan recommends that the Kenilworth project should proceed through further study development and evaluation, led by a locally responsible public agency, in cooperation with the State of Minnesota.

The State Rail Plan indicates that a successful, viable rail industry that meets the future needs of the Minnesota economy requires continued investment and improvement to its infrastructure. Key improvements elements defined in the plan include:

- Continue to make improvements to the condition and capacity of Minnesota's primary railroad arterials to accommodate existing and future demand;
- Address critical network bottlenecks;
- Upgrade main line track (all Class I-III railroads) to 25 mph minimum speed, as warranted;
- Improve the network (all Class I-III railroads) to support the use of 286,000 pound railcars throughout;
- Implement state of the art traffic control and safety systems and
- Expand intermodal service access options throughout the State.

City of St. Louis Park Comprehensive Plan, December 2009

The city's comprehensive plan references study of the MN&S alignment: *"Consideration of the TC&W traffic moving to the north/south CP lines has been a possibility. The physical options of various routing of trains are being studied by HCRRA at this time. Impacts to traffic circulation and neighborhoods need to be considered before a decision is made."*

Comprehensive Plan goals regarding freight rail include:

1) Minimize impacts of railroad operations in St. Louis Park (eliminate all blocking and switching operations; address noise and vibration impacts)

2) Work with govt. entities to address the potential rerouting of freight rail in St. Louis Park (participate in study). The plan has a "Railroad" land use category (RRR) that includes approximately 162 acres of right-of-way used for railroad and trail purposes.

<u>Impacts</u>

Minnesota Department of Transportation Comprehensive Statewide Freight and Passenger Rail

Plan, 2010
The State Rail Plan recommends that the Kenilworth project should proceed through further study development and evaluation, led by a locally responsible public agency, in cooperation with the State of Minnesota. The Proposed Action is consistent with this recommendation.

City of St. Louis Park Comprehensive Plan, December 2009
The MN&S Freight Rail Study has progressed as noted in the Comprehensive Plan. Specific issues of traffic circulation, neighborhood impacts, noise and vibration are being evaluated as part of the study process. The City of St. Louis Park is involved in the study, and representatives from city neighborhoods are active in the Project Management Team (PMT).

In the areas proposed for rail expansion or improvements, the designated land uses include Industrial, Business Park, and Mixed Use. Adjacent land uses include these, plus Low Density Residential, Medium Density Residential, Civic, and Park and Open Space. There is not a railroad zoning category. The zoning of the railroad property is based on the adjacent zoning, which extends into the rail right-of-way from either side.

<u>Mitigation: Area “B”</u>
Implementation of improvements associated with the Proposed Action will continue to be coordinated with the City of St. Louis Park regarding local plans and policies, along with Mn/DOT regarding consistency with the Statewide Freight and Passenger Rail Plan.

Infrastructure and Public Services
<u>Regulatory Context/Methodology</u>
Utilities within the proposed construction limits were observed in the field by representatives in November 2010. This information was supplemented by viewing available utility plans from the Metropolitan Council and the City of St. Louis Park.

<u>Existing Conditions: Total Project</u>

- Met Council Force Main: A 24-inch Metropolitan Council force main exists within the frontage road near where the railroad tracks cross Highway 7.
- Fiber optic utility: Fiber Optic Utility (FOU) cable markers were observed along the Cedar Lake LRT Trail north of the Bass Lake Spur tracks; along the east side of the MN&S Spur between Highway 7 and the Iron Triangle Wye Leg; along the east side of the Iron Triangle Wye Leg to the BNSF Wayzata Subdivision; and along the north and south side of the BNSF Wayzata Subdivision, east of the MN&S Spur.
- Electrical transmission towers: There are several steel towers along the west side of MN&S Spur in the Skunk Hollow area. These towers are illustrated in the concept level track plans, **Appendix A**.

Steel towers and/or tubular steel columns also exist in the following locations near the alignment:

  - Along the west side of MN&S, between TH 7 and Walker Street

- Between Walker Street and West 27th Street, along the west side of MN&S Spur
- Three tubular steel columns and one steel tower between 27th Street and BNSF Wayzata sub, all on the east side of MN&S
- In place poles along the south side of BNSF Wayzata Subdivision and south of the current North Cedar Lake Trail.

- Municipal utilities: Municipal utilities, including watermain, sanitary sewer, and storm sewer may be impacted as a result of the proposed track alignment, and closure of grade crossing at West 29th Street.
  Storm sewer may need to be addressed in conjunction with the proposed construction of an overpass of the North Cedar Lake Trail in the Iron Triangle area. It is assumed that minimal public and private utilities exist within the BNSF property limits.
- Emergency Access: The St. Louis Park Fire Department responds to about 4,500 calls each year, with an average response time of approximately 4 minutes, 20 seconds. The department has two stations, with one on each side of the rail system, as shown in **Figure 13a**. Both stations respond to reported fires and one station responds for medical calls. The possibility that a grade crossing may be blocked by a train when the fire department is responding to an incident has always existed and is part of the Fire Department's emergency response plan. The status of any blocked grade crossing is announced over the emergency radio channels and the emergency vehicles use a different route. In addition, at least one station can always reach the location of the incident because they are located on both sides of the freight rail lines.

<u>Impacts: Total Project</u>

- Met Council Force Main: The Met Council has programmed the upgrade on this force main to two 24-inch mains in the future. The proposed project will not impact the existing force main directly, but the rail crossing of Highway 7 would need to accommodate this future expansion.
- Fiber optic utility: Bridge construction for the connecting track over the CP Bass Lake Spur is not anticipated to impact in place FOU. Even though track profile grade elevations would increase in the area between TH 7 and Dakota Avenue; FOU infrastructure would not likely be impacted in this segment.
- FOU would likely be impacted by bridge construction over TH 7. The reconstruction of track on new horizontal alignment and slightly increased vertical alignment between Dakota Avenue and 27th Street would also likely impact FOU infrastructure. In addition, construction of new track on the abandoned Iron Triangle alignment, between West 27th Street and the connection with the BNSF Wayzata Subdivision would likely impact FOU infrastructure.
- Electrical transmission towers: Impacts are anticipated to electrical transmission towers in vicinity of the new track connecting the CP Bass Lake Spur and MN&S Spur. These impacts are illustrated in the plan sheets in **Appendix A.**
- It is assumed that the Proposed Action would not impact any of the other in place poles noted in Existing Conditions, with the exception of the pole just east of the proposed North

Cedar Lake Trail bridge crossing over the proposed Iron Triangle track. This pole is anticipated to be impacted as part of the construction of the overpass.

- Municipal utilities: Municipal utilities including watermain, sanitary sewer, and storm sewer may be impacted as a result of proposed connecting track alignment and closure of the 29th Street grade crossing. Storm sewer and drainage issues may need to be addressed in conjunction with construction of the proposed North Cedar Lake Trail crossing.
- Roadways: It is assumed that lane closures will be required on Louisiana Avenue to facilitate construction of the proposed MN&S connecting track bridge over Louisiana Avenue. This work will be closely coordinated with city and county. Nighttime lane closures would be required on Highway 7 to facilitate construction of the proposed MN&S bridge over TH 7. This work will be closely coordinated and scheduled with Mn/DOT. All closures would also be coordinated with Methodist Hospital to ensure continued availability of emergency vehicle routes and/or suitable detours.
- Emergency Vehicle Access: The possibility that a grade crossing may be blocked by a train when the fire department is responding to an incident has always existed and is part of the Fire Department's emergency response plan. The status of any blocked grade crossing is announced over the emergency radio channels and the emergency vehicles use a different route. In addition, at least one station can always reach the location of the incident because they are located on both sides of the freight rail lines. The Proposed Action could increase the instances that grade crossings are blocked, but there are measures currently in place to address this issue.

Mitigation: Area "B"

The Proposed Action would be constructed to accommodate the future expansion of the Metropolitan Council force main. Any anticipated utility impacts would be coordinated with the appropriate public or private entity. Advance notice would be provided for any disruptions in service.

On-going coordination will take place regarding the Fire Department's emergency response plan relative to the Proposed Action.

Cumulative Potential Effects

Past Actions in the Study Area

The past actions that have occurred in the environmentally relevant area of the MN&S study have been reflected in the definition of the Existing Conditions section of each relevant Issue Area. Please refer back to each specific issue area for a description of the existing conditions.

Foreseeable Future Actions

In addition to the MN&S Freight Rail Study, there are several other transportation-related projects that are at varying levels of design and development of required environmental review in the vicinity of the MN&S Freight Rail study area. The following projects are considered as reasonably foreseeable future actions, for the purpose of the cumulative impacts discussion below.

• Reconstruction of the Trunk Highway (TH) 100 from 36th Street to Cedar Lake Road, - Including Interchange Reconstruction, Noise Walls and Replacement of Bridges: This project is proposed by Mn/DOT; and includes the reconstruction of the TH 100/TH 7 interchange, and the replacement of the existing HCRRA bridge (for future LRT) and the CP freight rail bridge. The cultural resources review (Section 106 process) has been initiated on this project. The preliminary layout is scheduled to be completed in fall of 2011. Environmental review will be completed, but has not yet been initiated. The letting date for this Proposed Action is late 2014.

• Construction of a grade-separated interchange with roundabouts at TH 7 and Louisiana Avenue: This project is proposed by the City of St. Louis Park. This project will include the closure of the existing right-in /right-out access point to TH 7 at West Lake Street. The City of St. Louis Park has completed a federal Environmental Assessment for the Proposed Action, which is currently under review by the Federal Highway Administration (FHWA). The letting date for this Proposed Action is summer 2012. *(Note: Under the proposed MN&S Freight Rail study, the railroad will continue to cross over Louisiana Avenue on a structure).*

This proposed project will include pedestrian and bicycle friendly improvements along with the reconfiguration of local roads to enhance access, safety, and traffic flow for the TH 7 Corridor and Louisiana Avenue.

An additional element of consideration for this proposed project is the improvement to response time for emergency vehicles, most notably emergency vehicles from the Park Nicollet Methodist Hospital and related care facilities.

The proposed grade separated interchange with roundabouts at TH 7/Louisiana Avenue .

• Construction of the Southwest Light Rail Transit Project, including a proposed LRT station at Louisiana Avenue: A federal draft environmental impact statement is currently being prepared for the proposed Southwest LRT project, which runs from Eden Prairie to downtown Minneapolis. The lead federal agency for the Proposed Action is the Federal Transit Administration (FTA). The LRT project includes a station at Louisiana Avenue, with a park and ride facility to accommodate approximately 250 cars. The proposed LRT alignment would run parallel to and directly north of the proposed freight rail in the CP Bass Lake Spur section of the Proposed Action.

The proposed design concept for the MN&S Freight Rail Study took into account the proposed design of the LRT within the study limits, and complied with applicable safety and design standards. The design of the direct northerly connection from the CP Bass Lake Spur to the CP MN&S Spur was developed to minimize right of way impacts in the area, and hence provide optimal developable land associated with the proposed LRT project and station area.

<u>Impacts: Wetlands</u>

Wetlands in the study vicinity may be affected by the foreseeable future actions. However, each of the projects would be mitigated through regulatory approvals requiring avoidance, minimization and mitigation of impacts.

Wetlands in Minnesota are protected by Federal law (Section 404 of the Clear Water Act and Executive Orders) and State law (Minnesota Wetland Conservation Act and Public Waters Work Permit Program Rules) that mandate “no net loss” of wetland functions and values. These federal and state laws require the avoidance of wetland impacts to the extent possible, and when avoidance is not possible, impacts must be minimized and mitigated, and approved through a permit review process. Therefore, no substantial cumulative wetland impacts are anticipated to result from the Proposed Action and the foreseeable future actions.

Impacts: Water Quality

The future roadway and transit projects may result in increased impervious surfaces and/or stormwater quality/quantity (discharge rate) effects. However, these projects will be required to provide mitigation in conformance with NPDES and/or watershed regulations, minimizing surface water impacts.

Federal, state and local surface water management regulations require mitigation be provided in conjunction with proposed development and roadway projects. Given the design standards and management controls available for protecting the quality of surface waters, it is likely potential impacts of the Proposed Action, along with the foreseeable future actions would be minimized or mitigated. Through the proper management of stormwater within the project limits, cumulative impacts associated with additional runoff can be avoided, therefore, substantial adverse cumulative effects on water quality and quantity rates are not anticipated.

Impacts: Noise

The MN&S Freight Rail Study includes the findings from the noise analysis associated with the relocation of TC&W freight to the MN&S Spur. Noise mitigation for the Proposed Action includes the implementation of a whistle quiet zone through the area.

The environmental documents for both roadway projects will include a noise analysis in compliance with FHWA and Minnesota noise standards/guidelines. The federal EIS completed for the Southwest LRT will include noise analysis in conformance with noise guidelines set forth by the FTA for transit projects. Under these analyses, effective noise mitigation measures will be evaluated, as required, and disclosed in each project’s environmental document. Based on regulatory requirements, cumulative impacts associated with traffic noise can be mitigated; therefore substantial adverse cumulative noise impacts are not anticipated.

Contaminated Properties

The potential impacts of the foreseeable future actions on contaminated properties have been or will be evaluated through other environmental review documents. It is anticipated that sites with potential contamination would be addressed via state and local regulations requiring clean up or containment of the contaminant.

A plan would be developed, as necessary, for each project with potentially contaminated sites for properly handling and treating contaminated soil and/or groundwater during construction. In addition, other project proposers would work with the MPCA VIC Program, MPCA Voluntary Petroleum Investigation and Clean Up Program, and Minnesota MDA Incident Response Program, as appropriate, to develop and implement appropriate remedial actions. Through the proper management of known or suspected contamination by the Proposed Action or other foreseeable future actions within the project vicinity, cumulative impacts associated with contaminated sites would be prevented.

Relocation and Right of Way

Question 30 presents the potential right of way/easements required for the Proposed Action. Under each of the proposed foreseeable future actions, the respective project proposer would coordinate with each affected landowner prior to purchasing of property regarding access, right of way acquisition and relocation options on their respective properties as well as relocation to a comparable site. Means to minimize the impact to the property in question will also be discussed in each of the respective environmental documents. Each project sponsor will fully comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 USC 4601 et seq) and 49 CFR part 24 promulgated pursuant thereto.

Traffic

One of the initial findings from the traffic analysis conducted for the MN&S was the potential under worst-case conditions (120-car unit train traveling at less than 10 mph during peak traffic hour) for the auto vehicle queue to extend on to mainline TH 7. This condition had assumed existing traffic volumes on Lake Street, with access on TH 7 open. An initial mitigation measure for this potential impact was the inclusion of a dynamic warning sign on TH 7 that would warn drivers that the railroad crossing was blocked and to use an alternate route.

Based on the project definition under the TH 7/Louisiana Avenue Roundabout project, including the closure of the existing right-in/right-out access points to TH 7 at Lake Street, the potential for queuing onto TH 7 from Lake Street or Walker Street is eliminated. Additionally, given the assessment had assumed access onto Lake Street from TH 7, it reflects a worst case traffic volume condition with vehicle queuing as freight trains pass through on the MN&S Spur. The volumes on Lake Street would be expected to stay constant or potentially decrease due to the reduced access to TH 7.

Each of the potential foreseeable future actions will conduct a traffic study as part of the required environmental analysis, and developed mitigation measures in compliance with appropriate federal, state and local requirements. As the Proposed Action would not generate additional traffic, the cumulative effects of the Proposed Action on the potential future foreseeable projects is anticipated to be negligible.

Specific to the Southwest LRT project, under the Proposed Action the grade separation at Louisiana Avenue, a proposed LRT station location, would be maintained, thereby not directly impacting the traffic flow in the proposed station location area.

Conclusion

The potential impacts to resources identified can be avoided or minimized through existing regulatory controls, as described above. During the development of the MN&S Freight Rail Study, no potential significant cumulative impacts to the resources affected by the Proposed Action have been identified.

Community Facilities

Regulatory Context/Methodology

Community facilities and public services contribute to the social fabric of each community. These facilities are visited both by necessity and choice and provide essential services. The way in which these facilities are used, accessed, and their ability to deliver services in the most beneficial manner can impact the well-being of the community.

The following facilities were inventoried and evaluated:

- Government buildings
- Schools
- Hospitals/clinics
- Non-profit activity centers
- Emergency service providers

Existing Conditions: MN&S Section

Facilities in vicinity of the MN&S and BNSF sections are listed below and illustrated in **Figures 13Aa and 13b**, Community Facilities**.**

- Methodist Hospital
- Metropolitan Open School
- Park Spanish Immersion School/Community Center (including continuing education, child care, and free medical clinic)
- St. Louis Park High School
- Holy Family Academy
- Peter Hobart Elementary School

The facility closest to the proposed alignment is the St. Louis Park Senior High School. It is located at 6425 West 33rd Street, adjacent to the CP MN&S Spur. The primary facility is located on the west side of the tracks, but athletic fields are also located on the east side of the tracks. Students and patrons of athletic events cross the tracks to access the athletic fields on the south side of the high school.

Existing Conditions: BNSF Section

- Benilde St. Margaret's High School
- Jewish Day School/Community Center

Existing Conditions: Total Project

The area is served by two fire stations. One is located about 0.3 mile east of the Skunk Hollow area, near Highway 100 and Wooddale Avenue; and the other is located about 0.5 mile west of the intersection of the MN&S and BNSF tracks, off of Cedar Lake Road and Louisiana Avenue (see **Figures 13a and 13b**). Both stations respond to reported fires and one station responds for medical calls.

Impacts: MN&S Section

It is likely that users and administrators of community facilities would experience temporary or minor impacts as a result of construction of the Proposed Action. These impacts are not expected to be substantial. There would be some short-term construction-related impacts (e.g., noise and alterations in access and traffic patterns, as discussed in other sections), but no adverse, long-term social impacts are anticipated.

Increased number of trains could increase the safety risk for students and athletic fans crossing in areas other than designated crossings near the high school.

Impacts: BNSF Section

No impacts to community facilities are anticipated in this section.

Mitigation

Mitigation measures related to the safety of crossings near the high school are addressed in the Safety section.

Right-of-Way/Relocation

Regulatory Context/Methodology

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 U.S.C. 4601 et seq) and 49 CFR Part 24 promulgated pursuant thereto, requires that specific procedures regarding land acquisition and landowner relocations on all transportation projects undertaken be adhered to. The authority for this assurance is found in Minnesota Statutes, 117.51, 117.52, 117.53 and 645.31(2).

The agency responsible for acquiring right-of-way will fully comply with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*, as amended (42 U.S.C. 4601 et seq), on all transportation projects. The responsibility for this compliance is found in Minnesota Statues, 161.36.

Existing Conditions

Outside of the existing mainline railroad right-of-way, there are 105 parcels recorded adjacent to the MN&S section. Twenty-three (23) of these are identified as commercial and/or industrial parcels, 3 are railroad or utility parcels, with the remaining 79 classified as residential. Most activity within the MN&S section occurs within existing railroad right-of-way, with the exception of the south end of the section.

All activity in the BNSF section would occur within existing railroad right-of-way.

The City of St. Louis Park also holds an easement for railroad purposes over a portion of the former Golden Auto Site, now occupied by the Highway 7 Business Center. The limits of this easement are shown in **Figure 18**.

Impacts: MN&S Section

Based on the proposed construction limits, one full parcel take and twelve partial parcel takes would be required to accommodate construction of the Proposed Action. Eight of the partial takes would require both permanent and temporary easements, and four would require a temporary easement only. A temporary easement indicates the easement would only be required during construction, and would be returned once construction is complete. A permanent easement indicates that the easement would be required on a permanent basis and may have permanent impacts to the property in that area.

All of these parcels are located along the CP Bass Lake Spur, generally located between the tracks and Oxford Street, in addition to the electrical substation property along the Highway 7 frontage road (see **Figure 18** and **Appendix A**). All are designated as industrial uses. Some are in use and some are vacant buildings. The one full take would be required because construction and implementation of the Proposed Action would occur too close to the existing building, which is currently in use. Having the elevated rail structure be constructed this close to the building would make current operations very difficult. The twelve partial parcels would be required to accommodate the new track and embankment at maximum 0.86 percent grade, as well as the elevated track and necessary retaining wall (see **Figure 18**). **Table 19** includes a summary of these parcels.

Table 19. Proposed Right-of-Way Acquisition

Parcel	Type of Take	Permanent Easement	Temporary Easement
96	Full	65,282	-
97	Partial	1,763	38,668
98	Partial	2,366	37,328
100	Partial	3,000	37,985
101	Partial	3,825	48,430
107	Partial	8,170	8,170
108	Partial	2,550	2,550
109	Partial	2,950	2,950

Parcel	Type of Take	Permanent Easement	Temporary Easement
110	Partial	2,507	2,550
114	Partial	-	7,843
118	Partial	-	5,933
119	Partial	-	4,828
121	Partial	-	1,948
Total (SF)		**92,413**	**199,183**
Total (AC)		**2.12**	**4.57**

During construction, the operation of the properties may change slightly, but business overall should not be affected. Current access to the substation property would be maintained. Every effort will be made to accommodate the functionality of the businesses during construction.

While not directly impacted by the construction of the rail realignment or improvements, there would be unique challenges experienced by two residential parcels along the alignment. The potential acquisition of these parcels is therefore identified as a mitigation measure to address potential safety concerns. This is discussed further in the Safety section. The parcels are illustrated in **Figure 19**.

Impacts: BNSF Section
No property impacts are anticipated in the BNSF section. All activity would occur within the existing railroad right-of-way.

Impacts: Total Project
In total, the proposed project would require one full parcel take and eight permanent partial property takes, totaling 92,413 square feet or 2.12 acres of permanent right-of-way acquisition. If the purchase of the two additional residences is elected as mitigation for safety concerns, the additional permanent acquisition would be 10,480 square feet or 0.24 acre. Temporary easements are needed for twelve parcels, and would total 199,183 square feet or 4.57 acres. In total, thirteen to fifteen parcels would be impacted on a permanent and/or temporary basis.

Mitigation: Area “A”
For those properties affected by temporary easements during construction, the area affected would be restored as closely as possible to its pre-construction state. Those properties with permanent partial easements would fundamentally be the same. The permanent easement area is necessary because the footings for the retaining wall would be buried within it, and the area would need to be accessible in the event of any maintenance needs.

Coordination would occur with all landowners to discuss construction impacts and means to minimize impacts to each property and its operations. Coordination will also occur with the landowner of full take properties regarding relocation options. The agency responsible for acquisition will fully comply with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970,* as amended (42 U.S.C. 4601 et seq) and 49 CFR Part 24 promulgated pursuant thereto, on all transportation projects undertaken. The authority for this assistance is found in Minnesota Statues, 117.51, 117.52, and 117.53.

Mitigation: Area “B”

There would be unique challenges experienced by two additional residential parcels along the alignment. There will be on going coordination with the owners of the two residential properties to determine the most feasible mitigation measures to address their safety concerns, given the unique location of their homes relative to the railroad right of way. Mitigation could include the acquisition and relocation of up to two residential properties.

Safety

Regulatory Context/Methodology

Although there are no clearly established impact thresholds relative to safety risks associated with railway operations, it can be stated that the railways’ overarching goal with respect to safety is “zero incidents.”

Safety is the primary responsibility and priority of Federal Railroad Administration (FRA) and Mn/DOT rail programs, and also railway operators. Many different measures are undertaken by the railways to improve operational safety and mitigate the safety risks associated with railway operations. The FRA also provides statutory rules and regulations that the railways must adhere to in the performance of their duties. Each railway operates under “Codes of Operating Rules,” among other rules and regulations, and requires that its employees perform in conformance with these rules.

Safety measures, such as the sounding of whistles and the use of flashers and bells at public grade crossings, are examples of the railways’ risk mitigation for public grade crossings. Track Classification and Standards are established and regulated by the FRA and inspected and maintained by the railways, which have their own rules and standards in conformance with FRA rules governing track standards. These rules and standards are measures that reduce the risk of derailments caused by track defects. Where required, railway train movement signals reduce the risk of collisions by providing separation between trains moving opposite to each other, or in the same direction. Inherent in all of the rules and regulations described above is the mitigation of safety risks, including avoidance and reduction of derailments.

There are no established standards regarding the safety risk of a property based on distance from the railroad. Based on professional judgment, and consistent with other rail studies in the area, a distance of 50 feet has been used to assess the proximity of habitable, or dwelling, structures to the centerline of the tracks. The St. Louis Park Zoning Code defines a dwelling as “a building or one or more parts of a building occupied or intended to be occupied exclusively for residence purposes, but not including rooms in motels, hotels, nursing homes, boardinghouses, trailers, tents, cabins or trailer coaches" (Sec. 36-4. Definitions**).** An assessment of parcels located within 50 feet of the centerline of the rail centerline, and identification of dwelling units, was conducted using aerial photography, Google Streetview photography, and in-person field visits.

Primary safety concerns associated with the proposed project, as expressed by the community, are derailments, chemical spills, the accessibility and safety of pedestrians (particularly near schools), and vehicular and traffic safety at grade crossings. These issues are addressed in the discussion below.

<u>Existing Conditions</u>

Derailments

There have been no recent derailments within the study limits. Two recent incidents in the project vicinity have occurred. The first in Wayzata along BNSF track on June 20, 2010. Although the incident caused property damage, there were no injuries reported. The second occurred in Minneapolis, near Beltline Boulevard on October 2, 2010. There were no reports of injuries or significant property damage.

The assessment of parcels in the project area indicated that two parcels on Minnetonka Boulevard have dwelling structures located within 50 feet of the rail centerline.

Chemical Spills

There have been no rail-related releases of hazardous materials reported within the past 10 years in Hennepin County, along Class I railroads (CP and BNSF)[9]. In the event of a spill or release, the St. Louis Park Fire Department has a hazardous materials response plan, with the Fire Department as the principal response agency.

Pedestrian Accessibility/Safety

There are two schools located near the MN&S alignment – St. Louis Park Senior High School (grades 9-12) and Park Spanish Immersion (PSI) School (grades K-5). In addition to bus traffic between the schools, pedestrian traffic is also generated by the high school, including open lunch for grade 12 students, high school students that leave the school during the day to do community service, and after school/evening activities at the football field, which is located across the tracks from the high school. A similar situation exists between Roxbury and Keystone parks, which are directly across from each other, separated by the railroad tracks.

At-Grade Crossing Safety

There are seven at-grade railroad crossings in the MN&S section of the alignment, and none in the BNSF section. Each of the existing grade crossings was evaluated in terms of traffic volumes,

[9] http://safetydata.fra.dot.gove/officeofsafety/publicsite

crash history, and control/grade crossing equipment. See the **Figure 8** (at-grade crossings) and **Table 3** Existing At-Grade Crossing Data**.** Neither the crash history nor the current traffic volumes indicated significant traffic operations or safety issues at the existing grade crossings. Some of the crossings have been identified for additional crossing enhancements in the near term based on available Mn/DOT funding.

Impacts: Total Project

Derailments

The assessment of parcels indicated that two parcels have dwelling structures located within 50 feet of the rail centerline. These parcels are unique because they are situated parallel and not perpendicular to the railroad right-of-way. This situation results in dwelling structures located significantly closer than any other traditional lot that backs up to the right of way, as exists throughout the remainder of the corridor.

These two unique parcels are located directly across the tracks from one another, along Minnetonka Boulevard (see **Figure 18**). At this location, the slope of the rail embankment takes up the entire side yards of the properties. In the event of a derailment or spill in this location, these structures may have a higher likelihood of being impacted than other dwelling structures along the alignment.

Regarding the longer rail bridge proposed in the southern part of the alignment, connecting the Bass Lake Spur with the MN&S Spur, there is no added safety risk inherent in freight trains traveling on long bridges adjacent to active land uses and over roads and trails. Throughout North America, freight trains safely operate daily under similar conditions. The curvature of the bridge structures and grade on the bridge structures would be engineered and constructed to meet very stringent railway engineering requirements to reduce the risk of mishaps. The required train control signalization measures to be designed and constructed would also improve the safety of train operations in this area. Train crew members operating such trains are all trained on how to operate trains safely on grades, curves and structures.

Chemical Spills

There is potential for freight cars to transport chemicals or other hazardous materials along this alignment. A relocation of freight traffic within the city of St. Louis Park would not change the current hazardous materials response plan, as the same steps would be carried out for any train derailment or hazardous material spill.

Pedestrian Accessibility/Safety

Increased trains may increase the safety risk for students/staff/pedestrians crossing the tracks to access the football field on the other side of the tracks, or to travel between Roxbury and Keystone parks, or various features of the high school complex. Likewise, there may be a greater risk to residents living adjacent to the alignment that might trespass/enter on the railway right of way and tracks. .

At-Grade Crossing Safety
An increased number of trains may increase the potential for rail/vehicle or rail/pedestrian conflicts.

<u>Mitigation: Area "A"</u>
Chemical Spills
If there is a spill, the plan calls for the St. Louis Park Fire Department to determine the nature of the hazardous material, from a safe distance, and then notify the State Chemical Assessment Team, the nearest of which is located within the Hopkins Fire Department. There are also two other Chemical Assessment Teams in the metro area – one in the Coon Rapids/Fridley area and one within the St. Paul Fire Department. Once the Chemical Assessment Team has been called in, the Minnesota Pollution Control Agency is also brought in and the St. Louis Park Fire Department would handle any evacuations that might be necessary. The shipper of the hazardous materials bears significant responsibility for the cleanup of the spill; the St. Louis Park Fire Department works to make the site safe, but does not participate in the cleanup.

Pedestrian Accessibility/Safety and At-Grade Crossing Safety
As defined in the Project Description, the Proposed Action includes the closure of the existing 29th Street at-grade crossing.

<u>Mitigation: Area "B"</u>
Derailments
There would be unique challenges experienced by two additional residential parcels along the alignment. There will be on going coordination with the owners of the two residential properties to determine the most feasible mitigation measures to address their safety concerns, given the unique location of their homes relative to the railroad right of way. Mitigation could include the acquisition and relocation of up to two residential properties.

The property acquisition would total 10,480 square feet or 0.24 acre. This is also addressed in the Right-of-Way/Relocation section.

Pedestrian Accessibility/Safety and At-Grade Crossing Safety
Under the Proposed Action, Quiet Zone upgrades would be implemented at all remaining grade crossings between Walker and 28th Street. The quiet zone design concept includes improved pedestrian safety at the study area grade crossings, in the form of pedestrian gates at all existing and proposed sidewalk locations. Fencing will be included at all quiet zone grade crossings to control pedestrian movements at/around crossing signal gates.

In addition to the quiet zone design (see Figure 12), there will be further discussion with the City of St. Louis Park, St. Louis Park School Board, railroads, and other stakeholders regarding additional feasible and effective safety mitigation in the vicinity of the St. Louis Park High School. Additional mitigation could include a grade separated pedestrian crossing, High Intensity Activated Crosswalk (HAWK) signal, or overhead flashers to improve safety of pedestrians traveling between the high school and Park Spanish Immersion or the high school and the football field.

Additional fencing to address safety concerns will continue to be addressed through coordination with the City of St. Louis Park and the railroads.

Education programs, such as Operation Lifesaver will also be implemented as a safety mitigation measure.

Economics

Regulatory Context/Methodology

There are a number of issues that can be considered under the umbrella of economic impact. This section focuses on the function of businesses (commercial/industrial properties), the local property tax base, and property values.

Property data was obtained through the Hennepin County Property Tax Database.[10] This database provides parcel size as well as information for property taxes payable in the year 2011. Hennepin County administers and collects property taxes based on assessed value and need for services. Minnesota law requires that the assessed value of a home reflect its market value, i.e. the price a buyer would typically pay for a home in today's real estate market. Assessors set a home's value by comparing what similar homes in the neighborhood actually sold for in the last year. Independent governments such as cities and school districts have authority to levy property taxes to provide public services such as roads/streets, police and fire departments, parks, and educational facilities, among many others. Property taxes are set each year by determining the amount needed to provide services to the community.

[10] http://www16.co.hennepin.mn.us/pins/

Existing Conditions: Total Project

Business Impacts

There are 23 commercial or industrial properties directly adjacent to the Proposed Action. These properties are located along Oxford Street on the south end of the alignment. Twelve of these properties are within the proposed construction limits of the project. Other commercial properties are located nearby, in vicinity of Louisiana Avenue, Highway 7, and the Wooddale Avenue/Lake Street area. There are also some commercial properties along both sides of the BNSF section, between the Iron Triangle and Highway 100.

Temporary easements are proposed over the total area of parcels 97, 98, 100 and 101 (See Figure 19), which is proposed for a construction staging area. Currently, these parcels are vacant and used for materials storage. During construction, these materials would need to be relocated or condensed in a specific area of the site, to accommodate the constructions staging area for the project.

Property Tax Base

Properties in Hennepin County have a $131 billion taxable market value for 2010. Properties in the City of St. Louis Park have a $5.3 billion taxable market value for 2010.[11]

Property Values

Based on Hennepin County property records, total taxable market value of residential properties adjacent to the MN&S section between Dakota Avenue and West 27th Street[12] is approximately $15 million (2010 values). This includes 79 residential properties. The average value of these properties is $192,000. Values range from $156,000 to $262,000.

Impacts: Total Project

Business Impacts

Based on the proposed construction limits, 12 of the 23 business/industrial parcels in vicinity of Oxford Street would be subject to some kind of parcel take as a result of the Proposed Action (see the Right-of-Way section). Some of these parcels are in use and some are vacant buildings.

The one full take would occur at 6600 Oxford Street, which currently operates as an auto shop. The land would be purchased and the business would be potentially relocated as part of the project.

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[11] http://www.co.hennepin.mn.us/portal/site/HennepinUS/menuitem.b1ab75471750e40fa01dfb47ccf06498/?vgnextoid=12433b01263da210VgnVCM2000000a124689RCRD

[12] Includes properties on Blackstone Avenue, Brunswick Avenue, and 2 properties on Minnetonka Blvd.

Eight of the remaining parcels would require both permanent and temporary easements for construction, and four would require a temporary easement only. A temporary easement indicates the easement would only be required during construction, and would be returned once construction is complete. A permanent easement indicates that the easement would be required on a permanent basis and may have permanent impacts to the property in that area.

In each case, the permanent easements would occur along a strip at the rear of the properties. In some cases this may affect circulation or unloading activities during construction.

There are no direct impacts anticipated to the business/industrial parcels in other areas of the project alignment, along the MN&S or BNSF sections.

Property Tax Base

As discussed in the Right-of-Way section, under the Proposed Action one full commercial/industrial property would need to be acquired and relocated. Additionally, as a potential safety mitigation measure, two residential properties could also be acquired and relocated. For purposes of the property tax base analysis, it is assumed all three parcels would be removed from the tax base.

Property tax revenue is based on taxable market value. Based on the total city tax base of $5.3 billion, the loss in taxable market value as a result of the Proposed Action would be 0.028%. In addition, the industrial parcel could be redeveloped following project construction, returning tax base to the city.

In addition to the full parcel takes, the Proposed Action would also incur eight partial property takes. This would take a total of 27, 131 square feet of property from eight parcels. Based on the value of these parcels and the size of the takes, approximately $900,000 would be taken from the total city tax base. The impact is a decrease in 0.0001% of the overall tax base."

Property Values

Future changes in rail routes and traffic volume may influence property values in St. Louis Park. Proximity to railroad tracks can have an effect on property values as can proximity to freeways and other external influences. Valuation professionals such as appraisers and assessors carefully review market transactions in developing adjustment factors for external influences along with many other market attributes. Speculation on short term or long term influence can vary considerably as does the market response from individual buyers and sellers. The assessing office reports that their current annual modeling of market values varies within a range of 3 to 12 percent along rail tracks, highways and other similar external influences.

Primary areas of concern that are perceived to affect property values include air pollution, noise, vibration, and visual effects. The impacts of the Proposed Action on air pollution, noise, vibration and visual effects have been studied, potential impacts have been identified, and mitigation has been proposed, where appropriate.

Mitigation: Area "A"

Business Impacts

The purchase and potential relocation of the business at 6600 Oxford Street would be coordinated with the owner and done in accordance with provisions described in the Right-of-Way section. Coordination would occur with all landowners to discuss construction impacts and means to minimize impacts to each property and its operations.

For those properties affected by temporary easements during construction, the area affected would be restored as closely as possible to its pre-construction state. Those properties with permanent partial easements would fundamentally be the same. The permanent easement area is necessary because the footings for the retaining wall would be buried within it, and the area would need to be accessible in the event of any maintenance needs.

Project Coordination

As part of the MN&S Freight Rail Study, a Project Management Team (PMT) was developed. PMT members for the Study include the following Mn/DOT, Hennepin County, City of St. Louis Park (staff and planning commission), St. Louis Park School Board, CP, BNSF and TC&W Railways, fifteen neighborhood representatives and two representatives from Safety in the Park.

The role of the PMT is to provide input and guidance that is representative of the various groups sitting on the PMT, but that also works towards collaborative solutions that effectively and feasibly balance the interests of the varying groups.

The PMT had met on the following dates to discuss various aspects of the MN&S Freight Rail Study:

- July 22, 2010
- August 26, 2010
- October 2, 2010 (working tour of the study area with PMT members)
- November 9, 2010
- December 16 Open House
- February 24, 2011

Electronic copies of the PMT meeting summaries, and handouts provided at each of the above noted meetings/open house can be found on the study website: www.mnsrailstudy.org.

As this study considers potential transportation improvements to private infrastructure (railway/right of way owned by CP and BNSF); Mn/DOT, Hennepin County and the consultant team also met with representatives of the CP, BNSF and the TC&W to review conditions of the respective railroad right of way and design requirements.

Summary of Issues

Impacts of the Proposed Action and proposed mitigation measures are summarized in **Table 20**.

Area "A" Mitigation includes measures where there is a regulatory mandate or requirement by law to do the mitigation. **Area "B"** Mitigation includes commitment made by the project proposer that the Responsible Governmental Unit will take into consideration when making the environmental determination. These commitments are not specifically required by law or regulator mandate, but are actions that have been committed by the project proposer to include under the Proposed Action based on the defined impact.

The third category, **Area "C"**, includes actions that continue to be considered, but do not have a firm commitment for implementation. This third category would not be considered in the RGU's decision on the need for an EIS. A list of **Area C** mitigation measures is included in **Appendix D**

The list included in Appendix D reflects the suggestions made throughout the MN&S Study process relative to the Proposed Action definition, and mitigation measures. While these measures are not committed to as part of this process, there would be further coordination with the City of St. Louis Park and local stakeholders to develop community improvements that enhance the surrounding neighborhood area.

Table 20. Summary of Impacts and Mitigation[1]

Issue Area	Impact	Area "A" Mitigation	Area "B" Mitigation
Land use/ environmental hazards	• As the Proposed Action would be located primarily in active railroad right of way, it would not significantly change the area land use. • One high priority, one medium priority, and numerous low priority sites identified within the construction limits of the project. • Construction across the eastern corner of the Golden Auto site would alter the asphalt cap and contaminants may be disturbed.	• If required based on the further refinement of the Proposed Action (e.g. more detailed engineering), the area(s) of concern for any potentially contaminated site that may be impacted by the Proposed Action would be further assessed to determine the presence, type, and magnitude of contaminated soil and/or groundwater. • Plan developed for properly handling and treatment of contaminated soil and/or groundwater during construction. • Activities on the Golden Auto site would require coordination with the EPA and MPCA	• The project proposer will continue to coordinate with the City of St. Louis Park regarding land use planning efforts that enhance development/redevelopment in the study area.
Fish, wildlife and ecologically sensitive areas	• Potential to impact state-listed Blanding's Turtles due to wetlands located in the study area.	• Removal of trees, shrubs, and other habitat components would be limited to only those necessary to construct the project. Affected areas would be revegetated with similar species. • Specific recommendations for avoiding and/or minimizing impacts to the Blanding's Turtles area included in **Appendix B**.	
Physical impacts on water resources -	• 2.0 acres of potential wetland impact	• Wetland replacement and permitting.	

Issue Area	Impact	Area "A" Mitigation	Area "B" Mitigation
wetlands			
Physical impacts on water resources – surface waters	• No surface water impacts are anticipated under the Proposed Action		• Best Management Practices (BMP) would be used to control soil erosion and potential discharge to Minnehaha Creek, and Cedar and Brownie Lakes during construction.
Water use	• It is not anticipated that the Proposed Action would require the installation or abandonment of any wells. Additional freight activity along the MN&S and BSNF would not necessitate additional water use. No impact to the water supply is anticipated.	• No mitigation is required.	
Water-related land use management district - floodplain	• 2.0 acres of floodplain impact	• Floodplain mitigation would be through on-site creation of floodplain storage (cut) greater than or equal to the amount of fill. Retaining walls may also be used to reduce impacts, where appropriate.	
Water surface use	• No impact	• No mitigation is required	
Erosion and sedimentation	• Total ground disturbance approximately 21 acres or 84,450 cubic yards. • Three areas of soils with characteristically steep slopes.	• NPDES General Stormwater Permit for Construction Activity from the MPCA. • General Permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP), which details how stormwater will be controlled through Best Management Practices. • An Erosion Control Permit from the	

Issue Area	Impact	Area "A" Mitigation	Area "B" Mitigation
		MCWD and the City of St. Louis Park, along with a Conditional Use Permit.	
Water quality – surface water runoff	• Net increase of impervious area totaling approximately 1.7 acres.	• Meet MCWD permit and treatment requirements (Proposed Action includes three ponds). • Additional BMPs would be implemented as necessary to address indirect discharge to impaired waters.	
Water quality - wastewaters	• Not applicable	• Not applicable	
Geologic Hazards and Soil Conditions	• Construction of proposed rail bridge will occur within an existing rail easement over the Golden Auto National Lead site. Impacts to this site are discussed in the Land Use section. • Some areas of highly permeable soils identified in the MN&S section.	• All regulated materials/wastes would be managed on this project in accordance with the appropriate federal and state regulations. • Emergency response and containment plan would be developed for the project to minimize groundwater/soil impacts in the event of a release of hazardous substances during construction. • A management plan will be developed for properly handling, treating, storing and disposing of solid wastes, hazardous materials, petroleum products and other regulated materials/wastes that are used or generated during construction.	
Solid wastes, hazardous wastes, storage tanks	• Right of way purchase may involve the demolition of structures where asbestos, lead, or other contaminants may be present. • Toxic or hazardous substances may be used	• Any buildings to be removed for the project will be inspected for hazardous materials prior to demolition. • All regulated materials/wastes would be managed on this project in accordance with the appropriate federal and state	

Issue Area	Impact	Area "A" Mitigation	Area "B" Mitigation
	during project construction (petroleum products).	regulations. A management plan would be developed for properly handling, treating, storing, and disposing. • An emergency response and containment plan will be developed for the Proposed Action to minimize impacts to soils and groundwater in the event a release of hazardous substances occurs during construction. • Any contaminated soil removed on site will be treated as hazardous waste and disposed of in a MPCA approved landfill.	
Traffic	• The longest expected queue would occur in a scenario when a 120-car train arrived during school dismissal. The queues on northbound Dakota Avenue would extend through the Dakota Avenue/Lake Street intersection, but would not be expected to reach TH 7.	• Mn/DOT is currently completing the preliminary design/environmental review for the construction of a grade separated interchange with roundabouts at TH 7/Louisiana Avenue. Construction is proposed to begin in late 2012 on this project, and would include the closure of existing right-in/right-out access points to TH 7 at W. Lake Street (see Cumulative Effects section).	• Under the Proposed Action, Quiet Zone upgrades would be implemented at all remaining grade crossings between Walker and 28th Street. The quiet zone design concept includes improved pedestrian safety at the study area grade crossings, in the form of pedestrian gates at all existing and proposed sidewalk locations. Fencing will be included at all quiet zone grade crossings to control pedestrian movements at/around crossing signal gates. In addition to the quiet zone design (see Figure 12), there will be further discussion with the City of St. Louis Park, St. Louis Park School Board, railroads, and other stakeholders

Issue Area	Impact	Area “A” Mitigation	Area “B” Mitigation
			regarding additional feasible and effective safety mitigation in the vicinity of the St. Louis Park High School. Additional mitigation could include a grade separated pedestrian crossing, High Intensity Activated Crosswalk (HAWK) signal, or overhead flashers to improve safety of pedestrians traveling between the high school and Park Spanish Immersion or the high school and the football field.
Vehicle Related Air Emissions	• The Proposed Action is not directly adding additional traffic volumes to any local intersections; therefore, air quality localized impacts should be similar with or without the Proposed Action.		
Odors, noise and dust	• 25 residences with moderate noise impact and 327 residences with severe noise impact due to horn noise at at-grade crossings.	• Contractor(s) will comply with applicable local noise restrictions and ordinances to the extent it is reasonable. • Construction will be limited to daytime hours as much as possible, per St. Louis Park City Code (Sec. 12-124).	• The implementation of a quiet zone to include all grade-crossings in the study area would eliminate all severe noise impacts throughout the corridor. • Commitment to include continuously welded rail in project design.

Issue Area	Impact	Area "A" Mitigation	Area "B" Mitigation
Vibration	• Locomotive vibration levels of 80 VdB would be experienced up to 40 feet from the tracks and that rail car vibration levels of 75 VdB would be experienced up to 40 feet from the tracks. One building, an apartment above a welding shop is located within 40 feet of the tracks.	• Contractor(s) will comply with applicable local noise restrictions and ordinances to the extent it is reasonable. • Construction will be limited to daytime hours as much as possible, per St. Louis Park City Code (Sec. 12-124).	• Conduct more detailed vibration analysis at identified site to determine site if there would be vibration impact at this site. Potential mitigation would be considered if determined to be feasible and effective. • Commitment to include continuously welded rail in project design.
Archaeological, historical or architectural resources	• No additional archaeological surveys are required for the Proposed Action. • No adverse effects are anticipated to the one National Register of Historic Places (NRHP) listed property within the study area.		
Designated parks, recreation areas, or trails	• Implementation of new track in the Iron Triangle area would require a new crossing of North Cedar Lake Trail. Trail use would be temporarily impacted while the grade-separated crossing is being constructed. • Temporary trail closure would be anticipated for portions of the Cedar Lake LRT Trail along the CP-Bass Lake Spur, due to bridge demolition and construction. • Trail users in Keystone Park may be temporarily impacted while construction is taking place.	• Temporary disruption of trail use, required to construct the North Cedar Lake Trail overpass, would be limited in duration. Alternate crossing locations (detour) will be signed for users during construction. The new crossing would be constructed to match the character and pavement type of the existing trail. • The trail within Keystone Park would be lined with temporary construction fencing to separate trail users from construction activities.	

Issue Area	Impact	Area "A" Mitigation	Area "B" Mitigation
Visual impacts	• Retaining walls and elevated track would be a visual change at the south end of the corridor, and views from buildings adjacent to the existing railway would be obstructed.		• New track and associated retaining walls would be the property of the railroad, and subject to its requirements or preferences for mitigation. Coordination with the community and the railroad would continue through final design to investigate ways to decrease or otherwise mask the visual impact, including commitment to explore context sensitive retaining wall design and landscaping at selected locations.
Compatibility with plans and land use recommendations	• The project as proposed leaves the switching wye in the Skunk Hollow area intact. This is contradictory to the City of St. Louis Park's goal of eliminating all types of switching operations within the City.		• Although not a part of the Proposed Action under evaluation, or a required mitigation measure, stakeholder agencies would continue to work with the Canadian Pacific Railway regarding potential future removal of the wye in the Skunk Hollow area. • Implementation of improvements associated with the Proposed Action will continue to be coordinated with the City of St. Louis Park regarding local plans and policies; along with Mn/DOT regarding consistency with the Statewide Freight and Passenger Rail Plan.
Infrastructure and	• Limited impacts anticipated	• Closure of Louisiana Avenue during	• The Proposed Action would be

Issue Area	**Impact**	**Area "A" Mitigation**	**Area "B" Mitigation**
public services	to fiber optic utility, and municipal utilities of watermain, sanitary sewer, and storm sewer. • Impacts to electrical transmission towers in the vicinity of the new track connecting the CP Bass lake Spur and the MN&S Spur. • Lane closures on Louisiana Avenue to facilitate construction of the MN&S connecting track bridge over Louisiana Avenue. • Nighttime lane closures on TH 7 to facilitate construction of the proposed MN&S bridge over TH 7.	construction will be coordinated with the city and Hennepin County. Nighttime lane closure on TH 7 will be coordinated and scheduled with Mn/DOT. • Impacts to electrical transmission towers will be coordinated with the private utility and relocated.	constructed to accommodate the future expansion of the Metropolitan Council force main. Any anticipated utility impacts would be coordinated with the appropriate public or private entity. Advance notice would be provided for any disruptions in service. • All roadway closures during construction will be closely coordinated with Methodist Hospital to ensure continued availability of emergency vehicle routes and/or suitable detours. • On-going coordination will take place regarding the Fire Department's emergency response plan relative to the Proposed Action.
Cumulative Effects	• There are three projects currently proposed in the study area: TH 100 improvements, TH 7/Louisiana Avenue Roundabout, and Southwest Light Rail Transit (LRT). Coordination has taken place with each of these project sponsors to accurately assess the cumulative effects.		• Continued coordination with each of the local sponsoring agencies.
Community facilities	• Likely that community facilities would experience temporary impacts during construction. • Increased number of trains in the study area could increase the	• Detours and adherence to local construction times will occur during construction and be coordinated with the facilities.	• See Safety Section.

Issue Area	Impact	Area "A" Mitigation	Area "B" Mitigation
	safety risk for students and athletic fans crossing in areas other than designated crossings near the high school.		
Right-of-way/relocations	• In total, the proposed project would require one full parcel take and eight permanent partial property takes, totaling 126,913 square feet or 2.91 acres of permanent right-of-way acquisition. Temporary easements are needed for twelve parcels, and would total 199,183 square feet or 4.57 acres. In total, thirteen to fifteen parcels would be impacted on a permanent and/or temporary basis.	• Acquisition and relocation procedures for the proposed project will fully comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 USC 4601 et seq) and 49 CFR Part 24. • For properties affected by temporary easements during construction; the areas affected will be restored as closely as possible to its pre-construction state.	• There would be unique challenges experienced by two additional residential parcels along the alignment. There will be ongoing coordination with the owners of the two residential properties to determine the most feasible mitigation measure to address their safety concerns, given the unique location of their homes relative to the railroad right of way. Mitigation could include the acquisition and relocation of up to two residential properties.
Safety	• Two parcels have dwelling structures located within 50 feet of the rail centerline. These parcels are unique because they are situated parallel and not perpendicular to the railroad right-of-way. In the event of a derailment or spill in this location, these structures may have a higher likelihood of being impacted than other dwelling structures along the alignment. • There is potential for freight cars to transport chemicals or other hazardous materials along this alignment.	• If there is a spill, the current hazardous materials response plan would be activated. • Closure of grade crossing – 29^{th} Street (railroad design requirement)	• See Traffic Section for Quiet Zone description and other safety mitigation to be further coordinated with the City of St. Louis Park, St. Louis Park School Board, railroads, and other stakeholders. • The potential acquisition of the two unique residential parcels to address potential safety concerns (See ROW above) • Fencing will be included at all quiet zone grade crossings to control pedestrian movements at/around crossing signal gates. Fencing is also included in the design concept on the

Issue Area	Impact	Area "A" Mitigation	Area "B" Mitigation
	• Increased trains may increase the safety risk for students/ pedestrians crossing the tracks to access various amenities. • An increased number of trains may increase the potential for rail/vehicle or rail/pedestrian conflicts.		proposed Cedar Lake trail pedestrian/bike bridge over the BNSF track and the section of the Cedar Lake trail on retained fill leading up to the pedestrian/bike bridge. • Additional fencing locations will be considered/evaluated with the City of St. Louis Park and the railroads. • Educational programs – Operation Lifesaver
Economics	• The Proposed Action's impact on the total city tax base would be less than 1%. • Future changes in rail routes and traffic volume may influence property values in St. Louis Park. Proximity to railroad tracks can have an effect on property values as can proximity to freeways and other external influences. Valuation professionals such as appraisers and assessors carefully review market transactions in developing adjustment factors for external influences along with many other market attributes. Speculation on short term or long term influence can vary considerably as does the market response from individual buyers and sellers.	*Business Mitigation* • The purchase and relocation of one business would be done in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 USC 4601 et seq) and 49 CFR Part 24.	

[1]Area "A" Mitigation includes measures where there is a regulatory mandate or requirement by law to do the mitigation. Area "B" Mitigation includes commitment made by the project proposer that the Responsible Governmental Unit will take into consideration when making the environmental determination. These commitments are not

specifically required by law or regulator mandate, but are actions that have been committed by the project proposer to include under the Proposed Action based on the defined impact.

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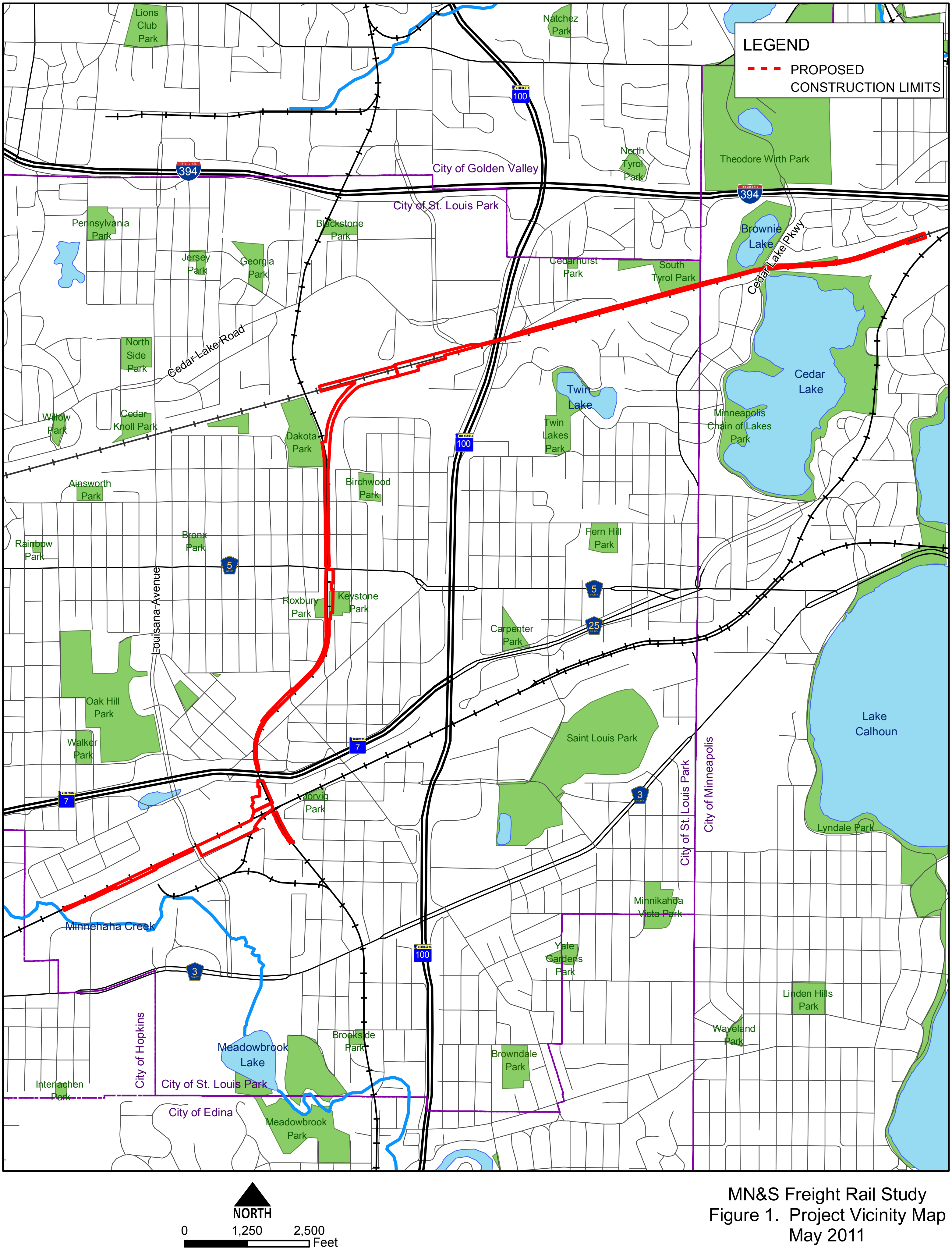
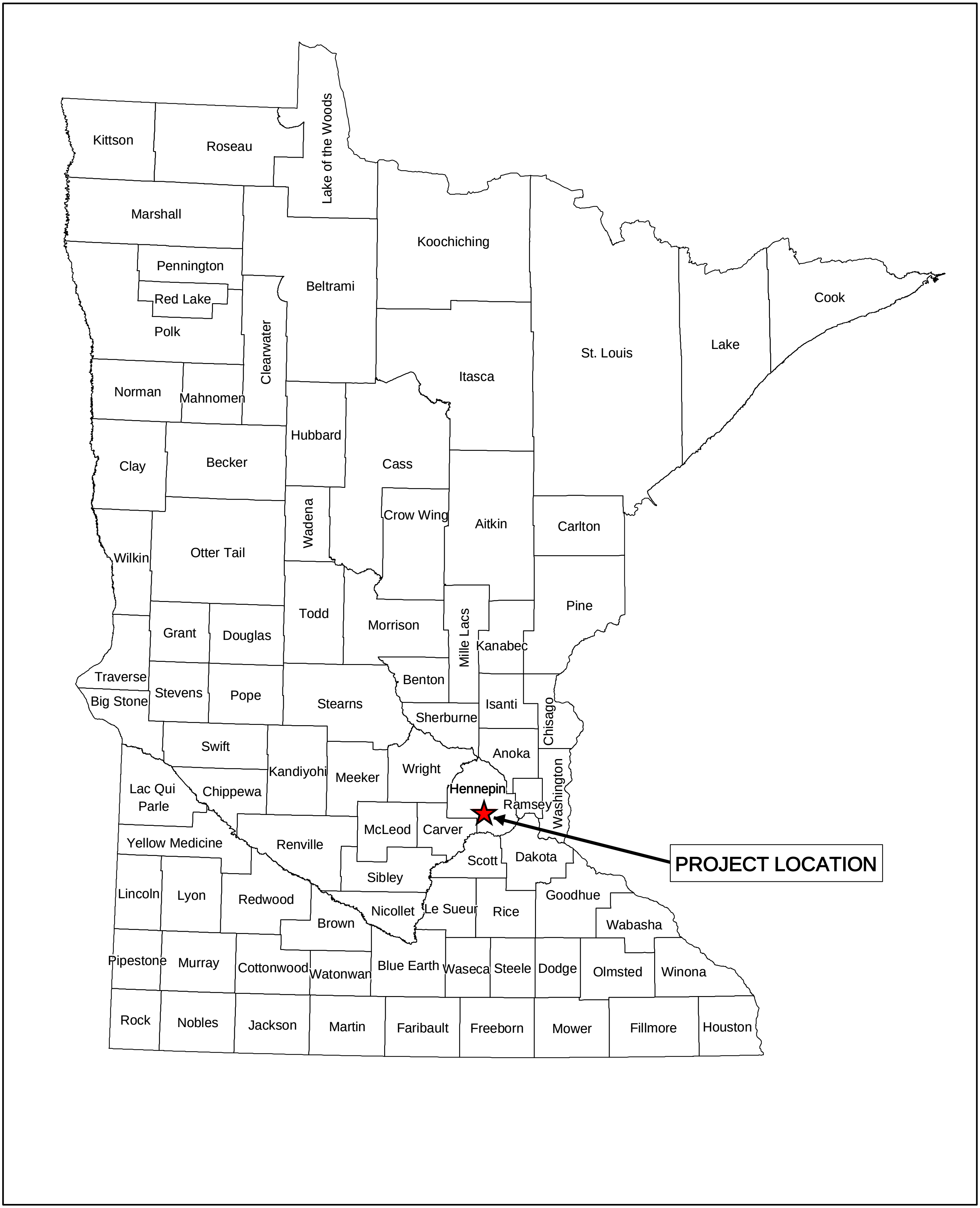
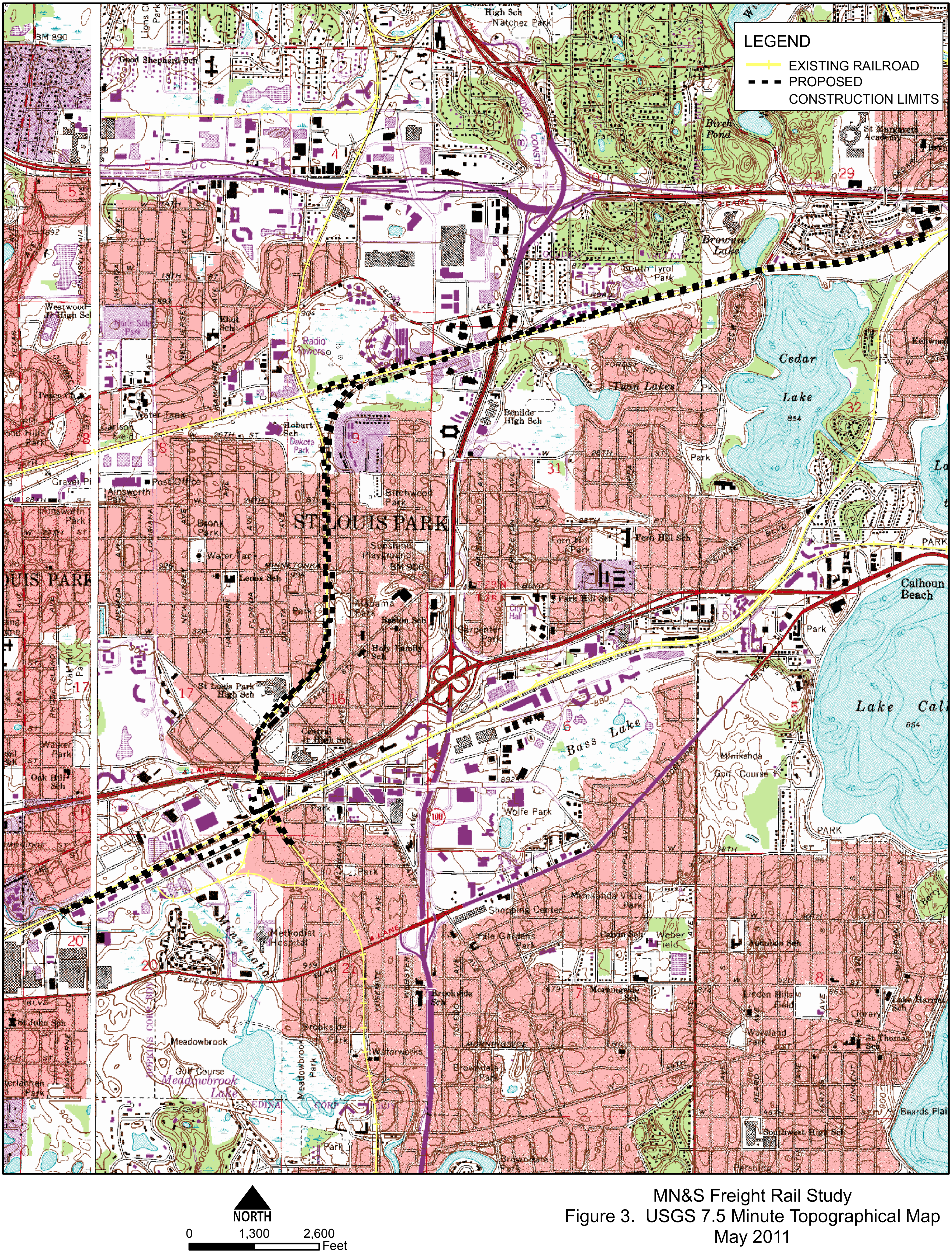


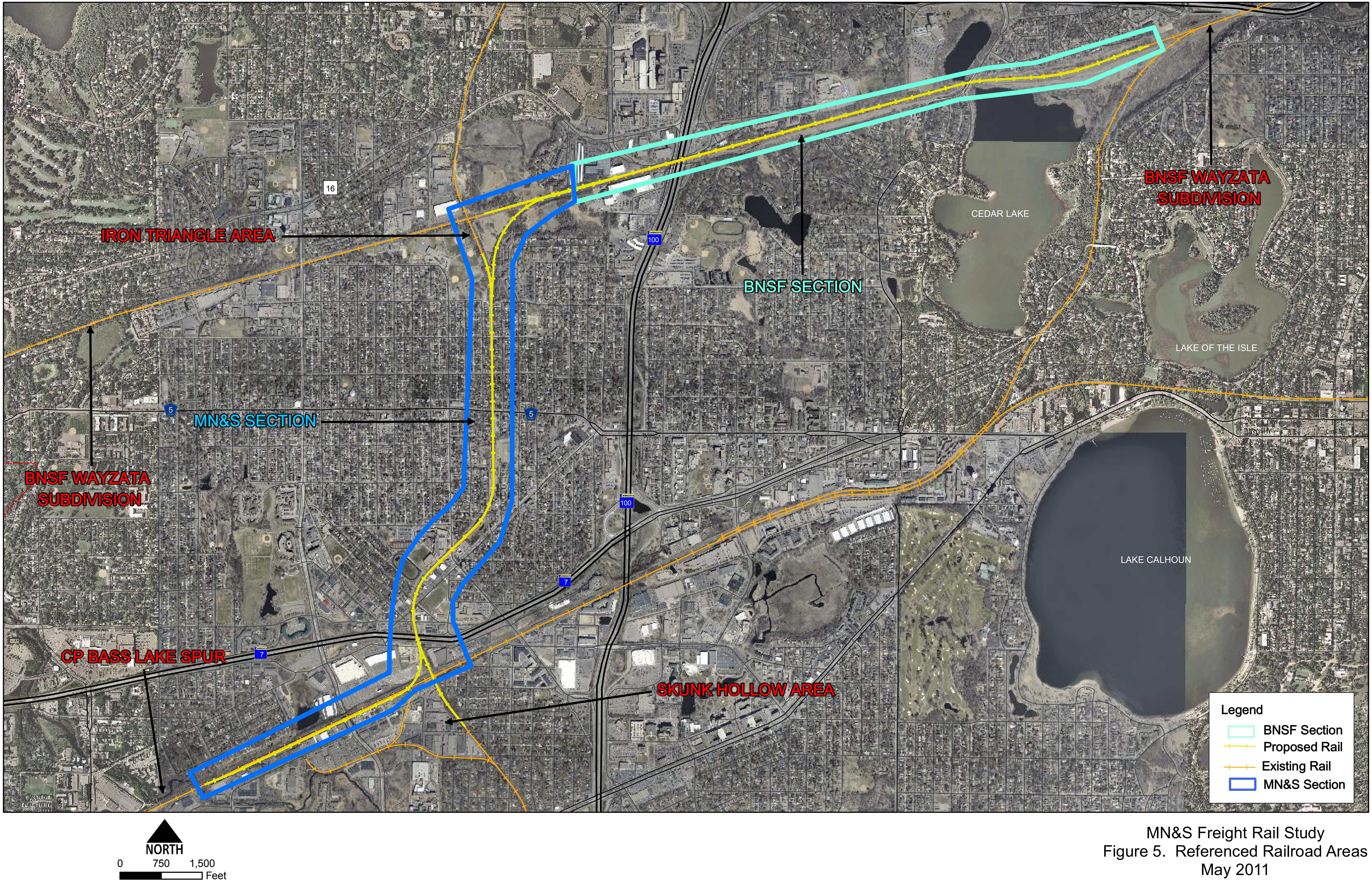
MN&S Freight Rail Study
Figure 1. Project Vicinity Map
May 2011



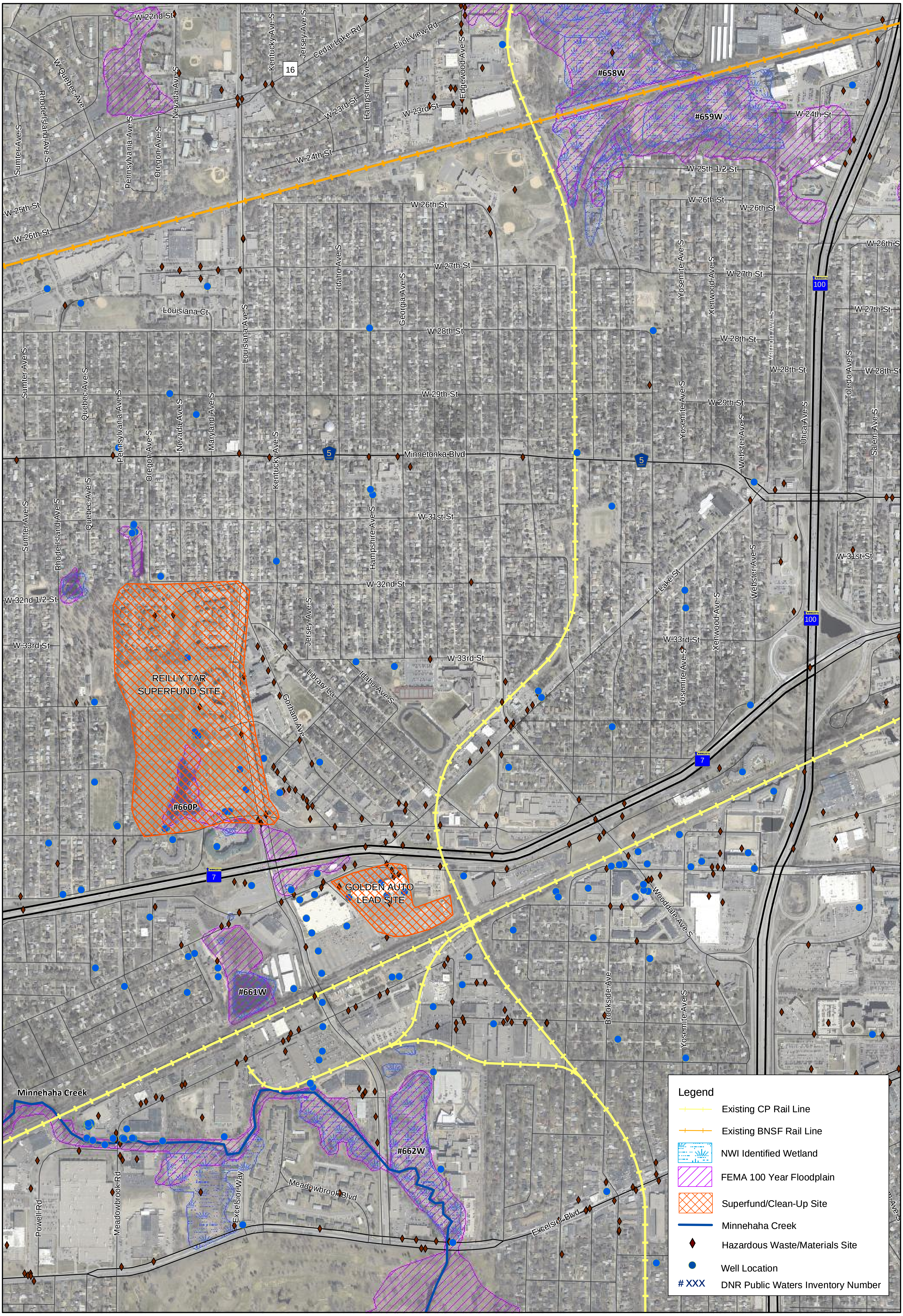
MN&S Freight Rail Study
Figure 2. Project Location
May 2011



MN&S Freight Rail Study
Figure 3. USGS 7.5 Minute Topographical Map
May 2011



MN&S Freight Rail Study
Figure 5. Referenced Railroad Areas
May 2011

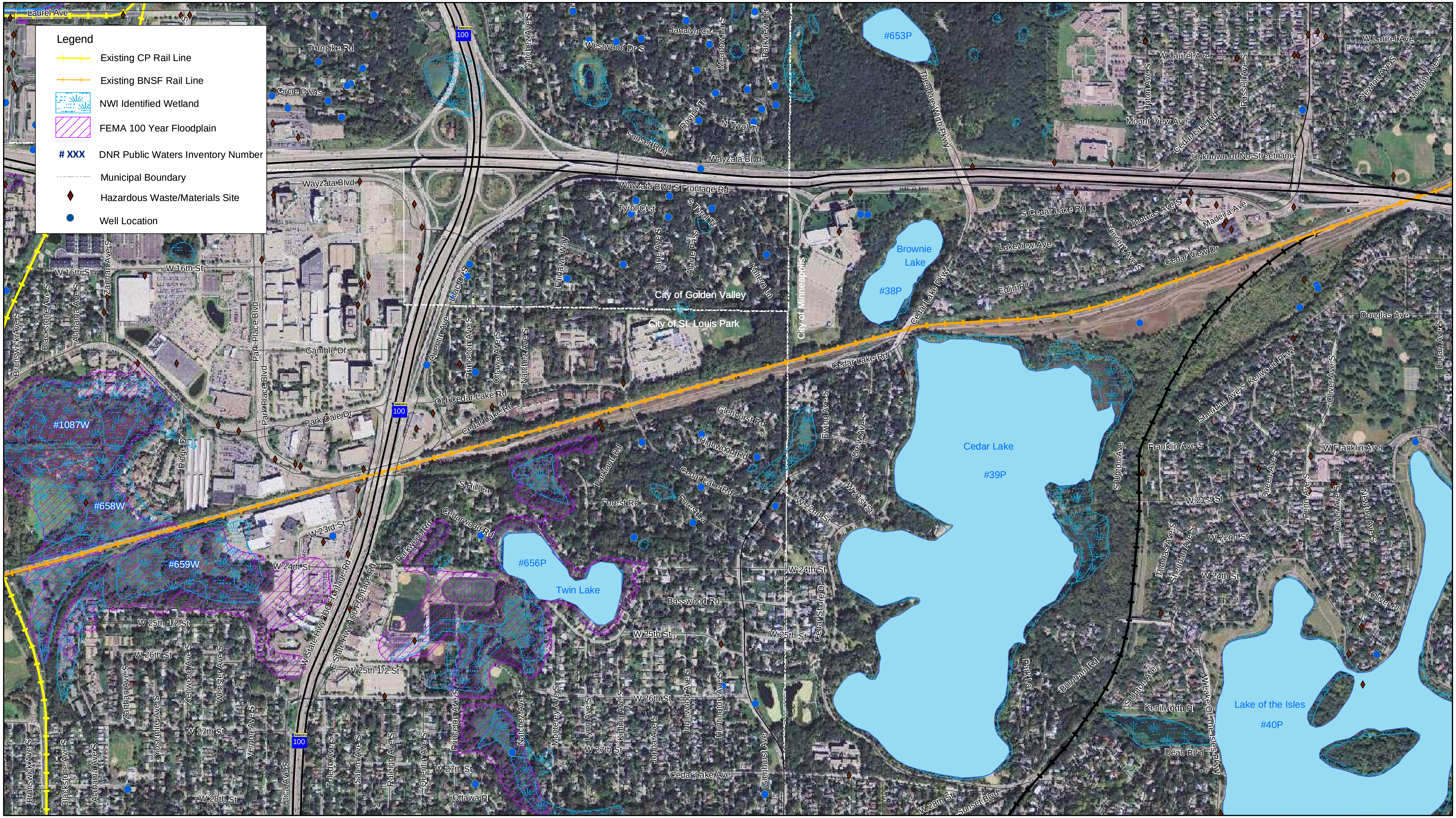


NORTH

0 450 900 Feet

Sources:
National Wetland Inventory
DNR Public Waters Inventory
MDH County Well Index
Environmental Data Resource (EDR), 2010

MN&S Freight Rail Study
Figure 6a. Environmental Resources - MN&S Section
May 2011

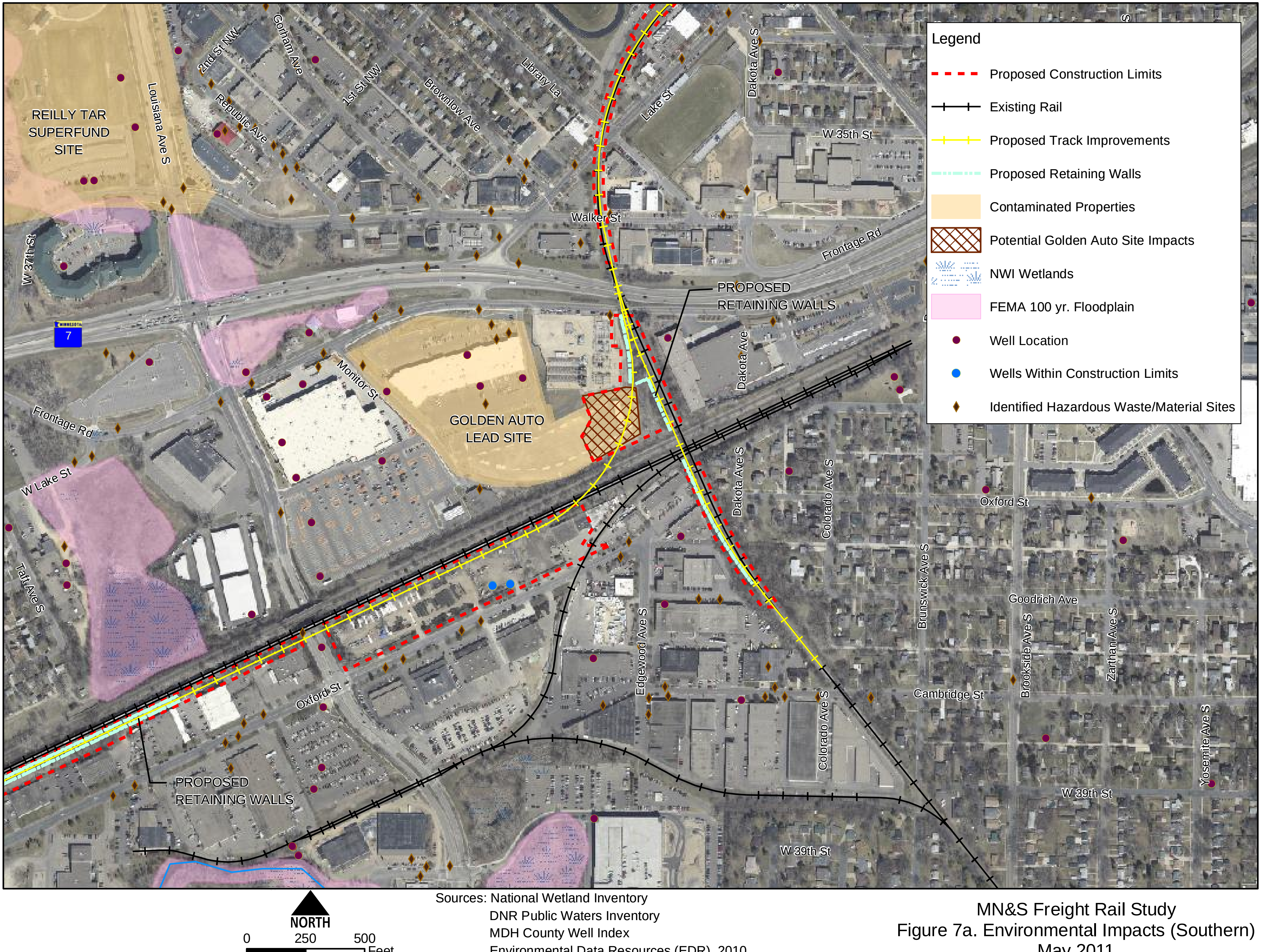


NORTH

0 500 1,000
Feet

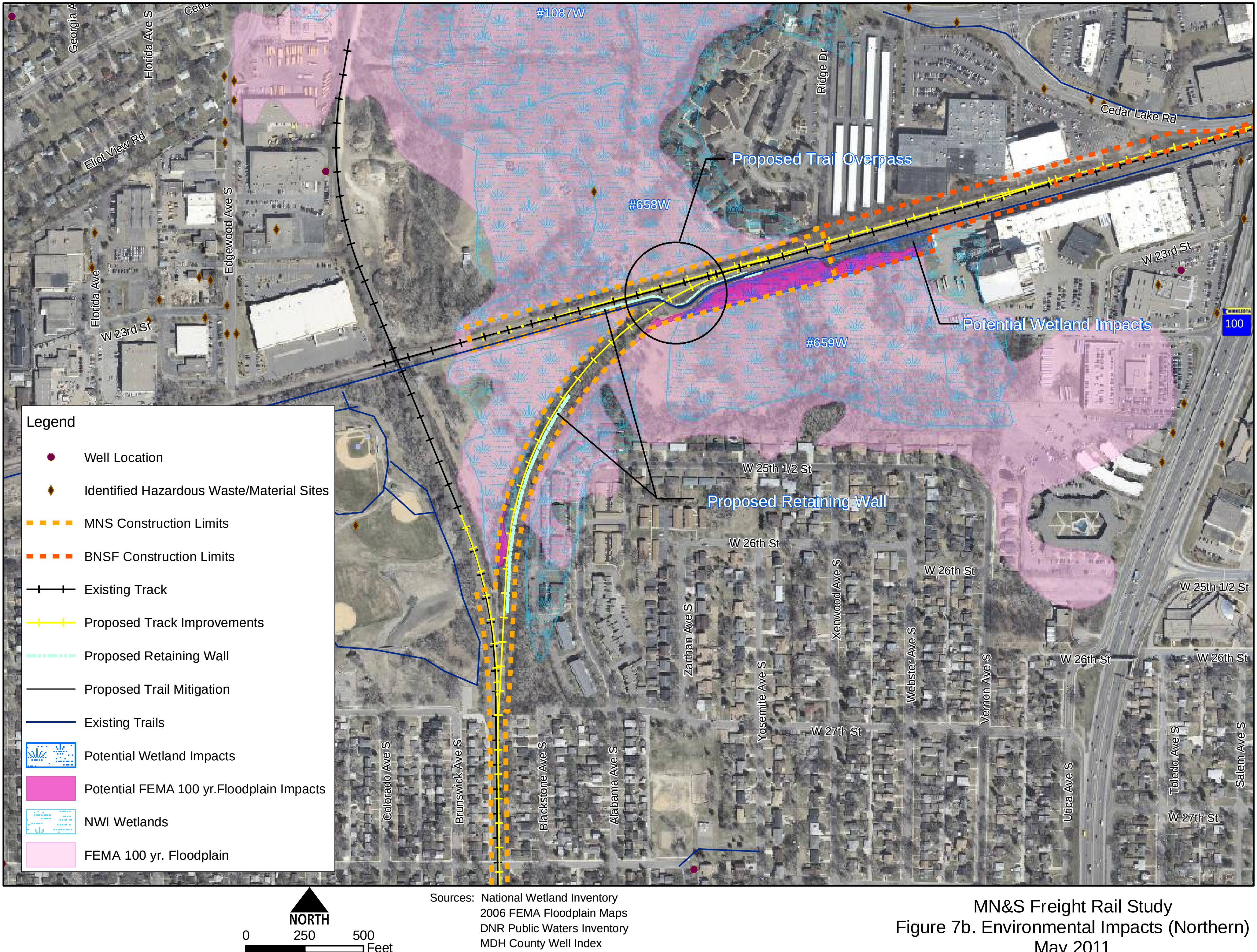
Sources: National Wetland Inventory
DNR Public Waters Inventory
MDH County Well Index
Environmental Data Resources (EDR), 2010

MN&S Freight Rail Study
Figure 6b. Environmental Resources - BNSF Section
May 2011



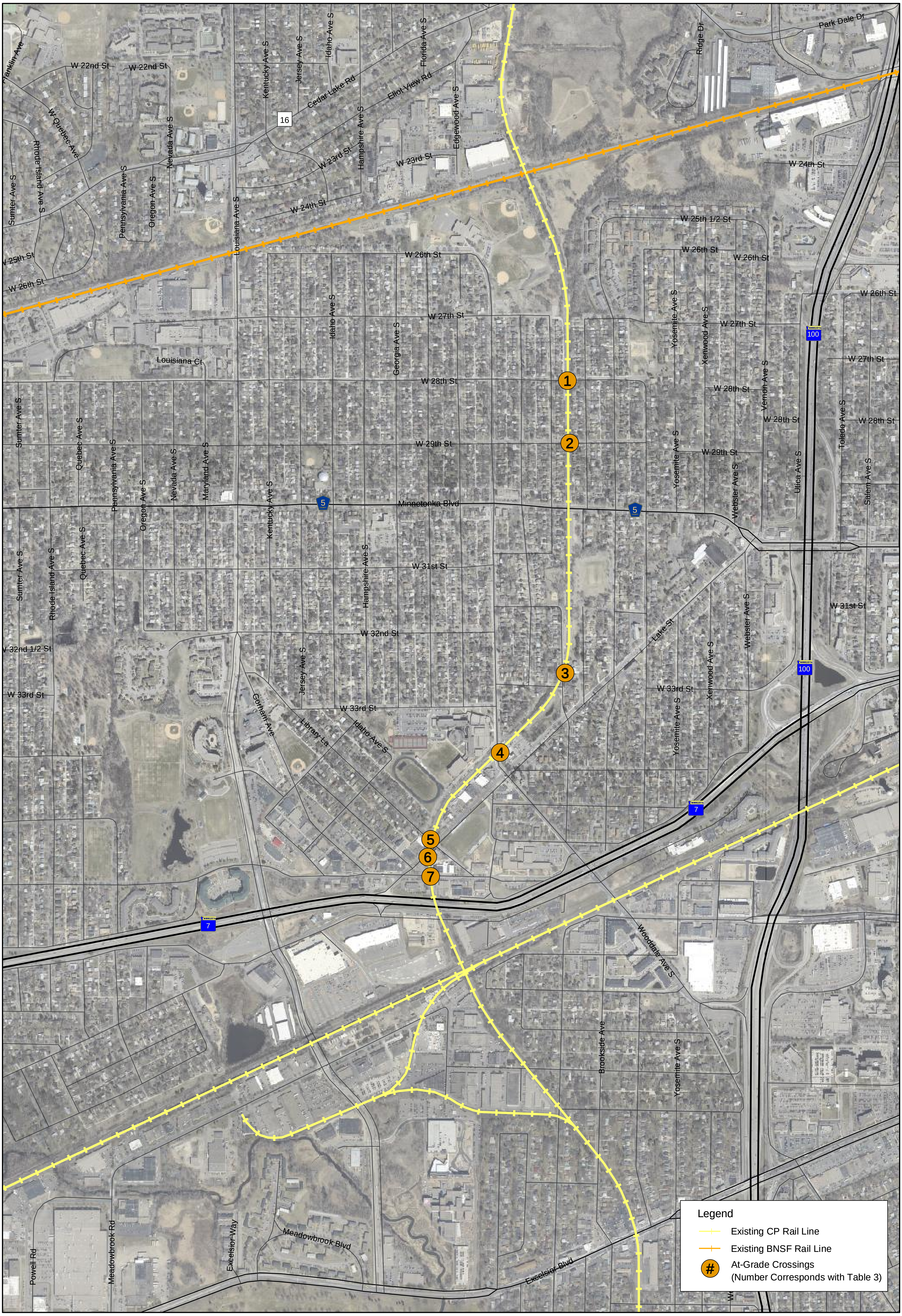
Sources: National Wetland Inventory
DNR Public Waters Inventory
MDH County Well Index
Environmental Data Resources (EDR), 2010

MN&S Freight Rail Study
Figure 7a. Environmental Impacts (Southern)
May 2011



Sources: National Wetland Inventory
2006 FEMA Floodplain Maps
DNR Public Waters Inventory
MDH County Well Index
Environmental Data Resource (EDR), 2010

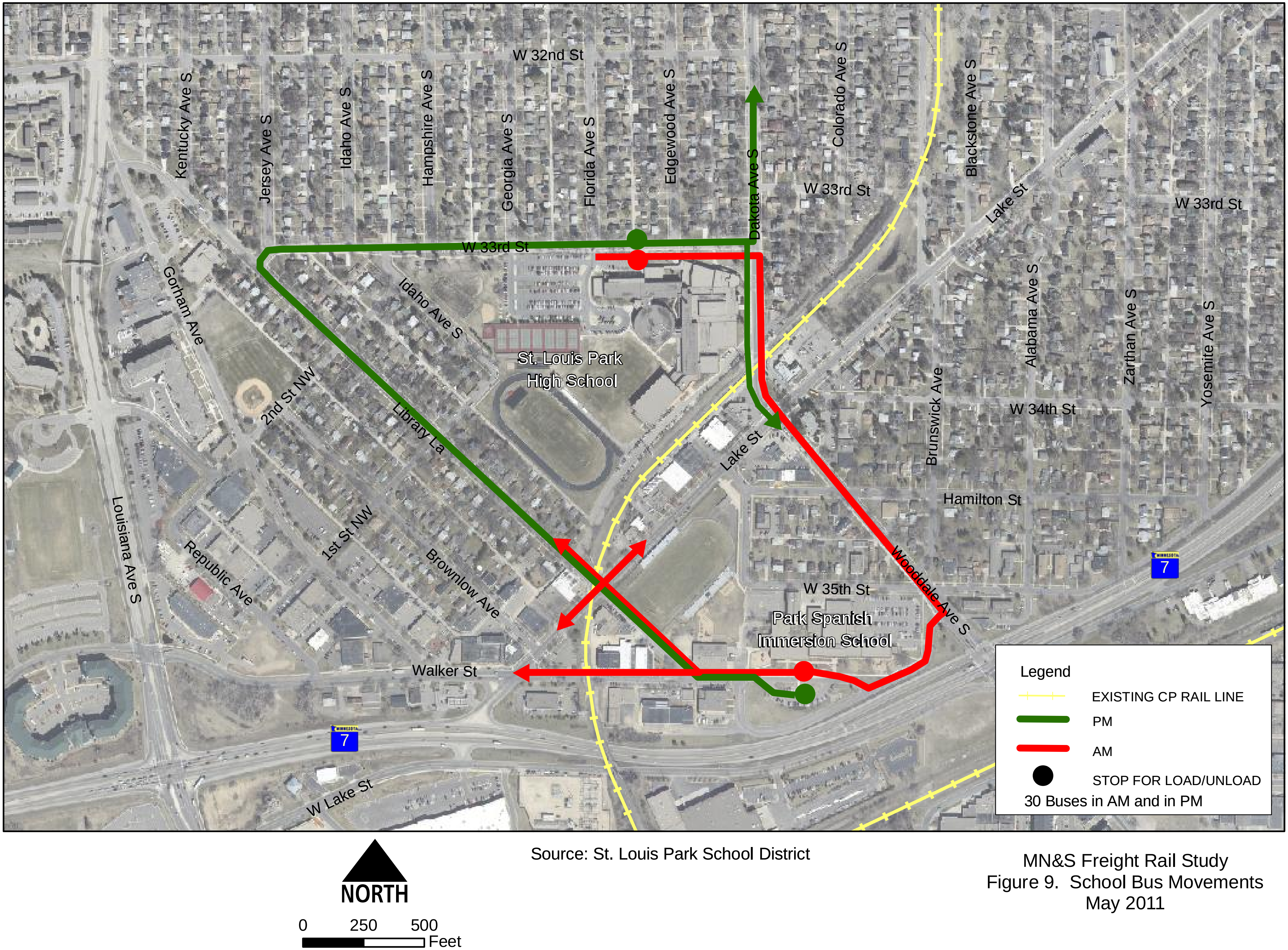
MN&S Freight Rail Study
Figure 7b. Environmental Impacts (Northern)
May 2011



NORTH

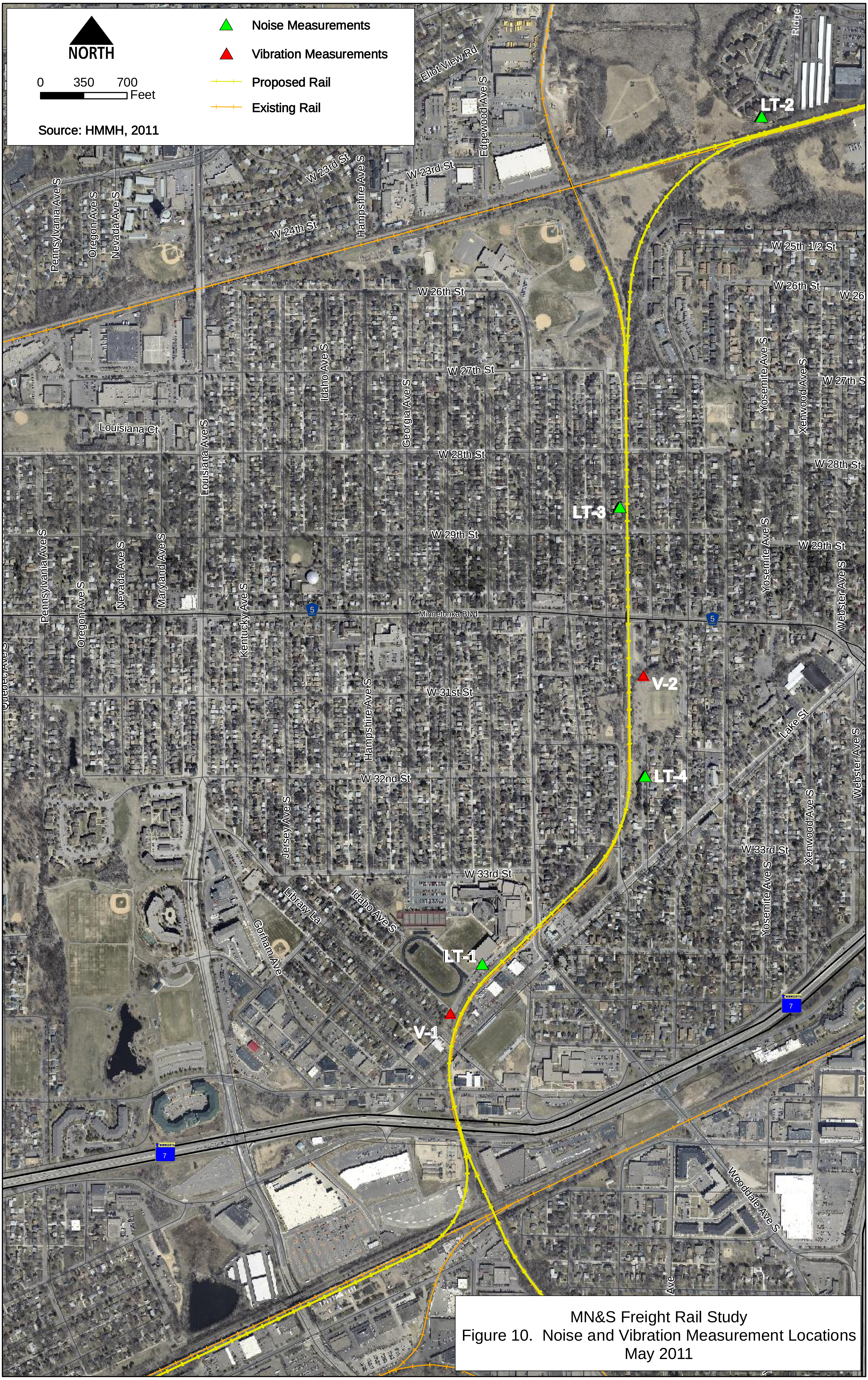
0 450 900 Feet

MN&S Freight Rail Study
Figure 8. At-Grade Crossings
May 2011

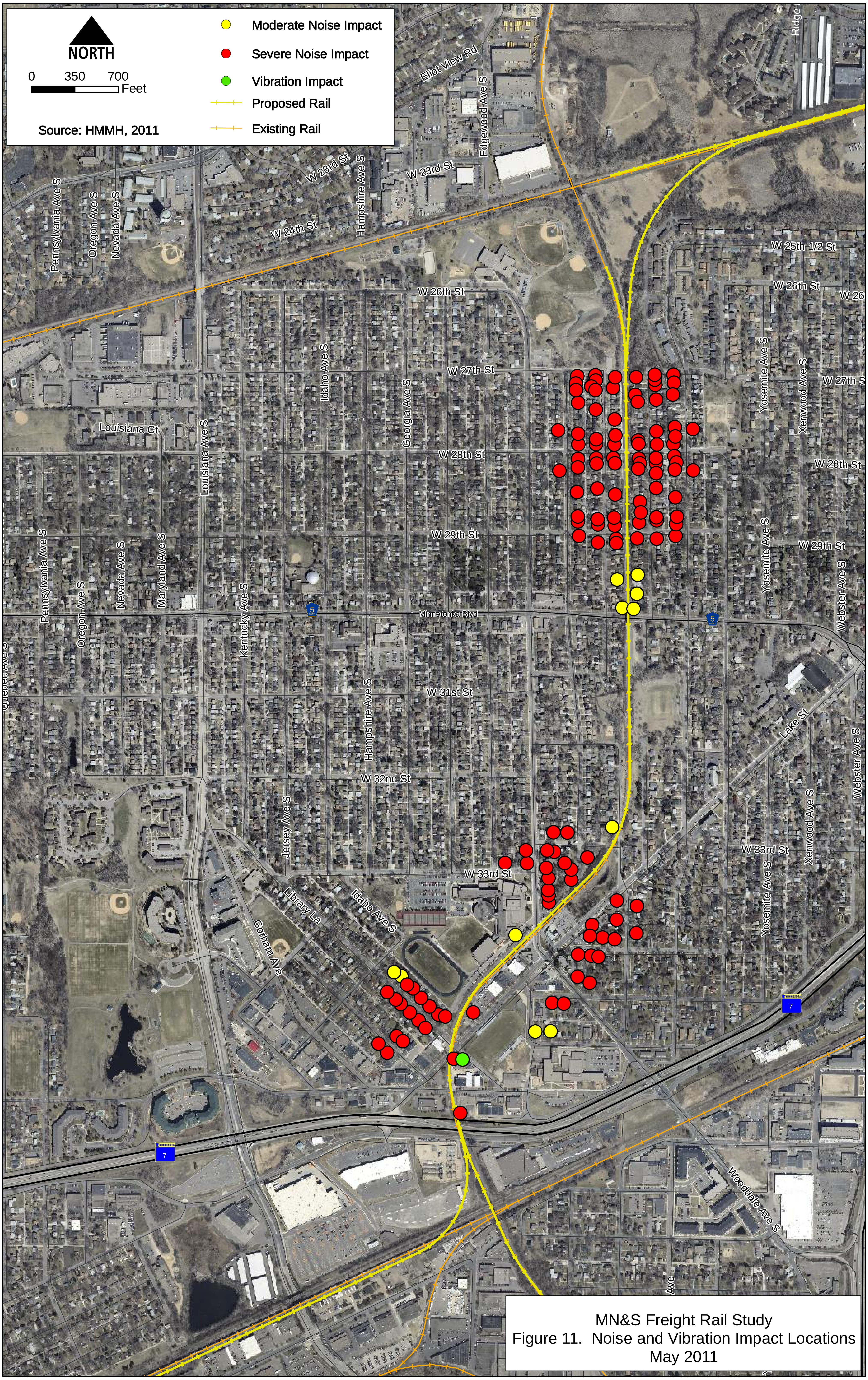


Source: St. Louis Park School District

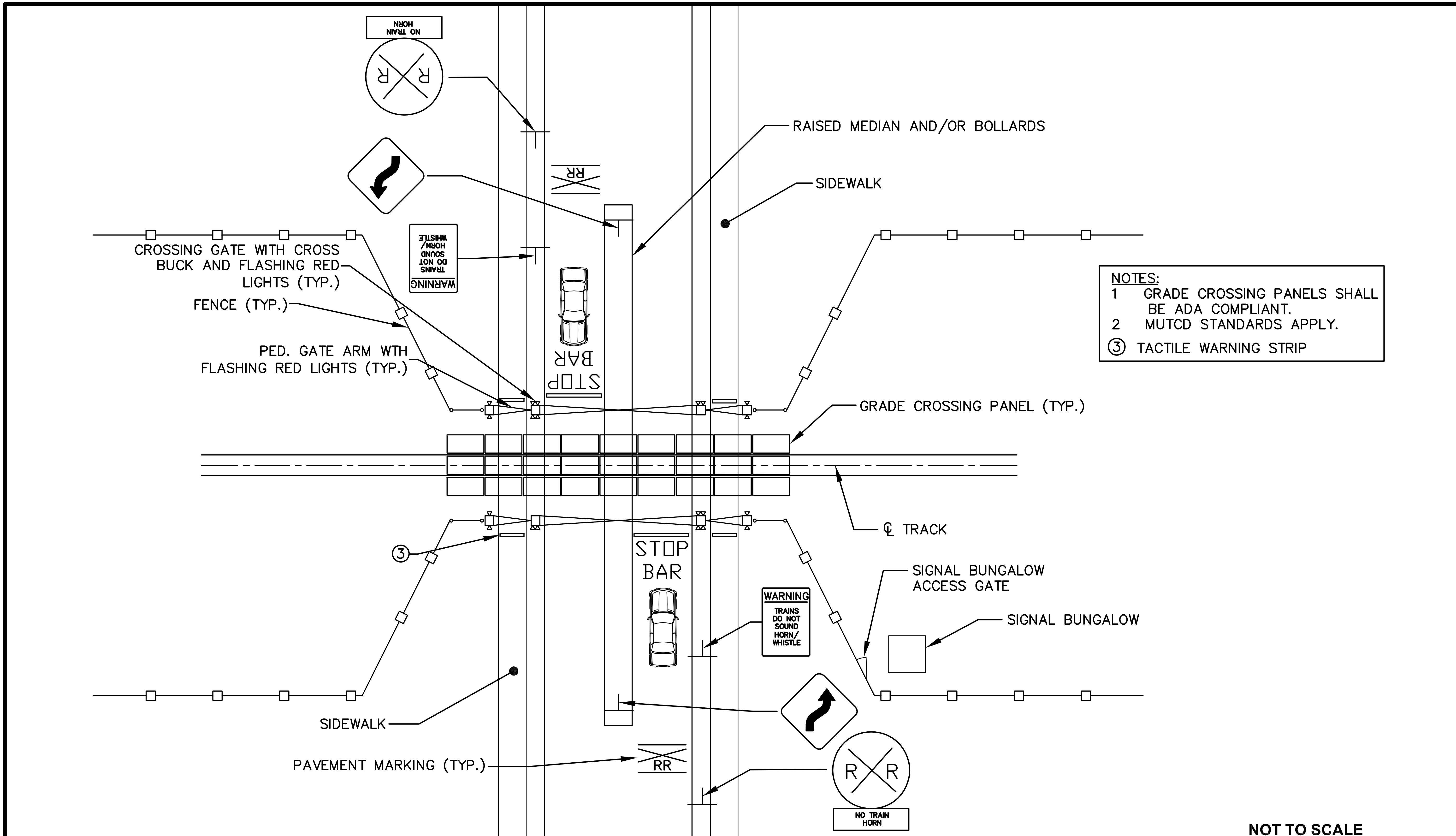
MN&S Freight Rail Study
Figure 9. School Bus Movements
May 2011



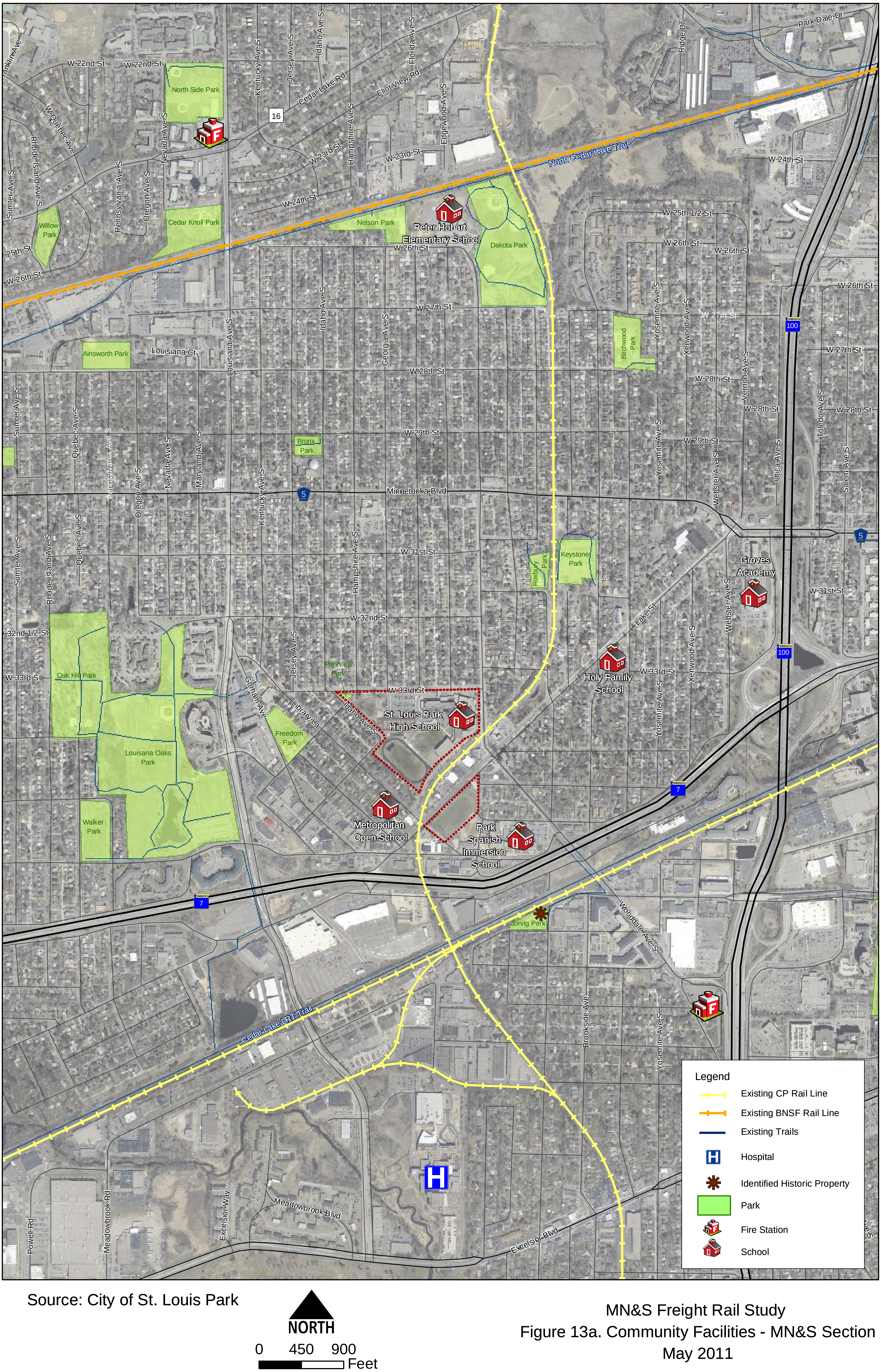
MN&S Freight Rail Study
Figure 10. Noise and Vibration Measurement Locations
May 2011



MN&S Freight Rail Study
Figure 11. Noise and Vibration Impact Locations
May 2011

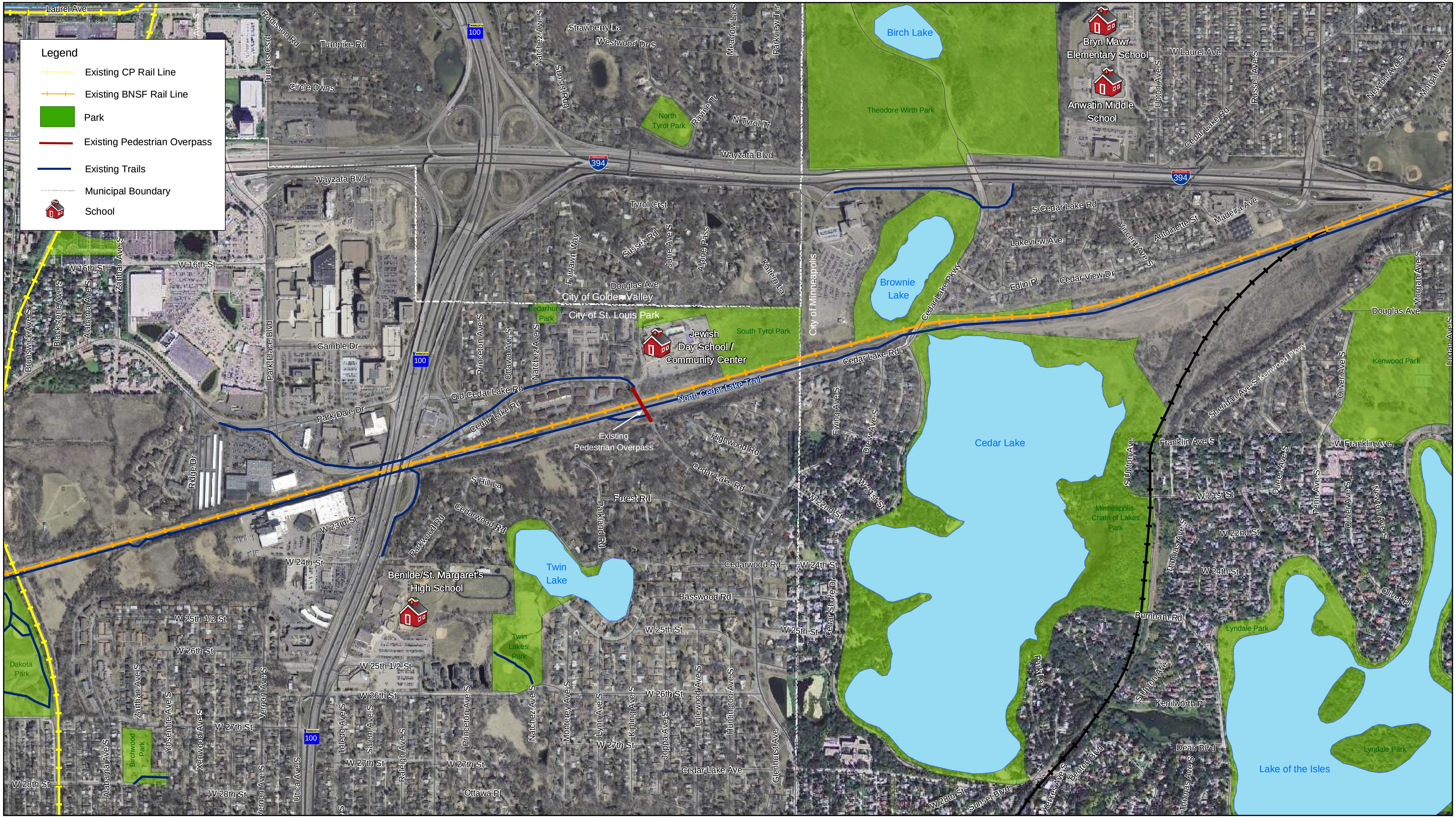


MN&S Freight Rail Study
Figure 12. RR/Grade Crossing with Quiet Zone
May 2011



Source: City of St. Louis Park

MN&S Freight Rail Study
Figure 13a. Community Facilities - MN&S Section
May 2011



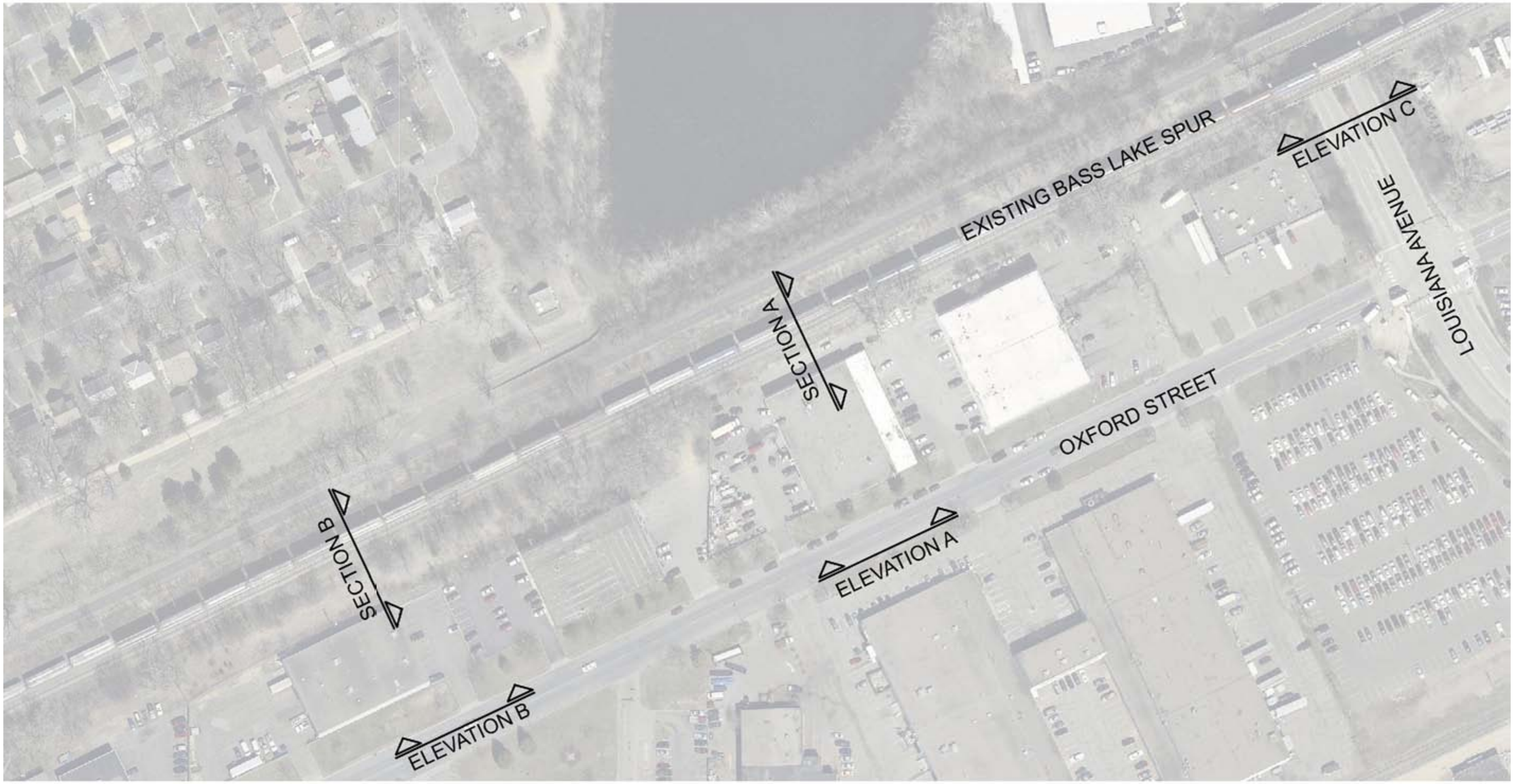
NORTH

0 450 900 Feet

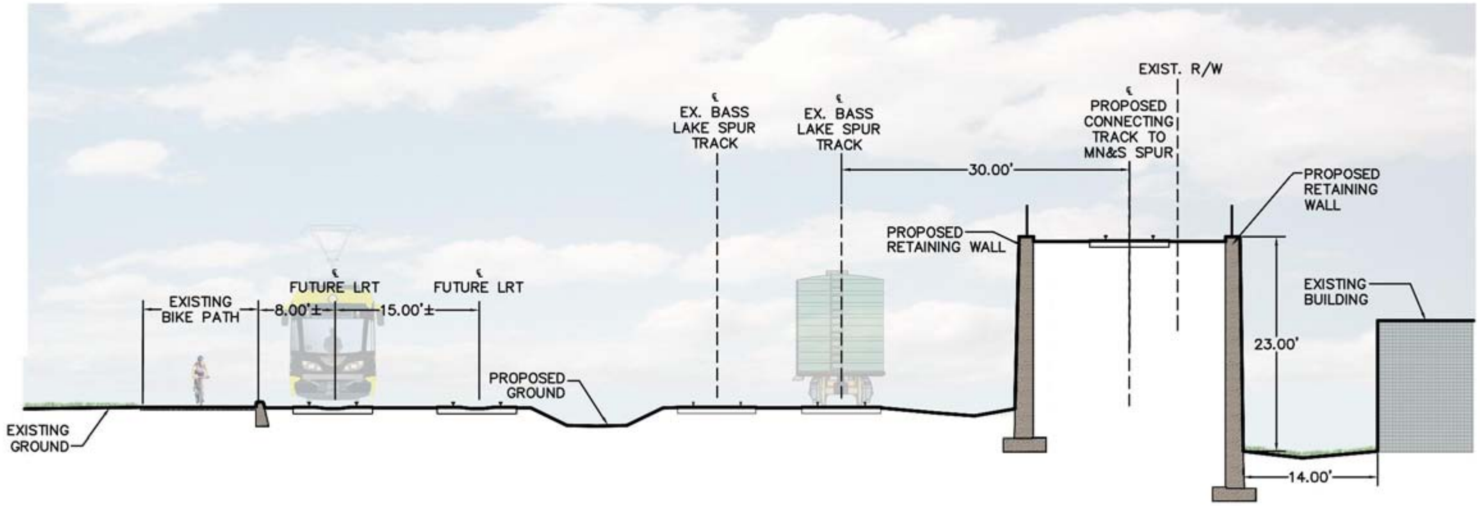
MN&S Freight Rail Study

Figure 13b. Community Facilities - BNSF Section

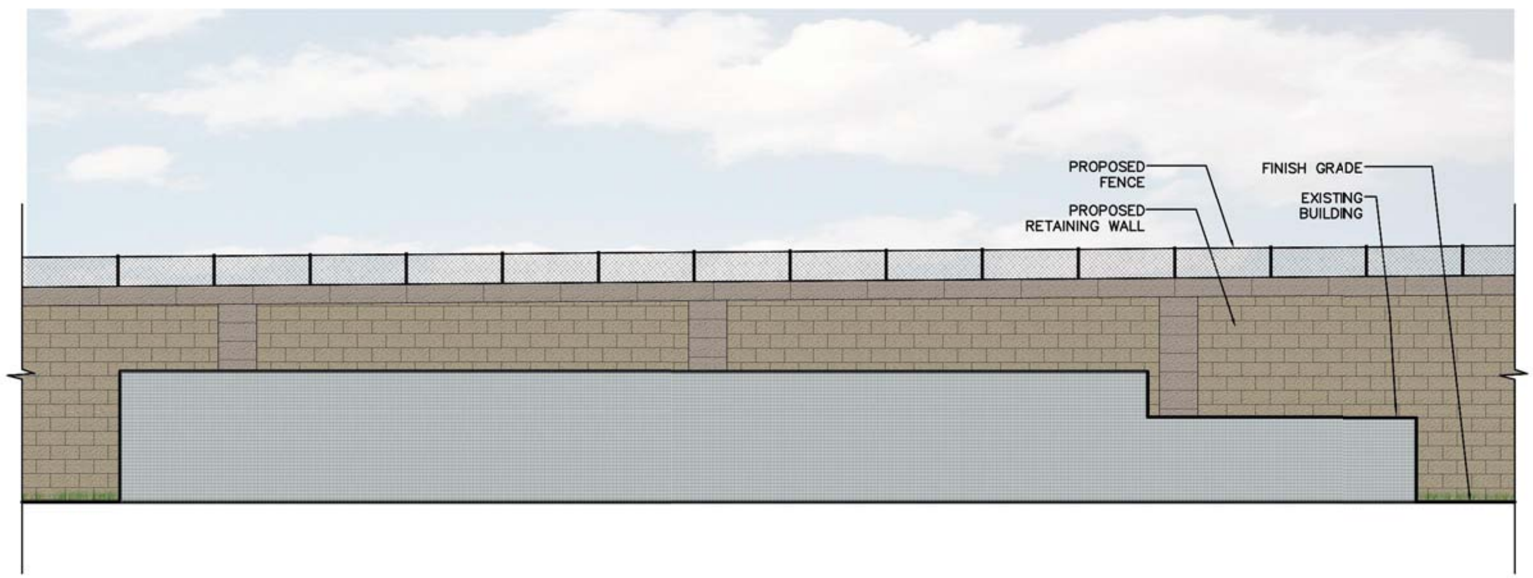
May 2011



MN&S Freight Rail Study
Figure 14. Visual Assessment - Proposed Sections & Elevations
May 2011



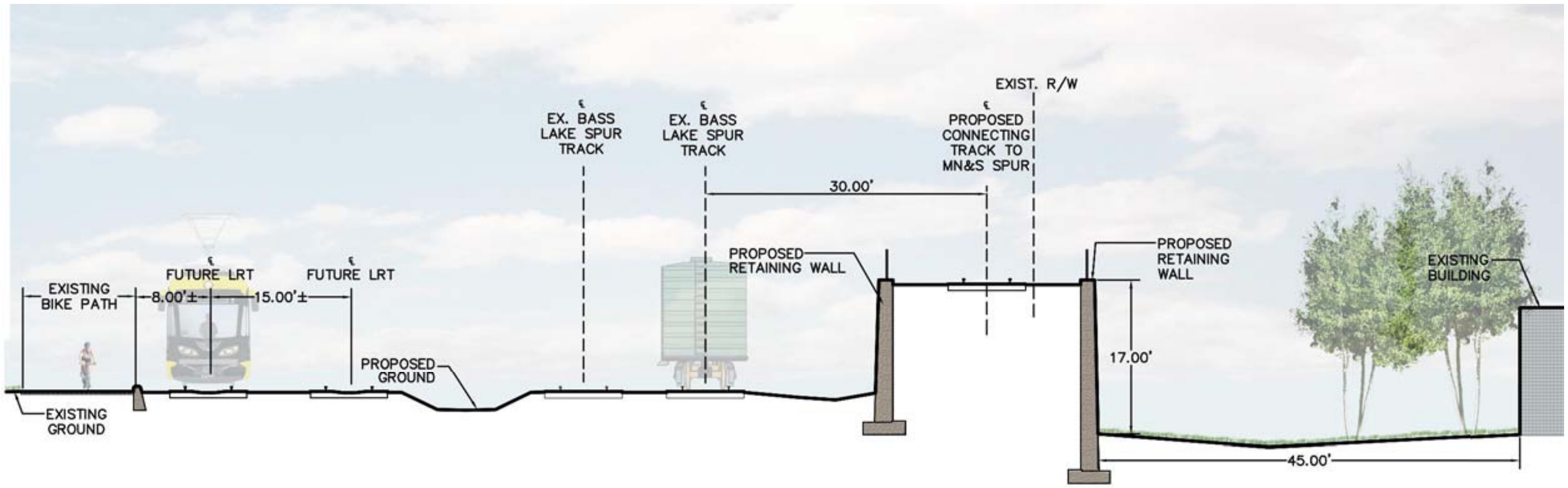
Section A



Elevation A

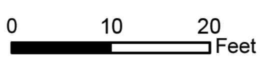
0 10 20 Feet

MN&S Freight Rail Study
Figure 15. Visual Assessment - Section A / Elevation A
May 2011



Section B

Elevation B

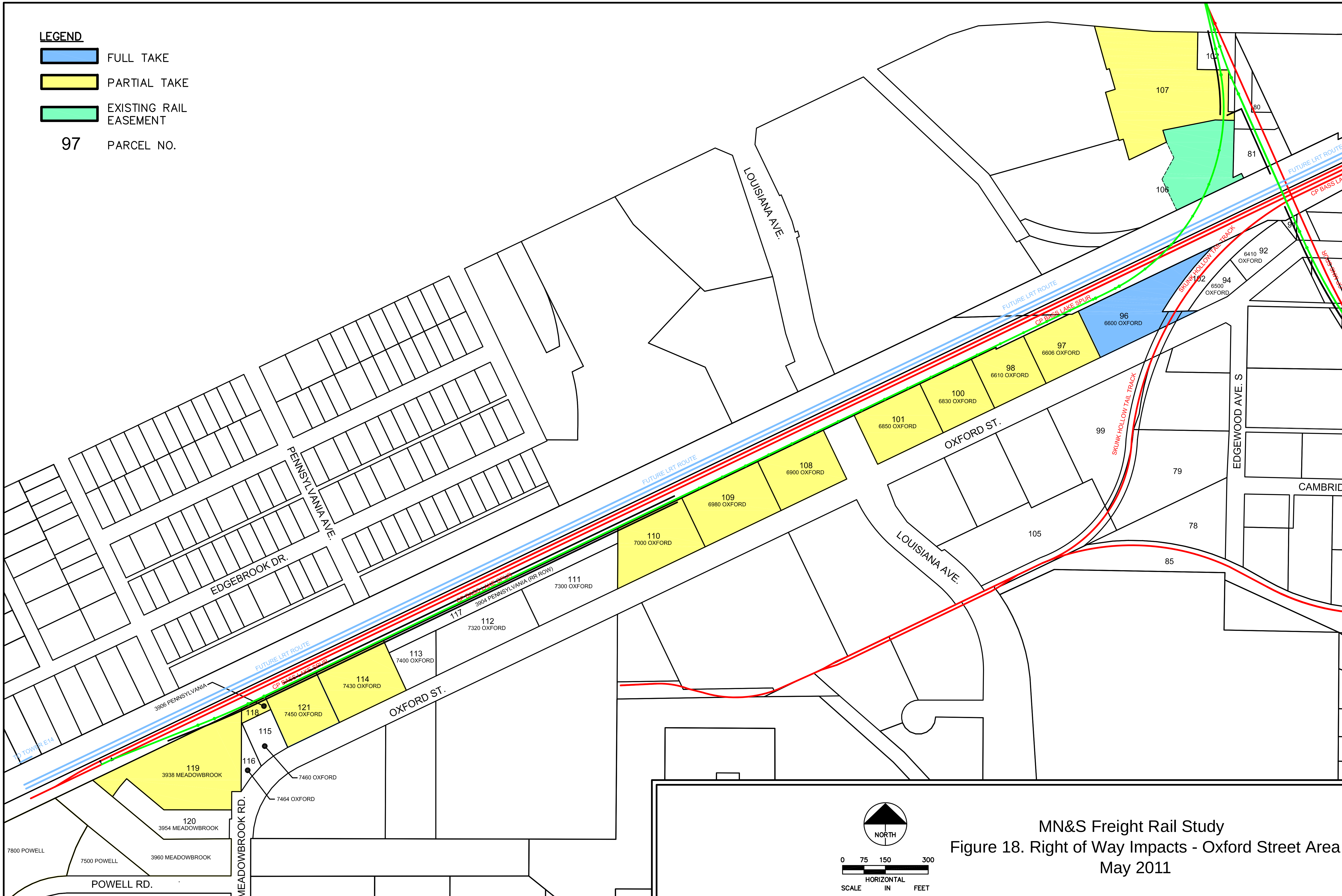


MN&S Freight Rail Study
Figure 16. Visual Assessment - Section B / Elevation B
May 2011

Elevation C

0 10 20
Feet

MN&S Freight Rail Study
Figure 17. Visual Assessment - Section C
May 2011



MN&S Freight Rail Study
Figure 18. Right of Way Impacts - Oxford Street Area
May 2011

K:\TWC_Transit\HCRRA\KENILWORTH\CADD\EXHIBITS\PARCELS\KENI_PARCEL-IMPACTS.dwg May 05, 2011 – 10:43am

MN&S Freight Rail Study
Figure 19. Area "B" Potential Right-of-Way and Safety Mitigation
May 2011

K:\TWC_Transit\HCRRA\KENILWORTH\CADD\EXHIBITS\PARCELS\KENI_PARCELS-6108-6116.dwg March 30, 2011 - 12:04pm

Soil, Groundwater and Dewatering Conditions Information

APPENDIX H – SOIL, GROUNDWATER, AND DEWATERING CONDITIONS

Shallow Groundwater Locations Requiring Dewatering

Using a water removal system during construction could be necessary at numerous locations along the Build Alternatives for tunnel excavations, grade leveling, and structural footings. For the purposes of this evaluation, the focus was on identifying areas where it is likely that groundwater exists within 10 feet of the ground surface. Within the study area, the County Well Index (CWI) was queried for wells completed in shallow **aquifers** where water levels have been measured within 10 feet of the ground surface. Because the resultant number of wells was relatively small and the spatial distribution was uneven, the water level measurement data were supplemented by identifying areas on topographic maps where the Build Alternatives cross or are adjacent to surface water.

A permanent water removal system could be necessary at deeper excavations along the Build Alternatives. Data for evaluating the cuts insofar as they affect groundwater and soil stability have been compiled from the CWI, the Geologic Atlas of Hennepin County, the Hennepin County Soil Survey, and topographic maps for the area.

Soil and Groundwater Conditions at Proposed Cuts

Seven major excavations (cuts) are proposed along the Build Alternatives (see Figures 1 through 4 in this Appendix). The soil and groundwater conditions at the proposed cuts are described below, and summarized in Table 1 that follows. (See elsewhere in this section of the appendix for discussion of soil and groundwater impacts on construction.)

- Segment 1 (Figure 1): Cut No. 1, located just north of the crossing of County Road 62, is for an underpass beneath the Twin Cities and Western Railroad (TC&W) tracks. Soils at this location are described in the Geologic Atlas of Hennepin County as glacial outwash, although review of well logs in the area indicated the presence of interfingered clay and silt, which is more indicative of glacial till. The proposed cut would have a base elevation of approximately 895 feet above mean sea level (ft amsl). The elevation of groundwater from well logs and the topographic maps is expected at about 905 feet amsl, so groundwater may be encountered in this cut.

> An "aquifer" is a water-bearing layer (or several layers) of rock or sediment capable of yielding supplies of water through a water well or spring.

- Segment 3 (Figure 2): Cut No. 2 is located between the Southwest and Eden Prairie Town Center stations. The purpose of this cut is for construction of a tunnel beneath Prairie Center Drive. The geologic materials in the area consist of clay overlying sand at depth. Peat soils are present nearby and could be encountered. The proposed cut would have a base elevation of about 823 feet amsl. The regional water table appears to be lower than the proposed cut, at about 820 feet amsl. However, a pond located northeast of the Eden Prairie Town

Center station has an elevation of 852 feet amsl, suggesting that perched groundwater may be a potential issue in this area.

- Segment 3 (Figure 2): Cut No. 3 is located on Segment 3 near the crossing of the South Branch of Nine Mile Creek. Cut No. 3 would consist of cutting into a hillside to lower the grade. It would also be necessary to replace culverts. The soils in this area consist of glacial till in the uplands and peat at the lower elevations near the creek. The till is characterized as silty sand. The elevation of groundwater in the area will occur at or near the creek elevation (845 feet amsl), which is expected to be about 16 feet below the depth of the cut.
- Segment 3 (Figure 2): Cut No. 4 is located near the intersection of Flying Cloud Drive and Shady Oak Road. Its purpose is for the construction of a tunnel beneath Shady Oak Road. Soils in the area consist of glacial outwash and alluvial terrace deposits, suggesting that the materials are sandy, potentially with small amounts of silt and/or clay. The water table in the area is expected at about an elevation of 880 feet amsl, which is above the elevation of the base of the cut at 868 feet amsl, meaning groundwater may be encountered.
- Segment A (Figure 3): Cuts No. 5 and 6 lie north of Glenwood Avenue. Cut No. 5 is for the purposes of grade leveling, and Cut No. 6 would be for the underpass where the rail line crosses N. Seventh Street. The geologic materials consist of a significant thickness of fluvial sand overlying clay. It is expected that Cut No. 5 would terminate above the water table, which is at about 810 feet amsl, but Cut No. 6 may encounter groundwater near its base.
- Segments C-1 and C-2 (Figure 4): Cut No. 7 is the proposed tunnel along Nicollet Avenue. The geologic materials in this area are glacial outwash consisting of sand overlying clay at depth. The Geologic Atlas of Hennepin County indicates the elevation of the water table is approximately 825 feet amsl, well below the estimated base elevation of the cut. Given the granular soil types, the potential for perched water is low.
- Freight Rail Relocation Segment: No significant cuts are proposed.

Table 1. Soil and Groundwater Conditions at Proposed Cuts

Cut Number	Alternative Segment	Alignment Stationing	Cut Name	Surface Elevation (feet)	Proposed Elevation (feet)	Cut Depth (feet)	Geology			Water Elevation (feet)
							Deposition	Material Description	Unified Classification	
1	1	312+00	CP/TC&W Rail Crossing	916	895	21	Outwash (Des Moines Lobe)	Clay with stone	SC, w/ SM & CL	905
2	3	205+00	Prairie Center Dr / TH 5	849	823	26	Till (Des Moines Lobe), with adjacent Peat	Clay overlying sand	CL-ML w/ CL, Pt	820[a]
3	3	349+00	Nine Mile Creek-S. Fork	880	861	19	Till (Des Moines lobe) with adjacent Peat	Sand with silt, Peat	SM, Pt	845
4	3	376+00	Flying Cloud Dr/ Shady Oak Rd	894	868	26	Outwash and granular ice contact deposits (Des Moines Lobe)	Sand with some clay and silt	SC	880
5	A	1146+00	North of Glenwood	842	823	19	Fluvial	Sand overlying lean clay	Urban [b]	810
6	A	1162+00	Royalston Ave / 7th St.	832	808	24	Fluvial	Sand overlying clayey sand	Urban [b]	810
7	C	1096+00	Tunnel North	896	870	26	Outwash (Des Moines Lobe)	Sand with some clay and silt	Urban [b]	825
		1085+00	Tunnel Mid	884	857	27	Outwash (Des Moines Lobe)	Sand overlying sandy clay	Urban [b]	825
		1069+00	Tunnel South	872	848	24	Outwash (Des Moines Lobe)	Sand	Urban [b]	825

Notes:

[a] Potential for perched groundwater (adjacent pond at 852 feet amsl)

[b] Soils filled or disturbed

Figure 1. Cut Locations (Excavations): Segment 1

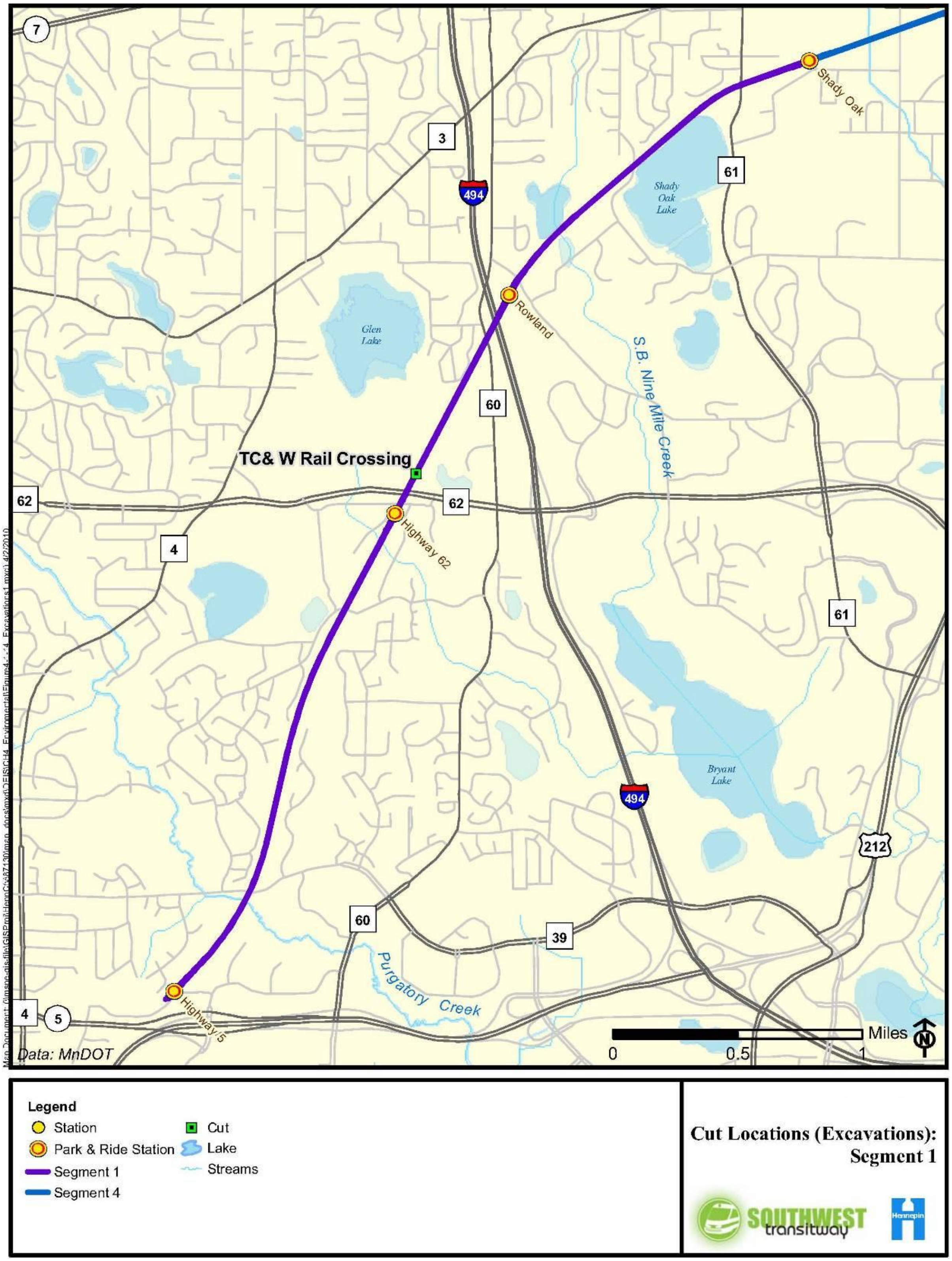


Figure 2. Cut Locations (Excavations): Segment 3

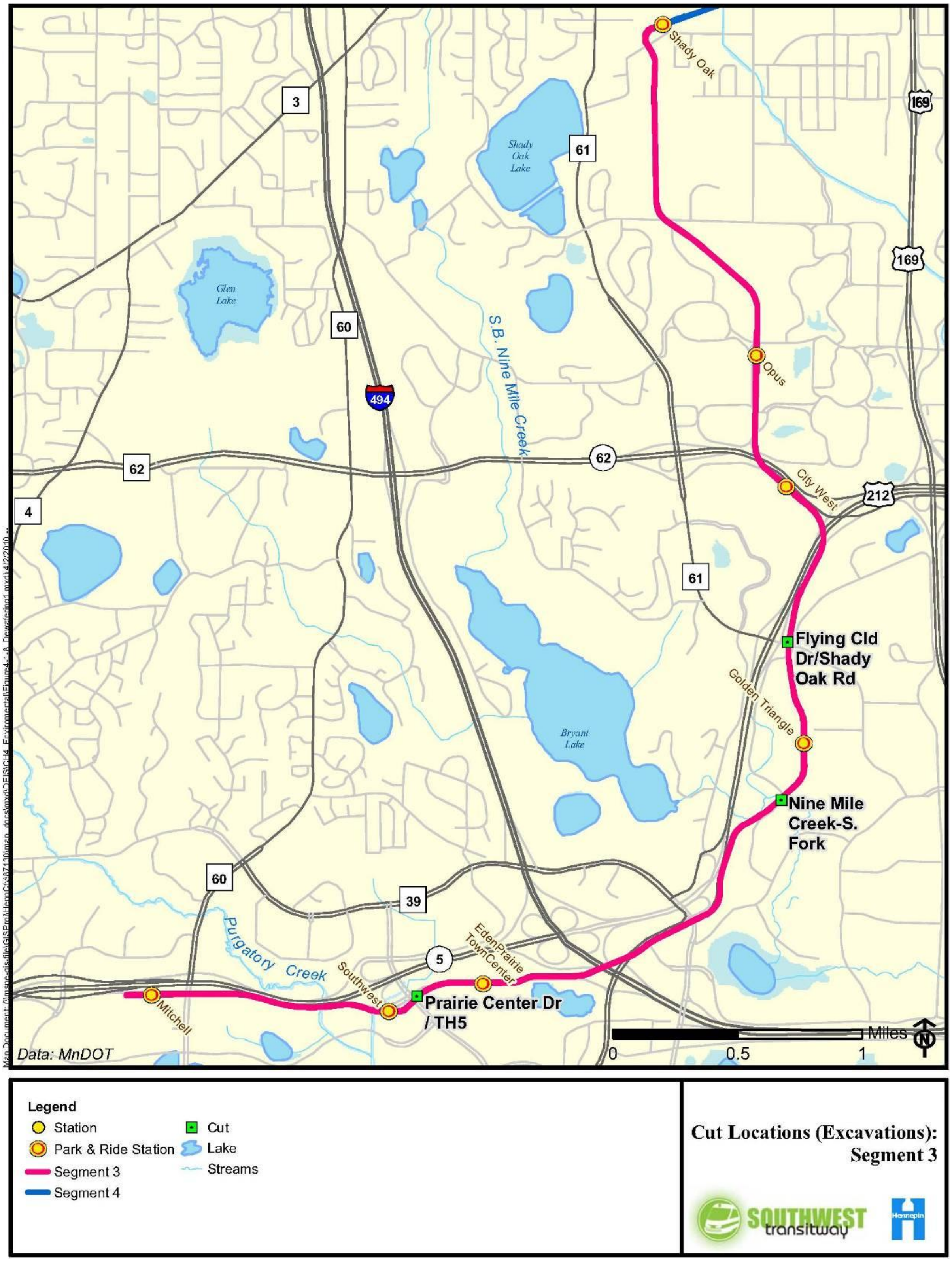


Figure 3. Cut Locations (Excavations): Segment A

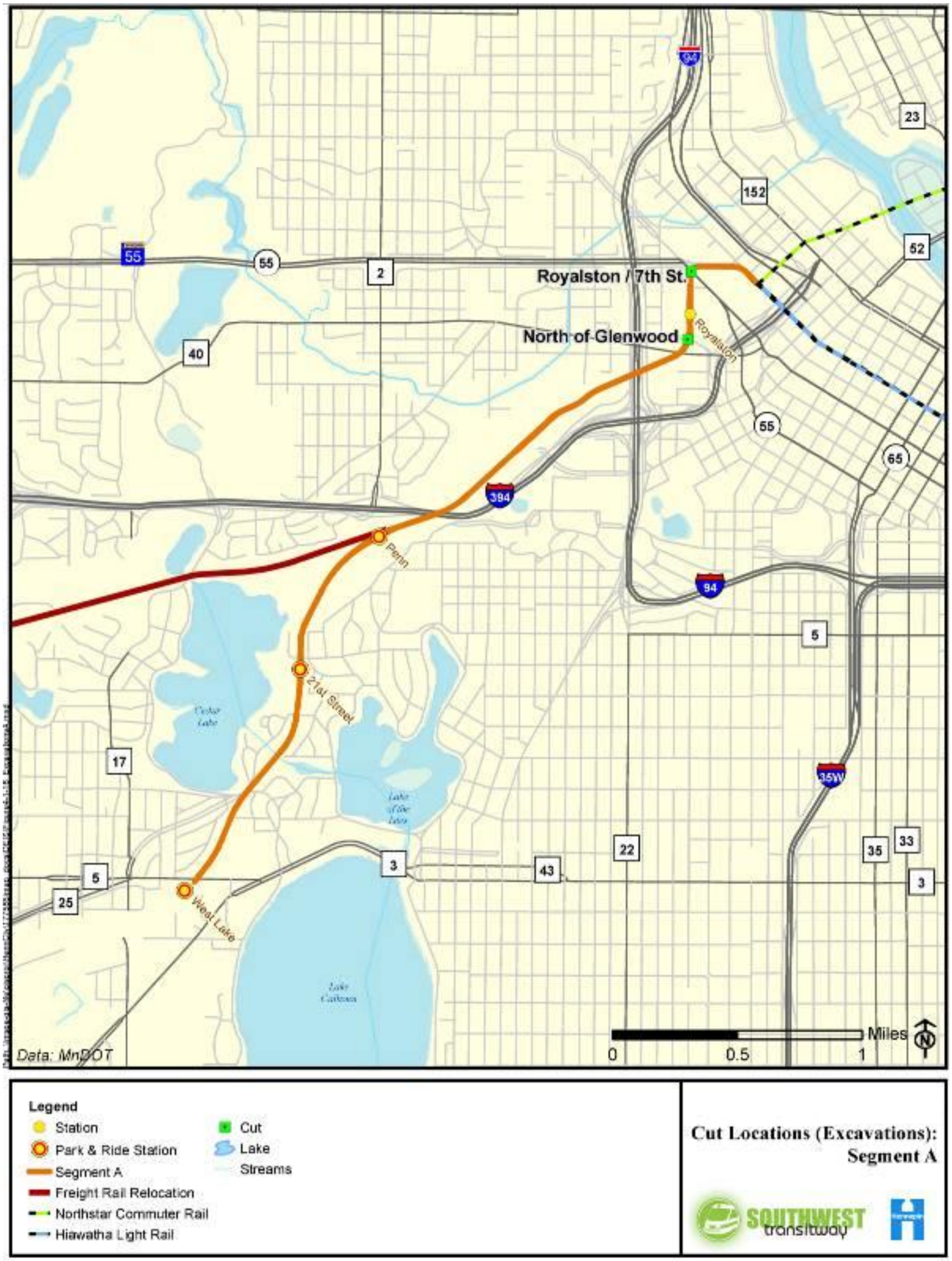


Figure 4. Cut Locations (Excavations): Segments C-1 and C-2

Potential Impacts from Cuts

The Build Alternatives may have long-term impacts on groundwater if a permanent water removal system (dewatering) is required. Permanent water removal is anticipated where the cut extends below the water table. There is a probable need for permanent water removal at one cut on both Segment 1 and Segment 3, and possible needs on Segment A and at a second cut along Segment 3, because of shallow groundwater. The status of each cut is summarized in Table 2 below.

A permanent water removal system has the potential to lower the water level in nearby wells and adjacent surface water features. Residents in the area are connected to municipal water systems for drinking water, so drawdown from a permanent water removal system would be limited to non-domestic wells (e.g., municipal, monitoring), and surface water features. The CWI was used to identify wells near cuts No. 1, 2, and 4, where probable or possible permanent water removal systems have been indicated. The nearest well to any cut is more than 800 feet away, and no effects on wells are expected at that distance. If permanent water removal systems are required at cuts No. 1 or 2, the nearby wetlands could be affected if water was diverted into or away from the wetland, but design and construction-engineering options would be considered to minimize impacts. The magnitude of the impact to adjacent surface water features could be estimated through pumping tests or groundwater modeling. Note that no significant cuts are proposed along the Freight Rail Relocation Segment.

"Shoring" is bracing used to temporarily prevent an excavation, such as a tunnel, trench, or ditch, from caving in.

Table 2. Permanent Water Removal Systems at Cuts

Cut Number	Segment	Cut Name	Permanent Water Removal System
1	1	TC&W Rail Crossing	Probable
2	3	Prairie Center Drive/TH 5	Possible
3	3	Nine Mile Creek-S. Fork	Unlikely
4	3	Flying Cloud Drive/ Shady Oak Road	Probable
5	A	North of Glenwood	Unlikely
6	A	Royalston Avenue/7th Street	Possible
7	C	Tunnel North, Mid, South	Unlikely

Short-term impacts to soil resources are limited to those construction activities that would disturb unpaved or permeable surfaces; however, development has already disturbed many of the soil resources in the study area. Table 3 summarizes the anticipated side slopes for the major excavations or cuts, which will affect the amount of soil that is disturbed. Excavations in sandy soils may require a 1.5:1 side slope, which will result in the removal of more soil compared to clayey soils, which may allow for a steeper (e.g., 1:1) side slope. If the total depth of the excavation or cut is greater than 20 feet, federal Occupational Safety and Health Agency (OSHA) guidance indicates that a site-specific excavation plan is warranted. The need for excavation **shoring** is also shown in Table 3. If the limits of the work area prohibit excavation of proper side slopes, shoring would be necessary. Thus, shoring has the effect of reducing the amount of soil disturbance. Note that no significant cuts are proposed along the Freight Rail Relocation Segment.

Table 3. Excavation Summary

Cut Number	Segment	Cut Name	Excavation Side Slopes	Excavation Depth (ft) [a]	Need for Shoring
1	1	TC&W Rail Crossing	1:1	21	Yes
2	3	Prairie Center Drive/TH 5	1:1	26	Yes
3	3	Nine Mile Creek-S. Fork	1.5:1	19	No
4	3	Flying Cloud Drive/ Shady Oak Road	1.5:1	26	Yes
5	A	North of Glenwood	1.5:1	19	No
6	A	Royalston Avenue/7th Street	1.5:1	24	Yes
7	C	Tunnel North, Mid, South	1.5:1	24-27	Yes

[a] Site-specific excavation engineering, including benching or shoring, is required for excavations greater than 20 feet deep. Shored excavations have been assumed necessary for underpasses and where the width of excavations may be limited.

Public Utilities Information

Appendix H – Public Utilities Data

Table 1. Existing Public Utility Inventory

Utility Description	Location	Owner
Water (8" - 24")	Underground	City of Eden Prairie
Sanitary Sewer (8" - 60")	Underground	City of Eden Prairie
Storm Sewer (15" - 48")	Underground	City of Eden Prairie
Water (6" - 16")	Underground	City of Hopkins
Sanitary Sewer (8" - 24")	Underground	City of Hopkins
Storm Sewer (30" - 66")	Underground	City of Hopkins
Water (6" - 36")	Underground	City of Minneapolis
Sanitary Sewer (8" - 90")	Underground	City of Minneapolis
Storm Sewer (9" - 11', Lift Station)	Underground	City of Minneapolis
Water (6" - 24")	Underground	City of Minnetonka
Sanitary Sewer (8" - 54")	Underground	City of Minnetonka
Storm Sewer (15" - 48")	Underground	City of Minnetonka
Water (8" - 12")	Underground	City of St. Louis Park
Sanitary Sewer (12" - 36")	Underground	City of St. Louis Park
Storm Sewer (72")	Underground	City of St. Louis Park

Table 2. Existing Private Utility Inventory

Utility Description	Location	Owner
City Of Eden Prairie		
Gas	Underground	Center Point Energy
Communications	Underground	Comcast
Communications	Underground	MCI (Verizon)
Communications	Underground	Mcleod USA (Now Paetec)
Communications	Underground	Sprint/Long Distance
Electric	Underground & Overhead	Xcel Energy
City Of Minnetonka		
Communications	Underground	Comcast
Communications	Underground	MCI (Verizon)
Communications	Underground	Mcleod USA (Now Paetec)
Communications	Underground	Sprint/Long Distance
City Of Hopkins		
Gas	Underground	Center Point Energy
Communications	Underground	Comcast
Communications	Underground	MCI (Verizon)
Communications	Underground	Mcleod USA (Now Paetec)
Communications	Underground	Sprint/Long Distance
Electric	Underground & Overhead	Xcel Energy
City Of St. Louis Park		
Communications	Underground	A T & T/Transmission
Gas	Underground	Center Point Energy
Communications	Underground	Comcast
Communications	Underground	Level 3 Communications
Communications	Underground	MCI (Verizon)
Communications	Underground	Mcleod USA (Now Paetec)
Communications	Underground	Sprint/Long Distance
Communications	Underground	St. Louis Park School District
Electric	Underground & Overhead	Xcel Energy
City of Minneapolis		
Communications	Underground	AT&T/Transmission
Communications	Underground	Callnet Technology Services
Communications	Underground	Comcast
Communications	Underground	Hennepin County IT Operations
Communications	Underground	CenturyTel Solutions
Communications	Underground	MCI
Gas	Underground	Center Point Energy

Utility Description	Location	Owner
Communications	Underground	Qwest Communications
Communications	Underground	Sterling Technologies
Communications	Underground	Time Warner Telecom
Communications	Underground	Sprint/Long Distance
Communications	Underground	Level 3 Communications
Electric	Underground & Overhead	Xcel Energy
Communications	Underground	Xo Communications Inc

Freight Rail Relocation Utilities

Along the Freight Rail Relocation Segment, the following utilities were identified:

Metropolitan Council Force Main: A 24-inch diameter Metropolitan Council force main exists within the frontage road near where the railroad tracks cross Highway 7.

Fiber optic utility: Fiber Optic Utility (FOU) cable markers were observed along the Cedar Lake LRT Trail north of the Bass Lake Spur tracks; along the east side of the MN&S Spur between Highway 7 and the Iron Triangle Wye Leg; along the east side of the Iron Triangle Wye Leg to the BNSF Wayzata Subdivision; and along the north and south side of the BNSF Wayzata Subdivision, east of the MN&S Spur.

Electrical transmission towers:

There are several steel towers along the west side of MN&S Spur in the Skunk Hollow area. These towers are illustrated in the concept level track plans in Appendix F of the MN&S Freight Rail study—Environmental Assessment Worksheet (May 2011).

Steel towers and/or tubular steel columns also exist in the following locations near the alignment:

- Along the west side of MN&S, between TH 7 and Walker Street
- Between Walker Street and West 27th Street, along the west side of MN&S Spur
- Three tubular steel columns and one steel tower between 27th Street and BNSF Wayzata sub, all on the east side of MN&S
- In place poles along the south side of BNSF Wayzata Subdivision and south of the current North Cedar Lake Trail.

Municipal utilities:

Municipal utilities, including water main, sanitary sewer, and storm sewer may be impacted as a result of the proposed track alignment, and closure of grade crossing at West 29th Street.

Storm sewer may need to be addressed in conjunction with the proposed construction of an overpass of the North Cedar Lake Trail in the Iron Triangle area.

Noise – Additional data

Appendix H – Noise Additional Data

Human Perception Levels

"Sound" is a physical disturbance in a medium that is capable of being detected by the human ear.

Sound travels through the air as waves of tiny air pressure fluctuations caused by vibration. In general, sound waves travel away from the noise source as an expanding spherical surface. As a result, the energy contained in a sound wave is spread over an increasing area as it travels away from the source, resulting in a decrease in loudness at greater distances from the noise source. Noise is typically defined as unwanted or undesirable sound.

"Decibel" (dB) is a common measurement of sound intensity, or pressure, with the minimum change perceptible to the human ear being roughly equivalent to 1 decibel.

"Logarithmic scale" is a tool to compare sound intensity. It requires about a tenfold increase in power for a sound to register twice as loud to **the** human ear.

The intensity or loudness of a sound is determined by how much the sound pressure fluctuates above and below the atmospheric pressure and is expressed in units of **decibels**. The decibel (dB) scale used to describe sound is a **logarithmic scale** that accounts for the large range of sound pressure levels in the environment. By using this scale, the range of normally encountered sound can be expressed by values between 0 and about 140 dB. The logarithmic nature of dB scales is such that individual dB levels for different noise sources cannot be added directly to give the noise level for the combined noise source. For example, two noise sources that produce equal dB levels at a given location will produce a combined noise level that is 3 dBA greater than either sound alone. When two noise sources differ by 10 dBA, the combined noise level will be 0.4 dBA greater than the louder source alone.

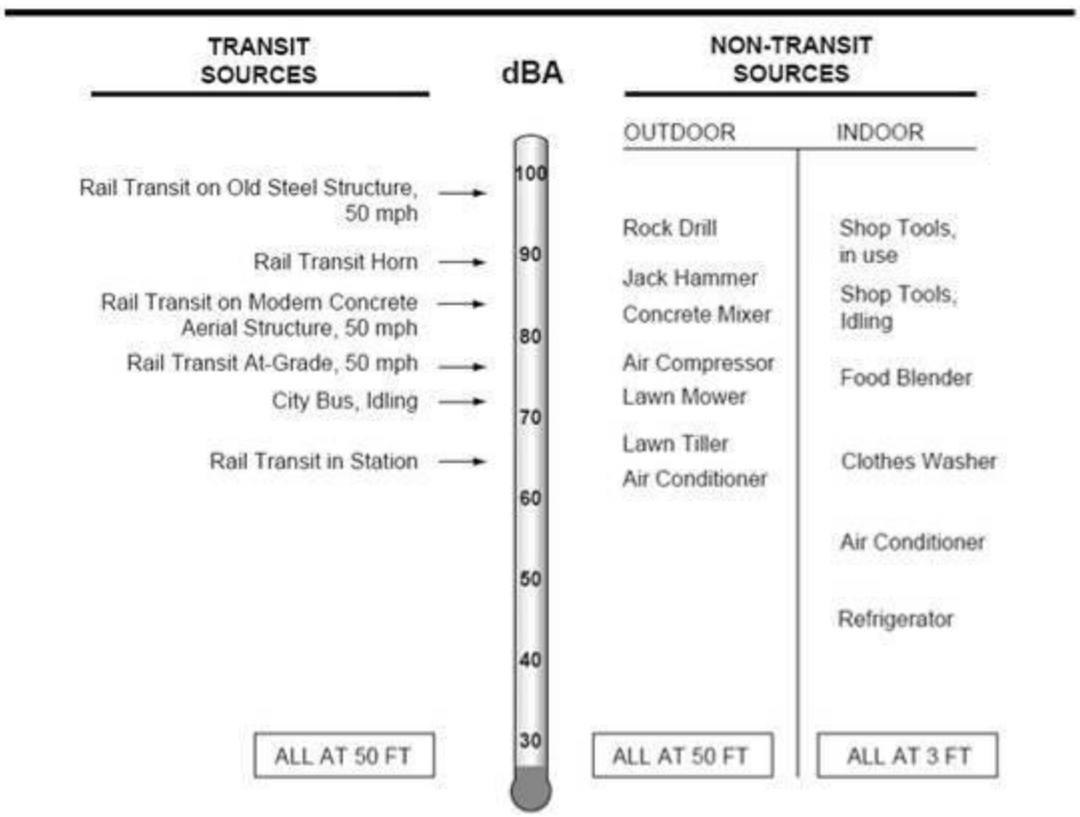
Although adding two sound sources of equal pressure is noticeable, it does not result in double the total sound pressure level. For example, adding 50 dB + 50 dB would result in a total level of 53 dB. Adding 45 dB+55 dB, however, would result in a total level of 55 dB. Because the pressure caused by the 55 dB source is higher, the 45 dB source would not increase the pressure level—that is, it would not be heard.

People generally perceive a 10 dBA increase in a noise level as a doubling of loudness. For example, a 70 dBA sound will be perceived by an average person as twice as loud as a 60 dBA sound. People generally cannot detect differences of 1 dBA to 2 dBA. Differences of 3 dBA can be detected by most people with average hearing abilities. A 5 dBA change would likely be perceived by most people under normal listening conditions.

"A-weighting" (dBA) scale is a standardized filter used to alter the sensitivity of a sound level meter with respect to frequency so that the instrument is less sensitive at low and high frequencies where the human ear is less sensitive.

Sound-level meters can measure the actual pressure fluctuations caused by sound waves and record separate measurements for different frequency ranges. Most sounds consist of a broad range of sound frequencies, from low to high. The average human ear does not perceive all frequencies equally. Therefore, the **A-weighting scale** (dBA) was developed to approximate the way the human ear responds to sound levels; it mathematically applies less "weight" to frequencies we don't hear well, and applies more "weight" to frequencies we do hear well. Typical A-weighted noise levels for various types of sound sources are summarized in Figure 1.

Figure 1. Typical A-Weighted Sound Levels



Source: FTA, "Transit Noise and Vibration Impact Assessment" (May 2006)

When distance is the only factor considered, sound levels from isolated point sources of noise typically decrease by about 6 dBA for every doubling of distance from the noise source. When the noise source is a continuous line (for example, vehicle traffic on a highway) noise levels decrease by about 3 dBA for every doubling of distance away from the source.

"Equivalent Level" (Leq) is the level of a steady sound which, in a stated time period and at a stated location, has the same sound energy as the time-varying sound.

"Descriptor" is a quantitative metric used to identify a specific measure of sound level.

Noise levels at different distances can also be affected by factors other than the distance from the noise source. Topographic features and structural barriers that absorb, reflect, or scatter sound waves can increase or decrease noise levels. Atmospheric conditions (wind speed and direction, humidity levels, and temperatures) can also affect the degree to which sound is attenuated over distance.

Reflections off topographical features or buildings can sometimes result in higher noise levels (lower sound attenuation rates) than would normally be expected. Temperature inversions and wind conditions can also diffract and focus a sound wave to a location at considerable distance from the noise source. As a result of these factors, the existing noise environment can be highly variable depending on local conditions.

The **equivalent sound level** (Leq) is often used to describe sound levels that vary over time, usually a one-hour period. The Leq is considered an energy-based average noise level. Using twenty-four consecutive 1-hour Leq values it is possible to calculate daily cumulative noise exposure. The **descriptor** used to express daily cumulative noise exposure is the **Day-Night Sound Level** (Ldn). The Ldn includes a 10-dBA penalty imposed on noise that occurs during the nighttime hours (between 10 p.m. and 7a.m.) where sleep interference might be an issue. The 10-dBA penalty makes the Ldn useful when assessing noise in communities. The Sound Exposure Level (SEL) combines the equivalent sound level with the duration of an event to determine the total amount of noise exposure.

"Day-Night Sound Level" (Ldn) is the sound exposure level for a 24-hour day calculated by adding the sound exposure level obtained during the daytime (7 a.m. to 10 p.m.) to 10 times the sound exposure level obtained during the nighttime (10 p.m. to 7 a.m.). This unit is used throughout the U.S. for environmental impact assessment. Also written as DNL.

Evaluation Criteria

The FTA has established procedures and guidelines for assessing noise impacts. The noise descriptors most often used for transit noise evaluations are the dBA, the Leq and the Ldn. The FTA impact criteria are used to estimate existing noise levels and future noise impacts from transit operations.

The Ldn descriptor is used to assess transit-related noise for residential areas and land uses where overnight sleep occurs. The Leq descriptor is used to assess transit-related noise at other noise-sensitive land uses.

The land use classifications applicable to transit projects are shown in Table 1.

Table 1. Land-Use Categories and Metrics for Transit Noise Impact Criteria

Land-Use Category	Noise Descriptor, dBA	Description of Land-Use Category
1	Outdoor Leq(h)[a]	Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as national historic landmarks with significant outdoor use. Also included are recording studios and concert halls.
2	Outdoor Ldn	Residences and buildings where people normally sleep. This category includes homes, hospitals, and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor Leq(h)[a]	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, and churches where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds and recreational facilities can also be considered to be in this category. Certain historical sites and parks are also included.

Source: FTA, "Transit Noise and Vibration Impact Assessment" (May 2006)

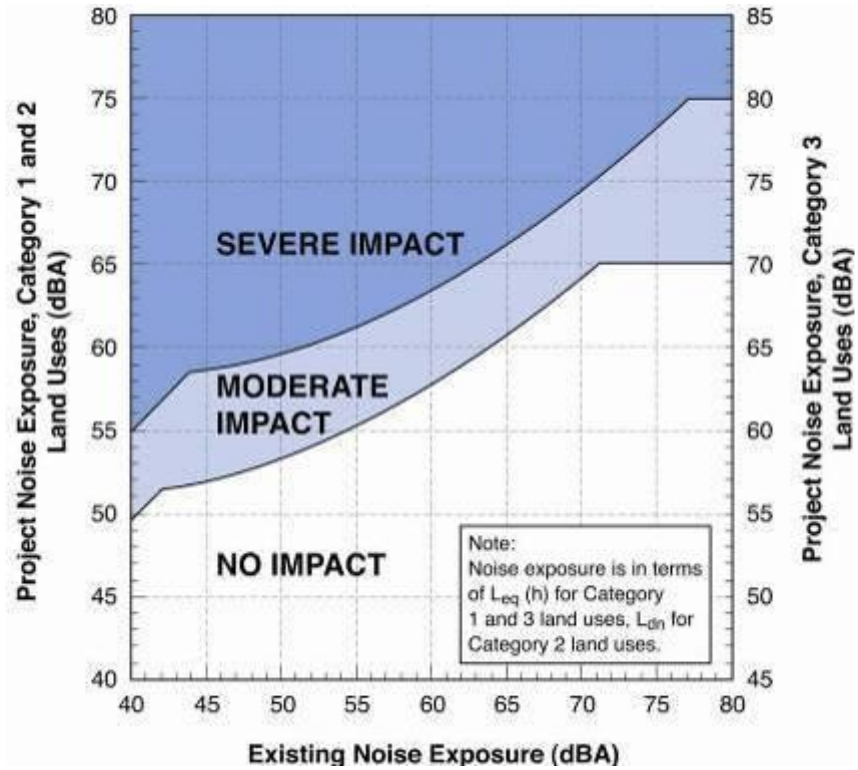
[a] Leq for the noisiest hour of transit-related activity during hours of noise sensitivity.

FTA noise impact thresholds vary depending on land use and existing noise exposure. Two types of noise impacts are included in the FTA criteria. The type of impact affects whether noise mitigation is implemented.

- **Severe Impact.** A significant percentage of people are highly annoyed by noise in this range. Noise mitigation would normally be specified for severe impact areas unless it is not feasible or reasonable (unless there is no practical method of mitigating the impact).
- **Moderate Impact.** In this range, other project-specific factors are considered to determine the magnitude of the impact and the need for mitigation. Other factors include the predicted increase over existing noise levels, the types and number of noise-sensitive land uses affected, existing outdoor-indoor sound insulation, and the cost-effectiveness of mitigating noise to more acceptable levels.

The FTA noise impact criteria are shown in Figure 2 below. The figure illustrates existing noise exposure and project-related noise exposure, and demonstrates that FTA noise impact thresholds vary with existing noise levels.

Figure 2. FTA Noise Impact Criteria



Source: FTA, "Transit Noise and Vibration Impact Assessment" (May 2006)

Table 2. Summary of Ambient Noise Measurements

Site No.	Meas. Time (hrs)	Noise Exposure (dBA)	
		Leq	Ldn
Segment 1 (LRT 1A) - Highway 5 Station to Shady Oak Station			
2	24	48[a]	51
3	24	57[a]	57
4	24	60[a]	63
22	24	59[a]	52
23	24	62[a]	64
24	24	54[a]	55
Segment 3 (LRT 3A, LRT 3C-1, and LRT 3C-2) - Mitchell Station to Shady Oak Station			
6	24	62[a]	63
7[a]	1	60	56[b]
7[b]	1	55	56[b]
25	24	59[a]	61
26	24	64[a]	65
27	24	62[a]	62
Segment 4 (LRT 1A, LRT 3A, LRT 3C-1, and LRT 3C-2) - Shady Oak Station to West Lake Station			
9	24	62[a]	63
10[a]	1	61	63[b]
10[b]	1	67	63[b]
11[a]		56	54[b]
11[b]		56	54[b]
28	24	61[a]	64
29	24	63[a]	61
Segment A (LRT 1A and LRT 3A) - West Lake Station to Intermodal Station			
14[a]	1	63	58[b]
14[b]	1	44	58[b]
15[a]	1	55	52[b]
15[b]	1	53	52[b]
20[a]	1	65	62[b]
20[b]	1	62	62[b]
30	24	54[a]	55
31	24	59[a]	60
33	24	56[a]	63

Site No.	Meas. Time (hrs)	Noise Exposure (dBA)	
		Leq	Ldn
Segment C (LRT 3C-1 and LRT 3C-2) - West Lake Station to 4th Street Station			
17[a]	1	69	68[b]
17[b]	1	71	68[b]
18[a]	1	65	65[b]
18[b]	1	68	65[b]
21[a]	1	59	58
21[b]	1	61	58
34	24	58[a]	58
35	24	64[a]	59

Notes: A site number with an "a" and "b" designation represents two separate measurements on two occasions, refer to Appendix H for details and for a complete summary of the measurement location descriptions, the date of the measurement and the start and end time for each measurement.

[a] The Leq for these long-term (24-hour) measurement sites was the average of two hourly Leq intervals – one from the morning peak traffic hours and one from the evening peak traffic hours.

[b] The Ldn for these sites was estimated using methods described in the FTA Noise and Vibration Assessment Manual.

Short-Term Construction Noise

The MPCA has established noise standards to regulate environmental noise using L10 and L50 descriptors that represent noise levels exceeded 10 percent and 50 percent of the time (for one hour measured). The L10 and the L50 sound level descriptors are arrived at through statistical analysis of a measurement period. MPCA standards are based upon an hour-long period. The L10 is defined as the sound level which is exceeded for 10 percent of the hour, and the L50 is the sound level exceeded for 50 percent of the hour. By definition, the L50 is also the median sound level through the hour-long period.

Additionally, MPCA regulates noise during daytime (7:00 a.m. to 10:00 p.m.) and also during nighttime (10:00 p.m. to 7:00 a.m.) using different limits for each time period. MPCA noise standards establish different maximum allowable noise levels for three different categories of land use or **Noise Area Classification** (NAC), with residential lands included in NAC 1. Table 3 details the MPCA Noise Area Classification limits.

"Noise Area Classification" is based on the land use activity at the location of the receiver. It is similar to FTA land use categories in that it determines the noise standard for the land

Table 3. MPCA Noise Area Classification

Noise Area Classification (NAC)	Daytime		Nighttime	
	L_{10} (dBA)	L_{50} (dBA)	L_{10} (dBA)	L_{50} (dBA)
1	65	60	55	50
2	70	65	70	65
3	80	75	80	75

Source: "A Guide to Noise in Minnesota," MPCA, 2008

Although projects which create environmental noise are subject to MPCA standards, the MPCA typically does not regulate construction noise, which can be irregular in nature and of short term duration.

Other noise descriptors and impacts are based on FTA construction noise impact thresholds as provided within chapter 12 of the "Transit Noise and Vibration Impact Assessment" manual (FTA 2006).

The Hennepin County Regional Rail Authority (HCRRA) proposes to create a new light rail line, therefore construction activities will occur at different times and in different locations throughout the study area. Construction activities often generate noise and sometimes ground-borne vibration; however these emissions vary greatly depending upon the duration and complexity of the project.

It is unlikely that each piece of construction equipment would be used throughout the entire duration of a construction project. Rather, each phase of a construction project may require use of certain pieces of equipment, and some equipment may be unique to that phase. Therefore, each phase of any construction project could have unique noise characteristics.

Construction noise effects related to the Southwest Transitway would be temporary and localized around the track and proposed stations. In the FTA guidance manual "Transit Noise and Vibration Impact Assessment," Chapter 12; "Noise and Vibration during Construction," the FTA provides guidance for assessing land uses and defines these as illustrated within Table 4.

Table 4. FTA Land Use Guidelines

Land Use	8-hour L_{eq} (dBA)	
	Day	Night
Residential	80	70
Commercial	85	85
Industrial	90	90

Source: "Transit Noise and Vibration Impact Assessment, FTA, May 2006

The majority of land uses adjacent to the Southwest Transitway are residential and include single family homes, condominiums, and apartments. Other noise- and vibration-sensitive receptors along the project corridor that may be affected by construction noise and vibration would be theaters, houses of worship, recording studios, and concert halls.

Ambient Noise Table (2012 Update)

Ambient Noise Table (2012 version)

Site No.	Measurement Location Description	Start of Measurement		Meas. Time (hrs)	Noise Exposure (dBA)	
		Date	Time		Leq	Ldn
Segment 1 (LRT 1A) - Highway 5 Station to Shady Oak Station						
2	Glen Lake Children's Camp: This site is at a summer camp adjoining Birch Island Park in Eden Prairie. Vegetation rustling, wildlife noise, and some human activity in the area are the dominant noise sources. This location is representative of noise-sensitive outdoor recreation land use along Segment 1, West of I-494.	3/18/2010	09:17	24	48[a]	51
3	Sonica Recording Studio: 6520 Edenvale Blvd: This site is at a recording studio in Eden Prairie. Light traffic on Evendale Boulevard is the dominant noise source. This location is representative of category 1 and 3 land use near the Edenvale grade-crossing.	3/18/2010	09:06	24	57[a]	57
4	Old Apostolic Church: 5617 Rowland Road: This site is at a church in Minnetonka. Distant traffic noise from I-494 is the dominant noise source. This location is representative of category 3 land use along near I-494 and Segment 1.	3/17/2010	08:53	24	60[a]	63
22	6799 Harlan Dr: This site is at a single-family residence in Eden Prairie. Residential traffic is the dominant noise source but is infrequent. This location is representative of noise-sensitive residential land use along Segment 1, West of I-494.	3/2/2010	13:10	24	59[a]	52
23	Empty Lot near 5424-5598 North St: This site is at an empty lot in a Minnetonka residential neighborhood. Traffic noise on I-494 is the dominant noise source. This location is representative of noise-sensitive land use near I-494 at Segment 1	3/3/2010	15:07	24	62[a]	64

Site No.	Measurement Location Description	Start of Measurement		Meas. Time (hrs)	Noise Exposure (dBA)	
		Date	Time		Leq	Ldn
24	Dominick Drive at the Segment 1 alignment location: This site is at Shady Oak Lake in Minnetonka. The dominant noise source was residential traffic but was observed to be infrequent. This location is representative of noise-sensitive land use in the area surrounding Shady Oak Lake.	3/3/2010	15:24	24	54[(a)]	55
Segment 3 (LRT 3A, LRT 3C-1, and LRT 3C-2) - Mitchell Station to Shady Oak Station						
6	St. Andrew Lutheran Church: 13600 Technology Drive: This site is at a church in Eden Prairie. Traffic noise from US-212 is the dominant noise source. This location is representative of noise-sensitive land use near US-212 and west of I-494.	3/18/2010	09:33	24	62[(a)]	63
7	Shady Oak Road and Flying Cloud Drive: This site is near a studio in Eden Prairie. Traffic noise from US-212 and Shady Oak Road are the dominant noise sources. This location is representative of Category 1 and 3 land uses near US-212 and MN-62.	3/31/2010	07:43	1	60	56[(b])]
		4/1/2010	17:45	1	55	
25	Homestead Hotel: 11905 Technology Drive: This site is at a hotel with nighttime sensitivity to noise in Eden Prairie. Traffic noise on the interchange of I-494 and US-212 is the dominant noise source. This location is representative of noise-sensitive land use near the interchange.	3/8/2010	10:07	24	59[(a)]	61
26	Nine Mile Creek Apartment Building: 7475 Flying Cloud Drive: This site is at a multi-family residence in Eden Prairie. Traffic on US-212 and on Flying Cloud Drive is the dominant noise sources. This location is representative of Category 2 land uses near US-212 and MN-62.	3/2/2010	14:05	24	64[(a)]	65
27	Smetana Road and Nolan Drive: This site is at a single-family residence. Traffic noise on Smetana Road is the dominant noise source. This location is representative of noise-sensitive land use near Smetana Road.	3/4/2010	10:15	24	62[(a])]	62

Site No.	Measurement Location Description	Start of Measurement		Meas. Time (hrs)	Noise Exposure (dBA)	
		Date	Time		Leq	Ldn
Segment 4 (LRT 1A, LRT 3A, LRT 3C-1, and LRT 3C-2) - Shady Oak Station to West Lake Station						
9	Monroe Ave and 2nd Street North: This site is at a multi-family residence in Hopkins. Traffic noise on I-169 and local traffic noise are the dominant noise sources. This location is representative of noise-sensitive land between US-169 and Louisiana Avenue but not near Excelsior Boulevard.	3/17/2010	08:37	24	62[(a)]	63
10	Park Spanish Immersion Elementary School: 6300 Walker Street: This site is at an elementary school in St. Louis Park. Traffic noise on State Highway 7 is the dominant noise source. The noise of one CT&W train pass-by events was removed from the measurement data. This location is representative of noise-sensitive land use near State Highway 7 and along segment 4.	3/31/2010	09:05	1	61	63[(b)]
		4/1/2010	16:27	1	67[(c)]	
11	Minikahda Golf Course: This site is just outside a golf course in Minneapolis. Airplane noise and local traffic noise are the dominant noise sources. This location is representative of noise-sensitive land uses near Segment 4 between Lake Street and MN-100, but not near a highway or major thoroughfare.	3/30/2010	15:22	1	56	54[(b)]
		4/1/2010	08:12	1	56	
28	6th Avenue and Excelsior Boulevard: This site is at a multi-family residence in Hopkins. Traffic noise on Excelsior Boulevard is the dominant noise source. A nearby commercial building also contributed towards the daytime noise level. This location is representative of noise-sensitive land use along Excelsior Boulevard between Blake Road and Shady Oak Road.	3/4/2010	15:45	24	61[(a)]	64

Site No.	Measurement Location Description	Start of Measurement		Meas. Time (hrs)	Noise Exposure (dBA)	
		Date	Time		Leq	Ldn
29	Brunswick Avenue South near West 37th Street: This site is at the Union Congregational Church in St. Louis Park. Local traffic noise and airplane noise are the dominant noise sources. The noise of several CT&W train pass-by events was removed from the measurement data. This location is representative of noise-sensitive land use near segment 4 but not near a large-volume road.	3/31/2010	19:00	24	63[a,c]	61[c]
Segment A (LRT 1A and LRT 3A) - West Lake Station to Intermodal Station						
14	Cedar Lake portion of the Minneapolis Chain of Lakes Regional Park, northeast of Cedar Lake: This site is on a walking path within the Park. Vegetation rustling, wildlife noise, and airplane noise are the dominant sources. The noise of one CT&W train pass-by event was removed from the measurement data. This location only represents the Cedar Lake portion of the regional park.	3/26/2010	15:52	1	63[c]	58[b]
		3/29/2010	15:50	1	44	
15	Kenwood Park: This site is at a park surrounded by residential neighborhoods. Airplane noise and local traffic noise are the dominant noise sources. The noise of one CT&W train pass-by event was removed from the measurement data. This location is representative of park land uses within the Kenwood Neighborhood.	3/26/2010	15:57	1	55	52[b]
		3/29/2010	15:30	1	53	
20	350 7th Avenue North: This site is at a multi-family residence. Local street traffic, nearby interstate traffic and the nearby incinerator are the dominant noise sources. This location is representative of noise-sensitive land use in the warehouse district.	3/30/2010	07:12	1	65	62[b]
		4/1/2010	17:03	1	62	

Site No.	Measurement Location Description	Start of Measurement		Meas. Time (hrs)	Noise Exposure (dBA)	
		Date	Time		Leq	Ldn
30	Kenilworth Place and South Upton Avenue: This site is at a single-family residence next to Lake of the Isles Park in Minneapolis. Airplane noise and local street traffic are the dominant noise sources. The noise of several CT&W train pass-by events was removed from the measurement data. This location is representative of noise-sensitive land use in the Kenwood Neighborhood, away from major thoroughfares.	3/29/2010	16:00	24	54[a,c]	55[c]
31	3427 St. Louis Avenue: This site is at multi-family residences in Minneapolis. Natural sounds and recreational activities are the dominant noise sources, with lesser noise contributions from Lake Street traffic. This location is representative of noise-sensitive land use at the south end of the Kenwood Neighborhood, within earshot of Lake Street.	4/7/2010	23:00	24	59[a,c]	60[c]
33	699 Oliver Ave S: This site is at Bryn Mawr Park, just in front of several single-family residences. Airplane noise, local traffic noise, and recreational activities are the dominant noise sources. This location is representative of noise-sensitive residential land use between Bryn Mawr Park and Penn Ave S.	3/30/2010	19:00	24	56[a]	63
Segment C (LRT 3C-1 and LRT 3C-2) - West Lake Station to 4th Street Station						
17	Jungle Theater: 2951 Lyndale Ave S: This site is at a regional dramatic theater in Minneapolis. Traffic noise on Lyndale Avenue is the dominant noise sources. This location is representative of noise-sensitive land use along lake street and nearby side streets.	3/29/2010	15:48	1	69	68[b]
		4/1/2010	15:41	1	71	
18	Orchestra Hall: 1111 Nicollet Mall: This site is at a concert hall in downtown Minneapolis. Local traffic noise is the dominant noise source. This location is representative of noise-sensitive land use along Nicollet Mall and in Downtown Minneapolis	3/31/2010	08:04	1	65	65[b]
		4/1/2010	15:29	1	68	

Site No.	Measurement Location Description	Start of Measurement		Meas. Time (hrs)	Noise Exposure (dBA)	
		Date	Time		Leq	Ldn
21	2617 1st Ave South: This site is at a single-family residence in Minneapolis. Traffic noise on Nicollet Avenue and I-94 are the dominant noise sources. This location is representative of noise-sensitive land use along the alignment, north of the tunnel.	3/29/2010	17:00	1	59	58
		4/1/2010	16:53	1	61	
34	2809 Irving Ave S.: This site is at a single-family residence in Minneapolis. Moderate-volume residential traffic and activity are the dominant noise sources. This location is representative of noise-sensitive land use three blocks north of Lake Street and two blocks west of Hennepin Avenue.	3/15/2010	10:25	24	58[a]	58
35	Empty lot on 2800 block of Pillsbury Avenue, east side of the street: This site is at a single-family residence. Traffic noise on nearby streets is the dominant noise source, including heavy-volumes of vehicles and emergency vehicle sirens. This location is representative of noise-sensitive land use along in the area of the southern tunnel opening and the 28th Street Station.	3/15/2010	10:42	24	64[a]	59

(a) The Leq for these long-term (24-hour) measurement sites was the average of two hourly Leq intervals – one from the morning peak traffic hours and one from the evening peak traffic hours.

(b) The Ldn for these sites was estimated using methods described in the FTA Noise and Vibration Assessment Manual.

(c) Noise monitoring data included noise from existing freight train operations.

Ambient Noise Table (2010)

Ambient Noise Table (2010 version)

Site No.	Measurement Location Description	Start of Measurement		Meas. Time (hrs)	Noise Exposure (dBA)	
		Date	Time		Leq	Ldn
Segment 1 (LRT 1A) - Highway 5 Station to Shady Oak Station						
2	Glen Lake Children's Camp: This site is at a summer camp adjoining Birch Island Park in Eden Prairie. Vegetation rustling, wildlife noise, and some human activity in the area are the dominant noise sources. This location is representative of noise-sensitive outdoor recreation land use along Segment 1, West of I-494.	3/18/2010	09:17	24	48[a]	51
3	Sonica Recording Studio: 6520 Edenvale Blvd: This site is at a recording studio in Eden Prairie. Light traffic on Evendale Boulevard is the dominant noise source. This location is representative of category 1 and 3 land use near the Edenvale grade-crossing.	3/18/2010	09:06	24	57[a]	57
4	Old Apostolic Church: 5617 Rowland Road: This site is at a church in Minnetonka. Distant traffic noise from I-494 is the dominant noise source. This location is representative of category 3 land use along near I-494 and Segment 1.	3/17/2010	08:53	24	60[a]	63
22	6799 Harlan Dr: This site is at a single-family residence in Eden Prairie. Residential traffic is the dominant noise source but is infrequent. This location is representative of noise-sensitive residential land use along Segment 1, West of I-494.	3/2/2010	13:10	24	59[a]	52
23	Empty Lot near 5424-5598 North St: This site is at an empty lot in a Minnetonka residential neighborhood. Traffic noise on I-494 is the dominant noise source. This location is representative of noise-sensitive land use near I-494 at Segment 1	3/3/2010	15:07	24	62[a]	64

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Segment 3 (LRT 3A, LRT 3C-1, and LRT 3C-2) - Mitchell Station to Shady Oak Station						
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7	Shady Oak Road and Flying Cloud Drive: This site is near a studio in Eden Prairie. Traffic noise from US-212 and Shady Oak Road are the dominant noise sources. This location is representative of Category 1 and 3 land uses near US-212 and MN-62.	3/31/2010	07:43	1	60	56[(b)])
		4/1/2010	17:45	1	55	
25	Homestead Hotel: 11905 Technology Drive: This site is at a hotel with nighttime sensitivity to noise in Eden Prairie. Traffic noise on the interchange of I-494 and US-212 is the dominant noise source. This location is representative of noise-sensitive land use near the interchange.	3/8/2010	10:07	24	59[(a)]	61
26	Nine Mile Creek Apartment Building: 7475 Flying Cloud Drive: This site is at a multi-family residence in Eden Prairie. Traffic on US-212 and on Flying Cloud Drive is the dominant noise sources. This location is representative of Category 2 land uses near US-212 and MN-62.	3/2/2010	14:05	24	64[(a)]	65

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		4/1/2010	16:27	1	66	
11	Minikahda Golf Course: This site is just outside a golf course in Minneapolis. Airplane noise and local traffic noise are the dominant noise sources. This location is representative of noise-sensitive land uses near Segment 4 between Lake Street and MN-100, but not near a highway or major thoroughfare.	3/30/2010	15:22	1	56	54[b]
		4/1/2010	08:12	1	56	

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Segment A (LRT 1A and LRT 3A) - West Lake Station to Intermodal Station						
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		3/29/2010	15:50	1	44	
15	Kenwood Park: This site is at a park surrounded by residential neighborhoods. Airplane noise and local traffic noise are the dominant noise sources. The noise of one CT&W train pass-by event was removed from the measurement data. This location is representative of park land uses within the Kenwood Neighborhood.	3/26/2010	15:57	1	55	52[b]
		3/29/2010	15:30	1	53	

Site No.	Measurement Location Description	Start of Measurement		Meas. Time (hrs)	Noise Exposure (dBA)	
		Date	Time		Leq	Ldn
20	350 7th Avenue North: This site is at a multi-family residence. Local street traffic, nearby interstate traffic and the nearby incinerator are the dominant noise sources. This location is representative of noise-sensitive land use in the warehouse district.	3/30/2010	07:12	1	65	62[(b)]
		4/1/2010	17:03	1	62	
30	Kenilworth Place and South Upton Avenue: This site is at a single-family residence next to Lake of the Isles Park in Minneapolis. Airplane noise and local street traffic are the dominant noise sources. The noise of several CT&W train pass-by events was removed from the measurement data. This location is representative of noise-sensitive land use in the Kenwood Neighborhood, away from major thoroughfares.	3/29/2010	16:00	24	53[(a)]	54
31	3427 St. Louis Avenue: This site is at multi-family residences in Minneapolis. Natural sounds and recreational activities are the dominant noise sources, with lesser noise contributions from Lake Street traffic. This location is representative of noise-sensitive land use at the south end of the Kenwood Neighborhood, within earshot of Lake Street.	4/7/2010	23:00	24	53[(a)]	57
33	699 Oliver Ave S: This site is at Bryn Mawr Park, just in front of several single-family residences. Airplane noise, local traffic noise, and recreational activities are the dominant noise sources. This location is representative of noise-sensitive residential land use between Bryn Mawr Park and Penn Ave S.	3/30/2010	19:00	24	56[(a)]	63

Site No.	Measurement Location Description	Start of Measurement		Meas. Time (hrs)	Noise Exposure (dBA)	
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		4/1/2010	15:41	1	71	
18	Orchestra Hall: 1111 Nicollet Mall: This site is at a concert hall in downtown Minneapolis. Local traffic noise is the dominant noise source. This location is representative of noise-sensitive land use along Nicollet Mall and in Downtown Minneapolis	3/31/2010	08:04	1	65	65[b]
		4/1/2010	15:29	1	68	
21	2617 1st Ave South: This site is at a single-family residence in Minneapolis. Traffic noise on Nicollet Avenue and I-94 are the dominant noise sources. This location is representative of noise-sensitive land use along the alignment, north of the tunnel.	3/29/2010	17:00	1	59	58
		4/1/2010	16:53	1	61	
34	2809 Irving Ave S.: This site is at a single-family residence in Minneapolis. Moderate-volume residential traffic and activity are the dominant noise sources. This location is representative of noise-sensitive land use three blocks north of Lake Street and two blocks west of Hennepin Avenue.	3/15/2010	10:25	24	58[a]	58
35	Empty lot on 2800 block of Pillsbury Avenue, east side of the street: This site is at a single-family residence. Traffic noise on nearby streets is the dominant noise source, including heavy-volumes of vehicles and emergency vehicle sirens. This location is representative of noise-sensitive land use along in the area of the southern tunnel opening and the 28th Street Station.	3/15/2010	10:42	24	64[a]	59

Noise Assessment Table (2012 Update)

Noise Assessment Table

Alternatives with Freight-rail Traffic Relocation

Project:	Southwest Transit
Project #:	177565
Analyst:	GR/EBD
Date:	March 16, 2012

Representative Receptor/Cluster Identifier	Receptor Count		Land Use Category (1,2 or 3)	Side of Guideway (EB/WB)	Distance to Track (feet)	Train Speed (mph)	Noise Assessment Metric (Leq/Ldn)	Existing Noise Level (dBA)	Impact Criteria		Project Related Noise (dBA)	Cumulative Noise Level (dBA)	Increase Over Existing (dBA)	Impact Level	Number of Impacted Receptors	
	Land (qty)	Unit (qty)							Moderate (dBA)	Severe (dBA)					Moderate (land [units])	Severe (land [units])
1-A-EB-1-1	1	1	1	EB	584	50	Leq	57	56	62	55	59	2	None	-	-
1-A-EB-2-11	16	16	2	EB	650	50	Ldn	52	54	60	60	61	9	Moderate	16 [16]	-
1-A-EB-2-12	6	6	2	EB	174	50	Ldn	52	54	60	69	69	17	Severe	-	6 [6]
1-A-EB-2-13	6	6	2	EB	276	50	Ldn	52	54	60	63	63	11	Severe	-	6 [6]
1-A-EB-2-14	8	8	2	EB	623	50	Ldn	52	54	60	58	59	7	Moderate	8 [8]	-
1-A-EB-2-15	51	51	2	EB	105	50	Ldn	52	54	60	62	62	10	Severe	-	51 [51]
1-A-EB-2-16	38	38	2	EB	302	50	Ldn	52	54	60	53	56	4	None	-	-
1-A-EB-3-3	1	1	3	EB	194	50	Leq	48	58	64	55	56	8	None	-	-
1-A-EB-3-5	1	1	3	EB	141	50	Leq	57	61	67	68	68	11	Severe	-	1 [1]
1-A-WB-2-1	26	26	2	WB	581	50	Ldn	52	54	60	52	55	3	None	-	-
1-A-WB-2-10	18	18	2	WB	331	50	Ldn	52	54	60	62	62	10	Severe	-	18 [18]
1-A-WB-2-2	20	24	2	WB	115	50	Ldn	52	54	60	63	63	11	Severe	-	20 [24]
1-A-WB-2-3	10	10	2	WB	292	50	Ldn	52	54	60	56	57	5	Moderate	10 [10]	-
1-A-WB-2-4	22	22	2	WB	397	50	Ldn	52	54	60	56	57	5	Moderate	22 [22]	-
1-A-WB-2-5	47	49	2	WB	98	50	Ldn	52	54	60	62	62	10	Severe	-	47 [49]
1-A-WB-2-6	24	24	2	WB	230	50	Ldn	52	54	60	57	58	6	Moderate	24 [24]	-
1-A-WB-2-7	66	66	2	WB	394	50	Ldn	52	54	60	52	55	3	None	-	-
1-A-WB-2-8	22	22	2	WB	292	50	Ldn	52	54	60	56	57	5	Moderate	22 [22]	-
1-A-WB-3-1	1	1	3	WB	899	50	Leq	48	58	64	50	52	4	None	-	-
1-A-WB-3-2a	1	1	3	WB	105	50	Leq	57	61	67	58	61	4	None	-	-
1-A-WB-3-4	1	1	3	WB	663	50	Leq	48	58	64	46	50	2	None	-	-
1-B-EB-2-17	1	1	2	EB	85	50	Ldn	52	54	60	63	63	11	Severe	-	1 [1]
1-B-WB-2-18	6	6	2	WB	131	50	Ldn	64	60	66	71	72	8	Severe	-	6 [6]
1-B-WB-2-19	5	5	2	WB	141	50	Ldn	52	54	60	65	65	13	Severe	-	5 [5]
1-B-WB-2-20	15	15	2	WB	256	50	Ldn	52	54	60	63	63	11	Severe	-	15 [15]
1-B-WB-2-21	12	12	2	WB	276	50	Ldn	64	60	66	64	67	3	Moderate	12 [12]	-
1-B-WB-2-22	2	2	2	WB	499	50	Ldn	64	60	66	64	67	3	Moderate	2 [2]	-
1-B-WB-2-23	10	10	2	WB	571	50	Ldn	64	60	66	59	65	1	None	-	-
1-B-WB-3-6	1	1	3	WB	669	50	Leq	60	63	68	53	61	1	None	-	-
1-C-EB-1-2	1	1	1	EB	446	40	Leq	62	59	64	52	62	0	None	-	-
1-C-EB-2-27	61	61	2	EB	121	40	Ldn	64	60	66	63	67	3	Moderate	61 [61]	-
1-C-EB-2-28	6	6	2	EB	794	40	Ldn	55	55	61	50	56	1	None	-	-
1-C-EB-2-29	49	49	2	EB	118	40	Ldn	55	55	61	59	60	5	Moderate	49 [49]	-
1-C-EB-2-30	3	3	2	EB	167	40	Ldn	55	55	61	61	62	7	Moderate	3 [3]	-
1-C-EB-2-31	4	4	2	EB	322	40	Ldn	55	55	61	56	59	4	Moderate	4 [4]	-

Noise Assessment Table

Alternatives with Freight-rail Traffic Relocation

Representative Receptor/Cluster Identifier	Receptor Count Land (qty)	Receptor Count Unit (qty)	Land Use Category (1,2 or 3)	Side of Guideway (EB/WB)	Distance to Track (feet)	Train Speed (mph)	Noise Assessment Metric (Leq/Ldn)	Existing Noise Level (dBA)	Impact Criteria Moderate (dBA)	Impact Criteria Severe (dBA)	Project Related Noise (dBA)	Cumulative Noise Level (dBA)	Increase Over Existing (dBA)	Impact Level	Number of Impacted Receptors Moderate (land [units])	Number of Impacted Receptors Severe (land [units])
1-C-EB-2-32	1	1	2	EB	663	40	Ldn	55	55	61	50	56	1	None	-	-
1-C-EB-2-38	6	6	2	EB	89	40	Ldn	55	55	61	60	61	6	Moderate	6 [6]	-
1-C-EB-2-39	8	8	2	EB	312	40	Ldn	55	55	61	51	56	1	None	-	-
1-C-EB-3-7	1	1	3	EB	1407	40	Leq	60	63	68	44	60	0	None	-	-
1-C-WB-2-24	13	13	2	WB	125	40	Ldn	64	60	66	62	66	2	Moderate	13 [13]	-
1-C-WB-2-25	17	17	2	WB	489	40	Ldn	64	60	66	53	64	0	None	-	-
1-C-WB-2-26	13	12	2	WB	443	40	Ldn	55	55	61	54	58	3	None	-	-
1-C-WB-2-33	10	10	2	WB	210	40	Ldn	55	55	61	60	61	6	Moderate	10 [10]	-
1-C-WB-2-34	6	6	2	WB	121	40	Ldn	55	55	61	60	61	6	Moderate	6 [6]	-
1-C-WB-2-35	26	26	2	WB	413	40	Ldn	55	55	61	53	57	2	None	-	-
1-C-WB-2-36	13	13	2	WB	115	40	Ldn	55	55	61	59	60	5	Moderate	13 [13]	-
1-C-WB-2-37	43	43	2	WB	305	40	Ldn	55	55	61	52	57	2	None	-	-
3-A-EB-2-1	1	91	2	EB	20	50	Ldn	63	60	65	71	72	9	Severe	-	1 [91]
3-A-EB-2-2	2	146	2	EB	125	50	Ldn	63	60	65	63	66	3	Moderate	2 [146]	-
3-A-EB-3-1	1	1	3	EB	154	50	Leq	62	64	69	58	63	1	None	-	-
3-A-WB-3-9	1	1	3	WB	1040	50	Leq	62	64	69	51	62	0	None	-	-
3-B-EB-1-1	1	1	1	EB	758	20	Leq	62	59	64	51	62	0	None	-	-
3-B-WB-3-2	1	1	3	WB	912	20	Leq	62	64	69	53	63	1	None	-	-
3-C-EB-2-3	4	4	2	EB	1293	30	Ldn	63	60	65	51	63	0	None	-	-
3-C-EB-2-4	2	2	2	EB	719	30	Ldn	61	58	64	54	62	1	None	-	-
3-C-EB-2-5	2	2	2	EB	702	30	Ldn	61	58	64	51	61	0	None	-	-
3-C-EB-2-6	2	2	2	EB	256	30	Ldn	61	58	64	57	62	1	None	-	-
3-C-EB-2-8	2	97	2	EB	653	30	Ldn	65	61	66	53	65	0	None	-	-
3-C-EB-3-3	1	1	3	EB	240	30	Leq	64	65	71	58	65	1	None	-	-
3-C-WB-2-23	4	4	2	WB	1112	30	Ldn	65	61	66	51	65	0	None	-	-
3-C-WB-2-7	2	2	2	WB	233	30	Ldn	61	58	64	58	63	2	None	-	-
3-D-EB-1-2	1	1	1	EB	213	30	Leq	58	57	62	55	60	2	None	-	-
3-D-EB-2-10	1	1	2	EB	627	30	Ldn	65	61	66	54	65	0	None	-	-
3-D-EB-2-9	1	1	2	EB	269	30	Ldn	65	61	66	56	66	1	None	-	-
3-D-WB-2-11	2	2	2	WB	791	30	Ldn	65	61	66	52	65	0	None	-	-
3-D-WB-3-4	1	1	3	WB	89	30	Leq	58	62	67	57	61	3	None	-	-
3-D-WB-3-5	1	1	3	WB	617	30	Leq	58	62	67	51	59	1	None	-	-
3-E-EB-3-6	1	1	3	EB	768	30	Leq	62	64	69	49	62	0	None	-	-
3-E-WB-2-12	1	1	2	WB	1237	30	Ldn	65	61	66	51	65	0	None	-	-
3-F-EB-2-13	3	99	2	EB	938	50	Ldn	62	59	64	55	63	1	None	-	-
3-F-EB-2-14	1	1	2	EB	187	50	Ldn	62	59	64	66	67	5	Severe	-	1 [1]
3-F-EB-2-15	1	1	2	EB	164	50	Ldn	62	59	64	71	72	10	Severe	-	1 [1]
3-F-EB-2-18	1	1	2	EB	230	50	Ldn	62	59	64	66	67	5	Severe	-	1 [1]
3-F-EB-2-19	3	3	2	EB	528	50	Ldn	62	59	64	63	66	4	Moderate	3 [3]	-
3-F-EB-3-8	1	1	3	EB	607	50	Leq	62	64	69	57	63	1	None	-	-

Noise Assessment Table

Alternatives with Freight-rail Traffic Relocation

Representative Receptor/Cluster Identifier	Receptor Count Land (qty)	Receptor Count Unit (qty)	Land Use Category (1,2 or 3)	Side of Guideway (EB/WB)	Distance to Track (feet)	Train Speed (mph)	Noise Assessment Metric (Leq/Ldn)	Existing Noise Level (dBA)	Impact Criteria Moderate (dBA)	Impact Criteria Severe (dBA)	Project Related Noise (dBA)	Cumulative Noise Level (dBA)	Increase Over Existing (dBA)	Impact Level	Number of Impacted Receptors Moderate (land [units])	Number of Impacted Receptors Severe (land [units])
3-F-WB-1-3	1	1	1	WB	125	50	Leq	62	59	64	61	65	3	Moderate	1 [1]	-
3-F-WB-2-16	1	1	2	WB	295	50	Ldn	62	59	64	63	66	4	Moderate	1 [1]	-
3-F-WB-2-17	1	1	2	WB	200	50	Ldn	62	59	64	70	71	9	Severe	-	1 [1]
3-F-WB-2-20	13	19	2	WB	344	50	Ldn	62	59	64	68	69	7	Severe	-	13 [19]
3-F-WB-2-21	33	33	2	WB	449	50	Ldn	62	59	64	64	66	4	Moderate	33 [33]	-
3-F-WB-2-22	7	13	2	WB	673	50	Ldn	62	59	64	62	65	3	Moderate	7 [13]	-
3-F-WB-3-7	1	1	3	WB	1056	50	Leq	62	64	69	52	62	0	None	-	-
4-A-WB-2-1	8	8	2	WB	692	40	Ldn	64	60	66	53	64	0	None	-	-
4-A-WB-3-1	1	1	3	WB	1010	40	Leq	61	63	69	48	61	0	None	-	-
4-B-EB-1-1	1	1	1	EB	112	50	Leq	62	59	64	59	64	2	None	-	-
4-B-EB-2-4	10	11	2	EB	233	50	Ldn	64	60	66	59	65	1	None	-	-
4-B-EB-2-5	24	24	2	EB	420	50	Ldn	64	60	66	54	64	0	None	-	-
4-B-EB-2-6	32	33	2	EB	617	50	Ldn	64	60	66	49	64	0	None	-	-
4-B-EB-3-2	4	4	3	EB	843	50	Leq	63	65	70	50	63	0	None	-	-
4-B-WB-2-11	36	36	2	WB	584	50	Ldn	63	60	65	54	64	1	None	-	-
4-B-WB-2-2	16	19	2	WB	292	50	Ldn	64	60	66	61	66	2	Moderate	16 [19]	-
4-B-WB-2-3	14	17	2	WB	427	50	Ldn	64	60	66	56	65	1	None	-	-
4-B-WB-3-3	1	1	3	WB	810	50	Leq	62	64	69	49	62	0	None	-	-
4-B-WB-3-4	1	1	3	WB	128	50	Leq	62	64	69	61	65	3	None	-	-
4-C-EB-2-7	1	1	2	EB	148	50	Ldn	64	60	66	63	67	3	Moderate	1 [1]	-
4-C-EB-2-8	1	1	2	EB	620	50	Ldn	64	60	66	54	64	0	None	-	-
4-C-WB-2-10	1	1	2	WB	686	50	Ldn	63	60	65	57	64	1	None	-	-
4-C-WB-2-12	35	35	2	WB	207	50	Ldn	63	60	65	57	64	1	None	-	-
4-C-WB-2-13	61	63	2	WB	384	50	Ldn	63	60	65	54	64	1	None	-	-
4-C-WB-2-14	41	41	2	WB	728	50	Ldn	63	60	65	51	63	0	None	-	-
4-C-WB-2-9	17	17	2	WB	551	50	Ldn	63	60	65	58	64	1	None	-	-
4-C-WB-3-5	2	2	3	WB	121	50	Leq	62	64	69	59	64	2	None	-	-
4-D-EB-2-15	2	62	2	EB	220	40	Ldn	61	58	64	61	64	3	Moderate	2 [62]	-
4-D-EB-2-16	3	96	2	EB	476	40	Ldn	61	58	64	55	62	1	None	-	-
4-D-EB-2-17	17	23	2	EB	600	40	Ldn	61	58	64	52	62	1	None	-	-
4-D-EB-2-18	19	25	2	EB	312	40	Ldn	61	58	64	58	63	2	None	-	-
4-D-EB-2-19	13	13	2	EB	180	40	Ldn	61	58	64	59	63	2	Moderate	13 [13]	-
4-D-EB-3-8	1	1	3	EB	486	40	Leq	63	65	70	52	63	0	None	-	-
4-D-WB-2-20	7	8	2	WB	558	40	Ldn	63	61	66	58	64	1	None	-	-
4-D-WB-3-6	1	1	3	WB	312	40	Leq	65	67	71	55	65	0	None	-	-
4-D-WB-3-7	1	1	3	WB	669	40	Leq	65	67	71	53	65	0	None	-	-
4-E-EB-2-24	2	2	2	EB	719	50	Ldn	61	58	64	52	62	1	None	-	-
4-E-WB-2-21	16	16	2	WB	551	50	Ldn	63	61	66	58	64	1	None	-	-
4-E-WB-2-22	14	14	2	WB	728	50	Ldn	63	61	66	52	63	0	None	-	-
4-E-WB-2-23	1	1	2	WB	144	50	Ldn	63	61	66	61	65	2	None	-	-

Noise Assessment Table

Alternatives with Freight-rail Traffic Relocation

Representative Receptor/Cluster Identifier	Receptor Count Land (qty)	Receptor Count Unit (qty)	Land Use Category (1,2 or 3)	Side of Guideway (EB/WB)	Distance to Track (feet)	Train Speed (mph)	Noise Assessment Metric (Leq/Ldn)	Existing Noise Level (dBA)	Impact Criteria Moderate (dBA)	Impact Criteria Severe (dBA)	Project Related Noise (dBA)	Cumulative Noise Level (dBA)	Increase Over Existing (dBA)	Impact Level	Number of Impacted Receptors Moderate (land [units])	Number of Impacted Receptors Severe (land [units])
4-E-WB-2-25	1	1	2	WB	817	50	Ldn	63	61	66	56	64	1	None	-	-
4-F-EB-2-26	1	1	2	EB	413	40	Ldn	54	55	61	59	60	6	Moderate	1 [1]	-
4-F-EB-2-28	1	1	2	EB	400	40	Ldn	54	55	61	52	56	2	None	-	-
4-F-EB-2-29	10	10	2	EB	643	40	Ldn	54	55	61	50	55	1	None	-	-
4-F-EB-2-30	25	128	2	EB	308	40	Ldn	54	55	61	55	58	4	None	-	-
4-F-EB-2-39	12	14	2	EB	144	40	Ldn	54	55	61	61	62	8	Moderate	12 [14]	-
4-F-EB-2-40	3	3	2	EB	187	40	Ldn	54	55	61	61	62	8	Moderate	3 [3]	-
4-F-EB-3-11	1	1	3	EB	495	40	Leq	56	61	67	50	57	1	None	-	-
4-F-WB-2-27	8	19	2	WB	505	40	Ldn	63	61	66	53	63	0	None	-	-
4-F-WB-2-31	7	86	2	WB	151	40	Ldn	54	55	61	59	60	6	Moderate	7 [86]	-
4-F-WB-2-32	24	24	2	WB	285	40	Ldn	54	55	61	54	57	3	None	-	-
4-F-WB-2-33	19	32	2	WB	482	40	Ldn	63	61	66	51	63	0	None	-	-
4-F-WB-2-34	13	20	2	WB	240	40	Ldn	60	60	64	59	63	3	None	-	-
4-F-WB-2-35	51	73	2	WB	118	40	Ldn	60	60	64	64	65	5	Moderate	51 [73]	-
4-F-WB-2-36	27	38	2	WB	492	40	Ldn	60	60	64	55	61	1	None	-	-
4-F-WB-2-37	14	19	2	WB	361	40	Ldn	60	60	64	56	61	1	None	-	-
4-F-WB-2-38	13	15	2	WB	653	40	Ldn	60	60	64	52	61	1	None	-	-
4-F-WB-3-10	1	1	3	WB	112	40	Leq	56	61	67	58	60	4	None	-	-
4-F-WB-3-9	2	2	3	WB	787	40	Leq	65	67	71	50	65	0	None	-	-
A-A-EB-2-12	11	15	2	EB	390	45	Ldn	55	56	61	56	59	4	None	-	-
A-A-EB-2-13	20	27	2	EB	463	45	Ldn	55	56	61	55	58	3	None	-	-
A-A-EB-2-14	14	14	2	EB	236	45	Ldn	55	56	61	60	61	6	Moderate	14 [14]	-
A-A-EB-2-15	24	24	2	EB	453	45	Ldn	55	56	61	54	58	3	None	-	-
A-A-EB-2-5	37	142	2	EB	46	45	Ldn	60	60	64	65	66	6	Severe	-	37 [142]
A-A-EB-2-8	55	172	2	EB	89	45	Ldn	55	56	61	62	63	8	Severe	-	55 [172]
A-A-EB-2-9	62	64	2	EB	282	45	Ldn	55	56	61	55	58	3	None	-	-
A-A-EB-3-7	1	1	3	EB	295	45	Leq	54	60	66	51	56	2	None	-	-
A-A-WB-2-1	32	32	2	WB	49	45	Ldn	60	60	64	65	66	6	Severe	-	32 [32]
A-A-WB-2-2	17	17	2	WB	295	45	Ldn	60	60	64	53	61	1	None	-	-
A-A-WB-2-3	30	30	2	WB	49	45	Ldn	60	60	64	65	66	6	Severe	-	30 [30]
A-A-WB-2-4	33	35	2	WB	430	45	Ldn	60	60	64	50	60	0	None	-	-
A-A-WB-2-6	22	23	2	WB	85	45	Ldn	55	56	61	63	64	9	Severe	-	22 [23]
A-A-WB-2-7	46	46	2	WB	279	45	Ldn	55	56	61	55	58	3	None	-	-
A-A-WB-3-8	1	2	3	WB	233	45	Leq	54	60	66	52	56	2	None	-	-
A-A-WB-3-9	2	2	3	WB	331	45	Leq	54	60	66	54	57	3	None	-	-
A-B-EB-2-11	14	17	2	EB	285	45	Ldn	55	56	61	57	59	4	Moderate	14 [17]	-
A-B-EB-2-16	27	32	2	EB	469	45	Ldn	55	56	61	54	58	3	None	-	-
A-B-EB-2-17	15	17	2	EB	778	45	Ldn	55	56	61	49	56	1	None	-	-
A-B-EB-2-18	33	37	2	EB	207	45	Ldn	55	56	61	60	61	6	Moderate	33 [37]	-
A-B-EB-2-20	12	13	2	EB	748	45	Ldn	55	56	61	56	59	4	None	-	-

Noise Assessment Table

Alternatives with Freight-rail Traffic Relocation

Representative Receptor/Cluster Identifier	Receptor Count: Land (qty)	Receptor Count: Unit (qty)	Land Use Category (1,2 or 3)	Side of Guideway (EB/WB)	Distance to Track (feet)	Train Speed (mph)	Noise Assessment Metric (Leq/Ldn)	Existing Noise Level (dBA)	Impact Criteria: Moderate (dBA)	Impact Criteria: Severe (dBA)	Project Related Noise (dBA)	Cumulative Noise Level (dBA)	Increase Over Existing (dBA)	Impact Level	Number of Impacted Receptors: Moderate (land [units])	Number of Impacted Receptors: Severe (land [units])
A-B-EB-2-30	1	1	2	EB	102	45	Ldn	55	56	61	64	65	10	Severe	-	1 [1]
A-B-EB-3-5	1	2	3	EB	771	45	Leq	54	60	66	44	54	0	None	-	-
A-B-WB-2-10	6	6	2	WB	118	45	Ldn	55	56	61	64	65	10	Severe	-	6 [6]
A-B-WB-2-19	17	17	2	WB	604	45	Ldn	63	60	65	57	64	1	None	-	-
A-C-EB-2-21	15	16	2	EB	272	50	Ldn	63	60	65	60	65	2	None	-	-
A-C-EB-2-22	10	10	2	EB	161	50	Ldn	63	60	65	61	65	2	Moderate	10 [10]	-
A-C-EB-2-23	34	38	2	EB	571	50	Ldn	63	60	65	54	64	1	None	-	-
A-C-EB-3-4	1	1	3	EB	23	50	Leq	60	65	69	67	68	8	Moderate	1 [1]	-
A-C-EB-3-6	1	1	3	EB	1017	50	Leq	54	60	66	49	55	1	None	-	-
A-C-WB-2-24	6	7	2	WB	630	50	Ldn	63	60	65	57	64	1	None	-	-
A-C-WB-3-3	2	2	3	WB	177	50	Leq	56	61	67	58	60	4	None	-	-
A-D-EB-1-1	1	1	1	EB	1063	40	Leq	67	62	67	48	67	0	None	-	-
A-D-EB-2-26	1	1	2	EB	469	40	Ldn	62	59	64	57	63	1	None	-	-
A-D-EB-2-27	1	1	2	EB	338	40	Ldn	62	59	64	59	64	2	None	-	-
A-D-EB-3-2	1	1	3	EB	1109	40	Leq	64	65	71	51	64	0	None	-	-
A-D-WB-2-25	2	6	2	WB	43	40	Ldn	62	59	64	64	66	4	Moderate	2 [6]	-
A-D-WB-2-31	1	96	2	WB	1024	40	Ldn	62	59	64	51	62	0	None	-	-
A-E-WB-1-2	2	2	1	WB	1184	25	Leq	64	60	66	48	64	0	None	-	-
A-E-WB-2-28	5	448	2	WB	518	25	Ldn	62	59	64	55	63	1	None	-	-
A-E-WB-2-29	1	1	2	WB	577	25	Ldn	62	59	64	58	63	1	None	-	-
A-E-WB-3-1	2	2	3	WB	89	25	Leq	64	65	71	63	67	3	None	-	-
C-2-A-EB-2-28	11	127	2	EB	59	50	Ldn	60	60	64	67	68	8	Severe	-	11 [127]
C-2-A-EB-2-29	6	150	2	EB	282	50	Ldn	60	60	64	62	64	4	Moderate	6 [150]	-
C-2-A-EB-2-36	26	106	2	EB	161	50	Ldn	58	57	62	71	71	13	Severe	-	26 [106]
C-2-A-EB-2-37	32	56	2	EB	377	50	Ldn	58	57	62	63	64	6	Severe	-	32 [56]
C-2-A-EB-2-75	3	3	2	EB	741	50	Ldn	58	57	62	59	62	4	Moderate	3 [3]	-
C-2-A-EB-3-1	2	2	3	EB	135	50	Leq	70	69	74	66	71	1	None	-	-
C-2-A-WB-2-24	37	142	2	WB	72	50	Ldn	60	60	64	72	72	12	Severe	-	37 [142]
C-2-A-WB-2-25	18	18	2	WB	118	50	Ldn	60	60	64	72	72	12	Severe	-	18 [18]
C-2-A-WB-2-26	14	14	2	WB	197	50	Ldn	60	60	64	70	70	10	Severe	-	14 [14]
C-2-A-WB-2-27	10	13	2	WB	384	50	Ldn	60	60	64	63	65	5	Moderate	10 [13]	-
C-2-A-WB-2-31	12	21	2	WB	154	50	Ldn	55	56	61	62	63	8	Severe	-	12 [21]
C-2-A-WB-2-32	19	19	2	WB	69	50	Ldn	55	56	61	65	65	10	Severe	-	19 [19]
C-2-A-WB-2-33	14	15	2	WB	233	50	Ldn	55	56	61	59	60	5	Moderate	14 [15]	-
C-2-A-WB-2-34	26	28	2	WB	502	50	Ldn	55	56	61	58	60	5	Moderate	26 [28]	-
C-2-A-WB-2-35	29	29	2	WB	459	50	Ldn	55	56	61	56	59	4	None	-	-
C-2-A-WB-2-38	57	60	2	WB	95	50	Ldn	58	57	62	73	73	15	Severe	-	57 [60]
C-2-A-WB-2-39	12	14	2	WB	200	50	Ldn	58	57	62	67	68	10	Severe	-	12 [14]
C-2-A-WB-2-40	48	57	2	WB	335	50	Ldn	58	57	62	62	63	5	Moderate	48 [57]	-
C-2-A-WB-3-2	1	1	3	WB	118	50	Leq	70	69	74	67	72	2	None	-	-

Noise Assessment Table

Alternatives with Freight-rail Traffic Relocation

Representative Receptor/Cluster Identifier	Receptor Count Land (qty)	Receptor Count Unit (qty)	Land Use Category (1,2 or 3)	Side of Guideway (EB/WB)	Distance to Track (feet)	Train Speed (mph)	Noise Assessment Metric (Leq/Ldn)	Existing Noise Level (dBA)	Impact Criteria Moderate (dBA)	Impact Criteria Severe (dBA)	Project Related Noise (dBA)	Cumulative Noise Level (dBA)	Increase Over Existing (dBA)	Impact Level	Number of Impacted Receptors Moderate (land [units])	Number of Impacted Receptors Severe (land [units])
C-2-B-EB-2-43	23	70	2	EB	410	30	Ldn	58	57	62	54	59	1	None	-	-
C-2-B-EB-2-44	4	4	2	EB	128	30	Ldn	58	57	62	59	62	4	Moderate	4 [4]	-
C-2-B-EB-3-3	3	3	3	EB	226	30	Leq	70	69	74	56	70	0	None	-	-
C-2-B-EB-3-4	1	1	3	EB	732	30	Leq	70	69	74	53	70	0	None	-	-
C-2-B-EB-3-7	2	2	3	EB	141	30	Leq	70	69	74	60	70	0	None	-	-
C-2-B-EB-3-8	3	3	3	EB	400	30	Leq	70	69	74	56	70	0	None	-	-
C-2-B-WB-2-41	2	129	2	WB	456	30	Ldn	58	57	62	54	59	1	None	-	-
C-2-B-WB-2-45	31	112	2	WB	115	30	Ldn	58	57	62	59	62	4	Moderate	31 [112]	-
C-2-B-WB-2-46	44	64	2	WB	341	30	Ldn	58	57	62	57	61	3	None	-	-
C-2-B-WB-2-47	59	99	2	WB	682	30	Ldn	58	57	62	50	59	1	None	-	-
C-2-B-WB-3-6	1	1	3	WB	292	30	Leq	70	69	74	57	70	0	None	-	-
C-2-C-EB-1-2	1	1	1	EB	289	35	Leq	70	64	69	51	70	0	None	-	-
C-2-C-EB-2-29	10	17	2	EB	75	35	Ldn	58	57	62	62	63	5	Moderate	10 [17]	-
C-2-C-EB-2-30	13	20	2	EB	312	35	Ldn	58	57	62	54	59	1	None	-	-
C-2-C-EB-2-31	7	77	2	EB	564	35	Ldn	58	57	62	50	59	1	None	-	-
C-2-C-EB-2-32	1	128	2	EB	98	35	Ldn	59	57	63	60	63	4	Moderate	1 [128]	-
C-2-C-EB-2-33	6	6	2	EB	39	35	Ldn	59	57	63	69	69	10	Severe	-	6 [6]
C-2-C-EB-2-34	16	25	2	EB	371	35	Ldn	59	57	63	54	60	1	None	-	-
C-2-C-EB-2-35	14	17	2	EB	686	35	Ldn	59	57	63	49	59	0	None	-	-
C-2-C-EB-3-10	1	1	3	EB	56	35	Leq	64	65	71	61	66	2	None	-	-
C-2-C-EB-3-11	1	1	3	EB	220	35	Leq	64	65	71	55	65	1	None	-	-
C-2-C-EB-3-9	2	2	3	EB	774	35	Leq	70	69	74	46	70	0	None	-	-
C-2-C-WB-1-1	1	1	1	WB	262	35	Leq	70	64	69	57	70	0	None	-	-
C-2-C-WB-1-2	1	1	1	WB	262	35	Leq	70	64	69	57	70	0	None	-	-
C-2-C-WB-2-25	10	12	2	WB	79	35	Ldn	59	57	63	61	63	4	Moderate	10 [12]	-
C-2-C-WB-2-26	45	65	2	WB	207	35	Ldn	58	57	62	61	63	5	Moderate	45 [65]	-
C-2-C-WB-2-27	40	70	2	WB	433	35	Ldn	58	57	62	52	59	1	None	-	-
C-2-C-WB-2-28	20	40	2	WB	673	35	Ldn	58	57	62	47	58	0	None	-	-
C-2-C-WB-2-36	5	14	2	WB	289	35	Ldn	59	57	63	57	61	2	None	-	-
C-2-C-WB-2-37	19	27	2	WB	679	35	Ldn	59	57	63	52	60	1	None	-	-
C-2-C-WB-3-5	2	2	3	WB	702	35	Leq	70	69	74	53	70	0	None	-	-
C-2-D-EB-2-43	8	16	2	EB	233	50	Ldn	59	57	63	58	62	3	Moderate	8 [16]	-
C-2-D-EB-2-44	13	17	2	EB	305	50	Ldn	59	57	63	57	61	2	None	-	-
C-2-D-EB-2-45	17	27	2	EB	367	50	Ldn	59	57	63	55	60	1	None	-	-
C-2-D-EB-2-46	23	28	2	EB	692	50	Ldn	59	57	63	49	59	0	None	-	-
C-2-D-EB-2-47	45	125	2	EB	558	50	Ldn	59	57	63	52	60	1	None	-	-
C-2-D-EB-2-49	4	68	2	EB	246	50	Ldn	58	57	62	58	61	3	Moderate	4 [68]	-
C-2-D-EB-3-13	3	3	3	EB	768	50	Leq	60	63	68	47	60	0	None	-	-
C-2-D-EB-3-14	4	4	3	EB	233	50	Leq	60	63	68	58	62	2	None	-	-
C-2-D-EB-3-16	1	1	3	EB	554	50	Leq	64	65	71	48	64	0	None	-	-

Noise Assessment Table

Alternatives with Freight-rail Traffic Relocation

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C-2-D-EB-3-17	1	1	3	EB	545	50	Leq	60	63	68	49	60	0	None	-	-
C-2-D-WB-2-38	8	11	2	WB	325	50	Ldn	59	57	63	57	61	2	None	-	-
C-2-D-WB-2-39	14	21	2	WB	531	50	Ldn	59	57	63	53	60	1	None	-	-
C-2-D-WB-2-40	13	23	2	WB	955	50	Ldn	59	57	63	48	59	0	None	-	-
C-2-D-WB-2-41	2	47	2	WB	364	50	Ldn	59	57	63	56	61	2	None	-	-
C-2-D-WB-2-42	47	74	2	WB	541	50	Ldn	59	57	63	53	60	1	None	-	-
C-2-D-WB-2-48	7	33	2	WB	39	50	Ldn	58	57	62	68	68	10	Severe	-	7 [33]
C-2-D-WB-3-12	2	2	3	WB	899	50	Leq	64	65	71	48	64	0	None	-	-
C-2-D-WB-3-15	4	4	3	WB	413	50	Leq	60	63	68	51	61	1	None	-	-
C-2-E-EB-2-50	7	64	2	EB	394	30	Ldn	58	57	62	57	61	3	None	-	-
C-2-E-EB-2-52	16	27	2	EB	889	30	Ldn	58	57	62	50	59	1	None	-	-
C-2-E-EB-2-53	12	39	2	EB	141	30	Ldn	65	61	66	64	68	3	Moderate	12 [39]	-
C-2-E-EB-2-54	6	10	2	EB	69	30	Ldn	65	61	66	67	69	4	Severe	-	6 [10]
C-2-E-EB-2-55	25	66	2	EB	364	30	Ldn	58	57	62	56	60	2	None	-	-
C-2-E-EB-2-56	45	117	2	EB	712	30	Ldn	58	57	62	51	59	1	None	-	-
C-2-E-EB-3-18	4	4	3	EB	92	30	Leq	67	67	72	63	68	1	None	-	-
C-2-E-EB-3-21	3	3	3	EB	417	30	Leq	67	67	72	52	67	0	None	-	-
C-2-E-EB-3-22	3	3	3	EB	702	30	Leq	60	63	68	47	60	0	None	-	-
C-2-E-WB-2-51	24	38	2	WB	755	30	Ldn	58	57	62	52	59	1	None	-	-
C-2-E-WB-2-57	13	68	2	WB	56	30	Ldn	65	61	66	68	70	5	Severe	-	13 [68]
C-2-E-WB-2-58	25	74	2	WB	449	30	Ldn	65	61	66	55	65	0	None	-	-
C-2-E-WB-2-69	22	225	2	WB	833	30	Ldn	65	61	66	49	65	0	None	-	-
C-2-E-WB-3-19	2	2	3	WB	52	30	Leq	67	67	72	65	69	2	None	-	-
C-2-E-WB-3-20	1	1	3	WB	673	30	Leq	67	67	72	50	67	0	None	-	-
C-2-E-WB-3-37	1	1	3	WB	259	30	Leq	60	63	68	58	62	2	None	-	-
C-2-F-WB-2-67	3	5	2	WB	72	30	Ldn	65	61	66	67	69	4	Severe	-	3 [5]
C-2-F-WB-2-70	6	8	2	WB	453	30	Ldn	65	61	66	56	66	1	None	-	-
C-2-G-EB-1-4	3	3	1	EB	135	20	Leq	67	62	67	62	68	1	None	-	-
C-2-G-EB-2-71	3	100	2	EB	502	20	Ldn	65	61	66	56	66	1	None	-	-
C-2-G-EB-2-72	3	3	2	EB	617	20	Ldn	65	61	66	54	65	0	None	-	-
C-2-G-EB-3-26	3	3	3	EB	85	20	Leq	67	67	72	63	68	1	None	-	-
C-2-G-EB-3-29	3	3	3	EB	463	20	Leq	67	67	72	56	67	0	None	-	-
C-2-G-WB-2-16	5	356	2	WB	72	20	Ldn	65	61	66	68	70	5	Severe	-	5 [356]
C-2-G-WB-2-17	31	330	2	WB	436	20	Ldn	65	61	66	55	65	0	None	-	-
C-2-G-WB-2-18	2	4	2	WB	85	20	Ldn	65	61	66	66	69	4	Moderate	2 [4]	-
C-2-G-WB-2-76	15	15	2	WB	863	20	Ldn	65	61	66	51	65	0	None	-	-
C-2-G-WB-3-28	2	2	3	WB	430	20	Leq	67	67	72	57	67	0	None	-	-
C-2-H-EB-1-1	1	1	1	EB	210	25	Leq	67	62	67	55	67	0	None	-	-
C-2-H-EB-2-19	6	21	2	EB	66	25	Ldn	65	61	66	68	70	5	Severe	-	6 [21]
C-2-H-EB-2-23	1	1	2	EB	207	25	Ldn	62	59	64	62	65	3	Moderate	1 [1]	-

Noise Assessment Table

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C-2-H-EB-3-27	2	2	3	EB	92	25	Leq	67	67	72	63	68	1	None	-	-
C-2-H-EB-3-30	3	3	3	EB	768	25	Leq	67	67	72	54	67	0	None	-	-
C-2-H-WB-2-20	2	4	2	WB	436	25	Ldn	62	59	64	56	63	1	None	-	-
C-2-H-WB-2-21	4	6	2	WB	436	25	Ldn	65	61	66	56	66	1	None	-	-
C-2-H-WB-2-22	1	1	2	WB	164	25	Ldn	62	59	64	64	66	4	Moderate	1 [1]	-
C-2-I-WB-2-73	1	1	2	WB	594	25	Ldn	62	59	64	58	63	1	None	-	-
C-2-I-WB-2-74	5	448	2	WB	522	25	Ldn	62	59	64	55	63	1	None	-	-
C-2-I-WB-3-31	1	1	3	WB	69	25	Leq	64	65	71	63	67	3	None	-	-
C-A-EB-2-13	23	103	2	EB	154	50	Ldn	58	57	62	71	71	13	Severe	-	23 [103]
C-A-EB-2-14	32	56	2	EB	420	50	Ldn	58	57	62	61	63	5	Moderate	32 [56]	-
C-A-EB-2-5	11	127	2	EB	75	50	Ldn	60	60	64	68	69	9	Severe	-	11 [127]
C-A-EB-2-6	4	148	2	EB	262	50	Ldn	60	60	64	62	64	4	Moderate	4 [148]	-
C-A-EB-2-7	2	106	2	EB	554	50	Ldn	60	60	64	59	63	3	None	-	-
C-A-EB-2-73	3	3	2	EB	738	50	Ldn	58	57	62	59	62	4	Moderate	3 [3]	-
C-A-EB-3-1	2	2	3	EB	135	50	Leq	70	69	74	66	71	1	None	-	-
C-A-WB-2-1	37	142	2	WB	69	50	Ldn	60	60	64	72	72	12	Severe	-	37 [142]
C-A-WB-2-10	14	15	2	WB	194	50	Ldn	55	56	61	61	62	7	Moderate	14 [15]	-
C-A-WB-2-11	26	28	2	WB	456	50	Ldn	55	56	61	57	59	4	Moderate	26 [28]	-
C-A-WB-2-12	29	29	2	WB	456	50	Ldn	55	56	61	56	59	4	None	-	-
C-A-WB-2-15	57	60	2	WB	52	50	Ldn	58	57	62	75	75	17	Severe	-	57 [60]
C-A-WB-2-16	12	14	2	WB	164	50	Ldn	58	57	62	68	68	10	Severe	-	12 [14]
C-A-WB-2-17	48	57	2	WB	328	50	Ldn	58	57	62	62	63	5	Moderate	48 [57]	-
C-A-WB-2-18	2	129	2	WB	486	50	Ldn	58	57	62	62	63	5	Moderate	2 [129]	-
C-A-WB-2-2	18	18	2	WB	125	50	Ldn	60	60	64	72	72	12	Severe	-	18 [18]
C-A-WB-2-3	14	14	2	WB	194	50	Ldn	60	60	64	70	70	10	Severe	-	14 [14]
C-A-WB-2-4	10	13	2	WB	387	50	Ldn	60	60	64	63	65	5	Moderate	10 [13]	-
C-A-WB-2-8	12	21	2	WB	138	50	Ldn	55	56	61	62	63	8	Severe	-	12 [21]
C-A-WB-2-9	19	19	2	WB	66	50	Ldn	55	56	61	66	66	11	Severe	-	19 [19]
C-A-WB-3-2	1	1	3	WB	118	50	Leq	70	69	74	67	72	2	None	-	-
C-B-EB-2-19	3	3	2	EB	174	30	Ldn	58	57	62	63	64	6	Severe	-	3 [3]
C-B-EB-2-20	22	69	2	EB	384	30	Ldn	58	57	62	54	59	1	None	-	-
C-B-EB-2-21	4	4	2	EB	230	30	Ldn	58	57	62	58	61	3	Moderate	4 [4]	-
C-B-EB-3-3	3	3	3	EB	226	30	Leq	70	69	74	56	70	0	None	-	-
C-B-EB-3-4	1	1	3	EB	732	30	Leq	70	69	74	47	70	0	None	-	-
C-B-EB-3-7	2	2	3	EB	141	30	Leq	70	69	74	57	70	0	None	-	-
C-B-EB-3-8	3	3	3	EB	400	30	Leq	70	69	74	53	70	0	None	-	-
C-B-WB-2-22	31	112	2	WB	121	30	Ldn	58	57	62	59	62	4	Moderate	31 [112]	-
C-B-WB-2-23	44	64	2	WB	341	30	Ldn	58	57	62	54	59	1	None	-	-
C-B-WB-2-24	59	99	2	WB	679	30	Ldn	58	57	62	49	59	1	None	-	-
C-B-WB-3-6	1	1	3	WB	292	30	Leq	70	69	74	54	70	0	None	-	-

Noise Assessment Table

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C-C-EB-1-2	1	1	1	EB	289	35	Leq	70	64	69	51	70	0	None	-	-
C-C-EB-2-29	10	17	2	EB	75	35	Ldn	58	57	62	62	63	5	Moderate	10 [17]	-
C-C-EB-2-30	13	20	2	EB	312	35	Ldn	58	57	62	54	59	1	None	-	-
C-C-EB-2-31	7	77	2	EB	564	35	Ldn	58	57	62	50	59	1	None	-	-
C-C-EB-2-32	1	128	2	EB	98	35	Ldn	59	57	63	60	63	4	Moderate	1 [128]	-
C-C-EB-2-33	6	6	2	EB	39	35	Ldn	59	57	63	69	69	10	Severe	-	6 [6]
C-C-EB-2-34	16	25	2	EB	371	35	Ldn	59	57	63	54	60	1	None	-	-
C-C-EB-2-35	14	17	2	EB	686	35	Ldn	59	57	63	49	59	0	None	-	-
C-C-EB-3-10	1	1	3	EB	56	35	Leq	64	65	71	61	66	2	None	-	-
C-C-EB-3-11	1	1	3	EB	220	35	Leq	64	65	71	55	65	1	None	-	-
C-C-EB-3-9	2	2	3	EB	774	35	Leq	70	69	74	46	70	0	None	-	-
C-C-WB-1-1	1	1	1	WB	262	35	Leq	70	64	69	57	70	0	None	-	-
C-C-WB-2-25	10	12	2	WB	79	35	Ldn	59	57	63	61	63	4	Moderate	10 [12]	-
C-C-WB-2-26	45	65	2	WB	207	35	Ldn	58	57	62	61	63	5	Moderate	45 [65]	-
C-C-WB-2-27	40	70	2	WB	433	35	Ldn	58	57	62	52	59	1	None	-	-
C-C-WB-2-28	20	40	2	WB	673	35	Ldn	58	57	62	47	58	0	None	-	-
C-C-WB-2-36	5	14	2	WB	289	35	Ldn	59	57	63	57	61	2	None	-	-
C-C-WB-2-37	19	27	2	WB	679	35	Ldn	59	57	63	52	60	1	None	-	-
C-C-WB-3-5	2	2	3	WB	702	35	Leq	70	69	74	45	70	0	None	-	-
C-D-EB-2-43	8	16	2	EB	233	50	Ldn	59	57	63	58	62	3	Moderate	8 [16]	-
C-D-EB-2-44	13	17	2	EB	305	50	Ldn	59	57	63	57	61	2	None	-	-
C-D-EB-2-45	17	27	2	EB	367	50	Ldn	59	57	63	55	60	1	None	-	-
C-D-EB-2-46	23	28	2	EB	692	50	Ldn	59	57	63	49	59	0	None	-	-
C-D-EB-2-47	45	125	2	EB	558	50	Ldn	59	57	63	52	60	1	None	-	-
C-D-EB-2-49	4	68	2	EB	246	50	Ldn	58	57	62	58	61	3	Moderate	4 [68]	-
C-D-EB-3-13	3	3	3	EB	768	50	Leq	60	63	68	47	60	0	None	-	-
C-D-EB-3-14	4	4	3	EB	233	50	Leq	60	63	68	58	62	2	None	-	-
C-D-EB-3-16	1	1	3	EB	554	50	Leq	64	65	71	48	64	0	None	-	-
C-D-EB-3-17	1	1	3	EB	545	50	Leq	60	63	68	49	60	0	None	-	-
C-D-WB-2-38	8	11	2	WB	325	50	Ldn	59	57	63	57	61	2	None	-	-
C-D-WB-2-39	14	21	2	WB	531	50	Ldn	59	57	63	53	60	1	None	-	-
C-D-WB-2-40	13	23	2	WB	955	50	Ldn	59	57	63	48	59	0	None	-	-
C-D-WB-2-41	2	47	2	WB	364	50	Ldn	59	57	63	56	61	2	None	-	-
C-D-WB-2-42	47	74	2	WB	541	50	Ldn	59	57	63	53	60	1	None	-	-
C-D-WB-2-48	7	33	2	WB	39	50	Ldn	58	57	62	68	68	10	Severe	-	7 [33]
C-D-WB-3-12	2	2	3	WB	899	50	Leq	64	65	71	48	64	0	None	-	-
C-D-WB-3-15	4	4	3	WB	413	50	Leq	60	63	68	51	61	1	None	-	-
C-E-EB-2-50	7	64	2	EB	394	30	Ldn	58	57	62	57	61	3	None	-	-
C-E-EB-2-52	16	27	2	EB	889	30	Ldn	58	57	62	50	59	1	None	-	-
C-E-EB-2-53	12	39	2	EB	141	30	Ldn	65	61	66	64	68	3	Moderate	12 [39]	-

Noise Assessment Table

Alternatives with Freight-rail Traffic Relocation

Representative Receptor/Cluster Identifier	Receptor Count Land (qty)	Receptor Count Unit (qty)	Land Use Category (1,2 or 3)	Side of Guideway (EB/WB)	Distance to Track (feet)	Train Speed (mph)	Noise Assessment Metric (Leq/Ldn)	Existing Noise Level (dBA)	Impact Criteria Moderate (dBA)	Impact Criteria Severe (dBA)	Project Related Noise (dBA)	Cumulative Noise Level (dBA)	Increase Over Existing (dBA)	Impact Level	Number of Impacted Receptors Moderate (land [units])	Number of Impacted Receptors Severe (land [units])
C-E-EB-2-54	6	10	2	EB	69	30	Ldn	65	61	66	67	69	4	Severe	-	6 [10]
C-E-EB-2-55	25	66	2	EB	364	30	Ldn	58	57	62	56	60	2	None	-	-
C-E-EB-2-56	45	117	2	EB	712	30	Ldn	58	57	62	51	59	1	None	-	-
C-E-EB-3-18	4	4	3	EB	92	30	Leq	67	67	72	63	68	1	None	-	-
C-E-EB-3-21	3	3	3	EB	417	30	Leq	67	67	72	52	67	0	None	-	-
C-E-EB-3-22	3	3	3	EB	702	30	Leq	60	63	68	47	60	0	None	-	-
C-E-WB-2-51	24	38	2	WB	755	30	Ldn	58	57	62	52	59	1	None	-	-
C-E-WB-2-57	13	68	2	WB	56	30	Ldn	65	61	66	68	70	5	Severe	-	13 [68]
C-E-WB-2-58	25	74	2	WB	449	30	Ldn	65	61	66	55	65	0	None	-	-
C-E-WB-2-59	6	275	2	WB	59	30	Ldn	65	61	66	67	69	4	Severe	-	6 [275]
C-E-WB-2-60	22	376	2	WB	436	30	Ldn	65	61	66	56	66	1	None	-	-
C-E-WB-2-61	54	290	2	WB	833	30	Ldn	65	61	66	51	65	0	None	-	-
C-E-WB-3-19	2	2	3	WB	52	30	Leq	67	67	72	65	69	2	None	-	-
C-E-WB-3-20	1	1	3	WB	673	30	Leq	67	67	72	50	67	0	None	-	-
C-E-WB-3-35	2	2	3	WB	502	30	Leq	67	67	72	51	67	0	None	-	-
C-E-WB-3-37	1	1	3	WB	259	30	Leq	60	63	68	58	62	2	None	-	-
C-F-EB-1-4	3	3	1	EB	72	20	Leq	67	62	67	64	69	2	Moderate	3 [3]	-
C-F-EB-1-5	2	2	1	EB	469	20	Leq	67	62	67	52	67	0	None	-	-
C-F-EB-2-62	1	1	2	EB	256	20	Ldn	65	61	66	59	66	1	None	-	-
C-F-EB-2-64	5	102	2	EB	489	20	Ldn	65	61	66	56	66	1	None	-	-
C-F-EB-3-23	2	2	3	EB	75	20	Leq	67	67	72	64	69	2	None	-	-
C-F-EB-3-24	2	2	3	EB	889	20	Leq	67	67	72	46	67	0	None	-	-
C-F-EB-3-25	1	1	3	EB	75	20	Leq	67	67	72	64	69	2	None	-	-
C-F-WB-2-63	3	3	2	WB	489	20	Ldn	65	61	66	55	65	0	None	-	-
C-F-WB-2-71	2	4	2	WB	236	20	Ldn	65	61	66	59	66	1	None	-	-
C-F-WB-3-34	2	2	3	WB	495	20	Leq	67	67	72	53	67	0	None	-	-
C-F-WB-3-36	2	2	3	WB	656	20	Leq	67	67	72	50	67	0	None	-	-
C-G-EB-1-6	2	2	1	EB	738	20	Leq	67	62	67	48	67	0	None	-	-
C-G-EB-1-7	2	2	1	EB	249	20	Leq	67	62	67	59	68	1	None	-	-
C-G-EB-2-66	2	2	2	EB	272	20	Ldn	65	61	66	59	66	1	None	-	-
C-G-EB-2-67	5	5	2	EB	620	20	Ldn	65	61	66	54	65	0	None	-	-
C-G-EB-3-27	2	2	3	EB	696	20	Leq	67	67	72	49	67	0	None	-	-
C-G-EB-3-28	1	1	3	EB	476	20	Leq	67	67	72	53	67	0	None	-	-
C-G-WB-1-8	1	1	1	WB	387	20	Leq	67	62	67	54	67	0	None	-	-
C-G-WB-1-9	1	1	1	WB	354	20	Leq	67	62	67	57	67	0	None	-	-
C-G-WB-2-65	1	1	2	WB	105	20	Ldn	65	61	66	65	68	3	Moderate	1 [1]	-
C-G-WB-2-72	1	3	2	WB	1263	20	Ldn	65	61	66	49	65	0	None	-	-
C-G-WB-3-30	3	3	3	WB	200	20	Leq	67	67	72	57	67	0	None	-	-
C-G-WB-3-31	2	2	3	WB	79	20	Leq	67	67	72	63	68	1	None	-	-
C-G-WB-3-32	1	1	3	WB	712	20	Leq	64	65	71	50	64	0	None	-	-

Noise Assessment Table

Alternatives with Freight-rail Traffic Relocation

Representative Receptor/Cluster Identifier	Receptor Count Land (qty)	Receptor Count Unit (qty)	Land Use Category (1,2 or 3)	Side of Guideway (EB/WB)	Distance to Track (feet)	Train Speed (mph)	Noise Assessment Metric (Leq/Ldn)	Existing Noise Level (dBA)	Impact Criteria Moderate (dBA)	Impact Criteria Severe (dBA)	Project Related Noise (dBA)	Cumulative Noise Level (dBA)	Increase Over Existing (dBA)	Impact Level	Number of Impacted Receptors Moderate (land [units])	Number of Impacted Receptors Severe (land [units])
C-H-EB-2-68	4	778	2	EB	679	20	Ldn	65	61	66	55	65	0	None	-	-
C-H-EB-3-26	1	1	3	EB	269	20	Leq	67	67	72	59	68	1	None	-	-
C-H-EB-3-29	2	2	3	EB	712	20	Leq	67	67	72	52	67	0	None	-	-
C-H-WB-2-69	4	14	2	WB	482	20	Ldn	62	59	64	56	63	1	None	-	-
C-H-WB-2-70	2	2	2	WB	899	20	Ldn	62	59	64	52	62	0	None	-	-
C-H-WB-3-33	4	4	3	WB	732	20	Leq	64	65	71	51	64	0	None	-	-

Noise Assessment Table (2010)

Noise Assessment Table

Project:	Southwest Transit
Project #:	87129
Analyst:	GR/EBD
Date:	May 14, 2010

Representative Receptor/Cluster Identifier	Receptor Count		Land Use Category (1,2 or 3)	Side of Guideway (EB/WB)	Distance to Track (feet)	Train Speed (mph)	Noise Assessment Metric (Leq/Ldn)	Existing Noise Level (dBA)	Impact Criteria		Project Related Noise (dBA)	Cumulative Noise Level (dBA)	Increase Over Existing (dBA)	Impact Level	Number of Impacted Receptors	
	Land (qty)	Unit (qty)							Moderate (dBA)	Severe (dBA)					Moderate (land [units])	Severe (land [units])
1-A-EB-1-1	1	1	1	EB	584	50	Leq	57	56	62	55	59	2	None	-	-
1-A-EB-2-11	16	16	2	EB	650	50	Ldn	52	54	60	60	61	9	Moderate	16 [16]	-
1-A-EB-2-12	6	6	2	EB	174	50	Ldn	52	54	60	69	69	17	Severe	-	6 [6]
1-A-EB-2-13	6	6	2	EB	276	50	Ldn	52	54	60	63	63	11	Severe	-	6 [6]
1-A-EB-2-14	8	8	2	EB	623	50	Ldn	52	54	60	58	59	7	Moderate	8 [8]	-
1-A-EB-2-15	51	51	2	EB	105	50	Ldn	52	54	60	62	62	10	Severe	-	51 [51]
1-A-EB-2-16	38	38	2	EB	302	50	Ldn	52	54	60	53	56	4	None	-	-
1-A-EB-3-3	1	1	3	EB	194	50	Leq	48	58	64	55	56	8	None	-	-
1-A-EB-3-5	1	1	3	EB	141	50	Leq	57	61	67	68	68	11	Severe	-	1 [1]
1-A-WB-2-1	26	26	2	WB	581	50	Ldn	52	54	60	52	55	3	None	-	-
1-A-WB-2-10	18	18	2	WB	331	50	Ldn	52	54	60	62	62	10	Severe	-	18 [18]
1-A-WB-2-2	20	24	2	WB	115	50	Ldn	52	54	60	63	63	11	Severe	-	20 [24]
1-A-WB-2-3	10	10	2	WB	292	50	Ldn	52	54	60	56	57	5	Moderate	10 [10]	-
1-A-WB-2-4	22	22	2	WB	397	50	Ldn	52	54	60	56	57	5	Moderate	22 [22]	-
1-A-WB-2-5	47	49	2	WB	98	50	Ldn	52	54	60	62	62	10	Severe	-	47 [49]
1-A-WB-2-6	24	24	2	WB	230	50	Ldn	52	54	60	57	58	6	Moderate	24 [24]	-
1-A-WB-2-7	66	66	2	WB	394	50	Ldn	52	54	60	52	55	3	None	-	-
1-A-WB-2-8	22	22	2	WB	292	50	Ldn	52	54	60	56	57	5	Moderate	22 [22]	-
1-A-WB-3-1	1	1	3	WB	899	50	Leq	48	58	64	50	52	4	None	-	-
1-A-WB-3-2a	1	1	3	WB	105	50	Leq	57	61	67	58	61	4	None	-	-
1-A-WB-3-4	1	1	3	WB	663	50	Leq	48	58	64	46	50	2	None	-	-
1-B-EB-2-17	1	1	2	EB	85	50	Ldn	52	54	60	63	63	11	Severe	-	1 [1]
1-B-WB-2-18	6	6	2	WB	131	50	Ldn	64	60	66	71	72	8	Severe	-	6 [6]
1-B-WB-2-19	5	5	2	WB	141	50	Ldn	52	54	60	65	65	13	Severe	-	5 [5]
1-B-WB-2-20	15	15	2	WB	256	50	Ldn	52	54	60	63	63	11	Severe	-	15 [15]
1-B-WB-2-21	12	12	2	WB	276	50	Ldn	64	60	66	64	67	3	Moderate	12 [12]	-
1-B-WB-2-22	2	2	2	WB	499	50	Ldn	64	60	66	64	67	3	Moderate	2 [2]	-
1-B-WB-2-23	10	10	2	WB	571	50	Ldn	64	60	66	59	65	1	None	-	-
1-B-WB-3-6	1	1	3	WB	669	50	Leq	60	63	68	53	61	1	None	-	-
1-C-EB-1-2	1	1	1	EB	446	40	Leq	62	59	64	52	62	0	None	-	-
1-C-EB-2-27	61	61	2	EB	121	40	Ldn	64	60	66	63	67	3	Moderate	61 [61]	-
1-C-EB-2-28	6	6	2	EB	794	40	Ldn	55	55	61	50	56	1	None	-	-
1-C-EB-2-29	49	49	2	EB	118	40	Ldn	55	55	61	59	60	5	Moderate	49 [49]	-
1-C-EB-2-30	3	3	2	EB	167	40	Ldn	55	55	61	61	62	7	Moderate	3 [3]	-
1-C-EB-2-31	4	4	2	EB	322	40	Ldn	55	55	61	56	59	4	Moderate	4 [4]	-

Noise Assessment Table

Representative Receptor/Cluster Identifier	Receptor Count Land (qty)	Receptor Count Unit (qty)	Land Use Category (1,2 or 3)	Side of Guideway (EB/WB)	Distance to Track (feet)	Train Speed (mph)	Noise Assessment Metric (Leq/Ldn)	Existing Noise Level (dBA)	Impact Criteria Moderate (dBA)	Impact Criteria Severe (dBA)	Project Related Noise (dBA)	Cumulative Noise Level (dBA)	Increase Over Existing (dBA)	Impact Level	Number of Impacted Receptors Moderate (land [units])	Number of Impacted Receptors Severe (land [units])
1-C-EB-2-32	1	1	2	EB	663	40	Ldn	55	55	61	50	56	1	None	-	-
1-C-EB-2-38	6	6	2	EB	89	40	Ldn	55	55	61	60	61	6	Moderate	6 [6]	-
1-C-EB-2-39	8	8	2	EB	312	40	Ldn	55	55	61	51	56	1	None	-	-
1-C-EB-3-7	1	1	3	EB	1407	40	Leq	60	63	68	44	60	0	None	-	-
1-C-WB-2-24	13	13	2	WB	125	40	Ldn	64	60	66	62	66	2	Moderate	13 [13]	-
1-C-WB-2-25	17	17	2	WB	489	40	Ldn	64	60	66	53	64	0	None	-	-
1-C-WB-2-26	13	12	2	WB	443	40	Ldn	55	55	61	54	58	3	None	-	-
1-C-WB-2-33	10	10	2	WB	210	40	Ldn	55	55	61	60	61	6	Moderate	10 [10]	-
1-C-WB-2-34	6	6	2	WB	121	40	Ldn	55	55	61	60	61	6	Moderate	6 [6]	-
1-C-WB-2-35	26	26	2	WB	413	40	Ldn	55	55	61	53	57	2	None	-	-
1-C-WB-2-36	13	13	2	WB	115	40	Ldn	55	55	61	59	60	5	Moderate	13 [13]	-
1-C-WB-2-37	43	43	2	WB	305	40	Ldn	55	55	61	52	57	2	None	-	-
3-A-EB-2-1	1	91	2	EB	20	50	Ldn	63	60	65	71	72	9	Severe	-	1 [91]
3-A-EB-2-2	2	146	2	EB	125	50	Ldn	63	60	65	63	66	3	Moderate	2 [146]	-
3-A-EB-3-1	1	1	3	EB	154	50	Leq	62	64	69	58	63	1	None	-	-
3-A-WB-3-9	1	1	3	WB	1040	50	Leq	62	64	69	51	62	0	None	-	-
3-B-EB-1-1	1	1	1	EB	758	20	Leq	62	59	64	51	62	0	None	-	-
3-B-WB-3-2	1	1	3	WB	912	20	Leq	62	64	69	53	63	1	None	-	-
3-C-EB-2-3	4	4	2	EB	1293	30	Ldn	63	60	65	51	63	0	None	-	-
3-C-EB-2-4	2	2	2	EB	719	30	Ldn	61	58	64	54	62	1	None	-	-
3-C-EB-2-5	2	2	2	EB	702	30	Ldn	61	58	64	51	61	0	None	-	-
3-C-EB-2-6	2	2	2	EB	256	30	Ldn	61	58	64	57	62	1	None	-	-
3-C-EB-2-8	2	97	2	EB	653	30	Ldn	65	61	66	53	65	0	None	-	-
3-C-EB-3-3	1	1	3	EB	240	30	Leq	64	65	71	58	65	1	None	-	-
3-C-WB-2-23	4	4	2	WB	1112	30	Ldn	65	61	66	51	65	0	None	-	-
3-C-WB-2-7	2	2	2	WB	233	30	Ldn	61	58	64	58	63	2	None	-	-
3-D-EB-1-2	1	1	1	EB	213	30	Leq	58	57	62	55	60	2	None	-	-
3-D-EB-2-10	1	1	2	EB	627	30	Ldn	65	61	66	54	65	0	None	-	-
3-D-EB-2-9	1	1	2	EB	269	30	Ldn	65	61	66	56	66	1	None	-	-
3-D-WB-2-11	2	2	2	WB	791	30	Ldn	65	61	66	52	65	0	None	-	-
3-D-WB-3-4	1	1	3	WB	89	30	Leq	58	62	67	57	61	3	None	-	-
3-D-WB-3-5	1	1	3	WB	617	30	Leq	58	62	67	51	59	1	None	-	-
3-E-EB-3-6	1	1	3	EB	768	30	Leq	62	64	69	49	62	0	None	-	-
3-E-WB-2-12	1	1	2	WB	1237	30	Ldn	65	61	66	51	65	0	None	-	-
3-F-EB-2-13	3	99	2	EB	938	50	Ldn	62	59	64	55	63	1	None	-	-
3-F-EB-2-14	1	1	2	EB	187	50	Ldn	62	59	64	66	67	5	Severe	-	1 [1]
3-F-EB-2-15	1	1	2	EB	164	50	Ldn	62	59	64	71	72	10	Severe	-	1 [1]
3-F-EB-2-18	1	1	2	EB	230	50	Ldn	62	59	64	66	67	5	Severe	-	1 [1]
3-F-EB-2-19	3	3	2	EB	528	50	Ldn	62	59	64	63	66	4	Moderate	3 [3]	-
3-F-EB-3-8	1	1	3	EB	607	50	Leq	62	64	69	57	63	1	None	-	-

Noise Assessment Table

Representative Receptor/Cluster Identifier	Receptor Count Land (qty)	Receptor Count Unit (qty)	Land Use Category (1,2 or 3)	Side of Guideway (EB/WB)	Distance to Track (feet)	Train Speed (mph)	Noise Assessment Metric (Leq/Ldn)	Existing Noise Level (dBA)	Impact Criteria Moderate (dBA)	Impact Criteria Severe (dBA)	Project Related Noise (dBA)	Cumulative Noise Level (dBA)	Increase Over Existing (dBA)	Impact Level	Number of Impacted Receptors Moderate (land [units])	Number of Impacted Receptors Severe (land [units])
3-F-WB-1-3	1	1	1	WB	125	50	Leq	62	59	64	61	65	3	Moderate	1 [1]	-
3-F-WB-2-16	1	1	2	WB	295	50	Ldn	62	59	64	63	66	4	Moderate	1 [1]	-
3-F-WB-2-17	1	1	2	WB	200	50	Ldn	62	59	64	70	71	9	Severe	-	1 [1]
3-F-WB-2-20	13	19	2	WB	344	50	Ldn	62	59	64	68	69	7	Severe	-	13 [19]
3-F-WB-2-21	33	33	2	WB	449	50	Ldn	62	59	64	64	66	4	Moderate	33 [33]	-
3-F-WB-2-22	7	13	2	WB	673	50	Ldn	62	59	64	62	65	3	Moderate	7 [13]	-
3-F-WB-3-7	1	1	3	WB	1056	50	Leq	62	64	69	52	62	0	None	-	-
4-A-WB-2-1	8	8	2	WB	692	40	Ldn	64	60	66	53	64	0	None	-	-
4-A-WB-3-1	1	1	3	WB	1010	40	Leq	61	63	69	48	61	0	None	-	-
4-B-EB-1-1	1	1	1	EB	112	50	Leq	62	59	64	59	64	2	None	-	-
4-B-EB-2-4	10	11	2	EB	233	50	Ldn	64	60	66	59	65	1	None	-	-
4-B-EB-2-5	24	24	2	EB	420	50	Ldn	64	60	66	54	64	0	None	-	-
4-B-EB-2-6	32	33	2	EB	617	50	Ldn	64	60	66	49	64	0	None	-	-
4-B-EB-3-2	4	4	3	EB	843	50	Leq	62	64	69	50	62	0	None	-	-
4-B-WB-2-11	36	36	2	WB	584	50	Ldn	63	60	65	54	64	1	None	-	-
4-B-WB-2-2	16	19	2	WB	292	50	Ldn	64	60	66	61	66	2	Moderate	16 [19]	-
4-B-WB-2-3	14	17	2	WB	427	50	Ldn	64	60	66	56	65	1	None	-	-
4-B-WB-3-3	1	1	3	WB	810	50	Leq	62	64	69	49	62	0	None	-	-
4-B-WB-3-4	1	1	3	WB	128	50	Leq	62	64	69	61	65	3	None	-	-
4-C-EB-2-7	1	1	2	EB	148	50	Ldn	64	60	66	63	67	3	Moderate	1 [1]	-
4-C-EB-2-8	1	1	2	EB	620	50	Ldn	64	60	66	54	64	0	None	-	-
4-C-WB-2-10	1	1	2	WB	686	50	Ldn	63	60	65	57	64	1	None	-	-
4-C-WB-2-12	35	35	2	WB	207	50	Ldn	63	60	65	57	64	1	None	-	-
4-C-WB-2-13	61	63	2	WB	384	50	Ldn	63	60	65	54	64	1	None	-	-
4-C-WB-2-14	41	41	2	WB	728	50	Ldn	63	60	65	51	63	0	None	-	-
4-C-WB-2-9	17	17	2	WB	551	50	Ldn	63	60	65	58	64	1	None	-	-
4-C-WB-3-5	2	2	3	WB	121	50	Leq	62	64	69	59	64	2	None	-	-
4-D-EB-2-15	2	62	2	EB	220	40	Ldn	61	58	64	61	64	3	Moderate	2 [62]	-
4-D-EB-2-16	3	96	2	EB	476	40	Ldn	61	58	64	55	62	1	None	-	-
4-D-EB-2-17	17	23	2	EB	600	40	Ldn	61	58	64	52	62	1	None	-	-
4-D-EB-2-18	19	25	2	EB	312	40	Ldn	61	58	64	58	63	2	None	-	-
4-D-EB-2-19	13	13	2	EB	180	40	Ldn	61	58	64	59	63	2	Moderate	13 [13]	-
4-D-EB-3-8	1	1	3	EB	486	40	Leq	62	64	69	52	62	0	None	-	-
4-D-WB-2-20	7	8	2	WB	558	40	Ldn	62	59	64	58	63	1	None	-	-
4-D-WB-3-6	1	1	3	WB	312	40	Leq	64	65	71	55	65	1	None	-	-
4-D-WB-3-7	1	1	3	WB	669	40	Leq	64	65	71	53	64	0	None	-	-
4-E-EB-2-24	2	2	2	EB	719	50	Ldn	61	58	64	52	62	1	None	-	-
4-E-WB-2-21	16	16	2	WB	551	50	Ldn	62	59	64	58	63	1	None	-	-
4-E-WB-2-22	14	14	2	WB	728	50	Ldn	62	59	64	52	62	0	None	-	-
4-E-WB-2-23	1	1	2	WB	144	50	Ldn	62	59	64	61	65	3	Moderate	1 [1]	-

Noise Assessment Table

Representative Receptor/Cluster Identifier	Receptor Count Land (qty)	Receptor Count Unit (qty)	Land Use Category (1,2 or 3)	Side of Guideway (EB/WB)	Distance to Track (feet)	Train Speed (mph)	Noise Assessment Metric (Leq/Ldn)	Existing Noise Level (dBA)	Impact Criteria Moderate (dBA)	Impact Criteria Severe (dBA)	Project Related Noise (dBA)	Cumulative Noise Level (dBA)	Increase Over Existing (dBA)	Impact Level	Number of Impacted Receptors Moderate (land [units])	Number of Impacted Receptors Severe (land [units])
4-E-WB-2-25	1	1	2	WB	817	50	Ldn	62	59	64	56	63	1	None	-	-
4-F-EB-2-26	1	1	2	EB	413	40	Ldn	54	55	61	59	60	6	Moderate	1 [1]	-
4-F-EB-2-28	1	1	2	EB	400	40	Ldn	54	55	61	52	56	2	None	-	-
4-F-EB-2-29	10	10	2	EB	643	40	Ldn	54	55	61	50	55	1	None	-	-
4-F-EB-2-30	25	128	2	EB	308	40	Ldn	54	55	61	55	58	4	None	-	-
4-F-EB-2-39	12	14	2	EB	144	40	Ldn	54	55	61	61	62	8	Moderate	12 [14]	-
4-F-EB-2-40	3	3	2	EB	187	40	Ldn	54	55	61	61	62	8	Moderate	3 [3]	-
4-F-EB-3-11	1	1	3	EB	495	40	Leq	56	61	67	50	57	1	None	-	-
4-F-WB-2-27	8	19	2	WB	505	40	Ldn	62	59	64	53	63	1	None	-	-
4-F-WB-2-31	7	86	2	WB	151	40	Ldn	54	55	61	59	60	6	Moderate	7 [86]	-
4-F-WB-2-32	24	24	2	WB	285	40	Ldn	54	55	61	54	57	3	None	-	-
4-F-WB-2-33	19	32	2	WB	482	40	Ldn	62	59	64	51	62	0	None	-	-
4-F-WB-2-34	13	20	2	WB	240	40	Ldn	57	56	62	59	61	4	Moderate	13 [20]	-
4-F-WB-2-35	51	73	2	WB	118	40	Ldn	57	56	62	64	65	8	Severe	-	51 [73]
4-F-WB-2-36	27	38	2	WB	492	40	Ldn	57	56	62	55	59	2	None	-	-
4-F-WB-2-37	14	19	2	WB	361	40	Ldn	57	56	62	56	60	3	None	-	-
4-F-WB-2-38	13	15	2	WB	653	40	Ldn	57	56	62	52	58	1	None	-	-
4-F-WB-3-10	1	1	3	WB	112	40	Leq	56	61	67	58	60	4	None	-	-
4-F-WB-3-9	2	2	3	WB	787	40	Leq	64	65	71	50	64	0	None	-	-
A-A-EB-2-12	11	15	2	EB	390	45	Ldn	54	55	61	56	58	4	Moderate	11 [15]	-
A-A-EB-2-13	20	27	2	EB	463	45	Ldn	54	55	61	55	58	4	None	-	-
A-A-EB-2-14	14	14	2	EB	236	45	Ldn	54	55	61	60	61	7	Moderate	14 [14]	-
A-A-EB-2-15	24	24	2	EB	453	45	Ldn	54	55	61	54	57	3	None	-	-
A-A-EB-2-5	37	142	2	EB	46	45	Ldn	57	56	62	65	66	9	Severe	-	37 [142]
A-A-EB-2-8	55	172	2	EB	89	45	Ldn	54	55	61	62	63	9	Severe	-	55 [172]
A-A-EB-2-9	62	64	2	EB	282	45	Ldn	54	55	61	55	58	4	None	-	-
A-A-EB-3-7	1	1	3	EB	295	45	Leq	53	59	65	51	55	2	None	-	-
A-A-WB-2-1	32	32	2	WB	49	45	Ldn	57	56	62	65	66	9	Severe	-	32 [32]
A-A-WB-2-2	17	17	2	WB	295	45	Ldn	57	56	62	53	58	1	None	-	-
A-A-WB-2-3	30	30	2	WB	49	45	Ldn	57	56	62	65	66	9	Severe	-	30 [30]
A-A-WB-2-4	33	35	2	WB	430	45	Ldn	57	56	62	50	58	1	None	-	-
A-A-WB-2-6	22	23	2	WB	85	45	Ldn	54	55	61	63	64	10	Severe	-	22 [23]
A-A-WB-2-7	46	46	2	WB	279	45	Ldn	54	55	61	55	58	4	None	-	-
A-A-WB-3-8	1	2	3	WB	233	45	Leq	53	59	65	52	56	3	None	-	-
A-A-WB-3-9	2	2	3	WB	331	45	Leq	53	59	65	54	57	4	None	-	-
A-B-EB-2-11	14	17	2	EB	285	45	Ldn	54	55	61	57	59	5	Moderate	14 [17]	-
A-B-EB-2-16	27	32	2	EB	469	45	Ldn	54	55	61	54	57	3	None	-	-
A-B-EB-2-17	15	17	2	EB	778	45	Ldn	54	55	61	49	55	1	None	-	-
A-B-EB-2-18	33	37	2	EB	207	45	Ldn	54	55	61	60	61	7	Moderate	33 [37]	-
A-B-EB-2-20	12	13	2	EB	748	45	Ldn	54	55	61	56	58	4	Moderate	12 [13]	-

Noise Assessment Table

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A-B-EB-2-30	1	1	2	EB	102	45	Ldn	54	55	61	64	64	10	Severe	-	1 [1]
A-B-EB-3-5	1	2	3	EB	771	45	Leq	54	60	66	44	54	0	None	-	-
A-B-WB-2-10	6	6	2	WB	118	45	Ldn	54	55	61	64	64	10	Severe	-	6 [6]
A-B-WB-2-19	17	17	2	WB	604	45	Ldn	63	60	65	57	64	1	None	-	-
A-C-EB-2-21	15	16	2	EB	272	50	Ldn	63	60	65	60	65	2	None	-	-
A-C-EB-2-22	10	10	2	EB	161	50	Ldn	63	60	65	61	65	2	Moderate	10 [10]	-
A-C-EB-2-23	34	38	2	EB	571	50	Ldn	63	60	65	54	64	1	None	-	-
A-C-EB-3-4	1	1	3	EB	23	50	Leq	49	58	64	67	67	18	Severe	-	1 [1]
A-C-EB-3-6	1	1	3	EB	1017	50	Leq	54	60	66	49	55	1	None	-	-
A-C-WB-2-24	6	7	2	WB	630	50	Ldn	63	60	65	57	64	1	None	-	-
A-C-WB-3-3	2	2	3	WB	177	50	Leq	56	61	67	58	60	4	None	-	-
A-D-EB-1-1	1	1	1	EB	1063	40	Leq	67	62	67	48	67	0	None	-	-
A-D-EB-2-26	1	1	2	EB	469	40	Ldn	62	59	64	57	63	1	None	-	-
A-D-EB-2-27	1	1	2	EB	338	40	Ldn	62	59	64	59	64	2	None	-	-
A-D-EB-3-2	1	1	3	EB	1109	40	Leq	64	65	71	51	64	0	None	-	-
A-D-WB-2-25	2	6	2	WB	43	40	Ldn	62	59	64	64	66	4	Moderate	2 [6]	-
A-D-WB-2-31	1	96	2	WB	1024	40	Ldn	62	59	64	51	62	0	None	-	-
A-E-WB-1-2	2	2	1	WB	1184	25	Leq	64	60	66	48	64	0	None	-	-
A-E-WB-2-28	5	448	2	WB	518	25	Ldn	62	59	64	55	63	1	None	-	-
A-E-WB-2-29	1	1	2	WB	577	25	Ldn	62	59	64	58	63	1	None	-	-
A-E-WB-3-1	2	2	3	WB	89	25	Leq	64	65	71	63	67	3	None	-	-
C-2-A-EB-2-28	11	127	2	EB	59	50	Ldn	57	56	62	67	67	10	Severe	-	11 [127]
C-2-A-EB-2-29	6	150	2	EB	282	50	Ldn	57	56	62	62	63	6	Moderate	6 [150]	-
C-2-A-EB-2-36	26	106	2	EB	161	50	Ldn	58	57	62	71	71	13	Severe	-	26 [106]
C-2-A-EB-2-37	32	56	2	EB	377	50	Ldn	58	57	62	63	64	6	Severe	-	32 [56]
C-2-A-EB-2-75	3	3	2	EB	741	50	Ldn	58	57	62	59	62	4	Moderate	3 [3]	-
C-2-A-EB-3-1	2	2	3	EB	135	50	Leq	70	69	74	66	71	1	None	-	-
C-2-A-WB-2-24	37	142	2	WB	72	50	Ldn	57	56	62	72	72	15	Severe	-	37 [142]
C-2-A-WB-2-25	18	18	2	WB	118	50	Ldn	57	56	62	72	72	15	Severe	-	18 [18]
C-2-A-WB-2-26	14	14	2	WB	197	50	Ldn	57	56	62	70	70	13	Severe	-	14 [14]
C-2-A-WB-2-27	10	13	2	WB	384	50	Ldn	57	56	62	63	64	7	Severe	-	10 [13]
C-2-A-WB-2-31	12	21	2	WB	154	50	Ldn	54	55	61	62	63	9	Severe	-	12 [21]
C-2-A-WB-2-32	19	19	2	WB	69	50	Ldn	54	55	61	65	65	11	Severe	-	19 [19]
C-2-A-WB-2-33	14	15	2	WB	233	50	Ldn	54	55	61	59	60	6	Moderate	14 [15]	-
C-2-A-WB-2-34	26	28	2	WB	502	50	Ldn	54	55	61	58	59	5	Moderate	26 [28]	-
C-2-A-WB-2-35	29	29	2	WB	459	50	Ldn	54	55	61	56	58	4	Moderate	29 [29]	-
C-2-A-WB-2-38	57	60	2	WB	95	50	Ldn	58	57	62	73	73	15	Severe	-	57 [60]
C-2-A-WB-2-39	12	14	2	WB	200	50	Ldn	58	57	62	67	68	10	Severe	-	12 [14]
C-2-A-WB-2-40	48	57	2	WB	335	50	Ldn	58	57	62	62	63	5	Moderate	48 [57]	-
C-2-A-WB-3-2	1	1	3	WB	118	50	Leq	70	69	74	67	72	2	None	-	-

Noise Assessment Table

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C-2-B-EB-2-43	23	70	2	EB	410	30	Ldn	58	57	62	54	59	1	None	-	-
C-2-B-EB-2-44	4	4	2	EB	128	30	Ldn	58	57	62	59	62	4	Moderate	4 [4]	-
C-2-B-EB-3-3	3	3	3	EB	226	30	Leq	70	69	74	56	70	0	None	-	-
C-2-B-EB-3-4	1	1	3	EB	732	30	Leq	70	69	74	53	70	0	None	-	-
C-2-B-EB-3-7	2	2	3	EB	141	30	Leq	70	69	74	60	70	0	None	-	-
C-2-B-EB-3-8	3	3	3	EB	400	30	Leq	70	69	74	56	70	0	None	-	-
C-2-B-WB-2-41	2	129	2	WB	456	30	Ldn	58	57	62	54	59	1	None	-	-
C-2-B-WB-2-45	31	112	2	WB	115	30	Ldn	58	57	62	59	62	4	Moderate	31 [112]	-
C-2-B-WB-2-46	44	64	2	WB	341	30	Ldn	58	57	62	57	61	3	None	-	-
C-2-B-WB-2-47	59	99	2	WB	682	30	Ldn	58	57	62	50	59	1	None	-	-
C-2-B-WB-3-6	1	1	3	WB	292	30	Leq	70	69	74	57	70	0	None	-	-
C-2-C-EB-1-2	1	1	1	EB	289	35	Leq	70	64	69	51	70	0	None	-	-
C-2-C-EB-2-29	10	17	2	EB	75	35	Ldn	58	57	62	62	63	5	Moderate	10 [17]	-
C-2-C-EB-2-30	13	20	2	EB	312	35	Ldn	58	57	62	54	59	1	None	-	-
C-2-C-EB-2-31	7	77	2	EB	564	35	Ldn	58	57	62	50	59	1	None	-	-
C-2-C-EB-2-32	1	128	2	EB	98	35	Ldn	59	57	63	60	63	4	Moderate	1 [128]	-
C-2-C-EB-2-33	6	6	2	EB	39	35	Ldn	59	57	63	69	69	10	Severe	-	6 [6]
C-2-C-EB-2-34	16	25	2	EB	371	35	Ldn	59	57	63	54	60	1	None	-	-
C-2-C-EB-2-35	14	17	2	EB	686	35	Ldn	59	57	63	49	59	0	None	-	-
C-2-C-EB-3-10	1	1	3	EB	56	35	Leq	64	65	71	61	66	2	None	-	-
C-2-C-EB-3-11	1	1	3	EB	220	35	Leq	64	65	71	55	65	1	None	-	-
C-2-C-EB-3-9	2	2	3	EB	774	35	Leq	70	69	74	46	70	0	None	-	-
C-2-C-WB-1-1	1	1	1	WB	262	35	Leq	70	64	69	57	70	0	None	-	-
C-2-C-WB-1-2	1	1	1	WB	262	35	Leq	70	64	69	57	70	0	None	-	-
C-2-C-WB-2-25	10	12	2	WB	79	35	Ldn	59	57	63	61	63	4	Moderate	10 [12]	-
C-2-C-WB-2-26	45	65	2	WB	207	35	Ldn	58	57	62	61	63	5	Moderate	45 [65]	-
C-2-C-WB-2-27	40	70	2	WB	433	35	Ldn	58	57	62	52	59	1	None	-	-
C-2-C-WB-2-28	20	40	2	WB	673	35	Ldn	58	57	62	47	58	0	None	-	-
C-2-C-WB-2-36	5	14	2	WB	289	35	Ldn	59	57	63	57	61	2	None	-	-
C-2-C-WB-2-37	19	27	2	WB	679	35	Ldn	59	57	63	52	60	1	None	-	-
C-2-C-WB-3-5	2	2	3	WB	702	35	Leq	70	69	74	53	70	0	None	-	-
C-2-D-EB-2-43	8	16	2	EB	233	50	Ldn	59	57	63	58	62	3	Moderate	8 [16]	-
C-2-D-EB-2-44	13	17	2	EB	305	50	Ldn	59	57	63	57	61	2	None	-	-
C-2-D-EB-2-45	17	27	2	EB	367	50	Ldn	59	57	63	55	60	1	None	-	-
C-2-D-EB-2-46	23	28	2	EB	692	50	Ldn	59	57	63	49	59	0	None	-	-
C-2-D-EB-2-47	45	125	2	EB	558	50	Ldn	59	57	63	52	60	1	None	-	-
C-2-D-EB-2-49	4	68	2	EB	246	50	Ldn	58	57	62	58	61	3	Moderate	4 [68]	-
C-2-D-EB-3-13	3	3	3	EB	768	50	Leq	60	63	68	47	60	0	None	-	-
C-2-D-EB-3-14	4	4	3	EB	233	50	Leq	60	63	68	58	62	2	None	-	-
C-2-D-EB-3-16	1	1	3	EB	554	50	Leq	64	65	71	48	64	0	None	-	-

Noise Assessment Table

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C-2-D-EB-3-17	1	1	3	EB	545	50	Leq	60	63	68	49	60	0	None	-	-
C-2-D-WB-2-38	8	11	2	WB	325	50	Ldn	59	57	63	57	61	2	None	-	-
C-2-D-WB-2-39	14	21	2	WB	531	50	Ldn	59	57	63	53	60	1	None	-	-
C-2-D-WB-2-40	13	23	2	WB	955	50	Ldn	59	57	63	48	59	0	None	-	-
C-2-D-WB-2-41	2	47	2	WB	364	50	Ldn	59	57	63	56	61	2	None	-	-
C-2-D-WB-2-42	47	74	2	WB	541	50	Ldn	59	57	63	53	60	1	None	-	-
C-2-D-WB-2-48	7	33	2	WB	39	50	Ldn	58	57	62	68	68	10	Severe	-	7 [33]
C-2-D-WB-3-12	2	2	3	WB	899	50	Leq	64	65	71	48	64	0	None	-	-
C-2-D-WB-3-15	4	4	3	WB	413	50	Leq	60	63	68	51	61	1	None	-	-
C-2-E-EB-2-50	7	64	2	EB	394	30	Ldn	58	57	62	57	61	3	None	-	-
C-2-E-EB-2-52	16	27	2	EB	889	30	Ldn	58	57	62	50	59	1	None	-	-
C-2-E-EB-2-53	12	39	2	EB	141	30	Ldn	65	61	66	64	68	3	Moderate	12 [39]	-
C-2-E-EB-2-54	6	10	2	EB	69	30	Ldn	65	61	66	67	69	4	Severe	-	6 [10]
C-2-E-EB-2-55	25	66	2	EB	364	30	Ldn	58	57	62	56	60	2	None	-	-
C-2-E-EB-2-56	45	117	2	EB	712	30	Ldn	58	57	62	51	59	1	None	-	-
C-2-E-EB-3-18	4	4	3	EB	92	30	Leq	67	67	72	63	68	1	None	-	-
C-2-E-EB-3-21	3	3	3	EB	417	30	Leq	67	67	72	52	67	0	None	-	-
C-2-E-EB-3-22	3	3	3	EB	702	30	Leq	60	63	68	47	60	0	None	-	-
C-2-E-WB-2-51	24	38	2	WB	755	30	Ldn	58	57	62	52	59	1	None	-	-
C-2-E-WB-2-57	13	68	2	WB	56	30	Ldn	65	61	66	68	70	5	Severe	-	13 [68]
C-2-E-WB-2-58	25	74	2	WB	449	30	Ldn	65	61	66	55	65	0	None	-	-
C-2-E-WB-2-69	22	225	2	WB	833	30	Ldn	65	61	66	49	65	0	None	-	-
C-2-E-WB-3-19	2	2	3	WB	52	30	Leq	67	67	72	65	69	2	None	-	-
C-2-E-WB-3-20	1	1	3	WB	673	30	Leq	67	67	72	50	67	0	None	-	-
C-2-E-WB-3-37	1	1	3	WB	259	30	Leq	60	63	68	58	62	2	None	-	-
C-2-F-WB-2-67	3	5	2	WB	72	30	Ldn	65	61	66	67	69	4	Severe	-	3 [5]
C-2-F-WB-2-70	6	8	2	WB	453	30	Ldn	65	61	66	56	66	1	None	-	-
C-2-G-EB-1-4	3	3	1	EB	135	20	Leq	67	62	67	62	68	1	None	-	-
C-2-G-EB-2-71	3	100	2	EB	502	20	Ldn	65	61	66	56	66	1	None	-	-
C-2-G-EB-2-72	3	3	2	EB	617	20	Ldn	65	61	66	54	65	0	None	-	-
C-2-G-EB-3-26	3	3	3	EB	85	20	Leq	67	67	72	63	68	1	None	-	-
C-2-G-EB-3-29	3	3	3	EB	463	20	Leq	67	67	72	56	67	0	None	-	-
C-2-G-WB-2-16	5	356	2	WB	72	20	Ldn	65	61	66	68	70	5	Severe	-	5 [356]
C-2-G-WB-2-17	31	330	2	WB	436	20	Ldn	65	61	66	55	65	0	None	-	-
C-2-G-WB-2-18	2	4	2	WB	85	20	Ldn	65	61	66	66	69	4	Moderate	2 [4]	-
C-2-G-WB-2-76	15	15	2	WB	863	20	Ldn	65	61	66	51	65	0	None	-	-
C-2-G-WB-3-28	2	2	3	WB	430	20	Leq	67	67	72	57	67	0	None	-	-
C-2-H-EB-1-1	1	1	1	EB	210	25	Leq	67	62	67	55	67	0	None	-	-
C-2-H-EB-2-19	6	21	2	EB	66	25	Ldn	65	61	66	68	70	5	Severe	-	6 [21]
C-2-H-EB-2-23	1	1	2	EB	207	25	Ldn	62	59	64	62	65	3	Moderate	1 [1]	-

Noise Assessment Table

Representative Receptor/Cluster Identifier	Receptor Count Land (qty)	Receptor Count Unit (qty)	Land Use Category (1,2 or 3)	Side of Guideway (EB/WB)	Distance to Track (feet)	Train Speed (mph)	Noise Assessment Metric (Leq/Ldn)	Existing Noise Level (dBA)	Impact Criteria Moderate (dBA)	Impact Criteria Severe (dBA)	Project Related Noise (dBA)	Cumulative Noise Level (dBA)	Increase Over Existing (dBA)	Impact Level	Number of Impacted Receptors Moderate (land [units])	Number of Impacted Receptors Severe (land [units])
C-2-H-EB-3-27	2	2	3	EB	92	25	Leq	67	67	72	63	68	1	None	-	-
C-2-H-EB-3-30	3	3	3	EB	768	25	Leq	67	67	72	54	67	0	None	-	-
C-2-H-WB-2-20	2	4	2	WB	436	25	Ldn	62	59	64	56	63	1	None	-	-
C-2-H-WB-2-21	4	6	2	WB	436	25	Ldn	65	61	66	56	66	1	None	-	-
C-2-H-WB-2-22	1	1	2	WB	164	25	Ldn	62	59	64	64	66	4	Moderate	1 [1]	-
C-2-I-WB-2-73	1	1	2	WB	594	25	Ldn	62	59	64	58	63	1	None	-	-
C-2-I-WB-2-74	5	448	2	WB	522	25	Ldn	62	59	64	55	63	1	None	-	-
C-2-I-WB-3-31	1	1	3	WB	69	25	Leq	64	65	71	63	67	3	None	-	-
C-A-EB-2-13	23	103	2	EB	154	50	Ldn	58	57	62	71	71	13	Severe	-	23 [103]
C-A-EB-2-14	32	56	2	EB	420	50	Ldn	58	57	62	61	63	5	Moderate	32 [56]	-
C-A-EB-2-5	11	127	2	EB	75	50	Ldn	57	56	62	68	68	11	Severe	-	11 [127]
C-A-EB-2-6	4	148	2	EB	262	50	Ldn	57	56	62	62	63	6	Moderate	4 [148]	-
C-A-EB-2-7	2	106	2	EB	554	50	Ldn	57	56	62	59	61	4	Moderate	2 [106]	-
C-A-EB-2-73	3	3	2	EB	738	50	Ldn	58	57	62	59	62	4	Moderate	3 [3]	-
C-A-EB-3-1	2	2	3	EB	135	50	Leq	70	69	74	66	71	1	None	-	-
C-A-WB-2-1	37	142	2	WB	69	50	Ldn	57	56	62	72	72	15	Severe	-	37 [142]
C-A-WB-2-10	14	15	2	WB	194	50	Ldn	54	55	61	61	62	8	Moderate	14 [15]	-
C-A-WB-2-11	26	28	2	WB	456	50	Ldn	54	55	61	57	59	5	Moderate	26 [28]	-
C-A-WB-2-12	29	29	2	WB	456	50	Ldn	54	55	61	56	58	4	Moderate	29 [29]	-
C-A-WB-2-15	57	60	2	WB	52	50	Ldn	58	57	62	75	75	17	Severe	-	57 [60]
C-A-WB-2-16	12	14	2	WB	164	50	Ldn	58	57	62	68	68	10	Severe	-	12 [14]
C-A-WB-2-17	48	57	2	WB	328	50	Ldn	58	57	62	62	63	5	Moderate	48 [57]	-
C-A-WB-2-18	2	129	2	WB	486	50	Ldn	58	57	62	62	63	5	Moderate	2 [129]	-
C-A-WB-2-2	18	18	2	WB	125	50	Ldn	57	56	62	72	72	15	Severe	-	18 [18]
C-A-WB-2-3	14	14	2	WB	194	50	Ldn	57	56	62	70	70	13	Severe	-	14 [14]
C-A-WB-2-4	10	13	2	WB	387	50	Ldn	57	56	62	63	64	7	Severe	-	10 [13]
C-A-WB-2-8	12	21	2	WB	138	50	Ldn	54	55	61	62	63	9	Severe	-	12 [21]
C-A-WB-2-9	19	19	2	WB	66	50	Ldn	54	55	61	66	66	12	Severe	-	19 [19]
C-A-WB-3-2	1	1	3	WB	118	50	Leq	70	69	74	67	72	2	None	-	-
C-B-EB-2-19	3	3	2	EB	174	30	Ldn	58	57	62	63	64	6	Severe	-	3 [3]
C-B-EB-2-20	22	69	2	EB	384	30	Ldn	58	57	62	54	59	1	None	-	-
C-B-EB-2-21	4	4	2	EB	230	30	Ldn	58	57	62	58	61	3	Moderate	4 [4]	-
C-B-EB-3-3	3	3	3	EB	226	30	Leq	70	69	74	56	70	0	None	-	-
C-B-EB-3-4	1	1	3	EB	732	30	Leq	70	69	74	47	70	0	None	-	-
C-B-EB-3-7	2	2	3	EB	141	30	Leq	70	69	74	57	70	0	None	-	-
C-B-EB-3-8	3	3	3	EB	400	30	Leq	70	69	74	53	70	0	None	-	-
C-B-WB-2-22	31	112	2	WB	121	30	Ldn	58	57	62	59	62	4	Moderate	31 [112]	-
C-B-WB-2-23	44	64	2	WB	341	30	Ldn	58	57	62	54	59	1	None	-	-
C-B-WB-2-24	59	99	2	WB	679	30	Ldn	58	57	62	49	59	1	None	-	-
C-B-WB-3-6	1	1	3	WB	292	30	Leq	70	69	74	54	70	0	None	-	-

Noise Assessment Table

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C-C-EB-1-2	1	1	1	EB	289	35	Leq	70	64	69	51	70	0	None	-	-
C-C-EB-2-29	10	17	2	EB	75	35	Ldn	58	57	62	62	63	5	Moderate	10 [17]	-
C-C-EB-2-30	13	20	2	EB	312	35	Ldn	58	57	62	54	59	1	None	-	-
C-C-EB-2-31	7	77	2	EB	564	35	Ldn	58	57	62	50	59	1	None	-	-
C-C-EB-2-32	1	128	2	EB	98	35	Ldn	59	57	63	60	63	4	Moderate	1 [128]	-
C-C-EB-2-33	6	6	2	EB	39	35	Ldn	59	57	63	69	69	10	Severe	-	6 [6]
C-C-EB-2-34	16	25	2	EB	371	35	Ldn	59	57	63	54	60	1	None	-	-
C-C-EB-2-35	14	17	2	EB	686	35	Ldn	59	57	63	49	59	0	None	-	-
C-C-EB-3-10	1	1	3	EB	56	35	Leq	64	65	71	61	66	2	None	-	-
C-C-EB-3-11	1	1	3	EB	220	35	Leq	64	65	71	55	65	1	None	-	-
C-C-EB-3-9	2	2	3	EB	774	35	Leq	70	69	74	46	70	0	None	-	-
C-C-WB-1-1	1	1	1	WB	262	35	Leq	70	64	69	57	70	0	None	-	-
C-C-WB-2-25	10	12	2	WB	79	35	Ldn	59	57	63	61	63	4	Moderate	10 [12]	-
C-C-WB-2-26	45	65	2	WB	207	35	Ldn	58	57	62	61	63	5	Moderate	45 [65]	-
C-C-WB-2-27	40	70	2	WB	433	35	Ldn	58	57	62	52	59	1	None	-	-
C-C-WB-2-28	20	40	2	WB	673	35	Ldn	58	57	62	47	58	0	None	-	-
C-C-WB-2-36	5	14	2	WB	289	35	Ldn	59	57	63	57	61	2	None	-	-
C-C-WB-2-37	19	27	2	WB	679	35	Ldn	59	57	63	52	60	1	None	-	-
C-C-WB-3-5	2	2	3	WB	702	35	Leq	70	69	74	45	70	0	None	-	-
C-D-EB-2-43	8	16	2	EB	233	50	Ldn	59	57	63	58	62	3	Moderate	8 [16]	-
C-D-EB-2-44	13	17	2	EB	305	50	Ldn	59	57	63	57	61	2	None	-	-
C-D-EB-2-45	17	27	2	EB	367	50	Ldn	59	57	63	55	60	1	None	-	-
C-D-EB-2-46	23	28	2	EB	692	50	Ldn	59	57	63	49	59	0	None	-	-
C-D-EB-2-47	45	125	2	EB	558	50	Ldn	59	57	63	52	60	1	None	-	-
C-D-EB-2-49	4	68	2	EB	246	50	Ldn	58	57	62	58	61	3	Moderate	4 [68]	-
C-D-EB-3-13	3	3	3	EB	768	50	Leq	60	63	68	47	60	0	None	-	-
C-D-EB-3-14	4	4	3	EB	233	50	Leq	60	63	68	58	62	2	None	-	-
C-D-EB-3-16	1	1	3	EB	554	50	Leq	64	65	71	48	64	0	None	-	-
C-D-EB-3-17	1	1	3	EB	545	50	Leq	60	63	68	49	60	0	None	-	-
C-D-WB-2-38	8	11	2	WB	325	50	Ldn	59	57	63	57	61	2	None	-	-
C-D-WB-2-39	14	21	2	WB	531	50	Ldn	59	57	63	53	60	1	None	-	-
C-D-WB-2-40	13	23	2	WB	955	50	Ldn	59	57	63	48	59	0	None	-	-
C-D-WB-2-41	2	47	2	WB	364	50	Ldn	59	57	63	56	61	2	None	-	-
C-D-WB-2-42	47	74	2	WB	541	50	Ldn	59	57	63	53	60	1	None	-	-
C-D-WB-2-48	7	33	2	WB	39	50	Ldn	58	57	62	68	68	10	Severe	-	7 [33]
C-D-WB-3-12	2	2	3	WB	899	50	Leq	64	65	71	48	64	0	None	-	-
C-D-WB-3-15	4	4	3	WB	413	50	Leq	60	63	68	51	61	1	None	-	-
C-E-EB-2-50	7	64	2	EB	394	30	Ldn	58	57	62	57	61	3	None	-	-
C-E-EB-2-52	16	27	2	EB	889	30	Ldn	58	57	62	50	59	1	None	-	-
C-E-EB-2-53	12	39	2	EB	141	30	Ldn	65	61	66	64	68	3	Moderate	12 [39]	-

Noise Assessment Table

Representative Receptor/Cluster Identifier	Receptor Count Land (qty)	Receptor Count Unit (qty)	Land Use Category (1,2 or 3)	Side of Guideway (EB/WB)	Distance to Track (feet)	Train Speed (mph)	Noise Assessment Metric (Leq/Ldn)	Existing Noise Level (dBA)	Impact Criteria Moderate (dBA)	Impact Criteria Severe (dBA)	Project Related Noise (dBA)	Cumulative Noise Level (dBA)	Increase Over Existing (dBA)	Impact Level	Number of Impacted Receptors Moderate (land [units])	Number of Impacted Receptors Severe (land [units])
C-E-EB-2-54	6	10	2	EB	69	30	Ldn	65	61	66	67	69	4	Severe	-	6 [10]
C-E-EB-2-55	25	66	2	EB	364	30	Ldn	58	57	62	56	60	2	None	-	-
C-E-EB-2-56	45	117	2	EB	712	30	Ldn	58	57	62	51	59	1	None	-	-
C-E-EB-3-18	4	4	3	EB	92	30	Leq	67	67	72	63	68	1	None	-	-
C-E-EB-3-21	3	3	3	EB	417	30	Leq	67	67	72	52	67	0	None	-	-
C-E-EB-3-22	3	3	3	EB	702	30	Leq	60	63	68	47	60	0	None	-	-
C-E-WB-2-51	24	38	2	WB	755	30	Ldn	58	57	62	52	59	1	None	-	-
C-E-WB-2-57	13	68	2	WB	56	30	Ldn	65	61	66	68	70	5	Severe	-	13 [68]
C-E-WB-2-58	25	74	2	WB	449	30	Ldn	65	61	66	55	65	0	None	-	-
C-E-WB-2-59	6	275	2	WB	59	30	Ldn	65	61	66	67	69	4	Severe	-	6 [275]
C-E-WB-2-60	22	376	2	WB	436	30	Ldn	65	61	66	56	66	1	None	-	-
C-E-WB-2-61	54	290	2	WB	833	30	Ldn	65	61	66	51	65	0	None	-	-
C-E-WB-3-19	2	2	3	WB	52	30	Leq	67	67	72	65	69	2	None	-	-
C-E-WB-3-20	1	1	3	WB	673	30	Leq	67	67	72	50	67	0	None	-	-
C-E-WB-3-35	2	2	3	WB	502	30	Leq	67	67	72	51	67	0	None	-	-
C-E-WB-3-37	1	1	3	WB	259	30	Leq	60	63	68	58	62	2	None	-	-
C-F-EB-1-4	3	3	1	EB	72	20	Leq	67	62	67	64	69	2	Moderate	3 [3]	-
C-F-EB-1-5	2	2	1	EB	469	20	Leq	67	62	67	52	67	0	None	-	-
C-F-EB-2-62	1	1	2	EB	256	20	Ldn	65	61	66	59	66	1	None	-	-
C-F-EB-2-64	5	102	2	EB	489	20	Ldn	65	61	66	56	66	1	None	-	-
C-F-EB-3-23	2	2	3	EB	75	20	Leq	67	67	72	64	69	2	None	-	-
C-F-EB-3-24	2	2	3	EB	889	20	Leq	67	67	72	46	67	0	None	-	-
C-F-EB-3-25	1	1	3	EB	75	20	Leq	67	67	72	64	69	2	None	-	-
C-F-WB-2-63	3	3	2	WB	489	20	Ldn	65	61	66	55	65	0	None	-	-
C-F-WB-2-71	2	4	2	WB	236	20	Ldn	65	61	66	59	66	1	None	-	-
C-F-WB-3-34	2	2	3	WB	495	20	Leq	67	67	72	53	67	0	None	-	-
C-F-WB-3-36	2	2	3	WB	656	20	Leq	67	67	72	50	67	0	None	-	-
C-G-EB-1-6	2	2	1	EB	738	20	Leq	67	62	67	48	67	0	None	-	-
C-G-EB-1-7	2	2	1	EB	249	20	Leq	67	62	67	59	68	1	None	-	-
C-G-EB-2-66	2	2	2	EB	272	20	Ldn	65	61	66	59	66	1	None	-	-
C-G-EB-2-67	5	5	2	EB	620	20	Ldn	65	61	66	54	65	0	None	-	-
C-G-EB-3-27	2	2	3	EB	696	20	Leq	67	67	72	49	67	0	None	-	-
C-G-EB-3-28	1	1	3	EB	476	20	Leq	67	67	72	53	67	0	None	-	-
C-G-WB-1-8	1	1	1	WB	387	20	Leq	67	62	67	54	67	0	None	-	-
C-G-WB-1-9	1	1	1	WB	354	20	Leq	67	62	67	57	67	0	None	-	-
C-G-WB-2-65	1	1	2	WB	105	20	Ldn	65	61	66	65	68	3	Moderate	1 [1]	-
C-G-WB-2-72	1	3	2	WB	1263	20	Ldn	65	61	66	49	65	0	None	-	-
C-G-WB-3-30	3	3	3	WB	200	20	Leq	67	67	72	57	67	0	None	-	-
C-G-WB-3-31	2	2	3	WB	79	20	Leq	67	67	72	63	68	1	None	-	-
C-G-WB-3-32	1	1	3	WB	712	20	Leq	64	65	71	50	64	0	None	-	-

Noise Assessment Table

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C-H-EB-2-68	4	778	2	EB	679	20	Ldn	65	61	66	55	65	0	None	-	-
C-H-EB-3-26	1	1	3	EB	269	20	Leq	67	67	72	59	68	1	None	-	-
C-H-EB-3-29	2	2	3	EB	712	20	Leq	67	67	72	52	67	0	None	-	-
C-H-WB-2-69	4	14	2	WB	482	20	Ldn	62	59	64	56	63	1	None	-	-
C-H-WB-2-70	2	2	2	WB	899	20	Ldn	62	59	64	52	62	0	None	-	-
C-H-WB-3-33	4	4	3	WB	732	20	Leq	64	65	71	51	64	0	None	-	-

Vibration – Additional Data

Appendix H – Additional Vibration Data

GROUND-BORNE VIBRATION

Human Perception Levels

Vibration consists of rapidly fluctuating (many times per second) motions. Human response to vibration is a function of the average fluctuating motion over a time period, such as 1 second. The **root mean square** (RMS) **amplitude** of a motion over a 1 second period is commonly used to predict human response to vibration. For convenience, decibel notation is used to describe vibration relative to a reference level. In this section, **vibration decibels (VdB)** relative to a reference of 10^{-6} inches per second (**1 μin/sec**) are used.

"Amplitude" is the greatness of extent, or the magnitude of a wave; in this case a sound wave.

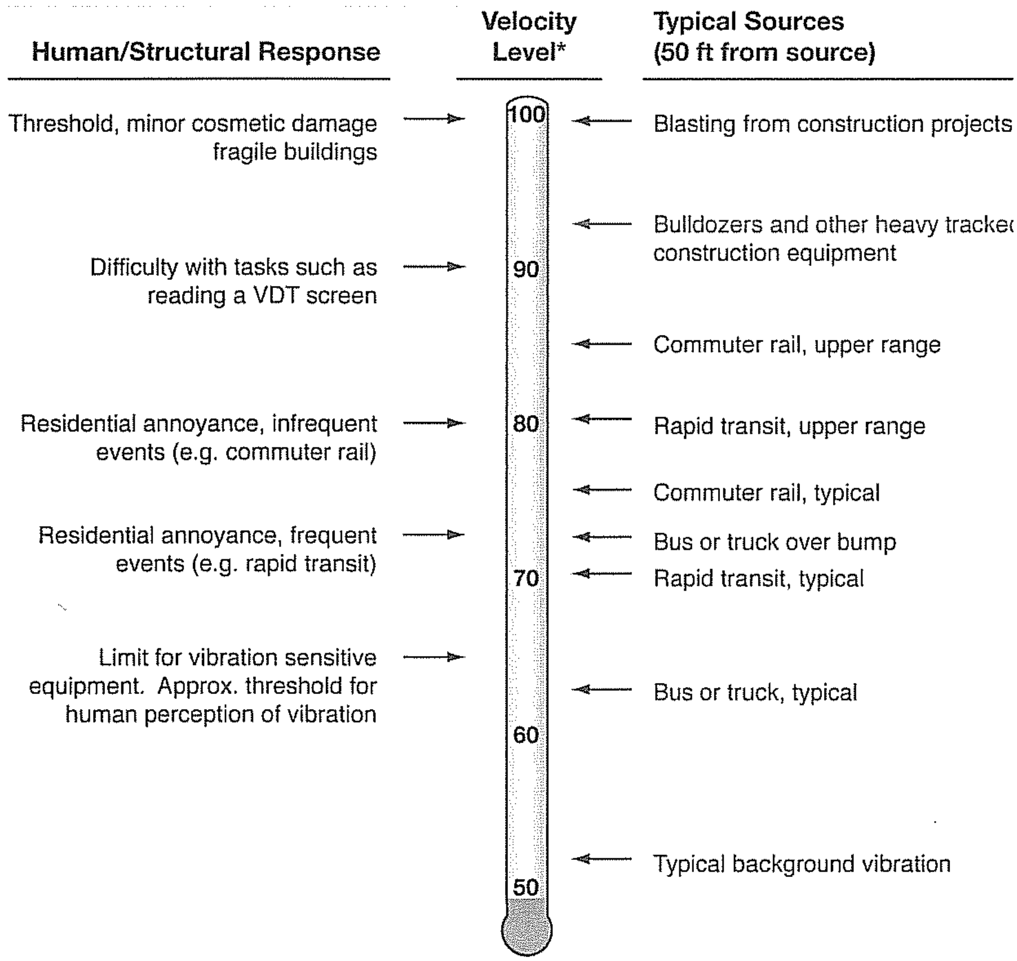
"Vibration decibels (VdB)" – Vibration can be expressed as an acceleration, displacement, or velocity. FTA chose to express vibration as a velocity. Like sound, the range of vibration velocities is enormous. To compress that range into a simple and meaningful scale, FTA created a logarithmic unit – the vibration decibel, or VdB.

"1 μin" = microinch which is equivalent to .000001Inches. This value represents 1 millionth of an inch.

Ground-borne vibration (GBV) can be a serious concern for residents or at facilities that are vibration-sensitive, such as laboratories or recording studios. The effects of ground-borne vibration include perceptible movement of building floors, interference with vibration sensitive instruments, rattling of windows, and the shaking of items on shelves or hanging on walls. According to the FTA *Transit Noise and Vibration Impact Assessment* (May 2006), "The [vibration] criteria … are related to ground-borne vibration causing human annoyance or interfering with use of vibration-sensitive equipment. It is extremely rare for vibration from train operations to cause any sort of building damage, even minor cosmetic damage. However, there is sometimes concern about damage to fragile historic buildings located near the ROW. Even in these cases, damage is unlikely except when the track will be very close to the structure." (pp. 8-4) There is a potential for underground infrastructure, such as utility vaults, to experience vibration from a railway that could contribute to deterioration. Refer to Section 4.10 of Chapter 4 for a discussion of utilities in the project area.

Additionally, GBV can cause the vibration of room surfaces resulting in ground-borne noise (GBN). Ground-borne noise is typically perceived as a low frequency rumbling sound. In contrast to airborne noise, ground-borne vibration is not an everyday experience for most people. The background vibration level in residential areas is usually 50 VdB or lower—well below the threshold of perception for humans, which is around 65 VdB. Levels at which vibration interferes with sensitive instrumentation such as nuclear magnetic resonance (NMR) equipment and other optical instrumentation can range from the level of human perception to a level much lower than the threshold of human perception for equipment. Most perceptible indoor vibration is caused by sources within a building such as the operation of mechanical equipment, movement of people, or slamming of doors. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. Rapid transit upper range sources and rapid transit typical sources are around 80 VdB and 70 VdB, 50 feet from the vibration source. Figure 1 illustrates common vibration sources and the human and structural response to ground-borne vibration.

Figure 1. Common Vibration Sources



** RMS Vibration Velocity Level in VdB relative to 10^{-6} inches/second*

Vibration, as it relates to railway movements, is generally caused by uneven interactions between the wheels of the train and the railway surfaces. Examples of this include wheels rolling over rail joints, or flat spots on wheels that are not true. These uneven interactions result in vibration that travels through the adjacent ground and can range from barely perceptible to very disruptive. The following section provides a description of how vibration is assessed by the FTA and railway activities.

Evaluation Criteria

The FTA uses three land use categories for assessing general vibration impacts; Land Use Categories1, 2 and 3, which are defined in Table 1.

Table 1. Land-Use Categories and Metrics for Transit Vibration Impact Criteria

Land-Use Category	Vibration Descriptor	Description of Land-Use Category
1	High Vibration Sensitivity	This category includes buildings where low ambient vibration is essential for operations within the building that may be well below levels associated with human annoyance. Typical Category 1 land uses include vibration-sensitive research and manufacturing facilities, hospitals, and university research operations. Category 1 also includes special land uses, such as concert halls, television and recording studios, and theaters, which can be very sensitive to vibration and ground-borne noise. The FTA has developed special vibration levels for these land uses.
2	Residential	This category includes all residential land uses and any building where people sleep, such as hotels and hospitals. No differentiation is made between different types of residential areas because ground-borne vibration and noise are experienced indoors, and building occupants have very few means of reducing their exposure to vibration. Even in a noisy urban area, the bedrooms often will be quiet in buildings that have effective noise insulation and tightly closed windows. Consequently, an occupant of a bedroom in a noisy urban area is just as likely to be sensitive to ground-borne noise and vibration as someone in a quiet suburban area.
3	Institutional	This category includes schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment, but still have the potential for activity interference. Although it is appropriate to include office buildings in this category, it is not appropriate to include all buildings that have office space.

Source: FTA, “Transit Noise and Vibration Impact Assessment” (May 2006)

Noise describes what an individual may hear, whereas vibration is what an individual may feel. This section discusses noise that travels through the air to **receptors** and addresses noise that originally travelled through the ground and was then transferred into the air through a vibrating surface.

"Receptors" (noise and vibration) are places or areas that may be affected by changes in noise and vibration. Generally they are residential areas, churches, schools, recreation areas, hospitals, etc.

FTA identifies separate criteria for both ground-borne vibration and ground-borne noise. Ground-borne noise is often masked by airborne-noise; therefore ground-borne noise criteria are primarily applied to subway operations in which airborne noise is negligible. The criteria for ground-borne vibration (general assessment) and ground-borne noise are shown in Table 2. The criteria for vibration and noise for Category 1 special buildings are shown in Table 3.

Table 2. Ground-Borne Vibration Impact Criteria for General Assessment

Land Use Category	Ground-Borne Vibration Impact Levels (VdB re 1 micro inch/sec)			Ground-Borne Noise Impact Levels (dB re 20 micro Pascals)		
	Frequent Events[a]	Occasional Events[b]	Infrequent Events[c]	Frequent Events[a]	Occasional Events[b]	Infrequent Events[c]
Category 1: Buildings where vibration would interfere with interior operations.	65 VdB[d]	65 VdB[d]	65 VdB[d]	N/A[e]	N/A[e]	N/A[e]
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

Source: FTA, "Transit Noise and Vibration Impact Assessment" (May 2006) (FTA-VA-90-1103-06), page 8-3.

Notes:

[a] "Frequent Events" is defines as more than 70 vibration events per day. Most rapid transit projects fall into this category.
[b] "Occasional Events" is defines as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.
[c] "Infrequent Events" is defined as fewer than 30 vibration events per day. This category includes most commuter rail ranch lines.
[d] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research would require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of HVAC systems and stiffened floors.
[e] Vibration-sensitive equipment is generally not sensitive to ground-borne noise.

Table 3. Ground-Borne Vibration and Noise Impact Criteria for Special Buildings

Type of Building or Room[c]	Ground-Borne Vibration Impact Levels (VdB re 1 micro-inch/sec)		Ground-Borne Noise Impact Levels (dB re 20 micro-Pascals)	
	Frequent Events[a]	Occasional or Infrequent Events[b]	Frequent Events[a]	Occasional or Infrequent Events[b]
Concert Halls	65 VdB	65 VdB	25 dBA	25 dBA
TV Studios	65 VdB	65 VdB	25 dBA	25 dBA
Recording Studios	65 VdB	65 VdB	25 dBA	25 dBA
Auditoriums	72 VdB	80 VdB	30 dBA	38 dBA
Theaters	72 VdB	80 VdB	35 dBA	43 dBA

Source: FTA, "Transit Noise and Vibration Impact Assessment" (May 2006) (FTA-VA-90-1103-06), page 8-3. Notes:

[a] "Frequent Events" is defines as more than 70 vibration events per day. Most rapid transit projects fall into this category.
[b] "Occasional or Infrequent Events" is defines as fewer than 70 vibration events per day. This category includes most commuter rail systems.
[c] If the building will rarely be occupied when the trains are operating, there is no need to consider impact. As an example, consider locating a commuter rail line next to a concert hall. If no commuter trains will operate after 7 p.m., the trains should rarely interfere with the use of the hall.

General Vibration Assessment Results

General Vibration Assessment Results by Segment Tables

Table 1. Segment 1 (LRT 1A) General Vibration Assessment Results

Cluster ID	Land Use Category	Side of Track	Distance to Track (feet)	Speed (mph)	Predicted Vibration Level (VdB)	Impact Criterion (VdB)	Number of Impacts (No. of impacted units)
Segment 1 between Highway 5 Station and Highway 62 Station							
1-A-EB-2-8	2	EB	80	50	79	72	12 (12)
1-A-EB-2-9	2	EB	114	50	76	72	15 (15)
1-A-WB-2-1	2	WB	94	50	78	72	7 (10)
1-A-WB-2-2	2	WB	115	50	76	72	10 (10)
1-A-WB-2-21	2	WB	89	50	78	72	3 (3)
1-A-WB-2-23	2	WB	109	50	76	72	4 (6)
1-A-WB-2-4	2	WB	100	50	77	72	7 (7)
Segment 1 between Highway 62 Station and Rowland Station							
No Predicted Impacts							
Segment 1 between Rowland Station and Shady Oak							
1-C-EB-2-15	2	EB	99	40	75	72	44 (44)
1-C-WB-2-13	2	WB	106	40	75	72	16 (16)
						Total Number of Segment 1 Impacts	**118 (123)**

Table 2. Segment 3 (LRT 3A, LRT 3C-1, and LRT 3C-2)
General Vibration Assessment Results

Cluster ID	Land Use Category	Side of Track	Distance to Track (feet)	Speed (mph)	Predicted Vibration Level (VdB)	Impact Criterion (VdB)	Number of Impacts (No. of impacted units)
Segment 3 between Mitchell Station and Southwest Station							
3-A-EB-2-1	2	EB	38	50	85	72	1 (91)
3-A-EB-2-2	2	EB	124	50	75	72	2 (146)
Segment 3 between Southwest Station and Eden Prairie Town Center Station							
No Predicted Impacts							
Segment 3 between Eden Prairie Town Center Station and Golden Triangle Station							
No Predicted Impacts							
Segment 3 between Golden Triangle Station and City West Station							
3-D-EB-1-1	1	EB	160	30	68	65	1 (1)
Segment 3 between City West Station and Opus Station							
No Predicted Impacts							
Segment 3 between Opus Station and Shady Oak Station							
3-F-EB-2-7	2	EB	133	50	74	72	3 (3)
3-F-EB-3-3	3	EB	26	50	87	75	1 (1)
3-F-WB-1-2	1	WB	107	50	66	65	1 (1)
3-F-WB-3-4	3	WB	50	50	83	75	2 (2)
						Total Number of Segment 3 Impacts	**11 (245)**

Table 3. Segment 4 (LRT 1A, LRT 3A, LRT 3C-1, and LRT 3C-2)
General Vibration Assessment Results

Cluster ID	Land Use Category	Side of Track	Distance to Track (feet)	Speed (mph)	Predicted Vibration Level (VdB)	Impact Criterion (VdB)	Number of Impacts (No. of impacted units)
Segment 4 between Shady Oak Station and Hopkins Station							
No Predicted Impacts							
Segment 4 between Hopkins Station and Blake Station							
4-B-EB-1-1	1	EB	111	50	76	65	1 (1)
4-B-WB-3-1	3	WB	104	50	77	75	1 (1)
Segment 4 between Blake Station and Louisiana Station							
4-C-EB-2-2	2	EB	162	50	72	72	1 (1)
Segment 4 between Louisiana Station and Wooddale Station							
No Predicted Impacts							
Segment 4 between Wooddale Station and Beltline Station							
No Predicted Impacts							
Segment 4 between Beltline Station and West Lake Station							
4-F-EB-2-11	2	EB	101	40	75	72	12 (12)
						Total Number of Segment 4 Impacts	**15 (15)**

Table 4. Segment A (LRT 1A and LRT 3A) General Vibration Assessment Results

Cluster ID	Land Use Category	Side of Track	Distance to Track (feet)	Speed (mph)	Predicted Vibration Level (VdB)	Impact Criterion (VdB)	Number of Impacts (No. of impacted units)
Segment A between West Lake Station and 21st Street Station							
A-A-EB-2-5	2	EB	66	45	80	72	47 (152)
A-A-EB-2-6	2	EB	95	45	77	72	16 (17)
A-A-WB-2-1	2	WB	41	45	73	72	34 (34)
A-A-WB-2-3	2	WB	94	45	77	72	19 (20)
Segment A between 21st Street Station and Penn Station							
A-B-EB-2-10	2	EB	87	45	77	72	1 (1)
A-B-WB-2-9	2	WB	120	45	74	72	6 (6)
Segment A between Penn Station and Van White Station							
No Predicted Impacts							
Segment A between Van White Station and Royalston Station							
No Predicted Impacts							
Segment A between Royalston Station and Intermodal Station							
A-E-WB-3-2	3	WB	56	25	76	75	1 (1)
						Total Number of Segment A Impacts	**124 (231)**

Table 5. Segment C-1 (LRT 3C-1) General Vibration Assessment Results

Cluster ID	Land Use	Side of Track	Distance to Track (feet)	Speed (mph)	Ground-Borne Vibration		Ground-Borne Noise		Number of Impacts (No. of impacted units)
					Predicted Vibration Level (VdB)	GBV Impact Criterion (VdB)	Predicted GBN Level (dB)	GBN Impact Criterion (dB)	
Segment C-1 between West Lake Station and Uptown Station									
C-A-EB-2-5	2	EB	67	50	81	72	46	35	13 (129)
C-A-EB-3-1	3	EB	93	50	78	75	43	40	1 (1)
C-A-WB-2-1	2	WB	75	50	80	72	45	35	48 (153)
Segment C-1 between Uptown Station and Lyndale Station									
No Predicted Impacts									
Segment C-1 between Lyndale Station and 28th Street Station									
C-C-EB-2-13	2	EB	31	35	73	72	38	35	2 (2)
Segment C-1 between 28th Street Station and Franklin Station									
C-D-EB-1-6	1	EB	73	50	67	65	32	25	1 (1)
C-D-WB-2-18	2	WB	48	50	70	72	35	35	13 (37)
Segment C-1 between Franklin Station and 12th Street Station									
No Predicted Impacts									
Segment C-1 between 12th Street Station and 8th Street Station									
No Predicted Impacts									
Segment C-1 between 8th Street Station and 4th Street									
No Predicted Impacts									
Total Number of Segment C-1 Impacts									**78 (323)**

Table 6. Segment C-2, C-2A, and C-2B (LRT 3C-2) General Vibration Assessment Results

Cluster ID	Land Use	Side of Track	Distance to Track (feet)	Speed (mph)	Ground-Borne Vibration		Ground-Borne Noise		Number of Impacts (No. of impacted units)
					Predicted Vibration Level (VdB)	GBV Impact Criterion (VdB)	Predicted GBN Level (dB)	GBN Impact Criterion (dB)	
Segment C-2 between West Lake Station and Uptown Station									
C-2-A-EB-2-27	2	EB	67	50	81	72	46	35	13 (129)
C-2-A-EB-3-12	3	EB	93	50	78	75	43	40	1 (1)
C-2-A-WB-2-29	2	WB	75	50	80	72	45	35	48 (153)
Segment C-2 between Uptown Station and Lyndale Station									
No Predicted Impacts									
Segment C-2 between Lyndale Station and 28th Street Station									
C-2-C-EB-2-13	2	EB	31	35	73	72	38	35	2 (2)
Segment C-2 between 28th Street Station and Franklin Station									
C-2-D-EB-1-5	1	EB	127	50	62	65	27	25	1 (1)
C-2-D-WB-2-18	2	WB	48	50	70	72	35	35	13 (37)
Segment C-2 between Franklin Station and 12th Street Station									
No Predicted Impacts									
Segment C-2 between 12th Street Station and Harmon / Hawthorne Station									
No Predicted Impacts									
Segment C-2 between Harmon /Hawthorne Station and Royalston Station									
No Predicted Impacts									
Segment C-2 between Royalston Station and Intermodal Station									
C-2-I-WB-3-10	3	WB	46	25	77	75	42	40	1 (1)
Total Number of Segment C-2 Impacts									**79 (324)**

Sources for Greenhouse Gas Emissions

Sources for Greenhouse Gas Emissions

Chapter 9, Section 9.7.

IPCC (2006). 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Intergovernmental Panel on Climate Change, Geneva, Switzerland.

EPA (2009). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2007. Chapter 3 (Energy), Tables 3-12, 3-13, and 3-14. U.S. Environmental Protection Agency, Washington, DC. U.S. EPA #430-R-09-004 (PDF)

EPA (2010). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2008. Annex 2 (Methodology for estimating CO2 emissions from fossil fuel combustion), Table A-33 and P. A-61. U.S. Environmental Protection Agency, Washington, DC. U.S. EPA #430-R-10-006 (PDF)

Air Quality Incomplete or Unavailable

Air Quality Incomplete or Unavailable Information for Project-Specific MSAT Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than by any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action (FHWA 2009). This logic can also be applied to non-highway projects such as the Southwest Transitway.

Techniques used for forecasting health impacts include emissions dispersion and exposure modeling and final determination of health impacts. Each technique builds on the previous step and each step has technical shortcomings or uncertainties that prevent a more complete distinction of MSAT health impacts for project alternatives. The shortcomings are magnified for lifetime (i.e., 70 year) assessments, as unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology over that time frame, since such information is unavailable. It is particularly difficult to reliably forecast MSAT exposure near roadways, and to determine the portion of time that people are actually exposed at a specific location.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (http://www.epa.gov/risk/basicinformation.htm#g) and the Health Effects Institute (HEI)[1] (HEI 2007) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also a lack of a national consensus on an acceptable level of risk. The current process used by the EPA requires a determination of "safe" or "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are then considered to minimize the number of people with risks greater than 1 in a million due to emissions from a source. The results of this process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million, however, and can result in maximum individual cancer risks that are as high as approximately 100 in a million. Information is incomplete or unavailable to establish whether even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Air toxics analysis is an emerging field and current scientific techniques, tools, and data are not sufficient to accurately estimate human health impacts that would result from a transportation project in a way that is useful to decision-makers.

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[1] HEI is a nonprofit corporation chartered in 1980 as an independent research organization to provide high-quality, impartial, and relevant science on the health effects of air pollution. Typically, HEI receives half of its core funds from the EPA and half from the worldwide motor vehicle industry. Other public and private organizations periodically support special projects or certain research programs.

Remediation Cost Analysis

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Technical Memo

Remediation Cost Analysis

OVERVIEW

This appendix contains an analysis of the potential remediation costs associated with each Southwest Transitway build alternative. The analysis began with a database review to obtain a count of known contaminated sites within 500 feet of the build alternatives, followed by development of a probabilistic estimate of remediation costs for each build alternative.

EXISTING CONDITIONS

Three on-line databases available in Minnesota were consulted to identify potentially contaminated properties. These databases are found on the "What's In My Neighborhood" Internet sites maintained by the Minnesota Pollution Control Agency (MPCA) and the Minnesota Department of Agriculture (MDA). The databases are described below:

- MPCA leaking underground storage tank (LUST) database: Contains locations of active and closed investigations of petroleum releases.
- MPCA Master Entity System (MES): Contains locations of Superfund sites (Comprehensive Environmental Response, Compensation and Liability Information System – CERCLIS; National Priority List – NPL; and Permanent List of Priorities – PLP sites), voluntary investigation and cleanup (VIC) sites, RCRA (Resource Conservation and Recovery Act) facilities, unpermitted dump sites and NFRAP (no further remedial action planned) sites.
- MDA AgChem database: Contains locations of agricultural chemical spill and investigation sites. Database includes active and closed spill sites, and the locations of pesticide and herbicide investigations.

For the purposes of this assessment, the databases were used to identify contaminated sites within 500 feet of the build alternatives. Table 1 summarizes the number of sites identified by segment.

Table 2 summarizes known contaminated sites by Build Alternative.

Table 1: Numbers of Contaminated Sites by Segment

Site Type	Segment					
	1	**3**	**4**	**A**	**C-1**	**C-2**
LUST	6	5	27	22	53	71
Superfund	0	0	2	0	0	0
VIC	2	3	15	12	26	42
AgChem	1	2	4	2	2	2
Dump	1	0	3	0	2	1
Other	1	0	0	1	0	1
Total	**11**	**10**	**51**	**37**	**83**	**117**

Table 2: Numbers of Contaminated Sites by Build Alternative

Site Type	Build Alternative			
	LRT 1A	**LRT 3A**	**LRT 3C-1 (Nicollet Mall)**	**LRT 3C-2 (11th/12th Street)**
LUST	55	54	85	103
Superfund	2	2	2	2
VIC	29	30	44	60
AgChem	7	8	8	8
Dump	4	3	5	4
Other	2	1	0	1
Total	**99**	**98**	**144**	**178**

It should be noted that environmental site investigations and remediation are designed to address significant risks to human health and the environment, and that these sites are often conditionally closed with some residual, low-risk contamination remaining. If encountered during construction, these materials would be removed and disposed of appropriately. As a result, the potential costs to a construction project are often not significantly changed by the active/closed status of the remediation site.

REMEDIATION COST ANALYSIS

This analysis used probabilistic cost estimation methodologies to compare the expected range of costs required to address environmental remediation during construction for each build alternative. Costs were estimated by the following equation:

$$C = A + Ch + V (E + O + D),$$

where C is the cost per site, A is the administrative cost per site, Ch is the cost to characterize the site, V is the volume of contaminated soil, E is the unit cost (per cubic yard) to excavate and transport the contaminated materials, O is the unit cost for environmental oversight and D is the disposal cost. The administrative cost was an assumed flat rate of $5,000 per site, determined by assuming a total of 50 hours from a team of environmental professionals with an average billing rate of $100 per hour. For all the remaining variables, a range of unit costs was estimated with an associated probability. Soil volumes and unit rates for excavation, oversight, and disposal were based on review of cleanup costs during the construction of TH 212 in southern Hennepin and Carver Counties ending in 2007. Characterization rates were estimated based on general ranges of cost for labor and chemical analyses from industry experience in coordinating disposal of contaminated materials.

A list of scenarios was developed by permuting all combinations of the inputs to the above equation. Costs per site and probabilities for each scenario were calculated. A probability density function was calculated by sorting costs and calculating the cumulative probability.

The total estimated cost for each Build Alternative was determined by multiplying the estimated number of sites along the alternative by the probabilistic cost per site. For purposes of this estimate, the actual number of sites was assumed to be somewhat less than the total number of contaminated sites. This is due to variability in factors such as distance, position relative to the alignment, and degree of contamination. To account for this, the total number of sites was reduced by 50 percent for LUST, VIC, Superfund, NFRAP, and unpermitted dump sites, and by 80 percent for AgChem sites (AgChem spills are assumed to be small and less likely to be encountered) and other types of sites[1].

The environmental remediation costs for each segment are summarized in Table 1. Table 2 shows cleanup costs by alignment based on the same method.

Figure 1, Comparative Environmental Remediation Costs, displays the 50 percent probable costs (i.e., a 50 percent chance that the actual cost will be less than or equal to the given amount) by segment and alignment. It should be emphasized that the objective of this evaluation was to develop a means of assessing the relative costs of environmental remediation for each Build Alternative. This analysis is a good faith effort to project the cost by using realistic ranges and actual numbers of known contaminated sites; however, it should not be taken as a projection of the actual remediation costs.

[1] The reduction factors for the number of contaminated sites were developed based on HDR's professional judgment and experience on similar infrastructure projects in urban settings.

Table 1: Estimated Costs in US $ for Environmental Remediation by Segment

Segment:		1	3	4	A	C-1	C-2
No. of Sites:		5	4	24	18	41	58
Probability (%)	Per Site Cost	Estimated Cost					
10	13,000	65,000	52,000	312,000	234,000	533,000	754,000
20	14,300	71,500	57,200	343,200	257,400	586,300	829,400
30	15,500	77,500	62,000	372,000	279,000	635,500	899,000
40	17,500	87,500	70,000	420,000	315,000	717,500	1,015,000
50	19,000	95,000	76,000	456,000	342,000	779,000	1,102,000
60	23,000	115,000	92,000	552,000	414,000	943,000	1,334,000
70	40,750	203,750	163,000	978,000	733,500	1,670,750	2,363,500
80	51,750	258,750	207,000	1,242,000	931,500	2,121,750	3,001,500
90	67,500	337,500	270,000	1,620,000	1,215,000	2,767,500	3,915,000

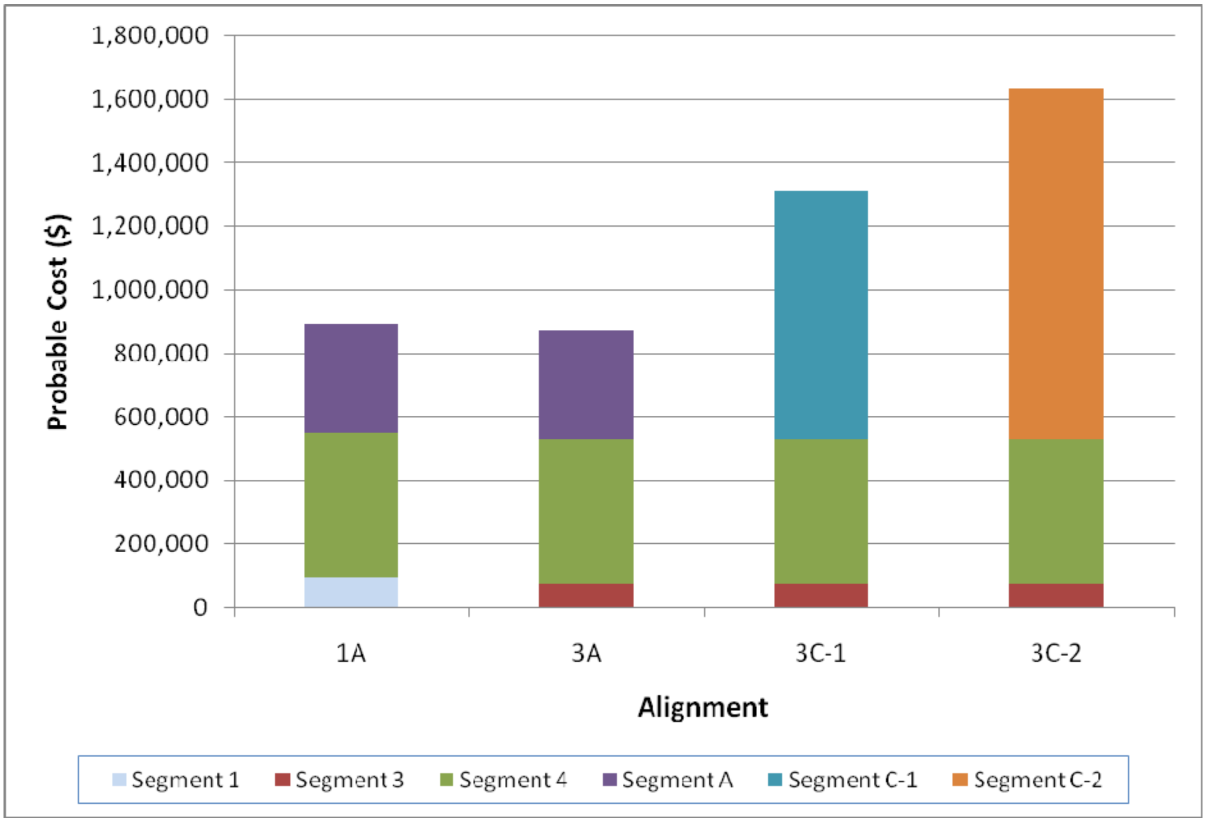
Note: Estimated costs are expressed as a probability of cost not to exceed, that is, the probability that the actual costs will be less than or equal to the amount indicated in the table.

Table 2: Estimated Costs in US $ for Environmental Remediation by Alternative

	Alignment			
Probability (%)	LRT 1A	LRT 3A	LRT 3C-1 (Nicollet Mall)	LRT 3C-2 (11th/12th Street)
10	611,000	598,000	897,000	1,118,000
20	672,100	657,800	986,700	1,229,800
30	728,500	713,000	1,069,500	1,333,000
40	822,500	805,000	1,207,500	1,505,000
50	893,000	874,000	1,311,000	1,634,000
60	1,081,000	1,058,000	1,587,000	1,978,000
70	1,915,250	1,874,500	2,811,750	3,504,500
80	2,432,250	2,380,500	3,570,750	4,450,500
90	3,172,500	3,105,000	4,657,500	5,805,000

Note: Estimated costs are expressed as a probability of cost not to exceed, that is, the probability that the actual costs will be less than or equal to the amount indicated in the table.

Figure 1


1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
Probable Cost ($)
1A
3A
3C-1
3C-2
Alignment
Segment 1
Segment 3
Segment 4
Segment A
Segment C-1
Segment C-2

Transit Effects

APPENDIX

TRANSIT EFFECTS

Projected Boardings

The Enhanced Bus Alternative is projected to carry 13,000 trips per day on two new limited-stop bus routes in the forecast year. In the Build Alternatives LRT 1A, LRT 3A (LPA), LRT 3A-1 (co-location alternative), LRT 3C-1 (Nicollet Mall), and LRT 3C-2 (11th/12th Street), the Enhanced Bus Alternative is replaced by a high-capacity light rail service. The travel demand model forecasts the daily ridership for LRT 1A and LRT 3C - 1 (Nicollet Mall) at approximately 24,850 and 24,550 trips respectively. Alternatives LRT 3A (LPA), LRT 3A-1 (co-location alternative), and LRT 3C-2 (11th/12th Street) are projected to carry about 27,550 and 27,500 trips respectively. These boardings include all trips that have either an origin or a destination along the stations on the Southwest Transitway alignment. In the case of interlined alternatives (LRT 1A, LRT 3A [LPA], LRT 3A-1 [co-location alternative], and LRT 3C-2 [11th/12th Street]), the ridership also included the trips that would board on the Central Corridor LRT and alight on the Southwest Corridor LRT, and vice versa, which accounts for between 12 and 18 percent of the total ridership depending on alternative. Based on the travel time advantages offered by the rail alternatives, the projected rail ridership, when compared to the Enhanced Bus service, is reasonable.

LRT Station Volumes

Presented in Figure 1 through Figure 5 are the estimated 2030 light rail boardings at each LRT station along the proposed alignment for each LRT alternative. As seen in Figure 6, 11 of the 15 stations on LRT 1A are projected to have a daily ridership in excess of 1,000 boardings. Royalston, West Lake, Shady Oak, and Highway 5 stations are among the LRT 1A stations that have high ridership. Of all four LRT alternatives, LRT 1A provides the shortest travel time to downtown (26 minutes). Consequently, it would draw a large amount of trips at its southern terminal station. A substantial portion of these trips (about 72 percent) would be park & ride trips.

For LRT 3A (LPA), LRT 3A-1 (co-location alternative), 13 out of 18 stations are projected to serve more than 1,000 boardings per day. Mitchell, Eden Prairie Town Center, and West Lake would be among those carrying 2,000 or more boardings a day (Figure 7). In terms of travel time to downtown, LRT 3A (LPA), LRT 3A-1 (co-location alternative), provide the next best option (31.5 minutes). This is reflected in the high number of daily boardings projected at three of its suburban stations in Eden Prairie.

For LRT 3C-1 (Nicollet Mall) 16 out of 20 stations are projected to carry 1,000 or more boardings, while LRT 3C-2 (11th/12th Street) has 15 out of 21 stations projected to carry 1,000 or more boardings. Mitchell, Eden Prairie Town Center, and West Lake would be among those carrying 1,500 or more boardings a day. Table 1 presents a summary of boardings for all the alternatives grouped by three segments.

Most regional travel models tend to assign transit trips to individual stations in a coarse and aggregate manner. For that reason, it is more appropriate to examine boardings in “station groups” or route segments. As seen in Table 1, in the southern most segment (from the south end of the line to Rowland Station), the “3” alternatives carry more ridership than LRT 1A because they traverse high density employment centers in the Golden Triangle area.

In the trunk section (Shady Oak to Beltline) the ridership is more or less similar. The slightly higher ridership projections in this section for LRT 1A, LRT 3A (LPA), LRT 3A-1 (co-location alternative) are attributable to shorter travel times to downtown than LRT 3C-1 (Nicollet Mall) and LRT 3C-2 ($11^{th}/12^{th}$ Street).

In the midtown to downtown segment (West Lake to downtown stations), LRT 3C-1 (Nicollet Mall) and LRT 3C-2 ($11^{th}/12^{th}$ Street) are projected to carry higher ridership than the other two alternatives mainly because they traverse the densely developed Uptown area. LRT 3C-2 ($11^{th}/12^{th}$ Street), among all the rail alternatives, has the longest travel time to downtown (40.8 minutes). This contributes to a slightly lower projected ridership at all suburban stations when compared to LRT 3A (LPA), LRT 3A-1 (co-location alternative). As seen in Table 1, in the midtown to downtown segment, LRT 3C-2 ($11^{th}/12^{th}$ Street) is projected to carry about 2,300 more trips than LRT 3A (LPA), LRT 3A-1 (co-location alternative), reflecting the high density activity in the Uptown area. But at the same time, it is projected to carry fewer boardings than LRT 3A (LPA), LRT 3A-1 (co-location alternative) in the other two segments, primarily because of the longer travel times to downtown.

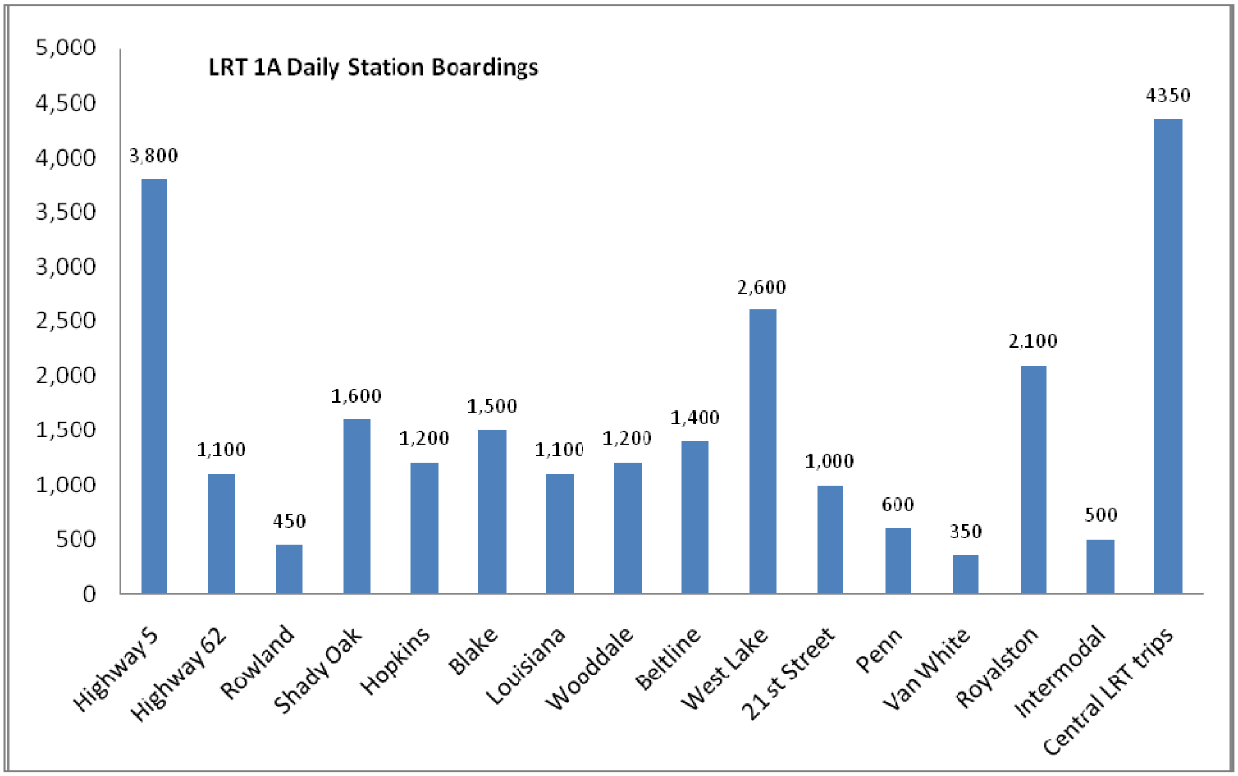
The fewer Central LRT trips shown for LRT 3C-2 ($11^{th}/12^{th}$ Street) are again attributable to its longer travel times to Central LRT destinations when compared to other LRT alternatives.

Table 1. Daily LRT Boardings by Segment

Segments	LRT 1A	LRT 3A (LPA)	LRT 3A-1 (co-location)	LRT 3C-1 (Nicollet Mall)	LRT 3C-2 ($11^{th}/12^{th}$ Streets)
South end of line to Rowland segment	5,350	7,850	7,850	6,650	7,050
Shady Oak to Beltline segment	8,000	8,200	8,200	7,600	7,750
West Lake to Downtown segment	7,150	7,350	7,350	10,300	10,950
Central LRT trips	4,350	5,300	5,300	NA	3,100
Total	**24,850**	**28,700**	**28,700**	**24,550**	**28,850**

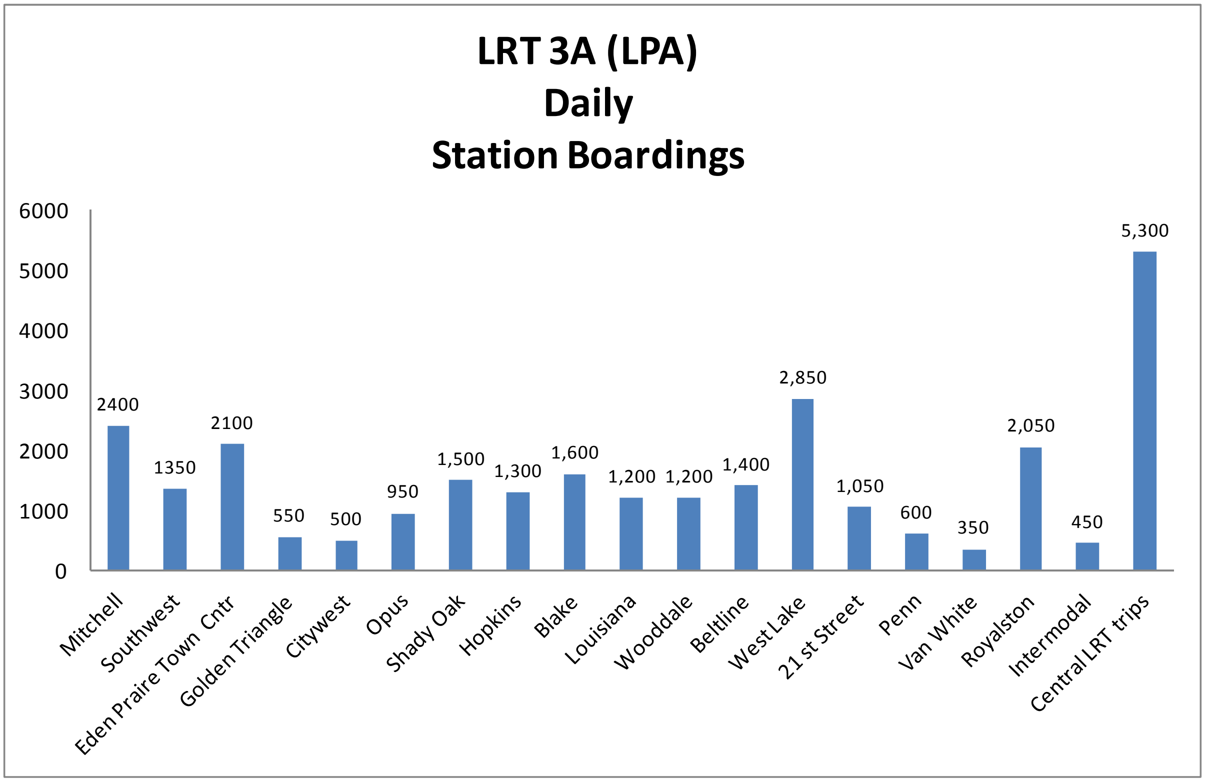
Source: HDR, Inc., 2012

Figure 1. Forecast of Daily Boardings for LRT 1A



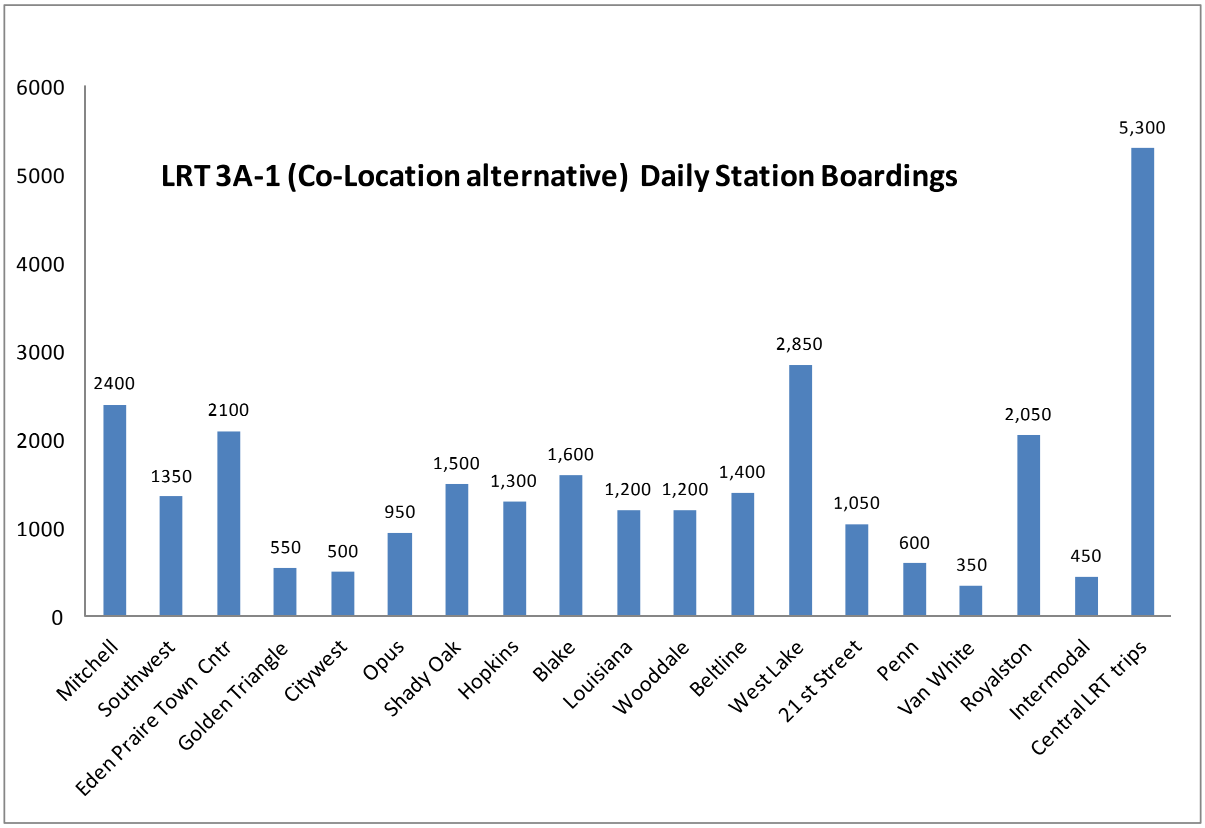
Note: Central LRT trips include those having an origin end on the Central LRT and a destination end on the Southwest Transitway and vice versa.
Source: HDR Inc., 2012

Figure 2. Forecast of Daily Boardings for LRT 3A (LPA)



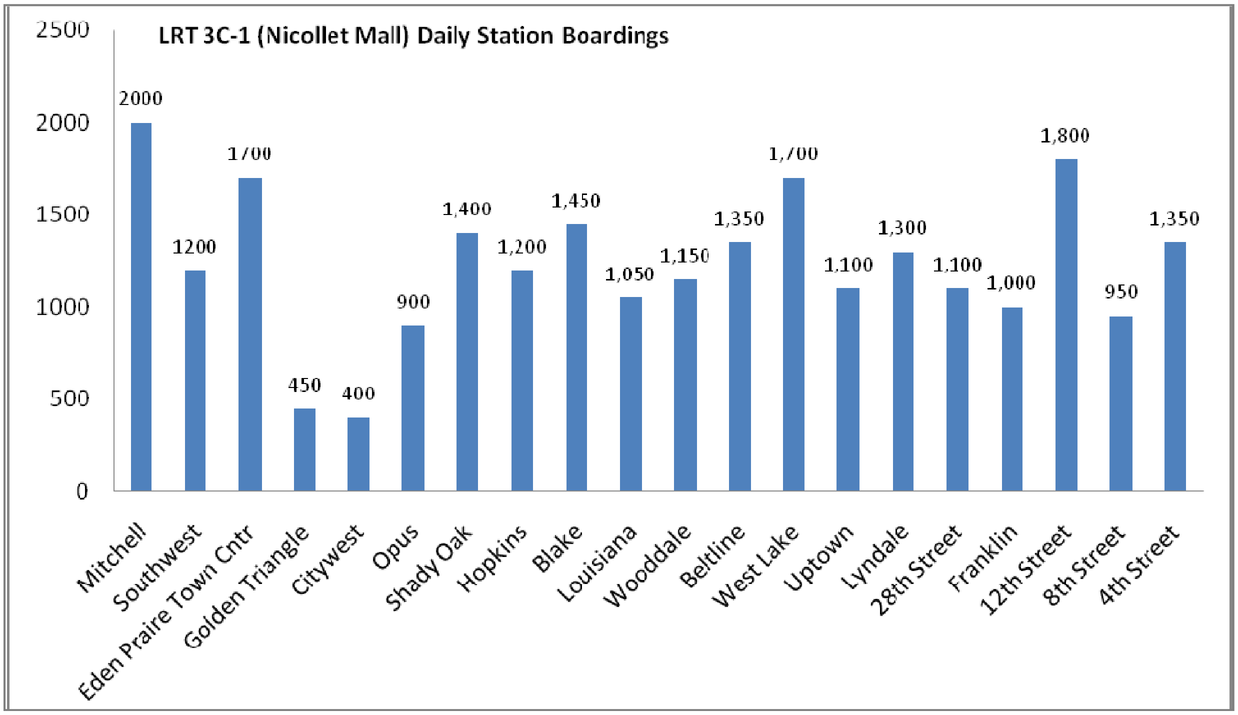
Note: Central LRT trips include those having an origin end on the Central LRT and a destination end on the Southwest Transitway and vice versa.
Source: HDR Inc., 2012

Figure 3. Forecast of Daily Boardings for LRT 3A-1 (co-location alternative)



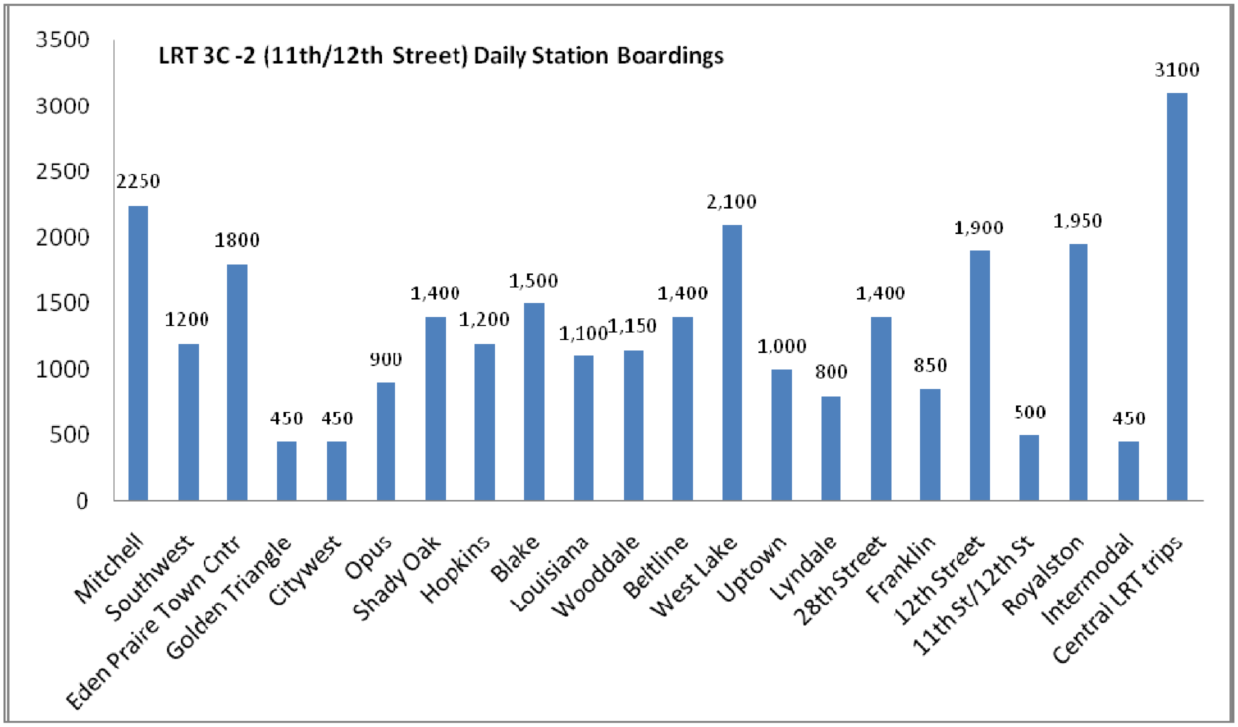
Note: Central LRT trips include those having an origin end on the Central LRT and a destination end on the Southwest Transitway and vice versa.
Source: HDR Inc., 2012

Figure 4. Forecast of Daily Boardings for LRT 3C-1 (Nicollet Mall)



Note: Central LRT trips include those having an origin end on the Central LRT and a destination end on the Southwest Transitway and vice versa.
Source: HDR Inc., 2012

Figure 5. Forecast of Daily Boardings for LRT 3C-2 (11th/12th Street)



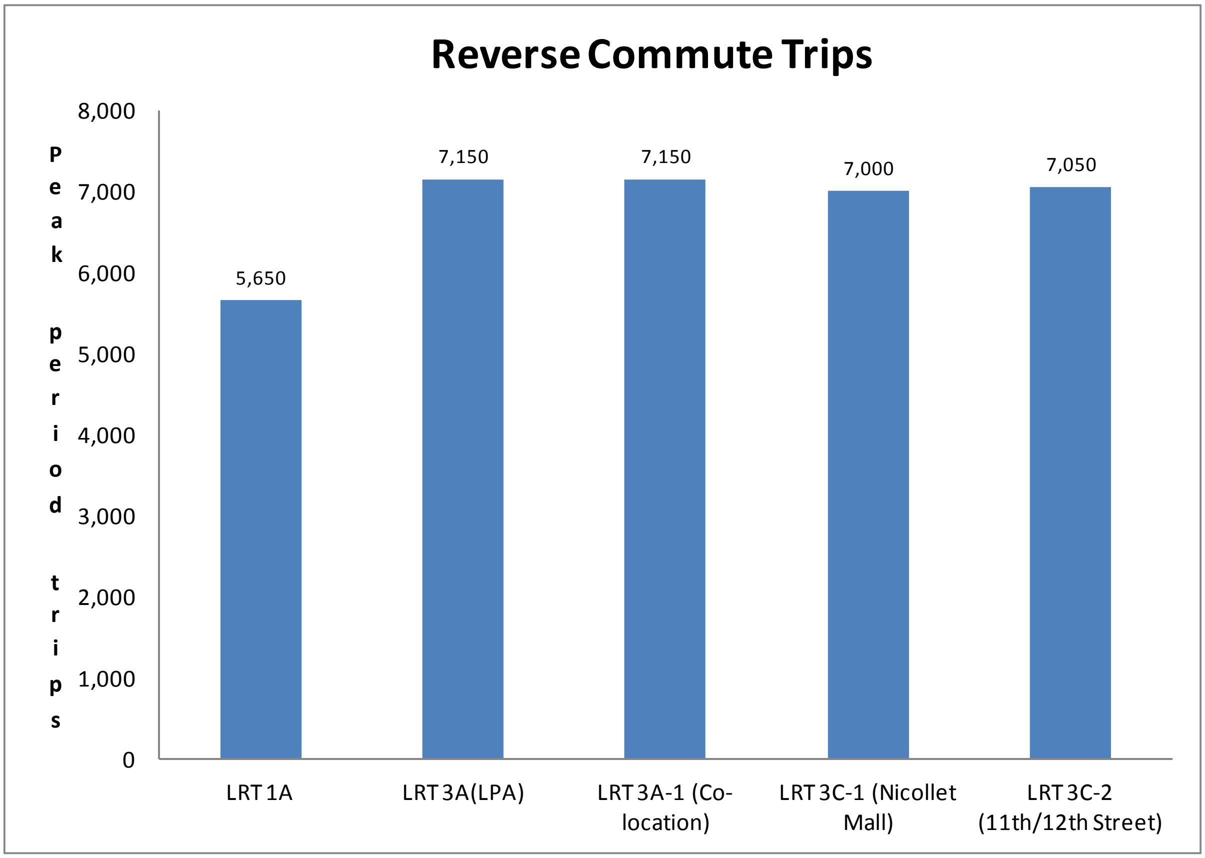
Note: Central LRT trips include those having an origin end on the Central LRT and a destination end on the Southwest Transitway and vice versa.
Source: HDR Inc., 2012

Reverse Commute Ridership

A reverse commute trip is defined as an AM peak period work trip boarding at a Southwest Transitway station in Minneapolis and alighting at a Southwest Transitway station outside of Minneapolis. West Lake station is included in the Minneapolis station group. When studied for their ability to serve reverse commute trips, LRT 3A (LPA), LRT 3A-1 (co-location alternative), LRT 3C-1 (Nicollet Mall) and LRT 3C-2 (11th/12th Street) are projected to serve more reverse commute trips than LRT 1A. This result would be expected because these LRT alignments—including Segment 3—directly serve the current and planned employment centers in Minnetonka and Eden Prairie. There appears to be an equivalent number of reverse commute trips using any of the three Minneapolis alternatives. Again, this demonstrates the strong ability of a Southwest Transitway line to provide a competitive travel choice for reverse commute trips. As shown in Figure 6, LRT 3A (LPA), LRT 3A-1 (co-location alternative), LRT 3C-1 (Nicollet Mall), and LRT 3C-2 (11th/12th Street) are all projected to serve approximately 7,000 reverse commute trips a day, while the LRT 1A alternative is projected to serve approximately 5,700 reverse commute trips per day.

One major reason why LRT 3A (LPA), LRT 3A-1 (co-location alternative), LRT 3C-1 (Nicollet Mall), and LRT 3C-2 (11th/12th Street) carry higher reverse commute trips is because of the high concentration of employment opportunities available around the Golden Triangle, Opus, and Eden Prairie Town Center stations. For the purpose of this analysis, all peak trips were counted in estimating the reverse commute trips.

Figure 6. Forecast of Reverse Commute Trips



Source: HDR Inc., 2012

Traffic Analysis (2012 Update)

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Technical Memorandum

To: *Craig R. Lenning, PE*
HDR Engineering

cc. Michael Martinez, PE
HDR Engineering

From: *Sean Delmore, PE, PTOE*
Chad Ellos, PE

cc. Tony Heppelmann, PE

Date: *April 20, 2010 (Updated on March 21, 2012)*

Re: *Southwest Transitway DEIS – Traffic Analysis Update*
WSB Project No. 01837-050

Introduction and Purpose

The Hennepin County Regional Railroad Authority (HCRRA) is in the process of developing a Southwest Light Rail Transit (LRT) line between downtown Minneapolis and the City of Eden Prairie. Southwest LRT is a proposed high-frequency line with stations in Saint Louis Park, Hopkins, and Minnetonka, as well as Minneapolis and Eden Prairie. It will link with the Hiawatha and Central Corridor LRT lines, as well as the Northstar Commuter rail serving the northwest portion of the Metro area. After extensive analysis and public input culminating in the *Southwest Transitway Scoping Summary Report* (January 2009), four Southwest LRT alternative alignments have been identified for analysis in the Draft Environmental Impact Statement (DEIS) for the project.

The proposed Southwest LRT line will be at-grade for most of its project length. Therefore, many at-grade roadway crossings may be impacted by this project. WSB and Associates, Inc. (WSB) has been retained to analyze the impact of the Southwest LRT alternatives on vehicular traffic operations in the project corridor.

Fixed guideway station access would vary by station. Depending on the alignment chosen, many of the proposed stations would not provide public parking available for transit riders. Since the details of transit stations, including surrounding land-use and proposed traffic patterns, are not finalized at this time, they were not included in this analysis. Engineered drawings for each location are included in Appendix F of the DEIS. Detailed information on parking at each facility is covered in Chapter 2 of the DEIS. Spill-over parking is a possibility and mitigation for site specific impacts will be identified in the FEIS.

The purpose of this memorandum is to describe the analysis, methodology, and its results. This analysis will serve as the basis for the traffic portion of the DEIS document. Each station and the impacts on traffic operations and circulation will be analyzed in detail with the Final Environmental Impact Statement (FEIS).

Alternatives Studied

The Southwest LRT alternatives are identified in **Figure 1**. An index sheet depicting the Major Segments which make up the alternatives is provided in **Figure 2**. The following is a summary of the alternatives being studied:

No-Build: The No-Build Alternative includes all roadway and transit facility and service improvements (other than the proposed project) that are planned, programmed and included in the Metropolitan Council's Financially Constrained Regional Transportation Policy Plan to be implemented by 2030. The No-Build Alternative serves as the National Environmental Policy Act (NEPA) baseline against which the potentially significant environmental benefits and impacts of the build alternatives are measured.

The build alternatives are described below. Under the LRT 1A, LRT 3A, and LRT 3C Alternatives, freight trains that currently operate in the Kenilworth Corridor will be relocated to the MN&S alignment through Saint Louis Park leaving only LRT trains in the Kenilworth Corridor (refer to **Figure 3**). This potential relocation will increase the number of freight trains crossing at-grade along the MN&S alignment. Since this relocation is directly related to the proposed LRT corridor, the at-grade crossing locations through Saint Louis Park on the MN&S alignment will also be evaluated. Under the LRT 3A-1 Alternative (co-location alternative), LRT and freight trains will both operate in the Kenilworth Corridor.

LRT 1A: This alternative would operate from downtown Minneapolis to Eden Prairie terminating at TH 5. It consists of Major Segments 1, 4, and A. The route would connect to the Hiawatha LRT tracks on 5th Street past the downtown Minneapolis Intermodal Station (at Target Field) to Royalston Avenue to the Kenilworth Corridor through Minneapolis, and the HCRRA property through Saint Louis Park, Hopkins, Minnetonka, and Eden Prairie, terminating at TH 5.

LRT 3A: This alternative would operate from downtown Minneapolis to Eden Prairie terminating at Mitchell Road/TH 5. It consists of Major Segments 3, 4, and A. The route would connect to the Hiawatha LRT tracks on 5th Street past the downtown Minneapolis Intermodal Station to Royalston Avenue to the Kenilworth Corridor through Minneapolis, the HCRRA property in Saint Louis Park and Hopkins, to a new right-of-way through the Opus/Golden Triangle area, Southwest Station, terminating at TH 5 and Mitchell Road.

LRT 3A-1: The LRT alignment for this alternative is the same as that of the LRT 3A Alternative. The only difference is that freight trains would not be relocated to the MN&S alignment as assumed in the LRT 3A Alternative. Therefore, in the Kenilworth Corridor, LRT and freight trains would operate alongside each other (co-location) through Saint Louis Park and Minneapolis.

LRT 3C: This alternative would operate from downtown Minneapolis to Eden Prairie terminating at Mitchell Road/TH 5. It consists of Major Segments 3, 4, and C. The route would not interline with the Hiawatha LRT tracks on 5th Street nor connect to the downtown Minneapolis Intermodal Station at Target Field. The route would start at the intersection of Washington Avenue and Nicollet Mall and continue along Nicollet Mall to Nicollet Avenue (tunnel from Franklin Avenue to 28th Street), the Midtown Corridor through Minneapolis, the HCRRA property in Saint Louis Park and Hopkins, to a new right-of-way through the Opus/Golden Triangle Area, Southwest Station, terminating at TH 5 and Mitchell Road.

LRT 3C Sub-Alternatives: These sub-alternatives involve modifications to Major Segment C between the Nicollet Avenue/Midtown Corridor and downtown Minneapolis.

- Blaisdell Avenue Sub-alternative
  The alignment would proceed north from the Midtown Corridor in a tunnel under Blaisdell Avenue (one block west of Nicollet Avenue). The train would exit the tunnel just south of Franklin Avenue and transition across the Plymouth Congregational Church property to enter center running operations on Nicollet Avenue.

- 1st Avenue Sub-alternative
  The alignment would proceed north from the Midtown Corridor in a tunnel under 1st Avenue (one block east of Nicollet Avenue). The trains would exit the tunnel north of Franklin Avenue and would proceed with center running operations on 1st Avenue north to 16th Street, where it would transition diagonally to enter Nicollet Avenue at 15th Street.

- 11th/12th Street Sub-alternative
  This alternate alignment would turn west as a one-way couplet on 11th Street and 12th Street between Nicollet Mall and Royalston Avenue. At Royalston Avenue N, the same routing would be used as alternatives 1A and 3A, which both interline the Hiawatha LRT line on 5th Street.

Methodology

Crossings / Intersections Analyzed

Crossing locations were selected for analysis based on potential intersection impacts related to the proposed LRT transitway. All of the crossings were identified and put through a screening process to determine which crossings needed further analysis. A list of all the crossings is provided in **Attachment A**. Refer to the crossing decision tree, presented in **Figure 4**, for a graphical representation of the screening process described in the following paragraphs.

First, grade separated crossings were screened and at-grade crossings were carried to the next step. Next, applying the guidance in the MUTCD, Section 8C.10, if a signalized intersection was located within 200 feet of the at-grade crossing, it was analyzed. Otherwise, if a signal, roundabout, or stop sign controlling the roadway crossing the tracks was located within 600 feet of the tracks, it was carried to the next step. Then, if the AADT was greater than 5,000 vehicles per day, it was analyzed. Intersections that did not meet the previous criteria were not analyzed as part of this traffic study.

From this screening process, a list of crossings was selected for analysis. Nearby intersections were also included if the intersections were part of a network of intersections affected by the crossing. A total of 47 intersections, mostly signalized, were analyzed in this study and are identified in **Table 1**.

There were no intersections retained for analysis along Major Segment 1 and Major Segment A as part of this study. Also, for the freight train relocation segment through Saint Louis Park, no at-grade crossings along the MN&S alignment were retained. There were no signalized intersections near the crossings and all roadways crossing the tracks had daily traffic volumes of less than the benchmark 5000 vehicles per day (refer to the crossing decision tree in Figure 4).

The 47 intersections retained for analysis were grouped into 12 traffic models to evaluate the LRT impacts to the system of closely spaced intersections.

Intersection location codes, which refer directly to the Table 1 information, are depicted on **Figure 5** through **Figure 14**. These figures are organized according to Major Segment, as defined previously in the Southwest Corridor study process:

- Figures 4-5: Major Segment 1
- Figures 6-7: Major Segment 3
- Figures 8-9: Major Segment 4
- Figures 10-11: Major Segment A
- Figures 12-13: Major Segment C

Table 1 – Intersections Studied

Model #	Location Code	Intersection
Major Segment 3 (LRT 3A, 3C, & 3C Sub Alternatives)		
1	1	TH 5 North Ramp & Mitchell Rd
	2	TH 5 South Ramp & Mitchell Rd
	3	Lone Oak Rd & Mitchell Rd
	4	Technology Drive & Mitchell Rd
2	5	Bryant Lake Dr & Valley View Road
	6	Flying Cloud Dr & Valley View Road
	7	Praire Center Dr & Valley View Road (East Jct)
	8	Viking Dr & Prairie Center Dr
Major Segment 4 (All Alternatives)		
3	9	CSAH 3 & 17th Ave
	10*	5th Street & 16th Ave
4	11	CSAH 3 & 11th Ave
	12	CSAH 3 & 8th Ave
	13	CSAH 3 & 5th Ave
5	14	2nd Street & Blake Rd. N.
	15	Blake Rd. N. & CSAH 3
6	16	TH 7 WB On-Ramp & Woodale Ave.
	17	TH 7 EB Off-Ramp & Woodale Ave.
	18*	TH 7 Frontage Rd & Woodale Ave.
	19	36th St & Woodale Ave.
7	20	CSAH 25 & Belt Line Blvd
	21*	CSAH 25 S. Frontage Rd & Belt Line Blvd

Model #	Location Code	Intersection
Major Segment C (LRT 3C & 3C Sub Alternatives)		
8	22	28th St & Nicollet Ave
9	23	Blaisdell Ave & Franklin Ave
	24	Nicollet Ave & Franklin Ave
	25	1st Ave & Franklin Ave
10	26	W 15th St & Nicollet Ave S
	27	W Grant St & Nicollet Ave S
	28	13th St S & Nicollet Ave S
	29	12th St S & Nicollet Ave S
	30	11th St S & Nicollet Ave S
	31	S 10th St & Nicollet Ave S
	32	S 9th St & Nicollet Ave S
	33	S 8th St & Nicollet Ave S
	34	S 7th St & Nicollet Ave S
	35	S 6th St & Nicollet Ave S
	36	S 5th St & Nicollet Ave S
	37	S 4th St & Nicollet Ave S
	38	S 3rd St & Nicollet Ave S
11	39	11th St S & LaSalle Ave
	40	11th St S & Harmon Pl
	41	11th St N & Hennepin Ave
	42	11th St N & Hawthorne Ave
	43	12th St S & LaSalle Ave
	44	12th St S & Harmon Pl
	45	12th St N & Hennepin Ave
	46	12th St N & Hawthorne Ave
12	47	Glenwood Ave & Royalston Ave N

* Unsignalized intersection

<u>Traffic Counts</u>

To provide a basis for all the operational analysis summarized in this Technical Memorandum, existing turning movements, within the past two years (April 5, 2008 to the present) were needed for all of the study intersections. For some intersections, existing data was received from Mn/DOT, Hennepin County, the City of Eden Prairie, and the City of Minneapolis. For the majority, however, new counts were performed as part of this study. These counts were performed between February 10th and March 10th of 2010. Groups of intersections being modeled together required that turning movements between intersections be balanced, due to subtle fluctuations between counts performed on different days, to reflect an average number of vehicles performing that movement on an average day.

Analysis Years, Traffic Growth Factor, Assumed Future Projects

The intersections indentified previously were analyzed for the existing year (2010), opening year (2018), and the design year (2030). A single 20 year growth factor, provided by HDR Engineering, was used to project existing traffic volumes to the design year 2030 No Build and Build volumes. This factor was calculated by comparing the growth in traffic volumes adjacent to the Southwest Transitway Corridor in Metropolitan Council's Regional Models (2000 and 2030). An average growth over thirty years was determined. The twenty years of growth associated with the study timeframe (2010 – 2030) was calculated at twelve percent. As a result, forecast 2030 traffic volumes were generated by applying the twenty year growth factor of 1.12 to the existing counts. In order to obtain forecast year 2018 volumes, an eight year growth factor was derived by distributing the twenty years of growth (twelve percent) based on the assumption that initial growth would follow a flatter trend the first few years and then become steeper toward year 2030. From this growth distribution, volumes during the first eight years were estimated to increase three percent. As a result, forecast year 2018 volumes were then generated by applying a growth factor of 1.03 to the existing counts. A tabulation of traffic counts and forecasts for each intersection is provided in **Attachment B.**

Major transportation projects which would affect our operational analysis were identified by reviewing Mn/DOT's Statewide Transportation Improvement Program (STIP) and Capital Improvement Programs (CIPs) for Hennepin County, Eden Prairie, Minnetonka, Hopkins, Saint Louis Park, and Minneapolis. Since the Wooddale Avenue interchange improvements at Trunk Highway 7 in Saint Louis Park are currently under construction, these improvements were reflected in the existing and future analyses. Future improvements in Eden Prairie included modifications to the intersection of Valley View Road and Prairie Center Drive (East Jct). No other improvements along the Southwest LRT corridor were assumed.

Operational Analysis Methodology

The key periods of operational analysis are the times of greatest traffic volume and congestion: AM peak hour and PM peak hour. The AM peak hour characterizes the highest hourly volume of traffic for each group of intersections modeled together between 6:00 AM and 9:00 AM. The PM peak hour characterizes an hour between 3:00 PM and 6:00 PM.

The operational evaluation of the intersections was based on a Level of Service (LOS) analysis incorporating established methodologies documented in the Highway Capacity Manual (TRB, 2000). For intersections, LOS is primarily a function of delay, which is based on AM and PM peak-hour turning movement volumes, intersection lane configuration, and traffic control (e.g. traffic signal assumptions). Levels of service range from A (limited delay) through F (excessive delay). Level of service A through D are generally considered acceptable in metropolitan areas; LOS E conditions generally require mitigation, and LOS F represents very poor operational conditions which require mitigation.

The LOS analysis was performed using Synchro/SimTraffic:

- Synchro, a software package that implements Highway Capacity Manual (HCM) methodologies, was used to build each signalized intersection and provide an input database for turning-movement volumes, lane geometrics, and signal design and timing characteristics. In addition, Synchro was used to optimize signal timing parameters for future conditions. Output from Synchro is transferred to SimTraffic, the traffic simulation model.

- SimTraffic is a micro-simulation computer modeling software that simulates each individual vehicle's characteristics and driver behavior in response to traffic volumes, intersection configuration, and signal operations. The model simulates drivers' behaviors and responses to surrounding traffic flow as well as different vehicle types and speeds. It outputs estimated vehicle delay and queue lengths at each intersection being analyzed.

Synchro/SimTraffic was used not only to project future LOS conditions, but to define existing conditions using existing signal timing and traffic count information described previously. Intersection signal timing was requested from the controlling agencies for each intersection analyzed. For intersections where data was unavailable, Mn/DOT standard signal timing parameters were applied. Additionally, signal timing for intersections within the City of Minneapolis was determined from field observations.

Future intersection signal timing for the no-build alternative was computed utilizing the appropriate increase in traffic and optimizing the intersection offsets and splits in the Synchro software package.

Future signal timing, for intersections where the LRT alignment passed in close proximity, was modeled using the Synchro/SimTraffic modeling software. Synchro/SimTraffic does not have the direct capacity to model LRT and freight trains, but a timing plan was created to represent the disruption to the signal's timing plan caused by the trains at intersections where signal preemption or priority would be used. The signal's timing plan was modified to include two to four additional phases within the signal's ring and barrier to represent a clearance interval and limited service phases allowed to operate with the trains. A preemption/priority call to the signal would be placed only when a train was present, which was assumed to be every 3.75 minutes during the peak periods for LRT (According to the Technical Memorandum No. 2: Description of Alternatives, the Southwest LRT would provide high frequency, 7.5 minute peak period, bidirectional headways) and once per peak period for freight trains.

The first additional phase provided a clearance interval which allows vehicles to clear the tracks and time for the gate arms to descend. This phase duration was estimated at 30 seconds. The second additional phase permitted limited service to phases that were allowed to time while the train was crossing through the intersection. This phase duration was estimated at 15 seconds for LRT and 120 seconds for a freight train[1]. In summary, a train call to the signal would disrupt the signal's normal cycle length for a total of 45 seconds for LRT and 150 seconds for a freight train before normal phasing would be restored.

[1] A freight train was assumed to consist of 30 traincars measuring 60 feet each and traveling at a speed of 10 mph.

LRT in downtown Minneapolis was assumed to run with traffic, without preemption or priority. It was assumed that when LRT was present along Nicollet Mall between 13th Street and Washington Avenue that only the LRT will operate along Nicollet Mall. Local bus service and taxis will have to relocate to other streets. It was also assumed that when LRT was in-place along 11th Street and 12th Street, it would replace one traffic lane along each street, thus reducing the street's capacity. Future segment capacity analyses along 11th Street and 12th Street incorporate this reduction in cross-sectional width.

A special case of the traffic signal turning all-red to allow the train to diagonally cross the intersection was used in two locations. First, the Blaisdell Avenue sub-alternative crosses the Franklin Avenue / Nicollet Avenue intersection at-grade. Secondly, the 11th / 12th Street sub-alternative crosses the Nicollet Mall / 11th Street intersection at-grade. When the train crosses these intersections, the signal remains all-red for approximately 18 seconds, allowing the train to diagonally cross through the intersection before traffic phases are allowed to resume.

During collection of turning movement counts, pedestrian counts were also taken. Pedestrians at intersections were modeled two ways, one for suburban intersections and one for urban intersections within the City of Minneapolis.

- **Suburban Intersections:** All pedestrian counts at intersections outside of Minneapolis City limits were less than 5 pedestrians per hour crossing an approach. Pedestrians were accommodated at these intersections by ensuring the max green time for any phase was long enough to accommodate a pedestrian safely crossing an intersection; this move would be actuated by the pedestrian. Typically, the through phases during the peak hour max out and run the full green time, which is adequate for pedestrians to cross. Due to the excessively low pedestrian counts, pedestrians were not modeled.

- **Minneapolis Intersections:** Counts for intersections within the City of Minneapolis show that pedestrian volumes range between 50 and 250 pedestrians per hour for many of the crossing locations. Observed/measured signal timing revealed adequate time for pedestrians to cross regardless of pedestrian volumes. The minimum green time for all through phases at all intersection was set at a large enough value to safely accommodate the counted pedestrian volume.

Results

Traffic Operations

The results of the operational analysis are provided in **Table 2** (AM peak hour) and **Table 3** (PM peak hour). For each intersection in the study, these tables provide intersection level of service by major segment for the LRT alignments. This presentation facilitates a comparison of intersection operations for existing conditions and future conditions by Major Segment with and without LRT. More detailed information including LOS results and vehicle queue lengths for the individual approaches to each intersection is provided in **Attachments C** and **D**.

LRT stations, specifically those with Park & Ride facilities, will cause localized increases in traffic along the adjacent roadways. This may include some local cut-through traffic from drivers familiar with the roadway networks of adjacent neighborhoods. A more detailed analysis of these impacts will be included in the FEIS.

Table 2 Intersection Level of Service – AM Peak Hour

Alternative			2010 Peak Hour	2018 Peak Hour	2018 Peak Hour	2018 Peak Hour	2030 Peak Hour	2030 Peak Hour	2030 Peak Hour
			Existing Condition	No Build	Build LRT	Build LRT Co-Location Alternative	No Build	Build LRT	Build LRT Co-Location Alternative
Model #	Location Code	Intersection	LOS by Intersection	LOS by Intersection	LOS by Intersection	LOS by Intersection	LOS by Intersection	LOS by Intersection	LOS by Intersection
Major Segment 3 (LRT 3A, 3C, & 3C Sub Alternatives)									
1	1	TH 5 North Ramp & Mitchell Rd	B	B	C	C	B	C	C
	2	TH 5 South Ramp & Mitchell Rd	B	B	B	B	B	B	B
	3	Lone Oak Rd & Mitchell Rd	A	A	A	A	A	A	A
	4	Technology Drive & Mitchell Rd	C	C	C	C	C	C	C
2	5	Bryant Lake Dr & Valley View Road	C	D	F	F	E	F	F
	6	Flying Cloud Dr & Valley View Road	D	D	F	F	E	F	F
	7	Praire Center Dr & Valley View Road (East Jct)	B	C	B*	B*	C	C	C
	8	Viking Dr & Prairie Center Dr	C	D	C*	C*	D	C*	C*
Major Segment 4 (All Alternatives)									
3	9	CSAH 3 & 17th Ave	N/A	A	A	A	A	A	A
	10	5th Street & 16th Ave	N/A	A	A	A	A	A	A
4	11	CSAH 3 & 11th Ave	B	B	B	B	B	B	B
	12	CSAH 3 & 8th Ave	A	A	B	B	A	B	B
	13	CSAH 3 & 5th Ave	B	B	C	C	B	C	C
5	14	2nd Street & Blake Rd. N.	B	A	A	A	A	A	A
	15	Blake Rd. N. & CSAH 3	C	B	C	C	C	C	C
6	16	TH 7 WB On-Ramp & Wooddale Ave.	A	A	A	A	A	B	B
	17	TH 7 EB Off-Ramp & Wooddale Ave.	A	B	B	B	B	B	B
	18	TH 7 Frontage Rd & Wooddale Ave.	A	A	A	A	A	A	A
	19	36th St & Wooddale Ave.	C	B	B	C	C	C	C
7	20	CSAH 25 & Belt Line Blvd	C	C	C	C	C	C	C
	21	CSAH 25 S. Frontage Rd & Belt Line Blvd	A	A	A	A	A	A	A
Major Segment C (LRT 3C & 3C Sub Alternatives)									
8	22	28th St & Nicollet Ave	B	B	B	N/A	B	B	N/A
9	23	Blaisdell Ave & Franklin Ave	B	B	B	N/A	B	B	N/A
	24	Nicollet Ave & Franklin Ave	B	B	B	N/A	B	B	N/A
	25	1st Ave & Franklin Ave	B	B	B	N/A	B	B	N/A
Sub Alternatives Blaisdell Ave (No-Build Same as Nicollet									
9	23	Blaisdell Ave & Franklin Ave	N/A	N/A	B	N/A	N/A	B	N/A
	24	Nicollet Ave & Franklin Ave	N/A	N/A	B	N/A	N/A	C	N/A
	25	1st Ave & Franklin Ave	N/A	N/A	B	N/A	N/A	B	N/A
Major Segment C (LRT 3C & 3C Sub Alternatives)									
9	26	W 15th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	27	W Grant St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	28	13th St S & Nicollet Ave S	A	A	A	N/A	A	A	N/A
Sub Alternatives Nicollet Mall									
10	29	12th St S & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	30	11th St S & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	31	S 10th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	32	S 9th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	33	S 8th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	34	S 7th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	35	S 6th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	36	S 5th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	37	S 4th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	38	S 3rd St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
Sub Alternative 11th and 12th Street									
11	30	11th St S & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	39	11th St S & LaSalle Ave	B	B	B	N/A	B	B	N/A
	40	11th St S & Harmon Pl	B	B	B	N/A	B	B	N/A
	41	11th St N & Hennepin Ave	B	B	B	N/A	B	B	N/A
	42	11th St N & Hawthorne Ave	B	B	B	N/A	C	B	N/A
	29	12th St S & Nicollet Ave S	B	B	C	N/A	B	C	N/A
	43	12th St S & LaSalle Ave	C	C	C	N/A	C	C	N/A
	44	12th St S & Harmon Pl	B	B	B	N/A	B	B	N/A
	45	12th St N & Hennepin Ave	B	B	B	N/A	B	B	N/A
	46	12th St N & Hawthorne Ave	C	C	C	N/A	D	D	N/A
12	47	Glenwood Ave & Royalston Ave N	A	A	B	N/A	A	B	N/A

* Analysis reveals that the intersection LOS is better in the build scenario. This results from an unacceptable LOS and substantial queues at upstream and/or downstream intersections that meters traffic and causes approach volumes entering the intersection to be less than forecasted volumes.

Table 3 Intersection Level of Service – PM Peak Hour

Model #	Location Code	Intersection	2010 Peak Hour Existing Condition LOS by Intersection	2018 Peak Hour No Build LOS by Intersection	2018 Peak Hour Build LRT LOS by Intersection	2018 Peak Hour Build LRT Co-Location Alternative LOS by Intersection	2030 Peak Hour No Build LOS by Intersection	2030 Peak Hour Build LRT LOS by Intersection	2030 Peak Hour Build LRT Co-Location Alternative LOS by Intersection
Major Segment 3 (LRT 3A, 3C, & 3C Sub Alternatives)									
1	1	TH 5 North Ramp & Mitchell Rd	C	B	B	B	B	B	B
	2	TH 5 South Ramp & Mitchell Rd	B	B	B	B	B	B	B
	3	Lone Oak Rd & Mitchell Rd	A	A	A	A	A	A	A
	4	Technology Drive & Mitchell Rd	C	B	C	C	C	C	C
2	5	Bryant Lake Dr & Valley View Road	D	D	D	D	D	E	E
	6	Flying Cloud Dr & Valley View Road	D	C	D	D	D	E	E
	7	Praire Center Dr & Valley View Road (East Jct)	E	D	E	E	D	F	F
	8	Viking Dr & Prairie Center Dr	D	D	E	E	D	F	F
Major Segment 4 (All Alternatives)									
3	9	CSAH 3 & 17th Ave	N/A	A	A	A	B	B	B
	10	5th Street & 16th Ave	N/A	A	A	A	A	A	A
4	11	CSAH 3 & 11th Ave	C	C	C	C	C	C	C
	12	CSAH 3 & 8th Ave	B	B	B	B	B	C	C
	13	CSAH 3 & 5th Ave	B	B	B	B	C	C	C
5	14	2nd Street & Blake Rd. N.	B	B	B	B	B	B	B
	15	Blake Rd. N. & CSAH 3	C	C	B	B	C	C	C
6	16	TH 7 WB On-Ramp & Wooddale Ave.	A	A	B	C	B	B	B
	17	TH 7 EB Off-Ramp & Wooddale Ave.	A	B	B	A	B	B	B
	18	TH 7 Frontage Rd & Wooddale Ave.	A	A	A	C	A	A	A
	19	36th St & Wooddale Ave.	B	C	B	C	C	C	D
7	20	CSAH 25 & Belt Line Blvd	D	D	D	C	D	D	D
	21	CSAH 25 S. Frontage Rd & Belt Line Blvd	A	B	B	F	E	F	F
Major Segment C (LRT 3C & 3C Sub Alternatives)									
8	22	28th St & Nicollet Ave	B	B	B	N/A	B	B	N/A
9	23	Blaisdell Ave & Franklin Ave	B	B	B	N/A	B	B	N/A
	24	Nicollet Ave & Franklin Ave	B	B	C	N/A	C	D	N/A
	25	1st Ave & Franklin Ave	B	B	B	N/A	C	C	N/A
Sub Alternatives Blaisdell Ave (No-Build Same as Nicollet									
9	23	Blaisdell Ave & Franklin Ave	N/A	N/A	B	N/A	N/A	C	N/A
	24	Nicollet Ave & Franklin Ave	N/A	N/A	D	N/A	N/A	D	N/A
	25	1st Ave & Franklin Ave	N/A	N/A	D	N/A	N/A	E	N/A
Major Segment C (LRT 3C & 3C Sub Alternatives)									
9	26	W 15th St & Nicollet Ave S	C	C	C	N/A	C	C	N/A
	27	W Grant St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	28	13th St S & Nicollet Ave S	B	B	B	N/A	B	B	N/A
Sub Alternatives Nicollet Mall									
10	29	12th St S & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	30	11th St S & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	31	S 10th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	32	S 9th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	33	S 8th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	34	S 7th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	35	S 6th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	36	S 5th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	37	S 4th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	38	S 3rd St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
Sub Alternative 11th and 12th Street									
11	30	11th St S & Nicollet Ave S	B	B	B	N/A	B	D	N/A
	39	11th St S & LaSalle Ave	C	C	C	N/A	C	D	N/A
	40	11th St S & Harmon Pl	B	B	B	N/A	B	B	N/A
	41	11th St N & Hennepin Ave	B	B	B	N/A	B	B	N/A
	42	11th St N & Hawthorne Ave	B	B	C	N/A	B	C	N/A
	29	12th St S & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	43	12th St S & LaSalle Ave	B	B	B	N/A	C	C	N/A
	44	12th St S & Harmon Pl	B	B	B	N/A	B	B	N/A
	45	12th St N & Hennepin Ave	B	B	B	N/A	B	B	N/A
	46	12th St N & Hawthorne Ave	B	B	B	N/A	B	B	N/A
12	47	Glenwood Ave & Royalston Ave N	B	B	B	N/A	B	C	N/A

Major Segment 1

Intersections along this segment were not analyzed because major roadway junctions are grade separated and the at-grade crossings are with roadways that carry mostly residential traffic at low volumes. Minimal traffic queuing is expected and not anticipated to cause significant impacts to traffic operations.

Major Segment 3

Two groups of intersections along this segment were analyzed. The analysis of intersections near the junction of Mitchell Road and TH 5 is anticipated to operate at an acceptable LOS in the future peak hours with and without at-grade LRT. The traffic model for the Valley View Road and Flying Cloud Drive/TH 212 area revealed future operational deficiencies in both the AM and PM peak hours with and without the at-grade LRT.

In the 2018 AM peak hour, the addition of the LRT caused the Bryant Lake Road / Valley View Road intersection to degrade from LOS D to LOS F. This was also the case with the Flying Cloud Drive / Valley View Road intersection. In 2030 AM peak hour, these same intersections experienced increased delay from the addition of the LRT, causing the intersection operations to degrade from LOS E to LOS F. Many of the turn lanes experience vehicle queues greater than the storage provided.

In the 2018 PM peak hour, the addition of the LRT caused the Prairie Center Drive / Valley View Road (East Jct.) and the Prairie Center Drive / Viking Drive intersections to degrade from LOS D to LOS E. In 2030 PM peak hour, these same intersections experienced increased delay from the addition of the LRT, causing LOS D conditions to change to LOS F. Similarly, the Bryant Lake Road / Valley View Road and Flying Cloud Drive / Valley View Road intersections experienced additional delay due to the LRT in the 2030 PM peak hour causing operations to degrade from LOS D conditions to LOS E. Many of the turn lanes experience vehicle queues greater than the storage provided.

Major Segment 4

In forecast year 2030, only the unsignalized intersection of Belt Line Boulevard and the CSAH 25 South Frontage Road is anticipated to operate at unacceptable LOS F in the PM peak hour due to LRT crossing at-grade. The operations of the unsignalized intersection changes from LOS E to LOS F. This occurs due to the queue of southbound vehicles on Belt Line Boulevard at the LRT crossing backing through the unsignalized intersection, and not allowing the eastbound traffic on the South Frontage Road to turn left, north. These queues are not anticipated to impact the signal operations at the high volume intersection of CSAH 25 and Belt Line Boulevard, though.

Major Segment A

Intersections along this segment were not analyzed because major roadway junctions are grade separated and the at-grade crossings are with roadways that carry mostly residential traffic at low volumes. Minimal traffic queuing is expected and not anticipated to cause significant impacts to traffic operations.

Major Segment C
The traffic analysis did not show any deficiencies for the main alignment of Major Segment C during both the AM and PM peak hours for existing and future conditions. However, the Blaisdell Avenue Sub-alternative alignment adversely impacts the operations of intersections analyzed along Franklin Avenue.

<u>Blaisdell Avenue Sub-alternative</u>
The Blaisdell Avenue Sub-alternative alignment intersections along Franklin Avenue experience a degraded level of service (LOS C to LOS E) in the 2030 PM peak hour. This is due to the train diagonally crossing through the intersection of Franklin Avenue and Nicollet Avenue. The train crossing requires an all red signal condition at the intersection of Franklin Avenue and Nicollet Avenue. The duration of this all red disrupts the westbound traffic along Franklin Avenue causing the queue of vehicles to back-up through 1st Avenue further degrading the operations at 1st Avenue.

<u>1st Avenue Sub-alternative</u>
Traffic operations were not analyzed for this alternative. The LRT line is grade separated to north of Franklin Avenue. Franklin Avenue traffic operations are not impacted from this alternative.

<u>11th/12th Street Sub-alternative</u>
The traffic analysis shows the 11th and 12th Street Sub-alternative operates at an acceptable level of service during both the AM and PM peak hours for existing and future conditions.

Potential Mitigation

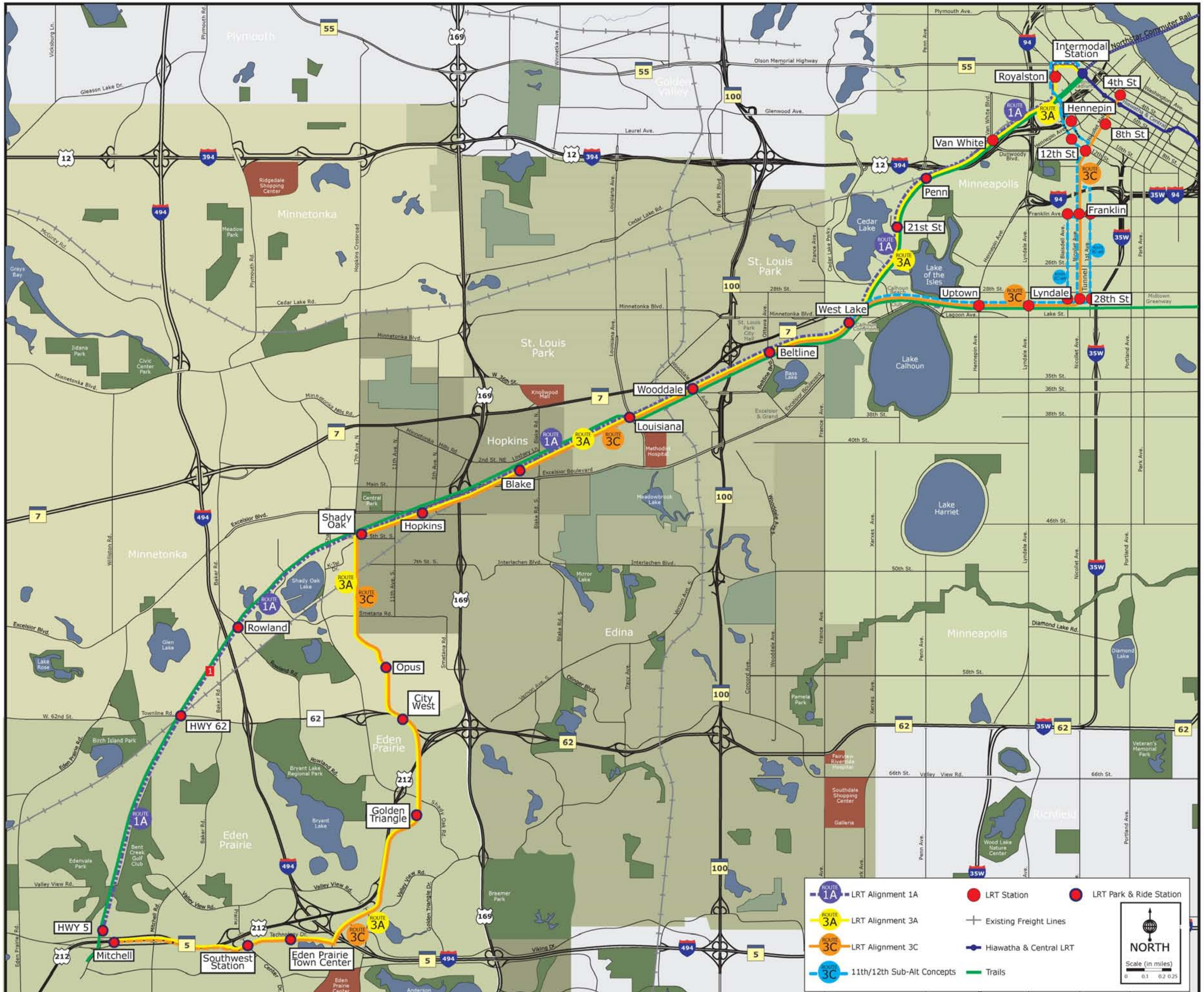
The following general mitigation measures are recommended for implementation to address impacts on all signalized intersections throughout the Southwest LRT corridor:

- Optimized signal timing splits at each intersection.
- Provide light rail vehicles (LRV) detection at signalized intersections to coordinate priority treatment where needed.
- New traffic signal controllers, pedestrian controllers, and signage at signalized intersections.
- Protected left- and right-turn lanes at specific intersections for traffic turning across the LRT line.

Mitigation measures that can be implemented to address impacts at intersections forecast to operate at LOS E or F in the future include:

- Constructing additional right or left-turn lanes.
- Lengthening turn lanes.
- Widening of the approaches on the cross-streets.
- Adding additional capacity to parallel routes.
- Possible grade separation between the roadway and LRT alignments

More detailed analysis and impacts of the potential mitigation measures will be included in the FEIS.



SOUTHWEST transitway

Figure 1
Southwest LRT
Alternative Alignments

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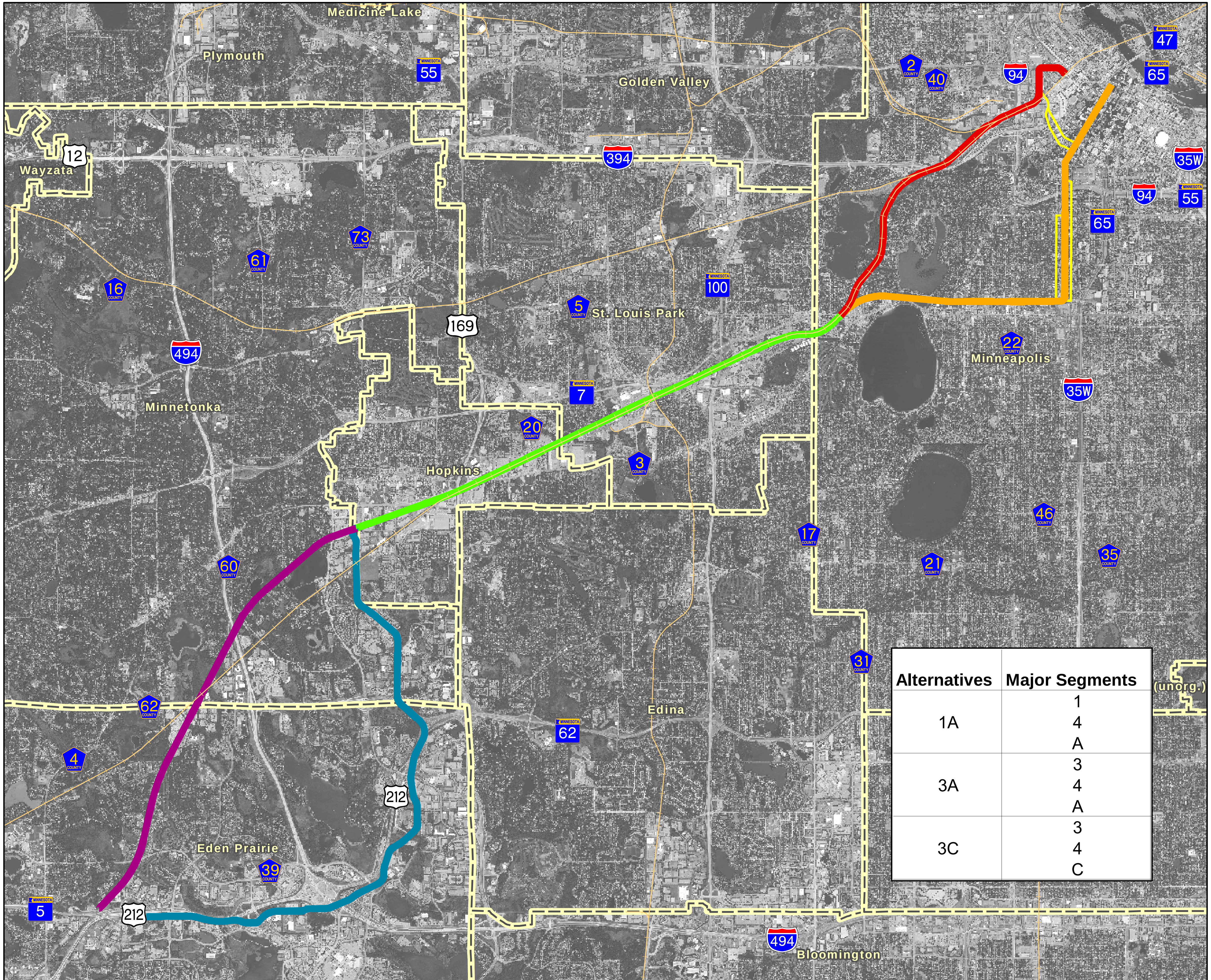


Alternatives	Major Segments
1A	1 4 A
3A	3 4 A
3C	3 4 C

SOUTHWEST transitway

Figure 2
Southwest LRT
Major Segment Index

Legend

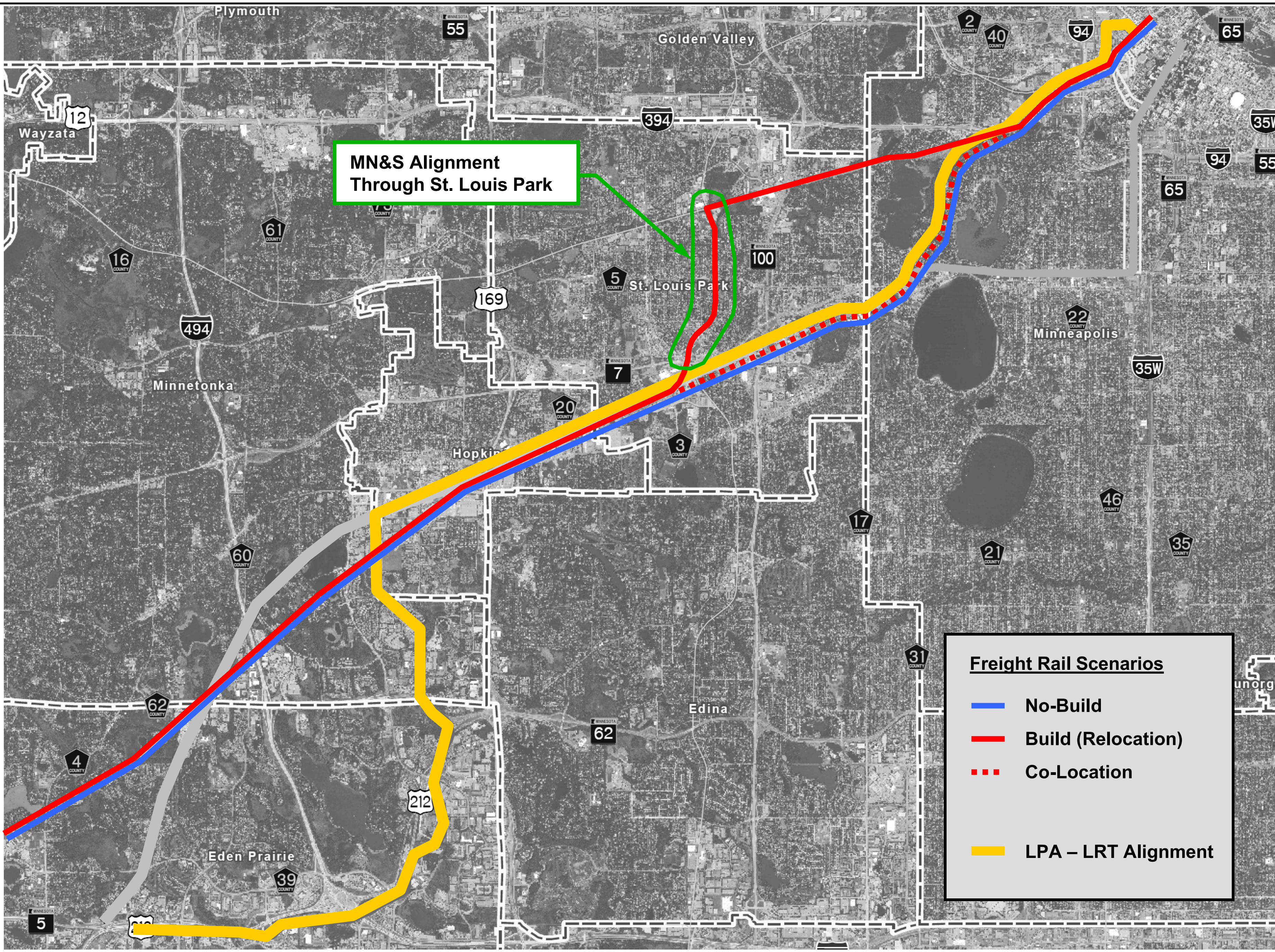
- Major Segment 1, Figure 3
- Major Segment 3, Figure 4
- Major Segment 4, Figure 5
- Major Segment A, Figure 6
- Major Segment C, Figure 7
- Subalternatives, Figure 7
- Existing Railroad
- Municipal Boundaries

0 5,000 Feet

N

Hennepin

WSB



Hennepin

Figure 3
Freight Rail Scenarios

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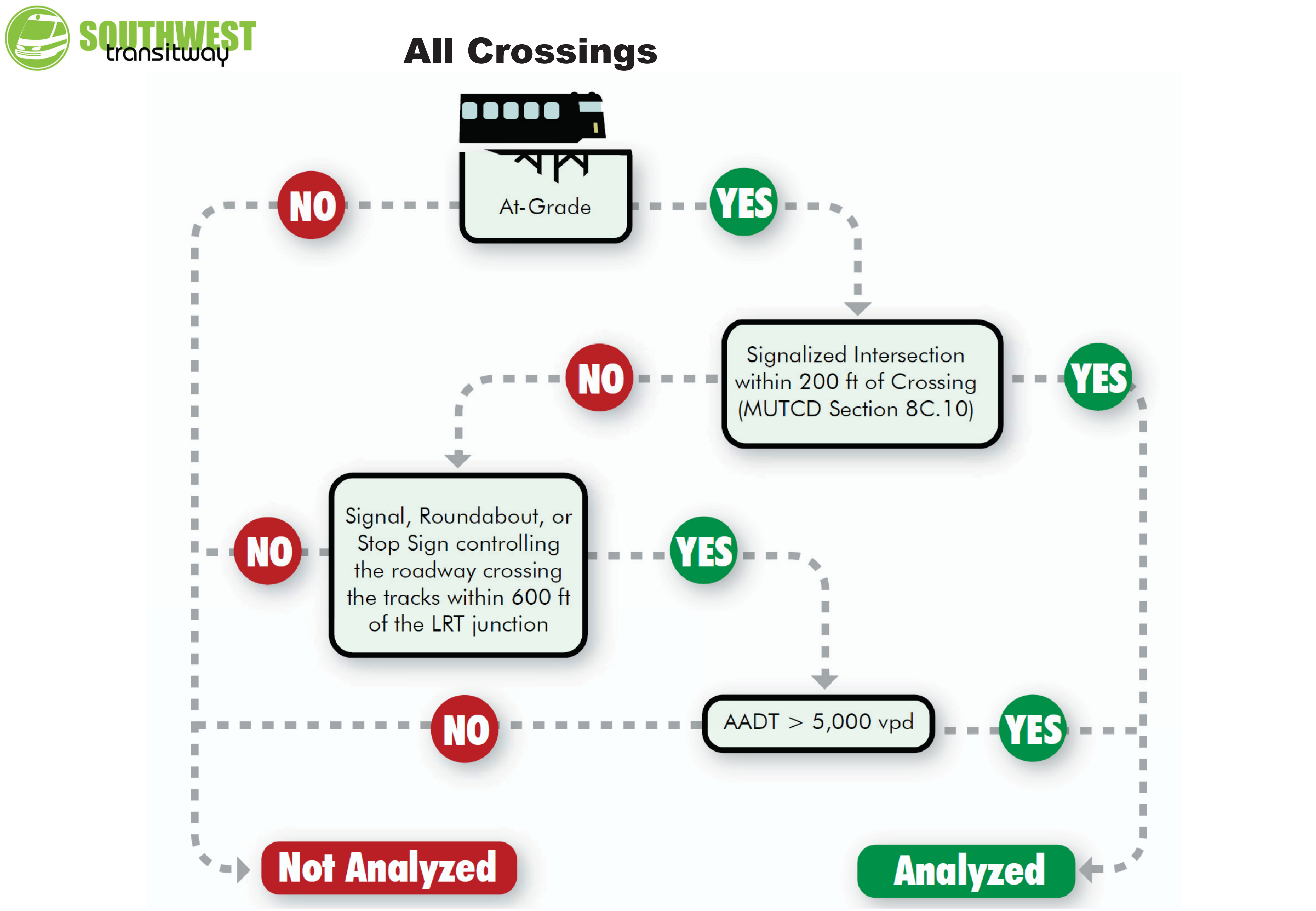


Hennepin

Figure 4
Roadway Crossing Analysis Decision Tree

WSB & Associates, Inc.

Hennepin

Figure 5
Major Segment 1
Alignments and Intersection Location Codes

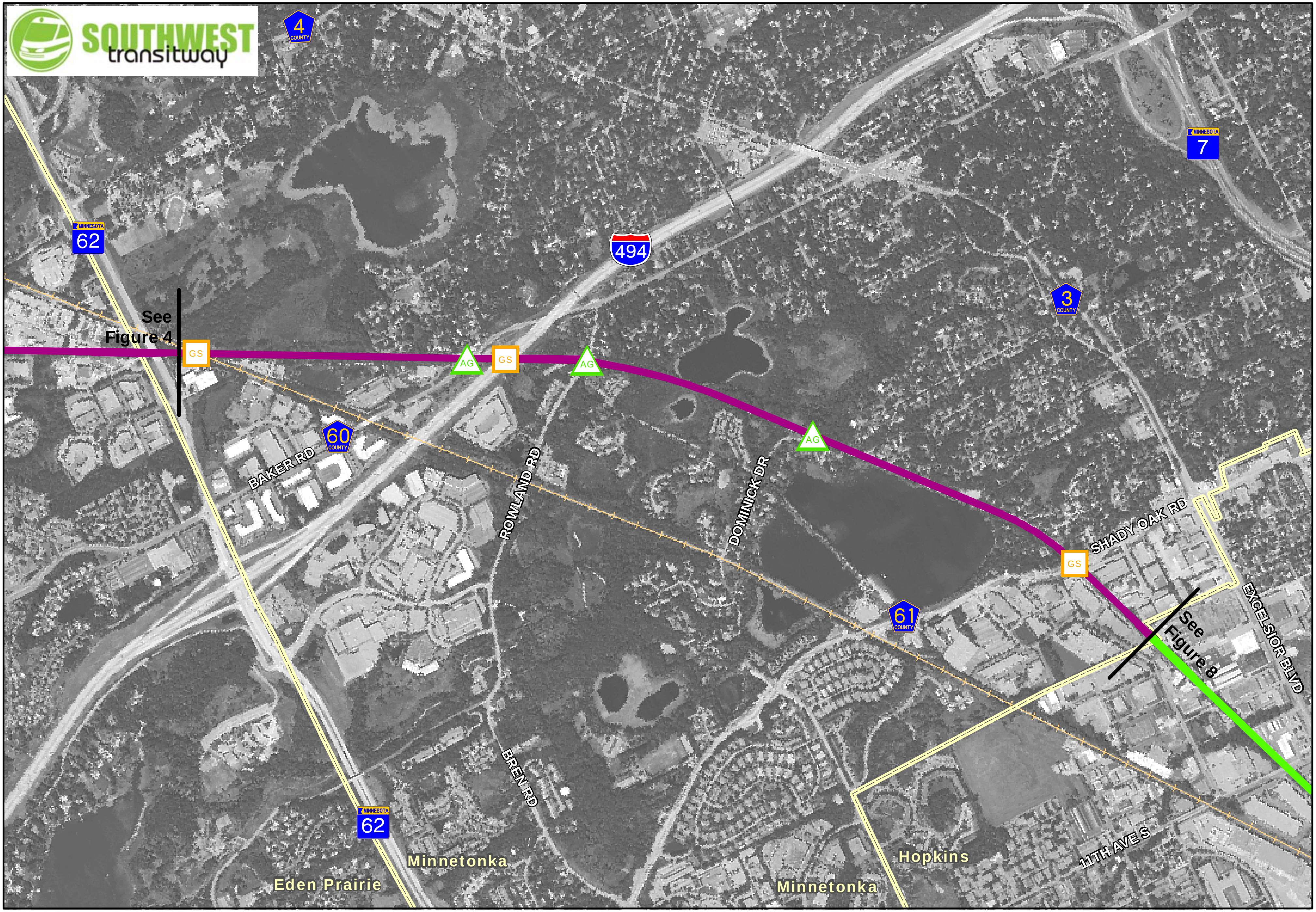
Legend

Major Segment 1
Existing Railroad
Municipal Boundaries
Location Code
Grade Seperated Crossing
At Grade Crossing

0 1,500 Feet

N

WSB & Associates, Inc.



Hennepin

Figure 6
Major Segment 1
Alignments and Intersection Location Codes

Legend

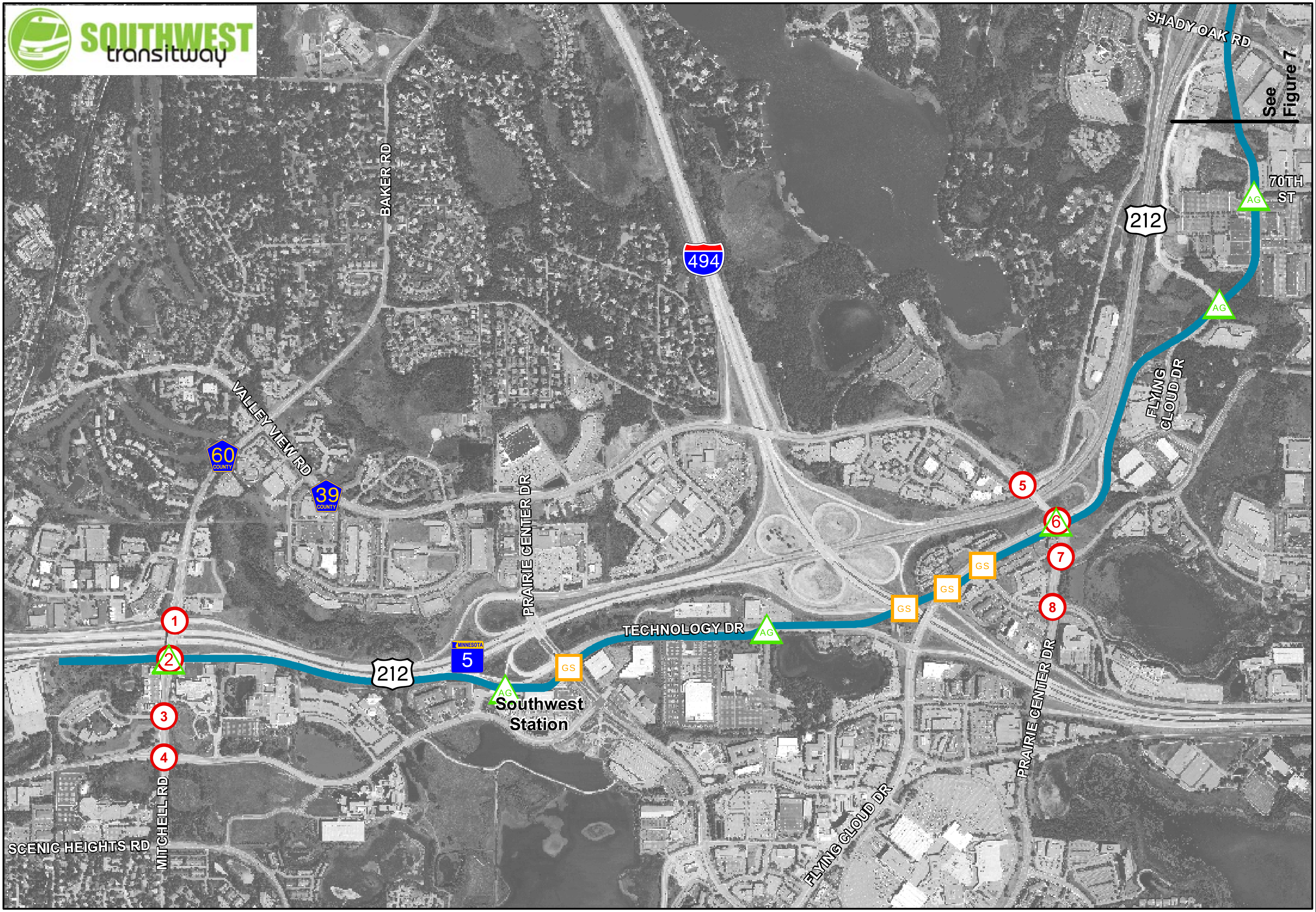
Major Segment 1 — Existing Railroad — Municipal Boundaries

1 Location Code — GS Grade Seperated Crossing — AG At Grade Crossing

0 1,500 Feet

N

WSB & Associates, Inc.



Hennepin

Figure 7
Major Segment 3
Alignments and Intersection Location Codes

Legend

- Major Segment 3
- Existing Railroad
- Municipal Boundaries
- 1 Location Code
- GS Grade Seperated Crossing
- AG At Grade Crossing

0 1,500 Feet

N

WSB & Associates, Inc.

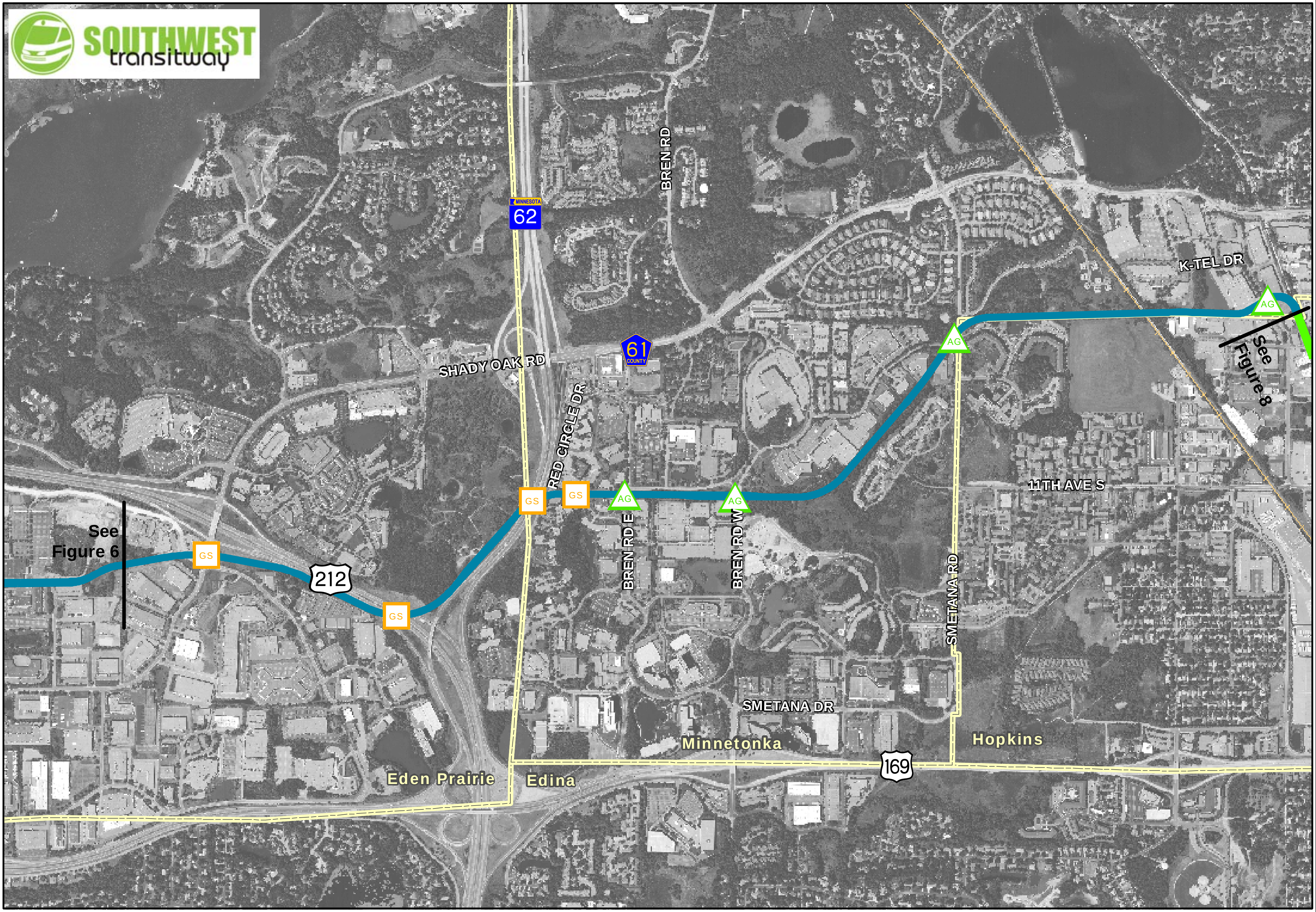


Figure 8
Major Segment 3
Alignments and Intersection Location Codes

Legend

Major Segment 3 — Existing Railroad — Municipal Boundaries

Location Code — Grade Seperated Crossing — At Grade Crossing

0 1,500 Feet

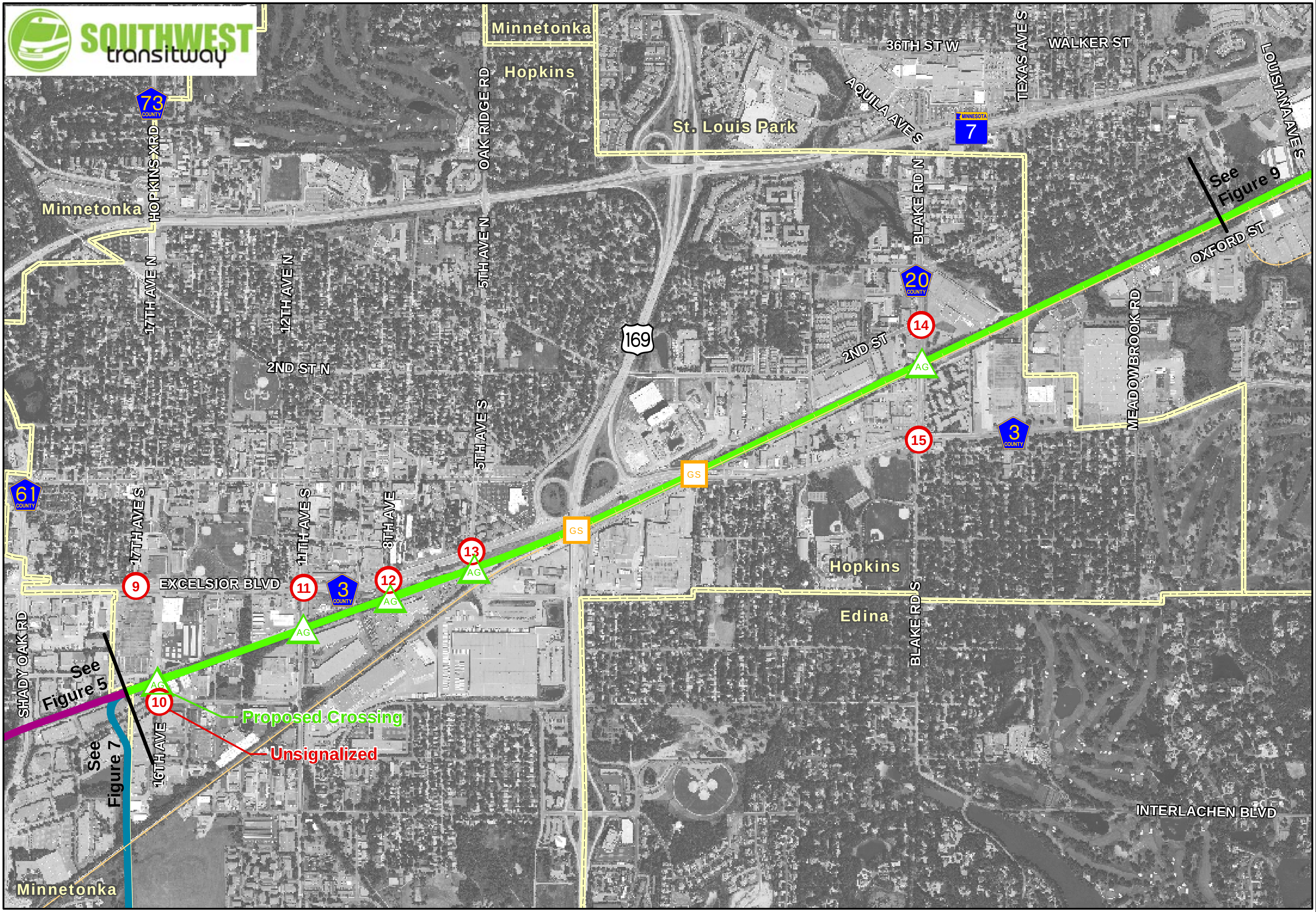


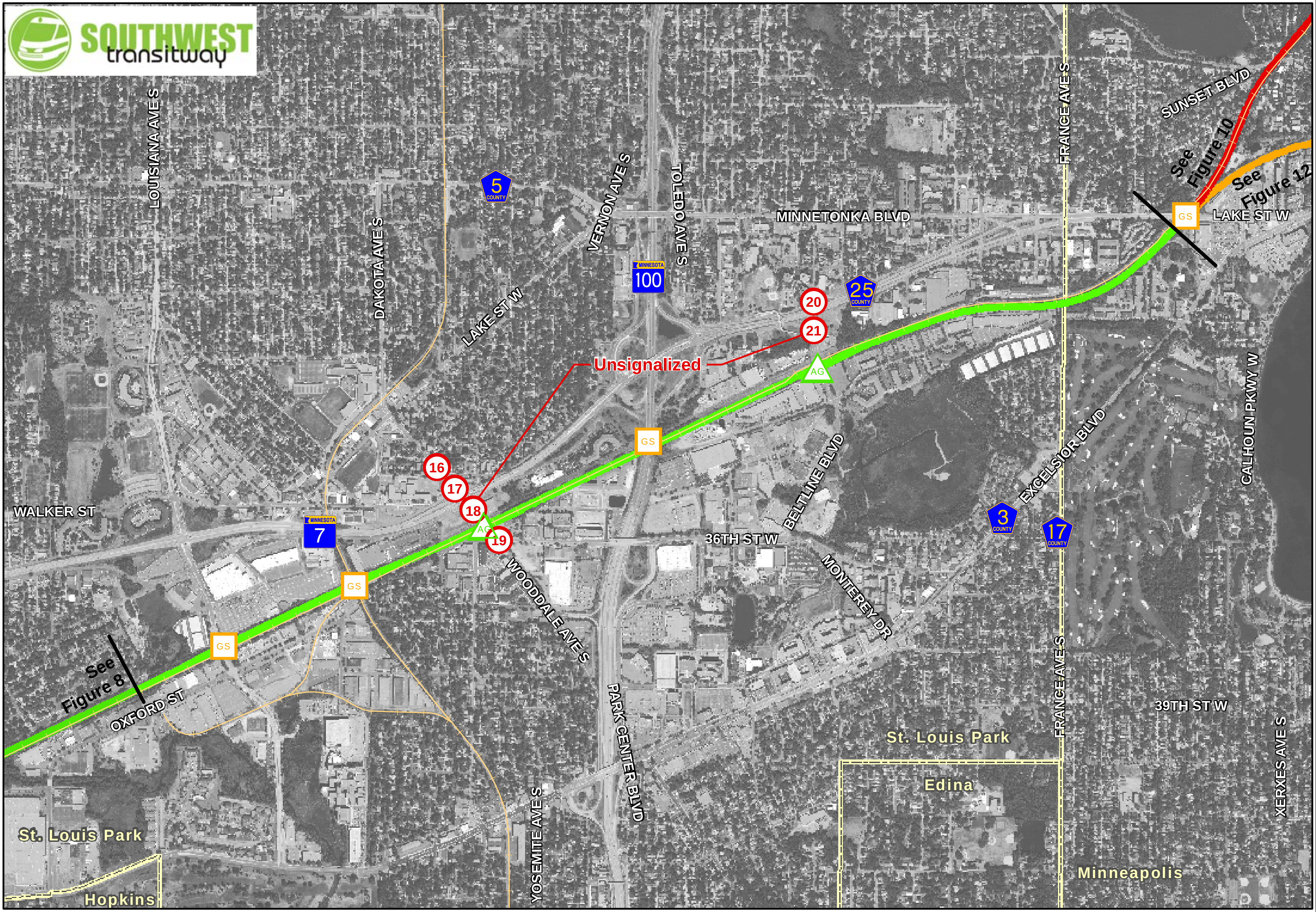
Figure 9
Major Segment 4
Alignments and Intersection Location Codes

Legend

- Major Segment 4
- Existing Railroad
- Municipal Boundaries
- Location Code
- GS Grade Seperated Crossing
- AG At Grade Crossing

0 1,500 Feet

WSB & Associates, Inc.



Hennepin

Figure 10
Major Segment 4
Alignments and Intersection Location Codes

Legend
Major Segment 4
Existing Railroad
Municipal Boundaries
1 Location Code
GS Grade Seperated Crossing
AG At Grade Crossing

0 1,500 Feet

N

WSB & Associates, Inc.

Hennepin

Figure 11
Major Segment A
Alignments and Intersection Location Codes

Legend

- Segment A
- Existing Railroad
- Municipal Boundaries
- 1 Location Code
- GS Grade Seperated Crossing
- AG At Grade Crossing

0 1,500 Feet

N

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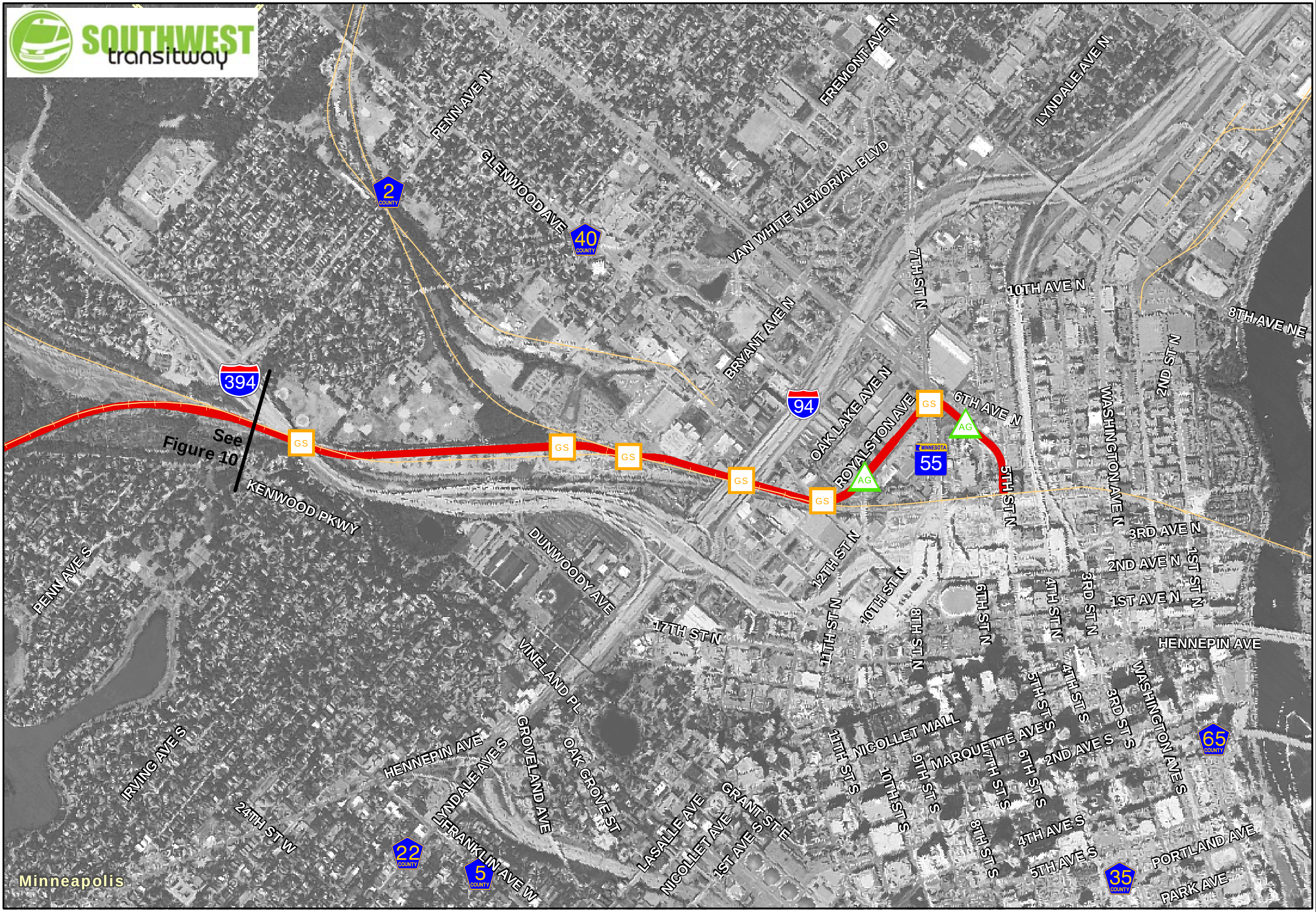

Hennepin

Figure 12
Major Segment A
Alignments and Intersection Location Codes

Legend

- Segment A
- Existing Railroad
- Municipal Boundaries
- 1 Location Code
- GS Grade Seperated Crossing
- AG At Grade Crossing

0 1,500 Feet

N

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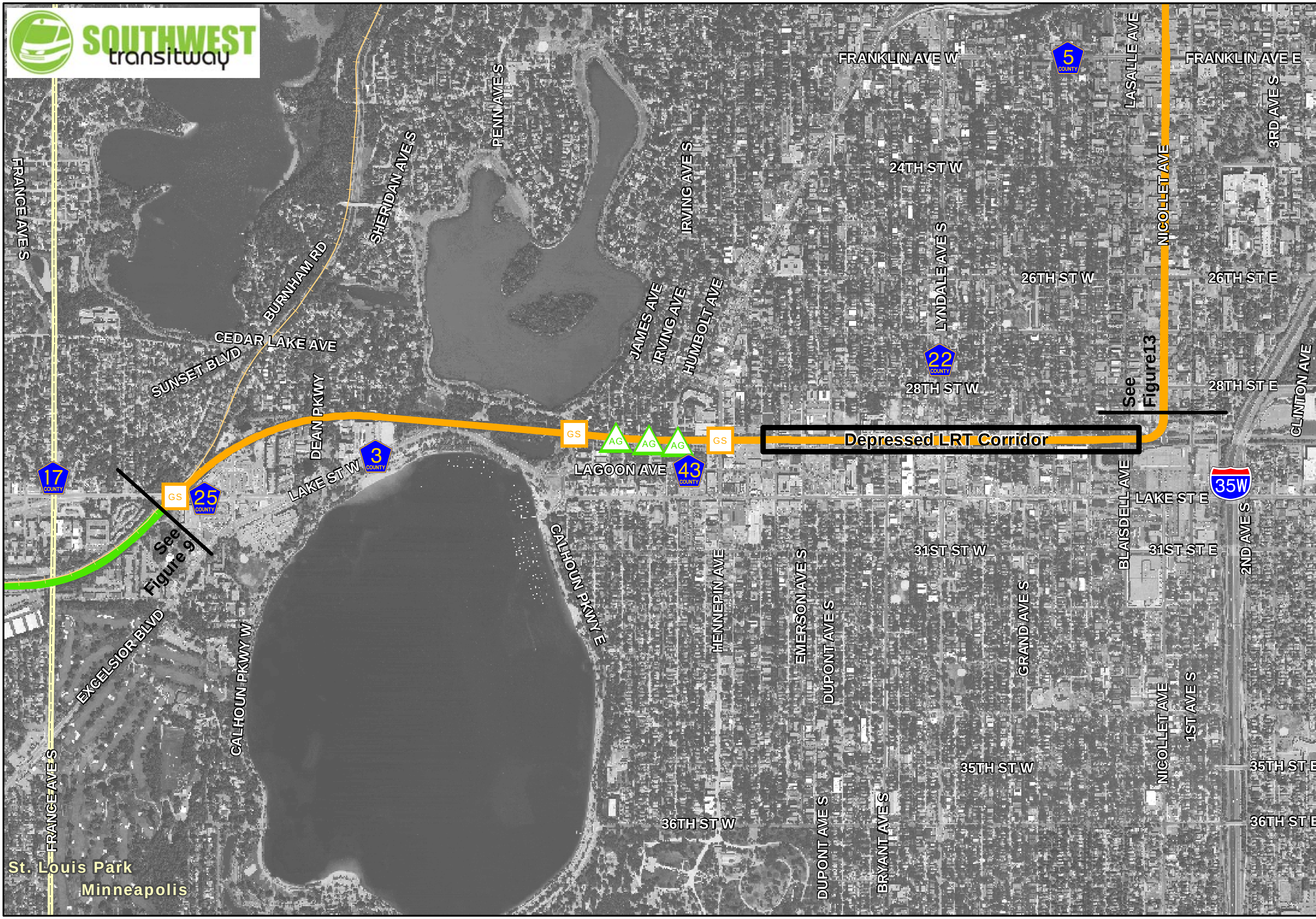

Hennepin

Figure 13
Major Segment C
Alignments and Intersection Location Codes

Legend

- Segment C
- Existing Railroad
- Municipal Boundaries
- Depressed LRT Corridor
- 1 Location Code
- GS Grade Seperated Crossing
- AG At Grade Crossing

0 1,500 Feet

N

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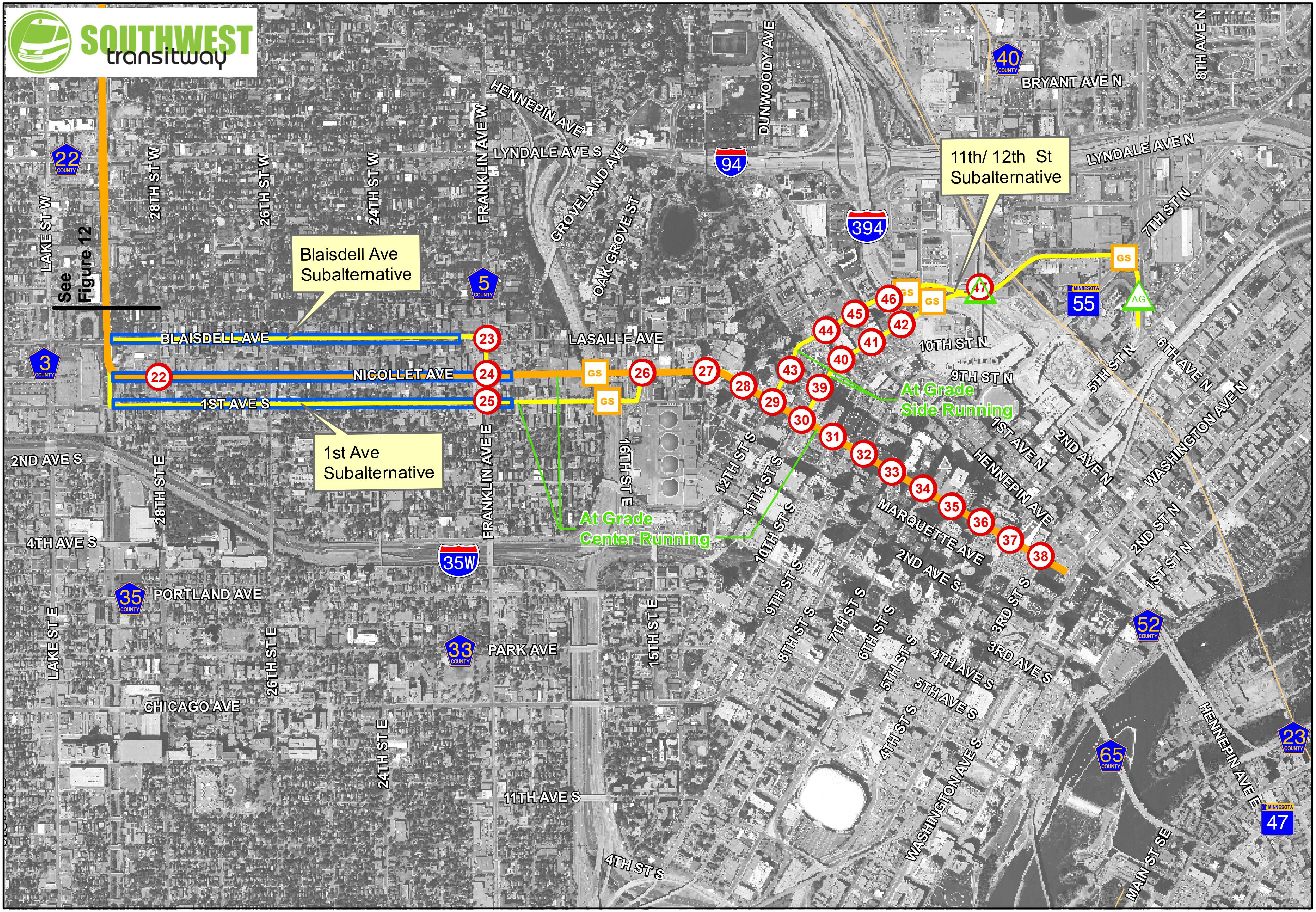

Hennepin

Figure 14
Major Segment C
Alignments and Intersection Location Codes

Legend

- Segment C
- Subalternatives
- Existing Railroad
- Municipal Boundaries
- LRT Tunnels
- 1 Location Code
- GS Grade Seperated Crossing
- AG At Grade Crossing

0 1,500 Feet

N

WSB & Associates, Inc.

Attachment A

(LRT Crossing Locations)

Attachment A (Crossing Locations)

SEGMENT	CROSSING		
	ROADWAY	GRADE SEPARATED	AT-GRADE
1	Valley View Rd	X	
	Edenvale Blvd		X
	W 62nd St		X
	CSAH 62	X	
	Baker Rd		X
	I-494	X	
	Rowland Rd		X
	Dominick Dr		X
	CSAH 61	X	
3	Mitchell Rd		X
	SW Station Bus Entrance		X
	Prarie Center Dr	X	
	Technology Drive		X
	I-494	X	
	Flying Cloud Drive	X	
	Viking Drive	X	
	Valley View Rd		X
	Flying Cloud Dr		X
	W. 70th St.		X
	Flying Cloud Dr	X	
	Shady Oak Road	X	
	TH 212	X	
	TH 62	X	
	Red Circle Drive	X	
	Bren Rd E.		X
	Bren Rd W.		X
	Smetana Rd		X
	K-Tel Dr		X
4	16th Ave Extension		Proposed
	11th Ave		X
	8th Ave		X
	5th Ave		X
	TH 169	X	
	CSAH 3	X	
	Blake Rd		X
	Louisiana Ave	X	
	Wooddale Ave		X
	TH 100	X	
	Belt Line Blvd		X
	West Lake Street	X	
A	Cedar Lake Pkwy	X	
	Burnham Rd	X	
	21st St.		X
	I-394	X	
	West Lyndale Ave	X	
	I-94	X	
	East Lyndale Ave	X	
	Glenwood Ave	X	
	Royalston Avenue N.		X
	HERC Facility Entrance		X

SEGMENT	CROSSING		
	ROADWAY	GRADE SEPARATED	AT-GRADE
C	Dean Pkwy	X	
	West Calhoun Pkwy	X	
	James Ave		X
	Irving Ave		X
	Humboldt Ave		X
	Hennepin Ave	X	
	Fremont Ave	X	
	Emerson Ave	X	
	Dupont Ave	X	
	Colfax Ave	X	
	Bryant Ave	X	
	Aldrich Ave	X	
	Lyndale Ave	X	
	Garfield Ave	X	
	Harriet Ave	X	
	Grand Ave	X	
	Pleasant Ave	X	
	Pillsbury Ave	X	
	Blaisdell Ave	X	
	Nicollet Ave	X	
	29th Street	X	
	28th Street	X	
	27th Street	X	
	26th Street	X	
	25th Street	X	
	24th Street	X	
	22nd Street	X	
	Franklin Ave	X	
	E. 19th St/Groveland Ave		X
	E. 18th St.		X
	I-94	X	
	E. 16th St.		X
	W. 15th St.		X
	E. 15th St.		X
	W. 14th St.		X
	W. Grant St		X
	W. 13th St.		X
	W. 12th St.		X
	W. 11th St.		X
	W. 10th St.		X
	W. 9th St.		X
	W. 8th St.		X
	W. 7th St.		X
	W. 6th St.		X
	W. 5th St.		X
	W. 4th St.		X
	W. 3rd St.		X
	LaSalle Ave		X
	Harmon Pl.		X
	Hennepin Ave		X
	Hawthorne Ave		X
	Glenwood Ave		X

MN&S Alignment - Freight Rail Relocation

SEGMENT	CROSSING		
	ROADWAY	GRADE SEPARATED	AT-GRADE
MN&S	28th Street		X
	29th Street		X
	Minnetonka Boulevard	X	
	Dakota Avenue		X
	Library Lane		X
	Lake Street		X
	Walker Street		X

Attachment B

(Traffic Volumes)

Table B1 Traffic Counts by Movement – 2010 AM Peak Hour

Location Code	Movement											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	311	430			466	50				349		250
2		636	515	205	610		105	38	295			
3	56	1135			849	56	16		9			
4	89	1093	259	325	403	130	28	69	39	39	32	70
5		645	101	45	724					533		184
6	21	330	287	96	675	486	357	689	72	268	30	59
7	8	582	268	434	569	12	3		2	42		53
8	38	804	502	301	300	12	28	129	43	45	10	26
9	8	3	8	62	5	28	16	182	27	40	300	68
10	6	6	1	48	19	5		49	20	1	12	13
11	108	66	258	58	93	36	78	434	195	285	372	62
12	6		4	57	6	23	33	700	17	17	690	92
13	48	15	58	85	29	43	41	663	57	55	708	112
14	67	224	2	1	304	176	67		62	4		
15	97	146	80	161	137	97	51	508	45	62	426	115
16	121	273			267	30				57		98
17		305	66	60	264		89		281			
18	31	308	5	9	514	22	5	1	30	13	2	58
19	10	60	220	217	291	49	55	46		112	41	229
20	264	171	166	5	105	65	71	684	310	122	762	2
21	9	585	15	14	473	50	11	1	1	16		5
22		131	9	114	49		81	1077	3			
23				115	252	36		455	66	37	242	
24	43	182	68	42	82	11	34	497	39	53	225	49
25	31	256	62				43	554	10	13	296	56
26	57	196	14	22	86	10	23	141	42	15	72	16
27	98	81	48	2	35	16	74	102	8	43	99	68
28	13	36	41		22					25		1
29		35	2	8	22		20	948				
30	4	51			28	11				2	1020	9
31		58	2	9	36		2	967	3			
32		60			44	6		2		1	725	3
33		63		3	49		1	717	1			
34	4	60			48	4				4	1059	6
35		66		7	49		1	1166	3			
36	1	66			53	1				3	152	1
37		63	4	2	53			1421	1			
38	11	52			54					1	536	
39	125	391			122	62				94	519	257
40	98	96			24	41				54	627	25
41	45	805			144	12				42	572	152
42	88	657			310	29				70	430	129
43		237	25	54	162		279	843	196			
44		64	61	38	40		130	1219	18			
45		650	150	29	157		200	1188	47			
46		730	731	48	332		15	656	11			
47	124	89	24	7	106	6	9	285	179	11	11	5

Table B2 Traffic Counts by Movement – 2010 PM Peak Hour

Location Code	Movement											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	228	335			575	63				325		199
2		495	423	228	672		68		205			
3	32	848			869	8	70		45			
4	33	533	81	128	765	21	123	41	65	165	47	224
5		879	275	36	744					1121		175
6	157	833	300	145	726	994	304	484	20	43	45	17
7	6	878	70	70	717	2	21	2	10	472	1	391
8	56	501	82	49	1115	35	6	16	83	671	62	447
9	35	10	35	94		26	112	601	12	12	626	140
10	12	18	1	8	8	8	8	8	7		54	54
11	238	189	388	80	154	97	152	511	143	284	609	70
12	28	7	18	201	5	65	65	902	12	8	870	174
13	75	30	36	102	19	54	64	962	95	77	923	204
14	69	564		2	424	119	245		133		1	1
15	89	160	48	179	230	109	131	646	120	50	526	238
16	215	331			268	32				72		74
17		466	70	73	267		80		267			
18	19	515	16	31	496	7	7		53	4	2	14
19	9	89	265	259	221	73	41	69	2	194	57	420
20	338	310	261	4	150	19	73	840	211	187	652	17
21	3	860	22	7	531	10	39	3	14	23		10
22		227	8	143	192		98	708	10			
23				146	852	115		409	84	114	703	
24	68	255	86	67	195	44	46	448	61	98	705	74
25	88	226	72				20	554	27	18	789	56
26	121	199	15	30	184	35	15	84	39	44	112	106
27	117	65	27		56	33	40	39	48	132	354	29
28	24	39	39	1	32	1				51	2	1
29		38	2	3	32		5	551	2			
30	4	39			34	30				1	1344	21
31		57	3	6	55		4	766	9			
32	3	56	2		60	6		1		1	1121	
33		54	2	4	60		10	708	6			
34	5	59		4	57					7	1315	5
35		55	9	2	58		10	851	3			
36	2	57	6		56		3	5		4	244	
37		60			52			702	4			
38	13	47			50	2				2	1718	
39	129	96			495	279				183	865	133
40	76	28			103	54				193	1052	28
41	43	560			449	64				199	871	112
42	17	91			827	100				495	478	5
43		155	30	116	562		70	450	398			
44		26	51	105	191		78	762	20			
45		519	103	58	590		84	699	125			
46		91	382	172	1150		17	354	56			
47	334	227	35	1	136	23	7	120	125	114	147	20

Table B3 Traffic Forecasts by Movement – 2018 AM Peak Hour

Location Code	Movement											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	325	445			485	55				360		260
2		660	535	215	630		110	40	305			
3	60	1175			875	60	20		10			
4	95	1130	270	335	415	135	30	75	45	45	35	75
5		665	105	50	755					550		190
6	25	335	300	100	700	505	370	710	75	280	35	65
7	10	600	280	450	590	15	5		5	45		55
8	40	830	520	315	310	15	30	135	45	50	15	30
9	10	5	10	65	10	30	20	190	30	45	310	70
10	10	10	5	50	25	10		55	25	5	15	15
11	115	70	265	60	100	40	80	450	200	295	385	65
12	10		5	60	10	25	35	720	20	20	710	95
13	50	20	60	90	30	45	45	680	60	60	730	115
14	70	230	5	5	315	185	70		65	5		
15	100	150	85	170	145	100	55	525	50	65	440	120
16	140	290			285	35				65		105
17		335	80	65	285		95		300			
18	35	345	5	10	550	25	10	5	35	15	5	60
19	15	65	230	240	305	55	60	50	5	135	45	260
20	275	180	175	10	110	70	75	705	320	130	785	5
21	10	605	20	15	490	55	15	5	5	20		10
22		135	10	120	55		85	1105	5			
23				120	260	40		480	70	40	255	
24	45	190	75	45	85	15	40	515	45	55	235	55
25	35	265	65				45	575	15	15	310	60
26	60	205	15	25	90	15	25	150	45	20	75	20
27	105	85	50	5	40	20	80	110	10	45	105	75
28	15	40	45		25					30		5
29		40	5	10	25		25	980				
30	5	60			30	15				5	1055	10
31		65	5	10	40		5	1000	5			
32		70			45	15		5		5	750	5
33		70		5	55		5	740	5			
34	5	70			55	5				5	1095	10
35		80		10	55		5	1205	5			
36	5	80			60	5				5	160	5
37		80	5	5	60			1465	5			
38	15	65			60					5	555	
39	130	405			130	65				100	540	265
40	105	100			25	45				60	645	30
41	50	830			150	15				45	590	160
42	95	680			320	30				75	445	135
43		245	30	60	170		290	870	205			
44		70	65	40	45		135	1260	20			
45		670	160	30	165		210	1225	50			
46		755	755	50	345		20	680	15			
47	130	95	25	10	110	10	10	295	185	15	15	10

Table B4 Traffic Forecasts by Movement – 2018 PM Peak Hour

Location Code	Movement											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	235	350			595	65				335		205
2		510	440	235	695		75		215			
3	35	875			900	10	75		50			
4	35	545	85	135	790	25	130	45	70	170	50	235
5		910	285	40	770					1155		185
6	165	860	310	150	750	1025	315	500	25	45	50	20
7	10	905	75	75	740	5	25	5	15	490	5	405
8	60	515	85	55	1150	40	10	20	90	695	65	465
9	40	15	40	100		30	115	620	15	15	645	145
10	15	25	5	10	10	10	10	10	10		60	60
11	245	195	400	85	160	100	160	525	150	295	625	75
12	30	10	20	210	10	70	70	925	15	10	895	180
13	80	35	40	105	20	60	70	985	100	80	945	210
14	75	580		5	435	125	255		140		5	5
15	95	165	50	185	240	115	135	665	125	55	540	245
16	240	345			290	35				95		80
17		500	90	80	305		85		294			
18	20	560	20	34	555	10	10	5	60	5	5	15
19	15	100	285	305	235	80	45	75	5	220	65	455
20	350	320	270	5	155	20	75	865	220	195	670	20
21	5	885	25	10	545	15	40	5	15	25		15
22		235	10	150	200		105	730	15			
23				155	880	120		425	90	120	730	
24	75	265	90	70	205	50	50	465	65	105	725	80
25	95	235	75				25	570	30	20	815	60
26	125	205	20	35	190	40	20	90	45	50	120	110
27	125	70	30		60	35	45	45	50	140	365	30
28	25	45	45	5	35	5				55	5	5
29		45	5	5	40		10	570	5			
30	5	50			40	35				5	1385	25
31		70	5	10	65		5	790	10			
32	5	65	5		65	10		5		10	1155	
33		60	5	5	65		15	730	10			
34	10	65		5	60					10	1355	10
35		60	15	5	60		15	880	5			
36	5	60	10		60		5	10		5	255	
37		65			55			725	5			
38	15	50			50	5				5	1770	
39	135	100			510	290				190	890	140
40	80	35			110	60				200	1085	30
41	45	580			465	70				205	900	120
42	20	95			855	105				510	495	10
43		160	35	120	580		75	465	410			
44		30	55	110	200		85	785	25			
45		535	115	60	610		90	720	130			
46		95	395	180	1185		20	365	60			
47	345	235	40	5	145	25	10	125	130	120	155	25

Table B5 Traffic Forecasts by Movement – 2030 AM Peak Hour

Location Code	Movement											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	350	490			520	60				400		280
2		720	580	230	690		120	50	340			
3	70	1280			960	70	20		20			
4	100	1230	300	370	460	150	40	80	50	50	40	80
5		720	120	60	820					600		210
6	30	370	330	110	760	550	400	780	90	310	40	70
7	10	660	310	500	640	20	10		10	50		60
8	50	910	570	340	340	20	40	150	50	60	20	30
9	10	10	10	70	10	40	20	210	40	50	330	80
10	10	10	10	60	30	10		60	30	10	20	20
11	120	80	290	70	110	40	90	480	220	320	410	70
12	10		10	70	10	30	40	780	20	20	760	110
13	60	20	70	100	40	50	50	740	70	70	780	130
14	80	250	10	10	340	200	80		70	10		
15	110	170	90	180	160	110	60	560	50	70	470	130
16	180	340			325	35				85		110
17		415	105	70	340		105		340			
18	35	450	5	10	640	30	10	5	35	15	5	60
19	15	90	255	290	345	55	65	55	5	200	55	335
20	300	190	190	10	120	80	80	760	350	140	840	10
21	10	650	20	20	530	60	20	10	10	20		10
22		150	10	130	60		90	1190	10			
23				130	290	50		520	80	50	280	
24	50	210	80	50	100	20	40	560	50	60	260	60
25	40	290	70				50	620	20	20	340	70
26	70	220	20	30	100	20	30	160	50	20	90	20
27	110	100	60	10	40	20	90	120	10	50	120	80
28	20	40	60		40					30		10
29		40	10	10	40		30	1070				
30	10	60			40	20				10	1150	20
31		70	10	20	50		10	1090	10			
32		80			60	20		10		10	820	10
33		90		10	65		10	810	15			
34	20	80			60	10				10	1190	10
35		90		10	60		10	1310	10			
36	10	90			60	10				10	180	20
37		100	10	20	60			1600	10			
38	30	70			70					10	610	
39	140	450			140	70				110	600	290
40	110	115			30	50				70	710	30
41	60	910			170	20				50	640	180
42	100	740			360	40				80	490	150
43		270	30	70	180		320	950	220			
44		75	70	50	50		150	1370	30			
45		740	170	40	180		230	1340	60			
46		820	820	60	380		20	750	20			
47	140	100	30	10	120	10	20	320	210	20	20	10

Table B6 Traffic Forecasts by Movement – 2030 PM Peak Hour

Location Code	Movement											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	260	380			650	80				370		230
2		560	480	260	760		80		230			
3	40	960			980	10	80		60			
4	40	600	100	150	860	30	140	50	80	190	60	260
5		1000	310	50	850					1260		200
6	180	940	340	170	820	1120	350	550	30	50	60	20
7	10	990	80	80	810	10	30	10	20	530	10	440
8	70	560	100	60	1260	40	10	20	100	760	70	510
9	40	20	40	110		30	130	670	20	20	690	160
10	20	30	10	15	15	10	10	10	10		60	60
11	270	210	430	90	170	110	170	580	160	320	680	80
12	40	10	20	230	10	80	80	1000	20	10	960	200
13	90	40	40	120	30	60	80	1060	110	90	1020	230
14	80	630		10	470	140	270		150		10	10
15	100	180	60	200	260	120	150	720	140	60	580	270
16	305	395			335	40				150		80
17		600	110	85	400		100		364			
18	20	680	20	34	715	15	10	5	65	5	5	20
19	15	120	340	430	270	85	45	90	5	280	70	555
20	380	350	290	10	170	30	90	930	240	210	720	20
21	10	950	30	10	590	20	50	10	20	30		20
22		250	10	160	220		110	780	20			
23				170	960	130		470	100	130	790	
24	80	290	100	80	220	50	60	510	70	110	790	90
25	100	260	90				30	620	40	30	890	70
26	140	230	20	40	210	40	20	100	50	50	130	120
27	140	80	40		70	40	50	50	60	150	400	40
28	30	50	50	10	40	10				60	10	10
29		50	10	10	50		10	620	10			
30	10	50			50	40				10	1510	30
31		70	10	10	70		20	860	20			
32	10	70	10		70	10		10		10	1260	10
33		70	10	10	70		20	800	10			
34	10	80		10	70					10	1480	10
35		70	20	10	70		20	960	10			
36	10	70	10		70		10	10		10	280	
37		80			60			790	10			
38	20	60			50	20				10	1930	
39	150	110			560	320				210	970	150
40	90	40			120	70				220	1180	40
41	50	640			510	80				230	980	130
42	20	110			930	120				560	540	10
43		180	40	130	640		80	510	450			
44		40	60	120	220		90	860	30			
45		590	120	70	670		100	790	140			
46		110	430	200	1290		20	400	70			
47	380	260	40	10	160	30	10	140	140	130	170	30

Attachment C

(LOS Tables by Approach)

Table C1 Approach Level of Service – AM Peak Hour

Alternative			2010 Peak Hour		2018 Peak Hour		2018 Peak Hour		2018 Peak Hour		2030 Peak Hour		2030 Peak Hour		2030 Peak Hour	
			Existing Condition		No Build		Build LRT		Build LRT Co-Location Alternative		No Build		Build LRT		Build LRT Co-Location Alternative	
			LOS		LOS		LOS		LOS		LOS		LOS		LOS	
Location Code	Intersection	Appr	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters
Major Segment 3 (LRT 3A, 3C, & 3C Sub Alternatives)																
		NB	A		A		B		B		A		B		B	
1	TH 5 North Ramp & Mitchell Rd	WB	C	B	C	B	C	C	C	C	C	B	C	C	C	C
		SB	B		B		C		C		B		B		B	
		EB														
		NB	A		A		B		B		A		B		B	
2	TH 5 South Ramp & Mitchell Rd	WB		B		B		B		B		B		B		B
		SB	B		B		B		B		B		B		B	
		EB	C		C		C		C		C		C		C	
		NB	A		A		A		A		A		A		A	
3	Lone Oak Rd & Mitchell Rd	WB		A		A		A		A		A		A		A
		SB	A		A		A		A		A		A		A	
		EB	**D**		D		D		D		D		D		D	
		NB	B		C		C		C		C		C		C	
4	Technology Drive & Mitchell Rd	WB	D	C	C	C	D	C	D	C	C	C	D	C	D	C
		SB	C		B		B		B		B		B		B	
		EB	D		D		D		D		D		D		D	
		NB	B		B		C		C		B		D		D	
5	Bryant Lake Dr & Valley View Road	WB	C	C	D	D	F	F	F	F	D	E	F	F	F	F
		SB	B		E		F		F		F		D		D	
		EB														
		NB	C		D	D	C		C		D		D		D	
6	Flying Cloud Dr & Valley View Road	WB	F	D	E	D	F	F	F	F	F	E	F	F	F	F
		SB	D		E		E		E		E		E		E	
		EB	D		D		F		F		E		F		F	
		NB	A		C		C		C		C		C		C	
7	Praire Center Dr & Valley View Road (East Jct)	WB	A	B	C	C	B	B	B	B	C	C	D	C	D	C
		SB	B		B		B		B		C		C		C	
		EB	E		D		C		C		E		F		F	
		NB	B		D		B		B		D		C		C	
8	Viking Dr & Prairie Center Dr	WB	D	C	D	D	C	C	C	C	D	D	E	C	E	C
		SB	C		C		B		B		C		D		D	
		EB	D		D		D		D		D		E		E	
Major Segment 4 (All Alternatives)																
		NB			C		C		C		C		C		C	
9	CSAH 3 & 17th Ave	WB		N/A	A	A	A	A	A	A	A	A	A	A	A	A
		SB			C		B		B		B		B		B	
		EB			A		A		A		A		A		A	
		NB			A		A		A		A		A		A	
10	5th Street & 16th Ave	WB		N/A	A	A	A	A	A	A	A	A	A	A	A	A
		SB			A		A		A		A		A		A	
		EB			A		A		A		A		A		A	
		NB	B		B		B		B		B		B		B	
11	CSAH 3 & 11th Ave	WB	B	B	C	B	C	B	C	B	C	B	C	B	C	B
		SB	C		C		C		C		C		C		C	
		EB	B		B		B		B		B		B		B	
		NB	C		D		D		D		D		D		D	
12	CSAH 3 & 8th Ave	WB	A	A	A	A	A	B	A	B	A	A	A	B	A	B
		SB	C		D		D		D		D		D		D	
		EB	A		A		B		B		A		B		B	
		NB	B		C		C		C		C		C		C	
13	CSAH 3 & 5th Ave	WB	B	B	B	B	B	C	B	C	B	B	B	C	B	C
		SB	C		D		D		D		D		D		D	
		EB	B		B		B		B		B		B		B	
		NB	B		A		A		A		A		A		A	
14	2nd Street & Blake Rd. N.	WB	D	B	C	A	C	A	C	A	C	A	C	A	C	A
		SB	A		A		A		A		A		A		A	
		EB	B		B		B		B		B		B		B	
		NB	B		C		C		C		C		C		C	
15	Blake Rd. N. & CSAH 3	WB	B	C	B	B	B	C	B	C	B	C	B	C	B	C
		SB	D		C		C		C		C		C		C	
		EB	C		B		B		B		B		B		B	
		NB	A		A		A		A		A		A		A	
16	TH 7 WB On-Ramp & Wooddale Ave.	WB	B	A	C	A	B	A	B	A	C	A	C	B	C	B
		SB	A		A		A		A		B		B		B	
		EB														
		NB	A		B		B		B		B		B		B	
17	TH 7 EB Off-Ramp & Wooddale Ave.	WB		A		B		B		B		B		B		B
		SB	A		B		B		B		B		B		C	
		EB	B		B		B		B		B		B		C	

Table C1 Approach Level of Service – AM Peak Hour

Alternative			2010 Peak Hour		2018 Peak Hour		2018 Peak Hour		2018 Peak Hour		2030 Peak Hour		2030 Peak Hour		2030 Peak Hour	
			Existing Condition		No Build		Build LRT		Build LRT Co-Location Alternative		No Build		Build LRT		Build LRT Co-Location Alternative	
Location Code	Intersection	Appr	LOS by Appr	LOS by Inters	LOS by Appr	LOS by Inters	LOS by Appr	LOS by Inters	LOS by Appr	LOS by Inters	LOS by Appr	LOS by Inters	LOS by Appr	LOS by Inters	LOS by Appr	LOS by Inters
Major Segment 4 (All Alternatives) (Continued)																
18	TH 7 Frontage Rd & Wooddale Ave.	NB	A		A		A		A		A		A		A	
		WB	A	A	B	A	A	A	B	A	C	A	D	A	C	A
		SB	A		A		A		A		A		A		A	
		EB	A		C		B		C		C		D		D	
19	36th St & Wooddale Ave.	NB	A		B		B		B		B		B		B	
		WB	A	C	B	B	B	B	C	C	B	C	B	C	C	C
		SB	C		C		B		B		D		C		C	
		EB	C		C		C		C		C		D		D	
20	CSAH 25 & Belt Line Blvd	NB	D		C		C		C		C		C		C	
		WB	D	C	C	C	C	C	C	C	C	C	C	C	C	C
		SB	D		C		C		C		C		C		C	
		EB	C		C		C		C		C		C		C	
21	CSAH 25 S. Frontage Rd & Belt Line Blvd	NB	A		A		A		A		A		A		A	
		WB	E	A	B	A	C	A	C	A	C	A	C	A	C	A
		SB	A		A		A		A		A		A		A	
		EB	F		C		C		C		E		C		C	
Major Segment C (LRT 3C & 3C Sub Alternatives)																
22	28th St & Nicollet Ave	NB	B		B		B				C		C			
		WB		B		B		B				B		B		
		SB	B		B		B				B		B			
		EB	B		B		B				B		B			
23	Blaisdell Ave & Franklin Ave	NB														
		WB	A	B	A	B	A	B			A	B	A	B		
		SB	C		C		C				C		C			
		EB	A		A		A				A		A			
24	Nicollet Ave & Franklin Ave	NB	C		C		C				C		C			
		WB	A	B	A	B	A	B			A	B	A	B		
		SB	C		C		C				C		C			
		EB	A		A		A				A		A			
25	1st Ave & Franklin Ave	NB	C		C		C				C		C			
		WB	A	B	A	B	A	B			A	B	A	B		
		SB											A			
		EB	A		A		A				A		A			
Sub Alternatives Blaisdell Ave (No-Build Same as Nicollet Ave Center-Running Alignment)																
23	Blaisdell Ave & Franklin Ave	NB														
		WB					A	B					A	B		
		SB					C						C			
		EB					A						A			
24	Nicollet Ave & Franklin Ave	NB					B						B			
		WB					C	B					C	C		
		SB					B						C			
		EB					C						C			
25	1st Ave & Franklin Ave	NB					C						C			
		WB					A	B					A	B		
		SB														
		EB					A						B			
Major Segment C (LRT 3C Alternatives) (Continued)																
26	W 15th St & Nicollet Ave S	NB	B		C		C				C		C			
		WB	B	B	B	B	B	B			B	B	B	B		
		SB	B		B		B				B		B			
		EB	B		C		C				C		C			
27	W Grant St & Nicollet Ave S	NB	B		B		B				B		B			
		WB	B	B	B	B	B	B			B	B	B	B		
		SB	B		B		B				B		B			
		EB	B		B		B				B		B			

Table C1 Approach Level of Service – AM Peak Hour

Alternative			2010 Peak Hour Existing Condition		2018 Peak Hour No Build		2018 Peak Hour Build LRT		2018 Peak Hour Build LRT Co-Location Alternative		2030 Peak Hour No Build		2030 Peak Hour Build LRT		2030 Peak Hour Build LRT Co-Location Alternative	
			LOS		LOS		LOS		LOS		LOS		LOS		LOS	
Location Code	Intersection	Appr	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters
Major Segment C (LRT 3C Alternatives) (Continued)																
Sub Alternatives Nicollet Mall																
28	13th St S & Nicollet Ave S	NB	A		A		A				A		A			
		WB	C	A	C	A	C	A			C	A	C	A		
		SB	A		A		A				A		A			
		EB														
29	12th St S & Nicollet Ave S	NB	B		B		B				A		A			
		WB		B		B		B				B		B		
		SB	A		A		A				B		B			
		EB	B		B		B				B		B			
30	11th St S & Nicollet Ave S	NB	B		B		B				B		B			
		WB	B	B	B	B	B	B			B	B	B	B		
		SB	C		B		B				B		B			
		EB														
31	S 10th St & Nicollet Ave S	NB	B		B		B				B		B			
		WB		B		B		B				B		B		
		SB	B		B		B				B		B			
		EB	B		B		B				B		B			
32	S 9th St & Nicollet Ave S	NB	B		B		B				B		B			
		WB	B	B	A	B	A	B			B	B	B	B		
		SB	C		C		C				C		C			
		EB														
33	S 8th St & Nicollet Ave S	NB	B		B		B				B		B			
		WB		B		B		B				B		B		
		SB	A		A		A				B		B			
		EB	B		B		B				B		B			
34	S 7th St & Nicollet Ave S	NB	C		C		C				C		C			
		WB	B	B	B	B	B	B			B	B	B	B		
		SB	C		B		B				B		B			
		EB														
35	S 6th St & Nicollet Ave S	NB	B		B		B				B		B			
		WB		B		B		B				B		B		
		SB	C		C		C				C		C			
		EB	B		B		B				B		B			
36	S 5th St & Nicollet Ave S	NB	B		B		B				B		B			
		WB	B	B	B	B	B	B			B	B	B	B		
		SB	A		A		A				B		B			
		EB														
37	S 4th St & Nicollet Ave S	NB	B		B		B				B		B			
		WB		B		B		B				B		B		
		SB	A		A		A				B		B			
		EB	B		B		B				B		B			
38	S 3rd St & Nicollet Ave S	NB	B		B		B				B		B			
		WB	B	B	B	B	B	B			B	B	B	B		
		SB	B		B		B				C		C			
		EB														
Sub Alternative 11th and 12th Street																
30	11th St S & Nicollet Ave S	NB	B		B		C				B		C			
		WB	B	B	B	B	B	B			B	B	B	B		
		SB	B		C		C				B		C			
		EB														
39	11th St S & LaSalle Ave	NB	A		B		B				B		B			
		WB	A	B	B	B	C	B			A	B	B	B		
		SB	C		C		C				C		C			
		EB														
40	11th St S & Harmon Pl	NB	B		B		B				B		B			
		WB	A	B	A	B	A	B			A	B	A	B		
		SB	B		B		B				B		B			
		EB														
41	11th St N & Hennepin Ave	NB	A		A		B				A		B			
		WB	B	B	B	B	B	B			C	B	B	B		
		SB	B		B		B				B		B			
		EB											A			
42	11th St N & Hawthorne Ave	NB	B		B		B				B		B			
		WB	B	B	B	B	B	B			C	C	B	B		
		SB	B		B		B				B		B			
		EB														

Table C1 Approach Level of Service – AM Peak Hour

Alternative			2010 Peak Hour		2018 Peak Hour		2018 Peak Hour		2018 Peak Hour		2030 Peak Hour		2030 Peak Hour		2030 Peak Hour	
			Existing Condition		No Build		Build LRT		Build LRT Co-Location Alternative		No Build		Build LRT		Build LRT Co-Location Alternative	
Location Code	Intersection	Appr	LOS by Appr	LOS by Inters	LOS by Appr	LOS by Inters	LOS by Appr	LOS by Inters	LOS by Appr	LOS by Inters	LOS by Appr	LOS by Inters	LOS by Appr	LOS by Inters	LOS by Appr	LOS by Inters
Major Segment C (LRT 3C Alternatives) (Continued)																
Sub Alternative 11th and 12th Street (Continued)																
29	12th St S & Nicollet Ave S	NB	B		B		B				B		B			
		WB		B		B		C				B		C		
		SB	A		A		D				A		C			
		EB	B		B		C				B		C			
43	12th St S & LaSalle Ave	NB	B		B		C				B		C			
		WB		C		C		C				C		C		
		SB	B		B		C				B		C			
		EB	C		C		B				C		C			
44	12th St S & Harmon Pl	NB	B		B		B				B		B			
		WB		B		B		B				B		B		
		SB	B		B		C				B		B			
		EB	B		B		B				B		B			
45	12th St N & Hennepin Ave	NB	B		B		C				B		C			
		WB		B		B		B				B		B		
		SB	B		B		B				B		B			
		EB	B		B		B				B		B			
46	12th St N & Hawthorne Ave	NB	C		C		C				D		E			
		WB		C		C		C				D		D		
		SB	A		A		A				B		B			
		EB	C		C		C				C		C			
47	Glenwood Ave & Royalston Ave N	NB	A		A		B				B		B			
		WB	A	A	A	A	A	B			A	A	B	B		
		SB	A		A		B				A		B			
		EB	A		A		B				A		B			

Table C2 Approach Level of Service – PM Peak Hour

Alternative			2010 Peak Hour		2018 Peak Hour		2018 Peak Hour		2018 Peak Hour		2030 Peak Hour		2030 Peak Hour		2030 Peak Hour	
			Existing Condition		No Build		Build LRT		Build LRT Co-Location Alternative		No Build		Build LRT		Build LRT Co-Location Alternative	
			LOS		LOS		LOS		LOS		LOS		LOS		LOS	
Location Code	Intersection	Appr	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters
Major Segment 3 (LRT 3A, 3C, & 3C Sub Alternatives)																
1	TH 5 North Ramp & Mitchell Rd	NB	C	C	B	B	B	B	B	B	B	B	B	B	B	B
		WB	C		C		C		C		C		C		C	
		SB	C		B		B		B		B		B		B	
		EB														
2	TH 5 South Ramp & Mitchell Rd	NB	A	B	A	B	A	B	A	B	A	B	A	B	A	B
		WB														
		SB	B		B		B		B		B		B		B	
		EB	C		B		C		C		B		C		C	
3	Lone Oak Rd & Mitchell Rd	NB	A	A	A	A	A	A	A	A	A	A	A	A	A	A
		WB					A		A							
		SB	A		A		A		A		A		A		A	
		EB	D		C		C		C		C		C		C	
4	Technology Drive & Mitchell Rd	NB	B	C	B	B	B	C	B	C	B	C	B	C	B	C
		WB	C		C		C		C		C		C		C	
		SB	B		B		B		B		B		B		B	
		EB	D		D		D		D		D		D		D	
5	Bryant Lake Dr & Valley View Road	NB	D	D	C	D	C	D	C	D	C	D	C	E	C	E
		WB	D		E		E		E		F		F		F	
		SB	C		C		B		B		C		B		B	
		EB					A		A							
6	Flying Cloud Dr & Valley View Road	NB	D	D	D	C	E	D	E	D	C	D	E	E	E	E
		WB	E		D		D		D		E		D		D	
		SB	C		B		C		C		B		C		C	
		EB	D		E		F		F		F		F		F	
7	Praire Center Dr & Valley View Road (East Jct)	NB	D	E	E	D	F	E	F	E	F	D	F	F	F	F
		WB	F		C		C		C		C		D		D	
		SB	A		A		C		C		B		C		C	
		EB	C		D		F		F		F		F		F	
8	Viking Dr & Prairie Center Dr	NB	B	D	C	D	F	E	F	E	D	D	F	F	F	F
		WB	F		F		F		F		F		F		F	
		SB	B		C		B		B		C		B		B	
		EB	C		C		B		B		C		B		B	
Major Segment 4 (All Alternatives)																
9	CSAH 3 & 17th Ave	NB		N/A	C	A	C	A	C	A	C	B	C	B	C	B
		WB			A		A		A		B		B		B	
		SB			C		B		B		C		C		C	
		EB			A		A		A		A		A		A	
10	5th Street & 16th Ave	NB		N/A	A	A	A	A	A	A	A	A	A	A	A	A
		WB			A		A		A		A		A		A	
		SB			A		A		A		A		A		A	
		EB			A		A		A		A		A		A	
11	CSAH 3 & 11th Ave	NB	B	C	C	C	C	C	C	C	C	C	C	C	C	C
		WB	B		C		C		C		C		C		C	
		SB	C		C		C		C		C		C		C	
		EB	C		C		C		C		C		C		C	
12	CSAH 3 & 8th Ave	NB	C	B	D	B	D	C	D	C	D	B	D	C	D	C
		WB	A		B		B		B		B		C		C	
		SB	C		D		D		D		D		D		D	
		EB	A		B		B		B		B		C		C	
13	CSAH 3 & 5th Ave	NB	C	B	D	B	D	C	D	C	E	C	D	C	D	C
		WB	B		B		B		B		B		C		C	
		SB	C		D		D		D		E		D		D	
		EB	B		B		C		C		C		C		C	
14	2nd Street & Blake Rd. N.	NB	B	B	A	B	A	B	A	B	A	B	A	B	A	B
		WB	B		B		B		B		B		B		B	
		SB	A		A		A		A		A		B		B	
		EB	C		B		B		B		B		B		B	
15	Blake Rd. N. & CSAH 3	NB	C	C	C	C	C	C	C	C	C	C	C	C	C	C
		WB	B		B		B		B		B		B		B	
		SB	D		C		C		C		C		C		C	
		EB	C		B		B		B		C		B		B	
16	TH 7 WB On-Ramp & Wooddale Ave.	NB	A	A	A	A	A	B	A	A	A	B	A	B	A	B
		WB	B		C		D		C		C		C		C	
		SB	A		A		A		A		B		B		B	
		EB							A							
17	TH 7 EB Off-Ramp & Wooddale Ave.	NB	A	A	A	B	B	B	B	B	B	B	B	B	B	B
		WB							A							
		SB	A		B		B		B		C		C		C	
		EB	B		B		B		B		C		C		C	

Table C2 Approach Level of Service – PM Peak Hour

Alternative			2010 Peak Hour Existing Condition		2018 Peak Hour No Build		2018 Peak Hour Build LRT		2018 Peak Hour Build LRT Co-Location Alternative		2030 Peak Hour No Build		2030 Peak Hour Build LRT		2030 Peak Hour Build LRT Co-Location Alternative	
			LOS		LOS		LOS		LOS		LOS		LOS		LOS	
Location Code	Intersection	Appr	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters
Major Segment 4 (All Alternatives) (Continued)																
18	TH 7 Frontage Rd & Wooddale Ave.	NB	A		A		A		A		A		A		A	
		WB	B	A	B	A	B	A	C	A	C	A	E	A	C	A
		SB	A		A		A		A		A		A		A	
		EB	A		B		C		E		D		D		E	
19	36th St & Wooddale Ave.	NB	A		B		B		C		B		C		C	
		WB	A	B	B	C	B	B	C	C	C	C	C	C	C	D
		SB	C		C		B		C		D		C		D	
		EB	C		D		D		D		D		D		D	
20	CSAH 25 & Belt Line Blvd	NB	C		C		C		C		C		D		D	
		WB	E	D	D	D	C	D	C	D	C	D	C	D	C	D
		SB	C		C		C		C		D		E		D	
		EB	D		D		E		D		D		D		D	
21	CSAH 25 S. Frontage Rd & Belt Line Blvd	NB	A		A		A		B		C		D		D	
		WB	D	A	F	B	F	B	F	B	F	E	F	F	F	F
		SB	A		A		A		A		A		A		A	
		EB	E		F		F		F		F		F		F	
Major Segment C (LRT 3C & 3C Sub Alternatives)																
22	28th St & Nicollet Ave	NB	B		B		B				B		B			
		WB		B		B	A	B				B		B		
		SB	B		B		B				B		B			
		EB	B		B		B				B		B			
23	Blaisdell Ave & Franklin Ave	NB					A									
		WB	B	B	B	B	B	B			B	B	B	B		
		SB	C		C		C				C		C			
		EB	B		B		B				B		B			
24	Nicollet Ave & Franklin Ave	NB	C		C		D				C		D			
		WB	B	B	B	B	C	C			C	C	D	D		
		SB	C		C		C				C		D			
		EB	B		B		C				C		C			
25	1st Ave & Franklin Ave	NB	C		C		C				C		C			
		WB	A	B	B	B	B	B			C	C	D	C		
		SB					A									
		EB	A		A		A				B		B			
Sub Alternatives Blaisdell Ave (No-Build Same as Nicollet Ave Center-Running Alignment)																
23	Blaisdell Ave & Franklin Ave	NB														
		WB					B	B					C	C		
		SB					B						C			
		EB					B						B			
24	Nicollet Ave & Franklin Ave	NB					C						C			
		WB					D	D					E	D		
		SB					E						F			
		EB					D						D			
25	1st Ave & Franklin Ave	NB					C						E			
		WB					E	D					F	E		
		SB														
		EB					B						B			
Major Segment C (LRT 3C Alternatives) (Continued)																
26	W 15th St & Nicollet Ave S	NB	C		C		C				C		C			
		WB	B	C	B	C	B	C			B	C	B	C		
		SB	B		B		B				B		B			
		EB	C		C		C				C		C			
27	W Grant St & Nicollet Ave S	NB	A		B		B				B		B			
		WB	B	B	B	B	B	B			B	B	B	B		
		SB	B		B		B				B		B			
		EB	B		B		B				B		B			

Table C2 Approach Level of Service – PM Peak Hour

Alternative			2010 Peak Hour Existing Condition		2018 Peak Hour No Build		2018 Peak Hour Build LRT		2018 Peak Hour Build LRT Co-Location Alternative		2030 Peak Hour No Build		2030 Peak Hour Build LRT		2030 Peak Hour Build LRT Co-Location Alternative	
			LOS		LOS		LOS		LOS		LOS		LOS		LOS	
Location Code	Intersection	Appr	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters
Major Segment C (LRT 3C Alternatives) (Continued)																
Sub Alternatives Nicollet Mall																
		NB	A		A		A				A		A			
28	13th St S &	WB	C	B	C	B	C	B			C	B	C	B		
	Nicollet Ave S	SB	A		A		A				A		A			
		EB														
		NB	B		B		B				B		B			
29	12th St S &	WB		B		B		B				B		B		
	Nicollet Ave S	SB	A		B		B				B		B			
		EB	B		B		B				B		B			
		NB	A		B		B				B		B			
30	11th St S &	WB	B	B	B	B	B	B			B	B	B	B		
	Nicollet Ave S	SB	B		B		B				B		B			
		EB														
		NB	B		B		B				B		B			
31	S 10th St &	WB		B		B		B				B		B		
	Nicollet Ave S	SB	A		B		B				B		B			
		EB	B		B		B				B		B			
		NB	B		B		B				B		B			
32	S 9th St &	WB	B	B	B	B	B	B			B	B	B	B		
	Nicollet Ave S	SB	C		C		C				C		C			
		EB														
		NB	A		A		A				B		B			
33	S 8th St &	WB		B		B		B				B		B		
	Nicollet Ave S	SB	B		B		B				A		A			
		EB	B		B		B				B		B			
		NB	C		C		C				B		B			
34	S 7th St &	WB	B	B	B	B	B	B			B	B	B	B		
	Nicollet Ave S	SB	B		B		B				B		B			
		EB														
		NB	B		B		B				B		B			
35	S 6th St &	WB		B		B		B				B		B		
	Nicollet Ave S	SB	B		C		C				C		C			
		EB	B		B		B				B		B			
		NB	B		B		B				B		B			
36	S 5th St &	WB	B	B	B	B	B	B			B	B	B	B		
	Nicollet Ave S	SB	A		A		A				A		A			
		EB														
		NB	B		B		B				B		B			
37	S 4th St &	WB		B		B		B				B		B		
	Nicollet Ave S	SB	A		A		A				B		B			
		EB	B		B		B				B		B			
		NB	B		B		B				B		B			
38	S 3rd St &	WB	B	B	B	B	B	B			B	B	B	B		
	Nicollet Ave S	SB	B		B		B				B		B			
		EB														
Sub Alternative 11th and 12th Street																
		NB	B		B		C				B		C			
30	11th St S &	WB	B	B	B	B	B	B			B	B	D	D		
	Nicollet Ave S	SB	B		B		B				B		C			
		EB														
		NB	B		B		C				B		D			
39	11th St S &	WB	A	C	B	C	C	C			B	C	C	D		
	LaSalle Ave	SB	D		D		D				D		E			
		EB														
		NB	B		C		C				B		C			
40	11th St S &	WB	A	B	A	B	B	B			A	B	B	B		
	Harmon Pl	SB	B		B		B				B		B			
		EB														
		NB	B		A		A				B		B			
41	11th St N &	WB	B	B	B	B	B	B			B	B	B	B		
	Hennepin Ave	SB	B		B		C				B		C			
		EB														
		NB	B		B		C				B		C			
42	11th St N &	WB	B	B	B	B	B	C			B	B	B	C		
	Hawthorne Ave	SB	B		B		C				C		C			
		EB														

Table C2 Approach Level of Service – PM Peak Hour

Alternative			2010 Peak Hour		2018 Peak Hour		2018 Peak Hour		2018 Peak Hour		2030 Peak Hour		2030 Peak Hour		2030 Peak Hour	
			Existing Condition		No Build		Build LRT		Build LRT Co-Location Alternative		No Build		Build LRT		Build LRT Co-Location Alternative	
			LOS		LOS		LOS		LOS		LOS		LOS		LOS	
Location Code	Intersection	Appr	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters
Major Segment C (LRT 3C Alternatives) **(Continued)**																
Sub Alternative 11th and 12th Street **(Continued)**																
29	12th St S & Nicollet Ave S	NB	B	B	B	B	B	B			B	B	B	B		
		WB														
		SB	A		A		D				A		D			
		EB	B		B		B				B		B			
43	12th St S & LaSalle Ave	NB	B	B	B	B	B	B			B	C	B	C		
		WB														
		SB	A		A		A				A		A			
		EB	C		C		C				C		D			
44	12th St S & Harmon Pl	NB	A	B	A	B	B	B			A	B	B	B		
		WB														
		SB	B		B		B				B		B			
		EB	B		B		B				B		B			
45	12th St N & Hennepin Ave	NB	B	B	B	B	B	B			B	B	B	B		
		WB														
		SB	A		A		B				A		B			
		EB	B		B		B				B		B			
46	12th St N & Hawthorne Ave	NB	A	B	A	B	A	B			A	B	A	B		
		WB														
		SB	B		B		B				B		B			
		EB	C		C		C				C		C			
47	Glenwood Ave & Royalston Ave N	NB	B	B	B	B	B	B			B	B	C	C		
		WB	B		B		C				B		C			
		SB	A		A		B				A		B			
		EB	A		A		B				B		B			

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Attachment D

(Queue Tables)

Table D1 Vehicle Queue by Turn Lane – AM Peak Hour

Alternative			2010 Peak Hour Existing Condition		2018 Peak Hour No Build		2018 Peak Hour Build LRT		2018Peak Hour Build LRT Co-Location Alternative		2030 Peak Hour No Build		2030 Peak Hour Build LRT		2030 Peak Hour Build LRT Co-Location Alternative	
Location Code	Intersection	Appr	Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)	
			LT	RT	LT	RT	LT	RT	LT	RT	LT	RT	LT	RT	LT	RT
Major Segment 3 (LRT 3A, 3C, & 3C Sub Alternatives)																
1	TH 5 North Ramp & Mitchell Rd	NB	184		221		286		286		200		284		284	
		WB	185	118	198	122	200	112	200	112	206	143	211	118	211	118
		SB		22		68		37		37		56		25		25
		EB														
2	TH 5 South Ramp & Mitchell Rd	NB		133		175		266		266		202		280		280
		WB														
		SB	146		133		177		177		129		150		150	
		EB	89	149	94	170	99	232	99	232	104	190	96	252	96	252
3	Lone Oak Rd & Mitchell Rd	NB	68		82		91		91		98		96		96	
		WB														
		SB		37		44		34		34		38		38		38
		EB	43	23	52	31	52	27	52	27	64	23	48	27	48	27
4	Technology Drive & Mitchell Rd	NB	111	145	110	145	102	145	102	145	117	145	104	145	104	145
		WB	95	67	72	80	77	72	77	72	94	71	74	75	74	75
		SB	128	44	128	55	128	65	128	65	128	57	128	60	128	60
		EB	66		71		57		57		78		54		54	
5	Bryant Lake Dr & Valley View Road	NB														
		WB	354	189	394	121	739	695	739	695	525	226	1041	1050	1041	1050
		SB	123		274		275		275		275		274		274	
		EB														
6	Flying Cloud Dr & Valley View Road	NB	84	208	110	247	152	239	152	239	154	274	158	238	158	238
		WB	350	102	348	48	350	83	350	83	350	52	350	80	350	80
		SB	335	121	374	398	375	608	375	608	374	400	375	616	375	616
		EB	492	87	488	99	575	113	575	113	509	207	574	324	574	324
7	Praire Center Dr & Valley View Road (East Jct)	NB	26		30		58		58		66		25		25	
		WB			77		64		64		78		98		98	
		SB	250		250		250		250		250		250		250	
		EB	43		60		57		57		125		128		128	
8	Viking Dr & Prairie Center Dr	NB	102	381	163	569	106	332	106	332	299	674	209	477	209	477
		WB	76		72	11	54	11	54	11	71	11	76		76	
		SB	298		299		235		235		300		300		300	
		EB	101	117	133	80	114	119	114	119	138	40	162	200	162	200
Major Segment 4 (All Alternatives)																
9	CSAH 3 & 17th Ave	NB			36		46		46		37		41		41	
		WB			39		52		52		47		52		52	
		SB			91		108		108		104		82		82	
		EB			38	35	43	30	43	30	29	31	34	35	34	35
10	5th Street & 16th Ave	NB														
		WB														
		SB														
		EB														
11	CSAH 3 & 11th Ave	NB	131	55	163	70	168	111	168	111	148	86	146	111	146	111
		WB	152		165	14	180		180		164		173		173	
		SB	105		90	14	77		77		100	11	95		95	
		EB	115	49	102	42	126	50	126	50	126	44	118	61	118	61
12	CSAH 3 & 8th Ave	NB														
		WB	35	35	37	33	48	51	48	51	34	30	56	58	56	58
		SB														
		EB	46	23	63	26	66	48	66	48	68	33	82	69	82	69
13	CSAH 3 & 5th Ave	NB	98		122		100		100		123		130		130	
		WB	169		121		140		140		133		175		175	
		SB			161		167		167		159		180		180	
		EB	91		104		102		102		136		110		110	
14	2nd Street & Blake Rd. N.	NB	128		94		98		98		107		110		110	
		WB														
		SB	11		20		20		20		24		28		28	
		EB	45		40		45		45		48		45		45	
15	Blake Rd. N. & CSAH 3	NB	122	63	134	57	132	49	132	49	126	57	146	65	146	65
		WB	84		113	8	125	18	125	18	102		113	11	113	11
		SB	253	120	200	128	222	126	222	126	218	133	252	131	252	131
		EB	58	70	60	44	57	36	57	36	57	48	55	49	55	49
16	TH 7 WB On-Ramp & Wooddale Ave.	NB	99		102		97		123		90		117		113	
		WB		68		55		54		59		71		63		91
		SB														
		EB														
17	TH 7 EB Off-Ramp & Wooddale Ave.	NB		32		76		105		105		87		108		108
		WB														
		SB														
		EB		136		322		150		291		311		204		398

Queues greater than 300 feet highlighted in red.

Table D1 Vehicle Queue by Turn Lane – AM Peak Hour

Alternative			2010 Peak Hour Existing Condition		2018 Peak Hour No Build		2018 Peak Hour Build LRT		2018Peak Hour Build LRT Co-Location Alternative		2030 Peak Hour No Build		2030 Peak Hour Build LRT		2030 Peak Hour Build LRT Co-Location Alternative	
Location Code	Intersection	Appr	Max Queue (ft) LT	RT	Max Queue (ft) LT	RT	Max Queue (ft) LT	RT	Max Queue (ft) LT	RT	Max Queue (ft) LT	RT	Max Queue (ft) LT	RT	Max Queue (ft) LT	RT
Major Segment 4 (All Alternatives)(Continued)																
18	TH 7 Frontage Rd & Wooddale Ave.	NB														
		WB	38		38		42		47		34		64		56	
		SB														
		EB	24		41		29		33		32		33		30	
19	36th St & Wooddale Ave.	NB		98		105		102		116		91		112		119
		WB	85	37	183	96	140	100	220	173	259	93	200	135	294	178
		SB	288		218		190		204		218		206		218	
		EB														
20	CSAH 25 & Belt Line Blvd	NB	179	129	179	101	179	157	179	150	179	142	179	181	179	183
		WB	264		142		139		188		167		174		179	
		SB	46	110	38	66	29	61	41	74	33	78	41	69	38	79
		EB	147		121		120		134		134		121	80	145	
21	CSAH 25 S. Frontage Rd & Belt Line Blvd	NB														
		WB	66		45		57		54		56		61		61	
		SB														
		EB		11		31		31		31		31		31		31
Major Segment C (LRT 3C & 3C Sub Alternatives)																
22	28th St & Nicollet Ave	NB														
		WB														
		SB	110		104		104		104		143		143		143	
		EB														
23	Blaisdell Ave & Franklin Ave	NB														
		WB														
		SB	129	113	129	127	129	127	129	127	129	125	129	128	129	128
		EB														
24	Nicollet Ave & Franklin Ave	NB	95		95						82					
		WB														
		SB	96		110						106					
		EB														
25	1st Ave & Franklin Ave	NB		150		150		150		150		150		150		150
		WB														
		SB														
		EB														
Sub Alternatives Blaisdell Ave (No-Build Same as Nicollet Ave Center-Running Alignment)																
23	Blaisdell Ave & Franklin Ave	NB														
		WB														
		SB					129	127	129	127			129	127	129	127
		EB														
24	Nicollet Ave & Franklin Ave	NB					66		66				69		69	
		WB														
		SB														
		EB														
25	1st Ave & Franklin Ave	NB						150		150				150		150
		WB														
		SB														
		EB														
Major Segment C (LRT 3C Alternatives)(Continued)																
26	W 15th St & Nicollet Ave S	NB	69		69		69		69		69		69		69	
		WB	47		64		64		64		46		46		46	
		SB	49		48		48		48		57		57		57	
		EB														
27	W Grant St & Nicollet Ave S	NB														
		WB	76		57		57		57		79		79		79	
		SB														
		EB														

Queues greater than 300 feet highlighted in red.

Table D1 Vehicle Queue by Turn Lane – AM Peak Hour

Alternative			2010 Peak Hour		2018 Peak Hour		2018 Peak Hour		2018Peak Hour		2030 Peak Hour		2030 Peak Hour		2030 Peak Hour	
			Existing Condition		No Build		Build LRT		Build LRT Co-Location Alternative		No Build		Build LRT		Build LRT Co-Location Alternative	
Location Code	Intersection	Appr	Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)	
			LT	RT	LT	RT	LT	RT	LT	RT	LT	RT	LT	RT	LT	RT
Major Segment C (LRT 3C Alternatives) (Continued)																
Sub Alternatives Nicollet Mall																
28	13th St S & Nicollet Ave S	NB														
		WB	65		81		81		81		78		78		78	
		SB														
		EB														
29	12th St S & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
30	11th St S & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
31	S 10th St & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
32	S 9th St & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
33	S 8th St & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
34	S 7th St & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
35	S 6th St & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
36	S 5th St & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
37	S 4th St & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
38	S 3rd St & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
Sub Alternative 11th and 12th Street																
30	11th St S & Nicollet Ave S	NB														
		WB					31		31				38		38	
		SB														
		EB														
39	11th St S & LaSalle Ave	NB														
		WB														
		SB														
		EB														
40	11th St S & Harmon Pl	NB														
		WB														
		SB														
		EB														
41	11th St N & Hennepin Ave	NB	52		56		74		74		56		62		62	
		WB														
		SB		30		35		35		35		48		52		52
		EB														
42	11th St N & Hawthorne Ave	NB														
		WB	84		40		57		57		146		59		59	
		SB														
		EB														

Queues greater than 300 feet highlighted in red.

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Table D1 Vehicle Queue by Turn Lane – AM Peak Hour

Alternative			2010 Peak Hour		2018 Peak Hour		2018 Peak Hour		2018Peak Hour		2030 Peak Hour		2030 Peak Hour		2030 Peak Hour	
			Existing Condition		No Build		Build LRT		Build LRT Co-Location Alternative		No Build		Build LRT		Build LRT Co-Location Alternative	
Location Code	Intersection	Appr	Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)	
			LT	RT	LT	RT	LT	RT	LT	RT	LT	RT	LT	RT	LT	RT
Major Segment C (LRT 3C Alternatives) **(Continued)**																
Sub Alternative 11th and 12th Street **(Continued)**																
29	12th St S & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
43	12th St S & LaSalle Ave	NB														
		WB														
		SB														
		EB														
44	12th St S & Harmon Pl	NB														
		WB														
		SB														
		EB														
45	12th St N & Hennepin Ave	NB		150		150		150		150		150		150		150
		WB														
		SB	60		72		60		60		79		68		68	
		EB		47		38		86		86		43		300		300
46	12th St N & Hawthorne Ave	NB														
		WB														
		SB	79		102		94		94		129		111		111	
		EB														
47	Glenwood Ave & Royalston Ave N	NB	95		96		122		122		112		126		126	
		WB														
		SB														
		EB														

Queues greater than 300 feet highlighted in red.

Table D2 Vehicle Queue by Turn Lane – PM Peak Hour

Alternative			2010 Peak Hour		2018 Peak Hour		2018 Peak Hour		2018 Peak Hour		2030 Peak Hour		2030 Peak Hour		2030 Peak Hour	
			Existing Condition		No Build		Build LRT		Build LRT Co-Location Alternative		No Build		Build LRT		Build LRT Co-Location Alternative	
Location Code	Intersection	Appr	Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)	
			LT	RT	LT	RT	LT	RT	LT	RT	LT	RT	LT	RT	LT	RT
Major Segment 3 (LRT 3A, 3C, & 3C Sub Alternatives)																
1	TH 5 North Ramp & Mitchell Rd	NB	241		195		229		229		239		229		229	
		WB	160	110	183	86	170	100	170	100	180	106	170	100	170	100
		SB		105		33		29		29		110		29		29
		EB														
2	TH 5 South Ramp & Mitchell Rd	NB		184		135		197		197		93		197		197
		WB														
		SB	161		145		173		173		148		173		173	
		EB	89	115	68	113	90	195	90	195	87	121	90	195	90	195
3	Lone Oak Rd & Mitchell Rd	NB	48		63		61		61		48		61		61	
		WB														
		SB		30		28		29		29		29		29		29
		EB	84	127	84	137	84	115	84	115	81	176	84	115	84	115
4	Technology Drive & Mitchell Rd	NB	80	142	63	144	70	144	70	144	59	145	70	144	70	144
		WB	222	114	199	145	180	175	180	175	207	131	180	175	180	175
		SB	126	21	104	97	109	92	109	92	123	130	109	92	109	92
		EB	170		160		163		163		181		163		163	
5	Bryant Lake Dr & Valley View Road	NB														
		WB	744	687	821	776	727	462	727	462	993	955	1041	1050	1041	1050
		SB	95		116		91		91		117		104		104	
		EB														
6	Flying Cloud Dr & Valley View Road	NB	241	244	244	372	232	368	232	368	241	330	232	368	232	368
		WB	104	31	100	21	105	35	105	35	103	30	117	18	117	18
		SB	303	117	270	127	368	514	368	514	308	508	374	519	374	519
		EB	496	51	574	50	561	62	561	62	575	56	575	71	575	71
7	Praire Center Dr & Valley View Road (East Jct)	NB	128		96		200		200		164		199		199	
		WB		200	322	247	320	464	320	464	329	272	321	486	321	486
		SB	153		177		245		245		189		221		221	
		EB														
8	Viking Dr & Prairie Center Dr	NB	90	49	100	54	300	559	300	559	231	156	259	573	259	573
		WB	843	350	350	350	314	350	314	350	350	350	348	350	348	350
		SB	69		161		249		249		170		120		120	
		EB	36		46		46		46		54	60	54	30	54	30
Major Segment 4 (All Alternatives)																
9	CSAH 3 & 17th Ave	NB			36		46		46		81		90		90	
		WB			39		52		52		30		34	21	34	21
		SB			91		108		108		176		160		160	
		EB			38	35	43	30	43	30	104	29	112	30	112	30
10	5th Street & 16th Ave	NB														
		WB														
		SB														
		EB														
11	CSAH 3 & 11th Ave	NB	269	97	265	130	270	186	270	186	344	132	372	206	372	206
		WB	160	11	168	11	172		172		175	27	172		172	
		SB	116	38	134	28	118	33	118	33	115	55	117	55	117	55
		EB	182		204	11	190	33	190	33	213	28	238	55	238	55
12	CSAH 3 & 8th Ave	NB														
		WB	39	53	40	60	75	232	75	232	41	67	111	350	111	350
		SB														
		EB	88	24	91	35	90	91	90	91	107	30	132	126	132	126
13	CSAH 3 & 5th Ave	NB	115		150		132		132		191		132		132	
		WB	224		154		162		162		137		265		265	
		SB			166		164		164		233		244		244	
		EB	122		129		142	310	142	310	154	307	259	310	259	310
14	2nd Street & Blake Rd. N.	NB	128		154		130		130		109		144		144	
		WB		16		27		27		27		28		33		33
		SB	15		19		24		24		24		37		37	
		EB	147	66	102		101	32	101	32	110	33	110	23	110	23
15	Blake Rd. N. & CSAH 3	NB	143	50	123	48	140	42	140	42	127	47	141	51	141	51
		WB	84	54	93	47	101	47	101	47	97	56	92	62	92	62
		SB	266	111	208	131	277	132	277	132	264	126	279	135	279	135
		EB	86	77	87	70	89	78	89	78	93	67	92	82	92	82
16	TH 7 WB On-Ramp & Wooddale Ave.	NB	101		126		138		133		139		136		134	
		WB		51		59		115		54		58		54		63
		SB														
		EB														
17	TH 7 EB Off-Ramp & Wooddale Ave.	NB		100		108		108		108		108		108		108
		WB														
		SB														
		EB		94		248		120		311		357		279		349

Queues greater than 300 feet highlighted in red.

Table D2 Vehicle Queue by Turn Lane – PM Peak Hour

Alternative			2010 Peak Hour		2018 Peak Hour		2018 Peak Hour		2018 Peak Hour		2030 Peak Hour		2030 Peak Hour		2030 Peak Hour	
			Existing Condition		No Build		Build LRT		Build LRT Co-Location Alternative		No Build		Build LRT		Build LRT Co-Location Alternative	
Location Code	Intersection	Appr	Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)	
			LT	RT	LT	RT	LT	RT	LT	RT	LT	RT	LT	RT	LT	RT
Major Segment 4 (All Alternatives) (Continued)																
18	TH 7 Frontage Rd & Wooddale Ave.	NB														
		WB	24		25		25		24		29		42		29	
		SB														
		EB	24		36		37		72		50		29		42	
19	36th St & Wooddale Ave.	NB		118		111		122		126		181		161		180
		WB	131	85	318	164	233	178	365	200	401	197	367	199	420	200
		SB	276		220		206		220		220		209		220	
		EB														
20	CSAH 25 & Belt Line Blvd	NB	179	168	179	188	179	209	179	158	179	200	179	205	179	205
		WB	424		311		280		271		280		250		306	
		SB	37	35	45	39	42	31	33	30	38	92	41	140	42	92
		EB	298	325	280	409	323	408	289	324	230	246	231	242	268	325
21	CSAH 25 S. Frontage Rd & Belt Line Blvd	NB														
		WB	70		147		107		146		386		406		348	
		SB														
		EB		31		75		35		74		205		250		250
Major Segment C (LRT 3C & 3C Sub Alternatives)																
22	28th St & Nicollet Ave	NB														
		WB														
		SB	143		125		125		125		148		148		148	
		EB														
23	Blaisdell Ave & Franklin Ave	NB														
		WB														
		SB	129	130	129	130	129	130	129	130	130	130	130	130	130	130
		EB														
24	Nicollet Ave & Franklin Ave	NB	155		161						134					
		WB														
		SB	119		119						120					
		EB														
25	1st Ave & Franklin Ave	NB		150		150		150		150		150		150		150
		WB														
		SB														
		EB														
Sub Alternatives Blaisdell Ave (No-Build Same as Nicollet Ave Center-Running Alignment)																
23	Blaisdell Ave & Franklin Ave	NB														
		WB														
		SB					130	130	130	130			130	130	130	130
		EB														
24	Nicollet Ave & Franklin Ave	NB					106		106				188		188	
		WB														
		SB														
		EB														
25	1st Ave & Franklin Ave	NB						150		150				150		150
		WB														
		SB														
		EB														
Major Segment C (LRT 3C Alternatives) (Continued)																
26	W 15th St & Nicollet Ave S	NB	69		69		69		69		69		69		69	
		WB	81		95		95		95		81		81		81	
		SB	87		60		60		60		158		158		158	
		EB														
27	W Grant St & Nicollet Ave S	NB														
		WB	140		143		143		143		150		150		150	
		SB														
		EB														

Queues greater than 300 feet highlighted in red.

Table D2 Vehicle Queue by Turn Lane – PM Peak Hour

Alternative			2010 Peak Hour		2018 Peak Hour		2018 Peak Hour		2018 Peak Hour		2030 Peak Hour		2030 Peak Hour		2030 Peak Hour	
			Existing Condition		No Build		Build LRT		Build LRT Co-Location Alternative		No Build		Build LRT		Build LRT Co-Location Alternative	
Location Code	Intersection	Appr	Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)	
			LT	RT	LT	RT	LT	RT	LT	RT	LT	RT	LT	RT	LT	RT
Major Segment C (LRT 3C Alternatives) (Continued)																
Sub Alternatives Nicollet Mall																
28	13th St S & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
29	12th St S & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
30	11th St S & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
31	S 10th St & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
32	S 9th St & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
33	S 8th St & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
34	S 7th St & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
35	S 6th St & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
36	S 5th St & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
37	S 4th St & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
38	S 3rd St & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
Sub Alternative 11th and 12th Street																
30	11th St S & Nicollet Ave S	NB														
		WB					24		24				48		48	
		SB														
		EB														
39	11th St S & LaSalle Ave	NB														
		WB														
		SB														
		EB														
40	11th St S & Harmon Pl	NB														
		WB														
		SB														
		EB														
41	11th St N & Hennepin Ave	NB	45		73		79		79		77		89		89	
		WB														
		SB		124		146		144		144		147		147		147
		EB														
42	11th St N & Hawthorne Ave	NB														
		WB	118		119		234		234		129		340		340	
		SB														
		EB														

Queues greater than 300 feet highlighted in red.

Table D2 Vehicle Queue by Turn Lane – PM Peak Hour

Alternative			2010 Peak Hour		2018 Peak Hour		2018 Peak Hour		2018 Peak Hour		2030 Peak Hour		2030 Peak Hour		2030 Peak Hour	
			Existing Condition		No Build		Build LRT		Build LRT Co-Location Alternative		No Build		Build LRT		Build LRT Co-Location Alternative	
Location Code	Intersection	Appr	Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)	
			LT	RT	LT	RT	LT	RT	LT	RT	LT	RT	LT	RT	LT	RT
Major Segment C (LRT 3C Alternatives) (Continued)																
Sub Alternative 11th and 12th Street (Continued)																
29	12th St S & Nicollet Ave S	NB														
		WB														
		SB														
		EB														
43	12th St S & LaSalle Ave	NB														
		WB														
		SB														
		EB														
44	12th St S & Harmon Pl	NB														
		WB														
		SB														
		EB														
45	12th St N & Hennepin Ave	NB		137		148		150		150		148		150		150
		WB														
		SB	68		72		74		74		92		112		112	
		EB		102		73		65		65		97		73		73
46	12th St N & Hawthorne Ave	NB														
		WB														
		SB	170		143		170		170		170		169		169	
		EB														
47	Glenwood Ave & Royalston Ave N	NB	184		199		294		294		258		336		336	
		WB														
		SB														
		EB														

Queues greater than 300 feet highlighted in red.

Table 2 Intersection Level of Service – AM Peak Hour

Alternative			2010 Peak Hour	2018 Peak Hour	2018 Peak Hour	2018 Peak Hour	2030 Peak Hour	2030 Peak Hour	2030 Peak Hour
			Existing Condition	No Build	Build LRT	Build LRT Co-Location Alternative	No Build	Build LRT	Build LRT Co-Location Alternative
Model #	Location Code	Intersection	LOS by Intersection	LOS by Intersection	LOS by Intersection	LOS by Intersection	LOS by Intersection	LOS by Intersection	LOS by Intersection
Major Segment 3 (LRT 3A, 3C, & 3C Sub Alternatives)									
1	1	TH 5 North Ramp & Mitchell Rd	B	B	C	C	B	C	C
	2	TH 5 South Ramp & Mitchell Rd	B	B	B	B	B	B	B
	3	Lone Oak Rd & Mitchell Rd	A	A	A	A	A	A	A
	4	Technology Drive & Mitchell Rd	C	C	C	C	C	C	C
2	5	Bryant Lake Dr & Valley View Road	C	D	F	F	E	F	F
	6	Flying Cloud Dr & Valley View Road	D	D	F	F	E	F	F
	7	Praire Center Dr & Valley View Road (East Jct)	B	C	B*	B*	C	C	C
	8	Viking Dr & Prairie Center Dr	C	D	C*	C*	D	C*	C*
Major Segment 4 (All Alternatives)									
3	9	CSAH 3 & 17th Ave	N/A	A	A	A	A	A	A
	10	5th Street & 16th Ave	N/A	A	A	A	A	A	A
4	11	CSAH 3 & 11th Ave	B	B	B	B	B	B	B
	12	CSAH 3 & 8th Ave	A	A	B	B	A	B	B
	13	CSAH 3 & 5th Ave	B	B	C	C	B	C	C
5	14	2nd Street & Blake Rd. N.	B	A	A	A	A	A	A
	15	Blake Rd. N. & CSAH 3	C	B	C	C	C	C	C
6	16	TH 7 WB On-Ramp & Wooddale Ave.	A	A	A	A	A	B	B
	17	TH 7 EB Off-Ramp & Wooddale Ave.	A	B	B	B	B	B	B
	18	TH 7 Frontage Rd & Wooddale Ave.	A	A	A	A	A	A	A
	19	36th St & Wooddale Ave.	C	B	B	C	C	C	C
7	20	CSAH 25 & Belt Line Blvd	C	C	C	C	C	C	C
	21	CSAH 25 S. Frontage Rd & Belt Line Blvd	A	A	A	A	A	A	A
Major Segment C (LRT 3C & 3C Sub Alternatives)									
8	22	28th St & Nicollet Ave	B	B	B	N/A	B	B	N/A
9	23	Blaisdell Ave & Franklin Ave	B	B	B	N/A	B	B	N/A
	24	Nicollet Ave & Franklin Ave	B	B	B	N/A	B	B	N/A
	25	1st Ave & Franklin Ave	B	B	B	N/A	B	B	N/A
Sub Alternatives Blaisdell Ave (No-Build Same as Nicollet									
9	23	Blaisdell Ave & Franklin Ave	N/A	N/A	B	N/A	N/A	B	N/A
	24	Nicollet Ave & Franklin Ave	N/A	N/A	B	N/A	N/A	C	N/A
	25	1st Ave & Franklin Ave	N/A	N/A	B	N/A	N/A	B	N/A
Major Segment C (LRT 3C & 3C Sub Alternatives)									
9	26	W 15th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	27	W Grant St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	28	13th St S & Nicollet Ave S	A	A	A	N/A	A	A	N/A
Sub Alternatives Nicollet Mall									
10	29	12th St S & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	30	11th St S & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	31	S 10th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	32	S 9th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	33	S 8th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	34	S 7th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	35	S 6th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	36	S 5th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	37	S 4th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	38	S 3rd St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
Sub Alternative 11th and 12th Street									
11	30	11th St S & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	39	11th St S & LaSalle Ave	B	B	B	N/A	B	B	N/A
	40	11th St S & Harmon Pl	B	B	B	N/A	B	B	N/A
	41	11th St N & Hennepin Ave	B	B	B	N/A	B	B	N/A
	42	11th St N & Hawthorne Ave	B	B	B	N/A	C	B	N/A
	29	12th St S & Nicollet Ave S	B	B	C	N/A	B	C	N/A
	43	12th St S & LaSalle Ave	C	C	C	N/A	C	C	N/A
	44	12th St S & Harmon Pl	B	B	B	N/A	B	B	N/A
	45	12th St N & Hennepin Ave	B	B	B	N/A	B	B	N/A
	46	12th St N & Hawthorne Ave	C	C	C	N/A	D	D	N/A
12	47	Glenwood Ave & Royalston Ave N	A	A	B	N/A	A	B	N/A

* Analysis reveals that the intersection LOS is better in the build scenario. This results from an unacceptable LOS and substantial queues at upstream and/or downstream intersections that meters traffic and causes approach volumes entering the intersection to be less than forecasted volumes.

Table 3 Intersection Level of Service – PM Peak Hour

Alternative			2010 Peak Hour	2018 Peak Hour	2018 Peak Hour	2018 Peak Hour	2030 Peak Hour	2030 Peak Hour	2030 Peak Hour
			Existing Condition	No Build	Build LRT	Build LRT Co-Location Alternative	No Build	Build LRT	Build LRT Co-Location Alternative
Model #	Location Code	Intersection	LOS by Intersection	LOS by Intersection	LOS by Intersection	LOS by Intersection	LOS by Intersection	LOS by Intersection	LOS by Intersection
Major Segment 3 (LRT 3A, 3C, & 3C Sub Alternatives)									
1	1	TH 5 North Ramp & Mitchell Rd	C	B	B	B	B	B	B
	2	TH 5 South Ramp & Mitchell Rd	B	B	B	B	B	B	B
	3	Lone Oak Rd & Mitchell Rd	A	A	A	A	A	A	A
	4	Technology Drive & Mitchell Rd	C	B	C	C	C	C	C
2	5	Bryant Lake Dr & Valley View Road	D	D	D	D	D	E	E
	6	Flying Cloud Dr & Valley View Road	D	C	D	D	D	E	E
	7	Praire Center Dr & Valley View Road (East Jct)	E	D	E	E	D	F	F
	8	Viking Dr & Prairie Center Dr	D	D	E	E	D	F	F
Major Segment 4 (All Alternatives)									
3	9	CSAH 3 & 17th Ave	N/A	A	A	A	B	B	B
	10	5th Street & 16th Ave	N/A	A	A	A	A	A	A
4	11	CSAH 3 & 11th Ave	C	C	C	C	C	C	C
	12	CSAH 3 & 8th Ave	B	B	B	B	B	C	C
	13	CSAH 3 & 5th Ave	B	B	B	B	C	C	C
5	14	2nd Street & Blake Rd. N.	B	B	B	B	B	B	B
	15	Blake Rd. N. & CSAH 3	C	C	B	B	C	C	C
6	16	TH 7 WB On-Ramp & Wooddale Ave.	A	A	B	C	B	B	B
	17	TH 7 EB Off-Ramp & Wooddale Ave.	A	B	B	A	B	B	B
	18	TH 7 Frontage Rd & Wooddale Ave.	A	A	A	C	A	A	A
	19	36th St & Wooddale Ave.	B	C	B	C	C	C	D
7	20	CSAH 25 & Belt Line Blvd	D	D	D	C	D	D	D
	21	CSAH 25 S. Frontage Rd & Belt Line Blvd	A	B	B	F	E	F	F
Major Segment C (LRT 3C & 3C Sub Alternatives)									
8	22	28th St & Nicollet Ave	B	B	B	N/A	B	B	N/A
9	23	Blaisdell Ave & Franklin Ave	B	B	B	N/A	B	B	N/A
	24	Nicollet Ave & Franklin Ave	B	B	C	N/A	C	D	N/A
	25	1st Ave & Franklin Ave	B	B	B	N/A	C	C	N/A
Sub Alternatives Blaisdell Ave (No-Build Same as Nicollet									
9	23	Blaisdell Ave & Franklin Ave	N/A	N/A	B	N/A	N/A	C	N/A
	24	Nicollet Ave & Franklin Ave	N/A	N/A	D	N/A	N/A	D	N/A
	25	1st Ave & Franklin Ave	N/A	N/A	D	N/A	N/A	E	N/A
Major Segment C (LRT 3C & 3C Sub Alternatives)									
9	26	W 15th St & Nicollet Ave S	C	C	C	N/A	C	C	N/A
	27	W Grant St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	28	13th St S & Nicollet Ave S	B	B	B	N/A	B	B	N/A
Sub Alternatives Nicollet Mall									
10	29	12th St S & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	30	11th St S & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	31	S 10th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	32	S 9th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	33	S 8th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	34	S 7th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	35	S 6th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	36	S 5th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	37	S 4th St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	38	S 3rd St & Nicollet Ave S	B	B	B	N/A	B	B	N/A
Sub Alternative 11th and 12th Street									
11	30	11th St S & Nicollet Ave S	B	B	B	N/A	B	D	N/A
	39	11th St S & LaSalle Ave	C	C	C	N/A	C	D	N/A
	40	11th St S & Harmon Pl	B	B	B	N/A	B	B	N/A
	41	11th St N & Hennepin Ave	B	B	B	N/A	B	B	N/A
	42	11th St N & Hawthorne Ave	B	B	C	N/A	B	C	N/A
	29	12th St S & Nicollet Ave S	B	B	B	N/A	B	B	N/A
	43	12th St S & LaSalle Ave	B	B	B	N/A	C	C	N/A
	44	12th St S & Harmon Pl	B	B	B	N/A	B	B	N/A
	45	12th St N & Hennepin Ave	B	B	B	N/A	B	B	N/A
	46	12th St N & Hawthorne Ave	B	B	B	N/A	B	B	N/A
12	47	Glenwood Ave & Royalston Ave N	B	B	B	N/A	B	C	N/A

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Suite 300
Minneapolis, MN 55416
Tel: 763-541-4800
Fax: 763-541-1700

Technical Memorandum

To: *Craig R. Lenning, PE*
HDR Engineering

cc. Michael Martinez, PE
HDR Engineering

From: *Sean Delmore, PE, PTOE*
Chad Ellos, PE

cc. Tony Heppelmann, PE

Date: *April 20, 2010 (Updated on March 2, 2012)*

Re: *Cedar Lake Parkway – At-grade Analysis*
WSB Project No. 1837-05

Introduction and Purpose

The Hennepin County Regional Railroad Authority (HCRRA) is in the process of developing a Southwest Light Rail Transit (LRT) line between downtown Minneapolis and the City of Eden Prairie. Southwest LRT is a proposed high-frequency line with stations in Minneapolis, St. Louis Park, Hopkins, Minnetonka, and Eden Prairie.

WSB and Associates, Inc. (WSB) had been retained to provide traffic analysis of intersections affected by the proposed at-grade LRT. Through that analysis, the LRT crossing at Cedar Lake Parkway had previously been screened out due to a proposed grade separated crossing at this location. At the request of Hennepin County, three additional at-grade scenarios were analyzed. They include:

- No Build – Freight Rail Only (existing condition)
- Build – LRT Only (proposed base alternative without grade separation)
- Build – Co-location Alternative (freight rail and LRT)

The purpose of this memorandum is to describe the analysis, methodology, and results of at-grade crossing scenarios for Cedar Lake Parkway.

Study Location

The Southwest LRT alternatives are identified in **Figure 1**. An index sheet depicting the Major Segments which make up the alternatives is provided in **Figure 2**. The crossing being studied is on the alignment shared by Alternatives 1A and 3A along Major Segment A. The location and geometrics of the LRT alignment crossing Cedar Lake Parkway are identified in **Figures 3** and **4**.

Methodology

Traffic Counts
New counts along Cedar Lake Parkway were performed as part of this study at Burnham Road and Xerxes Avenue. These counts were performed on February 16, 2010.

Analysis Years, Traffic Growth Factor, Assumed Future Projects
The intersections indentified previously were analyzed for the existing year (2010), opening year (2018), and the design year (2030). A 20 year growth factor of 1.12, consistent with the SW Transitway DEIS Traffic Memo's growth factor, was used to project existing traffic volumes to design year 2030. Forecast 2018 volumes were derived by distributing the twenty years of growth based on the assumption that initial growth would follow a flatter trend the first few years and then become steeper toward year 2030. From this growth distribution, forecast 2018 volumes were generated by applying a growth factor of 1.03 to the existing counts. A tabulation of traffic counts and forecasts for each intersection is provided in **Attachment A.**

Major transportation projects listed in the Capital Improvement Program (CIP) for the City of Minneapolis were reviewed and no projects were identified as affecting the Cedar Lake Parkway study area.

Operational Analysis Methodology
The key periods of operational analysis are the times of greatest traffic volume and congestion: AM peak hour and PM peak hour. The AM peak hour characterizes the highest hourly volume of traffic for each group of intersections modeled together between 6:00 AM and 9:00 AM. The PM peak hour characterizes an hour between 3:00 PM and 6:00 PM.

The operational evaluation of the intersections was based on a Level of Service (LOS) analysis incorporating established methodologies documented in the Highway Capacity Manual (TRB, 2000). For intersections, LOS is primarily a function of delay, which is based on AM and PM peak-hour turning movement volumes, intersection lane configuration, and traffic control. Levels of service range from A (limited delay) through F (excessive delay). Level of service A through D are generally considered acceptable in metropolitan areas; LOS E conditions generally require mitigation, and LOS F represents very poor operational conditions which require mitigation.

The LOS analysis was performed using Synchro/SimTraffic:

- Synchro, a software package that implements Highway Capacity Manual (HCM) methodologies, was used to build each intersection and provide an input database for turning-movement volumes, lane geometrics, and signal design and timing characteristics. Output from Synchro is transferred to SimTraffic, the traffic simulation model.

- SimTraffic is a micro-simulation computer modeling software that simulates each individual vehicle's characteristics and driver behavior in response to traffic volumes, intersection configuration, and signal operations. The model simulates drivers' behaviors and responses to surrounding traffic flow as well as different vehicle types and speeds. It outputs estimated vehicle delay and queue lengths at each intersection being analyzed.

Synchro/SimTraffic was used not only to project future LOS conditions, but to define existing conditions using traffic count information described previously. Synchro/SimTraffic does not have the direct capacity to model trains, but a timing plan was created to represent the disruption to the traffic flow caused by the LRT and freight trains at the crossing.

An at-grade LRT crossing at this location would have preemption causing traffic on the roadway to stop in both directions for approximately 30 seconds before normal conditions would be restored. This 30 second time frame was based on the time needed for the advanced warning lights to flash, the gate arms to descend, the LRT to pass through the intersection, and the gate arms to ascend. From the 7.5 minute peak period bidirectional headways[1], an LRT train was assumed to be at the crossing every 3.75 minutes.

An at-grade freight train would also have preemption causing traffic on the roadway to stop in both directions for approximately 150 seconds before normal conditions would be restored. This 150 second time frame was based on the time needed for the advanced warning lights to flash, the gate arms to descend, the train to pass through the intersection, and the gate arms to ascend. A freight train was assumed to cross Cedar Lake Parkway once during each peak hour, consisting of 30 traincars measuring 60 feet each and traveling at a speed of 10 mph.

During collection of turning movement counts, pedestrian counts were also taken. The pedestrian counts at these intersections were less than 5 pedestrians per hour crossing an approach. Due to the low pedestrian counts, pedestrians were not modeled.

Results

Traffic Operations

The results of the LOS operational analysis are provided in **Attachments B** and **C**. These tables provide LOS by individual approaches and queue lengths by movement. The results of the traffic modeling indicate that the intersections adjacent to the Cedar Lake Parkway crossing will operate at acceptable level of service conditions during both the AM and PM peak hours for existing and future conditions. Under the co-location alternative, traffic on Burnham Road can expect to have increased delay leading to LOS E and F conditions during the PM peak hour. Due to the closeness of the intersections to the crossing, vehicle queuing is expected to block both the Burnham Road and Xerxes Avenue intersections while a freight trail uses the crossing. Since freight trains use this crossing infrequently, the traffic volume on the side streets is relatively low (30 to 40 vehicles in the peak hour), and Cedar Lake Parkway traffic level of service (based on the entire peak hour) is acceptable, no mitigation is recommended.

Affects of Train (Heavy-Rail vs. Light-Rail)

Since the analysis does not convey the level of service drivers encounter during a disruption at the existing heavy-rail crossing, a hypothetical comparison was made to show the disruption difference between heavy and light-rail trains at this crossing. **Table 1** displays this comparison

[1] According to Technical Memorandum No. 2: Description of Alternatives

between a fifty car heavy-rail train traveling at 10 mph[2] and a two car light-rail train traveling at 35 mph. The crossing width was assumed to be 36 feet.

Table 1. Train Disruption Comparison (Heavy-Rail vs. Light-Rail)

Cedar Lake Parkway Crossing		Heavy Rail	Light Rail
Traincars	#	50	2
Length/Car	ft	60	94
Total Length	ft	3000	188
Crossing Speed	mph	10	35
Flashing Warning	sec	3	3
Gates Decending	sec	12	12
Train at Crossing After Gates Are Down	sec	5	5
Train Crossing Roadway	sec	207	5
Gates Ascending	sec	5	5
Total Disruption to Roadway per Train	sec	232	30
	min	3.9	0.5

The disruption caused by the heavy-rail train is significantly greater than that of the light-rail train. Currently, roadway users may experience approximately four minutes of delay for a heavy-rail train to cross. In the future, roadway users could expect to experience approximately half a minute of delay for the LRT train to cross.

In order to evaluate the crossing in greater detail, the peak 15 minute periods in the AM and PM were analyzed. It was assumed that one heavy-rail train (50 traincars) would cross Cedar Lake Parkway during the peak 15 minute period to compare against four LRT vehicles crossing during that same period of time. The results of that modeling are included in **Table 2**.

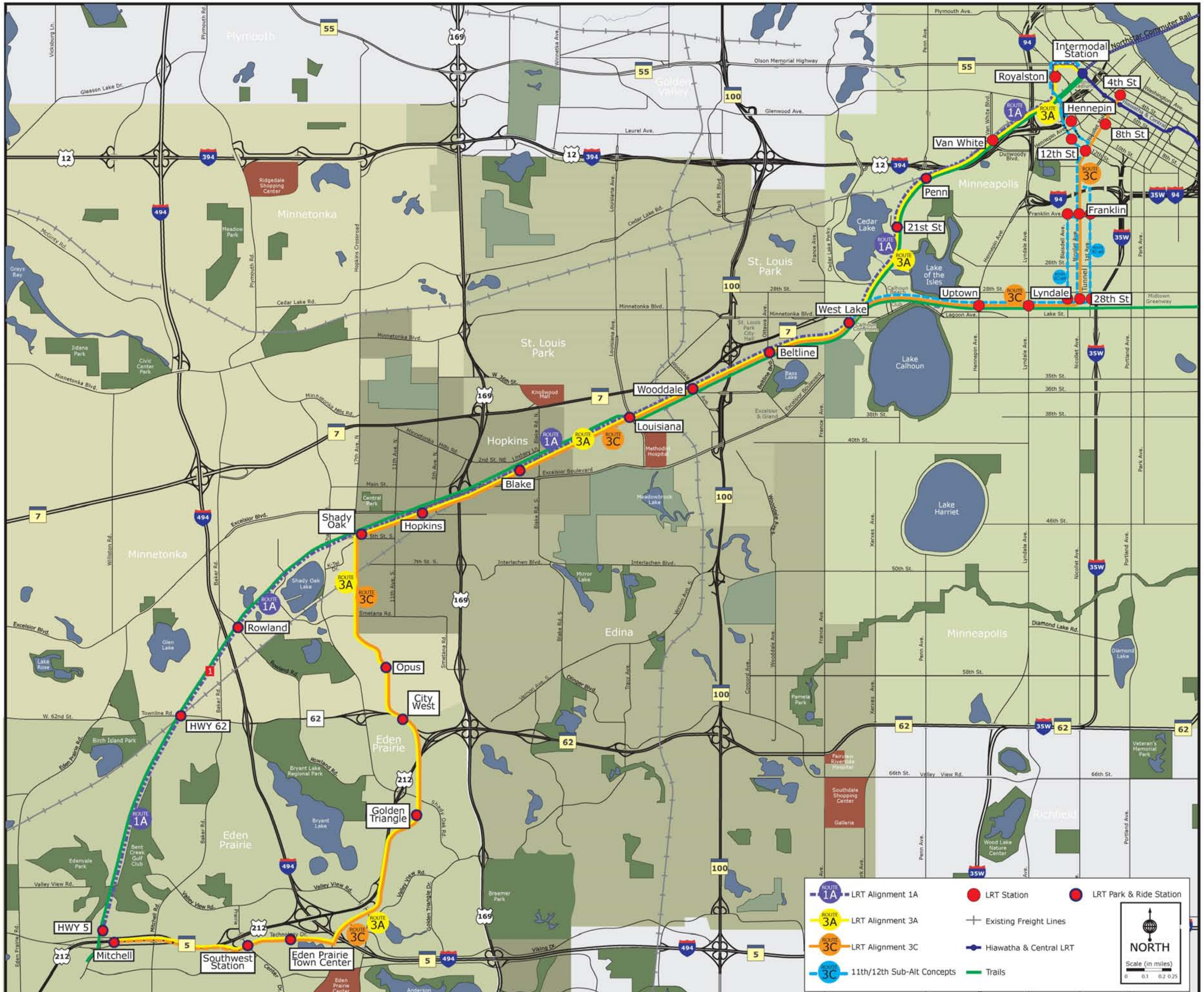
Table 2. LOS and Queue Comparison (Heavy-Rail vs. Light-Rail)

2010 Volumes		Disruption per Train (min)	Average Delay (sec/veh) and LOS				Max Queue (feet)	
			EB		WB		EB	WB
Light Rail	AM	0.5	4	A	5	A	100	150
	PM	0.5	7	A	5	A	275	150
Heavy Rail	AM	3.9	48	D	48	D	550	825
	PM	3.9	57	E	41	D	1325	525

NOTES:
Peak 15-minute periods were 7:45 - 8:00 AM & 5:15 - 5:30 PM.
One Heavy-Rail train crossed during the 15 minute time period.
Four Light-Rail trains crossed during the 15 minute time period.
Results are from Syncho/SimTraffic simulation outputs.
K:\01837-03\Admin\Docs\Traffic Tech Memo\Cedar Lk Pkwy\[Counts.xls]Summary

The results of this detailed traffic modeling indicate that vehicles delayed by the LRT at the Cedar Lake Parkway crossing would experience level of service A conditions, even during the heaviest travel times. The results also indicate that the crossing would see significant operational improvements with LRT only as compared to the disruptions currently encountered with heavy-rail.

[2] According to the U.S. DOT – Crossing Inventory Information in the Federal Railroad Administration database (Effective begin date of record: 02/12/2008)



SOUTHWEST transitway

Figure 1
Southwest LRT
Alternative Alignments

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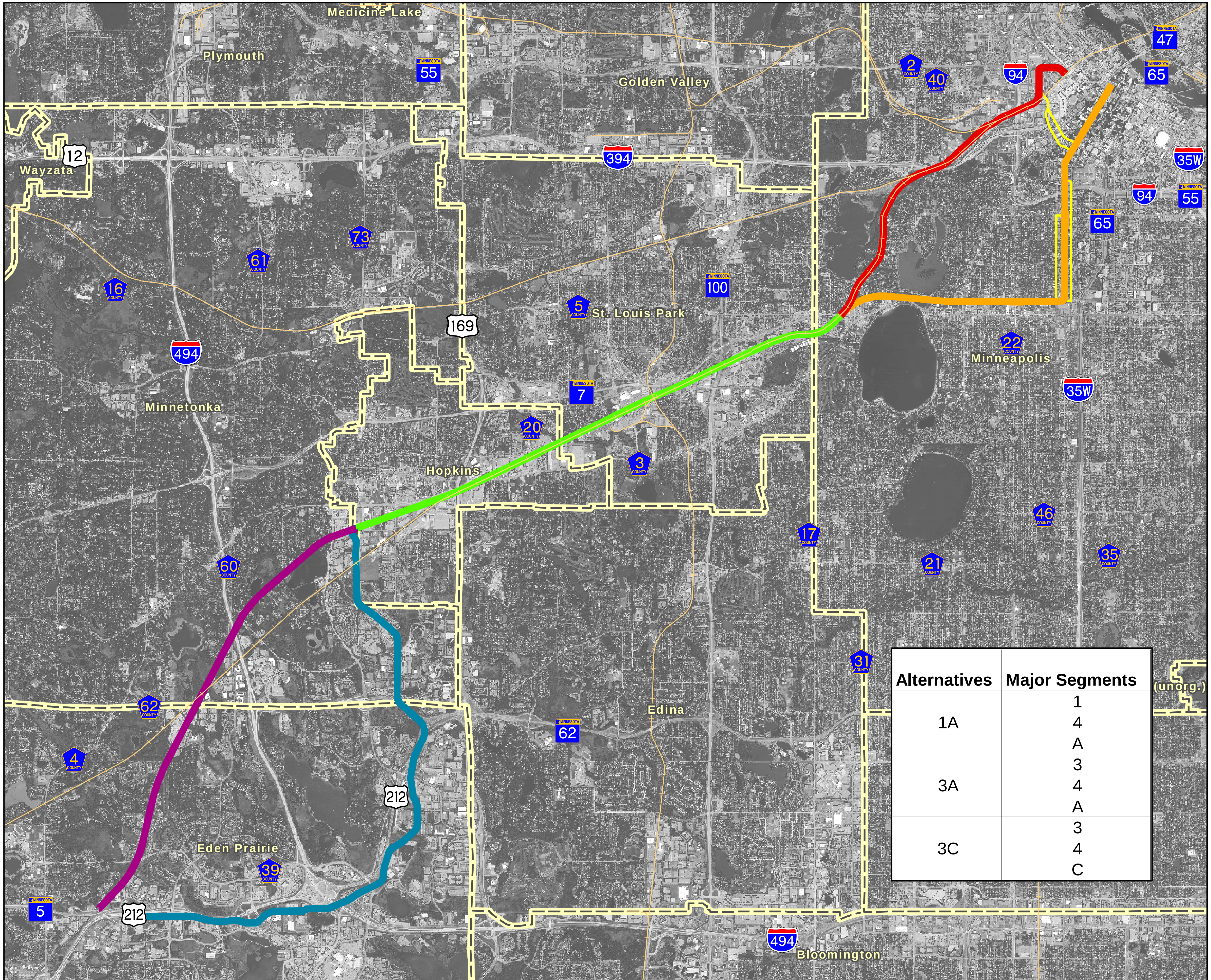
SOUTHWEST transitway

Figure 2
Southwest LRT
Major Segment Index



Alternatives	Major Segments
1A	1 4 A
3A	3 4 A
3C	3 4 C

Legend

- Major Segment 1, Figure 3
- Major Segment 3, Figure 4
- Major Segment 4, Figure 5
- Major Segment A, Figure 6
- Major Segment C, Figure 7
- Subalternatives, Figure 7
- Existing Railroad
- Municipal Boundaries

0 5,000 Feet

N

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Figure 3
Location Map
Potential Cedar Lake Parkway LRT Crossing

Legend

Segment A

Segment 4

Existing Railroad

Grade Seperated Crossing

Municipal Boundaries

At Grade Crossing

0 1,500 Feet

N

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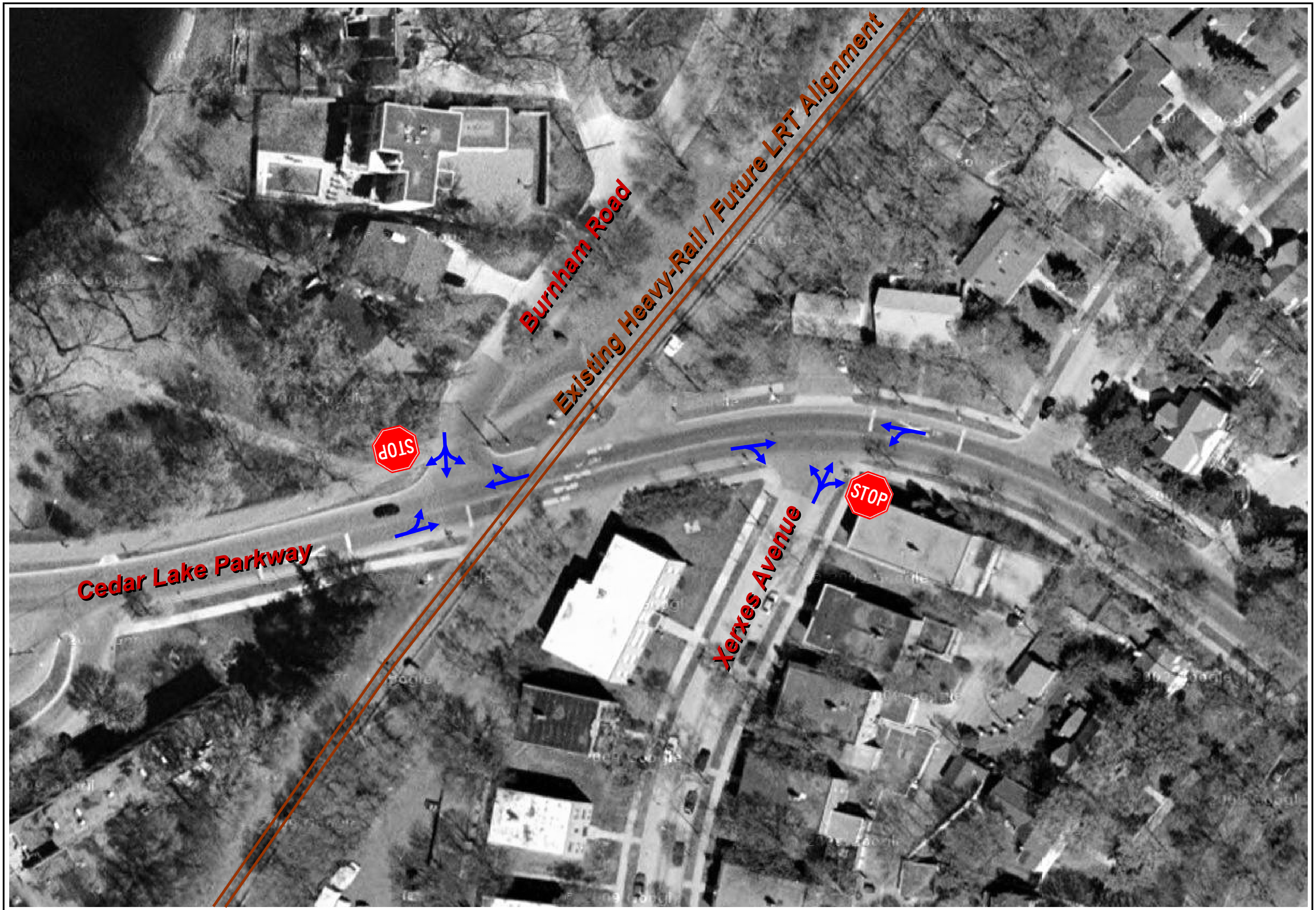

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Figure 4
Existing Geometrics
Potential Cedar Lake Parkway LRT Crossing

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Attachment A

(Traffic Volumes)

Burnham Road at Cedar Lake Parkway

Year	Peak Hour	Movement											
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
2010	AM	0	0	0	4	0	23	17	256	0	0	383	69
	PM	0	0	0	12	0	10	106	445	0	0	308	41
2017	AM	0	0	0	5	0	25	20	265	0	0	395	75
	PM	0	0	0	15	0	15	110	460	0	0	320	45
2030	AM	0	0	0	10	0	30	20	290	0	0	440	80
	PM	0	0	0	20	0	20	120	500	0	0	350	50

Xerxes Avenue at Cedar Lake Parkway

Year	Peak Hour	Movement											
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
2010	AM	37	0	10	0	0	0	0	260	0	0	415	0
	PM	26	0	5	0	0	0	0	457	0	2	323	0
2017	AM	40	0	15	0	0	0	0	270	0	0	430	0
	PM	30	0	10	0	0	0	0	475	0	5	335	0
2030	AM	50	0	20	0	0	0	0	300	0	0	470	0
	PM	30	0	10	0	0	0	0	520	0	10	370	0

Attachment B

(LOS Tables by Approach)

Intersection	Appr	2010 Existing Condition Freight Only LOS		2018 No Build Freight Only LOS		2018 Build LRT Only LOS		2018 Build Co-Location LOS		2030 No Build Freight Only LOS		2030 Build LRT Only LOS		2030 Build Co-Location LOS	
		by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters
AM Peak Hour															
Burnham Rd & Cedar Lake Parkway	NB														
	WB	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	SB	A		A		A		C		A		A		B	
	EB	A		A		A		A		A		A		A	
Xerxes Ave S & Cedar Lake Parkway	NB	A		B		B		D		C		B		C	
	WB	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	SB														
	EB	A		A		A		A		A		A		A	
PM Peak Hour															
Burnham Rd & Cedar Lake Parkway	NB														
	WB	A	A	A	A	A	A	A	A	A	A	A	A	A	B
	SB	A		C		B		E		C		C		F	
	EB	A		A		A		B		A		A		C	
Xerxes Ave S & Cedar Lake Parkway	NB	A		B		B		C		B		B		D	
	WB	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	SB														
	EB	A		A		A		A		A		A		A	

Attachment C

(Queue Tables)

Intersection	Appr	2010 Existing Condition Freight Only Max Queue (ft)			2018 No Build Freight Only Max Queue (ft)			2018 Build LRT Only Max Queue (ft)			2018 Build Co-Location Max Queue (ft)			2030 No Build Freight Only Max Queue (ft)			2030 Build LRT Only Max Queue (ft)			2030 Build Co-Location Max Queue (ft)		
		L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak Hour																						
Burnham Rd & Cedar Lake Parkway	NB																					
	WB																					
	SB	36			44			45			70			54			62			72		
	EB		54			101			83			230			173			117			200	
Xerxes Ave S & Cedar Lake Parkway	NB	57			87			92			135			111			83			170		
	WB					398			185			527			437			165			554	
	SB																					
	EB																					
PM Peak Hour																						
Burnham Rd & Cedar Lake Parkway	NB																					
	WB											54						44			54	
	SB	49			66			62			113			65			73			146		
	EB		147			515			286			515			484			337			515	
Xerxes Ave S & Cedar Lake Parkway	NB	57			70			80			79			71			62			133		
	WB					246			98			300			411			98			385	
	SB																					
	EB																					

Engineering ■ Planning ■ Environmental ■ Construction

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Technical Memorandum

To: *Craig R. Lenning, PE*
HDR Engineering

cc. Michael Martinez, PE
HDR Engineering

From: *Sean Delmore, PE, PTOE*
Chad Ellos, PE

Date: *May 31, 2012*

Re: *At-Grade Queue Analysis*
Wooddale Avenue Crossing
Beltline Boulevard Crossing
WSB Project No. 1837-05

The traffic queuing impacts related to at-grade crossings were considered relative to various train lengths and traffic volumes at two representative crossing. These crossings are Wooddale Avenue and Beltline Boulevard. Refer to **Attachment A** for figures displaying these crossing locations in relation to nearby intersections.

Analysis Assumptions and Methodology

Based on the existing scenario (30-car train @ 10 mph) and the worst-case scenario (120-car train @ 10 mph), traffic queues at each crossing were evaluated for the highest volume 15-minute period of the day for year 2010 and year 2030. Traffic volumes in the AM peak hour and PM peak hour were reviewed and it was determined that the highest peak 15-minute volumes at both crossings occurred during the PM peak hour. For this queue analysis, it was assumed that one train crossed during the highest volume 15-minute period.

The queue analysis was performed using Synchro/SimTraffic modeling software. Synchro was used to build each crossing and input the appropriate timing characteristics based on the size and speed of the train assumed. Output from Synchro is then transferred to SimTraffic, the traffic simulation model, which generates the maximum vehicle queue lengths experienced at each crossing.

Synchro/SimTraffic does not have the direct capacity to model trains, but a signal was placed at the crossing with a timing plan that represented the delay experienced by vehicles waiting for a train to cross. A 30-car train traveling at 10 mph was assumed block the intersection for 155 seconds (2.6 minutes). This time includes approximately 30 seconds of warning time / gate operations prior to the train reaching the crossing. A traincar was assumed to be 60 feet in length. A 120-car train traveling at 10 mph was assumed to block the intersection for 525 seconds (8.75 minutes).

Results

The model results produced a maximum queue length in feet which was converted to vehicles as shown in **Table 1**. It was assumed that 25 feet represents the space occupied by one vehicle.

Table 1. At-Grade Crossing Queuing Analysis

Crossing	Time of Day	Direction	Peak 15-Minute Volume		Estimated Maximum Vehicle Queue at Crossing (Vehicles) Based on Train During Peak 15-Minute Period: Existing 30-car Train @ 10 mph		Proposed (Worst Case) 120-car Train @ 10 mph	
			2010	2030	2010	2030	2010	2030
Wooddale Avenue	PM	NB	599	782	27	40	94	132
		SB	601	853	28	37	95	139
Beltline Boulevard	PM	NB	952	1065	49	57	156	179
		SB	611	688	27	31	93	107

NOTE: The Estimated Maximum Vehicle Queue represents the total number of queued vehicles related to the train blocking the crossing. These vehicles may be queued in the through lanes at the crossing and in intersection approaches where the vehicle queues have backed up through nearby intersections.

In order to assess the impacts these queued vehicle had on nearby intersections, the total queued vehicles in each direction were distributed based on available storage (the number of through lanes). When the queued vehicles backed-up to/through an intersection, the remaining number of queued vehicles was distributed proportionately to the intersection's contributing movements based on the contributing movement volumes. The results of the queuing analysis are further described in the following sections.

Wooddale Avenue Crossing: 30-car Train @ 10 mph

2010 Analysis

Based on an existing 30-car train, southbound vehicle queues are anticipated to reach approximately 350 feet, backing up through the south TH 7 Frontage Road intersection and the eastbound TH 7 Ramp intersection. Queues on the TH 7 ramps are anticipated to remaining at normal lengths.

Wooddale Avenue has two southbound lanes from Walker Street to the crossing, representing a distance of approximately 650 feet. North of Walker Street, Wooddale Avenue has a single lane in each direction.

The 36th Street / Wooddale Avenue intersection is located approximately 150 feet south of the crossing. Northbound traffic is expected to queue back through the 36th Street intersection (2 lanes wide), causing a few vehicles to queue up in the westbound right-turn lane, northbound through lane, and the eastbound left-turn lane at the 36th Street intersection. The westbound right-turn lane has the highest volume of these three movements and a queue of approximately 250 feet is anticipated.

2030 Analysis

Southbound vehicle queues are expected to increase slightly with the increase in traffic to approximately 425 feet along Wooddale Avenue. Queues in 2030 are anticipated to back-up through the south TH 7 Frontage Road intersection, the eastbound TH 7 ramp intersection, and the westbound TH 7 ramp intersection. Only a few vehicles are anticipated to be queuing on the eastbound and westbound TH 7 ramps. The ramps have adequate storage of approximately 1,100 feet each.

Northbound vehicle queues are anticipated to back-up through the 36th Street intersection, causing approximately 20 vehicles to queue up in the westbound right-turn lane, 5 vehicles in the northbound through lane, and 3 vehicles in the eastbound left-turn lane. The westbound right-turn lane queue is anticipated to reach approximately 500 feet in length.

Wooddale Avenue Crossing: 120-car Train @ 10 mph

2010 Analysis

Based on a worst-case scenario of a 120-car train, southbound vehicle queues are anticipated to reach approximately 750 feet, backing up through four intersections, to just before the 35th Street. Queues at the TH 7 ramps are anticipated to reach 600 feet on the eastbound off-ramp and 375 feet on the westbound off-ramp (the ramps lengths are 1,100 feet each).

Northbound vehicle queues are anticipated to back-up through the 36th Street intersection, causing approximately 60 vehicles to queue up in the westbound right-turn lane, 13 vehicles in the northbound through lane, and 9 vehicles in the eastbound left-turn lane. The westbound right-turn lane queue is anticipated to reach approximately 1,500 feet in length.

2030 Analysis

Southbound vehicle queues are expected to increase to approximately 1,200 feet along Wooddale Avenue, backing up through five intersections, extending north of 35th Street. Queues at the TH 7 ramps are anticipated to reach 1,050 feet on the eastbound off-ramp and 575 feet on the westbound off-ramp. Since the eastbound ramp length is approximately 1,100 feet long, traffic wanting to turn right onto Wooddale Avenue would essentially be backed up all the way to the TH 7 mainline.

Northbound vehicle queues are anticipated to back-up through the 36th Street intersection, causing approximately 90 vehicles to queue up in the westbound right-turn lane, 18 vehicles in the northbound through lane, and 12 vehicles in the eastbound left-turn lane. The westbound right-turn lane queue is anticipated to reach approximately 2,250 feet in length.

Beltline Boulevard Crossing: 30-car Train @ 10 mph

2010 Analysis

Based on an existing 30-car train, southbound vehicle queues are anticipated to reach approximately 350 feet, just short of the CSAH 25 South Frontage Road intersection approximately 400 feet from the crossing.

Beltline Boulevard has two northbound and southbound lanes from CSAH 25 (approximately 600 feet north of the crossing) to 36th Street (approximately 2,200 feet south of the crossing).

Northbound traffic is expected to queue back through the Park Glen Road intersection (400 feet south of the crossing), reaching a length of approximately 625 feet.

2030 Analysis
Southbound vehicle queues are anticipated to extend approximately 400 feet, just reaching the CSAH 25 South Frontage Road intersection.

Northbound traffic is again expected to queue back through the Park Glen Road intersection, reaching a length of approximately 725 feet.

Beltline Boulevard Crossing: 120-car Train @ 10 mph
2010 Analysis
Based on a worst-case scenario of a 120-car train, southbound vehicle queues are anticipated to back-up through the CSAH 25 / Beltline Boulevard intersection, causing approximately 16 vehicles to queue up in the westbound left-turn lane, 11 vehicles in the southbound through lane, and 18 vehicles in the eastbound right-turn lane at the CSAH 25 intersection. Signal operations at the CSAH 25 / Beltline Boulevard intersection will be impacted as vehicle wait for the train to clear the crossing.

Northbound traffic is expected to queue back through the Park Glen Road and 35th Street intersections, reaching a length of approximately 1,950 feet.

2030 Analysis
Similar to the 2010 analysis of the 120-car train, southbound vehicle queues are anticipated to back-up through the CSAH 25 / Beltline Boulevard intersection, causing approximately 21 vehicles to queue up in the westbound left-turn lane, 14 vehicles in the southbound through lane, and 24 vehicles in the eastbound right-turn lane. Signal operations at the CSAH 25 / Beltline Boulevard intersection will be impacted as vehicle wait for the train to clear the crossing.

Northbound traffic is expected to queue back to the 36th Street intersection approximately 2,200 feet south of the crossing.

General Note
As the existing and proposed frequency of trains traveling through these areas is relatively low (up to 4/day max), a scenario in which a train arrives during this relatively short timeframe (the peak 15-minute period) is possible, but would likely be a relatively rare occurrence. If a train arrives outside of this timeframe, traffic volumes at the crossing will be less, creating vehicle queues that would cause less of an impact to the surrounding intersections.

Attachment A

(Crossing Location Figures)

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Figure A1
Wooddale Avenue Crossing Location
Queue Analysis

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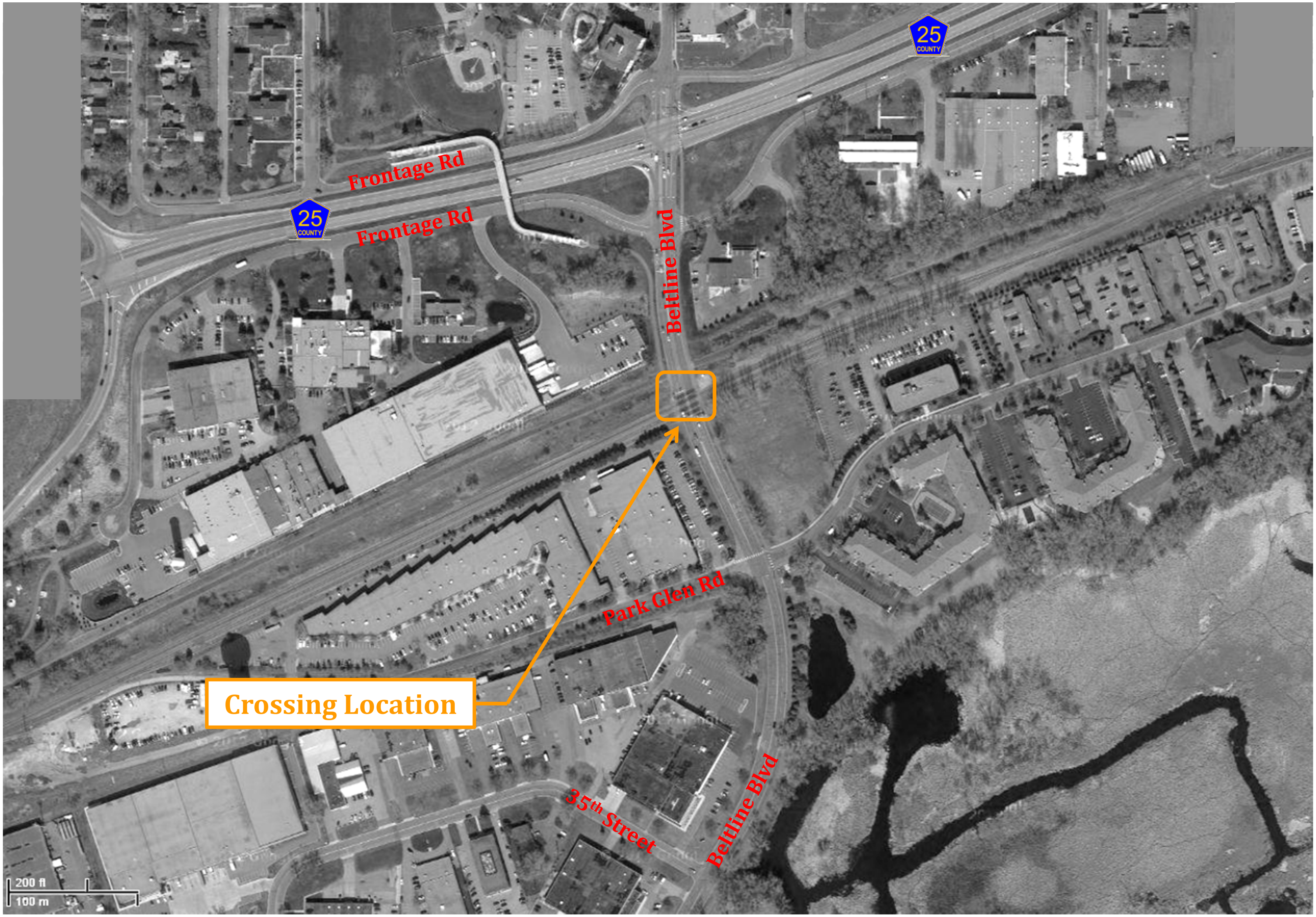

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Figure A2
Beltline Boulevard Crossing Location
Queue Analysis

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Existing Parking Inventory

Segment 1 (LRT 1A)

Property Address	Property Owner	Private	Public	Total
7690 Corporate Way	Bergin Auto Body	45	0	45
15794 Venture Lane	Venture Lane LLC	119	0	119
7550 Corporate Way	Bindery Express	123	0	123
6480 Carlson Drive	Curtis Delegard	128	0	128
6450 Carlson Drive	FHM Partners	67	0	67
11400 K-Tel Drive	Intaglio Property Group II	68	0	68
13608 County Road 62	IRET Properties	43	0	43
6330 Carlson Drive	John Allen	26	0	26
14101 62nd Street W	Lakeland Properties	10	0	10
5650 Rowland Road	Liberty Property LTD Partnership	390	0	390
5800 Baker Road	MJLB 1 Limited Partnership	105	0	105
5700 Baker Road	MOTE Enterprises LLC	52	0	52
15180 Martin Drive	ORCA Investments	42	0	42
6585 Edenvale Blvd	Schneider Properties LLC	146	0	146
6550 Edenvale Blvd	Schneider Properties LLC	113	0	113
5850 Baker Road	Skyridge Partners LLP	120	0	120
4777 Shady Oak Road	Stoneybrook Investments LLC	84	0	84
7021 Woodland Drive	Briarhill Co.	114	0	114
Segment 1 Total:		**1,795**	**0**	**1,795**

Segment 3 (LRT 3A, LRT 3A-1, LRT 3C-1, and LRT 3C-2)

Property Address	Property Owner	Private	Public	Total
10700 Bren Road W	American Medical Systems	700	0	700
10301 Yellow Circle Drive	Bohlig Family Partners	52	0	52
10297 Yellow Circle Drive	Bohlig Family Partners	30	0	30
11905 Technology Drive	BRE-HV Properties LLC	96	0	96
10301 Bren Road W	Bren Rd LLC	862	0	862
6574 Flying Cloud Drive	Bruce H Brill	10	0	10
11455 Viking Drive	Century Bank Bldg Limited Partnership	127	0	127
14100 Technology Drive	City of Eden Prairie	37	0	37
10400 Yellow Circle Drive	Continental Minnetonka	379	0	379

Property Address	Property Owner	Private	Public	Total
12011 Technology Drive	Costco	792	0	792
7731 Flying Cloud Drive	Crossroads Center	177	0	177
12125 Technology Drive	Dataserv Business Center	800	0	800
11001 Bren Road E	Digi International	406	0	406
7740 Flying Cloud Drive	Eden Prairie HHP-II	141	0	141
5435 Feltl Road	EPPA Real Estate	60	0	60
11985 Technology Drive	Flannery	32	0	32
7500 Flying Cloud Drive	Flying Cloud Office, Inc	804	0	804
12160 Technology Drive	Gander Mountain	50	0	50
6608 Flying Cloud Drive	Jean A Ouellette	52	0	52
14500 Lone Oak Road	Lone Oak Center LLC	128	0	128
US-212 and Shady Oak Road	Park-and-Ride	0	70	70
10501 Bren Road E	Robert Bolling	45	0	45
10500 Bren Road E	SAI Investment	74	0	74
6576 Flying Cloud Drive	Shurgard Storage Centers	6	0	6
13500 Technology Drive	SW Metro Transit Station	0	985	985
13000 Technology Drive	Technology Drive LLC	175	0	175
100 Prairie Center Drive	Westbrand RE Holdings	55	0	55
10401 Bren Road E	WL Real Estate Holdings	45	0	45
5501 Feltl Road	Wunderlich Properties	82	0	82
1600 5th Street S	AM Minnesota Funding	59	0	59
14900 Technology Drive	Eaton MDH Company Inc.	250	0	250
14615 Lone Oak Road	Eaton MDH Company Inc.	328	0	328
11501 K-Tel Drive	Fenton SB	257	0	257
7450 Flying Cloud Drive	Flying Cloud Ventures	222	0	222
6871 Flying Cloud Drive	Islamic Institute of MN	17	0	17
610 16th Avenue S	Kant-Sing Partnership	48	0	48
7075 Flying Cloud Drive	Liberty Property LTD / Supervalu	1,332	0	1,332
10301 70th Street W	Liberty Property LTD Partnership	753	0	753
5450 Feltl Road	Liberty Property LTD Partnership	448	0	448
7400 Flying Cloud Drive	Liberty Property LTD Partnership	102	0	102
10901 Bren Road E	Lyn-James LLC	77	0	77
6801 Flying Cloud Drive	Metro Design Center	101	0	101
544 16th Avenue S	MJTA Partners	69	0	69
14000 Technology Drive	MTS Systems Corp	1,354	0	1,354
7247 Flying Cloud Drive	Oakcreek Industrial	255	0	255

Property Address	Property Owner	Private	Public	Total
5421 Feltl Road	Office Warehouse Development	85	0	85
6851 Flying Cloud Drive	Property Resources Group	13	0	13
11011 Smetana Road	Real-Time Properties	66	0	66
12001 Technology Drive	Rosemount Inc.	735	0	735
11311 K-Tel Drive	St. Paul Properties	276	0	276
10701 Bren Road E	TJT	122	0	122
6700 Shady Oak Road	Valuevision Media	552	0	552
10601 Red Circle Drive	Volland Investment	21	0	21
13570 Technology Drive et. al.	Southwest Station Condo	204	0	204
7780 Flying Cloud Drive	CSM RI Eden Prairie LLC	134	0	134
1020 Feltl Court	Greenfield Apartments General Partnership	105	0	105
920 Feltl Court	Interlachen Oaks	132	0	132
10601 Smetana Road	SFI LTD Partnership 54	240	0	240
Segment 3 Total:		**14,574**	**1,055**	**15,629**

Segment 4 (LRT 1A, LRT 3A, LRT 3A-1, LRT 3C-1, and LRT 3C-2)

Property Address	Property Owner	Private	Public	Total
3745 Louisiana Avenue S	Sam's Real Estate Business Trust	689	0	689
10427 Excelsior Blvd	10417 Associates LLP	21	0	21
9380 Excelsior Blvd	American Fund US Invest. LP	1,100	0	1,100
3040 Excelsior Blvd	Calhoun Commons Shopping Center LTD PTNP	304	0	304
9320 Excelsior Blvd	Cargill Inc.	1,300	0	1,300
9350 Excelsior Blvd	Excelsior Crossings Invest. LLC	1,140	0	1,140
1002 2nd Street NE	HCRRA	103	0	103
9451 Excelsior Blvd	HCRRA	0	70	70
250 5th Avenue S	Hopkins Real Estate LLC	840	0	840
1102 2nd Street NE	James William McCoy	10	0	10
210 Blake Road N	JBB Properties LLC	55	0	55
10751 Excelsior Blvd	Justus Lumber Co.	80	0	80
300 11th Avenue S	Justus Lumber Co.	16	0	16
303 11th Avenue S	Nearco IV LLC	74	0	74
4500 Park Glen Road	Park Glen Corporate Center LLC	245	0	245
3220 Lake Street W	PFAFF Calhoun LLC	287	0	287
5802 36th Street W	Standal Properties Inc.	42	0	42

Property Address	Property Owner	Private	Public	Total
10901 Excelsior Blvd	Stiele & Bakken Investments LLC	120	0	120
10801 Excelsior Blvd	Stiele Inv. 10801 Excelsior	109	0	109
6363 State Hwy 7	Apex Realty Partnership	58	0	58
3130 Monterey Avenue S	Arneson Enterprises	14	0	14
4521 State Hwy 7	Basic Properties	76	0	76
325 Blake Road N	Blake Road Partners LLC	27	0	27
1315 5th Street S	Braxton Properties LLC	75	0	75
1415 5th Street S	Carman Realty Co.	60	0	60
4200 Park Glen Road	CSM Investors Inc.	326	0	326
5005 State Hwy 7	Dalquist Properties LLP	150	0	150
4301 State Hwy 7	Diamond Hill Center	78	0	78
415 11th Avenue S	Duke Realty LTD Partnership	249	0	249
800 2nd Street NE	EDCO Products Inc.	53	0	53
3565 Wooddale Ave S	HCRRA	69	0	69
7003 Lake Street W	Highway 7 Business Center LLC	728	0	728
600 2nd Street NE	Hopkins Mainstreet II LLC	89	0	89
11111 Excelsior Blvd	Hopkins Tech Center LLC	242	0	242
11300 K-Tel Drive	Intaglio Property Group II	67	0	67
4800 Park Glen Road	KK-Five Corporation	338	0	338
4300 Park Glen Road	MAP Partnership LLP	15	0	15
3750 Louisiana Avenue S	Mayflower Properties LLC	5	0	5
1625 5th Street S	McMenoman Properties LLC	9	0	9
1617 5th Street S	McMenoman Properties LLC	9	0	9
4725 State Hwy 7	MFLP4725 LLC	40	0	40
11301 47th Street W	MN CLN Services Inc	20	0	20
5725 State Hwy 7	Sara Lee Corporation	16	0	16
5925 State Hwy 7	St. Louis Park Economic Dev. Authority	20	0	20
3200 Lynn Avenue S	Superior Manufacturing Corp	10	0	10
410 11th Avenue S	Ugorets 410 LLC	50	0	50
11001 Excelsior Blvd	Venturian Place	136	0	136
10201 Excelsior Blvd	Municipal Trailhead Parking Lot	0	50	50
5707 State Hwy 7	BEL-EQR III LTD Partnership	46	0	46
3430 List Place	Calhoun Towers Inc.	214	0	214
5600 Camerata Way	Camerata LLC	138	0	138
3140 Chowen Avenue S	ISB Interests LLC	104	0	104
3121 Chowen Avenue S	ISB Interests LLC	116	0	116

Property Address	Property Owner	Private	Public	Total
4400 Park Glen Road	J & D 14-93 Limited Partnership	46	0	46
3800 32nd Street W	John Yarish	25	0	25
3031 Ewing Avenue S	Lakewood Isles LLC	115	0	115
3100 Dean Court	Michelle Manatt	92	0	92
3200 Inglewood Avenue	Sidal Realty Co.	88	0	88
3001 Lake Shore Drive et. al.	The Lakes CitiHomes	27	0	27
Segment 4 Total:		**10,575**	**120**	**10,695**

Segment A (LRT 1A, LRT 3A, and LRT 3A-1)

Property Address	Property Owner	Private	Public	Total
725 2nd Avenue N	City of Minneapolis	74	0	74
144 Glenwood Ave N	GDL Limited Partnership	48	0	48
1031 Madeira Avenue	Joffe MN Property LLC	70	0	70
173 Glenwood Ave N	Catholic Charities	36	0	36
661 5th Avenue N	City of Minneapolis	200	0	200
525 7th Street N	Sharing & Caring Hands	16	0	16
301 Royalston Avenue N	Hegman Properties LLC	6	0	6
419 5th Street N	HERC	120	0	120
315 Royalston Avenue N	Marilyn Hayes	23	0	23
401 Royalston Avenue N	Stark Electronics Supply Inc.	58	0	58
201 Royalston Avenue N	Two Couples LLC	53	0	53
501 Royalston Avenue N	UCIDS LLC	200	0	200
401 7th Street N	Sharing & Caring Hands Inc.	101	0	101
Segment A Total:		**1,005**	**0**	**1,005**

Segment C (LRT 3C-1 and LRT 3C-2)

Property Address	Property Owner	Private	Public	Total
1320 Lagoon Avenue	Ackerberg Investments et. al.	278	0	278
3100 Lake Street W	ACKY - 3100 Lake LTD Partnership	30	0	30
2909 Bryant Avenue S	C&A Labosky	35	0	35
2836 Lyndale Avenue S	Greenway Ventures	45	0	45
2880 Hennepin Avenue	Hennepin County Library	0	32	32
2900 Nicollet Avenue S	Jablonsky	5	0	5
2910 Pillsbury Avenue S	Karmel Properties	43	0	43
10 Lake Street W	K-Mart	416	0	416
2901 Pleasant Avenue S	Leonard Center LLC	19	0	19

Property Address	Property Owner	Private	Public	Total
1006 Lake Street W	Minneapolis Board of Ed. Dist #1	131	0	131
2835 Nicollet Avenue S	Nhu-Tuyet Thi Lai	29	0	29
2841 Hennepin Avenue	Old Chicago Restaurant	56	0	56
1210 Lagoon Avenue	Planned Parenthood	54	0	54
3118 Lake Street W	Pork's West Lake Drive-In	20	0	20
1104 Lagoon Avenue	Rainbow	125	0	125
2838 1st Avenue S	Richard Allan	20	0	20
2903 Lyndale Avenue S	Sonata Investment Group	17	0	17
30 Lake Street W	Supervalu	167	0	167
2828 Hennepin Avenue	YWCA of Minneapolis	196	0	196
2901 Fremont Avenue S	2901 Fremont LLC	49	0	49
2903 Harriet Avenue S	CF & TL Boedeker	23	0	23
2828 Emerson Avenue S	JPG-OFP	84	0	84
2904 Garfield Avenue S	Michienzi & Sondreaal	8	0	8
2845 Harriet Avenue S	Premier Storage	38	0	38
2901 Dean Parkway	Calhoun Apartment Co	18	0	18
3104 Lake Street W	Calhoun Holdings LLC	25	0	25
2818 Kenwood Isles Dr et. al.	Kenwood Isles CitiHomes	20	0	20
2920 Dean Parkway	Kraft Mercantile Co	24	0	24
2918 Dean Parkway	Lake Calhoun City Apts	8	0	8
2930 Blaisdell Avenue S	Park Square Condo	104	0	104
2900 Bryant Avenue S	Uptown Square Apts.	74	0	74
2801 Nicollet Avenue	Mohamed Somaha	19	0	19
2749 Nicollet Avenue	Frenz Brake Service	5	0	5
2743 Nicollet Avenue	Woa Mai Lam & Kit Tran	6	0	6
2738 Nicollet Avenue	Isidrio and Gloria Perez	42	0	42
2735 Nicollet Avenue	Tammy Wong	12	0	12
2727 Nicollet Avenue	Quang Family Corporation	64	0	64
2712 Nicollet Avenue	Daisy and Thomas Huang	28	0	28
2710 Nicollet Avenue	Daisy and Thomas Huang	21	0	21
2701 Nicollet Avenue	Gerst Properties	4	0	4
2643 Nicollet Avenue	Lynh and Pierre Nguyen	15	0	15
2628 Nicollet Avenue	Kyrenia LLC	22	0	22
2627 Nicollet Avenue	Dai Nam Oriental Grocery	30	0	30
2620 Nicollet Avenue	Linh Nguyen	8	0	8
2616 Nicollet Avenue	2616 Nicollet Ave LLC	8	0	8
2615 Nicollet Avenue	Erich Christ	42	0	42
2614 Nicollet Avenue	2616 Nicollet Ave LLC	12	0	12
2608 Nicollet Avenue	Pamer Brothers Company	4	0	4
2600 Nicollet Avenue	2600 Nicollet LLC	10	0	10
2548 Nicollet Avenue	Fung's Property Inc.	39	0	39

Property Address	Property Owner	Private	Public	Total
2533 Nicollet Avenue	Peter Ratsamy	8	0	8
2531 Nicollet Avenue	Tang Truong	28	0	28
2529 Nicollet Avenue	Tang Truong	4	0	4
2521 Nicollet Avenue	TA&T LLC	4	0	4
2520 Nicollet Avenue	Alma Andersen	29	0	29
2515 Nicollet Avenue	Pamer Brothers Company	3	0	3
2511 Nicollet Avenue	Hoa Nguyen	4	0	4
2510 Nicollet Avenue	Charles Hall	5	0	5
2443 Nicollet Avenue	Quarters for Creativity LTD	7	0	7
2430 Nicollet Avenue	Washburn Center for Children	64	0	64
2429 Nicollet Avenue	Pamer Brothers Corp	23	0	23
2424 Nicollet Avenue	TDN Enterprises	5	0	5
2419 Nicollet Avenue	Tasks Unlimited Lodges	7	0	7
2415 Nicollet Avenue	Ray Merz Living Trust	6	0	6
2412 Nicollet Avenue	Jimmy Chau Trinh	15	0	15
2411 Nicollet Avenue	Tasks Unlimited Lodges	12	0	12
2401 Nicollet Avenue	Nicollet Street LLC	18	0	18
2400 Nicollet Avenue	McDonald's Corporation	32	0	32
4 24th Street E	MN Conference Association of SDA's	5	0	5
2344 Nicollet Avenue	City of Lakes Waldorf School	117	0	117
2309 Nicollet Avenue	IB Property Holdings	11	0	11
2300 Nicollet Avenue	MFR-II Nicollett LLC	6	0	6
2222 Nicollet Avenue	MFR-II Nicollett LLC	10	0	10
2218 Nicollet Avenue	Nicollet Flats Condo	14	0	14
2217 Nicollet Avenue	Mena's Properties II LLC	3	0	3
2201 Nicollet Avenue	Huy and Nhung Tran	8	0	8
2200 Nicollet Avenue	CSJ Ministry Collaborative	25	0	25
2121 Nicollet Avenue	ERS Nicollet LLC	5	0	5
2120 Nicollet Avenue	Noel Korengold	9	0	9
2110 Nicollet Avenue	Tom Nguyen Properties	19	0	19
2109 Nicollet Avenue	Hong Kong Company	7	0	7
2025 Nicollet Avenue	Hopfenspirger	10	0	10
2012 Nicollet Avenue	Michael and Myra Moore	24	0	24
15 Franklin Avenue E	Eat Street Flats	41	0	41
1925 Nicollet Avenue	Loring Nicollet-Bethlehem	15	0	15
1913 Nicollet Avenue	Plymouth Congregational Church	41	0	41
1900 Nicollet Avenue	Plymouth Congregational Church	151	0	151
1820 Nicollet Avenue	Plymouth Congregational Church	78	0	78
1801 Nicollet Avenue	1801 Nicollet LLC	67	0	67
1735 Nicollet Avenue	Katzenjammer LP	50	0	50
1728 Nicollet Avenue	Katzenjammer LP	56	0	56

Property Address	Property Owner	Private	Public	Total
1601 Nicollet Avenue	Gary Kirt	40	0	40
1523 Nicollet Avenue	Woelm LLC	30	0	30
1501 Nicollet Avenue	City of Minneapolis	0	49	49
1500 Nicollet Ave et.al.	1500 Nicollet LLC	85	0	85
1411 Nicollet Avenue	Walden Properties	16	0	16
1400 Nicollet Avenue	14th Street Ventures LLC	38	0	38
1355 Nicollet Avenue	Loring 100 Partnership	28	0	28
15 Grant Street E	Loring Towers Preserv LP	36	0	36
1313 Nicollet Mall	Millenium Minneapolis Ramp	0	230	230
14 Grant Street W	Loring Municipal Ramp	0	750	750
1221 Nicollet Mall	1221 Limited Partnership	24	0	24
1200 Nicollet Avenue	1200 On the Mall	15	0	15
65 11th Street S	Sunstne - Doubletree Ramp	127	0	127
1130 Nicollet Mall	YWCA of Minneapolis	30	0	30
87 10th Street S	Central #415	37	0	37
900 Nicollet Mall	City of Minneapolis (Target)	0	830	830
901 Nicollet Mall	Young Quinlan Ramp	175	0	175
900 Marquette Avenue	614 Group (Allright #317)	150	0	150
801 LaSalle Avenue	LaSalle Court Parking	853	0	853
801 LaSalle Avenue	Bancorp Ramp	300	0	300
818 Marquette Avenue	Metro Building Ramp	467	0	467
801 Nicollet Mall	Midwest Plaza Ramp	872	0	872
701 Nicollet Mall	IDS Ramp	625	0	625
35 7th Street S	Plaza VII Ramp	313	0	313
17 7th Street S	Park & Shop Ramp	850	0	850
601 Nicollet Mall	Gaviidae Common Ramp	290	0	290
600 Nicollet Mall	City Center Ramp	687	0	687
50 South 6th Street	50 South 6th Ramp	300	0	300
12 South 6th Street	Plymouth Ramp	190	0	190
509 Hennepin Avenue	Baker Invst. Dtn. Auto Park	78	0	78
501 Nicollet Mall	Dain Rauscher Ramp	210	0	210
14 5th Street S	UGP - Midtown Ramp	491	0	491
401 Hennepin Avenue	UGP - Allied/Central #511	62	0	62
401 Nicollet Mall	Baker Inv. - Skyway Ramp	471	0	471
423 Nicollet Mall	Opus - Allied #517	110	0	110
400 Marquette Avenue	Allied #516	70	0	70
400 Marquette Avenue	Court Park Underground Ramp	450	0	450
300 Nicollet Mall	Hennepin County Library	0	175	175
315 Nicollet Mall	Olaf - Ritz Lot #519	312	0	312
250 Marquette Avenue	FRM - Marquette Plaza Ramp	299	0	299
30 3rd Street S	Minneapolis - North Term. #513	160	0	160
Segment C (LRT 3C-1 and LRT 3C-2) Total		**10,938**	**2,034**	**12,812**

Segment C Sub-Alt 1st Avenue (LRT 3C-2)

Property Address	Property Owner	Private	Public	Total
2645 1st Avenue S	GLT Properties	12	0	12
101 26th Street E	Lisa Poppenhagen	5	0	5
2300 Stevens Avenue S	Minneapolis Society of Fine Arts	81	0	81
2613 1st Avenue S	Voyager Two LLC	5	0	5
2800 1st Avenue S	Xayasack	9	0	9
2929 1st Avenue S	NICO Properties	39	0	39
2530 1st Avenue S	2530-2532 First Ave Condo	40	0	40
2218 1st Avenue S	Alano Society of Minneapolis	36	0	36
2630 1st Avenue S	CHDC Morrison LTD Partnership	6	0	6
2318 1st Avenue S	Derf D Bistodeau	12	0	12
111 Franklin Avenue E	Franklin Lofts Condo	43	0	43
2312 1st Avenue S	Garfield Court Partnership	18	0	18
2533 1st Avenue S	Minneapolis Public Housing Authority	11	0	11
2727 1st Avenue S	Village Investments/ Armadillo Flats Co-op	36	0	36
Segment C – Sub-Alt 1st Avenue S Total:		**353**	**0**	**353**

Segment C Sub-Alternative Blaisdell Avenue (LRT 3C-2)

Property Address	Property Owner	Private	Public	Total
2608 Blaisdell Avenue S	Calvary Baptist Church	13	0	13
2749 Blaisdell Avenue S	City of Minneapolis Fire Station	19	0	19
2554 Blaisdell Avenue S	Fallstaff Inc.	14	0	14
2100 Blaisdell Avenue S	Franklin National Bank of Minneapolis	10	0	10
2746 Blaisdell Avenue S	Gassan Walid Khori	9	0	9
2020 Blaisdell Avenue S	Park Nicollet Medical Center	133	0	133
2001 Blaisdell Avenue S	Park Nicollet Medical Center	40	0	40
2222 Blaisdell Avenue S	2222 Blaisdell LLC	11	0	11
2525 Blaisdell Avenue S	2525 Blaisdell Condo Inc.	14	0	14
2545 Blaisdell Avenue S	2545 Blaisdell Ave LLC	22	0	22
2312 Blaisdell Avenue S	Blaisdell Housing LTD Partnership	16	0	16
2736 Blaisdell Avenue S	BT&A Construction	13	0	13
2716 Blaisdell Avenue S	BT&A Construction	13	0	13
2735 Blaisdell Avenue S	BTA Construction	22	0	22
2804 Blaisdell Avenue S	James Tindall	24	0	24
2649 Blaisdell Avenue S	JPS Prop & BNS Prop	21	0	21
12 22nd Street W	Kingbay Properties Company	14	0	14

Property Address	Property Owner	Private	Public	Total
2530 Blaisdell Avenue S	KT Properties Partnership	20	0	20
2201 Blaisdell Avenue S	Minneapolis Urban League	34	0	34
2634 Blaisdell Avenue S	Monihugh Properties II LLC	15	0	15
2640 Blaisdell Avenue S	P19 LLC	15	0	15
2820 Blaisdell Avenue S	Tag Company LLP	23	0	23
2728 Blaisdell Avenue S	Tag Company LLP	13	0	13
2500 Blaisdell Avenue S	The W Condominiums LLC	29	0	29
2118 Blaisdell Avenue S	Underdahl Properties LLC	37	0	37
2609 Blaisdell Avenue S	Whttier Cooperative	47	0	47
Segment C – Sub-Alt Blaisdell Avenue S Total:		**641**	**0**	**641**

Segment C Sub-Alternative 11th and 12th Streets (LRT 3C-2)

Property Address	Property Owner	Private	Public	Total
1201 Yale Place	Condo	20	0	20
1201 Harmon Place	1201 Investments LLC	68	0	68
1112 Harmon Place	Univiversity of St. Thomas - 11th and Harmon Ramp	602	0	602
44 12th Street S	University of St. Thomas	101	0	101
66 12th Street S	Opportunity Housing Ltd. Ptnp.	12	0	12
1001 Hennepin Avenue	First Baptist Church of Minneapolis - State #214	111	0	111
1022 Hennepin Avenue et.al.	Minneapolis Venture / Standard #212, #212a, and #213	270	0	270
1100 Hennepin Avenue	Structured Parking	500	0	500
1101 Hennepin Avenue	TRC Glass Minneapolis	8	0	8
1127 Hennepin Avenue	Barlow Associates	20	0	20
1213 Hennepin Avenue	Lund Real Est Holdings	98	0	98
1216 Hennepin Avenue	Commercial	42	0	42
41 10th Street N	Minneapolis Venture - Allied #140	169	0	169
41 12th Street N	Minneapolis Youth Diversion Program	44	0	44
68 12th Street N	Bridgestone Tires	42	0	42
1103 Hawthorne Ave	Laurel Village Partners	54	0	54
1212 Chestnut Avenue	WEC Inc.	49	0	49
Segment C – Sub-Alt 11th/12th Total:		**2,210**	**0**	**2,210**

Source: WSB, 2010

Traffic Analysis (2010)

WSB & Associates, Inc.
Engineering ■ Planning ■ Environmental ■ Construction
701 Xenia Avenue South
Suite 300
Minneapolis, MN 55416
Tel: 763-541-4800
Fax: 763-541-1700

Technical Memorandum

To:	***Craig R. Lenning, PE*** ***HDR Engineering***	***cc. Michael Martinez, PE*** ***HDR Engineering***
From:	***Sean Delmore, PE, PTOE***	***cc. Tony Heppelmann, PE*** ***Chuck Rickart, PE, PTOE***
Date:	***April 20, 2010***	
Re:	***Southwest Transitway DEIS – Traffic Analysis*** ***WSB Project No. 1837-03***	

Introduction and Purpose

The Hennepin County Regional Railroad Authority (HCRRA) is in the process of developing a Southwest Light Rail Transit (LRT) line between downtown Minneapolis and the City of Eden Prairie. Southwest LRT is a proposed high-frequency line with stations in St. Louis Park, Hopkins, and Minnetonka, as well as Minneapolis and Eden Prairie. It will link with the Hiawatha and Central Corridor LRT lines, as well as the Northstar Commuter rail serving the northwest portion of the Metro area. After extensive analysis and public input culminating in the *Southwest Transitway Scoping Summary Report* (January 2009), four Southwest LRT alternative alignments have been identified for analysis in the Draft Environmental Impact Statement (DEIS) for the project.

The proposed Southwest LRT line will be at-grade for most of its project length. Therefore, many at-grade roadway crossings may be impacted by this project. WSB and Associates, Inc. (WSB) has been retained to analyze the impact of the Southwest LRT alternatives on vehicular traffic operations in the project corridor.

Fixed guideway station access would vary by station. Depending on the alignment chosen, many of the proposed stations would not provide public parking available for transit riders. Since the details of transit stations, including surrounding land-use and proposed traffic patterns, are not finalized at this time, they were not included in this analysis. Engineered drawings for each location are included in Appendix F of the DEIS. Detailed information on parking at each facility is covered in Chapter 2 of the DEIS. Spill-over parking is a possibility and mitigation for site specific impacts will be identified in the FEIS.

The purpose of this memorandum is to describe the analysis, methodology, and its results. This analysis will serve as the basis for the traffic portion of the DEIS document. Each station and the impacts on traffic operations and circulation will be analyzed in detail with the Final Environmental Impact Statement (FEIS).

Alternatives Studied

The Southwest LRT alternatives are identified in **Figure 1**. An index sheet depicting the Major Segments which make up the alternatives is provided in **Figure 2**. The following is a summary of the alternatives being studied:

No-Build: The No-Build Alternative includes all roadway and transit facility and service improvements (other than the proposed project) that are planned, programmed and included in the Metropolitan Council's Financially Constrained Regional Transportation Policy Plan to be implemented by 2030. The No-Build Alternative serves as the National Environmental Policy Act (NEPA) baseline against which the potentially significant environmental benefits and impacts of the build alternatives are measured.

LRT 1A: This alternative would operate from downtown Minneapolis to Eden Prairie terminating at TH 5. It consists of Major Segments 1, 4, and A. The route would connect to the Hiawatha LRT tracks on 5th Street past the downtown Minneapolis Intermodal Station (at Target Field) to Royalston Avenue to the Kenilworth Corridor through Minneapolis, and the HCRRA property through St. Louis Park, Hopkins, Minnetonka, and Eden Prairie, terminating at TH 5.

LRT 3A: This alternative would operate from downtown Minneapolis to Eden Prairie terminating at Mitchell Road/TH 5. It consists of Major Segments 3, 4, and A. The route would connect to the Hiawatha LRT tracks on 5th Street past the downtown Minneapolis Intermodal Station to Royalston Avenue to the Kenilworth Corridor through Minneapolis, the HCRRA property in St. Louis Park and Hopkins, to a new right-of-way through the Opus/Golden Triangle area, Southwest Station, terminating at TH 5 and Mitchell Road.

LRT 3C: This alternative would operate from downtown Minneapolis to Eden Prairie terminating at Mitchell Road/TH 5. It consists of Major Segments 3, 4, and C. The route would not interline with the Hiawatha LRT tracks on 5th Street nor connect to the downtown Minneapolis Intermodal Station at Target Field. The route would start at the intersection of Washington Avenue and Nicollet Mall and continue along Nicollet Mall to Nicollet Avenue (tunnel from Franklin Avenue to 28th Street), the Midtown Corridor through Minneapolis, the HCRRA property in St. Louis Park and Hopkins, to a new right-of-way through the Opus/Golden Triangle Area, Southwest Station, terminating at TH 5 and Mitchell Road.

LRT 3C Sub-Alternatives: These sub-alternatives involve modifications to Major Segment C between the Nicollet Avenue/Midtown Corridor and downtown Minneapolis.

- Blaisdell Avenue Sub-alternative
  The alignment would proceed north from the Midtown Corridor in a tunnel under Blaisdell Avenue (one block west of Nicollet Avenue). The train would exit the tunnel just south of Franklin Avenue and transition across the

Plymouth Congregational Church property to enter center running operations on Nicollet Avenue.

- 1st Avenue Sub-alternative
  The alignment would proceed north from the Midtown Corridor in a tunnel under 1st Avenue (one block east of Nicollet Avenue). The trains would exit the tunnel north of Franklin Avenue and would proceed with center running operations on 1st Avenue north to 16th Street, where it would transition diagonally to enter Nicollet Avenue at 15th Street.

- 11th/12th Street Sub-alternative
  This alternate alignment would turn west as a one-way couplet on 11th Street and 12th Street between Nicollet Mall and Royalston Avenue. At Royalston Avenue N, the same routing would be used as alternatives 1A and 3A, which both interline the Hiawatha LRT line on 5th Street.

Methodology

LRT Crossings / Intersections Analyzed
Crossing locations were selected for analysis based on potential intersection impacts from train operations. All of the LRT crossings were identified and put through a screening process to determine which crossings needed further analysis. A list of all the crossings is provided in **Attachment A**. Refer to the LRT crossing decision tree, presented in **Figure 3**, for a graphical representation of the screening process described in the following paragraphs.

First, grade separated crossings were screened and at-grade crossings were carried to the next step. Next, applying the guidance in the MUTCD, Section 8C.10, if a signalized intersection was located within 200 feet of the at-grade crossing, it was analyzed. Otherwise, if a signal, roundabout, or stop sign controlling the roadway crossing the tracks was located within 600 feet of the LRT junction, it was carried to the next step. Then, if the AADT was greater than 5,000 vehicles per day, it was analyzed. Intersections that did not meet the previous criteria were not analyzed as part of this traffic study.

From this screening process, a list of crossings was selected for analysis. Nearby intersections were also included if the intersections were part of a network of intersections affected by the LRT crossing. A total of 47 intersections, mostly signalized, were analyzed in this study and are identified in **Table 1**. There were no intersections retained for analysis along Major Segment 1 and Major Segment A as part of this study. The analyzed intersections were grouped into 12 traffic models to evaluate the LRT impacts to the system of closely spaced intersections.

Intersection location codes, which refer directly to the Table 1 information, are depicted on **Figure 4** through **Figure 13**. These figures are organized according to Major Segment, as defined previously in the Southwest Corridor study process:

- Figures 4-5: Major Segment 1
- Figures 6-7: Major Segment 3
- Figures 8-9: Major Segment 4

- Figures 10-11: Major Segment A
- Figures 12-13: Major Segment C

Table 1 – Intersections Studied

Model #	Location Code	Intersection
Major Segment 3 (LRT 3A, 3C, & 3C Sub Alternatives)		
1	1	TH 5 North Ramp & Mitchell Rd
	2	TH 5 South Ramp & Mitchell Rd
	3	Lone Oak Rd & Mitchell Rd
	4	Technology Drive & Mitchell Rd
2	5	Bryant Lake Dr & Valley View Road
	6	Flying Cloud Dr & Valley View Road
	7	Praire Center Dr & Valley View Road (East Jct)
	8	Viking Dr & Prairie Center Dr
Major Segment 4 (All Alternatives)		
3	9	CSAH 3 & 17th Ave
	10*	5th Street & 16th Ave
4	11	CSAH 3 & 11th Ave
	12	CSAH 3 & 8th Ave
	13	CSAH 3 & 5th Ave
5	14	2nd Street & Blake Rd. N.
	15	Blake Rd. N. & CSAH 3
6	16	TH 7 WB On-Ramp & Woodale Ave.
	17	TH 7 EB Off-Ramp & Woodale Ave.
	18*	TH 7 Frontage Rd & Woodale Ave.
	19	36th St & Woodale Ave.
7	20	CSAH 25 & Belt Line Blvd
	21*	CSAH 25 S. Frontage Rd & Belt Line Blvd

Model #	Location Code	Intersection
Major Segment C (LRT 3C & 3C Sub Alternatives)		
8	22	28th St & Nicollet Ave
9	23	Blaisdell Ave & Franklin Ave
	24	Nicollet Ave & Franklin Ave
	25	1st Ave & Franklin Ave
10	26	W 15th St & Nicollet Ave S
	27	W Grant St & Nicollet Ave S
	28	13th St S & Nicollet Ave S
	29	12th St S & Nicollet Ave S
	30	11th St S & Nicollet Ave S
	31	S 10th St & Nicollet Ave S
	32	S 9th St & Nicollet Ave S
	33	S 8th St & Nicollet Ave S
	34	S 7th St & Nicollet Ave S
	35	S 6th St & Nicollet Ave S
	36	S 5th St & Nicollet Ave S
	37	S 4th St & Nicollet Ave S
	38	S 3rd St & Nicollet Ave S
11	39	11th St S & LaSalle Ave
	40	11th St S & Harmon Pl
	41	11th St N & Hennepin Ave
	42	11th St N & Hawthorne Ave
	43	12th St S & LaSalle Ave
	44	12th St S & Harmon Pl
	45	12th St N & Hennepin Ave
	46	12th St N & Hawthorne Ave
12	47	Glenwood Ave & Royalston Ave N

* Unsignalized intersection

Traffic Counts

To provide a basis for all the operational analysis summarized in this Technical Memorandum, existing turning movements, within the past two years (April 5, 2008 to the present) were needed for all of the study intersections. For some intersections, existing data was received from Mn/DOT, Hennepin County, the City of Eden Prairie, and the City of Minneapolis. For the majority, however, new counts were performed as part of this study. These counts were performed between February 10th and March 10th of 2010. Groups of intersections being modeled together required that turning movements between intersections be balanced, due to subtle fluctuations between counts performed on different days, to reflect an average number of vehicles performing that movement on an average day.

Analysis Years, Traffic Growth Factor, Assumed Future Projects

The intersections indentified previously were analyzed for the existing year (2010), opening year (2017), and the design year (2030). A single 20 year growth factor, provided by HDR Engineering, was used to project existing traffic volumes to the design year 2030 No Build and Build volumes. This factor was calculated by comparing the growth in traffic volumes adjacent to the Southwest Transitway Corridor in Metropolitan Council's Regional Models (2000 and 2030). An average growth over thirty years was determined. The twenty years of growth associated with the study timeframe (2010 – 2030) was calculated at twelve percent. As a result, forecast 2030 traffic volumes were generated by applying the twenty year growth factor of 1.12

to the existing counts. In order to obtain forecast year 2017 volumes, a seven year growth factor was derived by distributing the twenty years of growth (twelve percent) based on the assumption that initial growth would follow a flatter trend the first few years and then become steeper toward year 2030. From this growth distribution, volumes during the first seven years were estimated to increase three percent. As a result, forecast year 2017 volumes were then generated by applying a growth factor of 1.03 to the existing counts. A tabulation of traffic counts and forecasts for each intersection is provided in **Attachment B.**

Major transportation projects which would affect our operational analysis were identified by reviewing Mn/DOT's Statewide Transportation Improvement Program (STIP) and Capital Improvement Programs (CIPs) for Hennepin County, Eden Prairie, Minnetonka, Hopkins, Saint Louis Park, and Minneapolis. Since the Wooddale Avenue interchange improvements at Trunk Highway 7 in Saint Louis Park are currently under construction, these improvements were reflected in the existing and future analyses. Future improvements in Eden Prairie included modifications to the intersection of Valley View Road and Prairie Center Drive (East Jct). No other improvements along the Southwest LRT corridor were assumed.

Operational Analysis Methodology

The key periods of operational analysis are the times of greatest traffic volume and congestion: AM peak hour and PM peak hour. The AM peak hour characterizes the highest hourly volume of traffic for each group of intersections modeled together between 6:00 AM and 9:00 AM. The PM peak hour characterizes an hour between 3:00 PM and 6:00 PM.

The operational evaluation of the intersections was based on a Level of Service (LOS) analysis incorporating established methodologies documented in the Highway Capacity Manual (TRB, 2000). For intersections, LOS is primarily a function of delay, which is based on AM and PM peak-hour turning movement volumes, intersection lane configuration, and traffic control (e.g. traffic signal assumptions). Levels of service range from A (limited delay) through F (excessive delay). Level of service A through D are generally considered acceptable in metropolitan areas; LOS E conditions generally require mitigation, and LOS F represents very poor operational conditions which require mitigation.

The LOS analysis was performed using Synchro/SimTraffic:

- Synchro, a software package that implements Highway Capacity Manual (HCM) methodologies, was used to build each signalized intersection and provide an input database for turning-movement volumes, lane geometrics, and signal design and timing characteristics. In addition, Synchro was used to optimize signal timing parameters for future conditions. Output from Synchro is transferred to SimTraffic, the traffic simulation model.

- SimTraffic is a micro-simulation computer modeling software that simulates each individual vehicle's characteristics and driver behavior in response to traffic volumes, intersection configuration, and signal operations. The model simulates drivers' behaviors and responses to surrounding traffic flow as well as different vehicle types and speeds. It outputs estimated vehicle delay and queue lengths at each intersection being analyzed.

Synchro/SimTraffic was used not only to project future LOS conditions, but to define existing conditions using existing signal timing and traffic count information described previously. Intersection signal timing was requested from the controlling agencies for each intersection analyzed. For intersections where data was unavailable, Mn/DOT standard signal timing parameters were applied. Additionally, signal timing for intersections within the City of Minneapolis was determined from field observations.

Future intersection signal timing for the no-build alternative was computed utilizing the appropriate increase in traffic and optimizing the intersection offsets and splits in the Synchro software package.

Future signal timing, for intersections where the LRT alignment passed in close proximity, was modeled using the Synchro/SimTraffic modeling software. Synchro/SimTraffic does not have the direct capacity to model LRT, but a timing plan was created to represent the disruption to the signal's timing plan caused by the train at intersections where signal preemption or priority would be used. The signal's timing plan was modified to include two additional phases within the signal's ring and barrier to represent a clearance interval and limited service phases allowed to operate with the train. A preemption/priority call to the signal would be placed only when a train was present, which was assumed to be every 3.75 minutes during the peak periods (According to the Technical Memorandum No. 2: Description of Alternatives, the Southwest LRT would provide high frequency, 7.5 minute peak period, bidirectional headways).

The first additional phase provided a clearance interval which allows vehicles to clear the tracks and time for the gate arms to descend. This phase duration was estimated at 30 seconds. The second additional phase permitted limited service to phases that were allowed to time while the train was crossing through the intersection. This phase duration was estimated at 15 seconds. In summary, a train call to the signal would disrupt the signal's normal cycle length for a total of 45 seconds before normal phasing would be restored.

LRT in downtown Minneapolis was assumed to run with traffic, without preemption or priority. It was assumed that when LRT was present along Nicollet Mall between 13th Street and Washington Avenue that only the LRT will operate along Nicollet Mall. Local bus service and taxis will have to relocate to other streets. It was also assumed that when LRT was in-place along 11th Street and 12th Street, it would replace one traffic lane along each street, thus reducing the street's capacity. Future segment capacity analyses along 11th Street and 12th Street incorporate this reduction in cross-sectional width.

A special case of the traffic signal turning all-red to allow the train to diagonally cross the intersection was used in two locations. First, the Blaisdell Avenue sub-alternative crosses the Franklin Avenue / Nicollet Avenue intersection at-grade. Secondly, the 11th / 12th Street sub-alternative crosses the Nicollet Mall / 11th Street intersection at-grade. When the train crosses these intersections, the signal remains all-red for approximately 18 seconds, allowing the train to diagonally cross through the intersection before traffic phases are allowed to resume.

During collection of turning movement counts, pedestrian counts were also taken. Pedestrians at intersections were modeled two ways, one for suburban intersections and one for urban intersections within the City of Minneapolis.

- **Suburban Intersections:** All pedestrian counts at intersections outside of Minneapolis City limits were less than 5 pedestrians per hour crossing an approach. Pedestrians were accommodated at these intersections by ensuring the max green time for any phase was long enough to accommodate a pedestrian safely crossing an intersection; this move would be actuated by the pedestrian. Typically, the through phases during the peak hour max out and run the full green time, which is adequate for pedestrians to cross. Due to the excessively low pedestrian counts, pedestrians were not modeled.

- **Minneapolis Intersections:** Counts for intersections within the City of Minneapolis show that pedestrian volumes range between 50 and 250 pedestrians per hour for many of the crossing locations. Observed/measured signal timing revealed adequate time for pedestrians to cross regardless of pedestrian volumes. The minimum green time for all through phases at all intersection was set at a large enough value to safely accommodate the counted pedestrian volume.

Results

Traffic Operations

The results of the operational analysis are provided in **Table 2** (AM peak hour) and **Table 3** (PM peak hour). For each intersection in the study, these tables provide intersection level of service by major segment for the LRT alignments. This presentation facilitates a comparison of intersection operations for existing conditions and future conditions by Major Segment with and without LRT. More detailed information including LOS results and vehicle queue lengths for the individual approaches to each intersection is provided in **Attachments C** and **D**.

LRT stations, specifically those with Park & Ride facilities, will cause localized increases in traffic along the adjacent roadways. This may include some local cut-through traffic from drivers familiar with the roadway networks of adjacent neighborhoods. A more detailed analysis of these impacts will be included in the FEIS.

Table 2 Intersection Level of Service – AM Peak Hour

Alternative			2010 Peak Hour	2017 Peak Hour	2017 Peak Hour	2030 Peak Hour	2030 Peak Hour
			Existing Condition	No Build	Build LRT	No Build	Build LRT
Model #	Location Code	Intersection	LOS by Intersection	LOS by Intersection	LOS by Intersection	LOS by Intersection	LOS by Intersection
Major Segment 3 (LRT 3A, 3C, & 3C Sub Alternatives)							
1	1	TH 5 North Ramp & Mitchell Rd	B	B	C	B	C
	2	TH 5 South Ramp & Mitchell Rd	B	B	B	B	B
	3	Lone Oak Rd & Mitchell Rd	A	A	A	A	A
	4	Technology Drive & Mitchell Rd	C	C	C	C	C
2	5	Bryant Lake Dr & Valley View Road	C	D	F	E	F
	6	Flying Cloud Dr & Valley View Road	D	D	F	E	F
	7	Praire Center Dr & Valley View Road (East Jct)	B	C	B*	C	C
	8	Viking Dr & Prairie Center Dr	C	D	C*	D	C*
Major Segment 4 (All Alternatives)							
3	9	CSAH 3 & 17th Ave	N/A	A	A	A	A
	10	5th Street & 16th Ave	N/A	A	A	A	A
4	11	CSAH 3 & 11th Ave	B	B	B	B	B
	12	CSAH 3 & 8th Ave	A	A	B	A	B
	13	CSAH 3 & 5th Ave	B	B	C	B	C
5	14	2nd Street & Blake Rd. N.	B	B	A	B	A
	15	Blake Rd. N. & CSAH 3	C	C	C	C	C
6	16	TH 7 WB On-Ramp & Woodale Ave.	A	A	A	A	B
	17	TH 7 EB Off-Ramp & Woodale Ave.	A	B	B	B	B
	18	TH 7 Frontage Rd & Woodale Ave.	A	A	A	A	A
	19	36th St & Woodale Ave.	C	B	B	B	C
7	20	CSAH 25 & Belt Line Blvd	C	C	C	C	C
	21	CSAH 25 S. Frontage Rd & Belt Line Blvd	A	A	A	A	A
Major Segment C (LRT 3C & 3C Sub Alternatives)							
8	22	28th St & Nicollet Ave	B	B	B	B	B
9	23	Blaisdell Ave & Franklin Ave	B	B	B	B	B
	24	Nicollet Ave & Franklin Ave	B	B	B	B	B
	25	1st Ave & Franklin Ave	B	B	B	B	B
Sub Alternatives Blaisdell Ave (No-Build Same as Nicollet Ave Center-Running Alignment)							
9	23	Blaisdell Ave & Franklin Ave	N/A	N/A	B	N/A	B
	24	Nicollet Ave & Franklin Ave	N/A	N/A	B	N/A	C
	25	1st Ave & Franklin Ave	N/A	N/A	B	N/A	B
Major Segment C (LRT 3C & 3C Sub Alternatives) (Continued)							
9	26	W 15th St & Nicollet Ave S	B	B	B	B	B
	27	W Grant St & Nicollet Ave S	B	B	B	B	B
	28	13th St S & Nicollet Ave S	A	A	A	A	A
Sub Alternatives Nicollet Mall							
10	29	12th St S & Nicollet Ave S	B	B	B	B	B
	30	11th St S & Nicollet Ave S	B	B	B	B	B
	31	S 10th St & Nicollet Ave S	B	B	B	B	B
	32	S 9th St & Nicollet Ave S	B	B	B	B	B
	33	S 8th St & Nicollet Ave S	B	B	B	B	B
	34	S 7th St & Nicollet Ave S	B	B	B	B	B
	35	S 6th St & Nicollet Ave S	B	B	B	B	B
	36	S 5th St & Nicollet Ave S	B	B	B	B	B
	37	S 4th St & Nicollet Ave S	B	B	B	B	B
	38	S 3rd St & Nicollet Ave S	B	B	B	B	B
Sub Alternative 11th and 12th Street							
11	30	11th St S & Nicollet Ave S	B	B	B	B	B
	39	11th St S & LaSalle Ave	B	B	B	B	B
	40	11th St S & Harmon Pl	B	B	B	B	B
	41	11th St N & Hennepin Ave	B	B	B	B	B
	42	11th St N & Hawthorne Ave	B	B	B	C	B
	29	12th St S & Nicollet Ave S	B	B	C	B	C
	43	12th St S & LaSalle Ave	C	C	C	C	C
	44	12th St S & Harmon Pl	B	B	B	B	B
	45	12th St N & Hennepin Ave	B	B	B	B	B
	46	12th St N & Hawthorne Ave	C	C	C	D	D
12	47	Glenwood Ave & Royalston Ave N	A	A	B	A	B

* Analysis reveals that the intersection LOS is better in the build scenario. This results from an unacceptable LOS and substantial queues at upstream and/or downstream intersections that meters traffic and causes approach volumes entering the intersection to be less than forecasted volumes.

Table 3 Intersection Level of Service – PM Peak Hour

Model #	Location Code	Intersection	2010 Peak Hour Existing Condition LOS by Intersection	2017 Peak Hour No Build LOS by Intersection	2017 Peak Hour Build LRT LOS by Intersection	2030 Peak Hour No Build LOS by Intersection	2030 Peak Hour Build LRT LOS by Intersection
Major Segment 3 (LRT 3A, 3C, & 3C Sub Alternatives)							
1	1	TH 5 North Ramp & Mitchell Rd	C	B	B	B	B
	2	TH 5 South Ramp & Mitchell Rd	B	B	B	B	B
	3	Lone Oak Rd & Mitchell Rd	A	A	A	A	A
	4	Technology Drive & Mitchell Rd	C	B	C	C	C
2	5	Bryant Lake Dr & Valley View Road	D	D	D	D	E
	6	Flying Cloud Dr & Valley View Road	D	C	D	D	E
	7	Praire Center Dr & Valley View Road (East Jct)	E	D	E	D	F
	8	Viking Dr & Prairie Center Dr	D	D	E	D	F
Major Segment 4 (All Alternatives)							
3	9	CSAH 3 & 17th Ave	N/A	A	A	B	B
	10	5th Street & 16th Ave	N/A	A	A	A	A
4	11	CSAH 3 & 11th Ave	C	C	C	C	C
	12	CSAH 3 & 8th Ave	B	B	C	B	C
	13	CSAH 3 & 5th Ave	B	B	C	C	C
5	14	2nd Street & Blake Rd. N.	B	B	B	B	B
	15	Blake Rd. N. & CSAH 3	C	C	C	C	C
6	16	TH 7 WB On-Ramp & Woodale Ave.	A	A	B	B	B
	17	TH 7 EB Off-Ramp & Woodale Ave.	A	B	B	B	B
	18	TH 7 Frontage Rd & Woodale Ave.	A	A	A	A	A
	19	36th St & Woodale Ave.	B	B	B	C	C
7	20	CSAH 25 & Belt Line Blvd	D	D	D	D	D
	21	CSAH 25 S. Frontage Rd & Belt Line Blvd	A	B	B	E	F
Major Segment C (LRT 3C & 3C Sub Alternatives)							
8	22	28th St & Nicollet Ave	B	B	B	B	B
9	23	Blaisdell Ave & Franklin Ave	B	B	B	B	B
	24	Nicollet Ave & Franklin Ave	B	B	C	C	D
	25	1st Ave & Franklin Ave	B	B	B	C	C
Sub Alternatives Blaisdell Ave (No-Build Same as Nicollet Ave Center-Running Alignment)							
9	23	Blaisdell Ave & Franklin Ave	N/A	N/A	B	N/A	C
	24	Nicollet Ave & Franklin Ave	N/A	N/A	D	N/A	D
	25	1st Ave & Franklin Ave	N/A	N/A	D	N/A	E
Major Segment C (LRT 3C & 3C Sub Alternatives) (Continued)							
9	26	W 15th St & Nicollet Ave S	C	C	C	C	C
	27	W Grant St & Nicollet Ave S	B	B	B	B	B
	28	13th St S & Nicollet Ave S	B	B	B	B	B
Sub Alternatives Nicollet Mall							
10	29	12th St S & Nicollet Ave S	B	B	B	B	B
	30	11th St S & Nicollet Ave S	B	B	B	B	B
	31	S 10th St & Nicollet Ave S	B	B	B	B	B
	32	S 9th St & Nicollet Ave S	B	B	B	B	B
	33	S 8th St & Nicollet Ave S	B	B	B	B	B
	34	S 7th St & Nicollet Ave S	B	B	B	B	B
	35	S 6th St & Nicollet Ave S	B	B	B	B	B
	36	S 5th St & Nicollet Ave S	B	B	B	B	B
	37	S 4th St & Nicollet Ave S	B	B	B	B	B
	38	S 3rd St & Nicollet Ave S	B	B	B	B	B
Sub Alternative 11th and 12th Street							
11	30	11th St S & Nicollet Ave S	B	B	B	B	D
	39	11th St S & LaSalle Ave	C	C	C	C	D
	40	11th St S & Harmon Pl	B	B	B	B	B
	41	11th St N & Hennepin Ave	B	B	B	B	B
	42	11th St N & Hawthorne Ave	B	B	C	B	C
	29	12th St S & Nicollet Ave S	B	B	B	B	B
	43	12th St S & LaSalle Ave	B	B	B	C	C
	44	12th St S & Harmon Pl	B	B	B	B	B
	45	12th St N & Hennepin Ave	B	B	B	B	B
	46	12th St N & Hawthorne Ave	B	B	B	B	B
12	47	Glenwood Ave & Royalston Ave N	B	B	B	B	C

Major Segment 1
Intersections along this segment were not analyzed because major roadway junctions are grade separated and the at-grade crossings are with roadways that carry mostly residential traffic at low volumes. Minimal traffic queuing is expected and not anticipated to cause significant impacts to traffic operations.

Major Segment 3
Two groups of intersections along this segment were analyzed. The analysis of intersections near the junction of Mitchell Road and TH 5 is anticipated to operate at an acceptable LOS in the future peak hours with and without at-grade LRT. The traffic model for the Valley View Road and Flying Cloud Drive/TH 212 area revealed future operational deficiencies in both the AM and PM peak hours with and without the at-grade LRT.

In the 2017 AM peak hour, the addition of the LRT caused the Bryant Lake Road / Valley View Road intersection to degrade from LOS D to LOS F. This was also the case with the Flying Cloud Drive / Valley View Road intersection. In 2030 AM peak hour, these same intersections experienced increased delay from the addition of the LRT, causing the intersection operations to degrade from LOS E to LOS F. Many of the turn lanes experience vehicle queues greater than the storage provided.

In the 2017 PM peak hour, the addition of the LRT caused the Prairie Center Drive / Valley View Road (East Jct.) and the Prairie Center Drive / Viking Drive intersections to degrade from LOS D to LOS E. In 2030 PM peak hour, these same intersections experienced increased delay from the addition of the LRT, causing LOS D conditions to change to LOS F. Similarly, the Bryant Lake Road / Valley View Road and Flying Cloud Drive / Valley View Road intersections experienced additional delay due to the LRT in the 2030 PM peak hour causing operations to degrade from LOS D conditions to LOS E. Many of the turn lanes experience vehicle queues greater than the storage provided.

Major Segment 4
In forecast year 2030, only the unsignalized intersection of Belt Line Boulevard and the CSAH 25 South Frontage Road is anticipated to operate at unacceptable LOS F in the PM peak hour due to LRT crossing at-grade. The operations of the unsignalized intersection changes from LOS E to LOS F. This occurs due to the queue of southbound vehicles on Belt Line Boulevard at the LRT crossing backing through the unsignalized intersection, and not allowing the eastbound traffic on the South Frontage Road to turn left, north. These queues are not anticipated to impact the signal operations at the high volume intersection of CSAH 25 and Belt Line Boulevard, though.

Major Segment A
Intersections along this segment were not analyzed because major roadway junctions are grade separated and the at-grade crossings are with roadways that carry mostly residential traffic at low volumes. Minimal traffic queuing is expected and not anticipated to cause significant impacts to traffic operations.

Major Segment C

The traffic analysis did not show any deficiencies for the main alignment of Major Segment C during both the AM and PM peak hours for existing and future conditions. However, the Blaisdell Avenue Sub-alternative alignment adversely impacts the operations of intersections analyzed along Franklin Avenue.

<u>Blaisdell Avenue Sub-alternative</u>

The Blaisdell Avenue Sub-alternative alignment intersections along Franklin Avenue experience a degraded level of service (LOS C to LOS E) in the 2030 PM peak hour. This is due to the train diagonally crossing through the intersection of Franklin Avenue and Nicollet Avenue. The train crossing requires an all red signal condition at the intersection of Franklin Avenue and Nicollet Avenue. The duration of this all red disrupts the westbound traffic along Franklin Avenue causing the queue of vehicles to back-up through 1^{st} Avenue further degrading the operations at 1^{st} Avenue.

<u>1^{st} Avenue Sub-alternative</u>

Traffic operations were not analyzed for this alternative. The LRT line is grade separated to north of Franklin Avenue. Franklin Avenue traffic operations are not impacted from this alternative.

<u>11^{th}/12^{th} Street Sub-alternative</u>

The traffic analysis shows the 11^{th} and 12^{th} Street Sub-alternative operates at an acceptable level of service during both the AM and PM peak hours for existing and future conditions.

Potential Mitigation

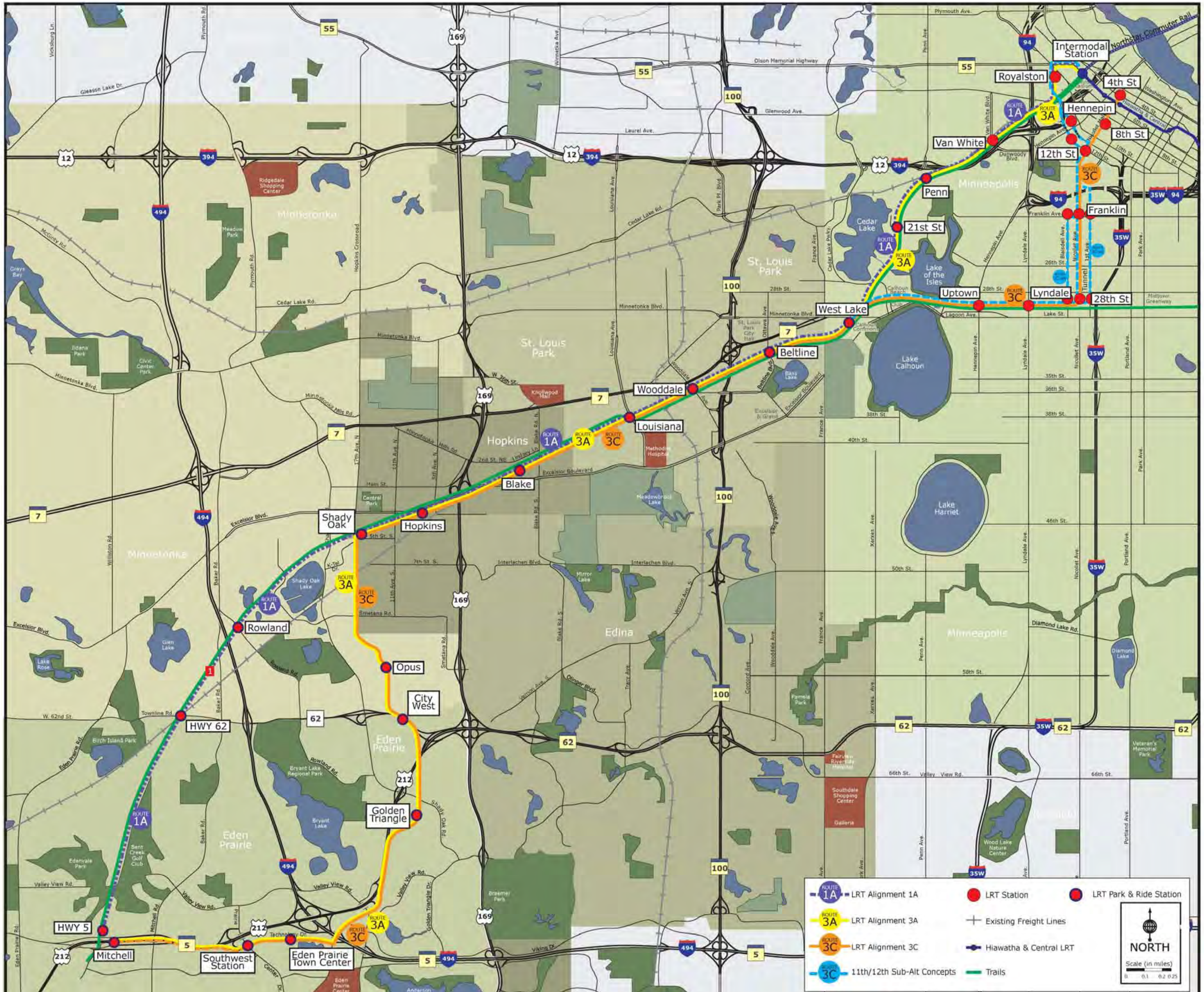
The following general mitigation measures are recommended for implementation to address impacts on all signalized intersections throughout the Southwest LRT corridor:

- Optimized signal timing splits at each intersection.
- Provide light rail vehicles (LRV) detection at signalized intersections to coordinate priority treatment where needed.
- New traffic signal controllers, pedestrian controllers, and signage at signalized intersections.
- Protected left- and right-turn lanes at specific intersections for traffic turning across the LRT line.

Mitigation measures that can be implemented to address impacts at intersections forecast to operate at LOS E or F in the future include:

- Constructing additional right or left-turn lanes.
- Lengthening turn lanes.
- Widening of the approaches on the cross-streets.
- Adding additional capacity to parallel routes.
- Possible grade separation between the roadway and LRT alignments

More detailed analysis and impacts of the potential mitigation measures will be included in the FEIS.



SOUTHWEST transitway

Figure 1
Southwest LRT
Alternative Alignments

Hennepin

WSB

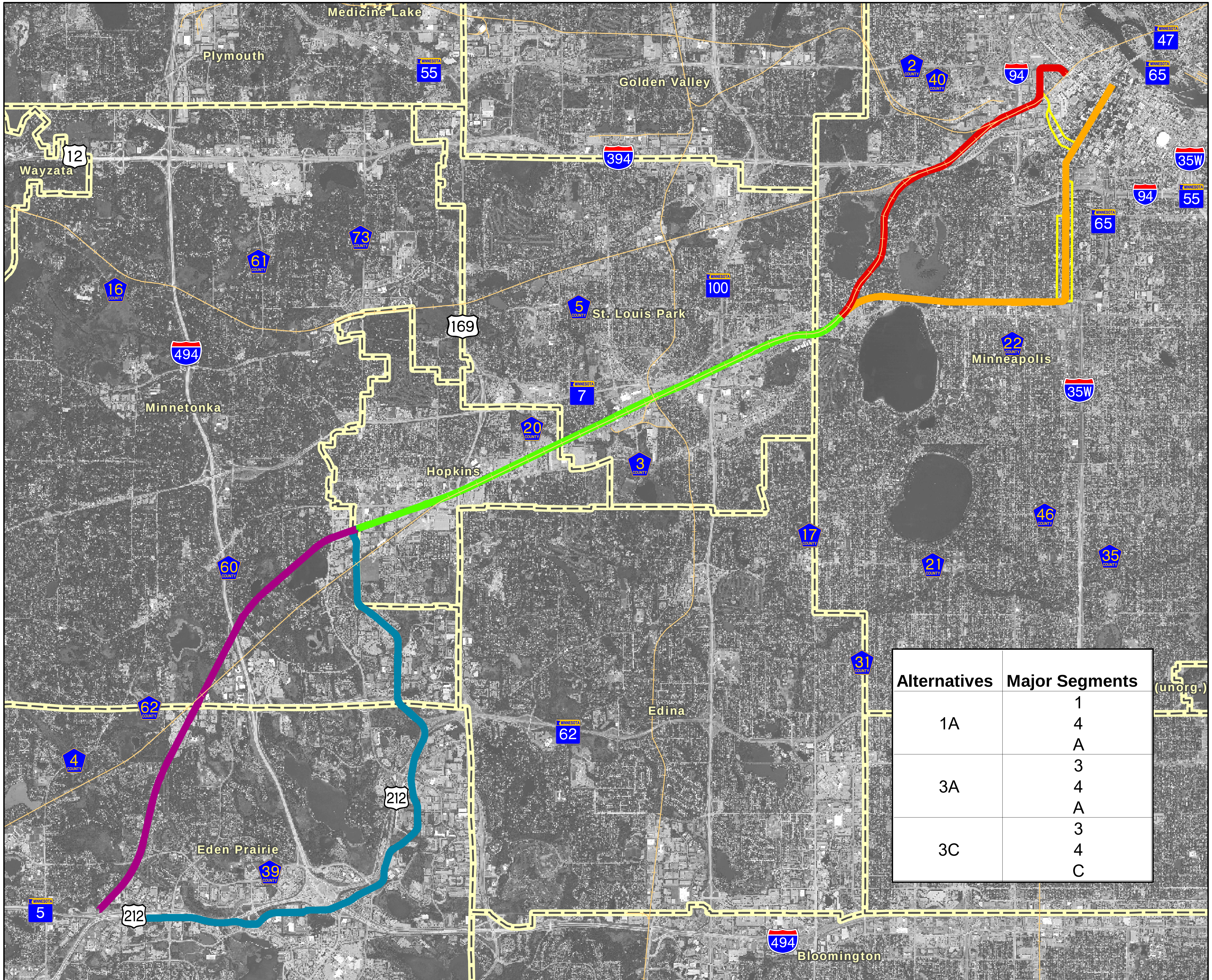


Figure 2
Southwest LRT
Major Segment Index

Legend

- Major Segment 1, Figure 3
- Major Segment 3, Figure 4
- Major Segment 4, Figure 5
- Major Segment A, Figure 6
- Major Segment C, Figure 7
- Subalternatives, Figure 7
- Existing Railroad
- Municipal Boundaries

Alternatives	Major Segments
1A	1 4 A
3A	3 4 A
3C	3 4 C

0 5,000 Feet

N

All Crossings

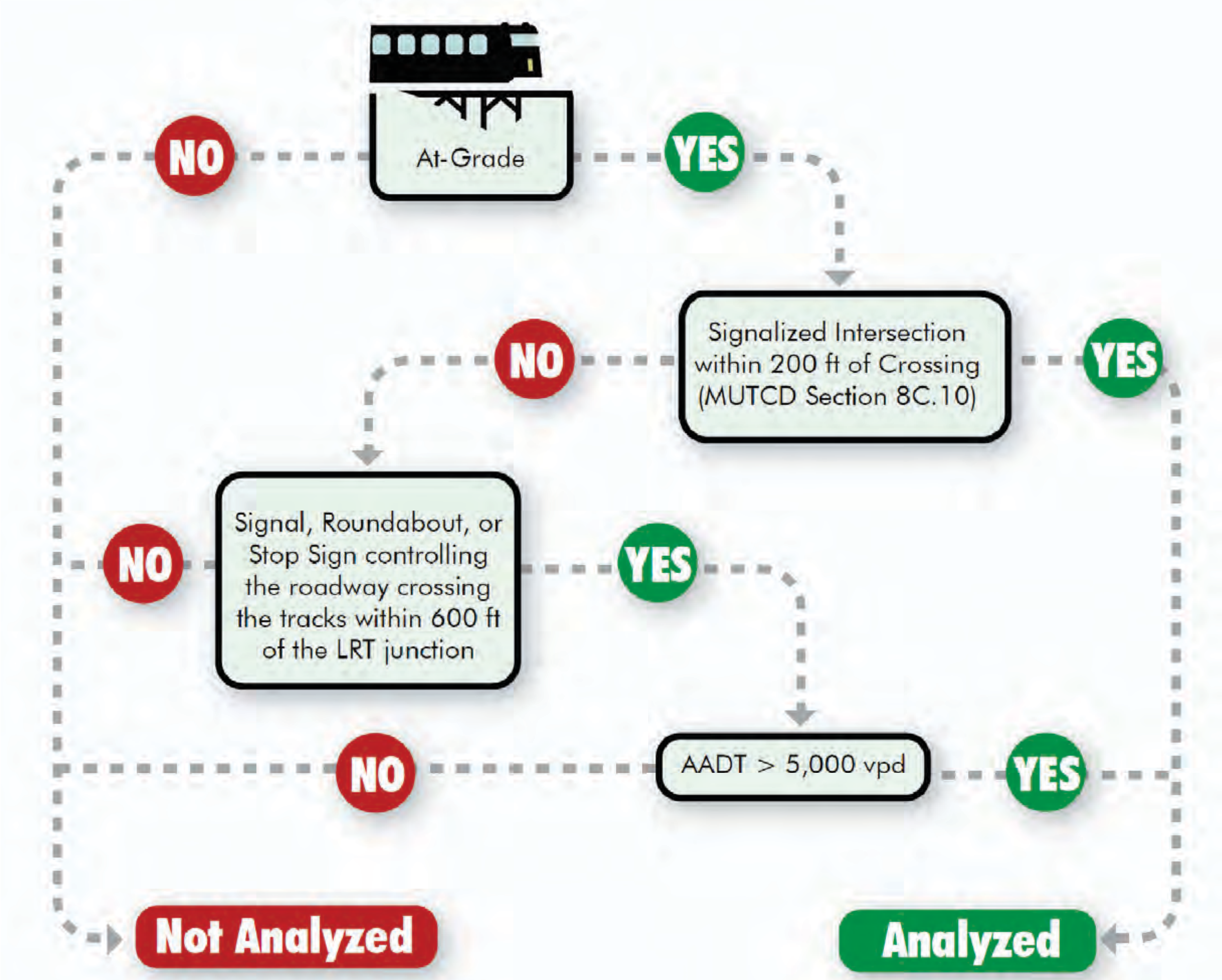


Figure 3
Roadway Crossing Analysis Decision Tree

Hennepin

Figure 4
Major Segment 1
Alignments and Intersection Location Codes

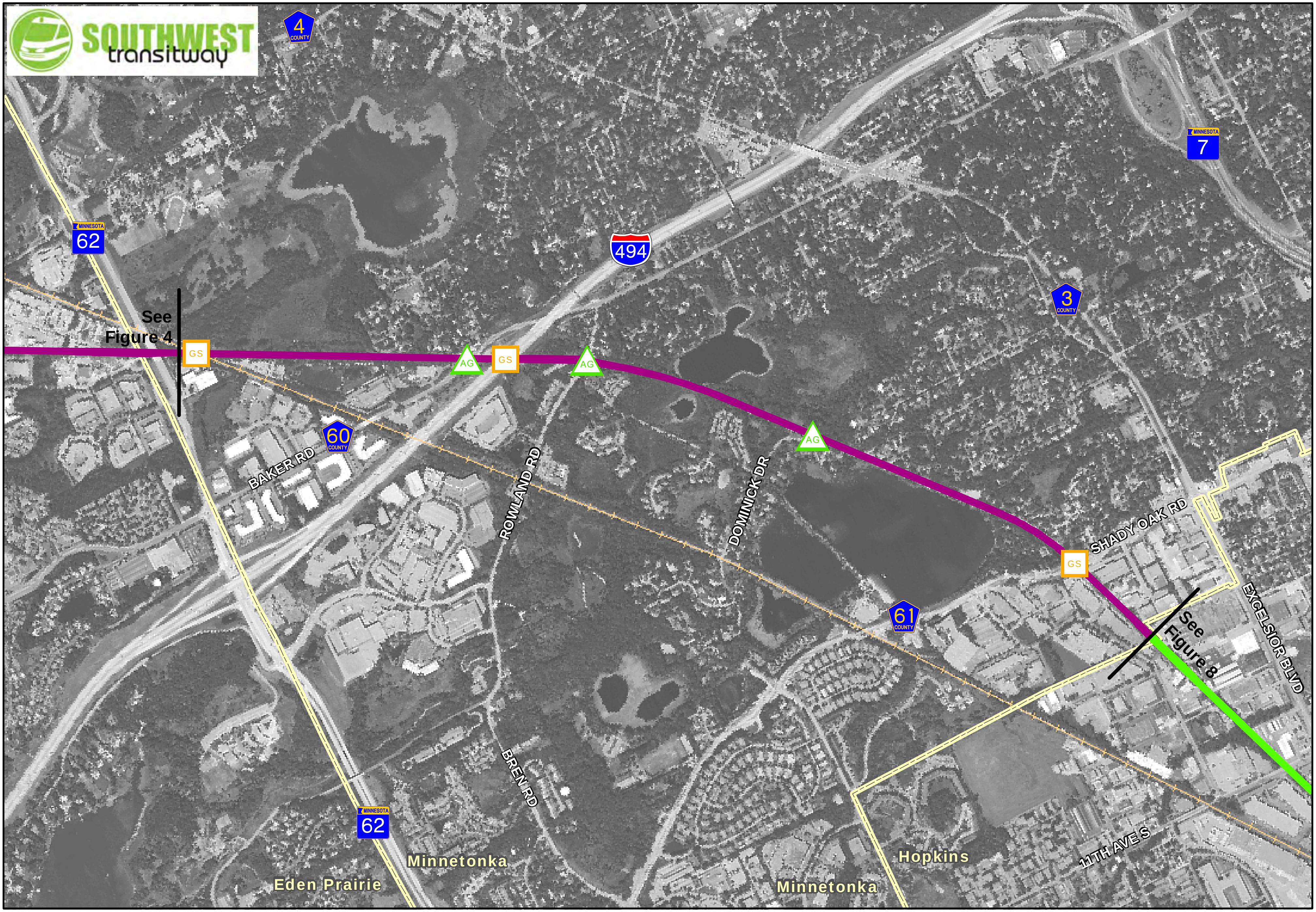
Legend

Major Segment 1
Existing Railroad
Municipal Boundaries
1 Location Code
GS Grade Seperated Crossing
AG At Grade Crossing

0 1,500 Feet

N

WSB & Associates, Inc.



Hennepin

Figure 5
Major Segment 1
Alignments and Intersection Location Codes

Legend

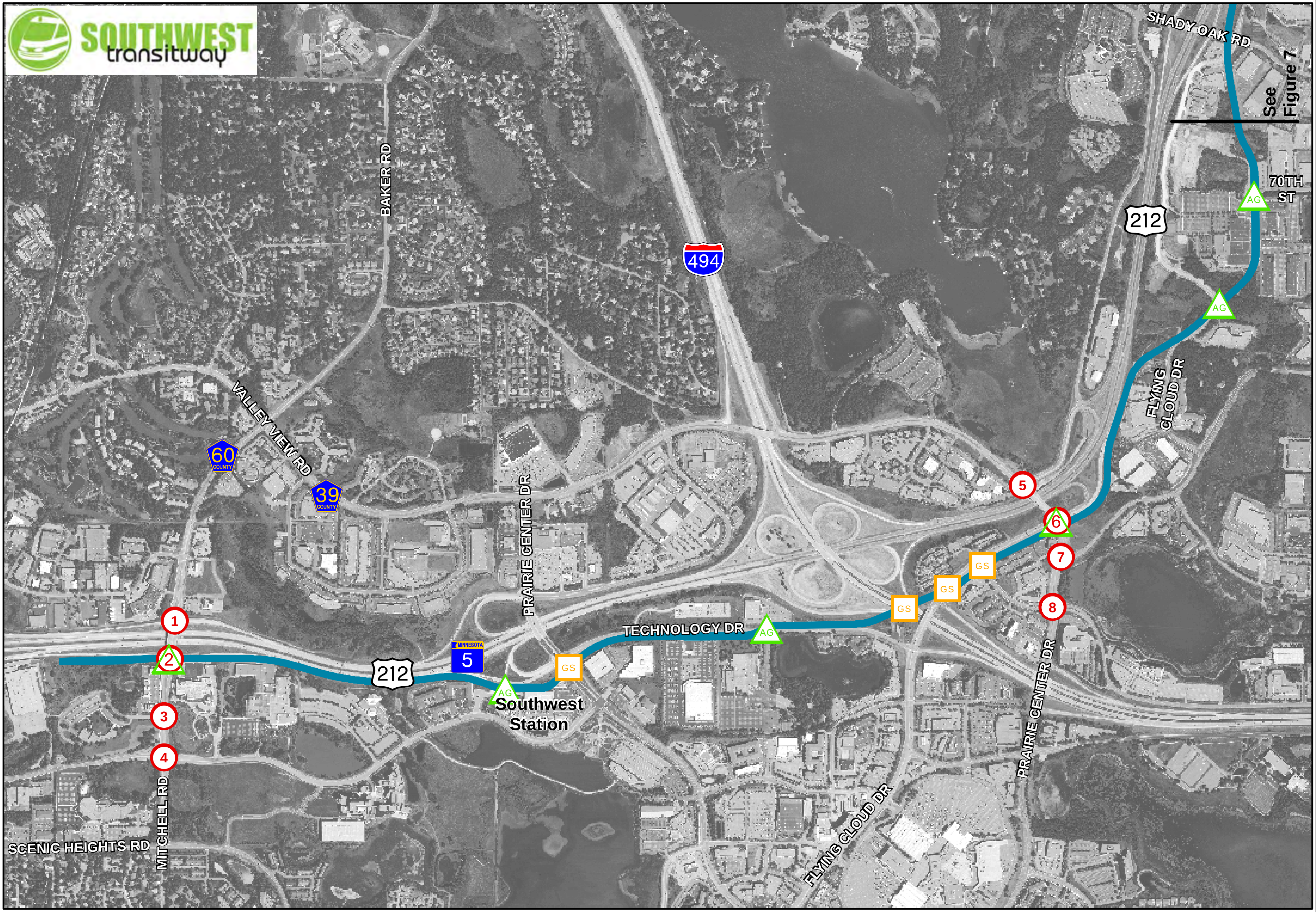
Major Segment 1 — Existing Railroad — Municipal Boundaries

1 Location Code — GS Grade Seperated Crossing — AG At Grade Crossing

0 1,500 Feet

N

WSB & Associates, Inc.



Hennepin

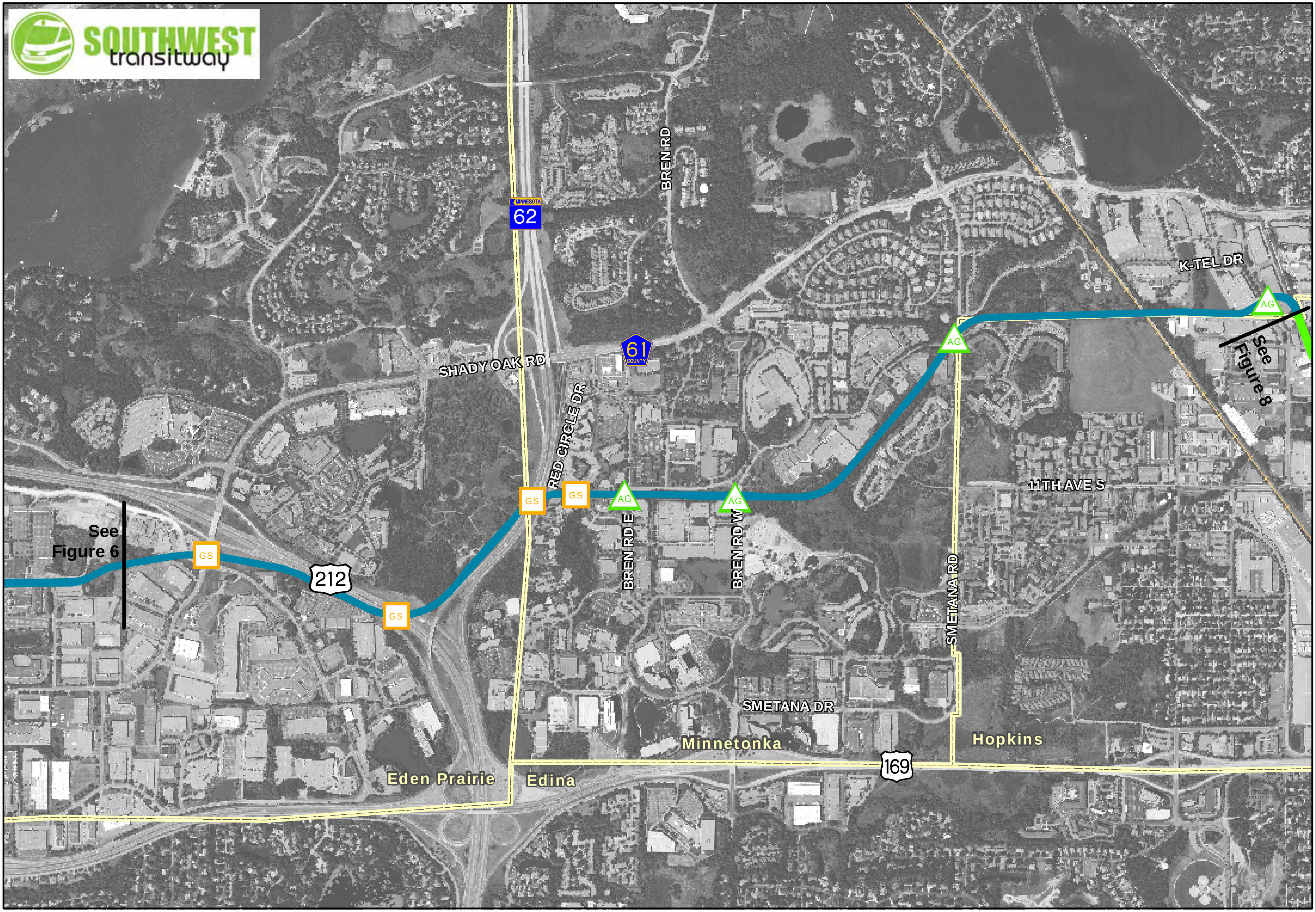
Figure 6
Major Segment 3
Alignments and Intersection Location Codes

Legend
Major Segment 3
Existing Railroad
Municipal Boundaries
Location Code
Grade Seperated Crossing
At Grade Crossing

0 1,500 Feet

N

WSB & Associates, Inc.



Hennepin

Figure 7
Major Segment 3
Alignments and Intersection Location Codes

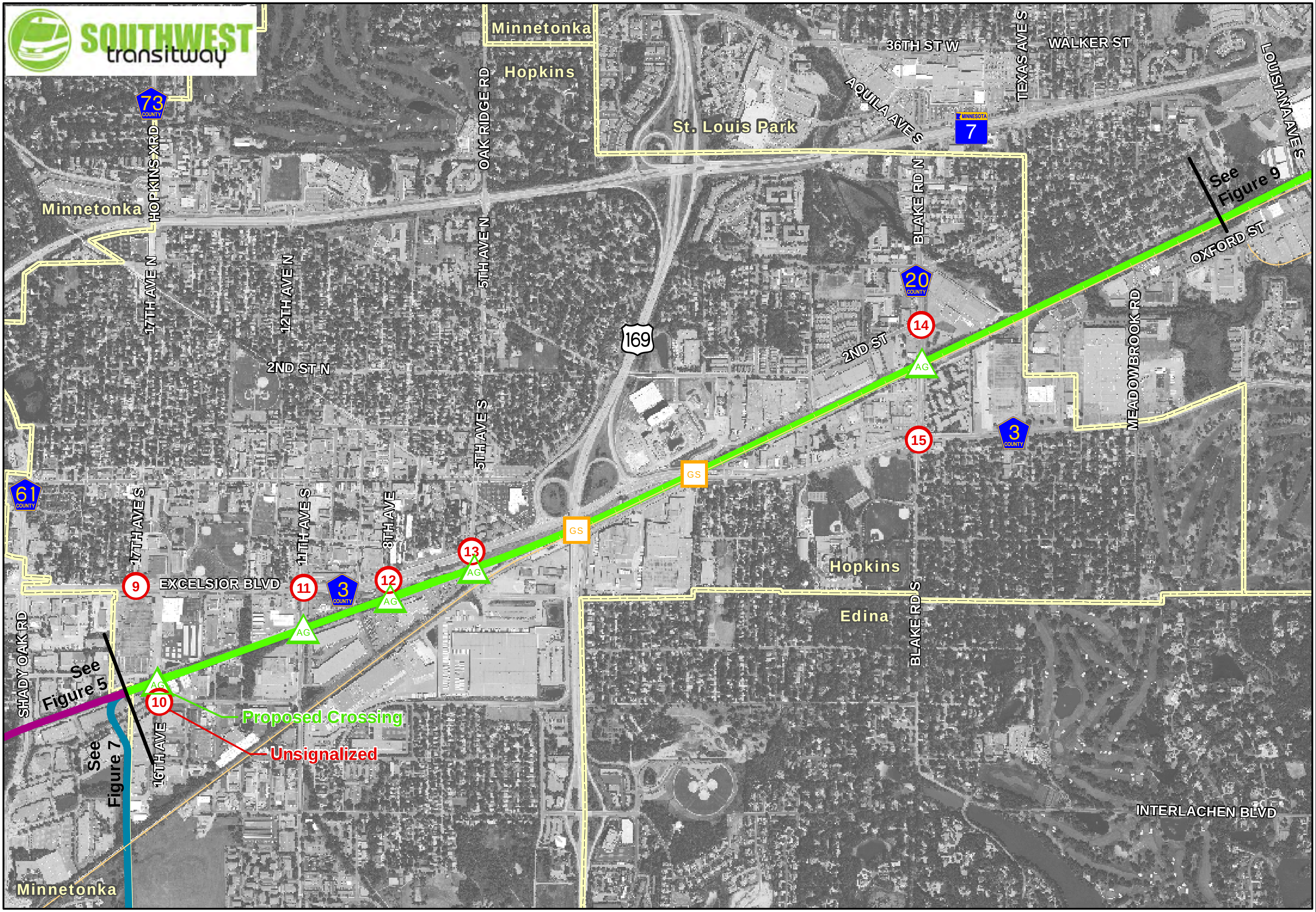
Legend

Major Segment 3
Existing Railroad
Municipal Boundaries
Location Code
Grade Seperated Crossing
At Grade Crossing

0 1,500 Feet

N

WSB & Associates, Inc.



Hennepin

Figure 8
Major Segment 4
Alignments and Intersection Location Codes

Legend

Major Segment 4 — Existing Railroad — Municipal Boundaries

1 Location Code — GS Grade Seperated Crossing — AG At Grade Crossing

0 — 1,500 Feet

N

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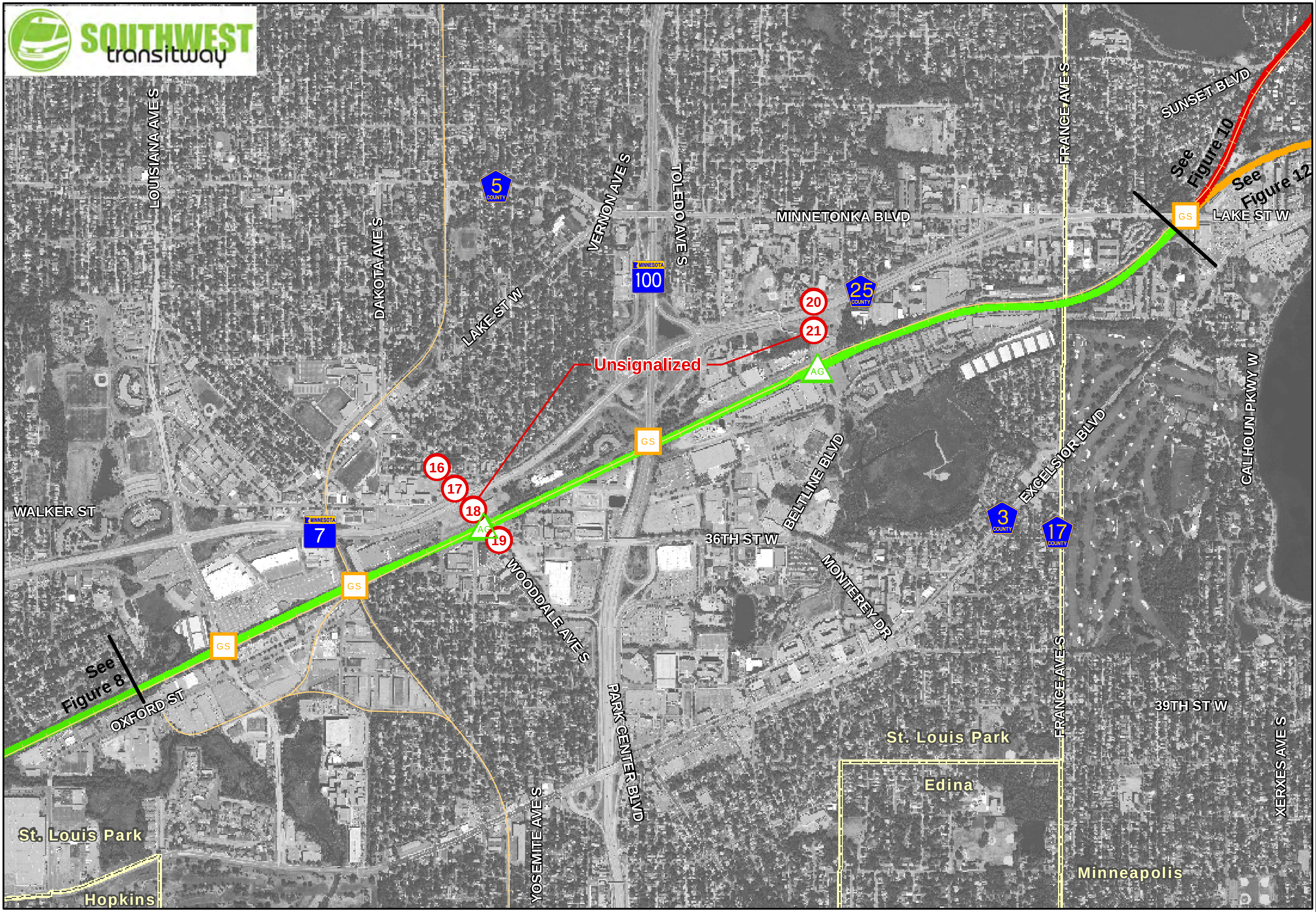


Hennepin

Figure 9
Major Segment 4
Alignments and Intersection Location Codes

Legend

- Major Segment 4
- Existing Railroad
- Municipal Boundaries
- 1 Location Code
- GS Grade Seperated Crossing
- AG At Grade Crossing

0 1,500 Feet

N

WSB & Associates, Inc.

Hennepin

Figure 10
Major Segment A
Alignments and Intersection Location Codes

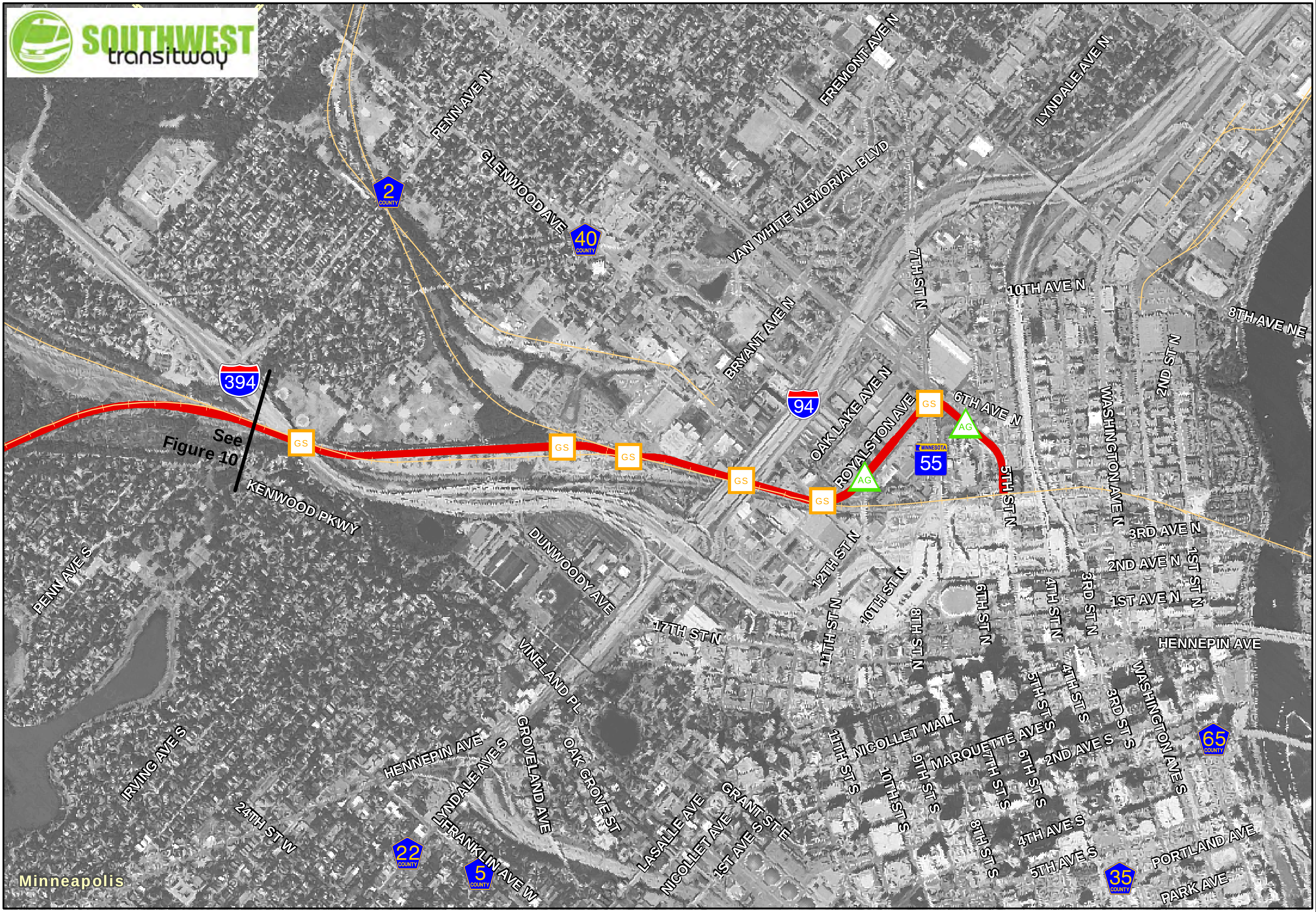
Legend

Segment A
Existing Railroad
Municipal Boundaries
1 Location Code
GS Grade Seperated Crossing
AG At Grade Crossing

0 1,500 Feet

N

WSB & Associates, Inc.



Hennepin

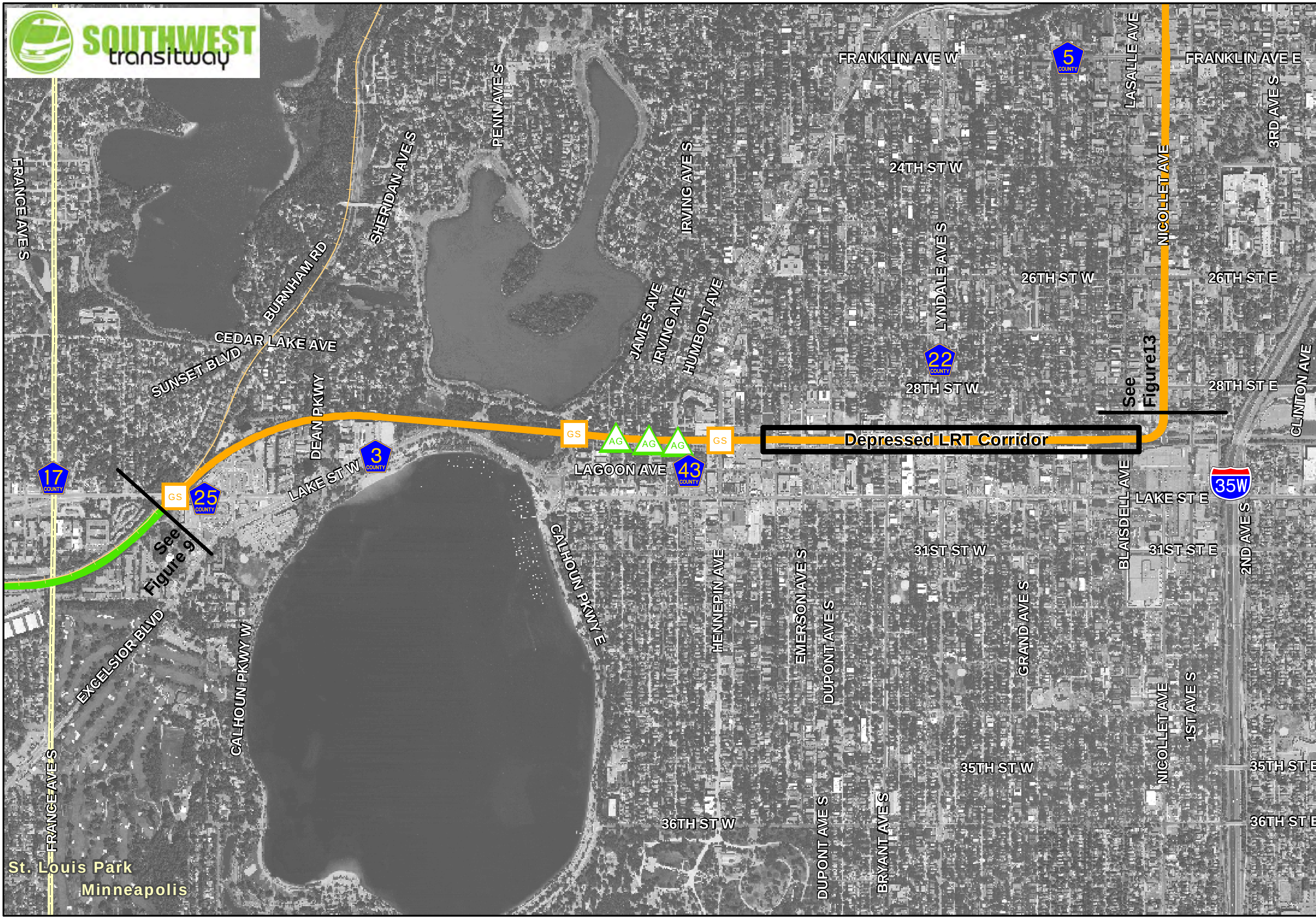
Figure 11
Major Segment A
Alignments and Intersection Location Codes

Legend
Segment A
Existing Railroad
Municipal Boundaries
1 Location Code
GS Grade Seperated Crossing
AG At Grade Crossing

0 1,500 Feet

N

WSB & Associates, Inc.



Hennepin

Figure 12
Major Segment C
Alignments and Intersection Location Codes

Legend

Segment C
Existing Railroad
Municipal Boundaries
Depressed LRT Corridor
1 Location Code
GS Grade Seperated Crossing
AG At Grade Crossing

0 1,500 Feet

N

WSB & Associates, Inc.

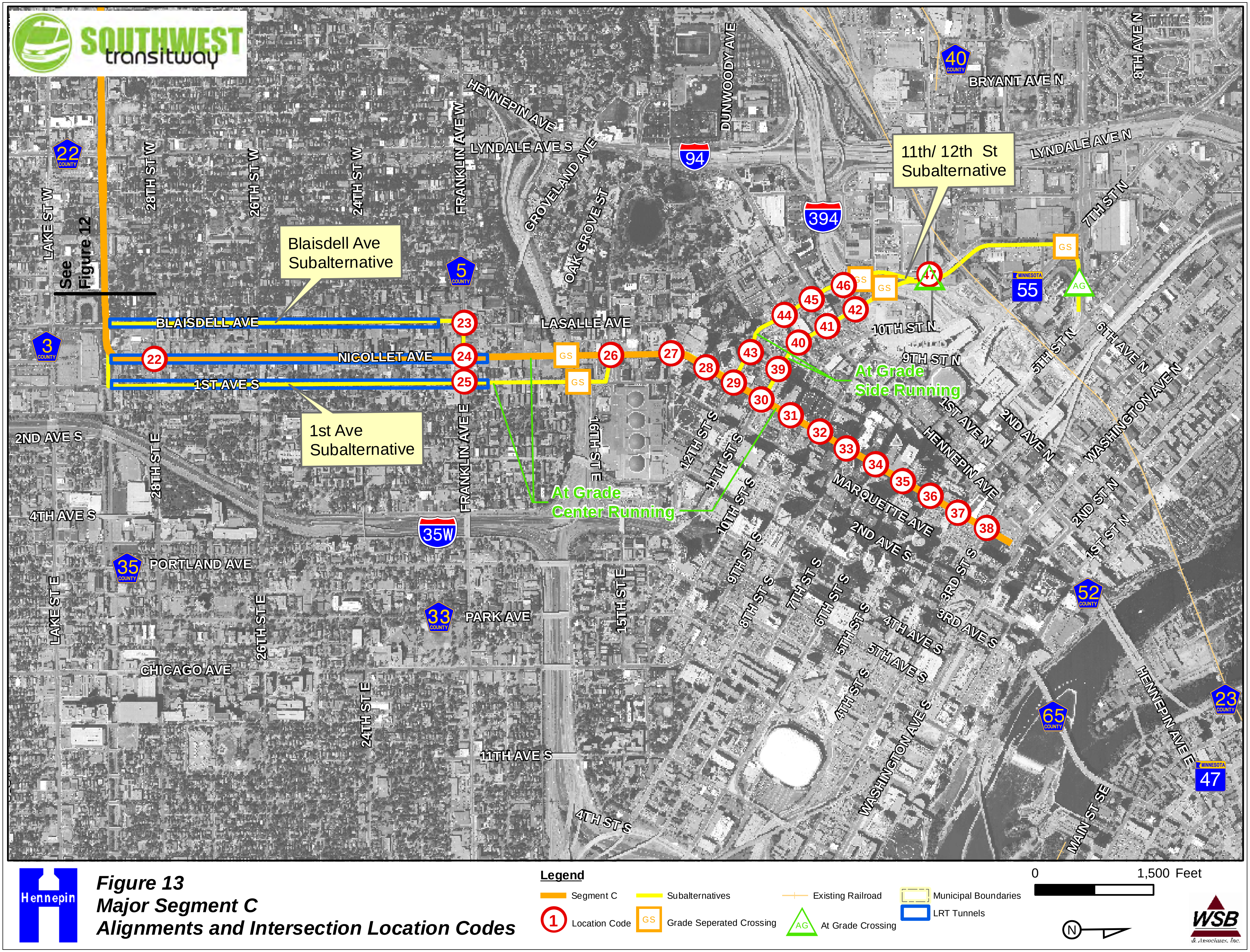


Figure 13
Major Segment C
Alignments and Intersection Location Codes

Attachment A

(LRT Crossing Locations)

Attachment A (Crossing Locations)

SEGMENT	CROSSING		
	ROADWAY	GRADE SEPARATED	AT-GRADE
1	Valley View Rd	X	
	Edenvale Blvd		X
	W 62nd St		X
	CSAH 62	X	
	Baker Rd		X
	I-494	X	
	Rowland Rd		X
	Dominick Dr		X
	CSAH 61	X	
3	Mitchell Rd		X
	SW Station Bus Entrance		X
	Prarie Center Dr	X	
	Technology Drive		X
	I-494	X	
	Flying Cloud Drive	X	
	Viking Drive	X	
	Valley View Rd		X
	Flying Cloud Dr		X
	W. 70th St.		X
	Flying Cloud Dr	X	
	Shady Oak Road	X	
	TH 212	X	
	TH 62	X	
	Red Circle Drive	X	
	Bren Rd E.		X
	Bren Rd W.		X
	Smetana Rd		X
	K-Tel Dr		X
4	16th Ave Extension		Proposed
	11th Ave		X
	8th Ave		X
	5th Ave		X
	TH 169	X	
	CSAH 3	X	
	Blake Rd		X
	Louisiana Ave	X	
	Wooddale Ave		X
	TH 100	X	
	Belt Line Blvd		X
	West Lake Street	X	
A	Cedar Lake Pkwy	X	
	Burnham Rd	X	
	21st Street		X
	I-394	X	
	West Lyndale Ave	X	
	I-94	X	
	East Lyndale Ave	X	
	Glenwood Ave	X	
	Royalston Avenue N.		X
	HERC Facility Entrance		X

SEGMENT	CROSSING		
	ROADWAY	GRADE SEPARATED	AT-GRADE
C	Dean Pkwy	X	
	West Calhoun Pkwy	X	
	James Ave		X
	Irving Ave		X
	Humboldt Ave		X
	Hennepin Ave	X	
	Fremont Ave	X	
	Emerson Ave	X	
	Dupont Ave	X	
	Colfax Ave	X	
	Bryant Ave	X	
	Aldrich Ave	X	
	Lyndale Ave	X	
	Garfield Ave	X	
	Harriet Ave	X	
	Grand Ave	X	
	Pleasant Ave	X	
	Pillsbury Ave	X	
	Blaisdell Ave	X	
	Nicollet Ave	X	
	29th Street	X	
	28th Street	X	
	27th Street	X	
	26th Street	X	
	25th Street	X	
	24th Street	X	
	22nd Street	X	
	Franklin Ave	X	
	E. 19th St/Groveland Ave		X
	E. 18th St.		X
	I-94	X	
	E. 16th St.		X
	W. 15th St.		X
	E. 15th St.		X
	W. 14th St.		X
	W. Grant St		X
	W. 13th St.		X
	W. 12th St.		X
	W. 11th St.		X
	W. 10th St.		X
	W. 9th St		X
	W. 8th St.		X
	W. 7th St.		X
	W. 6th St.		X
	W. 5th St.		X
	W. 4th St.		X
	W. 3rd St.		X
	LaSalle Ave		X
	Harmon Pl.		X
	Hennepin Ave		X
	Hawthorne Ave		X
	Glenwood Ave		X

Attachment B

(Traffic Volumes)

Table B1 Traffic Counts by Movement – 2010 AM Peak Hour

Location Code	Movement											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	311	430			466	50				349		250
2		636	515	205	610		105	38	295			
3	56	1135			849	56	16		9			
4	89	1093	259	325	403	130	28	69	39	39	32	70
5		645	101	45	724					533		184
6	21	330	287	96	675	486	357	689	72	268	30	59
7	8	582	268	434	569	12	3		2	42		53
8	38	804	502	301	300	12	28	129	43	45	10	26
9	8	3	8	62	5	28	16	182	27	40	300	68
10	6	6	1	48	19	5		49	20	1	12	13
11	108	66	258	58	93	36	78	434	195	285	372	62
12	6		4	57	6	23	33	700	17	17	690	92
13	48	15	58	85	29	43	41	663	57	55	708	112
14	67	224	2	1	304	176	67		62	4		
15	97	146	80	161	137	97	51	508	45	62	426	115
16	121	273			267	30				57		98
17		305	66	60	264		89		281			
18	31	308	5	9	514	22	5	1	30	13	2	58
19	10	60	220	217	291	49	55	46		112	41	229
20	264	171	166	5	105	65	71	684	310	122	762	2
21	9	585	15	14	473	50	11	1	1	16		5
22		131	9	114	49		81	1077	3			
23				115	252	36		455	66	37	242	
24	43	182	68	42	82	11	34	497	39	53	225	49
25	31	256	62				43	554	10	13	296	56
26	57	196	14	22	86	10	23	141	42	15	72	16
27	98	81	48	2	35	16	74	102	8	43	99	68
28	13	36	41		22					25		1
29		35	2	8	22		20	948				
30	4	51			28	11				2	1020	9
31		58	2	9	36		2	967	3			
32		60			44	6		2		1	725	3
33		63		3	49		1	717	1			
34	4	60			48	4				4	1059	6
35		66		7	49		1	1166	3			
36	1	66			53	1				3	152	1
37		63	4	2	53			1421	1			
38	11	52			54					1	536	
39	125	391			122	62				94	519	257
40	98	96			24	41				54	627	25
41	45	805			144	12				42	572	152
42	88	657			310	29				70	430	129
43		237	25	54	162		279	843	196			
44		64	61	38	40		130	1219	18			
45		650	150	29	157		200	1188	47			
46		730	731	48	332		15	656	11			
47	124	89	24	7	106	6	9	285	179	11	11	5

Table B2 Traffic Counts by Movement – 2010 PM Peak Hour

Location Code	Movement											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	228	335			575	63				325		199
2		495	423	228	672		68		205			
3	32	848			869	8	70		45			
4	33	533	81	128	765	21	123	41	65	165	47	224
5		879	275	36	744					1121		175
6	157	833	300	145	726	994	304	484	20	43	45	17
7	6	878	70	70	717	2	21	2	10	472	1	391
8	56	501	82	49	1115	35	6	16	83	671	62	447
9	35	10	35	94		26	112	601	12	12	626	140
10	12	18	1	8	8	8	8	8	7		54	54
11	238	189	388	80	154	97	152	511	143	284	609	70
12	28	7	18	201	5	65	65	902	12	8	870	174
13	75	30	36	102	19	54	64	962	95	77	923	204
14	69	564		2	424	119	245		133		1	1
15	89	160	48	179	230	109	131	646	120	50	526	238
16	215	331			268	32				72		74
17		466	70	73	267		80		267			
18	19	515	16	31	496	7	7		53	4	2	14
19	9	89	265	259	221	73	41	69	2	194	57	420
20	338	310	261	4	150	19	73	840	211	187	652	17
21	3	860	22	7	531	10	39	3	14	23		10
22		227	8	143	192		98	708	10			
23				146	852	115		409	84	114	703	
24	68	255	86	67	195	44	46	448	61	98	705	74
25	88	226	72				20	554	27	18	789	56
26	121	199	15	30	184	35	15	84	39	44	112	106
27	117	65	27		56	33	40	39	48	132	354	29
28	24	39	39	1	32	1				51	2	1
29		38	2	3	32		5	551	2			
30	4	39			34	30				1	1344	21
31		57	3	6	55		4	766	9			
32	3	56	2		60	6		1		1	1121	
33		54	2	4	60		10	708	6			
34	5	59		4	57					7	1315	5
35		55	9	2	58		10	851	3			
36	2	57	6		56		3	5		4	244	
37		60			52			702	4			
38	13	47			50	2				2	1718	
39	129	96			495	279				183	865	133
40	76	28			103	54				193	1052	28
41	43	560			449	64				199	871	112
42	17	91			827	100				495	478	5
43		155	30	116	562		70	450	398			
44		26	51	105	191		78	762	20			
45		519	103	58	590		84	699	125			
46		91	382	172	1150		17	354	56			
47	334	227	35	1	136	23	7	120	125	114	147	20

Table B3 Traffic Forecasts by Movement – 2017 AM Peak Hour

Location Code	Movement											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	325	445			485	55				360		260
2		660	535	215	630		110	40	305			
3	60	1175			875	60	20		10			
4	95	1130	270	335	415	135	30	75	45	45	35	75
5		665	105	50	755					550		190
6	25	335	300	100	700	505	370	710	75	280	35	65
7	10	600	280	450	590	15	5		5	45		55
8	40	830	520	315	310	15	30	135	45	50	15	30
9	10	5	10	65	10	30	20	190	30	45	310	70
10	10	10	5	50	25	10		55	25	5	15	15
11	115	70	265	60	100	40	80	450	200	295	385	65
12	10		5	60	10	25	35	720	20	20	710	95
13	50	20	60	90	30	45	45	680	60	60	730	115
14	70	230	5	5	315	185	70		65	5		
15	100	150	85	170	145	100	55	525	50	65	440	120
16	140	290			285	35				65		105
17		335	80	65	285		95		300			
18	35	345	5	10	550	25	10	5	35	15	5	60
19	15	65	230	240	305	55	60	50	5	135	45	260
20	275	180	175	10	110	70	75	705	320	130	785	5
21	10	605	20	15	490	55	15	5	5	20		10
22		135	10	120	55		85	1105	5			
23				120	260	40		480	70	40	255	
24	45	190	75	45	85	15	40	515	45	55	235	55
25	35	265	65				45	575	15	15	310	60
26	60	205	15	25	90	15	25	150	45	20	75	20
27	105	85	50	5	40	20	80	110	10	45	105	75
28	15	40	45		25					30		5
29		40	5	10	25		25	980				
30	5	60			30	15				5	1055	10
31		65	5	10	40		5	1000	5			
32		70			45	15		5		5	750	5
33		70		5	55		5	740	5			
34	5	70			55	5				5	1095	10
35		80		10	55		5	1205	5			
36	5	80			60	5				5	160	5
37		80	5	5	60			1465	5			
38	15	65			60					5	555	
39	130	405			130	65				100	540	265
40	105	100			25	45				60	645	30
41	50	830			150	15				45	590	160
42	95	680			320	30				75	445	135
43		245	30	60	170		290	870	205			
44		70	65	40	45		135	1260	20			
45		670	160	30	165		210	1225	50			
46		755	755	50	345		20	680	15			
47	130	95	25	10	110	10	10	295	185	15	15	10

Table B4 Traffic Forecasts by Movement – 2017 PM Peak Hour

Location Code	Movement											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	235	350			595	65				335		205
2		510	440	235	695		75		215			
3	35	875			900	10	75		50			
4	35	545	85	135	790	25	130	45	70	170	50	235
5		910	285	40	770					1155		185
6	165	860	310	150	750	1025	315	500	25	45	50	20
7	10	905	75	75	740	5	25	5	15	490	5	405
8	60	515	85	55	1150	40	10	20	90	695	65	465
9	40	15	40	100		30	115	620	15	15	645	145
10	15	25	5	10	10	10	10	10	10		60	60
11	245	195	400	85	160	100	160	525	150	295	625	75
12	30	10	20	210	10	70	70	925	15	10	895	180
13	80	35	40	105	20	60	70	985	100	80	945	210
14	75	580		5	435	125	255		140		5	5
15	95	165	50	185	240	115	135	665	125	55	540	245
16	240	345			290	35				95		80
17		500	90	80	305		85		294			
18	20	560	20	34	555	10	10	5	60	5	5	15
19	15	100	285	305	235	80	45	75	5	220	65	455
20	350	320	270	5	155	20	75	865	220	195	670	20
21	5	885	25	10	545	15	40	5	15	25		15
22		235	10	150	200		105	730	15			
23				155	880	120		425	90	120	730	
24	75	265	90	70	205	50	50	465	65	105	725	80
25	95	235	75				25	570	30	20	815	60
26	125	205	20	35	190	40	20	90	45	50	120	110
27	125	70	30		60	35	45	45	50	140	365	30
28	25	45	45	5	35	5				55	5	5
29		45	5	5	40		10	570	5			
30	5	50			40	35				5	1385	25
31		70	5	10	65		5	790	10			
32	5	65	5		65	10		5		10	1155	
33		60	5	5	65		15	730	10			
34	10	65		5	60					10	1355	10
35		60	15	5	60		15	880	5			
36	5	60	10		60		5	10		5	255	
37		65			55			725	5			
38	15	50			50	5				5	1770	
39	135	100			510	290				190	890	140
40	80	35			110	60				200	1085	30
41	45	580			465	70				205	900	120
42	20	95			855	105				510	495	10
43		160	35	120	580		75	465	410			
44		30	55	110	200		85	785	25			
45		535	115	60	610		90	720	130			
46		95	395	180	1185		20	365	60			
47	345	235	40	5	145	25	10	125	130	120	155	25

Table B5 Traffic Forecasts by Movement – 2030 AM Peak Hour

Location Code	Movement											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	350	490			520	60				400		280
2		720	580	230	690		120	50	340			
3	70	1280			960	70	20		20			
4	100	1230	300	370	460	150	40	80	50	50	40	80
5		720	120	60	820					600		210
6	30	370	330	110	760	550	400	780	90	310	40	70
7	10	660	310	500	640	20	10		10	50		60
8	50	910	570	340	340	20	40	150	50	60	20	30
9	10	10	10	70	10	40	20	210	40	50	330	80
10	10	10	10	60	30	10		60	30	10	20	20
11	120	80	290	70	110	40	90	480	220	320	410	70
12	10		10	70	10	30	40	780	20	20	760	110
13	60	20	70	100	40	50	50	740	70	70	780	130
14	80	250	10	10	340	200	80		70	10		
15	110	170	90	180	160	110	60	560	50	70	470	130
16	180	340			325	35				85		110
17		415	105	70	340		105		340			
18	35	450	5	10	640	30	10	5	35	15	5	60
19	15	90	255	290	345	55	65	55	5	200	55	335
20	300	190	190	10	120	80	80	760	350	140	840	10
21	10	650	20	20	530	60	20	10	10	20		10
22		150	10	130	60		90	1190	10			
23				130	290	50		520	80	50	280	
24	50	210	80	50	100	20	40	560	50	60	260	60
25	40	290	70				50	620	20	20	340	70
26	70	220	20	30	100	20	30	160	50	20	90	20
27	110	100	60	10	40	20	90	120	10	50	120	80
28	20	40	60		40					30		10
29		40	10	10	40		30	1070				
30	10	60			40	20				10	1150	20
31		70	10	20	50		10	1090	10			
32		80			60	20		10		10	820	10
33		90		10	65		10	810	15			
34	20	80			60	10				10	1190	10
35		90		10	60		10	1310	10			
36	10	90			60	10				10	180	20
37		100	10	20	60			1600	10			
38	30	70			70					10	610	
39	140	450			140	70				110	600	290
40	110	115			30	50				70	710	30
41	60	910			170	20				50	640	180
42	100	740			360	40				80	490	150
43		270	30	70	180		320	950	220			
44		75	70	50	50		150	1370	30			
45		740	170	40	180		230	1340	60			
46		820	820	60	380		20	750	20			
47	140	100	30	10	120	10	20	320	210	20	20	10

Table B6 Traffic Forecasts by Movement – 2030 PM Peak Hour

Location Code	Movement											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	260	380			650	80				370		230
2		560	480	260	760		80		230			
3	40	960			980	10	80		60			
4	40	600	100	150	860	30	140	50	80	190	60	260
5		1000	310	50	850					1260		200
6	180	940	340	170	820	1120	350	550	30	50	60	20
7	10	990	80	80	810	10	30	10	20	530	10	440
8	70	560	100	60	1260	40	10	20	100	760	70	510
9	40	20	40	110		30	130	670	20	20	690	160
10	20	30	10	15	15	10	10	10	10		60	60
11	270	210	430	90	170	110	170	580	160	320	680	80
12	40	10	20	230	10	80	80	1000	20	10	960	200
13	90	40	40	120	30	60	80	1060	110	90	1020	230
14	80	630		10	470	140	270		150		10	10
15	100	180	60	200	260	120	150	720	140	60	580	270
16	305	395			335	40				150		80
17		600	110	85	400		100		364			
18	20	680	20	34	715	15	10	5	65	5	5	20
19	15	120	340	430	270	85	45	90	5	280	70	555
20	380	350	290	10	170	30	90	930	240	210	720	20
21	10	950	30	10	590	20	50	10	20	30		20
22		250	10	160	220		110	780	20			
23				170	960	130		470	100	130	790	
24	80	290	100	80	220	50	60	510	70	110	790	90
25	100	260	90				30	620	40	30	890	70
26	140	230	20	40	210	40	20	100	50	50	130	120
27	140	80	40		70	40	50	50	60	150	400	40
28	30	50	50	10	40	10				60	10	10
29		50	10	10	50		10	620	10			
30	10	50			50	40				10	1510	30
31		70	10	10	70		20	860	20			
32	10	70	10		70	10		10		10	1260	10
33		70	10	10	70		20	800	10			
34	10	80		10	70					10	1480	10
35		70	20	10	70		20	960	10			
36	10	70	10		70		10	10		10	280	
37		80			60			790	10			
38	20	60			50	20				10	1930	
39	150	110			560	320				210	970	150
40	90	40			120	70				220	1180	40
41	50	640			510	80				230	980	130
42	20	110			930	120				560	540	10
43		180	40	130	640		80	510	450			
44		40	60	120	220		90	860	30			
45		590	120	70	670		100	790	140			
46		110	430	200	1290		20	400	70			
47	380	260	40	10	160	30	10	140	140	130	170	30

Attachment C

(LOS Tables by Approach)

Table C1 Approach Level of Service – AM Peak Hour

Alternative			2010 Peak Hour Existing Condition		2017 Peak Hour No Build		2017 Peak Hour Build LRT		2030 Peak Hour No Build		2030 Peak Hour Build LRT	
			LOS		LOS		LOS		LOS		LOS	
Location Code	Intersection	Appr	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters
Major Segment 3 (LRT 3A, 3C, & 3C Sub Alternatives)												
1	TH 5 North Ramp & Mitchell Rd	NB	A		A		B		A		B	
		WB	C	B	C	B	C	C	C	B	C	C
		SB	B		B		C		B		B	
		EB										
2	TH 5 South Ramp & Mitchell Rd	NB	A		A		B		A		B	
		WB		B		B		B		B		B
		SB	B		B		B		B		B	
		EB	C		C		C		C		C	
3	Lone Oak Rd & Mitchell Rd	NB	A		A		A		A		A	
		WB		A		A		A		A		A
		SB	A		A		A		A		A	
		EB	D		D		D		D		D	
4	Technology Drive & Mitchell Rd	NB	B		C		C		C		C	
		WB	D	C	C	C	D	C	C	C	D	C
		SB	C		B		B		B		B	
		EB	D		D		D		D		D	
5	Bryant Lake Dr & Valley View Road	NB	B		B		C		B		D	
		WB	C	C	D	D	F	F	D	E	F	F
		SB	B		E		F		F		D	
		EB										
6	Flying Cloud Dr & Valley View Road	NB	C		D		C		D		D	
		WB	F	D	E	D	F	F	F	E	F	F
		SB	D		E		E		E		E	
		EB	D		D		F		E		F	
7	Praire Center Dr & Valley View Road (East Jct)	NB	A		C		C		C		C	
		WB	A	B	C	C	B	B	C	C	D	C
		SB	B		B		B		C		C	
		EB	E		D		C		E		F	
8	Viking Dr & Prairie Center Dr	NB	B		D		B		D		C	
		WB	D	C	D	D	C	C	D	D	E	C
		SB	C		C		B		C		D	
		EB	D		D		D		D		E	
Major Segment 4 (All Alternatives)												
9	CSAH 3 & 17th Ave	NB			C		C		C		C	
		WB		N/A	A	A	A	A	A	A	A	A
		SB			C		B		B		B	
		EB			A		A		A		A	
10	5th Street & 16th Ave	NB			A		A		A		A	
		WB		N/A	A	A	A	A	A	A	A	A
		SB			A		A		A		A	
		EB			A		A		A		A	
11	CSAH 3 & 11th Ave	NB	B		B		B		B		B	
		WB	B	B	B	B	C	B	C	B	C	B
		SB	C		C		C		C		C	
		EB	B		B		B		B		B	
12	CSAH 3 & 8th Ave	NB	C		C		D		C		D	
		WB	A	A	A	A	A	B	A	A	A	B
		SB	C		C		D		C		D	
		EB	A		A		B		A		B	
13	CSAH 3 & 5th Ave	NB	B		C		C		C		C	
		WB	B	B	B	B	B	C	B	B	B	C
		SB	C		C		D		C		D	
		EB	B		B		B		B		B	
14	2nd Street & Blake Rd. N.	NB	B		B		A		B		A	
		WB	D	B	D	B	C	A	D	B	C	A
		SB	A		A		A		A		A	
		EB	B		C		B		C		B	
15	Blake Rd. N. & CSAH 3	NB	B		C		C		C		C	
		WB	B	C	C	C	B	C	C	C	B	C
		SB	D		C		C		C		C	
		EB	C		C		B		C		B	
16	TH 7 WB On-Ramp & Woodale Ave.	NB	A		A		A		A		A	
		WB	B	A	B	A	B	A	C	A	C	B
		SB	A		A		A		A		B	
		EB										
17	TH 7 EB Off-Ramp & Woodale Ave.	NB	A		A		B		A		B	
		WB		A		B		B		B		B
		SB	A		B		B		B		B	
		EB	B		B		B		B		B	

Table C1 Approach Level of Service – AM Peak Hour

Alternative			2010 Peak Hour Existing Condition		2017 Peak Hour No Build		2017 Peak Hour Build LRT		2030 Peak Hour No Build		2030 Peak Hour Build LRT	
			LOS		LOS		LOS		LOS		LOS	
Location Code	Intersection	Appr	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters
Major Segment 4 (All Alternatives) (Continued)												
18	TH 7 Frontage Rd & Woodale Ave.	NB	A	A	A	A	A	A	A	A	A	A
		WB	A		A		A		B		D	
		SB	A		A		A		A		A	
		EB	A		B		B		B		D	
19	36th St & Woodale Ave.	NB	A	C	B	B	B	B	B	B	B	C
		WB	A		B		B		B		B	
		SB	C		C		B		C		C	
		EB	C		C		C		C		D	
20	CSAH 25 & Belt Line Blvd	NB	D	C	B	C	C	C	C	C	C	C
		WB	D		C		C		C		C	
		SB	D		C		C		C		C	
		EB	C		C		C		C		C	
21	CSAH 25 S. Frontage Rd & Belt Line Blvd	NB	A	A	A	A	A	A	A	A	A	A
		WB	E		B		C		C		C	
		SB	A		A		A		A		A	
		EB	F		C		C		C		C	
Major Segment C (LRT 3C & 3C Sub Alternatives)												
22	28th St & Nicollet Ave	NB	B	B	B	B	B	B	C	B	C	B
		WB										
		SB	B		B		B		B		B	
		EB	B		B		B		B		B	
23	Blaisdell Ave & Franklin Ave	NB		B		B		B		B		B
		WB	A		A		A		A		A	
		SB	C		C		C		C		C	
		EB	A		A		A		A		A	
24	Nicollet Ave & Franklin Ave	NB	C	B	C	B	C	B	C	B	C	B
		WB	A		A		A		A		A	
		SB	C		C		C		C		C	
		EB	A		A		A		A		A	
25	1st Ave & Franklin Ave	NB	C	B	C	B	C	B	C	B	C	B
		WB	A		A		A		A		A	
		SB										
		EB	A		A		A		A		A	
Sub Alternatives Blaisdell Ave (No-Build Same as Nicollet Ave Center-Running Alignment)												
23	Blaisdell Ave & Franklin Ave	NB						B			A	B
		WB					A				A	
		SB					C				C	
		EB					A				A	
24	Nicollet Ave & Franklin Ave	NB					B	B			B	C
		WB					C				C	
		SB					B				C	
		EB					C				C	
25	1st Ave & Franklin Ave	NB					C	B			C	B
		WB					A				A	
		SB									A	
		EB					A				B	
Major Segment C (LRT 3C Alternatives) (Continued)												
26	W 15th St & Nicollet Ave S	NB	B	B	C	B	C	B	C	B	C	B
		WB	B		B		B		B		B	
		SB	B		B		B		B		B	
		EB	B		C		C		C		C	
27	W Grant St & Nicollet Ave S	NB	B	B	B	B	B	B	B	B	B	B
		WB	B		B		B		B		B	
		SB	B		B		B		B		B	
		EB	B		B		B		B		B	

Table C1 Approach Level of Service – AM Peak Hour

Alternative			2010 Peak Hour		2017 Peak Hour		2017 Peak Hour		2030 Peak Hour		2030 Peak Hour	
			Existing Condition		No Build		Build LRT		No Build		Build LRT	
Location Code	Intersection	Appr	LOS		LOS		LOS		LOS		LOS	
			by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters
Major Segment C (LRT 3C Alternatives) (Continued)												
Sub Alternatives Nicollet Mall												
28	13th St S & Nicollet Ave S	NB	A	A	A	A	A	A	A	A	A	A
		WB	C		C		C		C		C	
		SB	A		A		A		A		A	
		EB										
29	12th St S & Nicollet Ave S	NB	B	B	B	B	B	B	A	B	A	B
		WB										
		SB	A		A		A		B		B	
		EB	B		B		B		B		B	
30	11th St S & Nicollet Ave S	NB	B	B	B	B	B	B	B	B	B	B
		WB	B		B		B		B		B	
		SB	C		B		B		B		B	
		EB										
31	S 10th St & Nicollet Ave S	NB	B	B	B	B	B	B	B	B	B	B
		WB										
		SB	B		B		B		B		B	
		EB	B		B		B		B		B	
32	S 9th St & Nicollet Ave S	NB	B	B	B	B	B	B	B	B	B	B
		WB	B		A		A		B		B	
		SB	C		C		C		C		C	
		EB										
33	S 8th St & Nicollet Ave S	NB	B	B	B	B	B	B	B	B	B	B
		WB										
		SB	A		A		A		B		B	
		EB	B		B		B		B		B	
34	S 7th St & Nicollet Ave S	NB	C	B	C	B	C	B	C	B	C	B
		WB	B		B		B		B		B	
		SB	C		B		B		B		B	
		EB										
35	S 6th St & Nicollet Ave S	NB	B	B	B	B	B	B	B	B	B	B
		WB										
		SB	C		C		C		C		C	
		EB	B		B		B		B		B	
36	S 5th St & Nicollet Ave S	NB	B	B	B	B	B	B	B	B	B	B
		WB	B		B		B		B		B	
		SB	A		A		A		B		B	
		EB										
37	S 4th St & Nicollet Ave S	NB	B	B	B	B	B	B	B	B	B	B
		WB										
		SB	A		A		A		B		B	
		EB	B		B		B		B		B	
38	S 3rd St & Nicollet Ave S	NB	B	B	B	B	B	B	B	B	B	B
		WB	B		B		B		B		B	
		SB	B		B		B		C		C	
		EB										
Sub Alternative 11th and 12th Street												
30	11th St S & Nicollet Ave S	NB	B	B	B	B	C	B	B	B	C	B
		WB	B		B		B		B		B	
		SB	B		C		C		B		C	
		EB										
39	11th St S & LaSalle Ave	NB	A	B	B	B	B	B	B	B	B	B
		WB	A		B		C		A		B	
		SB	C		C		C		C		C	
		EB										
40	11th St S & Harmon Pl	NB	B	B	B	B	B	B	B	B	B	B
		WB	A		A		A		A		A	
		SB	B		B		B		B		B	
		EB										
41	11th St N & Hennepin Ave	NB	A	B	A	B	B	B	A	B	B	B
		WB	B		B		B		C		B	
		SB	B		B		B		B		B	
		EB										
42	11th St N & Hawthorne Ave	NB	B	B	B	B	B	B	B	C	B	B
		WB	B		B		B		C		B	
		SB	B		B		B		B		B	
		EB										

Table C1 Approach Level of Service – AM Peak Hour

Alternative			2010 Peak Hour Existing Condition		2017 Peak Hour No Build		2017 Peak Hour Build LRT		2030 Peak Hour No Build		2030 Peak Hour Build LRT	
			LOS		LOS		LOS		LOS		LOS	
Location Code	Intersection	Appr	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters
Major Segment C (LRT 3C Alternatives) (Continued)												
Sub Alternative 11th and 12th Street (Continued)												
29	12th St S & Nicollet Ave S	NB	B	B	B	B	B	C	B	B	B	C
		WB										
		SB	A		A		D		A		C	
		EB	B		B		C		B		C	
43	12th St S & LaSalle Ave	NB	B	C	B	C	C	C	B	C	C	C
		WB										
		SB	B		B		C		B		C	
		EB	C		C		B		C		C	
44	12th St S & Harmon Pl	NB	B	B	B	B	B	B	B	B	B	B
		WB										
		SB	B		B		C		B		B	
		EB	B		B		B		B		B	
45	12th St N & Hennepin Ave	NB	B	B	B	B	C	B	B	B	C	B
		WB										
		SB	B		B		B		B		B	
		EB	B		B		B		B		B	
46	12th St N & Hawthorne Ave	NB	C	C	C	C	C	C	D	D	E	D
		WB										
		SB	A		A		A		B		B	
		EB	C		C		C		C		C	
47	Glenwood Ave & Royalston Ave N	NB	A	A	A	A	B	B	B	A	B	B
		WB	A		A		A		A		B	
		SB	A		A		B		A		B	
		EB	A		A		B		A		B	

Table C2 Approach Level of Service – PM Peak Hour

Alternative			2010 Peak Hour Existing Condition LOS		2017 Peak Hour No Build LOS		2017 Peak Hour Build LRT LOS		2030 Peak Hour No Build LOS		2030 Peak Hour Build LRT LOS	
Location Code	Intersection	Appr	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters
Major Segment 3 (LRT 3A, 3C, & 3C Sub Alternatives)												
1	TH 5 North Ramp & Mitchell Rd	NB	C		B		B		B		B	
		WB	C	C	C	B	C	B	C	B	C	B
		SB	C		B		B		B		B	
		EB										
2	TH 5 South Ramp & Mitchell Rd	NB	A		A		A		A		A	
		WB		B		B		B		B		B
		SB	B		B		B		B		B	
		EB	C		B		C		B		C	
3	Lone Oak Rd & Mitchell Rd	NB	A		A		A		A		A	
		WB		A		A		A		A		A
		SB	A		A		A		A		A	
		EB	D		C		C		C		C	
4	Technology Drive & Mitchell Rd	NB	B		B		B		B		B	
		WB	C	C	C	B	C	C	C	C	C	C
		SB	B		B		B		B		B	
		EB	D		D		D		D		D	
5	Bryant Lake Dr & Valley View Road	NB	D		C		C		C		C	
		WB	D	D	E	D	E	D	F	D	F	E
		SB	C		C		B		C		B	
		EB										
6	Flying Cloud Dr & Valley View Road	NB	D		D		E		C		E	
		WB	E	D	D	C	D	D	E	D	D	E
		SB	C		B		C		B		C	
		EB	D		E		F		F		F	
7	Praire Center Dr & Valley View Road (East Jct)	NB	D		E		F		F		F	
		WB	F	E	C	D	C	E	C	D	D	F
		SB	A		A		C		B		C	
		EB	C		D		F		F		F	
8	Viking Dr & Prairie Center Dr	NB	B		C		F		D		F	
		WB	F	D	F	D	F	E	F	D	F	F
		SB	B		C		B		C		B	
		EB	C		C		B		C		B	
Major Segment 4 (All Alternatives)												
9	CSAH 3 & 17th Ave	NB			C		C		C		C	
		WB		N/A	A	A	A	A	B	B	B	B
		SB			C		B		C		C	
		EB			A		A		A		A	
10	5th Street & 16th Ave	NB			A		A		A		A	
		WB		N/A	A	A	A	A	A	A	A	A
		SB			A		A		A		A	
		EB			A		A		A		A	
11	CSAH 3 & 11th Ave	NB	B		B		C		B		C	
		WB	B	C	B	C	C	C	B	C	C	C
		SB	C		C		C		C		C	
		EB	C		C		C		C		C	
12	CSAH 3 & 8th Ave	NB	C		C		D		C		D	
		WB	A	B	A	B	B	C	A	B	C	C
		SB	C		C		D		C		D	
		EB	A		A		B		A		C	
13	CSAH 3 & 5th Ave	NB	C		C		C		C		D	
		WB	B	B	B	B	C	C	B	C	C	C
		SB	C		C		D		C		D	
		EB	B		B		C		C		C	
14	2nd Street & Blake Rd. N.	NB	B		B		A		B		A	
		WB	B	B	B	B	B	B	B	B	B	B
		SB	A		A		A		B		A	
		EB	C		C		B		C		B	
15	Blake Rd. N. & CSAH 3	NB	C		C		C		C		C	
		WB	B	C	C	C	B	C	C	C	B	C
		SB	D		B		C		B		C	
		EB	C		C		B		C		C	
16	TH 7 WB On-Ramp & Woodale Ave.	NB	A		A		A		A		A	
		WB	B	A	C	A	D	B	D	B	C	B
		SB	A		A		A		B		B	
		EB										
17	TH 7 EB Off-Ramp & Woodale Ave.	NB	A		A		B		A		B	
		WB		A		B		B		B		B
		SB	A		B		B		B		C	
		EB	B		B		B		B		C	

Table C2 Approach Level of Service – PM Peak Hour

Alternative			2010 Peak Hour		2017 Peak Hour		2017 Peak Hour		2030 Peak Hour		2030 Peak Hour	
			Existing Condition		No Build		Build LRT		No Build		Build LRT	
			LOS		LOS		LOS		LOS		LOS	
Location Code	Intersection	Appr	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters
Major Segment 4 (All Alternatives) (Continued)												
18	TH 7 Frontage Rd & Woodale Ave.	NB	A	A	A	A	A	A	A	A	A	A
		WB	B		C		B		C		E	
		SB	A		A		A		A		A	
		EB	A		B		C		C		D	
19	36th St & Woodale Ave.	NB	A	B	B	B	B	B	B	C	C	C
		WB	A		B		B		B		C	
		SB	C		C		B		C		C	
		EB	C		D		D		D		D	
20	CSAH 25 & Belt Line Blvd	NB	C	D	C	D	C	D	C	D	D	D
		WB	E		D		C		C		C	
		SB	C		C		C		D		E	
		EB	D		E		E		D		D	
21	CSAH 25 S. Frontage Rd & Belt Line Blvd	NB	A	A	A	B	A	B	C	E	D	F
		WB	D		F		F		F		F	
		SB	A		A		A		A		A	
		EB	E		F		F		F		F	
Major Segment C (LRT 3C & 3C Sub Alternatives)												
22	28th St & Nicollet Ave	NB	B	B	B	B	B	B	B	B	B	B
		WB										
		SB	B		B		B		B		B	
		EB	B		B		B		B		B	
23	Blaisdell Ave & Franklin Ave	NB		B		B		B		B		B
		WB	B		B		B		B		B	
		SB	C		C		C		C		C	
		EB	B		B		B		B		B	
24	Nicollet Ave & Franklin Ave	NB	C	B	C	B	D	C	C	C	D	D
		WB	B		B		C		C		D	
		SB	C		C		C		C		D	
		EB	B		B		C		C		C	
25	1st Ave & Franklin Ave	NB	C	B	C	B	C	B	C	C	C	C
		WB	A		B		B		C		D	
		SB										
		EB	A		A		A		B		B	
Sub Alternatives Blaisdell Ave (No-Build Same as Nicollet Ave Center-Running Alignment)												
23	Blaisdell Ave & Franklin Ave	NB						B			A	C
		WB					B				C	
		SB					B				C	
		EB					B				B	
24	Nicollet Ave & Franklin Ave	NB					C	D			C	D
		WB					D				E	
		SB					E				F	
		EB					D				D	
25	1st Ave & Franklin Ave	NB					C	D			E	E
		WB					E				F	
		SB									A	
		EB					B				B	
Major Segment C (LRT 3C Alternatives) (Continued)												
26	W 15th St & Nicollet Ave S	NB	C	C	C	C	C	C	C	C	C	C
		WB	B		B		B		B		B	
		SB	B		B		B		B		B	
		EB	C		C		C		C		C	
27	W Grant St & Nicollet Ave S	NB	A	B	B	B	B	B	B	B	B	B
		WB	B		B		B		B		B	
		SB	B		B		B		B		B	
		EB	B		B		B		B		B	

Table C2 Approach Level of Service – PM Peak Hour

Alternative			2010 Peak Hour Existing Condition		2017 Peak Hour No Build		2017 Peak Hour Build LRT		2030 Peak Hour No Build		2030 Peak Hour Build LRT	
			LOS		LOS		LOS		LOS		LOS	
Location Code	Intersection	Appr	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters
Major Segment C (LRT 3C Alternatives) (Continued)												
Sub Alternatives Nicollet Mall												
28	13th St S & Nicollet Ave S	NB	A	B	A	B	A	B	A	B	A	B
		WB	C		C		C		C		C	
		SB	A		A		A		A		A	
		EB										
29	12th St S & Nicollet Ave S	NB	B	B	B	B	B	B	B	B	B	B
		WB										
		SB	A		B		B		B		B	
		EB	B		B		B		B		B	
30	11th St S & Nicollet Ave S	NB	A	B	B	B	B	B	B	B	B	B
		WB	B		B		B		B		B	
		SB	B		B		B		B		B	
		EB										
31	S 10th St & Nicollet Ave S	NB	B	B	B	B	B	B	B	B	B	B
		WB										
		SB	A		B		B		B		B	
		EB	B		B		B		B		B	
32	S 9th St & Nicollet Ave S	NB	B	B	B	B	B	B	B	B	B	B
		WB	B		B		B		B		B	
		SB	C		C		C		C		C	
		EB										
33	S 8th St & Nicollet Ave S	NB	A	B	A	B	A	B	B	B	B	B
		WB										
		SB	B		B		B		A		A	
		EB	B		B		B		B		B	
34	S 7th St & Nicollet Ave S	NB	C	B	C	B	C	B	B	B	B	B
		WB	B		B		B		B		B	
		SB	B		B		B		B		B	
		EB										
35	S 6th St & Nicollet Ave S	NB	B	B	B	B	B	B	B	B	B	B
		WB										
		SB	B		C		C		C		C	
		EB	B		B		B		B		B	
36	S 5th St & Nicollet Ave S	NB	B	B	B	B	B	B	B	B	B	B
		WB	B		B		B		B		B	
		SB	A		A		A		A		A	
		EB										
37	S 4th St & Nicollet Ave S	NB	B	B	B	B	B	B	B	B	B	B
		WB										
		SB	A		A		A		B		B	
		EB	B		B		B		B		B	
38	S 3rd St & Nicollet Ave S	NB	B	B	B	B	B	B	B	B	B	B
		WB	B		B		B		B		B	
		SB	B		B		B		B		B	
		EB										
Sub Alternative 11th and 12th Street												
30	11th St S & Nicollet Ave S	NB	B	B	B	B	C	B	B	B	C	D
		WB	B		B		B		B		D	
		SB	B		B		B		B		C	
		EB										
39	11th St S & LaSalle Ave	NB	B	C	B	C	C	C	B	C	D	D
		WB	A		B		C		B		C	
		SB	D		D		D		D		E	
		EB										
40	11th St S & Harmon Pl	NB	B	B	C	B	C	B	B	B	C	B
		WB	A		A		B		A		B	
		SB	B		B		B		B		B	
		EB										
41	11th St N & Hennepin Ave	NB	B	B	A	B	A	B	B	B	B	B
		WB	B		B		B		B		B	
		SB	B		B		C		B		C	
		EB										
42	11th St N & Hawthorne Ave	NB	B	B	B	B	C	C	B	B	C	C
		WB	B		B		B		B		B	
		SB	B		B		C		C		C	
		EB										

Table C2 Approach Level of Service – PM Peak Hour

Alternative			2010 Peak Hour Existing Condition		2017 Peak Hour No Build		2017 Peak Hour Build LRT		2030 Peak Hour No Build		2030 Peak Hour Build LRT	
			LOS		LOS		LOS		LOS		LOS	
Location Code	Intersection	Appr	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters	by Appr	by Inters
Major Segment C (LRT 3C Alternatives) (Continued)												
Sub Alternative 11th and 12th Street (Continued)												
29	12th St S & Nicollet Ave S	NB	B	B	B	B	B	B	B	B	B	B
		WB										
		SB	A		A		D		A		D	
		EB	B		B		B		B		B	
43	12th St S & LaSalle Ave	NB	B	B	B	B	B	B	B	C	B	C
		WB										
		SB	A		A		A		A		A	
		EB	C		C		C		C		D	
44	12th St S & Harmon Pl	NB	A	B	A	B	B	B	A	B	B	B
		WB										
		SB	B		B		B		B		B	
		EB	B		B		B		B		B	
45	12th St N & Hennepin Ave	NB	B	B	B	B	B	B	B	B	B	B
		WB										
		SB	A		A		B		A		B	
		EB	B		B		B		B		B	
46	12th St N & Hawthorne Ave	NB	A	B	A	B	A	B	A	B	A	B
		WB										
		SB	B		B		B		B		B	
		EB	C		C		C		C		C	
47	Glenwood Ave & Royalston Ave N	NB	B	B	B	B	B	B	B	B	C	C
		WB	B		B		C		B		C	
		SB	A		A		B		A		B	
		EB	A		A		B		B		B	

Attachment D

(Queue Tables)

Table D1 Vehicle Queue by Turn Lane – AM Peak Hour

Alternative			2010 Peak Hour Existing Condition		2017 Peak Hour No Build		2017 Peak Hour Build LRT		2030 Peak Hour No Build		2030 Peak Hour Build LRT	
Location Code	Intersection	Appr	Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)	
			LT	RT	LT	RT	LT	RT	LT	RT	LT	RT
Major Segment 3 (LRT 3A, 3C, & 3C Sub Alternatives)												
1	TH 5 North Ramp & Mitchell Rd	NB	184		221		286		200		284	
		WB	185	118	198	122	200	112	206	143	211	118
		SB		22		68		37		56		25
		EB										
2	TH 5 South Ramp & Mitchell Rd	NB	164		129		172		149		176	
		WB	89	149		170		232		190		252
		SB		160		78		208		74		195
		EB										
3	Lone Oak Rd & Mitchell Rd	NB	33		39		29		48		19	
		WB	43	68		82		91		98		96
		SB										
		EB										
4	Technology Drive & Mitchell Rd	NB	95		72		77		94		74	
		WB	66	109	71	116	57	117	78	112	54	122
		SB		129		129		129		129		129
		EB										
5	Bryant Lake Dr & Valley View Road	NB										
		WB	354	189	394	121	739	695	525	226	1041	1050
		SB	123		274		275		275		274	
		EB										
6	Flying Cloud Dr & Valley View Road	NB										
		WB	415	358	427	387	737	861	551	599	701	792
		SB	680		469		350		47		350	
		EB										
7	Praire Center Dr & Valley View Road (East Jct)	NB										
		WB	36	26	69	66	61	57	102	74	113	66
		SB	250		530		250		586		250	
		EB										
8	Viking Dr & Prairie Center Dr	NB										
		WB	204	117	222	80	168	119	241	40	297	200
		SB	102		11		106		11		476	
		EB										
Major Segment 4 (All Alternatives)												
9	CSAH 3 & 17th Ave	NB			36		46		37		41	
		WB			39		52		47		52	
		SB			91		108		104		82	
		EB			38	35	43	30	29	31	34	35
10	5th Street & 16th Ave	NB										
		WB										
		SB										
		EB			11		5		4	54	28	
11	CSAH 3 & 11th Ave	NB	131	55	168	66	180	121	169	111	190	118
		WB	152		169	11	158	11	183		197	11
		SB	105		91		101	10	87		95	
		EB	115	49	133	11	112	33	129	49	134	33
12	CSAH 3 & 8th Ave	NB	36	43	16		33		44	54	37	
		WB	73		72	36	113	45	76		101	40
		SB										
		EB	46	23	47	17	61	44	61	29	82	48
13	CSAH 3 & 5th Ave	NB	154		94		105		147		128	
		WB	197		198	124	296	150	216		286	183
		SB										
		EB	91	169	101	209	94	128	100	194	97	134
14	2nd Street & Blake Rd. N.	NB	128		114		102		114		98	
		WB										
		SB	11		28	8	32		41	11	37	
		EB	45		54		48		63		54	
15	Blake Rd. N. & CSAH 3	NB	238		235		188		243		221	
		WB										
		SB	141		154	137	159		162	153	142	
		EB	52		53		61		61		61	
16	TH 7 WB On-Ramp & Woodale Ave.	NB	99		104		97		124		117	
		WB		68		71		54		65		63
		SB										
		EB										
17	TH 7 EB Off-Ramp & Woodale Ave.	NB	83		112		108		116		120	
		WB		136		118		150		140		204
		SB										
		EB										

Queues greater than 300 feet highlighted in red.

Table D1 Vehicle Queue by Turn Lane – AM Peak Hour

Alternative			2010 Peak Hour		2017 Peak Hour		2017 Peak Hour		2030 Peak Hour		2030 Peak Hour	
			Existing Condition		No Build		Build LRT		No Build		Build LRT	
Location Code	Intersection	Appr	Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)	
			LT	RT	LT	RT	LT	RT	LT	RT	LT	RT
Major Segment 4 (All Alternatives) (Continued)												
18	TH 7 Frontage Rd & Woodale Ave.	NB	38		42		42		42		64	
		WB		60		38		43		59		62
		SB										
		EB										
19	36th St & Woodale Ave.	NB	85		145		140		183		200	
		WB		30		32		27		48		47
		SB										
		EB										
20	CSAH 25 & Belt Line Blvd	NB	179	129	179	127	179	157	179	109	179	181
		WB	264		170		139		202		174	
		SB	46	110	46	60	29	61	50	78	41	69
		EB	147		137		120		152		121	80
21	CSAH 25 S. Frontage Rd & Belt Line Blvd	NB	71		19		30		41			
		WB	342		88		238		145		10	
		SB										
		EB	52		40		52		53		56	198
Major Segment C (LRT 3C & 3C Sub Alternatives)												
22	28th St & Nicollet Ave	NB										
		WB										
		SB	110		104		104		143		143	
		EB										
23	Blaisdell Ave & Franklin Ave	NB										
		WB										
		SB	129	113	129	127	129	127	129	125	129	128
		EB										
24	Nicollet Ave & Franklin Ave	NB										
		WB										
		SB	95	131	95	142	339		82	179	390	
		EB										
25	1st Ave & Franklin Ave	NB										
		WB										
		SB	367									
		EB										
Sub Alternatives Blaisdell Ave (No-Build Same as Nicollet Ave Center-Running Alignment)												
23	Blaisdell Ave & Franklin Ave	NB										
		WB										
		SB					129	127			129	127
		EB										
24	Nicollet Ave & Franklin Ave	NB										
		WB										
		SB					66				69	
		EB										
25	1st Ave & Franklin Ave	NB										
		WB										
		SB									412	
		EB										
Major Segment C (LRT 3C Alternatives) (Continued)												
26	W 15th St & Nicollet Ave S	NB	69		69		69		69		69	
		WB	47		64		64		46		46	
		SB	49		48		48		57		57	
		EB										
27	W Grant St & Nicollet Ave S	NB	70		66		66		74		74	
		WB	77		87		87		86		86	
		SB	124		124		124		161		161	
		EB										

Queues greater than 300 feet highlighted in red.

Table D1 Vehicle Queue by Turn Lane – AM Peak Hour

Alternative			2010 Peak Hour Existing Condition		2017 Peak Hour No Build		2017 Peak Hour Build LRT		2030 Peak Hour No Build		2030 Peak Hour Build LRT	
Location Code	Intersection	Appr	Max Queue (ft) LT	Max Queue (ft) RT	Max Queue (ft) LT	Max Queue (ft) RT	Max Queue (ft) LT	Max Queue (ft) RT	Max Queue (ft) LT	Max Queue (ft) RT	Max Queue (ft) LT	Max Queue (ft) RT
Major Segment C (LRT 3C Alternatives) (Continued)												
Sub Alternatives Nicollet Mall												
28	13th St S & Nicollet Ave S	NB										
		WB	109		112		112		121		121	
		SB										
		EB										
29	12th St S & Nicollet Ave S	NB	56		56		56		65		65	
		WB	188									
		SB										
		EB										
30	11th St S & Nicollet Ave S	NB	60		61		61		78		78	
		WB	179		191		191		230		230	
		SB										
		EB										
31	S 10th St & Nicollet Ave S	NB	68		74		74		78		78	
		WB	171									
		SB										
		EB										
32	S 9th St & Nicollet Ave S	NB										
		WB										
		SB										
		EB										
33	S 8th St & Nicollet Ave S	NB										
		WB										
		SB										
		EB										
34	S 7th St & Nicollet Ave S	NB										
		WB										
		SB										
		EB										
35	S 6th St & Nicollet Ave S	NB										
		WB										
		SB										
		EB										
36	S 5th St & Nicollet Ave S	NB										
		WB										
		SB										
		EB										
37	S 4th St & Nicollet Ave S	NB										
		WB										
		SB										
		EB										
38	S 3rd St & Nicollet Ave S	NB										
		WB										
		SB										
		EB										
Sub Alternative 11th and 12th Street												
30	11th St S & Nicollet Ave S	NB										
		WB					31				38	
		SB										
		EB										
39	11th St S & LaSalle Ave	NB										
		WB					371				387	
		SB										
		EB										
40	11th St S & Harmon Pl	NB										
		WB					128				146	
		SB										
		EB										
41	11th St N & Hennepin Ave	NB										
		WB					309				369	
		SB										
		EB										
42	11th St N & Hawthorne Ave	NB										
		WB					57				59	
		SB										
		EB										

Queues greater than 300 feet highlighted in red.

Table D1 Vehicle Queue by Turn Lane – AM Peak Hour

Alternative			2010 Peak Hour Existing Condition		2017 Peak Hour No Build		2017 Peak Hour Build LRT		2030 Peak Hour No Build		2030 Peak Hour Build LRT	
Location Code	Intersection	Appr	Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)	
			LT	RT	LT	RT	LT	RT	LT	RT	LT	RT
Major Segment C (LRT 3C Alternatives) (Continued)												
Sub Alternative 11th and 12th Street (Continued)												
29	12th St S & Nicollet Ave S	NB										
		WB										
		SB										
		EB										
43	12th St S & LaSalle Ave	NB										
		WB										
		SB										
		EB										
44	12th St S & Harmon Pl	NB										
		WB										
		SB										
		EB										
45	12th St N & Hennepin Ave	NB										
		WB										
		SB										
		EB										
46	12th St N & Hawthorne Ave	NB										
		WB										
		SB										
		EB										
47	Glenwood Ave & Royalston Ave N	NB	95		96		122		112		126	
		WB										
		SB										
		EB										

Queues greater than 300 feet highlighted in red.

Table D2 Vehicle Queue by Turn Lane – PM Peak Hour

Alternative			2010 Peak Hour		2017 Peak Hour		2017 Peak Hour		2030 Peak Hour		2030 Peak Hour	
			Existing Condition		No Build		Build LRT		No Build		Build LRT	
Location Code	Intersection	Appr	Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)	
			LT	RT	LT	RT	LT	RT	LT	RT	LT	RT
Major Segment 3 (LRT 3A, 3C, & 3C Sub Alternatives)												
1	TH 5 North Ramp & Mitchell Rd	NB	241		195		229		239		229	
		WB	160	110	183	86	170	100	180	106	170	100
		SB		105		33		29		110		29
		EB										
2	TH 5 South Ramp & Mitchell Rd	NB	120		132		121		171		121	
		WB	89	115		113		195		121		195
		SB		83		99		223		179		223
		EB										
3	Lone Oak Rd & Mitchell Rd	NB	97		74		64		96		64	
		WB	84	48		63		61		48		61
		SB										
		EB										
4	Technology Drive & Mitchell Rd	NB	222		199		180		207		180	
		WB	170	111	160	116	163	120	181	124	163	120
		SB		118		87		98		67		98
		EB										
5	Bryant Lake Dr & Valley View Road	NB										
		WB	744	687	821	776	727	462	993	955	1041	1050
		SB	95		116		91		117		104	
		EB										
6	Flying Cloud Dr & Valley View Road	NB										
		WB	391	301	668	515	651	677	823	1070	821	1067
		SB	124		21		99		103		117	
		EB										
7	Praire Center Dr & Valley View Road (East Jct)	NB										
		WB	595	200	255	357	272	557	290	362	284	802
		SB	530		650		645		644		626	
		EB										
8	Viking Dr & Prairie Center Dr	NB										
		WB	64	843	56	350	61	314	69	60	58	30
		SB	422		100		300		380		370	
		EB										
Major Segment 4 (All Alternatives)												
9	CSAH 3 & 17th Ave	NB			36		46		81		90	
		WB			39		52		30		34	21
		SB			91		108		176		160	
		EB			38	35	43	30	104	29	112	30
10	5th Street & 16th Ave	NB										
		WB										
		SB										
		EB			11		5		27	31	11	
11	CSAH 3 & 11th Ave	NB	269	97	267	122	299	194	285	166	368	199
		WB	160	11	165	11	187	11	164		191	22
		SB	116	38	118	50	102	22	133	33	113	44
		EB	182		194	34	200	33	194	32	204	44
12	CSAH 3 & 8th Ave	NB	85	75	48		47		71	82	58	
		WB	32	53	79	79	210	75	67		311	88
		SB										
		EB	88		91	18	104	91	108	24	233	294
13	CSAH 3 & 5th Ave	NB	134		72		201		168		259	
		WB	235	68	271	149	290	103	332		358	120
		SB										
		EB	122		128	235	190	248	138	235	298	248
14	2nd Street & Blake Rd. N.	NB	128		140		106		122		105	
		WB		16		27		27		27		36
		SB	15		33	44	28		38	11	36	33
		EB	147	66	146	128	95		143	129	118	31
15	Blake Rd. N. & CSAH 3	NB	84		88		71		92		128	
		WB		77		79		243		139		77
		SB	54		31	94	176		51	105	38	92
		EB	88	263	95	251	91		109	280	104	239
16	TH 7 WB On-Ramp & Woodale Ave.	NB	101		109		138		140		136	
		WB		51		82		115		66		54
		SB										
		EB										
17	TH 7 EB Off-Ramp & Woodale Ave.	NB	104		116		121		119		120	
		WB		94		122		120		231		279
		SB										
		EB										

Queues greater than 300 feet highlighted in red.

Table D2 Vehicle Queue by Turn Lane – PM Peak Hour

Alternative			2010 Peak Hour		2017 Peak Hour		2017 Peak Hour		2030 Peak Hour		2030 Peak Hour	
			Existing Condition		No Build		Build LRT		No Build		Build LRT	
Location Code	Intersection	Appr	Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)	
			LT	RT	LT	RT	LT	RT	LT	RT	LT	RT
Major Segment 4 (All Alternatives) (Continued)												
18	TH 7 Frontage Rd & Woodale Ave.	NB	24		32		25		24		42	
		WB		59		76		64		90		145
		SB										
		EB										
19	36th St & Woodale Ave.	NB	131		231		233		272		367	
		WB		50		60		56		56		69
		SB										
		EB										
20	CSAH 25 & Belt Line Blvd	NB	179	168	179	148	179	209	179	194	179	205
		WB	424		366		280		318		250	
		SB	37	35	42	39	42	31	46	138	41	140
		EB	298	325	358	408	323	408	214	326	231	242
21	CSAH 25 S. Frontage Rd & Belt Line Blvd	NB			89	53			347	41	113	
		WB	111		307		204		37		4	
		SB							114			
		EB	104	280	196	139	108	310	411	400	411	406
Major Segment C (LRT 3C & 3C Sub Alternatives)												
22	28th St & Nicollet Ave	NB										
		WB										
		SB	143		125		125		148		148	
		EB										
23	Blaisdell Ave & Franklin Ave	NB										
		WB										
		SB	129	130	129	130	129	130	130	130	130	130
		EB										
24	Nicollet Ave & Franklin Ave	NB										
		WB										
		SB	155	268	161	320	476		134	310	602	146
		EB										
25	1st Ave & Franklin Ave	NB										
		WB										
		SB	10			150		150		150		150
		EB										
Sub Alternatives Blaisdell Ave (No-Build Same as Nicollet Ave Center-Running Alignment)												
23	Blaisdell Ave & Franklin Ave	NB										
		WB										
		SB					130	130			130	130
		EB										
24	Nicollet Ave & Franklin Ave	NB										
		WB										
		SB					106	275			188	357
		EB										
25	1st Ave & Franklin Ave	NB										
		WB										
		SB						150			553	632
		EB										
Major Segment C (LRT 3C Alternatives) (Continued)												
26	W 15th St & Nicollet Ave S	NB	69		69		69		69		69	
		WB	81		95		95		81		81	
		SB	87		60		60		158		158	
		EB										
27	W Grant St & Nicollet Ave S	NB	154		132		132		148		148	
		WB	79		83		83		99		99	
		SB	133		151		151		171		171	
		EB										

Queues greater than 300 feet highlighted in red.

Table D2 Vehicle Queue by Turn Lane – PM Peak Hour

Alternative			2010 Peak Hour		2017 Peak Hour		2017 Peak Hour		2030 Peak Hour		2030 Peak Hour	
			Existing Condition		No Build		Build LRT		No Build		Build LRT	
Location Code	Intersection	Appr	Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)	
			LT	RT	LT	RT	LT	RT	LT	RT	LT	RT
Major Segment C (LRT 3C Alternatives) (Continued)												
Sub Alternatives Nicollet Mall												
28	13th St S & Nicollet Ave S	NB										
		WB	88		100		100		117		117	
		SB										
		EB										
29	12th St S & Nicollet Ave S	NB	56		61		61		57		57	
		WB	107									
		SB										
		EB										
30	11th St S & Nicollet Ave S	NB	36		60		60		52		52	
		WB	249		254		254		264		264	
		SB										
		EB										
31	S 10th St & Nicollet Ave S	NB	89		82		82		86		86	
		WB	166									
		SB										
		EB										
32	S 9th St & Nicollet Ave S	NB										
		WB										
		SB										
		EB										
33	S 8th St & Nicollet Ave S	NB										
		WB										
		SB										
		EB										
34	S 7th St & Nicollet Ave S	NB										
		WB										
		SB										
		EB										
35	S 6th St & Nicollet Ave S	NB										
		WB										
		SB										
		EB										
36	S 5th St & Nicollet Ave S	NB										
		WB										
		SB										
		EB										
37	S 4th St & Nicollet Ave S	NB										
		WB										
		SB										
		EB										
38	S 3rd St & Nicollet Ave S	NB										
		WB										
		SB										
		EB										
Sub Alternative 11th and 12th Street												
30	11th St S & Nicollet Ave S	NB										
		WB					24				48	
		SB										
		EB										
39	11th St S & LaSalle Ave	NB										
		WB					405				413	
		SB										
		EB										
40	11th St S & Harmon Pl	NB										
		WB					279				342	
		SB										
		EB										
41	11th St N & Hennepin Ave	NB										
		WB					182				286	
		SB										
		EB										
42	11th St N & Hawthorne Ave	NB										
		WB					234				340	
		SB										
		EB										

Queues greater than 300 feet highlighted in red.

Table D2 Vehicle Queue by Turn Lane – PM Peak Hour

Alternative			2010 Peak Hour Existing Condition		2017 Peak Hour No Build		2017 Peak Hour Build LRT		2030 Peak Hour No Build		2030 Peak Hour Build LRT	
Location Code	Intersection	Appr	Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)		Max Queue (ft)	
			LT	RT	LT	RT	LT	RT	LT	RT	LT	RT
Major Segment C (LRT 3C Alternatives) (Continued)												
Sub Alternative 11th and 12th Street (Continued)												
29	12th St S & Nicollet Ave S	NB										
		WB										
		SB										
		EB										
43	12th St S & LaSalle Ave	NB										
		WB										
		SB										
		EB										
44	12th St S & Harmon Pl	NB										
		WB										
		SB										
		EB										
45	12th St N & Hennepin Ave	NB										
		WB										
		SB										
		EB										
46	12th St N & Hawthorne Ave	NB										
		WB										
		SB										
		EB										
47	Glenwood Ave & Royalston Ave N	NB	184		199		294		258		336	
		WB										
		SB										
		EB										

Queues greater than 300 feet highlighted in red.

Existing Bus Operations

Existing Bus Operations

Route	Weekday Service Operating Characteristics			
	Peak Frequency (minutes)	Midday Frequency (minutes)	Total Weekday Trips	Weekday Ridership
MT 2	10-15	15	150	7,521
MT 4	7-15	15	150	4,973
MT 6	4-10	10	216	7,920
MT 9	15-20	30	91	1,341
MT 12	10-20	30	95	2,457
MT 17	5-15	10-15	156	6,543
MT 18	5-8	7-8	277	11,114
MT 21	7-10	10-15	245	13,369
MT 23	20	20-30	91	1,636
MT 25	30	N/A	11	195
MT 53	20-30	N/A	30	1,109
MT 113	20	120	24	1,105
MT 114	15-20	120+	28	1,329
MT 115	N/A	30	8	293
MT 568	N/A	N/A	2	49
MT 604	60	60	20	53
MT 615	60	60	21	136
MT 664	30	N/A	9	174
MT 665	30	N/A	6	133
MT 667	10-20	N/A	21	560
MT 668	30	N/A	9	313
SWT 603	60	60	10	89
SWT 680	25-35	N/A	4	84
SWT 684	45-60	75	7	No Data
SWT 685	25-30	N/A	7	216
SWT 690	5-10	120	49	1,750
SWT 691	N/A	N/A	2	31
SWT 695	60	N/A	7	59
SWT 697	30	N/A	4	124 (2008)
SWT 698	90(am)-15(pm)	60	26	405
SWT 699	10-15	N/A	23	16 (2008)

Source: Metro Transit and SouthWest Transit, MetroGIS Datafinder, 2010

Section 106 Information

Phase Ia Archaeological Report

Phase Ia Archaeological Investigation for the Freight Rail Relocation Corridor

Phase I/Phase II Architecture History Investigation

Volume 1 - Eden Prairie, Minnetonka, Hopkins, St. Louis Park Survey Zones

Volume 2 - Minneapolis Survey Zones

Volume 3 - Rail Corridor Survey Zones

Volume 4 - Supplement Number One

Section 106 Consultation Package – Potential Effects on Historic Properties, including final determinations of eligibility

PHASE 1A ARCHAEOLOGICAL INVESTIGATION
FOR
THE PROPOSED SOUTHWEST CORRIDOR TRANSITWAY PROJECT, HENNEPIN COUNTY, MINNESOTA

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Attachments

Attachment A – Research Design
Attachment B – Figures (under separate cover)

Introduction

The Southwest Transitway Project (Project), sponsored by the Hennepin County Regional Railroad Authority (HCRRA), is seeking to obtain funding from the Federal Transit Administration (FTA). The Cultural Resources Unit (CRU) of the Minnesota Department of Transportation (MnDOT) has been delegated by FTA to act on its behalf to carry out many aspects of project review in accordance with the Section 106 process of the National Historic Preservation Act (NHPA) and the National Environmental Policy Act (NEPA).

HCRRA contracted HDR, Inc. (HDR) to develop the NEPA Draft Environmental Impact Statement (DEIS) and to conduct archival and field documentation to support the Section 106 consultation process. HDR led a team of consultants to carry out the identification of historic properties within the Project's area of potential effect (APE). This team consists of Hess Roise Consultants, Mead and Hunt, and Summit Envirosolutions to address historic buildings and structures. The technical reports prepared by these firms are referenced where appropriate and are available by request under separate cover.

Archaeological Resource Services (ARS) was retained to address issues relating to prehistoric and historic archaeological resources. Efforts to determine the Project's potential to impact known and as yet unidentified archaeological historic properties (archaeological sites eligible for or already listed in the National Register of Historic Places) were addressed by ARS principal investigator Christina Harrison and HDR archaeologist Michael Madson. Tribal consultation is being conducted for this project by FTA with the assistance of CRU.

The few previous archaeological surveys in the project vicinity identified few archaeological sites. Existing archaeological information for the project corridors is limited but nevertheless, when considered with other archival data, it appears that specific areas within the Project APE have potential to contain intact near surface archaeological deposits.

Methodology

In the spring of 2010, the Project consultant team developed *Southwest Transitway: A Research Design for Cultural Resources* (Attachment A). This document defined a three-phase approach for ongoing identification and evaluation of archaeological properties within the Archaeological APE (see Figure 1, Attachment A) throughout the Project life cycle.

The Archaeological APE was developed through consultation between FTA, CRU, and the Minnesota State Historic Preservation Officer (SHPO), and captures the project footprint based on the conceptual design completed as of early 2010. In order to adequately address the extent of the anticipated construction limits, the Archaeological APE was defined as:

- The full width of existing railroad right-of-way corridors proposed for utilization by the project,
- The area within 100 feet of the margins of current engineering alignments, and
- Any undeveloped and/or vacant property within 500 feet of station areas that could potentially be used for construction/development activities. (Depending on the station location, these may include open green spaces and paved parking lots.)

The three-phase approach for Section 106 review considers the potential need for changes to the Archaeological APE through the life of the Section 106 process. The Archaeological APE will be reviewed and modified if necessary.

As discussed in detail in *Southwest Transitway: A Research Design for Cultural Resources* (Attachment A), the approach addresses identification and evaluation of archaeological historic properties in three phases:

- Task 1: Presentation of an Archaeological Overview Report (this document) outlining the results of a literature review for archaeological properties within the Archaeological APE, supplemented with limited field observations of the corridor from public rights-of-way, and including recommendations for a field survey strategy. This information was summarized in the Draft Environmental Impact Statement (DEIS).
- Task 2: The APE will be refined and surveyed in a manner consistent with the recommendations presented in the Task 1 report. Field sampling will involve standard methods for identification, collection, and analysis of artifacts. Sites will be analyzed for dimensions, integrity, and National Register potential. The survey may utilize targeted geomorphological testing in areas likely to feature deeply buried archaeological evidence. Archaeological sites determined to have National Register potential will require formal Phase II testing.
- Task 3: Technical reports on the Phase I and Phase II investigations will be prepared in accordance with the applicable guidelines and include submittal of Geographic Information Systems (GIS) data. All sites documented during the survey will be recorded on new or updated Minnesota Archaeological Site Forms. Collected artifacts will be processed and analyzed in compliance with the applicable guidelines. Artifacts will be curated at an approved facility.

This Archaeological Overview Report (Task 1) summarizes the areas, landforms, parcels, and other property that might hold archaeological deposits. It was developed through a review of existing archaeological site and survey documents on file at SHPO and the Office of the State Archaeologist (OSA). The overview also includes a review of historic maps and aerial photographs, local histories, and other archival information on file at the Minnesota Historical Society, the Borchert Map Library (University of Minnesota-Twin Cities), and local libraries and historical societies. Other environmental and historic context information was also reviewed. This report documents visible indications of topographic and hydrological features, as well as past and current land use with any apparent associated loss of soil integrity. Field observations were combined with the data gathered during the archival review to develop information on archaeological site probability along the five Southwest Transitway Corridor segments.

Existing Conditions

This section presents the environmental and historic background information that informed the overview, including the selection of survey areas in and/or near the potential route segments examined for the NEPA process. A general environmental overview and a prehistoric and early historic-period overview are presented. The reports on historic buildings and structures contain information on the later portion of the historic-period context as it relates to late 19th and early 20th century activity.

The physical geography of the Southwest Transitway study area is composed of a glacially formed landscape. The most recent glacial activity was the advance and subsequent withdrawal of the Grantsburg sublobe of the Des Moines lobe of the Wisconsin glaciations around 12,000 years ago. The retreating glacier left an area of hilly uplands on glacial till with ice-block-formed lakes dotting the landscape. The study area is in the Owatonna Moraine area physiographic region (Wright 1972). The area drains into the Mississippi and Minnesota rivers via Bassett Creek, Minnehaha Creek, Nine Mile Creek, Purgatory Creek, and their associated tributaries and wetlands.

The boundaries of the three basic vegetation zones found in Minnesota (coniferous forest in the northeast, prairie in the west, and deciduous forest in the east and southeast), have changed over time. As the climate warmed and dried, a period known as the Hypsithermal peaked around 6,000-7,000 years ago and prairies pushed east and northwards (Lynott et al. 1986). Then, gradually, the region returned to a cooler, wetter climate, and prairies retreated westward, being replaced by deciduous forest and oak savanna. All three vegetation zones have significant biological diversity that could have formed a subsistence base for human inhabitants of the region during the last 10,000 years. The Project falls within the Central Deciduous Lakes Archaeological Region (Anfinson 1990).

Cultural Context

Archaeological sites associated with the precontact and historic-period contexts that are typically encountered in this region could be found in any of the five Project segments. Intact precontact and historic-period archaeological deposits from all contexts could exist within the Archaeological APE, although they may have been altered by post depositional development or natural processes such as erosion and deposition.

The following main cultural manifestations (and approximate time periods) either are known to exist or are likely to exist in the archaeological record of the Twin Cities metropolitan area:

- Paleoindian Tradition (9500 to 6000 BC)
  - Fluted Points (Clovis, Folsom, Eastern Fluted, 9500-8000 BC)
  - Lanceolate Points (Plano, 8500 to 6000 BC)
- Archaic Tradition (6000 to 500 BC)
  - Lake-Forest
  - Eastern/Riverine
- Woodland Tradition (500 BC to AD 1650)
  - Havana Related
  - Transitional Woodland
  - Kathio
  - Southeastern Minnesota Late Woodland
- Mississippian Tradition (AD 900 to 1650)
  - Silvernale
- Oneota Tradition (AD 900 to 1600)
  - Blue Earth
- Contact Period (1650 to 1837)
  - Native American (Eastern Dakota)
  - Euro-American (French, British, Initial United States Presence)
- Post Contact Period (1837 to present)
  - Indian Communities and Reservations (1837-1934)
  - Early Agriculture and River Settlement (1840-1870)
  - Railroads and Agricultural Development (1870-1940)
  - Urban Centers (1870-1940)

As the Minneapolis area was one of the earliest in the region to be developed, first for farming and timbering and later for residential and commercial use, much of the archaeological record was likely destroyed before it could have been recorded and studied. More is known about the archaeology of the lake country of the southwestern metro region and the uplands along the Minnesota River Valley, including those surrounding the confluence of the Mississippi and Minnesota rivers.

The following overview summarizes each historic context, its associated artifact and property types, and its known/expected regional distribution. It is based on information culled from a variety of sources including the Minnesota Historical Society reference library, the survey and inventory files maintained by SHPO, and the discussions of background data and survey results provided by reports on a number of individual projects including:

- City-wide cultural resources and historic landscapes surveys conducted for the City of Eden Prairie (Schweigert 1992; Vogel et al. 1994);
- Investigations conducted along the central Minneapolis riverfront by the Minnesota Historical Society's Municipal-County Highway Archaeology program (Anfinson 1989); and,
- Archaeological investigations conducted for improvement projects proposed by the Minneapolis Park and Recreation Board (at Lake of the Isles/Lake Calhoun, Bassett Creek, and Minnehaha Creek), by the Nine Mile Creek Watershed District, by the Minnesota Department of Transportation (Trunk Highway 212 corridor study) and by the Metropolitan Airports Commission (runway expansions at Flying Cloud Airport) as well as a number of proposed housing developments (Harrison 1988 to 2009).

Paleoindian Tradition and Early Archaic Periods

During the Paleoindian and Early Archaic periods, small, mobile hunting societies subsisted on large game, like bison, as well as on smaller game, fish, and plant resources as a distinct warming and drying trend followed the disappearance of the glaciers. This drying period culminated with the altithermal period and the spread of open grasslands. Like historically-known nomadic peoples, these earliest inhabitants of Minnesota are believed to have traveled in small, kinship based groups.

Within the long-lasting Paleoindian and early Archaic traditions, temporal and geographic variations have largely been defined on the basis of technological criteria. These are primarily the morphological changes in large, lanceolate, biface stone tools, which were well made out of high quality lithic raw materials. These tools were used as projectile points and probably also as cutting implements. Large, bifacially flaked knives, choppers, scrapers, and more expedient tools, often made with a minimum of modification from large flakes, were also used.

Finds that can be securely attributed to these early periods are scarce, and are often limited to isolated finds of diagnostic points. Lanceolate points, primarily late Paleoindian lanceolate varieties, but also a few earlier fluted points (Clovis and Folsom) have been reported from Hennepin and adjacent counties. Not far from the study area, lanceolate points were found at Mendota (Clouse 1997) and also in the Hasse Archaeological District in Carver County (Lofstrom 1978). In addition, many of the less diagnostic "lithic scatters" of stone tools, tool fragments, waste flakes, and fire-cracked rock that have been found on cultivated fields around the region lack ceramic debris, which suggests that such sites predate the use of ceramics and may date to the Paleoindian or Early Archaic periods.

During the later part of the Archaic period, the seasonal pattern of seminomadic hunting and gathering continued but with more of a focus on the wider range of resources that were made available by an environment which became increasingly rich and varied. Oak savanna and hardwood forest spread across much of the area as the climate became cooler and wetter. This left the prairie mainly on the upland plateaus and on the well-drained terraces of the river valleys.

Over time, the archaeological record shows regional variation in tool technology and other aspects of material culture. These changes are likely linked to greater utilization of local resources that were often marginal. Archaic groups on the western prairie continued to rely heavily on bison hunting. Eastern

Archaic groups developed an increasingly diverse technology for hunting and trapping smaller game, fishing, foraging and the processing food and edible plants in addition to some bison hunting. Chipped lithics continued to be the dominant tools; however, they often exhibit evidence of being changed and improved. Projectile points became smaller and were either stemmed or side-notched because they were used to tip the darts of atlatls, rather than spears. In addition, ground and polished stone implements came into widespread use as net-sinkers and as grooved mauls, gouges, and grindstones used for wood and plant processing. A distinctive aspect of the eastern Archaic period in the Upper Midwest is the common use of native copper.

Most Archaic habitation sites are found along larger lakes and rivers. These seem to have been seasonal camps associated with an established round of subsistence activities. Later Archaic sites are more common than those of the previous periods. In part, this may reflect an increase in population density. It is also likely that many early Archaic sites, once associated with the river bottoms and shorelines of a much drier climate, were later inundated by water or buried under layers of flood deposited silt.

Evidence of Archaic habitation has been found in excavation s along the Minnesota River bluffs and adjacent to larger bodies of water such as Rice Marsh Lake (Harrison 1988 and 1999, and Schweigert 1992). It has also been collected from cultivated fields throughout the area. In addition to clearly identified Archaic sites, numerous “lithic scatters” have been recorded that lack evidence of the use of ceramics, which suggests that they predate the subsequent Woodland period.

Archaic projectile points are also known from various private collections in western Hennepin and adjacent Carver County. Burials associated with Archaic points have been reported in Carver County. Copper points have been found around Lake Minnetonka and in Carver County.

Woodland Tradition

The use of ceramic vessels and the construction of earthen mounds for burials began in the Woodland period. Economic patterns established during the Archaic Tradition are thought to have continued largely unchanged until new subsistence practices emerged with the introduction of horticulture (primarily along the major river valleys in the south) and the increasing reliance on wild rice exploitation in the north. The use of the bow and arrow was another significant technological breakthrough that is associated with the Woodland period. The use of the bow and arrow led to the development of even smaller types of corner- and side-notched projectile points.

The earliest Woodland period, recognized by the use of rather plain, thick-walled ceramic vessels, is primarily known from sites in southeastern Minnesota near the Mississippi River. To date, ceramics for this period have only been found on one site near the study area, not far from Fort Snelling (Perkl 2001). Sites from the middle and late Woodland period are more common throughout the study area and include:

- Mounds (earthworks) found singly or in groups on heights of land that overlook many of the larger lakes and most of the major rivers, including the lower reaches of their tributaries. A majority of mounds were mapped in the late 1800s (Winchell 1911). Numerous large mound groups have been recorded along the bluffs and intermediate terraces of the Minnesota River as well as the shores of larger lakes in the southwestern metro region, particularly Lake Minnetonka. A large number of the archaeological localities known in these areas all feature earthworks, often near large habitation sites.
- Smaller camps and special activity sites presumed to have been associated with seasonal resource procurement, which are often found at a considerable distance from the major waterways and habitation centers. They are usually found in association with some water feature.

Like a majority of Woodland sites in central Minnesota, those of the Twin Cities metro region feature ceramics that are particularly distinctive for, and often named after, major archaeological localities. Ceramics are found near Mille Lacs and along the St. Croix River drainage and nearby segments of the Mississippi River Valley. Examples include early Woodland Havana-related Malmo, Howard Lake and Sorg Ware, "transitional Woodland" St. Croix and Onamia Ware, or later Woodland Kathio Ware.

Considerable continuity between Archaic and Woodland lifeways is evident in the technology and the food remains found at a number of sites in the region. For example, the previously-mentioned Hasse Archaeological District has yielded evidence from the Middle Woodland, Archaic, and, possibly, the Paleo-Indian periods. The nearby Miller Lake Archaeological district features Archaic burials near a large group of Woodland burial mounds and habitation areas with large quantities of Middle Woodland pottery (Lofstrom and VanBrocklin Spaeth 1978:16). Havana-like sherds found at Mendota, cord-impressed Late Woodland ceramics found at Fort Snelling, and small Woodland sites found elsewhere on the lower Minnesota River all seem to reflect fairly intensive procurement of floodplain resources.

Mississippian and Oneota Traditions

Late Woodland groups appear to have coexisted for some time with small groups of horticulturalists who established themselves in semi-permanent villages along the Mississippi and its major tributaries. The Oneota tradition, which emerged around A.D. 950-1000, appears to have developed out of the indigenous Woodland base despite sharing many traits with the more complex Mississippian cultures of the south (such as horticulture and settlement patterns). A later variant of this manifestation, the Silvernale Phase of A.D. 1150 to 1350, saw more direct contact with the south and the Middle Mississippian culture centered on Cahokia, Illinois. Further to the west, sites of the related Plains Village tradition extend from the upper Minnesota River to the Missouri River region.

The Oneota and Plains Village traits that break with earlier traditions, such as intensified horticulture, a modified and diversified tool kit, new methods of dwelling and mound construction, a wider variety of ceramics and non-utilitarian, often exotic items, all reflect the emergence of increasingly sedentary, complex, and stratified social groups. The shift in subsistence and settlement patterns is documented by archaeological sites with large storage pits; post molds; thick, organically rich occupation floors; implements like scapula hoes and antler picks; and organic remains such as charred beans and corn kernels. No Oneota sites have been identified in the immediate vicinity of the study area despite the documented presence of Oneota sites along the Mississippi River downstream from Fort Snelling and also along the central and upper Minnesota River. Plains Village ceramics were recovered from a Minnesota River terrace some distance downstream from the study area (George 1999).

Contact Period

Little is known about the later precontact period of this area. The Mississippian villages of the Silvernale phase seem to have declined at about the same time as related complexes elsewhere in the Midwest. Later Oneota manifestations, on the other hand, may have continued into the period of initial Euro-American contact. In southern Minnesota and Iowa the Orr phase occurred when Oneota traditions began to blend with early European influences among indigenous groups that are thought to have been the Siouan speaking Oto and Iowa. The latter later moved west, probably under pressure from Eastern Dakota groups coming down from the north and it was the Dakota who met the first Euro-Americans to visit the study area.

As demonstrated both archaeologically and by written accounts, indigenous groups continued to occupy the area throughout the period of initial contact with Euro-Americans. These groups remained in the region west of the Mississippi River after 1837 when two large areas east of that river were opened for logging and settlement through treaties signed with the Ojibwe and the Dakota. For decades, their villages and hunting grounds surrounded the military reserve that had been negotiated in 1805 between Lieutenant Zebulon Pike and local Dakota groups. These groups also had formal reasons to be present within the reserve boundaries once an Indian Agency had been established adjacent to the newly constructed Fort Snelling in 1820 (Taliaferro 1894; White and White 1998:28). One of their main reasons for contact with Euro-Americans, however, was the fur trade. Just across the Minnesota River from the fort was Mendota, or "meeting of waters" in the Dakota language, which was a settlement established in the 1820s to serve as the regional headquarters for the American Fur Company (Clouse 1999). In the 1820s a trading post was operated at Land's End on the northern side of the Minnesota River about a mile upstream from the agency and just outside the boundary of the military reservation. This trading post was run by a Mr. Lamont until 1831 when it was operated by Joseph R. Brown (Nute 1930).

In their journals and letters, French, British, and American explorers, military men, traders, and missionaries made numerous references to the Eastern Dakota. Among them were the Mdewakanton on the Minnesota and Mississippi Rivers between Shakopee and Winona, and the Wahpeton on the Upper Minnesota River (Keating 1825; Long 1978). Historic accounts refer to a number of eastern Dakota settlements in the area. Summer villages were occupied during the growing season and then abandoned. Short-term camps were used during the rest of the year as the Eastern Dakota balanced gardening with the gathering of wild plants and hunting needed to satisfy their needs and those of the fur trade.

Post Contact Period

A thorough discussion of Dakota beliefs, social customs, and material culture is found in the writings of Samuel Pond, who worked among the Dakota as a missionary between 1834 and 1851 (Pond 1940 and 1986). Living with several of the groups, he and his brother, Gideon, learned their language and became keen observers and recorders of their way of life. The two established Presbyterian missions on the Minnesota River in the 1840s. An important part of their intent was to teach Euro-American farming methods and lifeways to the local Dakota.

Samuel Pond estimated the number of Mdewakanton to be a little less than 2,000 and described the different bands, their chiefs, and their villages. Closest to Fort Snelling were Kaposia on the Mississippi River a few miles south of the site of St. Paul. Along the Minnesota River were found Black Dog village a few miles above Fort Snelling, Pinisha (Penichon's) village near the mouth of Nine Mile Creek, Tewapa village at Eagle Creek, and the village of Shakopee. Cloud Man's village was located a few miles west of Fort Snelling on the eastern shore of Lake Calhoun.

Pond also described the annual round of Eastern Dakota resource procurement. In October, people abandoned the summer villages on the main rivers for the fall and winter hunt which kept them moving through more forested regions in search of deer and smaller game. Late winter was a time for fishing, the trading of furs and deer skins, and the processing of hides into clothing. During March, most of the men hunted muskrats while the rest of the band made maple sugar. A number of sugar camps are thought to have been located in sheltered, wooded areas around Fort Snelling. By May, the bands had returned to their summer villages where they lived in bark houses, fished in local lakes and streams, gathered wild plant foods, and planted their gardens. Summer was also a time for visiting with other Dakota and for bartering with the traders. By late summer and early fall, there was wild rice to be harvested in many of the area lakes.

By 1851-1852, however, through the treaties of Mendota and Traverse des Sioux, the Dakota had exchanged all their lands west of the Mississippi for government annuities and life within designated reservations. Some of their descendants later returned to reestablish Dakota communities south and west of the Minnesota/Mississippi river confluence. The confluence area remains integral to the spiritual beliefs of some Dakota. The period of even intermittent physical presence of Native Americans in this region was essentially over by the early 1850s.

With few exceptions, these Dakota groups are not well represented in the archaeological record even though a few of their settlements have been identified on the lower Minnesota River. Some historic Dakota sites, if located on a frequently inundated flood plain or at the base of a bluff slope, may have been quite deeply buried by alluvial or colluvial deposits. For the most part, however, intensive farming and development have likely destroyed the villages that once occupied the higher and fertile river and lakeshore terraces because the evidence would have been concentrated in the upper horizons of the cultivated soil (George 1999; Spector 1993).

West of the Mississippi, Euro-American settlement was still sporadic until the ratification of the 1851 Treaties of Mendota and Traverse des Sioux opened the area to settlement. With the rapidly growing river towns and steam boat landings serving as gateways, settlers poured into the river valleys and hinterlands. Within a few decades, practically all arable lands in the area had been claimed for settlement. With the construction of roads and railroads, and logging of the river valley forest, settled land soon began to be some of the richest croplands in the Midwest. Spurred by rapid population growth and intensifying industry and commerce, urban development began to engulf the former Fort Snelling military reservation and spread west across the uplands that overlook the Minnesota River valley.

Roise (2010), Goodson (2010), and Schmidt (2010) provide an excellent foundation for later historic-period contexts in the Project vicinity. Particularly relevant are early agricultural activities, the development of railroads, and the development of industry in the urban centers, all between 1840 and 1870.

Archaeological Site Potential by Segment

The following discussion looks at each segment and examines its potential to hold intact and significant archaeological properties. ARS staff conducted a preliminary visual review of all segments. The investigations were completed under the direct supervision of Ms. Harrison.

Initial visual inspections took place in February 2010. Although the ground was still snow covered, it was possible to broadly identify topographic settings that may have invited past cultural use. In addition, the comparison between historic aerial photographs and current conditions provided important indications about what changes in land use and topography may have impacted the preservation of archaeological evidence. Once the snow cover disappeared, follow-up inspections conducted during late March and early April allowed for more reliable observations regarding current ground conditions.

All assumptions about the presence, absence, or degree of archaeological potential are based on past archaeological survey experience within or near the project corridors and it is also based on the patterns of Native American and early Euro-American land use and the results of the literature and records review. In addition to the discussion of conclusions and recommendations, organized by survey segments, areas considered to have archaeological potential are shown in the segment figures found in Attachment B and listed in Table 1 to 6.

A total of 371 acres within 48 mapped areas (*Areas*) thought to have the potential to contain intact archaeological resources are present within or adjacent to the five route segments (Table 1). Each *Area* was plotted using GIS and its acreage was calculated. Table 1 compares the number of *Areas*, total acreage by segment, and the potential for each of them to represent the three general archaeological contexts. Note that the segments ultimately chosen for development should be subject to inventory-level survey.

Table 1. Summary of Sensitive *Areas* with Archaeological Potential by Segment.

Segment	*Areas*	Total *Area*-Acres/*Area*-Acres within Archaeological APE	No. of *Areas* with Precontact Period, Contact Period Potential	No. of *Areas* with Historic Period Potential	No. of *Areas* with Precontact Period, Contact Period, Historic Period Potential
1	6	67/18	0	3	3
3	21	145/88	8	1	11
4	9	85/38	0	8	1
A	10	64/42	3	4	3
C	3	10/8	2	1	0
Total	48 (Aj/Cc are the same *Area*)	371/194	13	16 (Aj/Cc are the same *Area*)	18

The *Areas* shown in Tables 1 to 5, and discussed in the following subsections, are possible locations of intact archaeological deposits, based on archival and limited field review. These *Areas* will be targeted and specifically addressed during the work proposed as part of Task II of the research design (see Attachment A). If other *Areas* are identified during the field identification effort, they may also be specifically addressed during subsequent field inventory and evaluation.

Segment 1

No National Register eligible archaeological resources have been identified within this segment or in its immediate vicinity. Six *Areas* along Segment 1 have potential for intact archaeological deposits (See Table 2 and the Segment 1 topological and aerial figures [sheets 1 to 5] in Attachment B).

Table 2. Segment 1, *Areas* with Archaeological Potential.

Area	Archaeological Potential	*Area*-Acres/*Area*-Acre(s) within Archaeological APE	Comments	Task 2 Inventory Method(s)
1:a	Precontact Period, Contact Period, Historic Period	15/12	Upland near Purgatory Creek wetlands	Pedestrian survey, shovel tests
1:b	Precontact Period, Contact Period, Historic Period	19/3	Upland near Nine Mile Creek wetlands	Pedestrian survey, shovel tests
1:c	Precontact Period, Contact Period, Historic Period	25/1	Upland near Nine Mile Creek wetlands, associated with former Hennepin County boys home	Pedestrian survey, shovel tests
1:d	Historic Period	1/1	Former location of railroad switching house	Pedestrian survey, shovel tests, non-invasive sampling
1:e	Historic Period	3/1	Abandoned railroad spur embankment	Pedestrian survey
1:f	Historic Period	5/1	Possible location of railroad man-camp	Pedestrian survey, shovel tests, non-invasive sampling
Total		67/18		

These six *Areas* comprise 18 acres within the Archaeological APE along Segment 1. The three historic period *Areas* are generally associated with late 19th and early to mid 20th century railroad activities. The remaining three *Areas* may be associated with any of the three prehistoric contexts. One of these also has the potential to contain historic period resources associated with the nearby Hennepin County Home School (also known as the Glen Lake School for Boys).

As the corridor segment follows an existing railroad grade, it seems possible that construction may have destroyed or severely impacted any archaeological evidence located in its path. However, remnants of deeply buried archaeological deposits are known to have survived at the base of railroad embankments in other locations. This is of particular concern where the railroad corridor traverses areas of suspected archaeological potential such as the uplands that overlook the drainages.

The Archaeological APE at the Highway 5 (Minnesota Trunk Highway [TH] 5) station encompasses uplands that overlook wetlands associated with Purgatory Creek. Most areas northwest of the Transitway Corridor feature post-1960 residences located on heavily landscaped lots that have been greatly altered by the excavation of walkout basements. Most areas southeast of the Transitway Corridor have been heavily reconfigured by the expansion of TH 212 and TH 5. Only *Area* 1:a appears to retain enough physical integrity to warrant exploratory shovel testing for precontact, contact, and historic period archaeological resources.

The Archaeological APE at the proposed Highway 62 station is traversed by a tributary of the South Fork of Nine Mile Creek. This area features considerable archaeological potential along the stream, even in areas where commercial buildings and parking lots have been built fairly close to it.

Located north of West 62nd Street and Townline Road, *Area* 1:c encompasses relatively undisturbed grass and wood-covered uplands, which were once part of the Hennepin County Home School. Founded in1909, the Home School farmed, gardened, and pastured animals for their own use, and sold milk and produce to the nearby Glen Lake Sanatorium. In addition to the potential for historic evidence, precontact period potential is suggested by the presence of four precontact period archaeological sites around nearby Birch Island Lake (21 HE 215, 21 HE 216, 21 HE 217, and 21 HE 334). All four of these sites have yielded important archaeological information regarding the Woodland and possibly the Archaic periods. All four sites are in a setting that is very comparable to the uplands in *Area* 1: c (Harrison 2008a).

Wedged between two railroads north of Townline Road, *Area* 1:d has probably retained little if any precontact/contact period potential but it may feature the archaeological remains of a former, now demolished, railroad switching house.

At the proposed Rowland Road station area, which encompasses a number of knolls and ridges that overlook Minnetoga Lake and the South Fork of Nine Mile Creek, areas that invited historic use have been disturbed by residential development and extensive landscaping. The area has also been quite heavily impacted by the construction of I-494, Baker Road, and Rowland Road. In addition, previous archaeological surveys of both sides of the South Fork of Nine Mile Creek between Rowland Road and the Chicago & Northwestern and Chicago Milwaukee & St. Paul railroads have demonstrated that the uplands northeast of Rowland Road were lacking in archaeological resources (Harrison 1982). Additional Phase I testing of this area would be unwarranted.

Areas 1:e and 1:f were only partially included in the previous surveys and may have some historic archaeological potential. *Area* 1:e is part of an abandoned spur of the Chicago & Northwestern Railroad that was reportedly used for hauling ice from Shady Oak Lake during the early 1900s. *Area* 1:f, which is a higher area, appears on a 1940s aerial photograph to have held a cluster of buildings that may have been related to the ice harvesting activity (Sanborn Map Company 1912).

For a further discussion of the proposed Shady Oak Road station area, see Segment 4.

Segment 3

Twenty-one *Areas* along Segment 3 have potential for intact archaeological deposits (See Table 3 and the Segment 3 topological and aerial figures [sheets 1 to 5] in Attachment B).

Table 3. Segment 3 *Areas* with Archaeological Potential.

Area	Archaeological Potential	*Area*-Acres/*Area*-Acre(s) within Archaeological APE	Comments	Task 2 Inventory Method(s)
3:a	Precontact Period, Contact Period	11/8	Upland near Purgatory Creek wetlands	Pedestrian survey, shovel tests
3:b	Precontact Period, Contact Period	11/0	Upland near Purgatory Creek wetlands	Pedestrian survey, shovel tests
3:c	Precontact Period, Contact Period	4/1	Upland near Purgatory Creek wetlands	Pedestrian survey, shovel tests
3:d	Precontact Period, Contact Period	4/1	Upland near Purgatory Creek wetlands; Possible deposits associated with 21HE206	Pedestrian survey, shovel tests
3:e	Precontact Period, Contact Period	5/2	Upland near Purgatory Creek wetlands	Pedestrian survey, shovel tests
3:f	Precontact Period, Contact Period, Historic Period	3/0	Upland near Purgatory Creek wetlands, possible pre-1940s farmstead; possible deposits associated with 21HE208	Pedestrian survey, shovel tests
3:g	Precontact Period, Contact Period	9/7	Ridge w/terraces over Purgatory Creek drainage	Pedestrian survey, shovel tests
3:h	Precontact Period, Contact Period, Historic Period	7/3	Ridge w/terraces over Purgatory Creek drainage, possible pre-1940s farmstead	Pedestrian survey, shovel tests
3:i	Precontact Period, Contact Period, Historic Period	11/10	Ridge w/terraces over South Fork Nine Mile Creek drainage, possible pre-1940s farmstead(s)	Pedestrian survey, shovel tests
3:j	Precontact Period, Contact Period	6/3	Upland near South Fork Nine Mile Creek wetlands	Pedestrian survey, shovel tests
3:k	Precontact Period, Contact Period, Historic Period	19/18	Upland near South Fork Nine Mile Creek wetlands	Pedestrian survey, shovel tests
3:l	Precontact Period, Contact Period, Historic Period	2/2	Upland near South Fork Nine Mile Creek wetlands, possible pre-1940s farmstead	Pedestrian survey, shovel tests
3:m	Precontact Period, Contact Period	31/26	Upland near South Fork Nine Mile Creek	Pedestrian survey, shovel tests
3:n	Historic Period	9/1	Pre-1940s farmsteads	Pedestrian survey, shovel tests

Area	**Archaeological Potential**	***Area*-Acres/*Area*-Acre(s) within Archaeological APE**	**Comments**	**Task 2 Inventory Method(s)**
3:o	Precontact Period, Contact Period, Historic Period	8/4	Upland overlooking South Fork Nine Mile Creek, pre-1940s farmstead	Pedestrian survey, shovel tests
3:p	Precontact Period, Contact Period	6/3	Upland near South Fork Nine Mile Creek wetlands, possible pre-1940s farmstead	Pedestrian survey, shovel tests
3:q	Precontact Period, Contact Period	2/1	Upland near South Fork Nine Mile Creek wetlands	Pedestrian survey, shovel tests
3:r	Precontact Period, Contact Period, Historic Period	1/1	Upland overlooking South Fork Nine Mile Creek, pre-1940s farmstead	Pedestrian survey, shovel tests
3:s	Precontact Period, Contact Period, Historic Period	1/1	Upland overlooking South Fork Nine Mile Creek, pre-1940s farmstead	Pedestrian survey, shovel tests
3:t	Precontact Period, Contact Period, Historic Period	1/1	Upland overlooking South Fork Nine Mile Creek wetlands, pre-1940s farmstead	Pedestrian survey, shovel tests
3:u	Precontact Period, Contact Period, Historic Period	1/1	Upland overlooking South Fork Nine Mile Creek, pre-1940s farmstead	Pedestrian survey, shovel tests
Total		145/88		

These *Areas* comprise 88 acres within the Archaeological APE along Segment 3. Eight precontact/contact period *Areas* and one historic period *Area* are found along this segment. The historic period *Area* is generally associated with agricultural activities that were probably established in the 19th century and remained in place through 1940. The remaining *Areas* may be associated with both the prehistoric contexts and with the late 19th to mid-20th century agricultural activities. The portion of Segment 3 that closely parallels either TH 212/TH 5 or Technology Drive, traverses areas that are too disturbed to retain archaeological potential, with the exception of the three proposed station areas.

Near the proposed Mitchell Road station, the area north of the freeway has been completely altered by commercial development and landscaping. To the south, *Area* 3:a, *Area* 3:b, and *Area* 3:c all retain enough undisturbed upland terrain near wetlands to warrant exploratory testing.

Within and due west of the proposed Southwest station, three recorded precontact period sites in or near the project corridor demonstrate the potential for archaeological sensitivity in uplands along Purgatory Creek. Site 21 HE 206 (shown as *Area* 3:d) is a lithic scatter of indeterminate precontact period affiliation as well as the former location of a farm. These resources were largely destroyed by creek bank modifications as well as the construction of TH 212. Site 21 HE 207 is a lithic findspot of indeterminate precontact period affiliation that is located north of the Archaeological APE. Site 21 HE 208 (shown as *Area* 3:f) is a lithic scatter of indeterminate precontact period affiliation that was formerly located on an undisturbed upland north of the creek and determined eligible for the National Register. This site has been partly or completely destroyed by the construction of the TH 212/Prairie Center Drive interchange. Considering the likelihood that similar evidence is common all along the creek, the stream banks in *Area* 3:e warrant a visual inspection, and possibly shovel testing. Most likely to be impacted by station-related construction, *Area* 3:g is an upland which overlooks the creek and is now partly covered by Purgatory Creek Park and some large parking lots. Precontact period and historic period archaeological resources may remain and the *Area* warrants exploratory testing.

A short distance to the east, most of the proposed Eden Prairie Town Center station area features either pronounced slope or uplands heavily impacted by commercial development and associated landscaping. Two sites north and south of Technology Drive, together designated as *Area* 3:h, appear less disturbed and may, as former farmstead locations, have enough historic archaeological potential to warrant exploratory testing even though they appear partly destroyed by the construction of a substation.

As the project corridor continues east, it traverses an area too severely altered by the construction of the TH 212/I-494 interchange to retain any archaeological potential. Once beyond the interchange, the corridor curves north, for the most part following a new alignment which occasionally parallels existing roads but often cuts cross-country, traversing terrain that generally is quite rolling, with numerous wetlands that are part of the Nine Mile Creek watershed. Aerial photographs from the 1940s indicate that most of this land was still being farmed. Preliminary visual inspection of the entire Archaeological APE north of the TH 212/I-494 interchange indicated that *Areas* 3:i to *Area* 3:u are reasonably level and undisturbed enough to warrant a formal archaeological survey.

No archaeological sites have been recorded either within or immediately adjacent to this part of Segment 3. This is likely due to the fact that relatively few nearby areas have been subjected to archaeological reconnaissance survey. Considering that the Birch Island Lake area, located just a few miles further west and part of the same watershed, proved to be quite rich in archaeological evidence when systematically inspected as part of a city-wide survey (Harrison 2008a), it would be logical to expect similar cultural resource potential in this part of the watershed. It is somewhat surprising that of five archaeological reconnaissance reviews previously conducted near Segment 3 produced neither precontact nor historic period evidence. These included two surveys which encompassed uplands overlooking the northern part of Anderson Lakes in SW ¼ Section 13 (Harrison 1994 and 2008b); two separate studies of uplands adjacent to Smetana Lake in SW ¼ Section 12 due southeast of the Segment 3 Archaeological APE (Hagglund 1994; Harrison 1999b); and a survey along Nine Mile Creek between Excelsior Boulevard and TH 169, i.e. due east/northeast of the northern part of the Segment 3 Archaeological APE (Harrison 2009a). It should be noted, however, that these surveys still represent a fairly small sampling of the total Nine Mile Creek watershed.

Segment 4

No National Register eligible archaeological resources have been identified within this segment or in its immediate vicinity. However, nine *Areas* along Segment 4 have potential for intact archaeological deposits (See Table 4 and the Segment 4 topological and aerial figures [sheets 1 to 4] in Attachment B).

Table 4. Segment 4, *Areas* with Archaeological Potential.

Area	**Archaeological Potential**	***Area*-Acres/*Area*-Acre(s) within Archaeological APE**	**Comments**	**Task 2 Inventory Method(s)**
4:a	Historic Period	30/8	Red Wing/Minneapolis Sewer Pipe Company	Pedestrian survey, shovel tests, non-invasive sampling
4:b	Historic Period	26/9	Minneapolis Threshing Machine Company/ Minneapolis Moline	Pedestrian survey, shovel tests, non-invasive sampling
4:c	Historic Period	5/4	Old Hopkins	Pedestrian survey, shovel tests, non-invasive sampling
4:d	Historic Period	7/6	Produce distribution	Pedestrian survey, shovel tests, non-invasive sampling
4:e	Precontact Period, Contact Period, Historic Period	5/3	Uplands near Minnehaha Creek	Pedestrian survey, shovel tests
4:f	Historic Period	2/2	Milwaukee Road Depot	Pedestrian survey, shovel tests, non-invasive sampling
4:g	Historic Period	2/1	St. Louis Park Roadside Rest	Pedestrian survey, shovel tests, non-invasive sampling
4:h	Historic Period	1/2	Industrial use (around 1940)	Pedestrian survey, shovel tests, non-invasive sampling
4:i	Historic Period	2/1	Railroad-use (1920s to 1930s)	Pedestrian survey, shovel tests, non-invasive sampling
4:j	Historic Period	5/2	Rail	Pedestrian survey, shovel tests, non-invasive sampling
Total		85/38		

These *Areas* comprise approximately 38 acres within the Archaeological APE of Segment 4. The nine historic period *Areas* along the segment are generally associated with late 19th and 20th century railroad and heavy industrial activities, including the former locations of Minneapolis Moline and the Minneapolis Sewer Pipe Company. The remaining *Area* may be associated with precontact, contact period, and/or historic period resources due to its prominent location above the Minnehaha Creek floodplain.

At the proposed Shady Oak station site, much of the area north/northwest of the Project corridor was the former location of the Minneapolis Sewer Pipe Company, known prior to 1912 as the Red Wing Sewer Pipe Company (shown as *Area* 4:a). Torn down before the 1940s and shown to be in ruins on an aerial photograph from that period, it was redeveloped by Minneapolis Moline with a large building placed on top of ruins of the old structure and associated storage area. Still visible remnants include a smoke stack, foundations, a rail spur, and an abandoned loading dock to the immediate north of the railroad and the proposed station area. Judging by the same 1940s aerial photograph, the area south/southeast of the project corridor was still farmed at that time, with farm buildings located well southwest of the proposed station in an area that has been substantially altered by subsequent commercial development.

At the proposed Downtown Hopkins station site, the area south/southeast of the project corridor, shown as *Area* 4:b, is the former location of the large industrial complex which began as the Minneapolis Threshing Machine Company in 1887 and in 1929 evolved into Minneapolis Moline, staying in this location until the mid-1970s. Since reused for other industrial and commercial activity, the *Area* still encompasses some fairly open, though largely paved-over, spaces that are of historic archaeological interest. North/northwest of the corridor and Excelsior Boulevard, *Area* 4:c is the old Hopkins village center, a community first settled in 1852 and then known as West Minneapolis, but by 1928 incorporated as the City of Hopkins. Though heavily impacted by the construction of Excelsior Boulevard, the *Area* still has historic archaeological potential.

At the proposed Blake Road station site, the area surrounding the project corridor is part of a commercial center long associated with food distribution and possibly including structures and structural remnants near the proposed station (*Area* 4:d). Somewhat further east, within *Area* 4:e, the project corridor traverses uplands that overlook Minnehaha Creek. Only partially impacted by the construction of buildings and parking lots, these areas have considerable precontact, contact, and historic period archaeological potential.

At the proposed Louisiana Avenue station site, visual inspection of the station area indicated that it has been too heavily impacted by commercial development to retain any archaeological potential. The same is largely true of the proposed Wooddale station area, except for a parcel associated with the historic Milwaukee Railroad St. Louis Park Depot, namely *Area* 4:f.

East of TH 100, the project corridor skirts *Area* 4:g. This area does not appear to have the potential to be impacted by the current Project, but any modifications to the proposed Project should consider this area. Historically known as the St. Louis Park Roadside Rest, it has been called Lilac Park since the 1990s. It should be noted that this parcel includes a historic beehive structure that was moved to this location from of the original Lilac Park in the interchange to the north.

Within the proposed Beltline Boulevard station area are three *Areas* of potential historic archaeological interest:

- *Area* 4:h where an industrial complex that is shown in a 1940s aerial photograph has since been replaced by the parking lot for Nordic Ware.
- *Area* 4:i where a 1920s-1930s era building, as well as a wooded area between the building and the railroad, appears related to the use of the latter.
- *Area* 4:j, which also extends towards the east beyond the station area – a former rail yard which extended all along the south side of the railroad as far as Bass Lake.

The proposed West Lake Street station area is located approximately a quarter mile northwest of Lake Calhoun. It has been heavily impacted by residential and commercial development and its associated landscaping and appears totally lacking in archaeological potential.

Segment A

No National Register eligible archaeological resources have been identified within this segment or in its immediate vicinity. Nine *Areas* along Segment A have potential for intact archaeological deposits (See Table 5 and the Segment A topological and aerial figures [sheets 1 to 4] in Attachment B).

Table 5. Segment A, *Areas* with Archaeological Potential.

Area	**Archaeological Potential**	***Area*-Acres/*Area*-Acre(s) within Archaeological APE**	**Comments**	**Task 2 Inventory Method(s)**
A:a	Precontact Period, Contact Period	1/1	Upland near lake	Pedestrian survey, shovel tests
A:b	Precontact Period, Contact Period	5/5	Upland near lake	Pedestrian survey, shovel tests
A:c	Precontact Period, Contact Period and Historic Period	1/1	Upland near lake; historic residences	Pedestrian survey, shovel tests
A:d	Precontact Period, Contact Period and Historic Period	1/1	Upland near lake; historic residences	Pedestrian survey, shovel tests
A:e	Historic Period	4/4	Railroad-use (1880s to 1950s)	Pedestrian survey, non-invasive sampling
A:f	Historic Period	6/1	Cedar Lake Ice House (early 1900s)	Pedestrian survey, shovel tests, non-invasive sampling
A:g	Precontact Period, Contact Period	1/1	Upland overlooking former wetland	Pedestrian survey, shovel tests
A:h	Historic Period	38/21	Railroad-use (1880s to 1950s)	Pedestrian survey, non-invasive sampling
A:i	Precontact Period, Contact Period and Historic Period	1/1	Bluff top overlooking former wetland; historic residences	Pedestrian survey, shovel tests
A:j	Historic Period	6/6	19th-century residential neighborhood	Pedestrian survey, non-invasive sampling
Total		64/42		

These *Areas* comprise 42 acres within the Archaeological APE along Segment A. The three historic period *Areas* along the segment are generally associated with late 19th and 20th century railroad and industrial activities. Three precontact and contact period *Areas* may also exist along the alignment, focused in the general vicinity of Cedar Lake. The remaining three *Areas* may be associated with precontact, contact period, and/or historic period resources due to their prominent location above the Cedar Lake environs and may reflect historic period residences that generally occupied these locations beginning in the late 19th century.

Within and due northeast of the proposed 21st Street station area are six parcels that warrant further research and exploratory testing. These include *Areas* A:a to A:d, which encompass uplands that overlook Cedar Lake. Uplands overlooking nearby Lake of the Isles have proved to have high precontact and historic period archaeological potential. Consequently, similar potential appears at Cedar Lake. *Area* A:c may also feature historic archaeological evidence at the location of a cluster of recently demolished residences and the same may be true within parts of *Area* A:d. Railroad related use of nearby *Area* A:e may have left traces in the archaeological record as may the use of *Area* A:f for commercial ice harvesting in the early 1900s (Sanborn Map Company 1912). Though fairly far removed from Cedar Lake, *Area* A:g, as a small but distinct upland overlooking a former wetland, is also likely to feature evidence of precontact to historic period land use.

Area A:h, including the proposed Penn Avenue station area, is located within the Kenwood Rail Yards, which were in use between the 1880s and the 1950s. Consequently, it has clear historic archaeological potential. *Area* A:i – a bluff top that overlooks the former rail yard/wetland area – is also likely to feature evidence of past cultural activity associated with several historic residences as well as, possibly, the precontact and early historic periods (Goodson 2010; Sanborn Map Company 1912).

Within the proposed Van White Boulevard station area, visual review indicated that some wooded areas of the current course of Bassett Creek are within its perimeters and overlook the Bryn Mawr Meadows. It does not appear that these areas have retained enough physical integrity to feature archaeological potential.

Although the proposed Royalston Avenue and Intermodal station areas are located near the now buried lower course of Bassett Creek, they have both been too heavily impacted by 20th/early 21st century development to retain any precontact or contact period archaeological potential.

The Royalston Avenue station location and vicinity (*Area* A:j) may also harbor archaeological evidence of relatively affluent 19th century domestic occupations. Plat maps published between the 1880s and mid-20th century show the former location of Royalston Avenue just west of its current location. The current alignment, born from the urban renewal projects in the 1960s, clings to the very edge of the former railroad yard, on the locations of the domestic structures, outbuildings, and alley that once stood there. Depending on the methods used during the demolition of these structures and construction of the current alignment in the latter part of the 20th century, intact foundations, privy shafts, domestic middens, or other features may exist below the current grade.

Segment C

Two National Register eligible archaeological resources have been identified within and in the immediate vicinity of this segment, both along the southern shore of Lake of the Isles. Two *Areas* along Segment C have potential for intact archaeological deposits (See Table 6 and the Segment C topological and aerial figures [sheets 1 to 5] in Attachment B).

Table 6. Segment C, *Areas* with Archaeological Potential.

Area	Archaeological Potential	*Area*-Acres/*Area*-Acre(s) within Archaeological APE	Comments	Task 2 Inventory Method(s)
C:a	Precontact Period, Contact Period	3/1	Location of 21HE314, NRHP-eligible Woodland period habitation	Pedestrian survey, shovel tests, evaluative units
C:b	Precontact Period, Contact Period	1/1	Location of 21HE315, NRHP-eligible Woodland period habitation	Pedestrian survey, shovel tests, evaluative units
C:c	Historic Period	6/6	19th-century residential neighborhood	Pedestrian survey, non-invasive sampling
Total		10/8		

These *Areas* comprise 8 acres within the Archaeological APE along Segment C. Two previously-identified precontact (and possibly contact period) archaeological sites adjacent to the segment may be expressed within existing mid-town greenway right-of-way.

As this segment corridor also follows an existing railroad grade, it seems likely that construction of the latter would have destroyed or severely impacted archaeological evidence located in its path. However, as previously mentioned, there are cases where remnants of deeply buried archaeological deposits have survived at the base of railroad embankments. This would be of particular concern where the railroad corridor traverses areas of suspected archaeological potential such as uplands that overlook lakes and streams, in this case the Lake of the Isles and Lake Calhoun basins, both drained by Minnehaha Creek. This portion of Segment C has recently been reviewed for archaeological resources. A Phase I/II investigation was conducted in this area in support of a Metropolitan Council Environmental Services project to construct a new forcemain through Hopkins and the City of Saint Louis Park and into the City of Minneapolis as far as Irving Avenue and 27th Street on the east side of Lake of the Isles (Harrison 2009b).

The above-referenced study builds, in part, on the results of a cultural resources review completed in 1999 as part of the preparation of a master plan for Lake of the Isles (Roise 1999). An initial reconnaissance (Phase I) survey covered four islands/former islands in the lake:

- Mikes Island and Raspberry Island, which still are surrounded by water (and have remained quite undisturbed due, in part, to their designation, for many years, as protected heron rookeries);
- Two upland areas which once were known as the Maples Islands and occupied the extreme southern portion of the Lake of the Isles basin until they became landlocked following (a) the construction, in the late 1890s, of the Chicago, St. Paul and Milwaukee Railway across the isthmus between this lake and Lake Calhoun, and (b) by the creation of the parkway that now circles the lake – construction which necessitated extensive cutting and filling at the southern end of the lake.

Evidence of historic activity was identified in all four areas. Most of it was associated with precontact period Native American use of the lake and includes chipped lithic tools and flaking debris, cobble tools, pottery fragments, and faunal remains. Fire-cracked rock, charcoal, and burnt bone indicate the presence of fire hearths. The areas also featured thinly scattered evidence of more recent historic origin (Harrison in Roise 1999). Each find area was added to the Minnesota Archaeological Inventory and assigned a Smithsonian site number: 21 HE 0312 for Mikes Island, 21 HE 0313 for Raspberry Island, 21 HE 0314 and 21 HE 0315 for Maples Island West and Maples Island East. More intensive Phase II testing was then conducted within all four areas in order to assess their research significance and determine their eligibility for the National Register of Historic Places. All four sites were determined to meet National Register eligibility criteria as discussed in a separate technical report (Harrison 2000).

The proposed forcemain route directly parallels the northern side of the former Chicago, St. Paul and Milwaukee Railway embankment and skirts what would have been the southern shores of the Maple Islands. Both areas were revisited in 2009. Closer inspection of the Maples Island West site (21 HE 0314) and the proposed forcemain route determined that the latter runs south of what was once the southern shore of the island. Consequently, the archaeological deposit would not be impacted by construction associated with the Southwest Transitway Project.

The forcemain route seemed more likely to overlap with the *Maples Island East* (21 HE 0315) locality where the shore of this former island once extended south to within a few feet of what is now the railroad embankment. Intensive testing was conducted in this area in October 2009. Shovel tests and formal square meter units were placed within the southern part, which was the area of concern for the forcemain project. This yielded ceramic sherds, a crude biface, a scraper, lithic debitage, several cobble tools, fragments of fire-cracked rock, and some historic glass and metal fragments. Most of the ceramic sherds seem to come from one grit-tempered, cord-impressed Late Woodland vessel. Neither the biface nor the scraper was sufficiently diagnostic to be assigned to a specific time period or cultural tradition. The evidence and relatively undisturbed soil matrix very strongly suggests that the southern part of the site is quite well preserved and has considerable research potential. However, as the southern shore of the island does not appear to have extended below what is now covered by railroad embankment fill, impacts to the cultural deposit should be avoidable.

The forcemain study also focused on the project route segments that run east and west of the former Maples Islands, including the wooded upland due south of the existing embankment.

All of these areas proved to be too disturbed by past wetland modification or other construction to have retained any archaeological potential. This was confirmed by visual inspection and a number of negative shovel tests. Results of these studies indicate that no archaeological evidence would be impacted by future construction activities that parallel the railroad across the isthmus between Lake of the Isles and Lake Calhoun, as long as they are limited to the crest, slope, and immediate vicinity of the base of the existing embankment.

Similarly, testing and visual inspection on the uplands east and west of the isthmus area indicated that any future excavation for a forcemain – or in this case, the Southwest Transitway Project -- would be most unlikely to impact anything but fairly recent fill or slopes too steep to have archaeological potential.

Windshield reconnaissance conducted along the rest of Segment C also indicated very clearly that significant precontact and contact period archaeological evidence would not be impacted by construction in this area. It is very difficult to accurately assess the presence of historic-period archaeological deposits along the rest of Segment C. The lack of opportunities for comprehensive field investigation ahead of major earth moving activities, likely first available during construction along the corridor, will make an assessment of archaeological potential very difficult. As it is proposed entirely within existing city streets or along the former railroad corridor (Midtown Greenway), it is not likely to contain intact precontact and contact period archaeological deposits. While these rights-of-way will likely contain a large number and wide variety of historic material, the integrity and attributable significance of these remains as archaeological deposits is likely very low.

Summary and Recommendations

This overview documents archaeological potential along five Project segments as they are currently defined. Alterations or additions to these Project segments should undergo a similar analysis. These will likely include Operations and Maintenance Facilities (OMF) and Traction Power Substations (TPSS). Some of these areas have been roughly defined as of this writing, namely the OMF locations west of the western terminus of Segments 1 and 3 and in the vicinity of the Target Field Station. These areas may yet have archaeological potential and should be analyzed as appropriate.

In addition, any cumulative effects of development around the Target Field intermodal facility are not addressed here. Any such analysis would be based on development planned parcel by parcel, and most likely relevant when discussing currently blacktopped parcels. When assessing the potential archaeological values under such parcels for future projects, the assessment should include an appropriate level of analysis of adjacent parcels in order to best understand any potential associations that may add to those archaeological values as a whole.

Based on the analysis of the current Project components, it appears that approximately 194 acres across 48 specific areas would require intensive archaeological inventory and assessment if all segments were reviewed.

Segment 1

If Segment 1 is chosen for Project-related development, the six *Areas* should be targeted during the identification effort with a combination of pedestrian survey and shovel testing techniques. Identified resources should be evaluated against the NRHP criteria for eligibility. Should additional work be required in order to fully evaluate identified resources, a testing strategy would likely need to be developed by MnDOT CRU working with the consulting parties on behalf of the FTA.

At those locations with a potential for intact railroad resources, it may be appropriate (and more efficient) for the investigation to include non-invasive sampling techniques ahead of subsurface excavation. Ground penetrating radar (GPR) or electrical resistivity sampling may be used to establish the presence of intact historic period features. If such features appear during the non-invasive sampling effort a subsurface testing effort could be designed to further examine and evaluate the resource.

Segment 3

If Segment 3 is chosen for construction, the 21 *Areas* should be targeted during the survey effort with standard pedestrian survey methods and shovel testing techniques as necessary. Identified resources should be evaluated against the NRHP criteria. Should additional work be required in order to fully evaluate identified resources, a testing strategy would likely need to be developed by MnDOT CRU working with the consulting parties on behalf of the FTA.

Segment 4

If this segment is selected for construction, the nine *Areas* should be targeted during the survey effort with standard pedestrian survey methods and shovel testing techniques as necessary. Identified resources should be evaluated against the NRHP criteria for eligibility. Should additional work be required in order to fully evaluate identified resources, a testing strategy would likely need to be developed by MnDOT CRU working with the consulting parties on behalf of the FTA.

At those locations with a potential for intact railroad or industrial archaeological resources, it may be appropriate and more efficient for the initial investigation to include non-invasive sampling techniques ahead of subsurface excavation. GPR or electrical resistivity sampling may be utilized to establish the presence of intact historic period features. If any features appear during the non-invasive sampling effort, a subsurface testing effort may be designed to further examine and evaluate the resource.

Segment A

Should this segment be selected for construction, the ten *Areas* should be targeted during the survey effort with standard pedestrian survey methods and shovel testing techniques as necessary. Identified resources should be evaluated against the NRHP criteria for eligibility. Should additional work be required in order to fully evaluate identified resources, a testing strategy would likely need to be developed by MnDOT CRU working with the consulting parties on behalf of the FTA.

At those locations with a potential for intact railroad or industrial archaeological resources, it may be appropriate and more efficient for the initial investigation to include non-invasive sampling techniques ahead of subsurface excavation. GPR or electrical resistivity sampling may be utilized to establish the presence of intact historic period features. If any features appear during the non-invasive sampling effort a subsurface testing effort may be designed to further examine and evaluate the resource.

Segment C

The three *Areas* discussed above should be targeted during the identification effort with a combination of pedestrian survey and shovel testing techniques. Identified archaeological materials associated with these sites should be evaluated against the NRHP criteria for eligibility. Consideration may be required of the fact that these sites appear to extend outside of the Archaeological APE. Should additional work be required in order to fully evaluate identified resources, a testing strategy would likely need to be developed by MnDOT CRU working with the consulting parties on behalf of the FTA.

Recommended Future Investigations of Areas Reviewed for this Overview

Archaeological investigations of one or more of these preferred segments should consist of an updated literature search and field review of all areas within the Archaeological APE that are identified as having potential for archaeological deposits and that have not been previously surveyed. The archaeological survey should consist of:

- Pedestrian survey of areas within the Archaeological APE that have suitable surface visibility;
- Shovel testing of high- and moderate-potential areas for buried cultural deposits to a maximum of 1 meter in depth in areas of bridge replacement and trail construction;
- Non-invasive sampling of those areas with potential for industrial or commercial historic archaeological deposits;
- Initial Phase I/II inventory survey using surface survey and shovel testing, followed, as needed by more evaluative, formal testing, and;
- Digital photography documenting existing conditions.

References Cited/Bibliography

Andreas, A.T.

1874. An Illustrated Atlas of the State of Minnesota. A.T. Andreas, Chicago.

Anfinson, S. F.

1989. Archaeology of the Central Minneapolis Riverfront. Part I: Historical Overview and Archaeological Potentials. The Minnesota Archaeologist, Vol.48, No.1-2. Minnesota Archaeological Society, St. Paul.

1990. Archaeological Regions in Minnesota and the Woodland Period. In The Woodland Tradition in the Western Great Lakes: Papers presented to Elden Johnson, edited by G. Gibbon, pp. 135-166. University of Minnesota Publications in Anthropology Number 4, Minneapolis.

1994. Thematic Context: Lithic Scatter. Minnesota Historic Preservation Office.

Anfinson, S. F. and H. E. Wright, Jr.

1990. Climatic Changes and Culture in Prehistoric Minnesota. In The Woodland Tradition in the Western Great Lakes: Papers presented to Elden Johnson, edited by G. Gibbon, pp. 213-232. University of Minnesota Publications in Anthropology Number 4, Minneapolis.

Anfinson, Scott F.

1999 Archaeological Regions in Minnesota and the Woodland Period. In *The Woodland Tradition in the Western Great Lakes: Papers Presented to Elden Johnson*, edited by G.E. Gibbon, pp. 135-166. University of Minnesota Publications in Anthropology Number 3. Minneapolis.

Clouse, Robert A.

1997. Interim Report on Archaeological Excavations at the American Fur Company District Headquarters/Henry H. Sibley House (21 DK 31), Mendota, Minnesota. Minnesota Historical Society, Archaeology Department, St. Paul.

Foote, C.M.

1892. Atlas of the City of Minneapolis, Minnesota. C.M. Foote, Minneapolis.

George, Douglas

1999. Dredge Spoil Site Project, Fort Snelling State Park, Dakota County, Minnesota. Minnesota Historical Society, Minnesota State Park Cultural Resource Management Program, St. Paul.

Gibbon, Guy with Jan Streiff

1990. Elden Johnson, an Appreciation. In The Woodland Tradition in the Western Great Lakes: Papers Presented to Elden Johnson. University of Minnesota Publications in Anthropology Number 4, Minneapolis.

Grimm, E.

1983. Chronology and Dynamics of Vegetation Change in the Prairie-Woodland Region of Southern Minnesota, U.S.A. New Phytologist 93:311-350.

Hagglund, Karl

1994. A Phase I Archaeological Reconnaissance Survey Along the Shores of Smetana Lake, City of Eden Prairie, Hennepin County, Minnesota. Institute for Minnesota Archaeology, Minneapolis.

Harrison, Christina

1982 *Report on Cultural Resource Reconnaissance (Phase I) Survey Performed on the Site of the Proposed Meadow Lakes Addition, City of Minnetonka, Hennepin County, Minnesota*. Archaeological Research Services, Northfield, Minnesota.

1988. T.H.212 Environmental Impact Statement Technical Report: Cultural Resource Investigations. Archaeological Research Services, Minneapolis.

1994. *Report on Cultural Resource Reconnaissance Within the Prairie Lakes Business Center, Eden Prairie, Hennepin County, Minnesota*. Archaeological Research Services, Minneapolis.

1999a. Expansion of Flying Cloud Airport: Review of Cultural Resources, Part I. Prepared for the Metropolitan Airports Commission. Archaeological Research Services, Minneapolis.

1999b. *Report on Cultural Resource Reconnaissance Within the Proposed Liberty Place Development, Eden Prairie, Hennepin County, Minnesota*. Archaeological Research Services, Minneapolis.

2000a. Report on Archaeological Investigation at the Red Rock Site, Birch Island Park, Eden Prairie, Minnesota. Archaeological Research Services, Minneapolis.

2000b. Report on Archaeological Investigations Conducted on Four Islands in Lake of the Isles, Minneapolis, Hennepin County, Minnesota. Prepared for the Minneapolis Park and Recreation Board. Archaeological Research Services, Minneapolis.

2002a. Before the Fort: Native American Presence at the Confluence of the Mississippi and Minnesota Rivers. Prepared for the Minneapolis Park and Recreation Board. Archaeological Research Services, Minneapolis.

2002b. Report on Archaeological Reconnaissance Survey Conducted Along Theodore Wirth Park Bike Trail, Minneapolis, Hennepin County, Minnesota. Prepared for the Minneapolis Park and Recreation Board with Hess, Roise and Company, Minneapolis. Archaeological Research Services, Minneapolis.

2008a Archaeological Investigation Conducted for the NMCWD Eden Prairie Lakes Water Quality Improvement Projects at Birch Island Lake and the Cardinal Creek Conservation Area, City of Eden Prairie, Hennepin County, Minnesota. Archaeological Research Services, Minneapolis.

2008b. Archaeological Investigation Conducted for the NMCWD Eden Prairie Lakes Water Quality Improvement Project, NW and SW Anderson Lakes Drawdown, City of Eden Prairie, Hennepin County, Minnesota. Archaeological Research Services, Minneapolis.

2009a Archaeological Investigation Conducted for the Nine Mile Creek Stabilization Project, City of Hopkins, Hennepin County, Minnesota. Archaeological Research Services, Minneapolis.2009b. Report on Archaeological Investigation Conducted for the Hopkins Lift Station and Forcemain Project, Cities of Hopkins, St. Louis Park and Minneapolis, Hennepin County, Minnesota. Prepared for the Metropolitan Council Environmental Services. Archaeological Research Services, Minneapolis.

Lofstrom, Ted and Lynne VanBrocklin Spaeth

1978. Carver County: A Guide to Its Historic and Prehistoric Places. Minnesota Historical Society: State Historic Preservation Office, St. Paul.

Lueth, Robert A.

1974. Soil Survey of Hennepin County, Minnesota. USDA Soil Conservation Service, St. Paul.

Lynott, Mark J., Jeffrey J. Richner, and Mona Thompson.

1986. *Archeological Investigations at Voyageurs National Park, 1979 and 1980*. National Park Service, Midwest Archeological Center.

Marschner, F.

1974. The Original Vegetation of Minnesota: Compiled from U.S. General Land Office Survey Notes. North Central Forest Experiment Station. St. Paul. (Map reprinted from original published in 1930.)

Nute, Grace

1930. Posts in the Minnesota Fur-Trading area, 1660-1855. Minnesota History, 11: 353-385.

Perkl, Bradley E., James Lindbeck, Scott Buskey and Barbara Mitchell

2001. Phase I and Phase II Cultural Resource Investigations: The Metropolitan Airports Commission Drainage Improvement Project in Hennepin County, Minnesota. URS/BRW, Inc., Minneapolis.

Peterson, Leslie D.

1977. Investigation of the Black Dog Village and Burial Sites. Unpublished report, with amendment. Minnesota Historical Society, St. Paul.

1978. The Minnesota Trunk Highway Archaeological Reconnaissance Survey: Annual Report -1977. Minnesota Historical Society, St. Paul.

Pond, Samuel W.

1940. Two Missionaries in the Sioux Country. Minnesota History 21:15-32, 158-175 and 272-283.

1986. The Dakota or Sioux in Minnesota As They Were in 1834. First published in 1908. Reprinted with an introduction by Cary Clayton Anderson (pages vii-xxi).Minnesota Historical Society Press, St. Paul.

Roise, Charlene K.

1999. Lake of the Isles Master Plan: Document for Consultation. Prepared for the Minneapolis Park and Recreation Board by Hess Roise and Company.

Schweigert, Kurt P.

1992. City-Wide Cultural Resources Survey of Eden Prairie, Minnesota, Year 1: 1992. Tellus Consultants, Inc. Minneapolis, MN.

Spector, Janet D.

1993. What This Awl Means: Feminist Archaeology at a Wahpeton Dakota Village. Minnesota Historical Society Press, St. Paul.

Taliaferro, Lawrence

1894. Autobiography. Minnesota Historical Collections. 6:189-255.

Trygg, J.W.

1969. Composite Map of United States Land Surveyor’s Original Plats and Field Notes. Minnesota Series, Sheet 7. J.W. Trygg, Ely, Minnesota.

University of Minnesota, Agricultural Experiment Station

1973. Minnesota Soil Atlas: St. Paul Sheet. (Miscellaneous Report 120.) St. Paul.

Vogel, Robert C., David G. Stanley and E. Arthur Bettis III

1994. Historic Landscape and Archaeological Surveys in the City of Eden Prairie, Minnesota: Cultural Resource Survey III Final Report. Bear Creek Archaeology, Inc. Cresco, Iowa.

Winchell, N.H.

1911. The Aborigines of Minnesota. Minnesota Historical Society, St. Paul.

Wright, H.E. Jr.

1972a. Physiography of Minnesota. In Geology of Minnesota: A Centennial Volume, edited by P.K. Sims and G.B. Morey, pp. 559-580. Minnesota Geological Survey, St. Paul.

1972b. Quaternary History of Minnesota. In Geology of Minnesota: A Centennial Volume, edited by P.K. Sims and G.B. Morey, pp. 515-547. Minnesota Geological Survey, St. Paul.

1974. The Environment of Early Man in the Great Lakes Region. In Aspects of Upper Great Lakes Anthropology: Papers in Honor of Lloyd A. Wilford, edited by E. Johnson, pp. 8-14. Minnesota Prehistoric Archaeology Series Number 11. Minnesota Historical Society, St. Paul.

Attachment A – Research Design

Southwest Transitway:

A Research Design for Cultural Resources

12 February 2010
Updated 16 March 2010 and 2 April 2010

Prepared by

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Christina Harrison – Archaeological Research Services
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INTRODUCTION

The Hennepin County Regional Rail Authority is proposing to construct the Southwest Light Rail Transit (SWLRT) facility, linking the Intermodal Station in downtown Minneapolis with the central business area in suburban Eden Prairie. The line is located within the cities of Minneapolis, St. Louis Park, Hopkins, Minnetonka, and Eden Prairie.

The Federal Transit Administration (FTA) has determined that the proposed project is an undertaking as defined by the National Historic Preservation Act (NHPA) and is subject to the provisions of Section 106 of the NHPA. Section 106 requires that federal agencies take historic properties into account as part of project planning. The Cultural Resources Unit (CRU) of the Minnesota Department of Transportation (MnDOT) is acting on behalf of FTA for many aspects of the Section 106 review process for SWLRT. The FTA has also determined that the SWLRT is subject to the National Environmental Policy Act (NEPA) and a Draft Environmental Impact Statement (DEIS) is being prepared by Hennepin County under the direction of the FTA.

Through the NEPA scoping process, four build alternatives were identified. To streamline subsequent analysis, these alternatives were divided into five segments. The following table, which was included in the draft "Southwest LRT Technical Memorandum No. 9: Environmental Evaluation" (September 9, 2009), outlines the segments that are associated with each of the alternatives:

Alternative	Segments
LRT 1A	1, 4, A
LRT 3A	3, 4, A
LRT 3C-1 (Nicollet Mall)	3, 4, C-1 (Nicollet Mall)
LRT 3C-2 (11th/12th Street)	3,4, C-2 (11th-12th Streets), C-2A (Blaisdell Avenue), C-2B (1st Avenue)

Segment 1 extends northeast from a station in Eden Prairie at TH 5 along a former rail corridor owned by the Hennepin County Railroad Authority (HCRRA) to a station at Shady Oak Road, on the border between Minnetonka and Hopkins.

Segment 3 creates a new corridor, running east from a station at Mitchell Road in Eden Prairie and turning northerly to terminate at the Shady Oak Station.

Segment 4 follows an existing rail corridor east-northeasterly from the Shady Oak Station through Hopkins and Saint Louis Park to the West Lake Station in Minneapolis, near that city's western border.

Segment A continues northeast from the West Lake Station, mostly using an existing rail corridor, to the Intermodal Station on the western edge of downtown Minneapolis.

Segment C also begins at the West Lake Station, traveling east along a former rail corridor (now the Midtown Greenway), north along one of several alternative courses under and on city streets, to and through downtown Minneapolis, and ultimately ending at the Intermodal Station or South Fourth Street. (For the purpose of this cultural resources assessment, all of the "C" variations will be considered as a single group.)

It should be noted that the above segments overlap at three points: the Shady Oak Station, the West Lake Station, and the Royalston/Intermodal Stations. When the results of the cultural resource surveys are sorted by segment, there will be redundancy in the findings at these three points. This redundancy is inevitable if the effects of each segment are to be analyzed. When a single alternative is selected, it will be necessary to eliminate duplicated properties to obtain an accurate representation of the effects of that alternative.

PROPOSED METHODOLOGY FOR ARCHAEOLOGICAL RESOURCES SURVEY

Christina Harrison – Archaeological Research Services
Mike Justin and Mike Madsen – HDR Engineering

This work plan outlines a program to identify archaeological properties which meet the criteria of the National Register of Historic Places in the project's area of potential effect (APE), to be used in assessing potential effects to those properties. Three primary tasks comprise the work plan. First, in order to provide a uniform assessment of available data across the five project segments discussed in the DEIS, the project team will prepare a report (by project segment within a broad APE) to include: results of the literature search, an archaeological probability assessment, and a field survey strategy (Task 1). It is expected that a limited amount of field investigation/sampling may occur as part of this task depending upon the weather. Second, an archaeological inventory/evaluation of the selected alternative will be completed, using a refined APE based on proposed construction (Task 2). Finally, a report of the field investigations of the selected alternative and an assessment of effects will be prepared (Task 3).

Task 1 will involve archaeologists from both HDR and ARS. Support will be provided, as needed, by Hess Roise research staff as well as by geomorphologists and other paleoenvironmental experts provided by HDR. Division of responsibilities will partly depend on what survey needs are identified by the background research, but primary responsibility for precontact and contact period archaeology will rest with Christina Harrison (ARS) and Michael Justin (HDR), and for historic archaeology with Michael Madson (HDR). The personnel for Tasks 2 and 3 are pending.

The survey will be conducted in accordance with all federal, state, and local requirements, including the Minnesota Field Archaeology Act and the Minnesota Private Cemeteries Act.

Area of Potential Effect (APE)

The APE for archaeological resources is generally defined as the anticipated limits of construction activities. At this stage in the project development, factors influencing those limits have not yet been fully identified. The APE, starting with a broad area at first, will be refined as the engineering design advances.

For Task 1, the APE for the literature search and probability assessment will be based, as appropriate, on the project limits as defined in the project engineering drawings used to prepare the DEIS. This will include the full width of existing railroad right-of-way corridors as well as the area within 100 feet on either side of the current engineering alignments. The APE near station areas also includes any undeveloped and/or vacant property within 500 feet that could potentially be utilized for construction/development activities. Depending on the station location, these may include open, green spaces (particularly in suburban areas) and paved parking lots (particularly in urban areas).

If the literature search/probability assessment identifies potentially significant historic features or high probability areas immediately adjacent to the above-referenced APE parameters, and if the significance of potential sites in these areas is expected to relate to National Register criteria A, B, and/or C, the APE for the field strategy for the Phase I-II survey may be adjusted to include these locations.

During Task 2, the APE will be reviewed in light of more detailed engineering plans. Throughout the design phase of the project, the adequacy of the APE will be periodically evaluated and expanded or retracted as necessary as project elements are added or modified. The survey report specified in Task 3 will provide a clear delineation of the surveyed APE, including all additions, so that the adequacy of survey efforts can be readily determined when project changes are proposed.

It should be noted that, generally, the APE for archaeological resources is a smaller area located within the APE for history/architecture resources.

Task 1. Report of Archival Review/Site Probability/Field Strategy

This task will uniformly represent the readily available information across the five project segments discussed in the DEIS. In general the report will be a desktop analysis of existing archaeological research data supplemented by a discussion of probability for previously unidentified archaeological properties. Field inspections may be utilized to confirm existing conditions, particularly to inform the discussion on field survey strategies.

The desktop analysis will utilize documents on file at the State Historic Preservation Office (SHPO) and the Office of the State Archaeologist (OSA). Historic maps and aerial photographs, local histories, and other archival information on file at the Minnesota Historical Society, the Borchert Map Library (at the University of Minnesota), and local libraries and historical societies may also be reviewed. The task will review:

- Archaeological survey reports on file at SHPO, OSA and other repositories in order to establish what segments of the project routes have already been inventoried according to current standards;
- Known archaeological sites and/or (if applicable) recommendations/confirmations of NRHP eligibility;
- Relevant USGS topographic maps and soil surveys as well as any Mn/Model information and other environmental and paleoenvironmental data pertinent to the assessment of pre-contact archaeological site probability, including land use histories; and
- Historic maps and aerial photographs to identify localities with historic-period archaeological site potential.

A preliminary field review will be conducted. The survey team will document visible indications of topographic and hydrological features as well as past and current land use with concomitant loss of soil integrity. The information from field observations will be combined with the data gathered during the archival review to propose archaeological site probability along the five segments.

Pre-contact and historic-period contexts will be briefly reviewed, with a focus to inform the discussion of site types and assessment of probability. The probability assessment will be organized by the five project segments (1, 3, 4, A, and C). For each of the five segments the report will include:

- A general description of the APE;
- A discussion of previous surveys and previously identified sites;
- A discussion of historic site types and the associated conditions that may indicate a historic property;

- A discussion of archaeological probability (for pre-contact/contact period and historic-period); and
- A survey strategy and methods, including specific places targeted for field investigation.

The survey strategy for precontact and contact period evidence will be guided by Native American and early Euro-American settlement and land use patterns identified by previous archaeological investigations in the vicinity including, for example, the 1992-1994 city-wide cultural resource survey of Eden Prairie, the corridor surveys conducted for Trunk Highway 212 and Trunk Highway 12, and a number of smaller scale compliance surveys conducted within the Nine Mile, Minnehaha and Purgatory Creek watersheds.

The results of Task 1 will be summarized in the DEIS.

Task 2. Inventory/Evaluation (Phase I-II) Survey

For the Inventory/Evaluation survey, the APE will be refined to reflect the updated engineering design. That refined APE will be surveyed in a manner consistent with the recommendations presented in the Task 1 report. Field methods outlined in the Minnesota SHPO and MnDOT CRU guidelines will be generally followed; any exception, as well as more detail specific to the existing conditions along each segment, will have been documented in the Task 1 report.

In the case of precontact/contact period Native American evidence, the field sampling will involve standard methods for identification and the preliminary assessment of horizontal and vertical site dimensions, integrity, and National Register potential. In addition, the survey may utilize targeted geomorphological testing and analysis in areas likely to feature deeply buried archaeological evidence.

Artifacts will be collected and analyzed in a manner consistent with contemporary standards. Artifacts from private property will be collected with written permission of the landowner. Historic period artifacts will only be collected if they appear to represent a potentially significant archaeological property.

Archaeological sites determined to have National Register potential will then require more comprehensive Phase II formal testing. As the Phase I review more than likely will have identified a wide range of site types associated with highly varied environmental settings and precontact to historic period contexts, the scope, research questions, and field and analytic needs will be more appropriately defined at that stage of the investigation.

Task 3. Analysis and Reporting

A technical report of the Phase I and Phase II investigations, including the methodology, field work results, and recommendations, will be prepared in accordance with the guidelines of MnDOT's CRU, the Secretary of the Interior's Standards for Identification and Evaluation, and other applicable state and federal guidelines. This includes submittal of Geographic Information Systems (GIS) data per the CRU guidelines. All sites documented during the survey will be recorded on new or updated Minnesota Archaeological Site Forms.

Collected artifacts will be processed and analyzed in compliance with the survey guidelines of the SHPO and the Mn/DOT CRU. Artifacts will be curated at an approved facility as stipulated in the consultant's archaeology license.

PROPOSED METHODOLOGY FOR HISTORY/ARCHITECTURE RESOURCES SURVEY

Charlene Roise – Hess, Roise and Company

Area of Potential Effect (APE)

Generally, the APE for history/architecture resources extends 300 feet on either side of the centerline of the alignment of each corridor. Around each station, the APE includes property within a quarter-mile radius. This area addresses anticipated project-related infrastructure work and reasonably foreseeable development.

The APE is illustrated in maps of the five project segments. Exceptions to the parameters outlined above include the following:

- The APE for the Intermodal Station (in segments A and C) includes all property within the boundaries adopted for the "Downtown Minneapolis Transit Hub" Environmental Screening Report (October 28, 2009 review draft) prepared for Hennepin County by Kimley-Horn and Associates. The area shown in the report is extended northeast of Washington Avenue to and across the Mississippi River to include the first tier of properties on Nicollet Island, to provide adequate APE coverage for the three-block potential station area and related developments such as rail storage yards. This area addresses infrastructure work associated with the SWLRT project as well as cumulative effects related to the development of the Intermodal station. (See below for discussion about splitting responsibility for survey of this area between the SWLRT project and the Intermodal Station project.)
- The APE for the 4th Street, 8th Street, 12th Street, Harmon Place, Hawthorne Avenue, Lyndale, and Uptown Stations (in segment C) includes the adjacent blocks in all directions from the station. This area is proposed for the stations in the more densely-built urban area, in comparison to the larger quarter-mile radius for other stations in outlying areas.
- The APE for the proposed tunnel area under Blaisdell, Nicollet, or First Avenues, including the 28th Street and Franklin Stations (in segment C), extends from one-half block west of Blaisdell Avenue to one-half block east of First Avenue. If this alternative is selected, the APE may need to be expanded in light of the design and construction methods for the tunnel.
- Along some portions of the corridor, the 300 foot APE may be extended to take into account visual effects. For example, if the 300 foot area comprises open space, and a row of buildings is located beyond, these buildings may be included in the APE.
- In some station areas, there are known areas of project related work and/or anticipated development outside of the quarter-mile radius, and these areas are included in the APE. This includes areas in downtown Hopkins.

The APE may also be adjusted if a field surveyor recommends that the project may affect a property or properties not included in the established APE boundaries.

As project planning proceeds, additional factors will be assessed to determine if there are other effects (direct, visual, auditory, atmospheric, and/or changes in use) which could require an expansion of the above APE. These factors include:

- Noise analysis, including areas where the use of bells and whistles is anticipated.
- Vibration analysis, including vibration related to project construction and operations.
- The specific locations of project elements, including operations/maintenance facilities, park-and-ride facilities, traction power substations, signal bungalows, and other infrastructure.

Survey Approach

Survey Zones

The project cuts through a number of distinct communities, each with a unique history. As a result, these communities, which share similar physical and historical characteristics, can serve as a framework for conducting the survey. The survey will be organized around the following zones (related project segments and stations are listed in parenthesis):

- Eden Prairie (Segments 1 and 3; Highway 5, Highway 62, Mitchell Road, Southwest Station, Eden Prairie Town Center, Golden Triangle, City West Stations)
- Minnetonka (Segments 1 and 3; Rowland, Opus, Shady Oak Stations)
- Hopkins (Segment 4; Shady Oak, Hopkins, Blake Stations)
- Saint Louis Park (Segment 4; Louisiana, Wooddale, Beltline Stations)
- Minneapolis west residential, including parts of Bryn Mawr, Lowry Hill, East Isles, Kenwood, Cedar-Isles-Dean, and West Calhoun neighborhoods (Segments A and C; West Lake, 21st Street, Penn Stations)
- Minneapolis south residential/commercial, including parts of the Stevens Square/Loring Heights, Whittier, Lowry Hill East, East Isles, and Cedar-Isles-Dean neighborhoods and the Midtown Greenway (Segment C; Uptown, Lyndale, 28th Street, Franklin Stations)
- Minneapolis downtown north of I-94 (Segment C; 12th Street, 8th Street, 4th Street, Harmon Place, Hawthorne Avenue Stations)
- Minneapolis industrial (Segments A and C; Van White, Royalston Stations)
- Minneapolis warehouse (Segments A and C; Intermodal Station)

In addition, there are four railroad corridors that traverse these community boundaries. These corridors will be considered as four individual zones. The corridors (by historic names) are:

- Minneapolis and Saint Louis Railway (Chicago and North Western Railway). Part of the main line is in the APE (Segments 1, 4, A and C). A segment of this line between downtown Minneapolis and Merriam Junction has recently been evaluated by the Surface Transportation Board as not eligible to the National Register; however, the SHPO did not concur with this finding. The line will be further evaluated, focusing on the section within the APE.
- Chicago, Milwaukee and Saint Paul Railway (Milwaukee Road), Benton Cutoff. Part of the CM&SP Benton Cutoff is in the APE (Segments 4, A, and C). Except for the Chicago, Milwaukee and Saint Paul Railroad Grade Separation Historic District, which is listed in the National Register, the Benton Cutoff has previously been determined as not eligible to the National Register by the Federal Highway Administration, with concurrence by the SHPO.
- Saint Paul and Pacific Railway (Great Northern Railway). Part of the main line is in the APE (Segment A). This line will be evaluated.

- Minneapolis, Northfield, and Southern Railway. Part of the Auto Club-Luce Line Extension of the MN&S is in the APE (Segment 4). This line has been previously evaluated by Mn/DOT CRU, and the Auto Club-Luce Line Extension has been recommended as not eligible to the National Register. This determination has not been submitted to SHPO for concurrence. The Mn/DOT CRU evaluation will be summarized and incorporated into this survey by reference.

All of the above lines, including those which have been evaluated as not eligible, will be inventoried and evaluated to identify any railroad related features in the APE that are potentially significant in their own right. The statewide railroad context developed by Mn/DOT CRU will serve as a basis for evaluation of railroad resources.

The survey of the above thirteen zones will be completed by three consultants. Hess Roise will complete the surveys for the five zones in Minneapolis, Mead & Hunt will complete the surveys for St. Louis Park, Hopkins, Minnetonka, and Eden Prairie, and Summit Envirosolutions will complete the surveys for the four railroad zones. Each consultant will prepare a report for the Phase I-II survey of the zones completed. An overall summary, integrating the survey results from all thirteen zones, will be prepared for the analysis of effects, within the framework of the five project segments.

The survey will include properties built in 1965 and earlier. Although National Register guidelines use a 50-year cut-off for eligibility (except for properties of exceptional importance), adopting a 45-year cut-off for this survey provides 5 years for project planning before the survey becomes outdated.

NOTE ON RESPONSIBILITY FOR SURVEYS IN THE INTERMODAL STATION AREA: There is an overlap of the APEs for the SWLRT project and the Intermodal Station project (currently in the planning stage). The SWLRT survey effort will complete survey work for only a portion of the SWLRT APE in the vicinity of the Intermodal Station, including where SWLRT construction is anticipated. The remainder of this area will be surveyed as part of the planning for the Intermodal Station project. The survey results from the Intermodal Station survey will be included in the consideration of cumulative effects as part of the SWLRT Section 106 review. (See map for the division of survey responsibilities in this portion of the SWLRT APE.)

Phase I Survey (Reconnaissance Survey)

The primary goal of Phase I is to identify properties that appear to have the potential to qualify for the National Register and merit further analysis. This will eliminate from further consideration any properties that have little or no potential to meet National Register criteria. The Phase I survey will also verify that properties already listed or officially determined eligible for listing in the National Register still retain integrity.

Literature Search

The literature search will focus on areas within the APE, with broader contextual information procured as needed. The literature search will begin by collecting existing reports and research for each zone. Maps, atlases, and other information that can provide specific information about property within the APE for archaeology will be a high priority. Additional research will be conducted for specific areas, and occasionally on specific properties, as appropriate. The literature search will produce:

- A working set of research files, including maps and related materials, for each zone. A copy of these files will be provided to the archaeological team.
- For each zone, a brief context (perhaps with subcontexts) will be developed that is approximately two to five pages in length and comprises a brief narrative, an annotated list of relevant property types, and a preliminary period of significance. (This assumes that extensive narrative contexts will not be developed during this phase.) A similar context will also be prepared for each railway, focusing specifically on segments in the APE. These contexts will also be provided to the archaeological team.

Fieldwork

A project-specific inventory form will be developed. Prior to the onset of fieldwork, a draft inventory form will be submitted to the client for review and approval.

The Hennepin County property database provides building construction dates for tax parcels. These dates will be assumed to be generally reliable for properties erected in the last half of the twentieth century, and will therefore be used to eliminate properties built after 1965 from the survey. During fieldwork, however, surveyors will be observant of properties eliminated from the inventory to identify:

- Inaccuracies: Properties not included in the survey that appear to date from 1965 and earlier (in other words, instances where the county date appears to be incorrect);
- Incomplete data: Properties not included in the survey that contain multiple buildings or other features, where the county date may refer to a newer feature—but older features are also present;
- Exceptional properties: Properties dating from 1966 or later that might be of exceptional importance.

Fieldwork will be conducted by zones. The methodology for each zone is as follows:

- Using information from the Hennepin County database, surveyors will be provided with a spreadsheet listing all properties in the zone built in 1965 or earlier. In addition to the address and year built, the spreadsheet will include the property's use and the name of the owner and taxpayer. The survey will include properties listed or officially determined eligible for listing in the National Register (including those in historic districts) to verify that they retain integrity. Map books will be prepared for reference in the field.
- Surveyors will conduct site visits for each property, recording observations from public rights-of-way with field notes and digital photographs. At a minimum, surveyors will record information on noteworthy features and the property's integrity. Using the data categories for functions and uses outlined in the National Register bulletin *How to Complete the National Register Registration Form*, and with reference to the context information for each zone, the surveyor will suggest data categories that seem the most appropriate for evaluating the property's National Register potential. The surveyor will also provide a preliminary recommendation—and a justification for that recommendation—stating that 1) the property does not appear to be eligible for the National Register, or 2) the property should be evaluated in Phase II.
- All field surveyors will meet the Secretary of the Interior's Professional Qualifications Standards.

Deliverables for Phase I survey

- For each zone:
    - Synopsis for each zone, including the context and property type information.
    - Table of surveyed properties including recommendations for intensive level survey, with justification.
    - Inventory form (2 copies) for each property in the APE built in 1965 or earlier. In addition to the data collected in the field, the inventory forms will incorporate information on the property's location (UTM reference, township/range/section) from the county database. At least one color digital photograph of the property will be included on each form. (NOTE: For properties which go to a Phase II evaluation, the same survey form should incorporate the evaluation information.)
    - Map of zone with properties recommended for intensive-level survey identified.

Phase II Survey (Intensive)

The goal of Phase II is to evaluate properties, as recommended in Phase I, to determine which meet the criteria of the National Register of Historic Places. As with Phase I, the work will be organized by zones.

Literature Search

The literature search will focus on individual properties and districts that have potential to meet National Register criteria. To provide a framework for evaluating some properties, it may be necessary to expand the context synopses developed in Phase I to address specific physical areas, eras, and/or property types.

Fieldwork

Additional field work may be needed to evaluate the physical characteristics of individual properties and districts. It might be necessary to obtain permission to enter some properties for this evaluation—if, for example, there is the potential for a significant interior space, or if a parcel is large and contains a number of buildings and these buildings cannot be adequately evaluated from the public right-of-way, aerial photographs, or other means.

Deliverables for Phase II survey

- For each zone:
    - Table of Phase II properties, including recommendations on eligibility.
    - More detailed inventory form, including the narrative evaluation of eligibility, for each property included in this phase.
    - Map of zone, showing properties that appear to qualify for the National Register identified, along with listed and previously determined eligible properties.
- A Phase I-II survey report (for all zones completed by the same consultant) conforming to Mn/DOT CRU Architecture/History Report requirements and other applicable federal and state guidelines.

At the conclusion of all Phase II history/architecture survey work, a consolidated summary/table incorporating the work from all thirteen zones will be prepared for the analysis of effect. This summary will be organized by the five project segments.

Attachment B – Figures

Due to the sensitive nature of the information that they contain,
these maps will not be provided except by request to the Metropolitan Council.

Phase 1a Archaeological Investigation of the Freight Rail Relocation Corridor for the Southwest Corridor Transitway Project, Hennepin County, Minnesota

Prepared for

Metropolitan Council

Prepared by

SWCA Environmental Consultants

June 2012

Phase 1a Archaeological Investigation of the Freight Rail Relocation Corridor for the Southwest Corridor Transitway Project, Hennepin County, Minnesota

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FREIGHT RAIL RELOCATION CORRIDOR

This technical report supplements data presented in the *Phase Ia Archaeological Investigation for the Proposed Southwest Corridor Transitway Project, Hennepin County, Minnesota* (Harrison and Madson 2010). Since preparation of that document, potential future routes for freight rail traffic currently running along portions of proposed LRT segments 4 and A have been added to the scope of the DEIS and the Section 106 review. Relocation of this freight rail traffic to an existing freight rail corridor in St. Louis Park and Minneapolis and co-location of the freight rail with the proposed light rail are both being considered. This supplemental Phase 1a report addresses the Freight Rail Relocation Corridor (FRR). The co-location corridor was included in the analysis of Segments 4 and A in the 2010 Phase 1a report. Overlapping archaeological areas are included in Table 2 of this report.

The relocation of freight rail traffic would require track improvements to the existing Canadian Pacific Railway (CP) Bass Lake Spur, CP MN&S Spur, and the BNSF Railway (BNSF) Wayzata Subdivision in the Cities of St. Louis Park and Minneapolis (Attachment B: Figure 1). The freight rail traffic would be diverted from the current route necessitating upgrades and improvements to the FRR to accommodate increased loads and unit train frequency. A thorough analysis of the archaeological site potential along the FRR is warranted to understand any potential impacts (and ultimately adverse effects) to buried or near surface historic properties that may result from proposed upgrades and improvements.

The methodology for this Phase Ia archaeological investigation mimics that presented in Harrison and Madson (2010) for Task 1: an outline of the literature and map review supplemented by limited field review (2010: 2, see also Attachment A). This overview report summarizes the archaeological potential as identified through existing site and survey documents, historic maps, aerial photos analyzed in conjunction with visible indications of hydrological and topographic features. Background information, primarily in the form of historic and modern maps, was collected to characterize the archaeological potential along the FRR and to predict areas of archaeological sensitivity. On May 11, 2012 archaeologists from SWCA Environmental Consultants (SWCA), Archaeological Research Services (ARS), and Archaeo-Physics conducted a field review of the FRR to identify areas of archaeological potential.

METHODOLOGY

AREA OF POTENTIAL EFFECTS

The archaeological Area of Potential Effect (APE) for the FRR is based on the parameters established in the research design for cultural resource surveys for the project (Attachment A). The APE extends 100 feet on either side of current engineering alignments and includes the full width of the existing railroad right-of-way (ROW), which is generally 50 feet wide. The overall width of the APE is 250 feet.

On April 26 and 27, 2012 SWCA and ARS archaeologists reviewed files at the Minnesota Office of the State Archaeologist (OSA) and SHPO to identify information regarding previously identified sites within the APE. No previously identified sites were identified during the review

A cartographic and aerial photo search was conducted to identify area of high precontact and contact-period archaeological potential as well as historical period sites from the 1850s to 1920. Maps also identified ground disturbing activities in the historic period that will have destroyed archaeological sites, eliminating areas from further study.

Map collections consulted were: the Minneapolis Collection of the Hennepin County Library, the collections of the Minnesota Historical Society, the Hennepin County Historical Society, and the Borchart Map Library at the University of Minnesota. In addition, digital maps from the U.S. Geological Survey (USGS) were consulted as well as General Land Office (GLO) maps and historic topographic maps.

The FRR alignment was overlain on historic maps dating from the 1850s to 1890s using geographic information systems (GIS) layers to identify specific high potential areas.

EXISTING CONDITIONS

The glacial moraine landscape of the FRR is underlain by clay soils and characterized by low-lying, poorly drained kettles that tend to form swamps and small ponds as well as small upland “knobs” and long upland ridges where better drainage favored human settlement (Borchart 1958). Archaeologically the most important existing condition of the corridor is that it falls along railroad ROWs that may have destroyed the integrity of any superficial archaeological features, while also protecting areas within the ROW from twentieth century development.

CONTEXTUAL BACKGROUND

The precontact and contact-period archaeological context has been previously prepared by Harrison and Madson (2010). Historic period contexts can be found in Goodson (2010, 2012), Roise et al. (2012), and Schmidt (2010).

The FRR has the highest potential to preserve precontact and contact-period materials near the margins of bodies of water. Historical archaeological materials representing rural subsistence farming from 1851-1870, diversified farming from 1870-1890, and exurban railroad and industrial development from 1890-1920, as well as the domestic elements related to these economies, are also expected within the FRR project area.

FIELD REVIEW

After identifying the areas with the highest potential to contain archaeological resources based on map and document research, the May 11, 2012 site visit clarified which areas retain integrity to preserve archaeological materials. Archaeologists reviewed construction impacts related to rail development, utilities, street and highway construction as well as housing developments. Visual inspection consisted of a windshield survey of the entire FRR. High probability area were also visited on foot and photographed for reference.

ARCHAEOLOGICAL SITE POTENTIAL

FREIGHT RAIL RELOCATION CORRIDOR OVERVIEW

The FRR is 3 miles long and encompasses three discrete rail lines (Attachment B: Figure 1):

- The CP Bass Lake Spur running east-west on the southern section which overlaps the previously studied area surrounding the proposed Louisiana Station;
- The MN&S section running roughly north-south from south of the CP line to the Iron Triangle, and;
- the BNSF alignment overlapping Segment A of the proposed Southwest Transitway near Cedar Lake.

Identification of areas of high probability for archaeological sites was based on past archaeological survey near the project area, models of Native American land use, and European American settlement patterns aided by historic maps of the project area and previous studies in Minnesota. These factors guided identification of parcels with the highest potential to contain intact archaeological resources from significant time periods.

Five areas with potential to contain archaeological resources are located within the FRR alignment APE (Attachment B: Figure 2). Two of these areas (LRT Area 4:e in Segment 1 and LRT Area A:h in Segment 3) were identified in the previous study (Harrison and Madson 2010). Three unique locations were identified in the FRR. These areas, FRR:a, FRR:b, and FRR:c are summarized below.

Table 1: FRR Corridor: Archaeological Areas Identified in Current Study

Area	Archaeological Potential	Total Acres/Acres in APE	Comments	Task 2 Inventory Methods
FRR:a	Historic Period	0.15/0.03	Domestic, Block 67	Non-invasive testing, maps
FRR:b	Historic Period	1.60/0.32	Hutchinson line railroad	Pedestrian survey, aerial photos
FRR:c	Precontact, Contact-Period	4.34/1.77	Brownie Lake	Pedestrian survey, shovel testing,
Total		6.09/2.12		

FRR:a, Block 67

The back lots of the two large houses built ca. 1898 on block 67 on Oak Street (now Cambridge) fall within the APE at the far southern end of the Freight Rail Relocation Corridor (Attachment B: Figure 3). These two large houses have a clear connection with late nineteenth century industrial/village factory workers who lived in the boarding houses surrounding the St. Louis Park Industrial Village and have potential to contain back lot archaeological features outside of the rail bed and within the APE. Non-invasive testing of the paved areas and shovel testing of backyards of the houses at *FRR:a* should be undertaken to determine whether they contain intact archaeological features.

FRR:b, Hutchinson Branch Railroad

The Hutchinson Branch of the St. Paul and Pacific passed through the Iron Triangle in the late nineteenth century before the Minnetonka Cutoff was constructed north of Cedar Lake in the current BNSF location (Schmidt 2010, Wright 1873, Westby 1913) (Attachment B: Figure 4). The route, which was abandoned in the 1880s, is visible on twentieth century aerial maps and during the visual survey (Mark Hurd Aerial Surveys Inc. 1937: WN-10-849). It is recommended that the location of this section of the Hutchinson Branch of the St. Paul and Pacific rail line be identified and evaluated.

FRR:c, Brownie Lake

North of the existing BNSF tracks and west, south, and east of Brownie Lake there are relatively level, undisturbed areas within 300' of the current shoreline that have potential for precontact and contact-period archaeological materials (Attachment B: Figure 5).

Eliminated Areas

The poorly drained area south of the CP line in the Skunk Hollow was developed in the twentieth century for a variety of smaller light industrial and storage facilities. Due to evidence of cutting, filling and the absence of significant historical use, no further study is recommended. North of the CP line, the project area falls within former and current wetlands and the southern edge of the capped and sealed Golden Auto Lead Superfund Clean Up Site.

From the CP line to Highway 7 (formerly Highland) and continuing north to the St. Louis Park High School at Wooddale, the MN&S corridor passes though commercial and residential city blocks developed in nineteenth century. The narrow undeveloped railroad ROW represents only slivers of potential sites in front and side yards. In addition, the visual survey found that the ROW has been heavily modified by highway construction, railroad grading, underground utility lines linked to crossing barriers, fiber optics lines, and the bases of electrical towers. Further archaeological investigation is not recommended for this section of the alignment.

No high probability areas were identified in the map or field review from Wooddale Avenue to the Iron Triangle.

The Iron Triangle Area is shown within a marsh on maps from the 1854 GLO to the present. In addition, no structures are shown within the Iron Triangle Area on any maps from that period through the twentieth century. Because the entire area has been historically in a wetland, and there is no evidence of shoreline, knolls or islands within the APE, no further study is recommended for precontact and contact-period archaeology.

From the Iron Triangle Area east to Cedar Lake, historic maps from the 1850s to the present show two large marshes. Within St. Louis Park, no structures are visible on any of the early twentieth century maps and no roads intersect with the alignment of the Freight Rail Relocation Corridor. In addition to not being located in a high probability area, the current topographic maps show that there has been extensive grading surrounding the existing BNSF track. High potential upland areas in this segment have been graded down to fill in wetlands and destroying their potential to preserve intact archaeological resources.

Map and historical research provides evidence of massive earthmoving immediately north of (and within) Cedar Lake from at least the 1880s to the 1920s to fill in former shoreline and level the area to make room for the rails. This location is a heavily modified industrial landscape; thus the area from the northern shore of Cedar Lake to the northern edge of the existing railroad roadway does not have the potential to contain non-railroad cultural materials.

AREAS PREVIOUSLY IDENTIFIED

Areas 4e-north and 4e-south

The section of the FRR on either side of Minnehaha Creek contains uplands overlooking the creek. It is well drained and, because of its proximity to fresh water, has the potential to have been used by settlers prior to railroad construction in the precontact, contact and early historic periods. The GLO map shows a squatter's home just north of the FRR in a similar location of uplands next to the creek; squatter's fields are drawn south of FRR (GLO 1853). This area was identified in the previous study as *Areas 4e-north* and *4e-south* and can be seen in Figure 2 (Harrison and Madson 2010).

Area A:h

The Cedar Lake Yard, consisting of a round house, machine shop, blacksmithing shop, car shop, store house, as well as some smaller unidentified frame structures, was built at the eastern terminus of the FRR (Benneche 1914: 58 Hopkins 1885: 31). This area was previously identified in Segment A as *Area A:h* and recommended for further study (Harrison and Madson 2010).

SUMMARY

This document provides an overview of the archaeological potentials within the FRR as currently defined. Additions or expansions to the project area should be subject to similar investigations.

Background information, primarily in the form of historic and modern maps, was collected to characterize the archaeological potential of the corridor and to predict areas of archaeological sensitivity. A one-day field review was conducted to visually check the identified areas for archaeological potential.

Three unique areas with potential to contain archaeological resources were identified in the FRR (Attachment B: Figure 2). Two areas within the study area (*Area 4:e* and *Area A:h*) were identified in a previous study (Harrison and Madson 2010). Results of both studies are summarized below.

Table 2: FRR with LRT survey co-locations: All Areas with Archaeological Potential

Area	Archaeological Potential	Total Acres/Acres in APE	Comments	Task 2 Inventory Methods
LRT *Area 4:e*	Precontact, Contact, Historic Periods	5/3	Upland surrounding Minnehaha Creek	Pedestrian survey, shovel testing
FRR:a	Historic Period	0.15/0.03	Domestic, Block 67	Non-invasive testing, maps
FRR:b	Historic Period	1.60/0.32	Hutchinson railroad	Pedestrian survey, aerial photos
FRR:c	Precontact, Contact-Period	4.34/1.77	Brownie Lake	Pedestrian survey, shovel testing,
LRT *Area A:h*	Historic Period	38/21	Railroad	Pedestrian survey, shovel testing
Total		49.09/26.12		

LRT survey areas from the previous study are shaded in this table.

AREAS RECOMMENDED FOR ARCHAEOLOGICAL SURVEY

Three unique locations within the FRR are recommended for further study.

- Attachment B: Figure 3 illustrates *FRR:a*, the backyard of two lots in Block 67 (.15 acres). In order to complete the site identification, pedestrian survey and non-invasive testing in this partially paved area is recommended to determine whether intact archaeological features such as sealed privy vaults are located within the two lots in the APE. The site boundaries can be defined using map data. Should further work be needed to fully evaluate the site for NRHP eligibility, subsurface testing should be utilized in conjunction with an in-depth literature search.

- Attachment B: Figure 4 shows *FRR:b*, a remnant of the Hutchinson Rail line in the Iron Triangle area (1.60 acres) should be documented. Pedestrian survey in conjunction with aerial photography to define boundaries is recommended for subsequent study. Should further work be required to fully evaluate the rail segment for NRHP eligibility, additional map and archival research should be combined with non-invasive testing.

- Finally, Attachment B: Figure 5 shows *FRR:c* (4.34 acres), north of the BNSF line and on the margins of Brownie Lake, which is also recommended for more intensive study. It is unclear how the landscape has been altered by railroad filling and park development. Additionally, drastic changes are known to have been made to the lake level. A two-step approach is advised. In the first step, archival research should be undertaken to better understand historic-period alterations to the lake and its shoreline, especially within the APE. If this research suggests the area has precontact archaeological potential, a subsequent investigation should consist of shovel testing and pedestrian survey from the pre-industrial western lakeshore 300 feet to the west and from the eastern shore to the beginning of the road embankment to the east.

RECOMMENDED FUTURE INVESTIGATIONS OF IDENTIFIED AREAS

Archaeological investigations in the completion of the Phase I site identification phase of this segment should begin with of the creation of a refined APE developed in consultation with the MnDOT CRU to reflect any engineering changes. An updated literature review should be undertaken to identify results of new survey within the project area. Archaeological survey should consist of:

- Pedestrian survey of the areas with ground visibility;
- Shovel testing of the identified precontact and contact-period archaeological areas to a maximum of one meter in depth;
- Non-invasive sampling of those areas with potential to contain historical archaeological materials beneath pavement;
- Identification of industrial archaeological railroad features through visual survey, and;
- Digital photography, mapping and recordation of existing conditions.

Should any areas contain archaeological deposits potentially eligible to the NRHP, more formal archaeological testing should be conducted to determine archaeological integrity and information potential. More detailed contexts will be developed within which specific sites may be evaluated for their historical and cultural significance.

SOURCES

Andreas, Alfred T.
1874 *An Illustrated Historical Atlas of the State of Minnesota.* A.T. Andreas, Chicago, Illinois.

Benneche, H. W.
1914 *Atlas of Minneapolis, Hennepin County Minnesota*. Published by Albert Volk Engraver, Philadelphia, Pennsylvania. On file, Hennepin County Library and "Minnesota Digital Library". Available at: http://reflections.mndigital.org/cdm/compoundobject/collection/mpls/id/1956/rec/1. Accessed May 8, 2012

Borchart, John R.
1958 *A Reconnaissance Atlas of Minnesota Agriculture*. Published in Cooperation with the Minnesota Council of Geography Teachers, University of Minnesota.

Cappelin, F. W.
1897 *Map of Minneapolis, Hennepin Co., Minn.* Map. Scale unknown. City Engineers Office, Minneapolis, Minnesota. On file, Hennepin County Historical Society.

Cook, R. and Franklin Cook
1860 *Sectional Map of Hennepin County Showing Cities, Townships, Townsites, Roads and Railroads.* Published by authority of County Board of Supervisors by R. & F. Cook, Engineers & Surveyors, St. Paul, Minnesota. Lith. by Louis Buechner, St. Paul, Minnesota. On file, Minnesota Historical Society Library.

Dahl, P.
1898 *Plat Book of Hennepin County, Minnesota*. Northwestern Map Publishing Company and E. Noll and Company. On file, Minnesota Historical Society Library and "Minnesota Digital Library". Available at: http://reflections.mndigital.org/cdm/compoundobject/collection/mhs/id/1299/rec/2. Accessed May 8, 2012.

General Land Office, Bureau of Land Management
1853 (1854) "Township No. 117 North. Range No. 21West, 5th Mer.". Scale: 40 chains: 1". Online version created by the Minnesota Geospatial Information Office (MnGeo) 2004. "Historic Plat Map Retrieval System".Available at: http://www.mngeo.state.mn.us/glo/glo_ol.php?mapxy=-10393046.095187%205610311.3353979. Accessed May 8, 2012.

Goodson, Heather
2010 *Phase I/II Architecture History Investigation for the Southwest Transitway Project, Hennepin County, Minnesota*. Vol. 1. Prepared for Hennepin County Regional Railroad Authority and Metropolitan Council. Prepared by Mead and Hunt, Inc., Minneapolis, Minnesota.

2012 *Phase I/II Architecture History Investigation for the Southwest Transitway Project, Hennepin County, Minnesota*. Vol. 4. Prepared for Hennepin County Regional Railroad Authority and Metropolitan Council. Prepared by Mead and Hunt, Inc., Minneapolis, Minnesota.

Harrison, Christina and Michael Madson
2010 *Phase 1a Archaeological Investigation for the Proposed Southwest Transitway Corridor Transitway Project, Hennepin County, Minnesota.* Prepared for Hennepin County Property Services Group, Hennepin County, Minnesota. HDR Inc., Minneapolis, Minnesota.

Hopkins, Griffith Morgan
1885 *Map of Minneapolis, Minnesota.* Scale: 400':1". On file, Hennepin County Library and "Minnesota Digital Library". Available at: <http://reflections.mndigital.org/cdm/compoundobject/collection/mpls/id/1804/rec/2>. Accessed May 8, 2012.

Mark Hurd Aerial Surveys Inc.
1937 Hennepin County, Minnesota Aerial Survey. Scale: 1:20,000.
United States Agricultural Adjustment Administration, WN-10-848, WN-10-849, Washington D.C., "Minnesota Historical Aerial Photographs Online (MHAPO)". Available at: *http://map.lib.umn.edu/mhapo/index.html*. Accessed May 8, 2012.

Minneapolis Land and Investment Co., T.B. Walker
1891 *Plat of St. Louis Park and Surroundings*. ca 1:36,300. On file, Hennepin County Historical Society.

Rascher Insurance Map Publishing Co.
1892 *Atlas of Minneapolis and Suburbs, Minnesota.* Volume 2. Scale unknown. Revised to1904 or 1906. On file, Minnesota Historical Society Library.

Roise, Charlene, Elizabeth Gales, Stephanie Atwood, Linda Pate, and Penny Petersen
2012 *Phase I/Phase II Architecture History Investigation for the Proposed Southwest Transitway Project, Hennepin County, Minnesota. Vol. 2: West Residewntial, South Residential/Commcewrical, Downtown, Industrial, and Waregouse Survey Zones.* Prepared for Hennepin County Regional Railroad Authority and Metropolitan Council. Hess, Roise and Company.

St. Louis Park Historical Society
"Monitor Houses" Available at: http://www.slphistory.org/history/monitorhouses.asp. Accessed May 8, 2012.

"Monitor Drill" Available at: http://www.slphistory.org/history/monitorhouses.asp. Accessed May 8, 2012.

Sandborn Fire Insurance Map Company
1912-1951 *Minneapolis, Hennepin County.* Vol 6A. Scale unknown. Sanborn Map Company, New York. On file, Minnesota Historical Society Library.

Schmidt, Andrew
2010 *Phase I/Phase II Architecture History Investigation for the Proposed Southwest Transitway Project, Hennepin County, Minnesota. Vol. 3: Railroad Survey.* Prepared for Hennepin County Regional Railroad Authority and Metropolitan Council. Summit Envirosolutions.

Smith, David C.
2008 "Parks, Lakes, Trails and So Much More: An Overview of the Histories of MPRB Properties". Available at: http://www.minneapolisparks.org/documents/parks/Parks_Lakes_Trails_Much_More.pdf. Accessed May 12, 2012.

United States Department of the Interior Geological Survey
1894 (1938) "Minneapolis, Minn." USGS Topographic Map. Reprint of the 1896/1901 edition based on the 1894 survey. Scale: 1:62,500. "Minnesota Digital Library". Available at: http://reflections.mndigital.org/cdm/ref/collection/mpls/id/320. Accessed May 8, 2012.

1954 "Minneapolis, Minn." 7.5 minute quadrangle. Scale: 1:24,000. Washington, D.C.: USGS.

1967 "Minneapolis, South Quadrangle, Minnesota-Hennepin, (Topographic)." Scale:1:24,000. Washington, D.C.: USGS.

Wright, Geo. Burdick
1873 *Map of Hennepin Co.* G. Rice. St. Paul Litho. & Engr. Company. Scale: 1.5":1 mile. On file, Minnesota Historical Society and "Minnesota Digital Library". Available at: http://reflections.mndigital.org/cdm/ref/collection/mhs/id/865/show/836. Accessed May 8, 2012.

Westby, P. O.
1913 *Atlas of Hennepin County, Minnesota*. Hennepin Atlas and Publishing Company, Minneapolis, Minnesota. On file, Borchart Map Library, University of Minnesota and "John Borchart Map Library: Featured Minnesota Collections: Minnesota County Plat Maps and Atlases". Available at: http://geo.lib.umn.edu/plat_books/hennepin1913/composites/st_louis_park.html. Accessed May 8, 2012.

ATTACHMENT A:

Southwest Transitway: A Research Design for Cultural Resources

12 February 2010, updated 16 March 2010, 2 April 2010

Prepared by:
Charlene Roise (Hess, Roise and Company)
Christina Harrison (Archaeological Research Services)
Mike Justin, Mike Madson, and Joe Trnka (HDR Engineering, Inc.)

Southwest Transitway:
A Research Design for Cultural Resources
12 February 2010, updated 16 March 2010, 2 April 2010

Prepared by
Charlene Roise, Hess, Roise and Company
Christina Harrison, Archaeological Research Services
Mike Justin, Mike Madson, and Joe Trnka, HDR Engineering

INTRODUCTION

The Hennepin County Regional Rail Authority is proposing to construct the Southwest Light Rail Transit (SWLRT) facility, linking the Intermodal Station in downtown Minneapolis with the central business area in suburban Eden Prairie. The line is located within the cities of Minneapolis, St. Louis Park, Hopkins, Minnetonka, and Eden Prairie.

The Federal Transit Administration (FTA) has determined that the proposed project is an undertaking as defined by the National Historic Preservation Act (NHPA) and is subject to the provisions of Section 106 of the NHPA. Section 106 requires that federal agencies take historic properties into account as part of project planning. The Cultural Resources Unit (CRU) of the Minnesota Department of Transportation (MnDOT) is acting on behalf of FTA for many aspects of the Section 106 review process for SWLRT. The FTA has also determined that the SWLRT is subject to the National Environmental Policy Act (NEPA) and a Draft Environmental Impact Statement (DEIS) is being prepared by Hennepin County under the direction of the FTA.

Through the NEPA scoping process, four build alternatives were identified. To streamline subsequent analysis, these alternatives were divided into five segments. The following table, which was included in the draft "Southwest LRT Technical Memorandum No. 9: Environmental Evaluation" (September 9, 2009), outlines the segments that are associated with each of the alternatives:

Alternative	*Segments*
LRT 1A	1, 4, A
LRT 3A	3, 4, A
LRT 3C-1 (Nicollet Mall)	3, 4, C-1 (Nicollet Mall)
LRT 3C-2 (11th/12th Street)	3,4, C-2 (11th-12th Streets), C-2A (Blaisdell Avenue), C-2B (1st Avenue)

Segment 1 extends northeast from a station in Eden Prairie at TH 5 along a former rail corridor owned by the Hennepin County Railroad Authority (HCRRA) to a station at Shady Oak Road, on the border between Minnetonka and Hopkins.

Segment 3 creates a new corridor, running east from a station at Mitchell Road in Eden Prairie and turning northerly to terminate at the Shady Oak Station.

Segment 4 follows an existing rail corridor east-northeasterly from the Shady Oak Station through Hopkins and Saint Louis Park to the West Lake Station in Minneapolis, near that city's western border.

Segment A continues northeast from the West Lake Station, mostly using an existing rail corridor, to the Intermodal Station on the western edge of downtown Minneapolis.

Segment C also begins at the West Lake Station, traveling east along a former rail corridor (now the Midtown Greenway), north along one of several alternative courses under and on city streets, to and through downtown Minneapolis, and ultimately ending at the Intermodal Station or South Fourth Street. (For the purpose of this cultural resources assessment, all of the "C" variations will be considered as a single group.)

It should be noted that the above segments overlap at three points: the Shady Oak Station, the West Lake Station, and the Royalston/Intermodal Stations. When the results of the cultural resource surveys are sorted by segment, there will be redundancy in the findings at these three points. This redundancy is inevitable if the effects of each segment are to be analyzed. When a single alternative is selected, it will be necessary to eliminate duplicated properties to obtain an accurate representation of the effects of that alternative.

PROPOSED METHODOLOGY FOR ARCHAEOLOGICAL RESOURCES SURVEY

Christina Harrison, Archaeological Research Services
Mike Justin and Mike Madsen, HDR Engineering

This work plan outlines a program to identify archaeological properties which meet the criteria of the National Register of Historic Places in the project's area of potential effect (APE), to be used in assessing potential effects to those properties. Three primary tasks comprise the work plan. First, in order to provide a uniform assessment of available data across the five project segments discussed in the DEIS, the project team will prepare a report (by project segment within a broad APE) to include: results of the literature search, an archaeological probability assessment, and a field survey strategy (Task 1). It is expected that a limited amount of field investigation/sampling may occur as part of this task depending upon the weather. Second, an archaeological inventory/evaluation of the selected alternative will be completed, using a refined APE based on proposed construction (Task 2). Finally, a report of the field investigations of the selected alternative and an assessment of effects will be prepared (Task 3).

Task 1 will involve archaeologists from both HDR and ARS. Support will be provided, as needed, by Hess Roise research staff as well as by geomorphologists and other paleoenvironmental experts provided by HDR. Division of responsibilities will partly depend on what survey needs are identified by the background research, but primary responsibility for precontact and contact period archaeology will rest with Christina Harrison (ARS) and Michael Justin (HDR), and for historic archaeology with Michael Madson (HDR). The personnel for Tasks 2 and 3 are pending.

The survey will be conducted in accordance with all federal, state, and local requirements, including the Minnesota Field Archaeology Act and the Minnesota Private Cemeteries Act.

Area of Potential Effect (APE)

The APE for archaeological resources is generally defined as the anticipated limits of construction activities. At this stage in the project development, factors influencing those limits have not yet been fully identified. The APE, starting with a broad area at first, will be refined as the engineering design advances.

For Task 1, the APE for the literature search and probability assessment will be based, as appropriate, on the project limits as defined in the project engineering drawings used to prepare the DEIS. This will include the full width of existing railroad right-of-way corridors as well as the area within 100 feet on either side of the current engineering alignments. The APE near station areas also includes any undeveloped and/or vacant property within 500 feet that could potentially be utilized for construction/development activities. Depending on the station location, these may include open, green spaces (particularly in suburban areas) and paved parking lots (particularly in urban areas).

If the literature search/probability assessment identifies potentially significant historic features or high probability areas immediately adjacent to the above-referenced APE parameters, and if the significance of potential sites in these areas is expected to relate to National Register criteria A, B, and/or C, the APE for the field strategy for the Phase I-II survey may be adjusted to include these locations.

During Task 2, the APE will be reviewed in light of more detailed engineering plans. Throughout the design phase of the project, the adequacy of the APE will be periodically evaluated and expanded or retracted as necessary as project elements are added or modified. The survey report specified in Task 3 will provide a clear delineation of the surveyed APE, including all additions, so that the adequacy of survey efforts can be readily determined when project changes are proposed.

It should be noted that, generally, the APE for archaeological resources is a smaller area located within the APE for history/architecture resources.

Task 1. Report of Archival Review/Site Probability/Field Strategy

This task will uniformly represent the readily available information across the five project segments discussed in the DEIS. In general the report will be a desktop analysis of existing archaeological research data supplemented by a discussion of probability for previously unidentified archaeological properties. Field inspections may be utilized to confirm existing conditions, particularly to inform the discussion on field survey strategies.

The desktop analysis will utilize documents on file at the State Historic Preservation Office (SHPO) and the Office of the State Archaeologist (OSA). Historic maps and aerial photographs, local histories, and other archival information on file at the Minnesota Historical Society, the Borchert Map Library (at the University of Minnesota), and local libraries and historical societies may also be reviewed.

The task will review:

- archaeological survey reports on file at SHPO, OSA and other repositories in order to establish what segments of the project routes have already been inventoried according to current standards;
- known archaeological sites and/or (if applicable) recommendations/confirmations of NRHP eligibility;
- relevant USGS topographic maps and soil surveys as well as any Mn/Model information and other environmental and paleoenvironmental data pertinent to the assessment of pre-contact archaeological site probability, including land use histories;
- Historic maps and aerial photographs to identify localities with historic-period archaeological site potential.

A preliminary field review will be conducted. The survey team will document visible indications of topographic and hydrological features as well as past and current land use with concomitant loss of soil integrity. The information from field observations will be combined with the data gathered during the archival review to propose archaeological site probability along the five segments.

Pre-contact and historic-period contexts will be briefly reviewed, with a focus to inform the discussion of site types and assessment of probability. The probability assessment will be organized by the five project segments (1, 3, 4, A, and C). For each of the five segments the report will include:

- a general description of the APE;
- a discussion of previous surveys and previously identified sites;
- a discussion of historic site types and the associated conditions that may indicate a historic property;
- a discussion of archaeological probability (for pre-contact/contact period and historic-period), and;
- a survey strategy and methods, including specific places targeted for field investigation.

The survey strategy for precontact and contact period evidence will be guided by Native American and early Euro-American settlement and land use patterns identified by previous archaeological investigations in the vicinity including, for example, the 1992-1994 city-wide cultural resource survey of Eden Prairie, the corridor surveys conducted for Trunk Highway 212 and Trunk Highway 12, and a number of smaller scale compliance surveys conducted within the Nine Mile, Minnehaha and Purgatory Creek watersheds.

The results of Task 1 will be summarized in the DEIS.

Task 2. Inventory/Evaluation (Phase I-II) Survey

For the Inventory/Evaluation survey, the APE will be refined to reflect the updated engineering design. That refined APE will be surveyed in a manner consistent with the recommendations presented in the Task 1 report. Field methods outlined in the Minnesota SHPO and MnDOT CRU guidelines will be generally followed; any exception, as well as more detail specific to the existing conditions along each segment, will have been documented in the Task 1 report.

In the case of precontact/contact period Native American evidence, the field sampling will involve standard methods for identification and the preliminary assessment of horizontal and vertical site dimensions, integrity, and National Register potential. In addition, the survey may utilize targeted geomorphological testing and analysis in areas likely to feature deeply buried archaeological evidence.

Artifacts will be collected and analyzed in a manner consistent with contemporary standards. Artifacts from private property will be collected with written permission of the landowner. Historic period artifacts will only be collected if they appear to represent a potentially significant archaeological property.

Archaeological sites determined to have National Register potential will then require more comprehensive Phase II formal testing. As the Phase I review more than likely will have identified a wide range of site types associated with highly varied environmental settings and precontact to historic period contexts, the scope, research questions, field and analytic needs will be more appropriately defined at that stage of the investigation.

Task 3. Analysis and Reporting

A technical report of the Phase I and Phase II investigations, including the methodology, field work results, and recommendations, will be prepared in accordance with the guidelines of MnDOT's CRU, the Secretary of the Interior's Standards for Identification and Evaluation, and other applicable state and federal guidelines. This includes submittal of Geographic Information Systems (GIS) data per the CRU guidelines. All sites documented during the survey will be recorded on new or updated Minnesota Archaeological Site Forms.

Collected artifacts will be processed and analyzed in compliance with the survey guidelines of the SHPO and the Mn/DOT CRU. Artifacts will be curated at an approved facility as stipulated in the consultant's archaeology license.

PROPOSED METHODOLOGY FOR HISTORY/ARCHITECURE RESOURCES SURVEY

Charlene Roise, Hess, Roise and Company

Area of Potential Effect (APE)

Generally, the APE for history/architecture resources extends 300 feet on either side of the centerline of the alignment of each corridor. Around each station, the APE includes property within a quarter-mile radius. This area addresses anticipated project-related infrastructure work and reasonably foreseeable development.

The APE is illustrated in maps of the five project segments. Exceptions to the parameters outlined above include the following:

- The APE for the Intermodal Station (in segments A and C) includes all property within the boundaries adopted for the "Downtown Minneapolis Transit Hub" Environmental Screening Report (October 28, 2009 review draft) prepared for Hennepin County by Kimley-Horn and Associates. The area shown in the report is extended northeast of Washington Avenue to and across the Mississippi River to include the first tier of properties on Nicollet Island, to provide adequate APE coverage for the three-block potential station area and related developments such as rail storage yards. This area addresses infrastructure work associated with the SWLRT project as well as cumulative effects related to the development of the Intermodal station. (See below for discussion about splitting responsibility for survey of this area between the SWLRT project and the Intermodal Station project.)

- The APE for the 4th Street, 8th Street, 12th Street, Harmon Place, Hawthorne Avenue, Lyndale, and Uptown Stations (in segment C) includes the adjacent blocks in all directions from the station. This area is proposed for the stations in the more densely-built urban area, in comparison to the larger quarter-mile radius for other stations in outlying areas.

- The APE for the proposed tunnel area under Blaisdell, Nicollet, or First Avenues, including the 28th Street and Franklin Stations (in segment C), extends from one-half block west of Blaisdell Avenue to one-half block east of First Avenue. If this alternative is selected, the APE may need to be expanded in light of the design and construction methods for the tunnel.

- Along some portions of the corridor, the 300 foot APE may be extended to take into account visual effects. For example, if the 300 foot area comprises open space, and a row of buildings is located beyond, these buildings may be included in the APE.

- In some station areas, there are known areas of project related work and/or anticipated development outside of the quarter-mile radius, and these areas are included in the APE. This includes areas in downtown Hopkins.

The APE may also be adjusted if a field surveyor recommends that the project may affect a property or properties not included in the established APE boundaries.

As project planning proceeds, additional factors will be assessed to determine if there are other effects (direct, visual, auditory, atmospheric, and/or changes in use) which could require an expansion of the above APE. These factors include:

- Noise analysis, including areas where the use of bells and whistles is anticipated.
- Vibration analysis, including vibration related to project construction and operations.
- The specific locations of project elements, including operations/maintenance facilities, park-and-ride facilities, traction power substations, signal bungalows, and other infrastructure.

Survey Approach

Survey Zones

The project cuts through a number of distinct communities, each with a unique history. As a result, these communities, which share similar physical and historical characteristics, can serve as a framework for conducting the survey. The survey will be organized around the following zones (related project segments and stations are listed in parenthesis):

- Eden Prairie (Segments 1 and 3; Highway 5, Highway 62, Mitchell Road, Southwest Station, Eden Prairie Town Center, Golden Triangle, City West Stations)
- Minnetonka (Segments 1 and 3; Rowland, Opus, Shady Oak Stations)
- Hopkins (Segment 4; Shady Oak, Hopkins, Blake Stations)
- Saint Louis Park (Segment 4; Louisiana, Wooddale, Beltline Stations)
- Minneapolis west residential, including parts of Bryn Mawr, Lowry Hill, East Isles, Kenwood, Cedar-Isles-Dean, and West Calhoun neighborhoods (Segments A and C; West Lake, 21st Street, Penn Stations)
- Minneapolis south residential/commercial, including parts of the Stevens Square/Loring Heights, Whittier, Lowry Hill East, East Isles, and Cedar-Isles-Dean neighborhoods and the Midtown Greenway (Segment C; Uptown, Lyndale, 28th Street, Franklin Stations)
- Minneapolis downtown north of I-94 (Segment C; 12th Street, 8th Street, 4th Street, Harmon Place, Hawthorne Avenue Stations)
- Minneapolis industrial (Segments A and C; Van White, Royalston Stations)
- Minneapolis warehouse (Segments A and C; Intermodal Station)

In addition, there are four railroad corridors that traverse these community boundaries. These corridors will be considered as four individual zones. The corridors (by historic names) are:

- Minneapolis and Saint Louis Railway (Chicago and North Western Railway). Part of the main line is in the APE (Segments 1, 4, A and C). A segment of this line between downtown Minneapolis and Merriam Junction has recently been evaluated by the Surface Transportation Board as not eligible to the National Register; however, the SHPO did not concur with this finding. The line will be further evaluated, focusing on the section within the APE.
- Chicago, Milwaukee and Saint Paul Railway (Milwaukee Road), Benton Cutoff. Part of the CM&SP Benton Cutoff is in the APE (Segments 4, A, and C). Except for the Chicago, Milwaukee and Saint Paul Railroad Grade Separation Historic District, which is listed in the National Register, the Benton Cutoff has previously been determined as not eligible to the National Register by the Federal Highway Administration, with concurrence by the SHPO.
- Saint Paul and Pacific Railway (Great Northern Railway). Part of the main line is in the APE (Segment A). This line will be evaluated.
- Minneapolis, Northfield and Southern Railway. Part of the Auto Club-Luce Line Extension of the MN&S is in the APE (Segment 4). This line has been previously evaluated by Mn/DOT CRU, and the Auto Club-Luce Line Extension has been recommended as not eligible to the National Register. This determination has not been submitted to SHPO for concurrence. The Mn/DOT CRU evaluation will be summarized and incorporated into this survey by reference.

All of the above lines, including those which have been evaluated as not eligible, will be inventoried and evaluated to identify any railroad related features in the APE that are potentially significant in their own right. The statewide railroad context developed by Mn/DOT CRU will serve as a basis for evaluation of railroad resources.

The survey of the above thirteen zones will be completed by three consultants. Hess Roise will complete the surveys for the five zones in Minneapolis, Mead & Hunt will complete the surveys for St. Louis Park, Hopkins, Minnetonka, and Eden Prairie, and Summit Envirosolutions will complete the surveys for the four railroad zones. Each consultant will prepare a report for the Phase I-II survey of the zones completed. An overall summary, integrating the survey results from all thirteen zones, will be prepared for the analysis of effects, within the framework of the five project segments.

The survey will include properties built in 1965 and earlier. Although National Register guidelines use a 50-year cut-off for eligibility (except for properties of exceptional importance), adopting a 45-year cut-off for this survey provides 5 years for project planning before the survey becomes outdated.

NOTE ON RESPONSBILITY FOR SURVEYS IN THE INTERMODAL STATION AREA: There is an overlap of the APEs for the SWLRT project and the Intermodal Station project (currently in the planning stage). The SWLRT survey effort will complete survey work for only a portion of the SWLRT APE in the vicinity of the Intermodal Station, including where SWLRT construction is anticipated. The remainder of this area will be surveyed as part of the planning for the Intermodal Station project. The survey results from the Intermodal Station survey will be included in the consideration of cumulative effects as part of the SWLRT Section 106 review. (See map for the division of survey responsibilities in this portion of the SWLRT APE.)

Phase I Survey (Reconnaissance Survey)

The primary goal of Phase I is to identify properties that appear to have the potential to qualify for the National Register and merit further analysis. This will eliminate from further consideration any properties that have little or no potential to meet National Register criteria. The Phase I survey will also verify that properties already listed or officially determined eligible for listing in the National Register still retain integrity.

Literature Search

The literature search will focus on areas within the APE, with broader contextual information procured as needed. The literature search will begin by collecting existing reports and research for each zone. Maps, atlases, and other information that can provide specific information about property within the APE for archaeology will be a high priority. Additional research will be conducted for specific areas, and occasionally on specific properties, as appropriate. The literature search will produce:

- A working set of research files, including maps and related materials, for each zone. A copy of these files will be provided to the archaeological team.
- For each zone, a brief context (perhaps with subcontexts) will be developed that is approximately two to five pages in length and comprises a brief narrative, an annotated list of relevant property types, and a preliminary period of significance. (This assumes that extensive narrative contexts will not be developed during this phase.) A similar context will also be prepared for each railway, focusing specifically on segments in the APE. These contexts will also be provided to the archaeological team.

Fieldwork

A project-specific inventory form will be developed. Prior to the onset of fieldwork, a draft inventory form will be submitted to the client for review and approval.

The Hennepin County property database provides building construction dates for tax parcels. These dates will be assumed to be generally reliable for properties erected in the last half of the twentieth century, and will therefore be used to eliminate properties built after 1965 from the survey. During fieldwork, however, surveyors will be observant of properties eliminated from the inventory to identify:

- Inaccuracies: Properties not included in the survey that appear to date from 1965 and earlier (in other words, instances where the county date appears to be incorrect);
- Incomplete data: Properties not included in the survey that contain multiple buildings or other features, where the county date may refer to a newer feature—but older features are also present;
- Exceptional properties: Properties dating from 1966 or later that might be of exceptional importance.

Fieldwork will be conducted by zones. The methodology for each zone is as follows:

- Using information from the Hennepin County database, surveyors will be provided with a spreadsheet listing all properties in the zone built in 1965 or earlier. In addition to the address and year built, the spreadsheet will include the property's use and the name of the owner and taxpayer. The survey will include properties listed or officially determined eligible for listing in the National Register (including those in historic districts) to verify that they retain integrity. Map books will be prepared for reference in the field.
- Surveyors will conduct site visits for each property, recording observations from public rights-of-way with field notes and digital photographs. At a minimum, surveyors will record information on noteworthy features and the property's integrity. Using the data categories for functions and uses outlined in the National Register bulletin *How to Complete the National Register Registration Form*, and with reference to the context information for each zone, the surveyor will suggest data categories that seem the most appropriate for evaluating the property's National Register potential. The surveyor will also provide a preliminary recommendation—and a justification for that recommendation—stating that 1) the property does not appear to be eligible for the National Register, or 2) the property should be evaluated in Phase II.
- All field surveyors will meet the Secretary of the Interior's Professional Qualifications Standards.

Deliverables for Phase I survey

- For each zone:
    - Synopsis for each zone, including the context and property type information.
    - Table of surveyed properties including recommendations for intensive level survey, with justification.
    - Inventory form (2 copies) for each property in the APE built in 1965 or earlier. In addition to the data collected in the field, the inventory forms will incorporate information on the property's location (UTM reference, township/range/section) from the county database. At least one color digital photograph of the property will be included on each form. (NOTE: For properties which go to a Phase II evaluation, the same survey form should incorporate the evaluation information.)
    - Map of zone with properties recommended for intensive-level survey identified.

Phase II Survey (Intensive)

The goal of Phase II is to evaluate properties, as recommended in Phase I, to determine which meet the criteria of the National Register of Historic Places. As with Phase I, the work will be organized by zones.

Literature Search

The literature search will focus on individual properties and districts that have potential to meet National Register criteria. To provide a framework for evaluating some properties, it may be necessary to expand the context synopses developed in Phase I to address specific physical areas, eras, and/or property types.

Fieldwork

Additional field work may be needed to evaluate the physical characteristics of individual properties and districts. It might be necessary to obtain permission to enter some properties for this evaluation—if, for example, there is the potential for a significant interior space, or if a parcel is large and contains a number of buildings and these buildings cannot be adequately evaluated from the public right-of-way, aerial photographs, or other means.

Deliverables for Phase II survey

- For each zone:
    - Table of Phase II properties, including recommendations on eligibility.
    - More detailed inventory form, including the narrative evaluation of eligibility, for each property included in this phase.
    - Map of zone, showing properties that appear to qualify for the National Register identified, along with listed and previously determined eligible properties.
- A Phase I-II survey report (for all zones completed by the same consultant) conforming to Mn/DOT CRU Architecture/History Report requirements and other applicable federal and state guidelines.

At the conclusion of all Phase II history/architecture survey work, a consolidated summary/table incorporating the work from all thirteen zones will be prepared for the analysis of effect. This summary will be organized by the five project segments.

ATTACHMENT B:

Figures

Due to the sensitive nature of the information that they contain, these maps will not be provided except by request to the Metropolitan Council.

PHASE I/PHASE II ARCHITECTURE HISTORY INVESTIGATION FOR THE PROPOSED SOUTHWEST TRANSITWAY PROJECT HENNEPIN COUNTY, MINNESOTA

VOLUME ONE:
EDEN PRAIRIE SURVEY ZONE
MINNETONKA SURVEY ZONE
HOPKINS SURVEY ZONE
ST. LOUIS PARK SURVEY ZONE
(EXCLUDING RAILROAD – RELATED PROPERTIES)

Authorized and Sponsored by:
Hennepin County Regional Rail Authority
And
Metropolitan Council

Prepared by:
Heather Goodson, Principal Investigator
Mead & Hunt, Inc.
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September 2010

Management Summary

The Hennepin County Regional Rail Authority and the Metropolitan Council are proposing to construct the Southwest Transitway facility, linking the intermodal station area in downtown Minneapolis with the central business area in suburban Eden Prairie. The line is located in the cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

In general, the Area of Potential Effect (APE) for history/architecture properties extends 300 feet on either side of the centerline of the alignment of each corridor. Around each station, the APE includes properties within a quarter-mile radius. Several circumstances when the APE departs from these parameters are noted in the APE description in the Research Design for Cultural Resources (see Appendix A).

In March 2010, Mead & Hunt, Inc. (Mead & Hunt) was retained to complete a Phase I Architecture/History survey (Phase I Survey) of project segments 1, 3, and 4 (excluding railroad-related properties), and a Phase II Evaluation of properties that may be eligible for inclusion in the National Register of Historic Places (National Register). The Phase I Survey did not include railroad-related resources, which are documented in Volume 3. The Phase I Survey identified 523 properties within the APE of segments 1, 3, and 4. Twelve properties and one historic district were identified for Phase II Evaluation. Mead & Hunt's project team consisted of Principal Investigator Heather Goodson and architectural historians Christina Slattery, Emily Pettis, Bob Frame, Shannon Dolan, Katherine Haun, and Phillip Barlow.

As a result of the Phase II Evaluation, the Hopkins Downtown Commercial Historic District, Hopkins City Hall, and Woodmark Industries Building are recommended eligible for listing in the National Register. The Lang House and Motor Travel Services Buildings are recommended eligible for listing once they reach 50 years in age.

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46 Aerial of Minneapolis Moline Industrial Complex c.1925

47 East facade of 30 8th Avenue South

48 Oblique view of east and north elevations

49 Oblique view of west and south elevations

50 East (primary) facade

51 Oblique view of south and east elevations

52 West elevation

53 Oblique view of west (primary) and north elevations

54 Addition to building immediately north wrapping around east elevation to obscure a portion of the elevation

55 Hopkins and St. Louis Park Survey Zones: NRHP Listed, Eligible, and Recommended Eligible Properties

56 St. Louis Park High School, 1937 building, front (south) facade

57 St. Louis Park High School, 1937 building with additions on front (south) and side (east) elevations

58 St. Louis Park High School, addition on front (south) and side (west) elevations with 1937 building visible in background

59 St. Louis Park High School, additions to side (west) elevation

60 St. Louis Park High School, additions to the rear (north) and side (west) elevation

61 Woodmark Industries Building

62 Woodmark Industries Building office bay

63 Woodmark Industries Building entrance detail

64 Woodmark Industries Building, south and east elevations

65 Woodmark Industries Building, garage building at rear of property

66 SMD Sel-Mor building, view facing north

67 Overview of Union Congregational Church property

68 Union Congregational Church front (east) elevation

69 Union Congregational Church rear (west) elevation

70 Education Building, front (east) and side (north) elevations

71 1984 hyphen addition, front (east) elevation

72 Current site plan for the Northland Aluminum Products site

73 The first building for Northland Aluminum Products, constructed in 1946-47

74 Glass wall corner feature found on the northwest corner of Building #1, added in 1968

75 Northeast corner of Building #1, the prestressed concrete panels were added as part of the 1968 building addition

76 Rear elevation of Buildings #2 and #3

77 Building #4 facade and west elevation, the structure was built in 1950 and added to the Northland Aluminum building inventory in 2006

78 The facade of Building #6 features a large glass vestibule

79 Northeastern elevation of Building #7 showing both glass corners and loading docks

80 Front of the Motor Travel Lodge Building

81 Detail view of the geometric pattern formed concrete pattern

82 Front portion of the building

83 Loading dock on the south portion of the building

84 East side of the Motor Travel Services Building under construction

Table No.

1 Build Alternatives and Segments

2 Phase II Properties in Minnetonka Survey Zone

3 Phase II Properties in Hopkins Survey Zone

4 Listing of Buildings Within the Hopkins Downtown Commercial Historic District

5 Phase II Properties in St. Louis Park Survey Zone

6 Southwest Transitway Historic Properties

1.0 Introduction

The proposed Southwest Transitway line is a high-frequency train line serving the rapidly growing southwest metro area—Eden Prairie, Minnetonka, Edina, Hopkins, and St. Louis Park—as well as Minneapolis neighborhoods and the Minneapolis downtown area. The line will connect to other rail lines (Hiawatha, Central, and Northstar) and high-frequency bus routes. Through these connections, the Southwest Transitway will also provide access to the University of Minnesota, Minneapolis-St. Paul International Airport, Mall of America, Minnesota State Capitol, and downtown St. Paul.

The Federal Transit Administration (FTA) has determined that the proposed project is an undertaking as defined by the National Historic Preservation Act (NHPA) and is subject to the provisions of Section 106 of the NHPA. Section 106 requires that federal agencies take historic properties into account as part of project planning. The Cultural Resources Unit (CRU) of the Minnesota Department of Transportation (Mn/DOT) is acting on behalf of FTA for many aspects of the Section 106 review process for the Southwest Transitway project. This survey report is part of the identification/evaluation of historic properties required under the Section 106 review. The results of this survey will be submitted to the Minnesota State Historic Preservation Office (SHPO) for concurrence. Effects to properties that are listed in or eligible for listing in the National Register of Historic Places (National Register) will be assessed in consultation with the SHPO and other interested parties. It is expected that mitigation measures for these effects will be addressed in a Programmatic Agreement.

Through the scoping process of the National Environmental Policy Act, four build alternatives have been identified. To streamline subsequent analysis, these alternatives were divided into five segments. The following table outlines the segments that are associated with each of the alternatives:

Table 1

Build Alternatives and Segments	
Build Alternatives	**Segments**
LRT 1A	Segment 1, Segment 4, Segment A
LRT 3A	Segment 3, Segment 4, Segment A
LRT 3C-1 (Nicollet Mall)	Segment 3, Segment 4, Segment C-1 (Nicollet Mall)
LRT 3C-2 (11^{th}/12^{th} Street)	Segment 3, Segment 4, Segment C-2 (11^{th}/12^{th} Streets via Nicollet Avenue Tunnel)
	Segment 3, Segment 4, Segment C-2A (11^{th}/12^{th} Streets via Blaisdell Ave Tunnel)
	Segment 3, Segment 4, Segment C-2B (11^{th}/12^{th} Streets via 1^{st} Ave Tunnel)

Source: HDR, Engineering, 2009

Segment 1 extends northeast from a station in Eden Prairie at Trunk Highway (TH) 5 along a former rail corridor owned by the Hennepin County Railroad Authority (HCRRA) to a station at Shady Oak Road, on the border between Minnetonka and Hopkins.

Segment 3 creates a new corridor, running east from a station at Mitchell Road in Eden Prairie and turning northerly to terminate at the Shady Oak Station.

Segment 4 follows an existing rail corridor east-northeasterly from the Shady Oak Station through Hopkins and St. Louis Park to the West Lake Station in Minneapolis, near that city's western border.

Segment A continues northeast from the West Lake Station, mostly using an existing rail corridor, to the Intermodal Station on the western edge of downtown Minneapolis.

Segment C also begins at the West Lake Station, traveling east along a former rail corridor (now the Midtown Greenway), north along one of several alternative courses under and on city streets, to and through downtown Minneapolis, and ultimately ending at the Intermodal Station or the Fourth Street Station.

Figure 1 shows the build alternative segments.

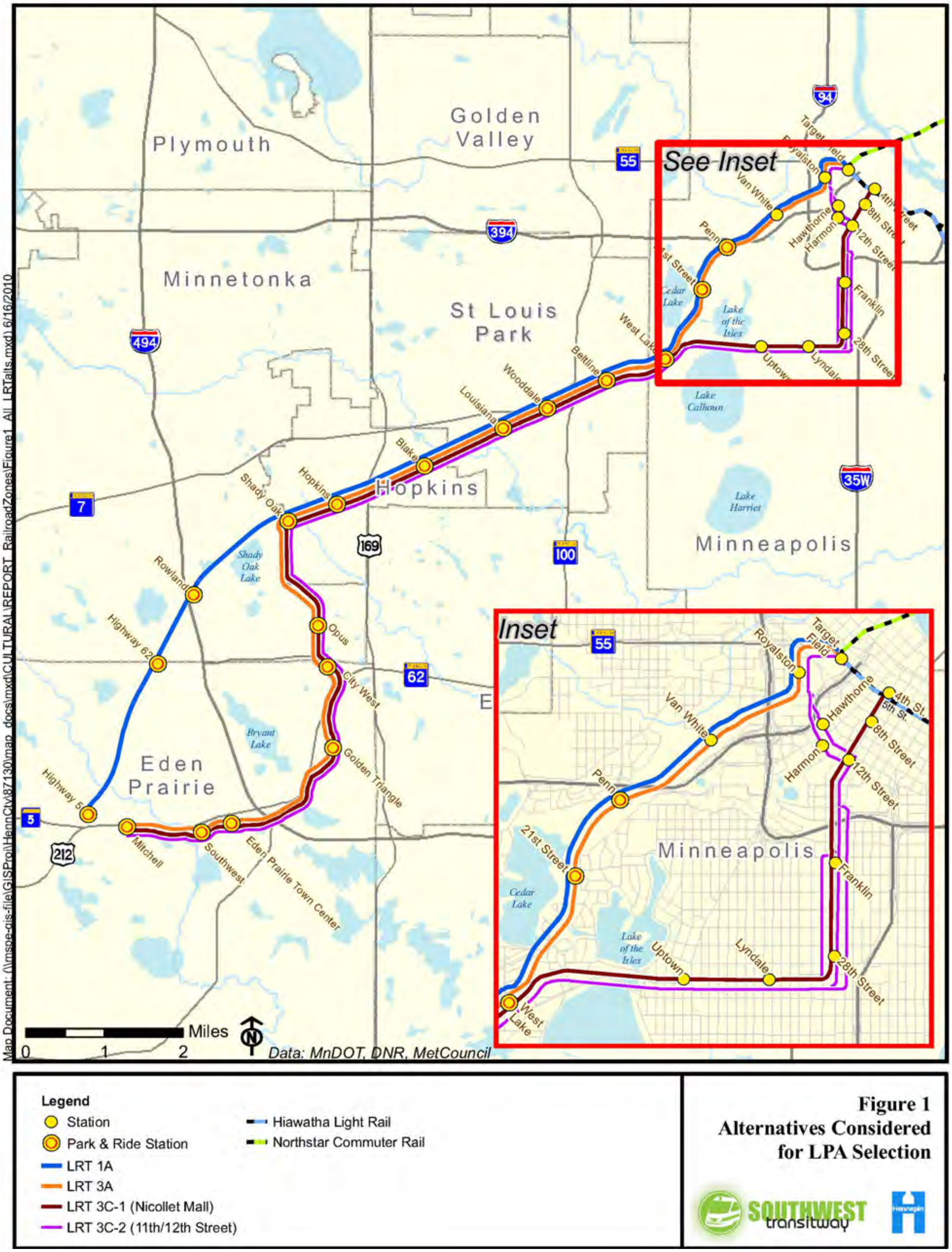

Figure 1. Alternatives Considered for LPA Selection.

2.0 Methods and Research Design

The Research Design for Cultural Resources for the Southwest Transitway project is included as an appendix to this report. This research design includes separate sections for archaeology and architecture/history surveys.

The methodology for the architecture/history survey is built around 13 survey zones, which are based on a historical and physical analysis of the project area. A historical context for each of these zones has been developed to serve as a framework for identifying and evaluating potential historic properties in the zone. Volume One of the survey report includes four survey zones encompassing areas of the project within the cities of Eden Prairie, Minnetonka, Hopkins, and St. Louis Park. Volume Two of the survey report includes project areas in five survey zones within the city of Minneapolis (western residential, southern residential/commercial, downtown, industrial, and warehouse). Volume Three of the survey report includes project areas in four survey zones encompassing four railroad corridors.

Historic-age properties were identified as those being at least 45 years of age. This age was selected so that the survey results remain relevant during the anticipated five years of project planning. *Minnesota Architecture/History Inventory Forms* were prepared for the surveyed properties and submitted separately to the SHPO. Fieldwork and documentation of properties was completed according to *Mn/DOT's Cultural Resources Unit Project Requirements* (January 2008) in March 2010.

Historic-age properties were reviewed to assess integrity and significance within the context of Hennepin County urban development and important historical themes. Properties that appear to possess significance were evaluated based on the National Register Criteria for Evaluation. Important historic themes within the APE include railroads, industry, commerce, and community development. These themes are discussed in Section 3. Figure 2 shows the APE.

A table at the conclusion of each survey report (including this one) summarizes the results of the evaluation of properties in the survey zones included in that report.

A separate report of the archaeological site probability assessment and field strategy has also been prepared, with archaeological field surveys of the selected alignment to follow.

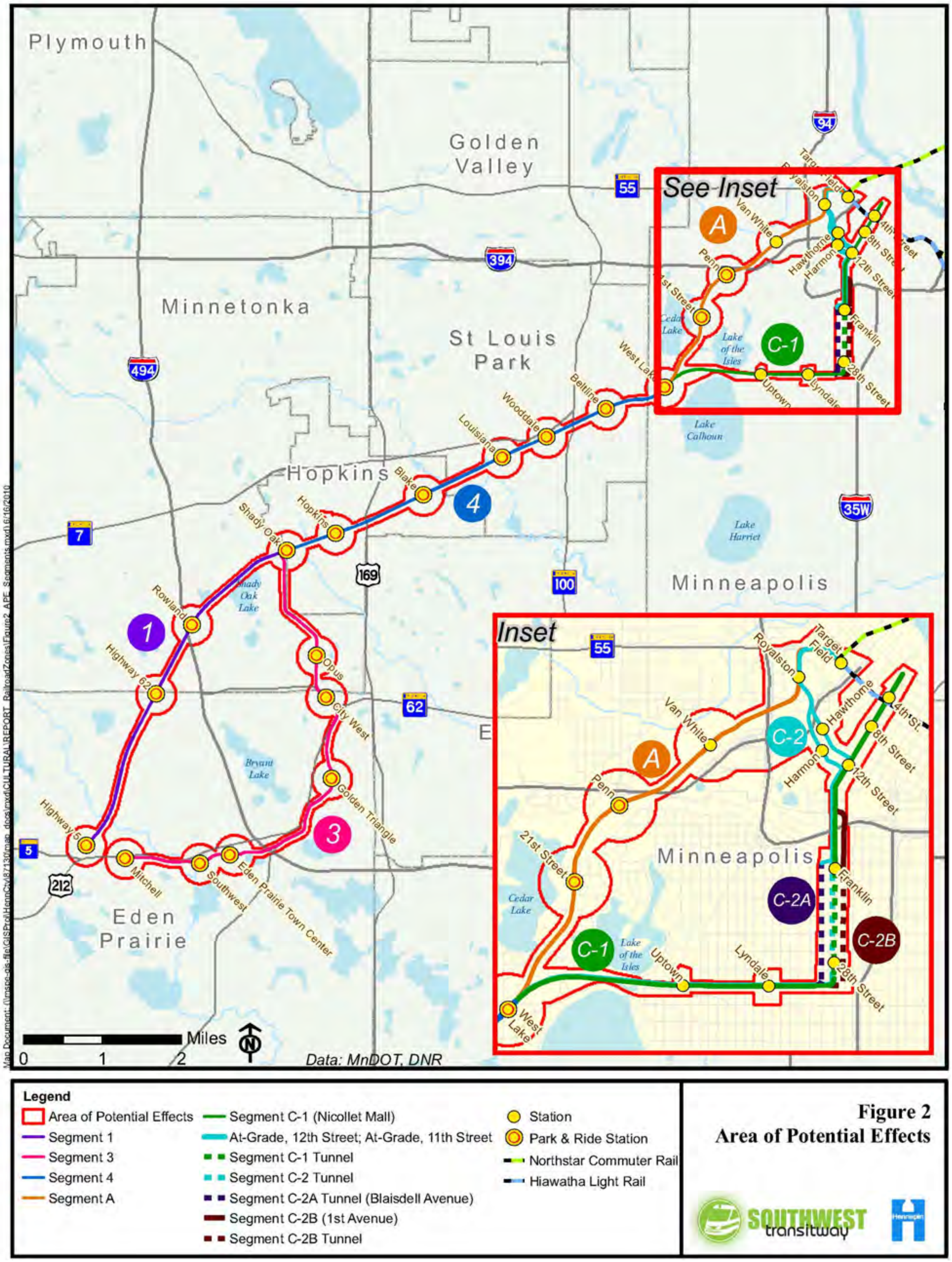

Figure 2. Area of Potential Effects.

3.0 Literature Search

3.1 Eden Prairie survey zone

Primary and secondary sources were reviewed to gain an understanding of the historic context for properties within the APE. These sources provided information about the area's development patterns and historic context.

3.1.1 Literature search

Repositories consulted to obtain historical information regarding Eden Prairie include:

- Minnesota Historical Society Library and Archives
- University of Minnesota, John B. Borchert Map Library
- Hennepin County Public Library
- Minnesota SHPO
- Eden Prairie Historical Society
- Hennepin County Assessor's Office Records (available online)
- Minnesota Geospatial Information Office (available online)

Primary and secondary sources included:

- Plat maps, atlases, and aerial images
- Minnesota SHPO site files and survey reports
- City histories

3.1.2 Previously evaluated properties in the APE

Mead & Hunt reviewed the Minnesota SHPO Architecture/History site files and identified no previously documented properties within the APE.

3.1.3 Historic context

Eden Prairie is located southwest of Minneapolis with the Minnesota River along its southern border. Due to its location along the river, settlers were quick to take up residency and farmsteads were established along lakes and streams as early as the 1850s. Eden Prairie Township was formally organized on May 11, 1858, the same day that Minnesota became a state.[1]

During the late nineteenth and early twentieth century, Eden Prairie was a predominately agricultural settlement. Wheat was the first cash crop grown by the farmers of Eden Prairie. Technological improvements in milling had created a large market for wheat and by the late 1860s Eden Prairie was one of the largest producers of wheat in Hennepin County. This agricultural success prompted increased development in the community and four general stores were established in addition to a flour mill on Mill Creek. However, as elsewhere in the state, the nutrient-stripping nature of monoculture forced many

[1] Helen Holden Anderson, *Eden Prairie the First 100 Years* (Eden Prairie, Minn.: Viking Press, 1979), 51.

farmers to diversify and focus on other crops in the last quarter of the nineteenth century, including corn, oats, barley, flax, alfalfa, and dairying.[2]

Prior to the arrival of the railroad, the Minnesota River was the primary means of transportation in Eden Prairie. However, this changed in 1871 with the arrival of the Minneapolis & St. Louis Railroad (M&StL). The following decade, the Hastings & Dakota Railway arrived, further removing transportation from the river. The M&StL depot, located near the center of the township, became a transportation hub and businesses were soon established along the corridor.[3] Built in the 1890s, one of these businesses was a small creamery across from the Miller Brothers store. Dairy production had been a key component of many farmers' income, with butter bringing in at least some amount of cash during difficult times. The opening of this creamery provided the dairy farmers with an outlet for their product until it closed in 1902, at which time many farmers banded together to ship the milk themselves by train. In 1916, spurred on by the low price farmers were getting for their milk and the lack of attention that was made to quality or cleanliness, Hennepin County agent K.A. Kirkpatrick called a meeting to discuss these issues and proposed the organization of the Twin Cities Milk Producers Association (TCMPA). The TCMPA secured the 2,500 members needed to get the organization off of the ground and was soon supplying 90 percent of the milk sold in the Twin Cities with guaranteed standards for the consumer and a level of security for the farmer.[4]

The popularity of the automobile and the construction of modern highways resulted in a major change to the Eden Prairie landscape. In 1924 Highway 169 was constructed through the center of the township, essentially splitting it into two. Although farmers were able to take advantage of the new highway, which allowed them to continue to ship products to the Twin Cities and other markets, the road also allowed local residents to travel further for essentials and schools to bus students in. As a result, the four general stores in Eden Prairie eventually closed, and the four rural schools were combined into the Eden Prairie Consolidated School.[5]

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[2] Anderson, 91-93.

[3] Anderson, 63.

[4] Anderson, 99.

[5] Anderson, 55, 73.

Figure 3. Eden Prairie was still predominately rural in 1936 when this photograph was taken of Highways 212 and 169 (Minnesota Historical Society, Negative 58570).

Although transportation was improving, expansion was slow during the early twentieth century due to the Great Depression of the 1930s and World War II.[6] Population growth was limited during this period, increasing from 983 in 1920 to 1,221 in 1940.[7] Agriculture continued to be the primary focus of the community during these decades. Soybeans were introduced as a new cash crop in the 1930s and eventually matched corn in production by the 1950s. Advances in agricultural machinery and methods were readily adopted by local farmers, resulting in fewer farmers on the land with more acres under production. Large equipment made it easier for one person to work on large expanses of land, and attention to record keeping identified areas for cost cutting.[8]

The rural nature of Eden Prairie began to change drastically in the late 1940s. The Flying Cloud Airport was constructed in 1946 in an area that had been used for Navy training.[9] Industries were attracted to the area, which offered rail, highway, and air transportation and was close to the Twin Cities. In addition, the continued growth and development of the Twin Cities caused many people to locate further from the city center in the expanding suburban area, including Eden Prairie. Local farmers were soon bought out by land developers who were eager to establish residential and commercial areas.[10]

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[6] Anderson, 94-95.

[7] Ernie Shuldhiess, *Eden Prairie Book of Days* (Eden Prairie, Minn.: Published by the author, 2003), n.p. Available at the Eden Prairie Historical Society, Eden Prairie, Minn.

[8] Anderson, 95.

[9] Anderson, 55.

[10] Anderson, 97.

Eden Prairie remained a township until 1963, when the 36-square-mile area was incorporated as a village and the first village hall was constructed in 1965 near the junction of Pioneer Trail and Eden Prairie Road.[11] This coincided with the transformation of the rural, agricultural community into a developing suburban area. The population grew exponentially during this period. Between 1950 and 1970 it increased from only 1,281 to 6,938. By 1980 it had more than doubled, increasing to over 16,000.

The 1970s saw additional development with the completion of Interstate 494 (I-494) in 1975 and the construction of Eden Prairie Center, an indoor shopping mall, in 1976. Between 1980 and the present, Eden Prairie continued to evolve from a rural landscape to a modern suburb, and is highly developed with modern residential subdivisions and commercial developments.

Property types expected to be found in Eden Prairie include business and industrial properties, modern single and multi-family residential properties, community buildings, and scattered farmhouses that have been encompassed by modern development.

3.2 Minnetonka survey zone

3.2.1 Literature search

Repositories consulted to obtain historical information regarding Minnetonka include:

- Minnesota Historical Society Library and Archives
- University of Minnesota, John B. Borchert Map Library
- Hennepin County Public Library
- Minnesota SHPO
- Minnetonka Historical Society
- City of Minnetonka Community Development Department
- Hennepin County Assessor's Office Records (available online)
- Minnesota Geospatial Information Office (available online)

Primary and secondary sources included:

- Plat maps, atlases, and aerial images
- Minnesota SHPO site files and survey reports for previously surveyed properties
- City histories
- City of Minnetonka Community Development site files:
    - Building permits
    - Land records

[11] Marie Wittenberg, *Images of America: Eden Prairie* (Charleston, SC.: Arcadia Publishing, 2003), 111; Anderson 56.

- Property records maintained by private owners:
    - Lang House
    - Minneapolis Sewer Pipe Works (Pump and Meter Services)

- Minnetonka Historical Society site files

3.2.2 Previously evaluated properties in the APE

Mead & Hunt reviewed the Minnesota SHPO Architecture/History site files and identified one previously documented property within the APE: a house at 13318 North Street (HE-MKC-031).

3.2.3 Historic context

The City of Minnetonka is located in Hennepin County Minnesota, approximately 14 miles southwest of Minneapolis. The City has over 1,000 acres of public open space with natural features that include prairie and wetlands.[12] In 1852 Simon Stevens and Calvin Tuttle filed a claim for a dam site on Minnehaha Creek to utilize the available water power to power a sawmill. Although the sawmill burned in 1854, it was replaced the following year with a building that housed a sawmill on the first floor and a furniture factory and warehouse on the second until it was also destroyed by fire in 1868. The site was later used for a flour mill and subsequently a grain elevator and warehouse.[13]

Although relatively short-lived, the mill was a catalyst for growth in Minnetonka Township as other businesses were established to take advantage of the concentration of workers and rooming houses and hotels were erected. Constructed in 1853, the Minnetonka Hotel was the first in the area and the site of the initial meeting of Minnetonka Township, which was organization on May 11, 1858, the same day as the state of Minnesota.[14]

At the time Minnetonka Township was organized, the population was only 192. However, the population grew steadily during the remainder of the nineteenth century, reaching 291 by 1860 and 552 by 1870.[15]

By 1874 two rail lines were present and a number of parcels, likely farms, were occupied in addition to the established communities of Wayzata on Wayzata Bay and Minnetonka City, also known as Minnetonka Mills, in the central portion, near the site of the mill.[16] During the 1880s Minnetonka City had a church, hotel, blacksmith shop, post office, and store, in addition to a few residences.[17]

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[12] City of Minnetonka, "About Minnetonka," http://www.eminnetonka.com/about_minnetonka.cfm (accessed 8 April 2010).

[13] Betty Johnson, *Minnetonka Mills: A Historic Profile in Pictures* (Minnetonka, Minn.: The Minnetonka Historical Society, 2002), 1-3.

[14] Anderson, 4.

[15] Johnson, 54.

[16] A.T. Andreas, *Hennepin County Minnesota 1874 Atlas*. Available at the Borchert Map Library, University of Minnesota, Minneapolis, Minn.

[17] "1880s map," Minnetonka Historical Society, www.minnetonka-history.org (accessed 27 April 2010).

It was during this period that the railroad became an important transportation corridor. The M&StL was constructed in the neighboring village of Hopkins, which quickly became a hub. M&StL and St. Paul, Minneapolis and Manitoba spur lines provided access to the Minnetonka flour mill.[18] These railroads expanded the market available to the flour mill and during the 1880s it was one of the most productive mills in the region. At its peak, 300 to 400 barrels of flour were produced daily. However, the technology of new mills in Minneapolis coupled with their superior access to additional transportation options proved to be too competitive and the Minnetonka flour mill closed in 1885.[19] While the mill era was over, the community remained rooted in agriculture, which provided a stable economic base.[20]

Minnetonka Township elected to become a village in 1892 but the State Supreme Court ruled that the area did not meet village criteria. Minnetonka remained a township, within which were settlements that included Hopkins and Oak Knoll. As these communities incorporated into their own villages, like Wayzata and Hopkins had, the shape of the township changed as portions of the land were annexed.[21] Although these settlements were growing, the majority of the township remained predominately agricultural, with numerous farmsteads located on 5- and 10-acre parcels.

A streetcar line provided service between Minneapolis and Minnetonka in 1905. Minneapolis residents were attracted to Minnetonka at this time as the streetcar made it possible to retain the higher wage jobs available in the city while living in the country. By 1913 more than 10 residential subdivisions had been platted by farmers and developers. Early highways also provided direct access to the Twin Cities, including Minnetonka Boulevard and Wayzata Boulevard, which had been paved by the early 1920s.[22]

Hennepin County opened the Glen Lake Sanitarium in 1916 on the south side of Glen Lake (see Figure 4). It expanded several times over the years to accommodate the increasing number of tuberculosis patients and had a reputation as one of the three leading tuberculosis treatment centers in the world. In the 1930s, during the height of the tuberculosis epidemic, 715 people lived at the sanitarium.[23] The facility was demolished in 1993 and the site currently houses a golf course.

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[18] Johnson, 5.

[19] Johnson, 3.

[20] Johnson, 3.

[21] Johnson, 61. Some of these former communities are recognizable neighborhood centers within modern-day Minnetonka.

[22] Johnson, 5-7.

[23] City of Minnetonka, "History," http://www.eminnetonka.com/about_minnetonka/history.cfm (accessed 23 April 2010).

Figure 4. Glen Lake Sanitarium c.1920 (Minnesota Historical Society, Photographer Charles J. Hibbard, Negative NP29919).

Minnetonka Township remained predominately rural and agricultural until the mid-twentieth century. As World War II came to a close the demand for residential housing increased and large sections of farmland were subdivided into residential housing developments. Many farmers found that the rising value of their land, combined with increases in the cost of seed and property tax, significantly impacted their ability to make a profit. As developers made cash offers for their land, most farmers decided to accept. In addition, the development of modern highways required the transformation of farmland into roads, including I-494 constructed in 1963, and the four-lane expansion of Highway 12, which obliterated the former community of Oak Knoll.[24]

The population nearly doubled from 6,466 in 1940 to 12,000 in 1950 and then more than doubled to 25,037 in 1960. This increase in population is evident in the building stock of Minnetonka, as the majority of the surveyed properties are detached single-family homes from this period.

Minnetonka incorporated as a village in 1956 to address land management issues and provide the services necessary to support the growing population. In 1968 it became a city and in 1971 a new city hall building was constructed to replace the 1907 town hall that was no longer capable of supporting the expanding government.[25] In the following decades Ridgedale Mall and other shopping centers, industrial parks, apartment complexes, and residential subdivisions replaced the rural character of Minnetonka with a modern suburban setting.[26]

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[24] Anderson, 11, 61.

[25] Johnson, 63.

[26] City of Minnetonka, "Minnetonka History Timeline," http://www.eminnetonka.com/about_minnetonka/history/timeline/timeline3.pdf (accessed 21 April 2010).

Property types in the survey area include single- and multi-family residences, shopping centers and other commercial developments, industrial complexes, and community buildings.

3.3 Hopkins survey zone

3.3.1 Literature search

Repositories consulted to obtain historical information regarding Hopkins include:

- Minnesota Historical Society Library and Archives
- University of Minnesota, John B. Borchert Map Library
- Hennepin County Public Library
- Minnesota SHPO
- Northwest Architecture Archives
- Hopkins Historical Society
- City of Hopkins Planning and Development Department
- Hennepin County Assessor's Office Records (available online)
- Minnesota Geospatial Information Office (available online)

Primary and secondary sources included:

- Plat maps, atlases, and aerial images
- Minnesota SHPO site files and survey reports for previously surveyed properties
- City histories
- Hopkins Historical Society site files
- City of Hopkins Planning and Development Department site files
    - Building permits
    - Land records

3.3.2 Previously evaluated properties in the APE

Mead & Hunt reviewed the Minnesota SHPO Architecture/History site files and identified one previously documented property within the APE: the Blake School at 110 Blake Road South (HE-HOC-006).

3.3.3 Historic context

The city of Hopkins is located southwest of Minneapolis in Hennepin County, Minnesota, and was originally known as West Minneapolis.[27] The first settlers arrived in 1852 and located south of present-day Excelsior Boulevard and west of County Road 18. Prior to the arrival of the M&StL Railroad in 1871, Hopkins was a predominately agricultural community. However, the M&StL served as a catalyst for the industrial growth of Hopkins, providing an efficient corridor to transport goods and materials to Minneapolis and St. Paul and outside markets. The rail also allowed local farmers to expand from

[27] Beverly Ewing, Ed. *Hopkins Minnesota Through the Years* (Hopkins, Minn.: Hopkins Historical Society, 2002), 1.

subsistence farming into retail agriculture.[28] Raspberries were an important local crop beginning as early as the 1880s.[29]

The M&StL depot was named after Harly H. Hopkins, who donated a portion of his land to the railroad. A post office was installed in the station soon after it opened and also took on the Hopkins moniker, leading many at the time to know the town as Hopkins instead of its official name, West Minneapolis. The name was officially changed to Hopkins in 1928.[30]

After the arrival of the railroad in 1871, the first large industrial manufacturer settled in Hopkins. The Minneapolis Threshing Machine Company (MTM) established itself in Hopkins in 1887 and quickly became a leader in threshing machine technology. By 1889 the company produced its first steam traction engines and in 1893 a threshing machine was awarded several medals at the Worlds Columbian Exposition in Chicago.[31] In 1929 MTM merged with the Minneapolis Steel and Machinery Company and the Moline Plow Company of Moline, Illinois, to form the Minneapolis Moline Power Implement Company (Minneapolis Moline). During its heyday, it was the fifth largest farm machinery manufacturer in the United States and occupied a large industrial complex located between the rail corridor and Excelsior Boulevard (see Figure 5).[32]

Figure 5. Minneapolis Moline complex in Hopkins, c.1925 (Minnesota Historical Society, Negative 49295).

The industrial expansion resulted in a demand for a large workforce and with it an associated demand for housing. This demand was first met by the 1887 construction of tenement properties to efficiently house large numbers of workers.[33] The neighborhood between Mainstreet and Excelsior Boulevard was home to several rooming houses that were used by workers during the week who took the train home on

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[28] Ewing, 6.

[29] Ewing, 53.

[30] Ewing, 39, 40.

[31] Ewing, 48.

[32] Ewing, 50.

[33] Ewing, 75. Many of these rooming houses were removed in the 1960s to make way for a new City Hall and other new municipal and commercial buildings.

weekends. Churches, schools, businesses, and professional services were established to serve the large number of industrial and agricultural workers in Hopkins. The Blake School, a private preparatory school, was established on a former farm in 1912 at the edge of the growing community (see Figure 6). These amenities made Hopkins the commercial, educational, and social activity center for neighboring communities.[34]

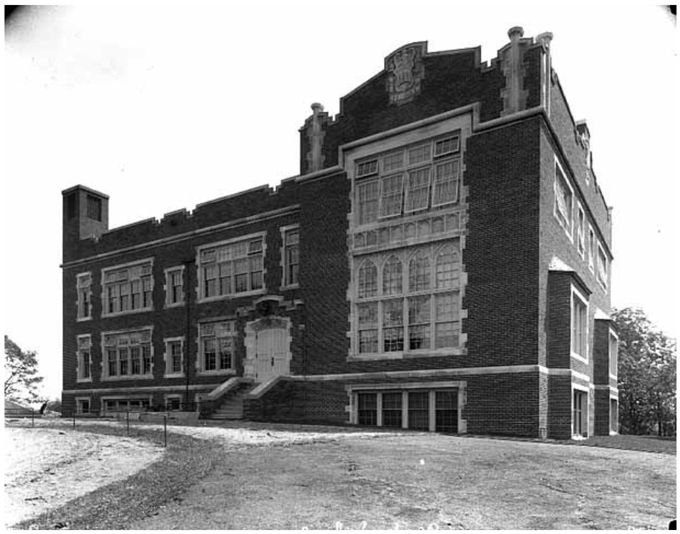

Figure 6. The Blake School, 1912 (Minnesota Historical Society, Photographer Charles Hibbard, Negative 5007-B).

Streetcar service was established in 1899, connecting Hopkins with Minneapolis. Along with the railroad, this corridor made it easy to commute between Hopkins and Minneapolis and helped to transport both the labor forces necessary for the growing industry and residents from outlying communities into Hopkins' growing downtown commercial area.[35]

Although Hopkins emerged as an industrial community, agriculture remained important through the twentieth century. Raspberry production began in the 1880s and increased in size in the following decades. By the 1920s it was estimated that the Hopkins area had over 800 acres devoted to the crop and was one of the largest berry producers nationwide. The Great Depression and drought conditions in the 1930s put many producers out of business and the crop size continued to dwindle through the 1950s and 1960s, eventually disappearing by the 1980s. During the Depression, an annual raspberry festival was established to boost the local economy. Although Hopkins is no longer a major producer of raspberries, this annual festival continues today.[36]

Population growth in Hopkins slowed dramatically during the Depression but then surged following World War II. Census records show a population of 4,100 in 1940, 7,595 in 1950, and 11,370 by 1960, a

[34] Ewing, 2.

[35] Ewing, 33.

[36] Ewing, 55, 136.

tremendous rate of growth for the 20-year period.[37] While Hopkins was growing at a rapid pace during this period, some of this growth can be attributed to the annexation of areas adjacent to Hopkins in Minnetonka Township, primarily as a way for the annexed areas to gain access to city services. As a result, single- and multiple-family homes were constructed to house the growing population. The oldest portion of the Interlachen Park neighborhood, located between the Interlachen County Club and Excelsior Boulevard, was platted in 1911. Interlachen Park's northern portion was platted between 1947 and 1949 with single-family homes that featured the popular Ranch style of the period.

The Minneapolis Moline Company declined in the years following World War II and other industrial companies were quick to move into the prime industrial corridor along the rail line in Hopkins. Companies such as National Tea, Red Owl, Winston & Newel Company (SuperValu), Superior Separator Company, and Honeywell were located in Hopkins by 1964. This dramatically increased employment with over 1,500 jobs created in Hopkins by these companies.[38] As a result, in 1964 a new City Hall was constructed to replace the aging 1912 structure that could no longer accommodate the growing workforce.[39]

Prior to the advent of the automobile, Hopkins served as a hub for nearby communities due to its large downtown commercial area and convenient rail and streetcar service. Residents of Eden Prairie, Minnetonka, and St. Louis Park were able to travel to the community to work and shop, resulting in a large number of services and merchants downtown including dental and medical offices, banks, bakeries, drug stores, hardware and grocery and stores, millineries, restaurants, theaters, and a library (see Figure 7).[40] However, as the automobile gained popularity, this position as a hub gradually disappeared. The freedom offered by automobiles made travel to Minneapolis, St. Paul, and other surrounding communities much easier. Residents were no longer tied to railroads or streetcars and were taking advantage of the new shops and services that catered to mobile customers away from the central downtown. As a result, businesses located along Mainstreet, including several automobile dealerships, relocated to Excelsior Boulevard and other major transportation corridors. During this period shopping centers were established in nearby communities, including St. Louis Park's Miracle Mile in 1951, the first commercial strip mall in Minnesota.[41] The success of Miracle Mile inspired others to quickly follow suit, including the 1955 Knollwood shopping center in St. Louis Park and the 1956 Southdale shopping center in Edina, the first indoor shopping mall in the nation.[42]

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[37] Ewing, 8-10.

[38] Ewing, 57.

[39] "Improve All City Services," c.1963. Available at Hopkins City Hall site files, Hopkins, Minnesota.

[40] Ewing, 3.

[41] Mickey Tibbis, "Miracle Mile celebrates 40 years of business success," 11 September 1991. Available at the St. Louis Park Historical Society, "Miracle Mile clippings folder," St. Louis Park, Minn.

[42] Ewing, 4.

Figure 7. Mainstreet in downtown Hopkins, c.1920 postcard (Minnesota Historical Society, Negative 104202).

As the last of the raspberry farmers sold off their acreage in the 1960s and 1970s, the former farmland was annexed into the city and converted into residential developments. One such development is located in southern Hopkins; Opus II is a 450-acre office, industrial and high-density residential development complex. In 1980 businesses in the development accounted for over 3,000 jobs.[43]

Apartment units became popular in the 1960s and 1970s, replacing the single-family home as the preferred residential developments of the period. This emphasis on multiple-unit dwellings continued as Federal urban renewal money became available in 1965 and the city zoning favored multiple-family dwellings. By 1980 the census revealed that these economic and political pressures had resulted in 60 percent of Hopkins dwelling units being apartments, with a total of 7,700 renters. An attempt to counteract this shift in demographics followed in the late twentieth and early twenty-first centuries with a greater emphasis on owner-occupied townhouses and a return to single family dwellings.[44]

Property types that can be expected to be found in the Hopkins survey area include industrial and commercial properties, single- and multi-family dwellings, and community buildings.

3.4 St. Louis Park survey zone

3.4.1 Literature search

Repositories consulted to obtain historical information regarding St. Louis Park include:

- Minnesota Historical Society Library and Archives
- University of Minnesota, John B. Borchert Map Library
- Hennepin County Public Library
- Minnesota SHPO

[43] Ewing, 81.

[44] Ewing, 83.

- Northwest Architecture Archives
- St. Louis Park Historical Society
- St. Louis Park Building Codes Department
- Hennepin County Assessor's Office Records (available online)
- Minnesota Geospatial Information Office (available online)

Primary and secondary sources included:

- Plat maps, atlases, and aerial images
- Minnesota SHPO site files and survey reports for previously surveyed properties
- City histories
- St. Louis Park Historical Society site files
- St. Louis Park Building Codes Department site files
  - Building permits
  - Land records

- Property records maintained by private owners:
  - Union Congregational Church
  - Northland Aluminum, Inc.

- City directories

3.4.2 Previously evaluated properties in the APE

Mead & Hunt reviewed the Minnesota SHPO Architecture/History site files and identified three previously documented properties within the APE: a house at 3456 Wooddale Avenue South (HE-SLC-007), the Peavey-Haglin Experimental Concrete Grain Elevator located on Northland Aluminum Products, Inc. property (HS-SLC-009), and the St. Louis Park Roadside Park at 5025 Highway 7 (HE-SLC-017).

The Peavey-Haglin Experimental Concrete Grain Elevator is listed in the National Register and is designated a National Historic Landmark. It is also is a Historic Civil Engineering Landmark.

The St. Louis Park Roadside Park was determined eligible for the National Register as part of the Lilac Way Historic District in 1998. However, this determination was changed to ineligible after most of the district was razed as part of Trunk Highway 100 reconstruction in 2006.

3.4.3 Historic context

The city of St. Louis Park is located southwest of Minneapolis in Hennepin County, Minnesota, on landscape characterized by a mixture of rolling uplands and level ground with intermittent ponds and wetlands.[45] The earliest known settlers of St. Louis Park arrived in 1854 and supported themselves with subsistence level farming. The growth of Minneapolis and St. Paul soon created a market for food that the farmers of St. Louis Park helped supply, resulting in a primarily agricultural economy for the first

[45] City of St. Louis Park, "Land & Climate," http://www.stlouispark.org/land_climate.htm (accessed 6 April 2010).

several decades. The St. Paul & Pacific and M&StL Railroads arrived in St. Louis Park in the 1870s and 1880s but did little to alter the social or economic status of the area as no depot was constructed until later in the century. The earliest settlers created the necessities of society soon after their arrival and constructed the first school around 1859 at the corner of Excelsior and Pleasant Avenue in the newly formed School District No. 18.[46]

The first step towards industry came in 1886 when 6,746 acres were officially incorporated as the village of St. Louis Park and the railroad built its first depot in the community. The cities of Minneapolis and St. Paul grew rapidly during this period and the proximity of St. Louis Park made it a target for industrial expansion. Although neighboring communities experienced organic growth in their population and industrial base in the years leading up to this point, St. Louis Park retained its agricultural nature until the 1890s, when the Minneapolis Land and Investment Company (MLIC) formed with the intent of developing the village into an industrial suburb.[47]

T. B. Walker, a successful Minnesota lumber baron, and his associates formed the MLIC to create a model community in St. Louis Park. The MLIC purchased 2,000 acres and re-platted the area to accommodate an industrial, commercial, and residential suburb. Beginning in 1890, the existing plats were rearranged, resulting in 12,000 lots on about 1,700 acres. A provision was incorporated into the deeding of the streets, roads, and parks to the city that retained the rights to lay gas, water, underground conduits, and street railway tracks. An industrial area was included in this re-platting along the M&StL and Milwaukee Railroads in the location where Highway 7 and Louisiana Avenue currently intersect.[48] Walker was responsible for constructing a church, factories, commercial buildings, and hotels to house workers involved in the development of the community and the local industries.[49]

The population grew from 350 in 1886 to 499 by 1890, but it was the following decade when growth began in earnest.[50] Walker influenced one specific upgrade to the infrastructure, the 1892 introduction of the electric streetcar, which ran between St. Louis Park and Minneapolis. Walker sought this transportation corridor to aid in population growth and provide the workforce necessary to expand local industry.

Efforts to bring in new industry began to show a return in the 1890s. Despite a national economic slowdown in 1893, several factories moved to the industrial section of the village, including Monitor Works, Esterly Harvester, the Sugar Factory, Republic Creosoting Company, Thompson Wagon Works, Malleable Iron Works, and Presto-Lite. The Peavy-Haglin Experimental Concrete Grain Elevator, a National Historic Landmark, was constructed during this period as well (see Figure 8).[51] The elevator

[46] Norman Thomas, "St. Louis Park: A Story of a Village," http://www.slphistory.org/history/normanthomas.asp (accessed 16 April 2010).

[47] Thomas, 43.

[48] Thomas, 44-45.

[49] "The Brookside Timeline," http://www.jeanneandersen.net/timeline.html#postwar (accessed 30 March 2010).

[50] Thomas, 61.

[51] "The Brookside Timeline."

was built along the rail line adjacent to other grain elevators. It was test-filled in May of 1899 and emptied the following year. Having been built as an experiment, the elevator was used only the one time to store grain but it has remained a highly visible feature on the St. Louis Park landscape to this day.[52]

Figure 8. Peavy-Haglin Experimental Concrete Grain Elevator, located along the rail corridor, c.1908 (photo courtesy of the Minnesota Historical Society, Negative 26073).

The population expanded to 1,325 by 1910 and 2,281 by 1920. During this period, area farms were subdivided and platted into residential developments, including the Goodrich Farm. This land became the Lenox Subdivision in 1913, located north of present-day Highway 7 and east of Louisiana Avenue.[53] The continuous expansion of the population and the rapid adoption of the automobile made necessary the first paved roads in St. Louis Park. Excelsior Boulevard was a main thoroughfare between Minneapolis and the western suburbs at this time and had several automobile-related businesses located along the corridor.[54]

This growth in the population led to the need for more services, notably in the schools. A new school was approved in March of 1913, and the St. Louis Park High School was soon built on land donated by Walker between the depot and streetcar line.[55] Industry began to lessen in importance in St. Louis Park during this period as Minneapolis continued to grow and the automobile made commuting from the St. Louis Park into the city easier. During the 1920s St. Louis Park had only four factories, two of which were still in

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[52] St. Louis Park Historical Society, "Grain Elevators,"

http://www.slphistory.org/history/grainelevators.asp (accessed 29 March 2010).

[53] "Goodrich Farm Platted," *Journal*, 1 November 1913. Available at St. Louis Park Historical Society, "General" clippings files, St. Louis Park, Minn.

[54] "The Brookside Timeline."

[55] Thomas, 71.

operation after 1930.[56] However, the population continued to grow and the numerous plats laid out by Walker and other developers were being bought and built upon. This dramatic increase in population placed a heavy demand for services on the local government just as the Great Depression made expansion problematic.[57]

Although the years of the Great Depression were difficult, the opportunities provided by work relief programs brought much needed improvements to St. Louis Park. The Works Progress Administration (WPA) made transportation to Minneapolis more efficient around 1934 by assisting the state with the construction of Highway 7; however, this also had the consequence of making the streetcar system obsolete.[58] Soon after the highway was complete, the owner of the streetcar system petitioned the village council for permission to remove the tracks and to begin a bus service, which was readily welcomed by the community.[59]

The 1930s saw the reduction of the Walker land holdings. The industrial suburb that Walker had envisioned did not come to fruition as planned. Community leaders adopted the slogan "A City of Homes," reflecting the desire of the community to remain a bedroom community of the larger and busier nearby Twin Cities.[60] The remaining undeveloped land that was owned by Walker and the MLIC lost value to property tax each year. By the end of the decade Walker made an offer to the village council to provide 27 acres in exchange for tax forgiveness with a certain acreage retained by Walker's organization to be replatted and improved. By 1940, with the improvements complete and the homes on these lots sold, the Walker era in St. Louis Park had passed.[61]

In 1940 the population of St. Louis Park was 7,737 and of the 2,200 dwellings present, 1,806 post-dated 1920, when the idea of a residential suburb was established.[62] By 1950 the estimated population of the village was 22,644, nearly triple the residents of the previous decade. Building permits accelerated as well, from 32 in 1942 when the World War II restricted the availability of materials to 857 in 1949 and 1,122 in 1950. All told, in the period between 1946 and 1952 a total of 4,500 building permits were granted in St. Louis Park, making it one of the fastest growing suburbs around the Twin Cities.[63] This period of development is evidenced in the concentrations of residences dating to the 1940s and 1950s located within the survey area.

Although the emphasis was on residential construction during the postwar period, commercial and industrial development still retained a presence within the community. Warehouses and office buildings

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[56] Thomas, 90.

[57] Thomas, 85.

[58] Thomas, 102.

[59] "The Brookside Timeline."

[60] "The Brookside Timeline."

[61] Thomas, 102.

[62] Thomas, 104.

[63] Thomas, 110-112.

were constructed along the rail corridor in the 1950s and 1960s. The Northland Aluminum Products facility, which incorporated the Peavey-Haglin Experimental Concrete Grain Elevator, was established in 1946 near the intersection of Highways 7 and 100. Still in operation, the company produces the Nordic Ware line of bake ware and pioneered the use of non-stick coatings.[64] St. Louis Park is also home to the first strip shopping center in Minnesota, known as the Miracle Mile (see Figure 9). The complex opened in 1951 at the highly-visible intersection of Excelsior Boulevard and Highway 100.[65]

Figure 9. Miracle Mile shopping center in 1955 (photo courtesy of the Minnesota Historical Society, Norton & Peel photographer, negative NP227976).

In January 1955 St. Louis Park was officially designated a city. In 1961 the city council chose Carpenter Park for the site of a new city hall, which was complete in 1963.[66] To accommodate the increasing population, over 4,000 apartment units were constructed in the early 1970s.[67] The 1970s proved to be the peak of population growth, as the 2006 population of 43,145 indicates stabilization in the community.[68] In recent years, the city has experienced increased commercial development along the major transportation corridors, Highway 7 and Excelsior Boulevard, including modern big-box stores and other service-related buildings. Modern apartment buildings are also located along these corridors.

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[64] "History of Northland Aluminum Products" (1975), 38. Available from St. Louis Park Historical Society "Nordic Ware" clippings files, St. Louis Park, Minn.

[65] Tibbis, "Miracle Mile Celebrates 40 years of Success," 11 September 1991.

[66] "City Hall," St. Louis Park Historical Society, http://www.slphistory.org/history/cityhall.asp (accessed 20 April 2010).

[67] "The Brookside Timeline."

[68] United States Census Bureau, "St. Louis Park, Minnesota," http://quickfacts.census.gov/qfd/states/27/2757220.html (accessed 30 March 2010).

The survey area for this proposed project follows the Southwest Transitway corridor through the southern half of St. Louis Park and runs adjacent to residential communities and the area platted by Walker for industrial use. The property types expected to exist within St. Louis Park survey area include industrial and business buildings, single and multi-family residential homes, community structures, and governmental buildings.

4.0 Results

Mead & Hunt's principal investigator for this project is Heather Goodson. The project team also included architectural historians Christina Slattery, Emily Pettis, Bob Frame, Shannon Dolan, Katherine Haun, and Phillip Barlow. Fieldwork and research was completed between March and April 2010.

4.1 Eden Prairie survey zone

A total of 20 properties were surveyed in the Eden Prairie survey zone (see Appendix B for the complete list of these properties). Of these properties, none warranted Phase II evaluation and none were listed, previously determined eligible, or recommended as eligible for the National Register.

4.2 Minnetonka survey zone

A total of 96 properties were surveyed in the Minnetonka survey zone (see Appendix B for the complete list of these properties). Of these properties, two warranted Phase II evaluation. One property is recommended eligible for the National Register when it becomes 50 years old. No properties were listed in or previously determined eligible for listing in the National Register. Table 2 presents the details of the Phase II properties in the Minnetonka survey zone. The Phase II evaluation of each property is presented in this section.

Table 2. Phase II Properties in Minnetonka Survey Zone

Property Name (Historic)	Property Address	SHPO Inventory Number	NRHP Status	Project Segment(s)
Lang House	5038 Dominick Spur, Minnetonka	HE-MKC-101	Recommended eligible when it is 50 years old (2016)	1
Minneapolis Sewer Pipe Works/ Red Wing Sewer Pipe Company	11303 Excelsior Boulevard, Minnetonka	HE-MKC-102	Recommended not eligible	1, 3, 4

Figure 10 shows the locations of Phase II properties located in the Minnetonka survey zone that are recommended eligible for National Register listing.

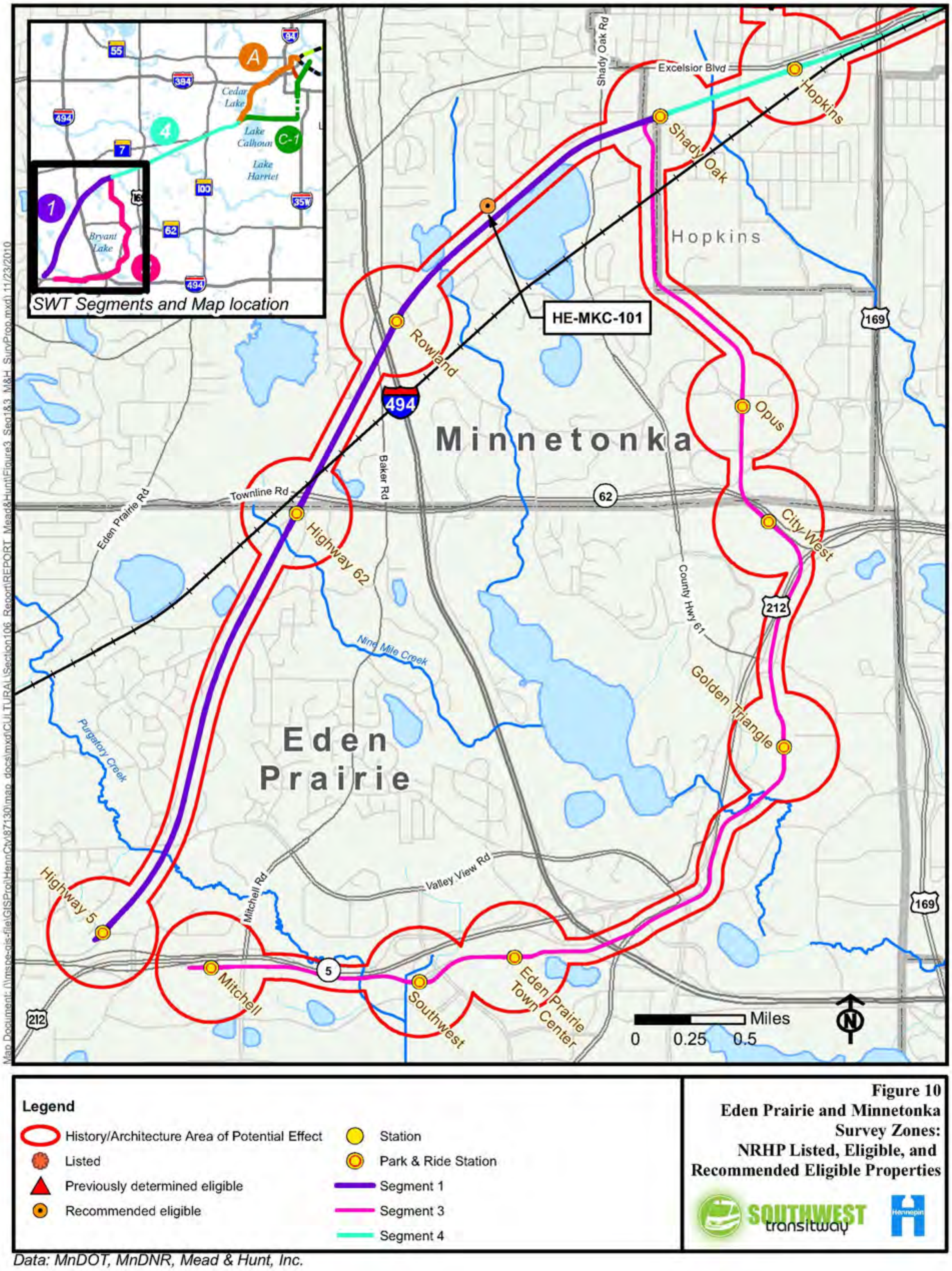

Figure 10. Eden Prairie and Minnetonka Survey Zones: NRHP Listed, Eligible, and Recommended Eligible Properties.

4.2.1 Lang House

MnSHPO Inventory Number: HE-MKC-101
Address: 5038 Dominick Spur
City/Township: Minnetonka

Description

The Lang House located at 5038 Dominick Spur in Minnetonka, Minnesota, is a unique modern residential building featuring an elliptic parabloid roof (see Figure 11). The home is located on 2.67 acres and overlooks a wooded flood plain.[69] Designed in 1961-1962 by owner Keith Lang, construction could not begin until funding was acquired through a Federal Housing Administration Experimental loan in 1963.[70] A 200-square-foot detached garage, designed in 1962 but not built until 1972, is located to the north of the house. The garage was specifically designed to be detached and set away from the house so not to interfere with the roof form or the viewshed (see Figure 12). [71]

The single-story home has a square footprint and was constructed between 1963 and 1966. The house features an elliptic parabloid roof where the roof appears to flex in the center, pushing the edges downward and creating a dome-like interior. An elliptic parabloid is created by "sliding a vertical parabola with a downward curve along a perpendicular parabola with a downward curve. The horizontal sections are ellipses while its vertical sections are parabolas."[72] In essence, if the surface is cut horizontally it is an ellipse and if cut vertically it is a parabola. The north and south roof edges curve down toward the ground; the east and west roof edges are not pushed downward but project away from the walls creating a wide eave (see Figure 13). The north and south roof edges are supported by two concrete anchors on the building. The concrete anchors are covered with plywood, shaped like inverted triangles, and extend the roofline to the ground (see Figures 14 and 15).

The Lang House features a "thin shell" roof comprised of light weight composite roof materials that are curved to resist both tensile and compressive forces.[73] Fiberglass forms the sheathing of the roof and polyethylene insulation protected by a fabric skin stretched over the surface protects the building. Steel columns 5.5 inches in size are located along the interior walls and support the load of the roof structure, leaving the interior space free of supporting columns.[74] The house is clad with brick veneer with canted east and west corners. A group of four fixed picture windows is located on each elevation. The north and south elevations are a mirror of the east and west elevations (see Figure 16).

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[69] Hennepin County Assessors Property Tax Web Database, www.16.co.hennepin.mn.us (accessed 12 April 2010).

[70] Mrs. Keith Lang, interview by Mead & Hunt, Minnetonka, Minn., 30 March 2010.

[71] Interview with Mrs. Keith Lang; "Application for garage permit," Permit No. 3660 (1972), City of Minnetonka building permit files, Minnetonka, Minn.

[72] Francis Ching, *A Visual Dictionary of Architecture* (New York: John Wiley & Sons, Inc., 1997), 219.

[73] Angus MacDonald, *Structure and Architecture* (Oxford: Architectural Press, 2001), 59.

[74] "Application for Building Permit," Permit No. 64-314 (April 28, 1964), City of Minnetonka building permit files, Minnetonka, Minn.

Minor modifications have been made over the years to the building. Primarily, the fiberglass roof was found to crack in inclement weather and a number of repairs to the roof have been made. A modern deck extending over the concrete-block retaining wall, located south of the house, was added to the south elevation in the 1990s.

Figure 11. North elevation of the Lang House, view facing south.

Figure 12. View of the garage and house, view facing southwest.

Figure 13. Note how the north and south sides of the roof are pinned to the ground while the east elevation is allowed to extend, view facing southwest.

Figure 14. Detail view of the concrete anchors.

Figure 15. Detail view of the roofing materials.

Figure 16. Northwest elevation, view facing southeast.

History

Since its construction in 1966, the Lang House has been used as a single-family residence and has been owned solely by the designer, Keith Lang, and his family. Designed in 1961-62, the house form and structure was developed by Lang without assistance from an architect, contractor, or designer. The inspiration for the unique roof form is unknown but may have been inspired by other prominent 1950s and 1960s buildings that stressed unusual roof forms.[75] Lang worked as a mechanical engineer for Northrop

[75] Malcom Millais, *Exploding the Myths of Modern Architecture* (New York: Frances Lincoln Ltd, 2009), 119.

Aircraft in California in the early 1950s before moving to Minneapolis, where he worked on the General Mills High Altitude Balloon program.[76] Though not a civil or structural engineer, Lang's understanding of aircraft design and aeronautics may have also lent to the inspiration of using an elliptic paraboloid roof form for his home.

The house was constructed on an undeveloped lot by the Langs and was purchased in 1960 for its location at the top of a hill and unobstructed view of the woods. The lot was located at the end of a cul-de-sac of an unplatted subdivision developed with post-World War II residences.[77] Extensive grading and the construction of a retaining wall along the south elevation of the house was necessary in order to build on the lot. In keeping with Modernist design ideals, the house was sited to take advantage of the wooded viewshed and allow ample natural light indoors.[78]

Evaluation

The Lang House was evaluated under *Criterion C: Architecture* as an example of distinctive characteristics of type, period, and method of construction. The postwar building era was one of experimentation for house construction, materials, and design and includes popular styles such as Minimal Traditional, Ranch, Split-Level, and Contemporary. Because of its unique design, the Lang House does not fit one particular architectural style and would fall into the architectural category of Modern, in which residents stressed unique construction and use of new building technologies, little ornamentation, open floor-plans, natural building materials, and ample windows to bring the outdoors in and open interior spaces. The Lang House was as built to fit the lot and is sited to overlook and appreciate the view shed. It was designed with brick to blend the house into the landscape, and large picture windows on each elevation brought the outdoors in. The parabloid roof form characterizes the Modern movement's celebration of unique forms and use of the latest building technology.

The house also displays characteristics of the less formal Googie architecture, which incorporates futuristic characteristics. Googie architecture features upswept rooflines, boomerang shapes, large glass windows on the facade, broad eaves, and angles that seem to "ignore gravity altogether," much like the Lang House.[79] Like contemporary architects who were developing innovative public buildings at this time that emphasized unique roof shapes, mathematics, and application of experimental materials, Lang's design also blends futurism and contemporary. Other famous examples of Modern buildings featuring parabloid roofs include Saarinen's Kresge Auditorium in Massachusetts, Candela's Valencia Oceanografic, and Utzon's Sydney Opera House.

The Lang House is significant for its distinctive Modern architectural characteristics - the open floor plan, use of brick veneer, large picture windows, little ornamentation, and unique building technique and form. The period of significance is 1966 to reflect completion of Lang House construction.

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[76] Interview with Mrs. Keith Lang.

[77] Dominick Spur subdivision plat, City of Minnetonka site files, Minnetonka, Minn.

[78] Interview with Mrs. Keith Lang.

[79] Douglas Haskell, "Googie Architecture," *House and Home* (February 1952, www.spaceagecity.com/googie/ (accessed 13 April 2010).

The Lang House retains integrity of location, setting, feeling, and association because the building reflects mid-twentieth century aesthetics and is an innovative design form utilizing new technologies and building ideas. Few alterations have been made to the building and repairs to the roof have been with in-kind materials. Therefore, integrity of design, materials, and workmanship is retained. Overall, the Lang House displays a high degree of integrity.

Recommendation

The Lang House is recommended eligible for the National Register under *Criterion C: Architecture* for its distinctive characteristics of type, period, and method of construction when the building reaches 50 years of age.

4.2.2 Minneapolis Sewer Pipe Works

MnSHPO Inventory Number: HE-MKC-102
Address: 11303 Excelsior Boulevard
City/Township: Minnetonka

Description

Historically part of the Minneapolis Sewer Pipe Works/Red Wing Sewer Pipe Company, the building is located on a 3.54-acre lot at 11303 Excelsior Boulevard in Minnetonka. Constructed in 1908, the original portion of the building is a cream brick, one-and-one-half-story, front-gable, rectangular plan building with large additions on the west gable end and south elevation (see Figure 17). The addition on the west gable end is a c.1950 brick, flat-roof building with replacement windows that effectively doubles the length of the building and serves as the current primary entrance with pedestrian access facing Excelsior Boulevard (see Figure 18). The south elevation addition is a large c.1950 gable-roof metal storage building with garage door (see Figure 19). This gable-roof addition features its own addition of a flat-roof concrete block storage building with metal sheathing on the east and west elevations.

The original building is visible on the east gable end, north elevation, and peak of the west gable end. The east gable end was likely the original entrance for the building and features two fixed-pane replacement windows, a pedestrian access door with glass surround centered on the first story, a loading door in the upper gable portion, and decorative brickwork along the raised parapet. The north elevation faces onto Excelsior Boulevard and features three fixed-pane replacement windows. The west gable end has a single fixed-pane window in the gable peak. The roof of the building features an original chimney just inside the high parapet on the west gable end and asphalt shingles.

The entirety of the parcel fronts Excelsior Boulevard and is surrounded by a chain-link fence. The parcel features a large c.1990 one-story concrete block warehouse to the south of the original building. Small metal storage sheds are located in both the southeast portion of the parcel and by the access gate near the parcel's northeast corner.

Figure 17. Original portion of the building, view facing northwest.

Figure 18. Original building and c.1950 brick addition, view facing southwest.

Figure 19. Original brick structure and additions, view facing northeast.

Figure 20. View of the parcel facing south.

History

The Red Wing Sewer Pipe Company was formed as a subsidiary of Red Wing Stoneware, a producer of a wide variety of clay and stoneware products since 1878 and based in Red Wing, Minnesota. The first piece of sewer pipe was made in 1890 by George Cook of Red Wing Stoneware who had experimented with pipe to determine a good use for the coarse clay on top of the fine clay extracted for pottery.[80] The pipe was produced with a salt glaze and baked at 2200 degrees to vitrify the product, sealing out moisture and creating a high quality product.[81] The Red Wing Sewer Pipe Company was formed soon thereafter and moved into their first production facility in Red Wing, Minnesota.[82] Due to the success of this enterprise, a new facility was constructed in Minnetonka to take advantage of the convenient raw material delivery and product distribution offered by the M&StL Railroad.[83]

Construction of the Red Wing Sewer Pipe Company was completed on December 1, 1908, by contractor C.F. Kaglin & Stahr. The 33-acre company complex consisted of three buildings: a four-story, 82-foot by 300-foot drying building, a 72-foot by 140-foot mixing room building, and a 62-foot by 194-foot clay house (believed to be the only remaining structure).[84] The property featured 16 furnaces and eight large smoke stacks that stood as tall as the drying building. These buildings were placed to take advantage of the adjacent rail line with trunk lines running up to the buildings for efficient loading and unloading.

Early images of this complex show that it was initially branded with the name Minneapolis Sewer Pipe Works, which was a branch of the Red Wing Sewer Pipe Company.[85] By 1915 the complex had the Red Wing Sewer Pipe Company name on the drying building and was shipping 1,500 train cars of product a year to northern Minnesota, the Dakotas, and Montana.[86]

During its period of operation from 1908 to 1924 the Red Wing Sewer Pipe Company was a large employer in Hopkins. This period of success was short, however, and by 1924 economic hardship forced the closure of the plant.[87] The complex sat vacant until approximately 1930 when it saw a short period of use by the National Bricklite Company. National Bricklite only stayed in operation for a few short years before also going out of business, at which point all of the buildings in the complex except for the subject building located at 11303 Excelsior Boulevard were destroyed.[88]

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[80] Madeline Angell, *Red Wing Minnesota, Saga of a River Town* (Minneapolis: Dillum Press, 1977), 200.

[81] Minnesota Historical Society, "Red Wing Sewer Pipe Company," http://www.mnhs.org/school/online/communities/occupations/POTdoc1T.htm (accessed 13 April 2010).

[82] Angell, 200.

[83] "Minneapolis Gets Sewer Pipe Co." *The Wall Street Journal*. 1 April 1908. Available at Minnesota Historical Society, Microfilm Archives, St. Paul, Minn. The facility was located on the boundary between Minnetonka and Hopkins and was considered to be a Hopkins-area industry at the time of construction.

[84] Jeff Wagner, ed, *Hopkins Centennial Album, 1887-1987* (Hopkins, Minn.: Hopkins Centennial Committee, 1987), 27; "Minneapolis Sewer Pipe Works," *The Hopkins News,* 9 July 1908. Available at Minnesota Historical Society, Microfilm Archives, St. Paul, Minn.

[85] "Conditions From the Atlantic to the Pacific as Reported by Our Expert Observers," *Brick and Clay Record* (September, 1908): 47.

[86] Ewing, 59.

[87] "Pump and Meter Service Company Building History," Available at Pump and Meter Service Company Inc. site files, Hopkins, Minn.

[88] "Pump and Meter Service Company Building History."

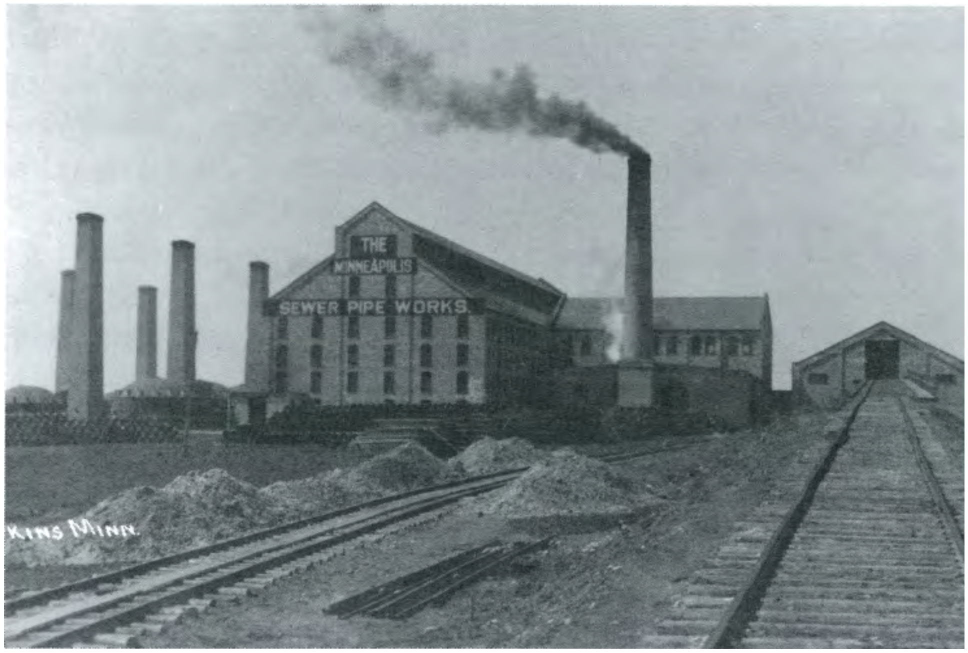

Figure 21. Red Wing Sewer Pipe Company. Subject building is visible on right
*(*Hopkins Through the Years*, 59).*

The remaining building was sold to O.F. Woodrich in the 1930s and repurposed as storage and shop space for his Minneapolis-based construction business. Woodrich Construction moved their operation into this building in 1949 after the interior was remodeled. A later alteration in 1954 addition extended the building to the west to provide additional office and work space. The property was sold again in 1981 to Lee H. Radermacher, owner of the Pump and Meter Service Company. The property underwent further remodeling in 1993 to create more office space for the Pump and Meter Service Company, which remains the building's occupant as of 2010.[89]

The original setting for this building was a 33-acre production site that was visually anchored by the four-story drying room and associated chimneys, which were all demolished in the 1930s.[90] The railroad spur lines that provided the primary means of transportation have been removed. The complex is now configured to utilize automobile transportation, evidenced by the paving of a majority of the remaining site and the reorientation of the building towards Excelsior Boulevard.

Evaluation

The remaining building from the Red Wing Sewer Pipe Company complex located at 11303 Excelsior Boulevard was evaluated for the National Register under *Criterion A: Industry* and *Criterion C: Architecture*. This facility was a secondary production facility for the Red Wing Sewer Pipe Company and does not have significance as the headquarters of the company, or significance as the site where the methodology for manufacturing sewer pipe was established. While the Red Wing Sewer Pipe Company

[89] "Pump and Meter Service Company Building History."

[90] "Pump and Meter Service Company Building History."

was an employer in Hopkins from 1908 to 1924, it does not appear to have been a significant contributor to the development of the community of Minnetonka or the nearby community of Hopkins. Furthermore, it is not significant under *Criterion A* due to the loss of a majority of the industrial complex with which it is historically associated resulting in the property's inability to convey the feeling and association of the historic period. The setting of the building has also been dramatically altered by the addition of pavement, multiple buildings constructed in the last several decades, and the removal of the railroad trunk lines.

The building is not significant under *Criterion C: Architecture* as the 1908 portion of the building does not display the high artistic value necessary to be considered eligible. In addition, the building displays a lack of integrity in the historic fabric caused by the replacement of windows and doors and the addition of large, visually incompatible additions that detract from the original structure's architectural and aesthetic design. Nor does it represent a significant example of a type, period, or method of construction. As such, this building is not eligible under *Criterion C*.

Recommendation

As the remaining building from the Red Wing Sewer Pipe Company, this building is recommended not eligible for the National Register under *Criterion A: Industry* or *C: Architecture*.

4.3 Hopkins survey zone

A total of 143 properties were surveyed in the Hopkins survey zone (see Appendix B for the complete list of these properties). Of these, five properties and one potential historic district warranted Phase II evaluation. One property and the historic district are recommended eligible for the National Register. No properties were listed in or previously determined eligible for listing in the National Register. Table 3 presents the details of the Phase II properties in the Hopkins survey zone. The Phase II evaluation of each property and the district is presented in this section.

Table 3. Phase II Properties in Hopkins Survey Zone

Property Name (Historic)	Property Address	SHPO Inventory Number	NRHP Status	Project Segment(s)
Hopkins City Hall	1010 1st Street South, Hopkins	HE-HOC-026	Recommended eligible	4
Hopkins Downtown Commercial Historic District	800 to 1000 block of Mainstreet, Hopkins	HE-HOC-027	Recommended eligible	4
Minneapolis Moline Company	11111-11119 Excelsior Boulevard, Hopkins	HE-HOC-028	Recommended not eligible	1, 3, 4
Prodel, Inc. Building	30 8th Avenue South, Hopkins	HE-HOC-029	Recommended not eligible	4
Nygren Building	50 9th Avenue South, Hopkins	HE-HOC-030	Recommended not eligible	4
Oakridge Investment Co. Building	15 10th Avenue South, Hopkins	HE-HOC-031	Recommended not eligible	4

Figure 55 on page 79 shows the locations of Phase II properties located in the Hopkins survey zone that are recommended eligible for National Register listing.

4.3.1 Hopkins City Hall

MnSHPO Inventory Number: HE-HOC-026
Address: 1010 1st Street South
City/Township: Hopkins

Description

Hopkins City Hall, located at 1010 First Street South in Hopkins, Minnesota, was constructed in 1964 as part of the need to expand city services for its growing population. City Hall is sited on 1.87 acres directly south of Hopkins' downtown and is surrounded by commercial and multi-family residential properties.[91] The modern Hopkins City Hall was designed by architects Lang, Raugland, and Brunet, Inc. in 1963.[92] The building was designed to house the city hall in a two-story building to the north with the fire department in a separate two-story building with a tower to the south. The buildings were connected with a one-story hyphen.[93] Overall, the building is symmetrical, clad in brick veneer, and rests on a concrete foundation (see Figure 22).

Original Building

The primary facade (north) of City Hall features brick veneer in a running course pattern with an end brick row every fifth course. The facade is broken by vertical ribbons of fixed-over-awning windows and aluminum panels. A concrete and glass vestibule is located in the center of the facade sheltered by a concrete portico with a sawtooth roof. The vestibule and portico project north from the facade and are original to the design of the building (see Figure 23). The outdoor steps, railing, pedestrian furniture, and landscaping on the north and west sides of the facade have recently been updated. A metal mansard roof projects from the center of the building and is original.

The side (west) elevation features a concrete water table and similar brick coursework. The elevation features a narrow ribbon of aluminum paneling and fixed-over-awning windows. A larger fixed-over-awning window is located in the recessed southern wing of the elevation. A cornerstone inscribed with "1964" is located on this side elevation to the right of the windows. The opposite side (east) elevation features one-over-one and narrow three-light fixed windows. The one-over-one window is directly above a modern entry door. An additional modern access door to the building is located at the northern end of the elevation.

To the south of the city hall building is the original fire department building, which now houses the police department. The rear (south) elevation features a modern steel overhead door, modern single light

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[91] Hennepin County Assessors Property Tax Web Database, www.16.co.hennepin.mn.us (accessed 14 April 14 2010).

[92] "Lang and Raugland Papers," Northwest Architecture Archives, Elmer Anderson Library, University of Minnesota, Minneapolis, Minn.

[93] "Building Elevations," Lang, Raugland, and Brunet architectural drawings of Hopkins City Hall, Sheet 6 of 14, 17 October 1963. Available at Northwest Architecture Archives, Elmer Anderson Library, University of Minnesota, Minneapolis, Minn.

windows, and a modern single-light entry door (see Figure 24). An entry east of the modern door has been filled with brick veneer. All of the doors and windows have new lintels of brick soldier coursing.

The side (east) elevation features 16 single-light, over-awning windows located equidistant on the elevation. Three brick channels, located between every two sets of windows, breaks the smooth facade. A modern entry door is located to the right of the windows. A tower used historically to dry fire hose projects from the ridge line of the building. The rectangular tower is clad in brick and features windows on the south, west, and north elevations and a flat roof with narrow eave. An access ladder is located on the south elevation of the tower (see Figure 25).

Additions

A few minor additions have been added to the rear building in 1990 and 2003 (see Figure 26). In 1990 a second story was added to the hyphen connecting the city hall building to the fire department. The addition features brick veneer and fixed windows flanked by a fixed-over-awning windows.

In 2003 a single-story addition was added to the side (west) elevation of the fire department. The addition projects west from the hyphen and wraps around the front of the building. The addition features a cast stone water table, brick coursework, and fixed-over-awning windows. An entry is located on the north elevation and features a glass vestibule and metal canopy (see Figure 26). An additional entry that features a metal canopy and a one-over-one window is located on the rear (south) elevation.

A 120-foot metal latticework communications tower is located adjacent to the side (east) elevation. The tower was erected in 1988 and rests on a concrete slab foundation.[94] A modern metal utility cabinet is adjacent to the communications tower, located in the southeast corner of the building.

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[94] Resolution No: 88-16 allowing a 120-foot high communications tower at the Hopkins City Hall was adopted March 1, 1988. "Resolution 88-16," (1988), Hopkins City Hall permit files, Hopkins, Minn.

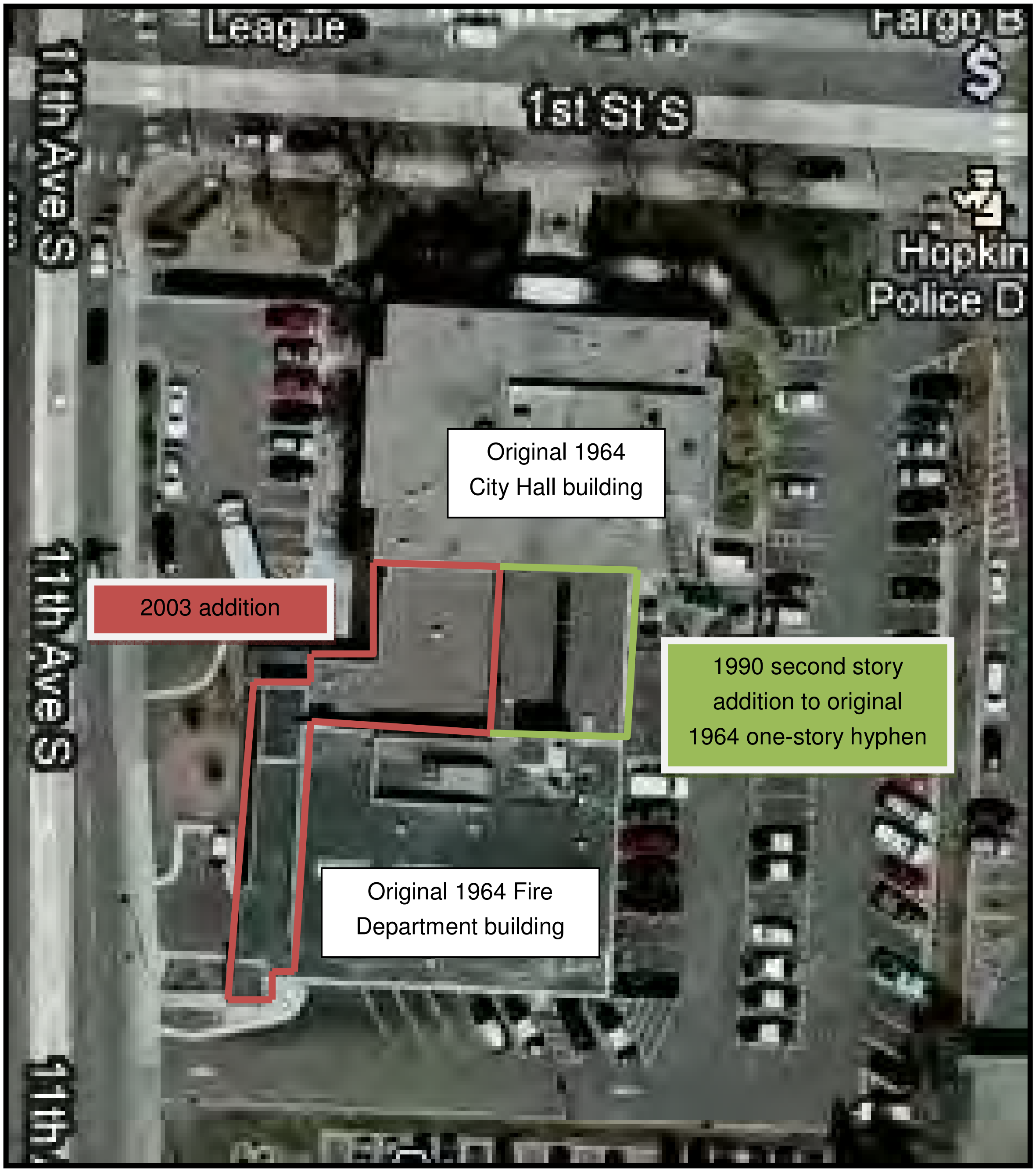
Figure 22. North facade of Hopkins City Hall, view facing southwest.

Figure 23. North facade of Hopkins City Hall, view facing southeast.

Figure 24. South elevation of Hopkins City Hall, view facing north.

Figure 25. East elevation of Hopkins City Hall, including the hose drying tower, view facing southwest.

Figure 26. 2003 addition to the west elevation, view facing southeast.



Hopkins City Hall 1010 First Street South, Hopkins, Minnesota Aerial photograph from www.maps.google.com (accessed 13 July 2010)	N	Figure 27 Spatial Evolution of Hopkins City Hall

Figure 27. Spatial Evolution of Hopkins City Hall

History

The growth of Hopkins in the 1950s through the 1960s pushed the city to expand its services, as represented by the construction of a larger civic building housing city hall and the fire department. When the original city hall was constructed in 1912, Hopkins was a small village of 2,500 residents. In a 1950 census, the City of Hopkins' population had grown to 7,595.[95] By 1963, its population almost doubled to 13,000.[96] Growth continued through the 1970s and 1980s, but at a slower pace, with populations at 13,428 and 15,336, respectively. In 2010 Hopkins had a population of just over 17,000.[97]

This sudden population growth in the 1950s and 1960s can be attributed to Hopkins' large industrial presence and annexation of land surrounding the city. Up until the 1950s, Hopkins was a small business and farming community. After World War II Hopkins grew as city dwellers moved west from Minneapolis into adjacent communities.[98] However, the largest growth of the city would occur between the 1950s and early 1960s, when major industrial employers moved into the area. Companies such as National Tea, Red Owl, Winston & Newel Company (SuperValu), Superior Separator Company, and Honeywell located in Hopkins by 1964, which dramatically increased employment and the city's population. According to the Civic and Commerce Association at the time, over 1,500 jobs were brought to Hopkins by these companies.[99]

Annexation of land provided additional room for new housing, office, and industrial development and aided in the growth of the city. In the late 1940s and early 1950s seven subdivisions were added to Hopkins. In the 1960s and 1970s, 450 acres in southern Hopkins, called Opus II, were annexed and developed with office, industrial, commercial, and high-density housing. By 1980 over 3,000 people were employed at businesses established in the subdivision.[100]

Because of this growth, Hopkins city government needed to expand its municipal services. The first Hopkins City Hall was located on the northeast corner of Mainstreet and 8th Avenue North. Built in 1912 the building originally housed a volunteer fire department and six part-time city employees.[101] The building was remodeled a number of times to find room for a growing staff but by 1963 the building could not meet code requirements and was "condemned by the State Fire Marshall and Electrical Inspector." A pamphlet circulated by the Fire Department to increase support for the special election to fund a new city hall building asks "This is Hopkins?" when describing the dilapidated building. City hall was not only "sub-standard" and "over-crowded, over-age, and over-due for replacement" but it was also seen as

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[95] Ewing, 4.

[96] "Improve All City Services," c.1963. Available at Hopkins City Hall site files, Hopkins, Minn.

[97] Ewing, 9-10.

[98] Ewing, 4.

[99] Ewing, 57.

[100] Ewing, 81.

[101] Ewing, 151-152.

representing Hopkins as a behind the times city. A larger "up-to-date" facility representing Hopkins success as a growing community was desired.[102]

On December 10, 1963, the citizens of Hopkins voted in favor of building a new municipal building and modern fire department.[103] The building was financed with $400,000 from permanent improvement revolving funds and $290,000 from surplus funds.[104] The new City Hall site was selected in the area southwest of downtown where plans had been in development since 1957 for urban renewal and revitalization projects due to the large amount of substandard housing.[105] Construction began on February 11, 1964, by the Dean Wichter Construction Company and was completed by November of the same year. The city hall building formally opened on December 30, 1964, and an open house welcomed the public on January 17, 1965 (see Figure 28).[106]

Figure 28. Laying the cornerstone for Hopkins City Hall on the west elevation, November 13, 1964. (Richard Sly, available at www.hopkinsmnhistoricalsociety.org).

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[102] "Improve All City Services," c.1963. Available at Hopkins City Hall site files, Hopkins, Minn.

[103] "Vesely to Give City Hall Dedication Speech Sunday," *Beltline Newspaper*, 14 January 1965.

[104] "Vesely to Give City Hall Dedication Speech Sunday."

[105] Ewing, 86.

[106] *Hennepin County Review*, 24 December 1964. Available at Hopkins City Hall site files, Hopkins, Minn.; *Hennepin County Review*, 14 January 1965. Available at Hopkins City Hall site files, Hopkins, Minn.

The building was designed by architects Lang, Raugland, and Brunet, Inc. Oscar Lang and Arnold Raugland established their partnership of Lang, Raugland and Lewis in 1922, becoming Lang and Raugland in 1930. Lang attended the University of Pennsylvania School of Architecture from 1913 to 1915. His early career included work with two noted Minneapolis architectural firms: Hewitt and Brown and the firm of Long, Lamoreaux and Long. Raugland was an engineer, receiving a degree from the University of Minnesota in 1920. The firm continued until 1992 under a series of partners following Lang's death in 1960.[107] As Lang and Raugland, the firm produced a wide variety of commissions for private and public buildings and structures, including a number of churches and schools in the Minneapolis area. They are noted for their work on Augsburg College facilities and the Mizpah Congregational Church in Hopkins. It appears their civic government building work was limited but in the 1950s the firm designed the Edina Village Hall.[108]

Alterations to the City Hall have been few over the last 40 years. Interior renovations and a second-story to the hyphen connecting city hall and the fire department building were undertaken in 1990.[109] The work was done by Bernard Jacob Architects, Ltd. More recently, the single-story addition to the front of the fire department building was designed and constructed by Braurer & Associates, Inc. in 2003. Both the 1990 and 2003 additions are sympathetic to the original Lang and Raugland design, matching the wall cladding and window type.

Evaluation

The Hopkins City Hall was evaluated for the National Register under *Criterion A* at the local level in the area of *Community Planning and Development*. Hopkins City Hall was constructed in response to explosive population growth to provide an increased level of municipal services to the community. The relocation of the city hall building to a larger site and the modern architectural design was a signal that the city was modern and meeting the needs of its citizens. Hopkins City Hall was also evaluated for the National Register under *Criteria Consideration G* at the local level for its exceptional importance to the city of Hopkins. Hopkins City Hall plays an important role in providing a needed level of service to its citizens and was built in response to the explosive growth experienced by Hopkins in the 1950s and 1960s. While there are other postwar buildings in the downtown area, the city hall building is the best local representation of this growth. The period of significance is the 1964 date of construction, which is a response to the growth and community need for improved municipal services.

Hopkins City Hall retains integrity of location, setting, feeling, and association because the building reflects mid-twentieth century design aesthetics and conveys the city's progress during this period. While minor additions have been made, they are sensitive in scale and materials to the original structure. Therefore, integrity of design, materials, and workmanship is retained. Overall, Hopkins City Hall displays a high degree of integrity.

[107] "Lang and Raugland Papers," Available at Northwest Architectural Archives, Elmer Anderson Library, University of Minnesota, Minneapolis, Minnesota.

[108] "Lang and Raugland Papers."

[109] Building Plaque, Hopkins City Hall, Hopkins, Minnesota.

Recommendation

Hopkins City Hall building is locally significant under *Criterion A: Community Planning and Development*¸ applying *Criteria Consideration G,* for its embodiment of how a city government met the municipal needs of a growing community. It serves as the best representative example of a municipal property type representing this period of growth and development. Therefore, Hopkins City Hall is recommended eligible for the National Register.

4.3.2 Hopkins Downtown Commercial Historic District

MnSHPO Inventory Number: HE-HOC-027
Address: 800-1000 blocks of Mainstreet
City/Township: Hopkins

Description

The Hopkins Downtown Commercial Historic District is a collection of commercial, mixed-use, and fraternal buildings in a three-block corridor that extends along Mainstreet (formerly called Excelsior Avenue) from 8th Avenue to 11th Avenue (see Figures 29-31). The district consists of properties fronting Mainstreet that represent the principal periods of development along Mainstreet. These blocks are bound by 8th Avenue on the east and 11th Avenue the west. Although commercial development extends east and west along Mainstreet, much of the buildings outside this core area have been altered or replaced with modern buildings in recent years.

The buildings in the district are typically one or two stories with exceptions being the two, three-story buildings at 824 Mainstreet (see Figure 32) and 906-908 Mainstreet (see Figure 33). Buildings range in age from 1893 to 2006 with the majority representing two distinct periods of development: the turn of the twentieth century and the post-World War II population boom. The oldest buildings in the historic district are constructed of brick with decorative features that include brick corbelling, dentils, quoins, and other decorative patterns. Stone veneer as a decorative treatment is most common on retail buildings from the postwar period. Notable decorative elements include the large parapet with scrollwork and crucifix on the building at 823 Mainstreet (see Figure 34). Architectural ornamentation on the upper stories has typically been preserved, although the majority of storefronts have been modified over the years to include new entrances, windows, and siding materials.

Buildings along Mainstreet house a variety of historic and current uses, including restaurants, retail, and offices, some with second-story apartments. Several distinctive buildings serve as anchors along the historic district and include the two visually commanding three-story brick buildings constructed by Hilmer Olson in 1893 and 1902, the 1903 Independent Order of Odd Fellows (IOOF) Building, the c.1902 Opera Hall, and the 1902 Masonic Lodge (see Figure 35). The Masonic Lodge differentiates itself from the commercial block due to its deep setback.

Within the district Mainstreet is a two-lane asphalt road with on-street parking. Sidewalks and concrete curb and gutter are located between the buildings and the street. Street lights include period replicas with acorn lamps and modern fixtures with square lamps. Several mature trees are located along the sidewalk and decorative brick pavers are located at select intersections. A small clock tower and plaza are located at the southwest corner of 9th Avenue and Mainstreet, at the former site of a commercial building. The clock was installed in 1992 and the area includes planters, benches, and commemorative pavers.

Figure 29. South side of the 800 block of Mainstreet, note the Opera Hall in the center of the block, view facing southwest.

Figure 30. North side of 900 block of Mainstreet, note the IOOF Building on the corner, view facing northeast.

Figure 31. South side of 900 block of Mainstreet, note the clock and Olson Building on the corner, view facing southwest.

Figure 32. 1893 Olson Building located at 824 Mainstreet, view facing south.

Figure 33. 1902 Olson Building located at 906-908 Mainstreet, view facing southwest.

Figure 34. The 1903 IOOF building located at 823 Mainstreet, view facing northeast.

Figure 35. The 1902 Albert Pike Masonic Lodge located at 907 Mainstreet, view facing north.

Figure 36. The c.1960 building located at 911 Mainstreet, view facing northwest.

Figure 37. The 1958 Kokesh Hardware Store located at 1001 Mainstreet, view facing northwest.

History

Hopkins' location along the M&StL Railroad corridor attracted several industries in the mid- to late nineteenth century. The community developed to meet the needs of the growing workforce, with churches, schools, businesses, and professional services established in the areas surrounding the industrial complexes along the rail corridor. A concentration of commercial buildings was constructed along what was historically known as Excelsior Avenue (now known as Mainstreet), forming a central downtown area. Excelsior Avenue served as the main highway route between Minneapolis and Excelsior before it was re-routed to the south in the late twentieth century. The earliest buildings downtown were one- and two-story frame structures that were eventually replaced with the extant brick and masonry buildings. The oldest extant brick building on Mainstreet was constructed in 1893 by Hilmer Olson, who owned a local brickyard. Located at 822-824 Mainstreet, the building housed a number of commercial establishments on the first story with living quarters located on the second story. Olson was responsible for the construction of other downtown buildings, including the three-story Olson Block located at 902-904 Mainstreet.[110]

Excelsior Avenue was the center of commercial and social activity during the late nineteenth and early twentieth century. Commercial buildings lined both sides of Excelsior Avenue between 7th Avenue and 11th Avenue, churches were located within walking distance, and an unofficial streetcar waiting station was located at the corner of Excelsior Avenue and 9th Avenue. The block along Excelsior Avenue between 7th Avenue and 8th Avenue was characterized primarily by a lumber yard, blacksmith shop, and livery stables. The streetcar allowed residents of surrounding communities to travel into Hopkins and shop in this commercial area, which was more substantial than those in the smaller and more rural surrounding communities of Eden Prairie and Minnetonka.

[110] Ewing, 192.

The growing economy and population is reflected in the growth of downtown during the first decade of the twentieth century. Several of the existing buildings were constructed around this time, including 901 Mainstreet (which served as the unofficial waiting station for the streetcar), the Opera House, the Masonic Lodge, the IOOF building, Jack Shonka's Hopkins Theatre at 819 Mainstreet, and several commercial buildings.[111]

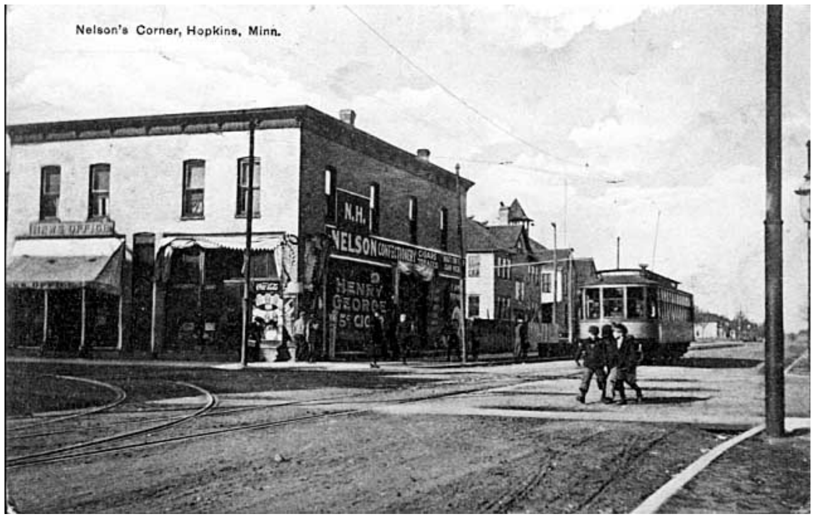

Figure 38. 901 Mainstreet and the streetcar line, c.1905 (Minnesota Historical Society, Negative 104200).

Figure 39. Excelsior Avenue (now Mainstreet) c.1920 (Minnesota Historical Society, Negative 104202).

Commercial development slowed in the following decades as World War I and the Great Depression took their toll on the area. Only four buildings were constructed in the district between 1920 and the 1940s.

[111] Ewing, 182-209.

However, the postwar boom resulted in the construction of new buildings within the district that replaced older buildings or utilized empty lots. These businesses offered a range of services, including a car dealership, hardware store, restaurants, bars, and offices.[112] With gas stations on nearly every corner, car dealerships lining Excelsior Avenue, and a number of local bars, Hopkins became known as the "cars and bars" town.[113] In 1951 streetcar service was removed and commercial development began to shift to the major transportation corridors, including Excelsior Boulevard.[114] Shopping malls were established in the surrounding communities, including the Miracle Mile, opened in 1951, and Knollwood Plaza, opened in 1955, in St. Louis Park, and Southdale Shopping Center, opened in 1956, in Edina, replacing downtowns as the primary retail areas. By the early 1960s, small, specialized stores were no longer profitable, and Hopkins merchants could no longer compete with the modern shopping malls. In addition, many of the surrounding agricultural communities that relied on the Hopkins downtown for shopping now had their own suburban commercial developments and travel to downtown Hopkins was no longer necessary.[115]

Evaluation

The Hopkins Downtown Commercial Historic District was evaluated under *Criterion A* at the local level in the area of *Commerce*. During the late nineteenth and early twentieth century, downtown Hopkins served as the commercial center for local residents and residents of the surrounding agricultural communities who traveled to Hopkins to buy goods and services. In addition to serving as the central location of a variety of businesses, the Opera Hall, Masonic Lodge, IOOF, and other social and civic institutions were housed in the district. Historically, the commercial core of Hopkins extended along Excelsior Avenue from 7th Avenue on the east to 11th Avenue on the west. However, the block between 7th and 8th Avenues was characterized primarily by lumberyards, a blacksmith shop, and livery stables. The buildings in this block have been replaced by modern buildings in recent years; therefore, this block is not included in the boundaries of the Hopkins Downtown Commercial Historic District. The period of significance begins in 1893 with the construction of the oldest building in the district and ends in 1960, when suburban shopping centers began to replace downtown Hopkins as the primary destination for local consumers. The Hopkins Downtown Commercial Historic District retains its commercial nature and represents this early period of commerce and settlement in Hopkins. Although the district is surrounded by modern commercial development, it retains a strong sense of time and place. Table 4 presents a listing of buildings within the district.

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[112] Ewing, 190-211.

[113] Ewing, 4.

[114] Ewing, 37.

[115] Ewing, 4.

Table 4. Listing of Buildings Within the Hopkins Downtown Commercial Historic District

Address	Historic Name	Date Built	Status	Notes
801 Mainstreet	Commercial Building	c.1908	Contributing	Rusticated concrete block construction.
802 Mainstreet	Commercial Building	1975	Noncontributing	Outside the period of significance.
805 Mainstreet	Commercial Building	1956	Noncontributing	Altered.
808 Mainstreet	Commercial Building	1900	Contributing	Two-story commercial with two storefronts.
809 Mainstreet	Commercial Building	1950	Contributing	Recessed entrance with stone veneer.
810-812 Mainstreet	Grocery Store	c.1900	Contributing	Retains recessed storefront and overall form.
811 Mainstreet	Commercial Building	1967	Noncontributing	Outside the period of significance.
815 Mainstreet	Commercial Building	c.1900	Contributing	Decorative brick corbelling at cornice.
816 Mainstreet	Opera Hall	c.1902	Contributing	Beltcourse over first story with decorative details, arched windows with Gothic Revival details, decorative cornice.
819 Mainstreet	Jack Shonka's Hopkins Theatre	c.1900	Contributing	First theatre in Hopkins, corner quoins, decorative brick corbelling at cornice, protruding brick window surrounds.
820 Mainstreet	Commercial Building	c.1900	Contributing	Brick arches over center entrance, brick corbelling and quoins, stone accents and quoins.
821-823 Mainstreet	International Order of Odd Fellows Lodge	1903	Contributing	Stepped brick banding above windows and below cornice, decorative cornice with scrollwork and crucifix detail.
824 Mainstreet	Olson Grocery	1893	Contributing	Oldest brick building on Mainstreet, constructed by Hilmer Olson, decorative brick corbelling, stone window lintels with floral designs and scrollwork.
901 Mainstreet	Commercial Building	c.1900	Noncontributing	Significant alterations include the addition of a large pent roof, faux half timbering, and replacement windows.

Table 4. Listing of Buildings Within the Hopkins Downtown Commercial Historic District

Address	Historic Name	Date Built	Status	Notes
903 Mainstreet	Montgomery Ward Catalog Order Store	1958	Contributing	Dressed stone veneer, recessed entrance.
906-908 Mainstreet	Olson Building	1902	Contributing	Known as the Olson Building, constructed by Hilmer Olson and one of a few three-story buildings on Mainstreet. Decorative brick corbelling, stone window sills.
907 Mainstreet	Albert Pike Masonic Lodge	1902	Contributing	Pedimented entablature over door with Masonic crest, wide eaves with cornice returns, dentils on cornice, arched windows. Building is deeply recessed from the street and has a small front yard.
910-912 Mainstreet	Nelson Meat Market	1894	Contributing	Raised parapet, small brick dentils in cornice, brick lintel over second story windows with oversized keystone.
911 Mainstreet	Commercial Building	c.1960	Contributing	Recessed storefront and stone veneer.
913 Mainstreet	Maetzold Hardware and Garage	c.1929	Contributing	Decorative brick details in cornice.
914 Mainstreet	Charleston Clothing	c.1910	Contributing	Stepped parapet, patterned brickwork.
915-921 Mainstreet	Commercial Building	c.1900	Contributing	Cornice features brick dentils and recessed panels.
916 Mainstreet	Smetana Drug Store	c.1900	Contributing	Original three-light casement windows in second story, large brick window lintels with oversized keystones.
918 Mainstreet	Anderson Dry Goods	c.1900	Contributing	Muted brick corbelling in cornice, non-protruding brick window surrounds.
922 Mainstreet	Commercial Building	c.1900	Contributing	Brick arched windows on second story and east elevation, dentils on upper cornice.
1001 Mainstreet	Kokesh Hardware	1958	Contributing	One-story, brick with recessed entrance.

Table 4. Listing of Buildings Within the Hopkins Downtown Commercial Historic District

Address	Historic Name	Date Built	Status	Notes
1004 Mainstreet	State Bank of Hopkins	1908	Contributing	Yellow brick used for window surrounds, decorative panels, and to highlight corbelling at the cornice. Upper windows have transom windows over a centered picture window flanked by one-over-one windows.
1006-1008 Mainstreet	Commercial Building	c.1930	Contributing	Stone veneer on first story, white brick window lintels.
1007 Mainstreet	Commercial Building	c.1930	Contributing	Two part building, retains awning over first story, recessed entrance.
1009-1015 Mainstreet	Commercial Building	c.1915	Contributing	Two-part storefront with a decorative panel over each denoted by protruding brick.
1010 Mainstreet	Commercial Building	2006	Noncontributing	Outside period of significance.
1014 Mainstreet	Commercial Building	c.1950	Contributing	Brick and granite veneer.
1016 Mainstreet	Commercial Building	c.1950	Contributing	Granite veneer.
1017-1023 Mainstreet	Dahlberg Brothers Ford	c.1940	Noncontributing	Entrance bays converted into storefront widows, replacement material.
1022 Mainstreet	Saloon	c.1915	Noncontributing	Significant alterations include replacement windows, wall sheathing, and entrances.

The buildings in the Hopkins Downtown Commercial Historic District retain enough integrity to convey the district's significance as an early downtown commercial center. Although several of the buildings have alterations, including modified storefronts, they are able to reflect a sense of time and place.

Recommendation

The Hopkins Downtown Commercial Historic District is locally significant under *Criterion A: Commerce* for its role in the commercial development of Hopkins. It is recommended eligible for the National Register.

Downtown Hopkins Commercial District Contributing and Non-contributing buildings

Aerial photograph from www.googleearth.com (accessed 27 July 2010)

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Figure 40

Downtown Hopkins Commercial District

Figure 40. Aerial photo of Hopkins Downtown Commercial Historic District showing locations of contributing and noncontributing resources.

4.3.3 Minneapolis Moline Company

MnSHPO Inventory Number: HE-HOC-028
Address: 11111 Excelsior Boulevard
City/Township: Hopkins

Description

The former Minneapolis Moline Company building is located at 11111 Excelsior Boulevard in Hopkins, Minnesota. The building is located on the south side of Excelsior Boulevard and north of a former railroad corridor. The facade of the building is oriented to the north. The red brick building was constructed in 1951 as part of the Minneapolis Moline Company complex. At the time of construction, the building had a footprint of 340,000 square feet.[116] Since then there have been multiple additions and modifications to the building spanning from 1962 through 1998.

The building has an irregular plan with a flat roof and rests on a concrete foundation. Windows are a combination of fixed single, multi-light, and glass block. A modern two-story addition with large fixed windows separated by decorative panels was added to the northeast corner of the original building and served as office space (see Figure 41). A flat roof portico supported by metal poles shelters an entryway on the east elevation and a decorative sign advertising the facility as the “Hopkins Tech Center” is located above the roofline on the north elevation and supported by a decorative metal frame (see Figure 42). The remaining portion of the facade features a long band of one-over-one, double-hung sash windows and a c.1960 decorative metal screen at the roofline (see Figure 43).

The building also features a loading dock and garage on the east elevation and several brick and concrete block warehouse additions with service bays (see Figure 44). A detached pole building is connected to the west elevation by a conveyor system. A brick smokestack, located adjacent to the side (west) elevation, is the only visible remnant of the former Minneapolis Moline factory. At some point after purchasing the property, “Napco” was painted in white letters over the original “MMCO” (Minneapolis Moline Company) white brickwork (see Figure 45).

[116] Ewing, 52.

Figure 41. Former Minneapolis Moline building, side (east elevation), view facing southwest.

Figure 42. Former Minneapolis Moline building, northeast corner (north and east elevations), view facing southwest.

Figure 43. Former Minneapolis Moline building, front (north elevation), view facing southeast.

Figure 44. Former Minneapolis Moline building, side (east) elevation, view facing southeast.

Figure 45. Former Minneapolis Moline building, side (east elevation), view facing north.

History

The Minneapolis Threshing Machine Company began manufacturing farm equipment in the late 1880s and quickly became the largest employer in western Hennepin County.[117] Aside from a minor decrease in production during the economic depression of 1893, the Minneapolis Threshing Machine Company experienced financial success well into the twentieth century. In 1929 it merged with the Minneapolis Steel and Machinery Company of Minneapolis and the Moline Implement Company of Moline, Illinois, to form the Minneapolis Moline Power Implement Company (Minneapolis Moline). The merger created the fifth largest farm implement manufacturing company in the United States and by 1930 more than 1,300 people were employed at the company.[118] In addition to its location in Hopkins, Minneapolis Moline had several other branches located across the United States, including Minneapolis and Moline, Illinois. The Hopkins branch housed the power machinery division office and factory.[119]

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[117] Ewing, 2.

[118] Ewing, 50.

[119] *The Story of Minnie Moline Minneapolis-Moline Power Implement Company*, 1941. Available at the Minneapolis Historical Society, St. Paul, Minn.

Figure 46. Aerial view of Minneapolis Moline Industrial Complex c.1925 (from the Hopkins Historical Society), view facing south.

Like many other companies, Minneapolis Moline contributed to the production of war-related materials during World War II. After the war, the company returned to manufacturing farm implements. In 1951 they built the building at 11111 Excelsior Boulevard and continued to be successful until the mid-1950s, when the agriculture-related economy began to decline.[120]

During its tenure in Hopkins, Minneapolis Moline constructed several ancillary buildings throughout the property to aid in the manufacture of farm implements. Many of the buildings associated with Minneapolis Moline, such as the main complex seen in Figure 46, are no longer extant. Only the subject 1951 red brick building located at 11111 Excelsior Boulevard and its smokestack, which were located several blocks to the west of the main complex, are extant today. The one-story red brick building was designed as a completely contained manufacturing building.[121]

In 1962 Napco Industries purchased the Minneapolis Moline building located at 11111 Excelsior Boulevard. Napco was a leading manufacturer of automotive parts and supplier of service parts and other components for commercial and military vehicles.[122] Napco built a one-story red brick building to the east of the Minneapolis Moline building in 1963. The 1963 building was designed to house multiple companies affiliated with Napco.[123]

During their ownership, Napco modified the original Minneapolis Moline building by adding several additions, including the two-story office addition on the northeast corner. The building currently houses the Hopkins Tech Center and is owned by Venturian Holdings LLC. Since Venturian Holdings LLC's acquisition, the interior space of the building has been modified to accommodate approximately 26 tenants.[124]

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[120] Ewing, 52.

[121] Ewing, 60.

[122] Ewing, 60.

[123] Ewing, 60.

[124] Ewing, 60.

Evaluation

The Minneapolis Moline property was evaluated for the National Register under *Criterion A: Industry* and *Criterion C: Architecture*. With regard to *Criterion A,* the property has an association with the industrial development of the Minneapolis Moline Company in the city of Hopkins. The 1951 building was associated with Minneapolis Moline Company for 11 years before it was purchased by Napco Industries. However, it post-dates the heyday of the Minneapolis Moline Company, from its merger in 1929 through the postwar era; therefore, it does not reflect the significance of the company. In addition, most of the key industrial buildings, structures, and objects associated with Minneapolis Moline have been demolished and there is nothing remaining of the original pre-World War II industrial complex. Thus, the property as a whole no longer conveys the early history of the Minneapolis Moline Company in Hopkins. As for the property's association with Napco Industries, research did not reveal a significant association between Napco and industrial development in Hopkins. Therefore, the building is not eligible under *Criterion A*.

As for *Criterion C*, the property is no longer representative of a mid-twentieth century industrial complex. The 1951 brick building has been significantly altered since it was sold in 1962. Multiple additions to the building spanning from 1962 through 1998 for remodeling of the interior space to accommodate multiple tenants has diminished the building's integrity. The property as a whole no longer represents an intact mid-twentieth century industrial complex. Therefore, the property is not eligible under *Criterion C* as property type.

Recommendation

The Minneapolis Moline Company building is recommended not eligible for the National Register under *Criterion A: Industry* or *Criterion C: Architecture.*

4.3.4 Prodel, Inc. Building

MnSHPO Inventory Number: HE-HOC-029
Address: 30 8th Avenue South
City/Township: Hopkins

Description

The Prodel, Inc. building is located at 30 8th Avenue South on the west side of the street, approximately mid-block between Mainstreet and 1st Street South. Constructed in 1961 as an office building, it is a two-story, concrete block building with a flat roof that measures 74 feet by 50 feet.[125] Shadow blocks, concrete blocks with a pattern of beveled recesses, were used in construction of the building's north elevation to lend an aesthetic element to the building. The identical east and west elevations feature aluminum curtain walls that are topped with bands of corrugated metal, and have large plate glass windows and small awning windows divided horizontally by porcelain panels. These features, coupled with the centered, full-height entry portico, reflect the building's interior spatial organization.

Parking lots flank the building on the north, south, and west sides. A small storage building stands at the northwest corner of the property, and a flag pole is located on the east side of the building just north of the primary entrance. The building was converted from an office building to the Elks Lodge in 1966, and the interior was remodeled.[126] On the exterior, the building has experienced few alterations. A metal awning overhangs the building's east entrance, and various windows on the east and west elevations were painted opaque white.

[125] "New Hopkins Office Building Work Starts," 22 June 1961. Available at the City of Hopkins permit files, Hopkins, Minn.

[126] "Hopkins Elks to Dedicate New Home Oct. 28-29," 27 October 1966. Available at the City of Hopkins permit files, Hopkins, Minn.

Figure 47. East facade of 30 8th Avenue South, view facing west.

Figure 48. Oblique view of east and north elevations, view facing southwest.

Figure 49. Oblique view of west and south elevations, view facing northeast.

History

In the decades following World War II, Hopkins experienced a surge in population as residents moved from the larger cities of Minneapolis and St. Paul to the surrounding suburban communities. To accommodate commercial and retail needs of the city's increased population, the city's commercial core began expanding south, east, and west from the historic downtown commercial core along Mainstreet in the late 1950s and early 1960s.[127] The area south of downtown was known for the boarding houses and apartment buildings constructed in the late nineteenth and early twentieth century to house the employees of the area's major industries, such as the Minneapolis Threshing Machine Company (later known as Minneapolis Moline Power Implement Company). By the middle of the twentieth century, many of the boarding houses and apartment buildings were dilapidated, and this area was prime for development. Located between the major transportation route of Excelsior Boulevard and Hopkins' downtown commercial core, this area represented the second wave of commercial and office development in the city.[128] Modern buildings in popular styles, including Contemporary and Ranch forms, were added by private developers to provide office space and professional services immediately north and south of Mainstreet. Additionally, the city built a new city hall complex, and the post office moved to the south side of downtown during this time.

The building located at 30 8th Avenue South was commissioned by Prodel, Inc., a corporation owned by four local residents: Robert Good, Robert Anderson, and local architects Earl and Eugene Branstrom. The Branstrom brothers were also the building's designers, and Rutledge Construction Company served as the general contractor. When construction began in mid-1961, the estimated construction cost was

[127] Ewing, 174-176; Wagner, 24.

[128] Ewing, 174-176.

$89,000, which included the cost of the land, from which an old house was moved. The new office building was designed to accommodate eight, air-conditioned rental spaces.[129]

In 1966 the Hopkins Elks Lodge sought a new home to accommodate its large membership, and eventually settled on the Prodel, Inc. building. The new lodge was dedicated in October 1966 after an interior remodeling adapted the building to the Elks' needs. The upper level was remodeled to include a bar, cocktail lounge, two dining rooms, and a kitchen. The lower floor accommodated the lodge room, offices for the manager and secretary, store rooms, and "probably the finest of all saunas in the Metropolitan area."[130] The building located at 30 8th Avenue South continues to serve as the Elks Lodge today.

Evaluation

The Prodel, Inc. building was evaluated under *Criterion A* in the area of *Community Planning and Development* for its association to Hopkins' mid-twentieth century efforts to respond to the post-World War II population surge and the expansion of the city's downtown commercial core and services. Construction of the Prodel, Inc. building was a private undertaking that does not convey the significance of community planning and development. Furthermore, there is not a cohesive collection of mid-twentieth century buildings in this area of the city to convey the overall significance of postwar community planning and development.

The building was also evaluated under *Criterion C* in the area of *Architecture*. The Prodel, Inc. building does not embody distinctive characteristics of a type, period, or method of construction or represent the work of a master. The building does not possess high artistic value and does not represent a significant and distinguishable entity whose components may lack individual distinction.

Recommendation

The Prodel, Inc. building is recommended not eligible under *Criterion A* in the area of *Community Planning and Development* and *Criterion C* in the area of *Architecture*.

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[129] "New Hopkins Office Building Work Starts," 22 June 1961.

[130] "Hopkins Elks to Dedicate New Home Oct. 28-29," 27 October 1966.

4.3.5 Nygren Building

MnSHPO Inventory Number: HE-HOC-030
Address: 50 9th Avenue South
City/Township: Hopkins

Description
The Nygren building is located at 50 9th Avenue South, at the northwest corner of 9th Avenue South and 1st Street South. Constructed in 1962, this is a two-story, concrete block office building with a flat roof that measures 74 feet by 50 feet.[131] Shadow blocks, concrete blocks with a pattern of beveled recesses, were used in construction of the building's south elevation to lend an aesthetic element to the building. The identical east and west elevations feature aluminum curtain walls that are topped with bands of corrugated metal, and have large plate glass windows and small awning windows divided horizontally by porcelain panels. These features, coupled with the centered, full-height entry portico, reflect the building's interior spatial organization. Windows on the south elevation are fixed lights with inset, small awning windows. There are also three fixed light windows and an emergency exit door on the north elevation.

Parking lots flank the building on the north and west sides. Other than installation of awnings to protect the building entrances on the east and west elevations, the building does not appear to have experienced alterations since it was constructed.

Figure 50. East (primary) facade, view facing west.

[131] "Building permit number B62-84," 50 9th Avenue South, Hopkins, Minn. Available at City of Hopkins permit files, Hopkins, Minn.

Figure 51. Oblique view of south and east elevations, view facing northwest.

Figure 52. West elevation, view facing east.

History

In the decades following World War II, Hopkins experienced a surge in population as residents moved from the larger cities of Minneapolis and St. Paul to the surrounding suburban communities. To accommodate commercial and retail needs of the city's increased population, the city's commercial core began expanding south, east, and west from the historic downtown commercial core along Mainstreet in the late 1950s and early 1960s.[132] The area south of downtown was known for the boarding houses and

[132] Ewing, 174-176; Wagner, 24.

apartment buildings constructed in the late nineteenth and early twentieth century to house the employees of the area's major industries, such as the Minneapolis Threshing Machine Company (later known as Minneapolis Moline Power Implement Company). By the middle of the twentieth century, many of the boarding houses and apartment buildings were dilapidated, and this area was prime for development. Located between the major transportation route of Excelsior Boulevard and Hopkins' downtown commercial core, this area represented the second wave of commercial and office development in the city. Modern buildings in popular styles, including Contemporary and Ranch forms, were added by private developers to provide office space and professional services immediately north and south of Mainstreet. Additionally, the city built a new city hall complex, and the post office moved to the south side of downtown during this time.[133]

Carlton D. Nygren, a local businessman, commissioned the building in mid-1962 after a house located on the lot was demolished.[134] The architecture firm of Branstrom and Branstrom designed the building, and Rutledge Construction Company served as the general contractor.[135] Constructed approximately a year after the building located at 30 8th Avenue South, this building is almost identical to the 8th Avenue South building. Although research did not yield information on the building's tenants throughout the latter part of the twentieth century, the building continues to be used today as an office building.

Evaluation

The Nygren building was evaluated under *Criterion A* in the area of *Community Planning and Development* for its association to Hopkins' mid-twentieth century efforts to respond to the post-World War II population surge and the expansion of the city's downtown commercial core. Construction of the Nygren building was a private undertaking that does not individually convey the significance of community planning and development. Furthermore, there is not a cohesive collection of mid-twentieth century buildings in this area of the city to convey the overall significance of postwar community planning and development.

The building was also evaluated under *Criterion C* in the area of *Architecture*. The Nygren building does not embody distinctive characteristics of a type, period, or method of construction or represent the work of a master. The building does not possess high artistic value and does not represent a significant and distinguishable entity whose components may lack individual distinction.

Recommendation

The Nygren building is recommended not eligible under *Criterion A* in the area of *Community Planning and Development* and *Criterion C* in the area of *Architecture*.

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[133] Ewing, 174-176.

[134] "Building permit number B62-74," 50 9th Avenue South, Hopkins, Minn. Available at City of Hopkins permit files Hopkins, Minn.

[135] "Building permit number B62-8," 50 9th Avenue South, Hopkins, Minn. Available at City of Hopkins permit files, Hopkins, Minn.

4.3.6 Oakridge Investment Co. Building

MnSHPO Inventory Number: HE-HOC-031
Address: 15 10th Avenue South
City/Township: Hopkins

Description

The Oakridge Investment Company building is located at 15 10th Avenue South, on the east side of the street. Commercial buildings are located to each (north and south) side of the building, and there is a parking lot to the east. Constructed in 1961 as an office building, this is a two-story, concrete block building with a flat roof that measures 80 feet by 40 feet.[136] The primary (west) facade features an aluminum curtain wall clad with a brick veneer that is topped with a band of pressed metal, and large plate glass windows with small inset awning windows. The facade also features an entry portico flanked by engaged brick columns. The east elevation reflects the same fenestration pattern as the west elevation. The building's north and south elevations are obscured by adjacent buildings.

Most of the windows and doors on the east and west elevations have been replaced. A large addition to the building immediately north of 15 10th Avenue South wraps around and obscures part of this building's east elevation.

Figure 53. Oblique view of west (primary) and north elevations, view looking southeast.

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[136] "Building permit number B-61-138A," 15 10th Avenue South, Hopkins, Minn. Available at City of Hopkins permit files, Hopkins, Minn.

Figure 54. Addition to building immediately north wrapping around east elevation to obscure a portion of the elevation, view facing northwest.

History

In the decades following World War II, Hopkins experienced a surge in population as residents moved from the larger cities of Minneapolis and St. Paul to the surrounding suburban communities. To accommodate commercial and retail needs of the city's increased population, the city's commercial core began expanding south, east, and west from the historic downtown commercial core along Mainstreet in the late 1950s and early 1960s.[137] The area south of downtown was known for the boarding houses and apartment buildings constructed in the late nineteenth and early twentieth century to house the employees of the area's major industries, such as the Minneapolis Threshing Machine Company (later known as Minneapolis Moline Power Implement Company). By the middle of the twentieth century, many of the boarding houses and apartment buildings were dilapidated and this area was prime for development. Located between the major transportation route of Excelsior Boulevard and Hopkins' downtown commercial core, this area represented the second wave of commercial and office development in the city.[138] Modern buildings in popular styles, including Contemporary and Ranch forms, were added by private developers to provide office space and professional services immediately north and south of Mainstreet. Additionally, the city built a new city hall complex, and the post office moved to the south side of downtown during this time.

The building located at 15 10th Avenue South was commissioned by the Oakridge Investment Company, and Lee Mason was the builder.[139] Constructed the same year as the building located at 30 8th Avenue South, the two buildings have a similar appearance to their primary facades. Although research did not

[137] Ewing, 174-176; Wagner, 24.

[138] Ewing, 174-176.

[139] "Building permit number B-61-138A."

yield information on the building's tenants throughout the latter part of the twentieth century, the building continues to be used today as an office building.

Evaluation

The Oakridge Investment Company building was evaluated under *Criterion A* in the area of *Community Planning and Development* for its association to Hopkins' mid-twentieth century efforts to respond to the post-World War II population surge and the expansion of the city's downtown commercial core and services. Construction of the Oakridge Investment Company building was a private undertaking that does not individually convey the significance of community planning and development. Furthermore, there is not a cohesive collection of mid-twentieth century buildings in this area of the city to convey the overall significance of postwar community planning and development in Hopkins.

The building was also evaluated under *Criterion C* in the area of *Architecture*. The Oakridge Investment Company building does not embody distinctive characteristics of a type, period, or method of construction or represent the work of a master. The building does not possess high artistic value and does not represent a significant and distinguishable entity whose components may lack individual distinction.

Recommendation

The Oakridge Investment Company building is recommended not eligible under *Criterion A* in the area of *Community Planning and Development* and *Criterion C* in the area of *Architecture*.

4.4 St. Louis Park Survey Zone

A total of 264 properties were surveyed in the St. Louis Park survey zone (see Appendix B for the complete list of these properties). Of these properties, six warranted Phase II evaluation. Two properties are recommended eligible for the National Register. One property was listed in the National Register and no properties were previously determined eligible for listing in the National Register. Table 5 presents the details of the Phase II properties in the St. Louis Park survey zone. The Phase II evaluation of each property is presented in this section.

Table 5. Phase II Properties in St. Louis Park Survey Zone

Property Name (Historic)	Property Address	SHPO Inventory Number	NRHP Status	Project Segment(s)
St. Louis ParkHigh School	6300 Walker Street, St. Louis Park	HE-SLC-051	Recommended not eligible	4
Woodmark Industries Building	4601 Highway 7	HE-SLC-052	Recommended eligible	4
Union Congregational Church	3700 Alabama Avenue South, St. Louis Park	HE-SLC-053	Recommended not eligible	4
Northland Aluminum, Inc.	5005 Highway 7, St. Louis Park	HE-SLC-054	Recommended not eligible	4
Motor Travel Services Building	3907 Highway 7, St. Louis Park	HE-SLC-055	Recommended eligible when it is 50 years old (2013)	4, A, C1, C2

Figure 55 shows the locations of Phase II properties located in the St. Louis Park survey zone that are recommended eligible for National Register listing.

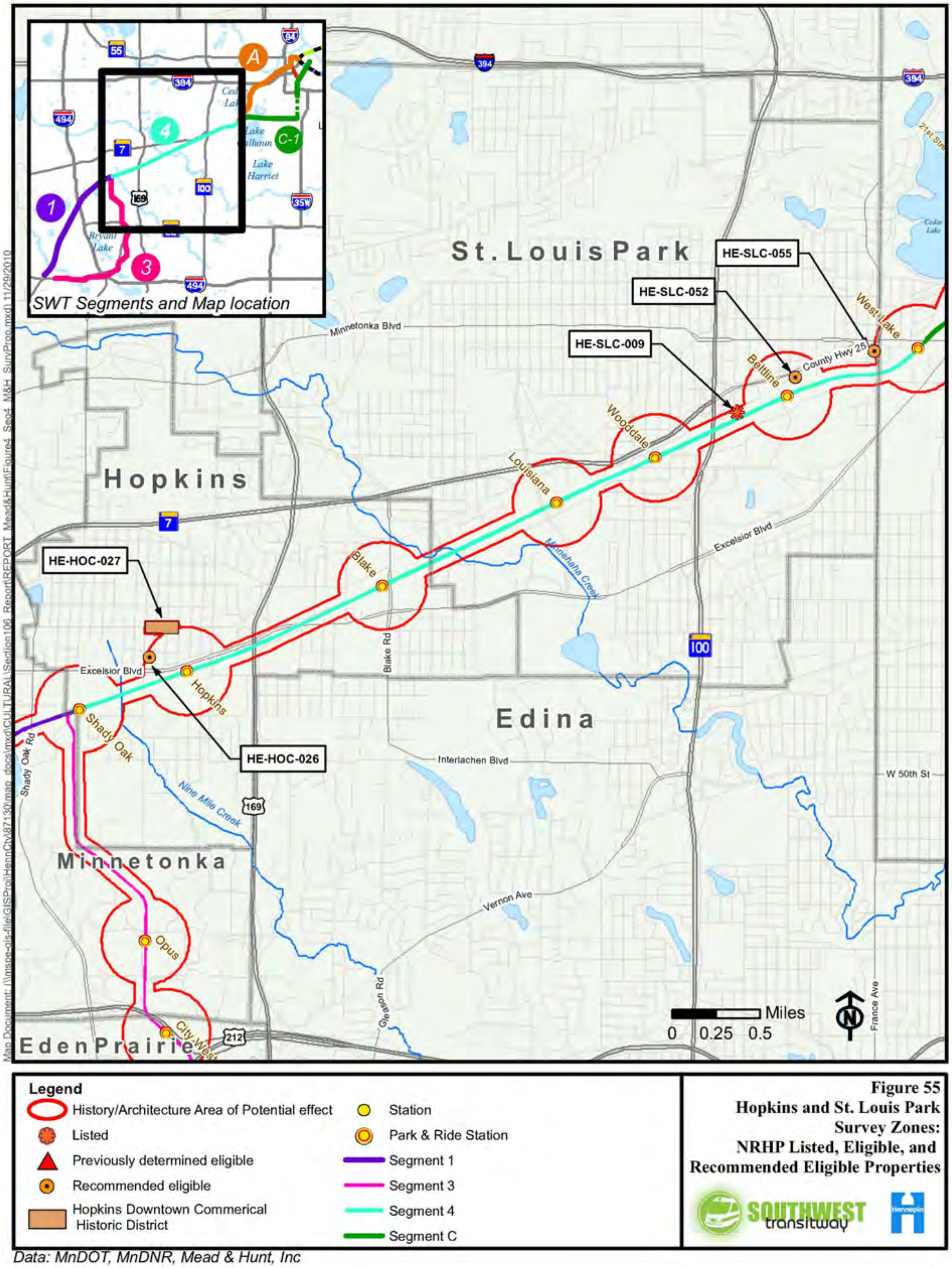

Figure 55. Hopkins and St. Louis Park Survey Zones: NRHP Listed, Eligible, and Recommended Eligible Properties.

4.4.1 St. Louis Park High School

MnSHPO Inventory Number: HE-SLC-051
Address: 6300 Walker Street
City/Township: St. Louis Park

Description

The former St. Louis Park High School building is located at 6300 Walker Street in St. Louis Park, Minnesota. The facade of the school building is oriented to the south facing a paved parking lot and is accessed by a series of concrete stairs. A playground with modern equipment is located at the southwest corner of the school building. A paved play area with basketball courts is located at the northwest corner of the school building. An athletic field and two ancillary buildings associated with the school property are located west of the school. Another paved parking area is located at the northeast corner of the school building. A sidewalk wraps around a portion of the perimeter of the school property before stopping at the northwest corner of the parcel at the athletic field. The only portion of the school property that does not have a sidewalk is located along the west and south sides of the athletic field.

The original 1914 structure associated with this property is no longer extant. The structures that are extant were added to the property between 1937 and 1967. The building that currently functions as the main entryway to the school complex was located east of the original building and was added to the property in 1937. This two-story brick building was designed by local architects Haxby & Bissell and constructed under the supervision of Mads Madson.[140] It has a rectangular footprint, rests on a concrete foundation, and has a stepped flat roof. The main entryway is centered on the symmetrical facade. Decorative details are reminiscent of the Modernistic style and include vertical projections capped with stylized concrete motifs, decorative brickwork, horizontal concrete courses, and the use of glass block as a decorative element. Windows are a combination of replacement fixed multi-light with multi-light awnings, and one-over-one double-hung sash. A band of three modern glass doors are located at the main entryway (see Figure 56).

Subsequent additions to the 1937 building were added to the north, east, and west elevations, creating an irregular footprint for the building as a whole. Completed by 1967, these additions are brick with flat roofs and vary in size and scale. They range from one to two stories and feature a range of decorative brickwork, fenestration, and window types (see Figures 57-60). As a result, the building is more than double the size of the 1937 building.

[140] St. Louis Park Historical Society, "Central Junior High School," http://slphistory.org/history/central.asp (accessed 24 March 2010).

Figure 56. St. Louis Park High School, 1937 building, front (south) facade, view facing north.

Figure 57. St. Louis Park High School, 1937 building with additions on front (south) and side (east) elevations, view facing northwest.

Figure 58. St. Louis Park High School, addition on front (south) and side (west) elevations with 1937 building visible in background, view facing northeast.

Figure 59. St. Louis Park High School, additions to side (west) elevation, view facing east.

Figure 60. St. Louis Park High School, additions to the rear (north) and side (west) elevation, view facing east.

History

The original three-story St. Louis Park High School building was constructed in 1914 on a parcel of land (Block 17) donated by the Honorable T.B. Walker.[141] In 1937 a two-story addition was added to the east elevation. The building was designed by local architects Haxby & Bissell. The WPA contributed 45 percent of the funds needed to construct the $300,000 addition. After construction, the addition became the senior high and the 1914 building continued to serve as the junior high. Funds received from the Public Works Administration were used to construct an athletic field in the late 1930s.

A second addition was added to the north side of the original school building in 1941 and functioned as an Industrial Arts wing.[142] In 1949 a total of 209 students graduated from the high school, the largest class in the history of the school.[143] As St. Louis Park experienced significant population growth, overcrowding became an issue and in 1952 another wing housing a new cafeteria and library was added to the east.[144] Throughout the early 1950s the student population continued to increase. In an effort to alleviate the stress of overcrowding, students attended classes in double shifts; 1,331 junior high students attended class in the morning while 881 senior high students attended class in the afternoon.[145] In order to accommodate the growing number of students and to permanently solve issues with overcrowding, a

[141] St. Louis Park Historical Society, "Central Junior High School."

[142] St. Louis Park Historical Society, "Central Junior High School."

[143] St. Louis Park Historical Society, "Central Junior High School."

[144] St. Louis Park Historical Society, "Central Junior High School."

[145] St. Louis Park Historical Society, "Central Junior High School."

new high school opened at the start of the 1956-1957 school year, and the school located on Walker Street became the St. Louis Park Junior High.[146]

In 1962 the original 1914 building was demolished and replaced with a new addition on the west side of the 1937 building. The new $900,000 addition consisted of 19 new classrooms, a physical education area for girls, visual aid office, nurse's area, and a multi-purpose classroom. At the same time, the principals' and counselors' offices were remodeled and the industrial arts facilities were improved. Although the student population began to show signs of decline during the 1963-1964 school year with an enrollment of approximately 1,200 students, a pool was added to the school property in 1967.[147]

Enrollment at the school continued to decline over the next two decades, resulting in a merger of the two St. Louis Park junior high schools in 1980. The merger resulted in the closure of the former St. Louis ParkHigh School. The building remains in use as a community center serving St. Louis Park.

Evaluation

The St. Louis Park High School property was evaluated under *Criterion C: Architecture*, *Criterion A: Education, and Criterion A: Federal Relief Construction in Minnesota*. With regard to *Criterion C*, the school building does not represent an intact example of a school constructed in the early twentieth century. St. Louis Park High School has had a significant loss of integrity due the demolition of the original 1914 school building in 1962; the core of the original structure is no longer present. Although additions were added to the 1937 structure throughout the 1960s, the overall school building lacks sufficient integrity to qualify as a representative example that reflects the evolution of an early to late twentieth century school building. Even though the additions to the 1937 building date to the historic period, the overall size and scale of the additions are visually disruptive and the lack of visual continuity detracts from the building's integrity. In addition, the 1937 portion of the school building designed by Haxby & Bissell does not display the high artistic value necessary to be considered eligible under *Criterion C*, nor does it represent a significant example of a type or method of construction. Therefore, the school is not eligible under *Criterion C*.

As for *Criterion A: Education*, while the school as a whole may have played an important role in education within the community, the absence of the original 1914 school building combined with the numerous additions indicates that the property no longer retains sufficient integrity for the property to be eligible under *Criterion A*.

The St. Louis Park High School was also evaluated under *Criterion A* using the National Register of Historic Places Multiple Property Documentation Form for *Federal Relief Construction in Minnesota, 1933-1941*. As the document states, "Educational facilities are historically significant for their association with the social, political, and economic impact of the Great Depression and the subsequent development of the various federal relief programs which were responsible for their construction."[148] The St. Louis Park

[146] St. Louis Park Historical Society, "Central Junior High School."

[147] St. Louis Park Historical Society, "Central Junior High School."

[148] *Federal Relief Construction in Minnesota, 1933-1941*. National Register of Historic Places Multiple Property Documentation Form.

High School meets the registration requirements set forth in the Multiple Property Documentation Form for educational facilities, as summarized below:

- Construction financed through a grant or loan from the federal government
- Construction was completed by the end of 1941
- Project represents a significant contribution to the community by providing a new and modern building, which offered programs and community services.

However, due to the large number of surviving resources associated with the Work Relief programs, a building must possess integrity of location, design, materials, workmanship, and association, and should be without substantial alterations. According to the Multiple Property Documentation Form, if the sizes of additions exceed the original building, the building may not be eligible.

As discussed in the *Description* section above, the St. Louis Park High School has had several, substantially sized additions creating an irregular footprint and more than doubling the size of the 1937 building. In particular, the large, 1962 addition to the west end, which replaced the original 1914 school, detracts from the overall design, feeling, and setting of the 1947 building. While the St. Louis Park High School possesses significance as an example of Federal Relief Construction in Minnesota, it no longer retains sufficient integrity to convey this significance.

Recommendation

St. Louis Park High School is recommended not eligible for the National Register under *Criterion A: Education, Criterion A: Federal Work Relief Construction in Minnesota* or *Criterion C: Architecture.*

4.4.2 Woodmark Industries Building

MnSHPO Inventory Number: HE-SLC-052
Common Name: Woodmark Industries Building
Address: 4601 Highway 7
City/Township: St. Louis Park

Description

The Woodmark Industries Building is located at 4601 Highway 7 in St. Louis Park. The exterior is designed in the Streamline Moderne architectural style, but the building also incorporates elements of traditional industrial or factory architecture, which is more functional than stylistic or aesthetic. The cream brick building is 200 feet wide by 70 feet deep and 17 feet high. The front (north) wall, however, extends an additional six or seven feet to include the upper band of windows (this unusual configuration is described below). The building presents an extremely wide, low, horizontal facade to the street (see Figure 61).[149] It is considered a one-story building according to the original building permit as well as the interior design and function; however, the main (north) facade windows are arranged in two bands to

[149] For building and site dimensions see B.H. Bradley, Civil Engineer & Surveyor, “Survey for Lincoln Tool & Die Co., Proposed Building, 4601 State Hwy. No. 7,” October 8, 1945. Available at St. Louis Park City Hall building permit files, St. Louis Park, Minn.

present the appearance of two stories, emphasizing the building's horizontality. A simple concrete band extends across the front facade about five brick courses below the plain metal cornice, tying the windows together horizontally. The flat brick walls exhibit no other surface treatment. The building corners are square and the concrete foundation is barely visible at grade, with the brick walls appearing to disappear into the ground. Individual bricks are standard size and proportion.

The window openings are proportioned three to one, with the width being three times the height. They are vertically stacked on the facade, one directly above the other, creating nine identical bays across the front facade. The openings are rectangles without trim, except for shallow concrete sills, and are filled with square glass block. Centered in each glass block field is a vertically oriented single-light wood sash, measuring three glass blocks wide and four glass blocks high. All window openings on the front facade are identical except the westernmost window opening at the first story level, which is approximately one-third narrower to accommodate a single door opening within the same bay.

Centered on the front facade is a 66-foot-wide office bay projecting 20 feet from the north wall (see Figure 62).[150] Its design and materials continue and enhance the theme of the facade. The single-story projection extends across the three center bays on the main wall behind it, and rises to the sill of the upper band of windows. The brick walls have curved corners with a continuous curved concrete coping. The walls curve into a recessed entrance centered on the front of the bay (see Figure 63). The curved entrance walls have curved glass-block windows with curved concrete sills. Centered beneath a glass transom in the recessed entrance are original double wood doors with large glass windows and aluminum hardware. The entrance has a concrete lintel with the building's address, "4601." Two large glass-block windows flank the entrance on the bay's facade. They are similar to the windows on the main wall, but larger, and each has four wood sash windows set into the glass block that are regularly spaced across the opening. A similar glass-block-with-sash window is set into each of the projecting bay's end walls. The pair of metal light standards in front of the entrance do not appear in a 1960 historic photograph and are considered later additions to the property.

The west and east (side) elevations are similar to the front facade but each is clearly designed as a single story. The top of the each wall is several feet lower than the front wall, possibly reflecting the interior space height. The tops of the end walls are extended to the height of the top of the front (north) wall with wood cornices or parapets painted tan to blend with the cream brick. Partial views showing the rear of these walls reveal their lighter construction (almost temporary in appearance) and their irregular wood supports angled into the roof area, suggesting that the end wall extensions were not part of the original design or construction and were a later addition, probably to conceal the ends of the sawtooth roof as discussed below.

The west (side) elevation has four square window openings with 12-light metal factory sash that appear to swivel open in the middle six-light horizontal sections. The west concrete basement wall is partially exposed and has another factory sash window and a shallow wood double service door. The east (side) elevation has two glass-block-with-sash windows similar to the main façade, and no other features.

[150] Bradley, "Survey," October 8, 1945.

The south (rear) elevation is an unadorned one-story wall with six, 12-light metal factory sash spaced at regular intervals (see Figure 64). At the west end is the building's only addition, a one-story concrete block structure extending to the south. At the east end are two vehicular openings with overhead doors for loading. Cream brick facing extends across the east loading dock area on the south wall; the remainder of the wall to the west corner is covered with stucco.

The building has a modified sawtooth factory roof designed for maximum daylight to the interior. Because of the building's limited depth, the roof area allows only two east-west "teeth" in the sawtooth roof (if there were only one it would more readily be termed a monitor roof). The sawtooth configuration is further modified from the conventional sawtooth configuration in that the vertical window area of the north bank of windows is actually the upper row of windows on the building's main (north) façade. This design element represents an ingenious method of accommodating the building's shallow depth while simultaneously incorporating the architectural design of the main façade with the factory design of the roof and the interior. The south "tooth" or window element is a conventionally designed component of a sawtooth roof, with the vertical window plane facing north and a sloped roof plane facing south. The irregular zig-zag ends of the roofline created by the vertical and sloping planes are concealed by the two wood end panels atop the end walls. The roof configuration is slightly visible from behind the building where there have been no structural attempts to conceal it.

The property retains the original front lawn open to the street, providing an unobstructed view of the entire main facade. There are two sidewalks, one extending directly north from the entrance to the street and another extending east from the entrance to a side parking area. On the east side of the property is a service drive leading to the rear of the building and the loading dock doors. The west and south property areas are lightly wooded. On the rear grounds are several small wood gazebos and storage sheds and a large free-standing vehicular garage erected after the original building construction (see Figure 65).

Figure 61. Woodmark Industries Building, view facing southwest.

Figure 62. Woodmark Industries Building office bay, view facing south.

Figure 63. Woodmark Industries Building entrance detail, view facing south.

Figure 64. Woodmark Industries Building, south and east elevations, view facing northwest.

Figure 65. Woodmark Industries Building, garage building at rear of property, view facing southwest.

History

Based on the site survey of October 8, 1945, the City of St. Louis Park's Building Department issued a building permit on October 16, 1945, to Lincoln Tool & Die Company, 1108 Second Avenue South, Minneapolis, to construct a "factory" at the 4601 Highway 7 location. The building permit identified the architect as Lang and Raugland. Although Lincoln Tool & Die received the survey and permit, a Certificate of Occupancy related to the building permit was issued to Woodmark Industries Inc. in October 1945 to use the building as a "machine shop."[151]

Woodmark Industries was incorporated March 29, 1946, and the incorporation filing identifies Woodmark's address as 4601 Highway 7 in Minneapolis.[152] Little is currently known about the company's business and products, although a worker in the building recently recalled that Woodmark produced a folding carpenter's rule. A folding aluminum rule reportedly was introduced by Woodmark in the 1940s or 1950s, and is thought to be innovative because of the aluminum material and was considered competitive with folding rules manufactured by the large national Stanley tool company.[153]

By 1963 the Professional Instrument Company had acquired the building. According to the company website, Professional Instruments Company was established in 1946 by brothers Ted and Harold Arneson. In 1963 the firm constructed a loading dock and ramp inside the building's southeast corner and built the large separate vehicular garage building south of the Woodmark building. No construction date was determined for the concrete block addition to the southwest corner of the building because no building permit was identified. The company produced a wide variety of precision and consumer machined products.[154]

The Arnesons are property owners of record in 2010 and the building continues to be used as a machine shop. The primary item produced in the building is Professional Instrument's "air bearing," the firm's signature product.[155]

The Woodmark Industries Building was designed in the Streamline Moderne architectural style by the Minneapolis firm of Lang and Raugland. Oscar Lang and Arnold Raugland established their partnership of Lang, Raugland and Lewis in 1922, becoming Lang and Raugland in 1930. Lang attended the

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[151] Bradley, "Survey," October 8, 1945; "Certificate of Occupancy for 4601 Highway #7, Building Permit 3553," October 1945. Available at St. Louis Park City Hall building permit files, St. Louis Park, Minn.

[152] Business Organization Inquiry, "Woodmark Industries, Inc.," Minnesota Secretary of State Online Access http://da.sos.state.mn.us/minnesota/corp_inquiry-entity.asp (accessed 20 April 2010).

[153] "A rare folding rule of aluminum – Woodmark," at Worthopeida – Premier Price Guide http://worthpoint.com, (accessed 4 April 2010).

[154] "Application for Building Permit and Certificate of Occupancy," Permit Number 1781, August 12, 1963 and "Application for Building Permit and Certificate of Occupancy," Permit Number 1989, November 20, 1963. Available at St. Louis Park City Hall building permit files, St. Louis Park, Minn. An early interior photograph on the company's history web page appears to show the interior of the Woodmark building with the square factory sash clearly visible. Professional Instruments Company website, http://www.airbearings.com/history1946, accessed April 20, 2010.

[155] Professional Instruments Company, "Established 1946," http://www.airbearings.com/history1946 (accessed 20 April 2010); also information from company employees at the building, 8 April 2010.

University of Pennsylvania School of Architecture from 1913 to 1915. His early career included work with two noted Minneapolis architectural firms, Hewitt and Brown, and Long, Lamoreaux and Long. Raugland was an engineer and received a degree from the University of Minnesota in 1920. The firm continued until 1992 under a series of partners following Lang's death in 1960.[156]

As Lang and Raugland, the firm produced a wide variety of commissions for private and public buildings and structures, including some industrial and commercial buildings with stylistic similarities to the Woodmark Building from the same post-World War II time period. The plans for the Woodmark Industries Building were not found in the Lang and Raugland Papers at the Northwest Architectural Archives. A similar design, however, was used for the D.B. Rosenblatt and Company's Minneapolis factory building in 1946.[157] Like the Woodmark building, the Rosenblatt factory plans depict a wide and low main façade (though not nearly as horizontal as Woodmark) that emphasizes the horizontality with unbroken bands of glass-block windows. As in the Woodmark building, rectangular fixed-sash windows are regularly spaced across the window band at the apparent centers of bay locations. The facade is two stories, similar to Woodmark, but in this case the exterior design reflects a true two-story interior.

Overall, the Rosenblatt Building as depicted in the plans and the Woodmark Building as built are similar light industrial variations of the Streamline Moderne design by Lang and Raugland. Before the Rosenblatt Building could be constructed, its proposed site at 1000 Currie Avenue North, Minneapolis, was acquired by the Warner Brothers Picture Distribution Corporation. Warner Brothers had its own architect, E.C.A. Bullock, adapt Lang and Raugland's Rosenblatt plans for their own purposes and, in the process, modified elements of the design—notably the corner entrance. As a result, the Warner Brothers Picture Distribution Corporation Building as built (now the Catholic Charities Branch Building) is somewhat different from the 1946 Rosenblatt plans, although there is a clear and identifiable relationship between the design and linear arrangement of the glass block windows in both buildings. The Catholic Charities Branch Building as it appears in 2010 is reminiscent of Lang and Raugland's Streamline Moderne style in industrial design, but not as representative of the style as the original 1946 plans for Rosenblatt and not nearly as representative as the extant Woodmark Industries Building. In addition, the Catholic Charities building does not have the open and unaltered setting that has been retained by the Woodmark Building.

Located two miles away from Woodmark at 6520 West Lake Street is another Streamline Moderne building that is almost a miniature version of the Woodmark Building (see Figure 67). The year built and the name of the designer of this small commercial building are unknown. Identified on its exterior as "SMD Sel-Mor," the small commercial building exhibits stylistic elements and materials similar to

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[156] "Lang and Raugland Papers," Northwest Architecture Archives, Elmer Anderson Library, University of Minnesota, Minneapolis, Minn.

[157] D.B. Rosenblatt and Co., Inc., Factory building blueprints, "Commission 0681," 1946. Available at "Lang and Raugland Papers," Northwest Architectural Archives, Elmer Anderson Library, University of Minnesota, Minneapolis, Minn. The Warner Brothers Picture Distribution Corporation Building (now Catholic Charities Branch Building) is discussed in Chad Moffett, "Evaluation of National Register Eligibility" letter report, Mead & Hunt, Inc., to Scott Ehrenberg, Community Planning and Economic Development (CPED), Minneapolis, January 20, 2005, copies available at the CPED office and the Minneapolis Heritage Preservation Commission office.

Woodmark, including the cream brick color, but it is not as fully developed architecturally and not as pristine. The SMD Sel-Mor building features include similar Streamline Moderne horizontality in one story, symmetrical design around a center entrance, rectangular glass-block windows with centered opening sash, and a recessed entrance with flanking rounded glass-block window-walls. The facade is altered with a large modern cornice used for signage. Unlike the free-standing Woodmark Industries Building, the SMD-Sel-Mor building is a single façade within a continuous block-long strip of largely unrelated commercial and retail structures and does not stand alone as a separate structure.

Figure 66. SMD Sel-Mor building, 6520 West Lake Street, Minneapolis, view facing north.

Evaluation

The Woodmark Industries Building is best evaluated in the context of architectural style incorporating selected features of industrial architectural. Two sources are used to establish the elements of design and construction: Marcus Whiffen's *American Architecture Since 1780: A Guide to the Styles,*[158] and Betsy Hunter Bradley, *The Works: The Industrial Architecture of the United States*.[159]

Whiffen establishes three fundamental characteristics for Streamline Moderne,[160] the style reflected in the Woodmark building's exterior design:

- Horizontality in overall form, with verticality reserved for entrances
- Curved surfaces, including end walls, corners, bays, and cylindrical projections
- No ornament apart from stringcourses and trim emphasizing horizontality

Additional elements noted by Whiffen and applicable to Woodmark include walls of brick or concrete, usually plastered, and the use of glass block for translucency and textural contrast. Whiffen further notes that Streamline Moderne was the architectural style of the late 1930s. He classifies the styles that follow chronologically as "Styles that have flourished since 1945," thus placing the Midwestern example of Woodmark in 1945-46 at the end of the Streamline Moderne period nationally.

As noted in the building description above, the Woodmark building clearly exhibits Whiffen's three character-defining features of Streamline Moderne. Feature one: Woodmark's main façade is absolutely horizontal with only the entrance exhibiting vertical elements. The projecting north bay has Whiffen's second key feature: all the bay's corners are curved. The minimal amount of trim represents Whiffen's third characteristic, no ornament apart from limited trim emphasizing horizontality: in Woodmark's case this is the narrow horizontal concrete band connecting the upper windows. Woodmark further exhibits the secondary features, including the use of glass block for both interior light and surface texture, and the use of brick for three facades and stucco for the fourth.

To understand how Woodmark's design and construction serve the building's function, however, the evaluation needs to extend beyond Streamline Moderne aesthetics and examine the building's industrial architecture. As Bradley writes in *The Works*, "Traditional emphasis on architectural style . . . fails to provide a framework for meaningful analysis of industrial architecture."[161] To explore this point and evaluate the interaction of aesthetic style and industrial design in the Woodmark building, it is useful to focus on a feature that embodies this particular intersection, the building's sawtooth roof. As described above, the industrial sawtooth roof employs a complex series of raised vertical window planes and sloping roof planes to bring light through an otherwise flat and windowless roof area into a large interior

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[158] Marcus Whiffen *American Architecture Since 1780: A Guide to the Styles*[158] (MIT Press, revised edition, 1992).

[159] Betsy Hunter Bradley, *The Works: The Industrial Architecture of the United States* (Oxford University Press, 1999).

[160] Whiffen, p. 241.

[161] Bradley, p. 202.

workspace. Its name is derived from the edge or cross-section of the roof, which appears similar to a giant sawblade with large saw teeth facing upwards, each triangle of window and roof segment creating one “tooth.”

Bradley discusses sawtooth factory roofs at length, but one statement in particular captures the essence of the situation in the Woodmark building. Bradley writes, “One engineer considered the introduction of the sawtooth roof one of the most important advances in the design of industrial buildings, though he admitted that appearance, uniformity, and symmetry were sacrificed for practical usefulness.”[162]

In other words, the sawtooth roof was an important innovation in industrial design, but its appearance created aesthetic problems even for efficiency-minded structural engineers, who had difficulty seeing how the aesthetic style and function could be combined in an acceptable manner.

As analyzed by Bradley, the sawtooth roof feature had significant advantages and liabilities. It provided necessary north light (consistent, even light) for large workspaces, especially those where “comparatively low headroom” was required, but it required a complicated roof design and construction with extensive flashing and was therefore expensive. And, as noted above, even to efficiency-minded engineers, it was not aesthetically pleasing. According to Bradley, “During the 1890s, factory designers often concealed the ‘unpleasant exterior effect of the sawtooth roof’ by extending walls as parapets” to hide the awkward sawtooth profile on the outside edge.[163]

The Woodmark sawtooth roof exhibits these same conflicting characteristics. It provides the north light needed for machine shop work over the entire building footprint, supplemented by the extensive use of large glass-block windows and factory-sash windows in the walls. On the other hand, it apparently was perceived as unattractive because the wood parapets were constructed to extend the end walls and thus conceal the sawtooth edge.

Significant here, however, is the ingenious incorporation of the roof’s north band of windows into the Streamline Moderne main façade. The sawtooth roof as constructed in the Woodmark building was not, by 1945, a new or innovative industrial design. The sawtooth concept, however, remained useful and may have become a less-expensive and practical solution to factory lighting when Lang and Raugland adapted it. No information is available to explain whether cost was a consideration in the Woodmark roof design. In Woodmark, Lang and Raugland integrated this factory lighting element—the sawtooth roof—within a limited amount of roof area and simultaneously used it to reinforce one of Whiffen’s character-defining features of Streamline Moderne style, horizontality on the main facade. While banded glass-block windows appear in other Lang and Raugland plans, including the Rosenblatt Building and the SMD-Sel-Mor building, they do not appear to be integrated with additional significant functional or industrial design elements as in Woodmark.[164]

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[162] Bradley, p. 192.

[163] Bradley, p. 192.

[164] For additional comparisons, see also in Lang and Raugland Papers, plans for Process Building for Northwest Linseed Company (1947), Electric Machinery Manufacturing Company building (1945), and Red Owl Stores Office and Warehouse (1946-1948).

Evaluated in the context of the Rosenblatt Building and the SMD-Sel-Mor building, the Woodmark Industries Building is an excellent representative of the Streamline Moderne architectural style as used for a light-industrial building. Lang and Raugland's design incorporates and expresses the three character-defining features of the style as described by Whiffen: extreme horizontality with banded windows and a carefully conceived two-story front facade, rounded brick corners on the projecting bay, and rounded glass-block recessed entrance features.

Of the three examples considered, Woodmark is not only the best-preserved and unaltered, but it survives in an unaltered suburban setting that allows the building to be viewed from all directions as it was when built. It especially retains the original views from the north (the Highway 7 frontage road) and is well sited in its large, open, and lightly wooded suburban lot. No other buildings intrude on the site to interrupt the primary views.

The use of the Streamline Moderne exterior to simultaneously facilitate and conceal the industrial functions inside is compatible with, and appropriate for, the building's location on a newly opened suburban boulevard where a purely functional factory design would be considered less aesthetically acceptable. Lang and Raugland's design cleverly adapts Streamline Moderne stylistic features to meet industrial needs, notably the use of the sawtooth roof and large glass-block windows to provide large amounts of daylight across an open interior space filled with precision machinery. As such, the Woodmark Industries Building is not only an excellent unaltered representative of the Streamline Moderne as defined by Whiffen, but it is also an excellent unaltered representative of light industrial architecture as described by Bradley, designed to fit within a mid-twentieth-century suburban setting.

The Woodmark building's integrity of design and materials is excellent, with no apparent alterations to the main facade and only minor changes and one addition to other elevations. The property also retains good integrity of location.

Recommendation

The Woodmark Industries Building is recommended eligible for the National Register under *Criterion C: Architecture* as an excellent example of the Streamline Moderne style used in industrial building design in a post-World War II suburb. The building is recommended not eligible under *Criterion A* because no association with a significant event or pattern of events was found. The building is recommended not eligible under *Criterion B* because no association with a significant person was found.

4.4.3 Union Congregational Church

MnSHPO Inventory Number: HE-SLC-053
Address: 3700 Alabama Avenue South
City/Township: St. Louis Park

Description

The Union Congregational Church is located at 3700 Alabama Avenue South in St. Louis Park, Minnesota. The church is situated at the northwest corner of Oxford Street and Alabama Avenue South. The front facade of the church is oriented to the east (see Figure 68). A paved parking lot is located immediately adjacent to the rear (west) elevation. A playground area with modern equipment is located along the north edge of the property. A concrete sidewalk wraps around the perimeter of the property to the north, east, and south.

The Union Congregational Church was designed by local architects Carl Bard and Joseph Vanderbilt in 1937. Construction of the church began in May 1939 and was completed in 1941. Constructed of cut stone, the side gable church has a rectangular plan with two one-story gable protrusions at the northwest and northeast corners of the building. Both of the protrusions feature a chimney (see Figure 69). A bell tower is located at the southeast corner and features a decorative crenellated buttress, pointed-arch vents, and a pointed-arch entryway with a wood door. A gable vestibule with a metal entrance door is located at the southwest corner (see Figure 70). Windows are a combination of paired, diamond-shaped, multi-light stained glass and bands of three pointed-arch stained glass with stone lintels and sills, and replacement one-over-one, double-hung sash. Windows feature their original wood traceries. A large stained glass rose window is centrally located on the north parapet. The cornerstone has three dates marking the start of the church in 1870, the official organization of the church in 1883 as the Union Congregational Church, and 1941 for the completion of the new building.[165]

An education building was constructed to the north of the church in 1951 (see Figure 71). The building was designed by local architects Armstrong and Schlicting.[166] The two-story vernacular building with modern influences has an irregular plan and flat roof with a brick chimney. The exterior cladding is a combination of brick and cut sandstone. An enclosed entrance vestibule with modern plate-glass doors is located near the northeast corner. Windows are a combination of one-over-one, double-hung sash, glass block, and awning. In 1984 a one-story, brick hyphen was constructed to connect the side (north) elevation of the church to the side (south) elevation of the education building (see Figure 72).[167] The hyphen has a rectangular plan with flat roof and fixed single pane windows. Flat roof porticos supported by brick columns shelter the entryways on the east and west elevations.

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[165] "Union Congregational Church Has Seen Numerous Changes in 110 Years." Newspaper clipping, available at Union Congregational Church site files, St. Louis Park, Minn.

[166] Caren E. Carlberg, Secretary, "Minutes of a Special Meeting of the Executive Committee of the General Building Commission," 27 November 1949. Available at Union Congregational Church site files, St. Louis Park, Minn; E.M. Martinson, "Minutes of the Executive Committee," 20 December 1949. Available at Union Congregational Church site files, St. Louis Park, Minn.

[167] Mary Kay Sauter, interview by Mead & Hunt, Inc., St. Louis Park, Minn., 30 March 2010.

With the connection of the two buildings in 1984, the footprint of the building more than doubled the original footprint of the church building. The education building was constructed in a much larger size and scale compared to the church and dominates the property as a whole. Although the education building features stone veneer cladding in an effort to complement the church, the use of brick masonry on the facade disrupts the intended visual continuity. In addition, the church is set back much farther on the property than the education building, which was placed much closer to the sidewalk. Therefore, the education building is featured more prominently on the parcel.

Figure 67. Overview of Union Congregational Church property, view facing northwest.

Figure 68. Union Congregational Church front (east) elevation, view facing west.

Figure 69. Union Congregational Church rear (west) elevation, view facing northeast.

Figure 70. Education Building, front (east) and side (north) elevations, view facing southwest.

Figure 71. 1984 hyphen addition, front (east) elevation, view facing northwest.

History

The Union Congregational Church started in 1870 when Reverend H.A. Stimson began delivering sermons to the rural residents living southwest of the city of Minneapolis in Minneapolis Township. Prior to the construction of a church, services were held in the local schoolhouse. In 1878 Mrs. Margaret Scott donated land located west of the existing schoolhouse at the corner of Wooddale Avenue and Excelsior Boulevard for a church to be built.[168]

The new church was called Clarke Chapel until it was formally organized on March 14, 1883, and the name was officially changed to Union Congregational Church.[169] As more people began settling in the area, church membership began to grow and by 1890 it had 123 members.[170] In 1893 the church received a generous donation from one of St. Louis Park's founding fathers, Joseph Hamilton, when he gifted a parcel of land located at the corner of Oxford Street and Alabama Avenue. Within the year, the church was dismantled and reassembled over a partial basement on the new lot.[171]

As more and more people were drawn to the community, the Union Congregational Church's membership increased. After the turn-of-the-century, the congregation outgrew the existing 30-by-48-foot building, which lacked indoor plumbing.[172] In the 1920s membership in the church increased again with the acceptance of members from a Methodist congregation whose church burned down.[173] As a result, the church was referred to as the Community Church of St. Louis Park from 1927 to 1941. During this time, church members recognized the need for more space and started a building fund. However, the Depression delayed fundraising efforts. Despite the financial challenges the church continued to move forward, and by 1937 plans for a new church building were complete. Two local architects, Carl Bard and Joseph Vanderbilt, designed the new building.[174] Construction began on Mother's Day 1939 under the supervision of Frank Bye, a local stone mason and church member.[175] Bye used stone from the foundation of the old church building to construct the new bell tower; the remainder of the stone was

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[168] "Dedication September 14-21, 1941", N.p., c.1941, 3. Available at Union Congregational Church site files, St. Louis Park, Minn. Union Congregational Church, St. Louis Park, Minn.

[169] Union Congregational Church: United Church of Christ, "History of Union Congregational Church," http://www.unionslp.com/history.html (accessed 24 March 2010); "Dedication September 14-21," 3.

[170] "Union Congregational Church Has Seen Numerous Changes in 110 Years."

[171] "Union Congregational Church Has Seen Numerous Changes in 110 Years":

[172] "History of Union Church," N.p., n.d. Available at Union Congregational Church files, St. Louis Park, Minn.; Unknown newspaper, "Union Congregational Church Has Seen Numerous Changes in 110 Years."

[173] "History of Union Church," N.p., n.d.; Unknown newspaper, "Union Congregational Church Has Seen Numerous Changes in 110 Years."

[174] "Union Congregational Church Has Seen Numerous Changes in 110 Years."

[175] "Union Congregational Church," N.p., n.d.

donated from an old Pillsbury Flour Mill.[176] Construction of the church was completed in 1941, and the building was large enough to house its 200 official members.[177]

After World War II, the population of St. Louis Park increased and it was not long before space once again became an issue for the church. By the late 1940s and early 1950s the church membership had increased to 701, including 510 children enrolled in Sunday school and 143 enrolled in the church's grade school.[178] The congregation decided to expand once again in 1949 by adding an education building to the north end of the property. The new education building was designed by Armstrong and Schlicting. Construction of the education building was completed in 1951. In 1957 church membership had increased to 1,148 and the new education building housed 653 students.[179] The congregation became a member of the United Church of Christ in 1961.

By the early 1980s the church was looking to improve the facility. A brick hyphen was added to connect the church with the education building in 1984, which created enough interior space for a foyer with a cloakroom and restrooms.[180] The church has continued to grow through the years, meeting the needs of the congregation, and continues to serve Hopkins.

Evaluation

The Union Congregational Church and associated education building were evaluated for the National Register under *Criterion C:* A*rchitecture* applying Criterion *Consideration A: Religious Properties*. Although the church was designed by two local architects, Carl Bard and Joseph Vanderbilt, it is not the best representative example of their work. The architects designed several buildings throughout the Midwest, including the Francis Drake Hotel and Hennepin Avenue Methodist Church in Minneapolis. While the Union Congregational Church features elements of the Gothic Revival style, it does not display the high artistic value necessary to be considered eligible under *Criterion C*. Nor is it a significant example of a type or method of construction. The connection of the church and education buildings more than doubled the original footprint of the church building. Compared to the church, the education building is of much larger size and scale and visually dominates the property. Although the church and associated education building represent a religious property that evolved during the mid-twentieth century to meet the needs of the congregation, the connection of the buildings with the addition of hyphen detracts from the overall design, feeling, and setting of the church and diminishes the historic integrity of the property.

Recommendation

The Union Congregational Church is recommended not eligible for the National Register under *Criterion C: Architecture*.

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[176] "Union Congregational Church," N.p., n.d.; "Union Congregational Church Has Seen Numerous Changes in 110 Years."

[177] "History of Union Church," N.p., n.d.

[178] "Churches in St. Louis Park," N.P, c.1959. Available at Union Congregational Church site files, St. Louis Park, Minn.

[179] "Union Congregational Church Has Seen Numerous Changes in 110 Years."

[180] Mary Kay Sauter, interview by Mead & Hunt, Inc., St. Louis Park, Minn., 30 March 2010.

4.4.4 Northland Aluminum, Inc.

MnSHPO Inventory Number: HE-SLC-054 and HE-SLC-009
Address: 5005 Highway 7
City/Township: St. Louis Park

Description

Northland Aluminum Products is located in the southeast corner of Trunk Highway 7 and Trunk Highway 100 on 12.10 acres of property in St. Louis Park, Minnesota (see Figure 73).[181] Located in an industrial area, Northland Aluminum's site has been developed by David Dalquist and his family. The first Northland Aluminum Products building was constructed in 1946-1947 (Building #1), but a number of additions and alterations obscure any of the original structure. The site has grown and developed over the last 60 years with a number of building additions and new construction during times of the company's prosperity. Today, seven buildings make up the Northland Aluminum Products site: Buildings #2, #3, #5, #6 and #7 are connected and appear to be one large building.

While the buildings on the complex range from 1946 to 2009, the overall design aesthetic of the buildings is similar. A large 1968 building addition to the original 1946 building set the tone for all other buildings constructed on the site. Each building features rough unfinished concrete surfaces, modular prestressed concrete structural panels, and vertically stacked ribbon windows.

Building #1

A single-story concrete block building was the first building built on the lot in 1946-47 by the Dalquists. The building was a simple industrial building with little adornment and 15-light windows (see Figure 74). A number of expansions throughout the 1950s and 1960s enveloped this original building and it is not visible today.

Currently, the front (north) facade is composed of modular prestressed concrete panels broken by vertically stacked, fixed-over-awning windows. Due to the topography, Building #1 is a multi-story building with the front facade at two stories and the rear (south) elevation just one story. Four loading docks are located on the first story of the facade directly west of an enclosed entry. Building #1 is defined by a large glass wall corner feature added in 1968 (see Figure 75). The side (west) elevation is defined with prestressed concrete panels, while the east elevation features a one-story gable front, concrete block building with a metal seam roof, and bay door (see Figure 76). The side and rear elevations feature a variety of windows including fixed and fixed-over-awning.

Building #2

Building #2 was added to the site in 1970 as a freestanding building used for anodizing products. The appearance of the building follows the precedent set by the 1968 addition to Building #1 and features prestressed concrete wall panels and windows that are vertically stacked fixed-over-awning. The facade (north) also features one-over-one fixed windows with concrete block frames. A series of metal pipes and flues extend above the roof on the rear (south) elevation (see Figure 77).

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[181] Hennepin County Assessors Property Tax Web Database, www.16.co.hennepin.mn.us (Accessed 12 April 12).

Building #3

Constructed in 1973, Building #3 is similar in appearance to its neighbors with prestressed concrete paneled walls and windows that are vertically stacked fixed-over-awning. Three loading docks are located in the hyphen of the building, which connects Building #3 to Building #2.

Building #4

This one-story commercial building with a rectangular footprint was built in 1950 and became part of the Northland Aluminum complex in 2006. The building features a flat roof and is clad with brick veneer over concrete block with a running course of edge brick defining the wall. The front (north) facade features two- and three-light, fixed replacement windows with canvas awnings. A modern stucco and glass vestibule and parapet extending above the roof line has been added to the facade (see Figure 78). The east and west elevations feature single-light fixed windows, all of which are replacements. A modern steel access door and brick chimney extending above the roof is located on the rear (south) elevation.

Building #5

Building #5 was constructed in 1974 and is the westernmost building on the complex. The building features prestressed concrete panels broken by vertically stacked fixed-over-awning windows. A concrete foundation is visible as the building gradually rises to the west. Two access doors are located on the front (north) facade on the east and west end of the facade, respectively. The side (west) elevation and rear (south) elevation are also prestressed concrete panels and feature a number of loading docks. A loading dock on the rear elevation was filled in when the pedestrian trail adjacent to the building was installed.

Building #6

Building #6 connected Buildings #2 and #5 to add additional warehouse and manufacturing space in the 1980s. The front (north) facade features a large glass and aluminum vestibule. Curved towers clad with glazed tile flanking the entrance to the building define the edges of the facade (see Figure 79). The rear (south) elevation features prestressed concrete panels and filled in loading docks with corrugated metal panels and concrete block. A set of three, one-over-one windows and modern steel access door has been added to the east.

Building #7

Constructed in 2009, Building #7 was designed to integrate stylistically into the site. Prestressed concrete modular panels and vertically stacked fixed-over-awning windows comprise all elevations. Fixed glass and aluminum windows are located on both the southeast and northeast corners of the addition (see Figure 80). Eleven loading docks and an entry door are located on the side (east) elevation.

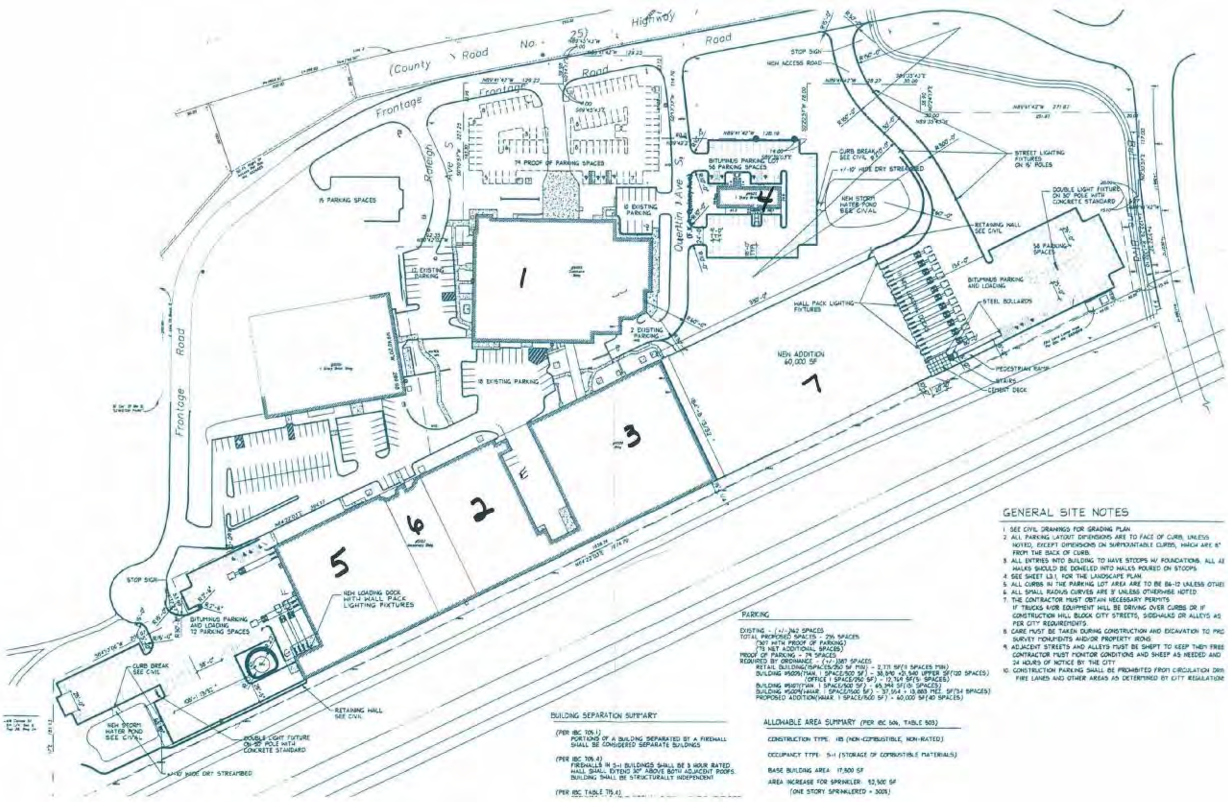

Figure 72. Current site plan for the Northland Aluminum Products site. The buildings have been numbered in chronological order of date of construction with the exception of Building #4, which was purchased and added to the complex in 2006.

Figure 73. The first building for Northland Aluminum Products, constructed in 1946-47, has since been enveloped by later additions (from The Nordic Ware Saga, 13).

Figure 74. Glass wall corner feature found on the northwest corner of Building #1, added in 1968, view facing southeast.

Figure 75. Northeast corner of Building #1, the prestressed concrete panels were added as part of the 1968 building addition, view facing southwest.

Figure 76. Rear elevation of Buildings #2 and #3, view facing north.

Figure 77. Building #4 facade and west elevation, the structure was built in 1950 and added to the Northland Aluminum building inventory in 2006, view facing southeast.

Figure 78. The facade of Building #6 features a large glass vestibule, view facing south.

Figure 79. Northeastern elevation of Building #7 showing both glass corners and loading docks, view facing southwest.

History

The area that is now the Northland Aluminum Products site was largely undeveloped in the 1930s and 1940s. A railroad corridor defines the southern border of the property, part of which is now a pedestrian trail. The site was home to the Robin Hood Flour grain elevator (razed in 1968) and the extant Peavey-Haglin Experimental Concrete Grain Elevator (built in 1899).[182] In 1946 brothers Mark and Dave Dalquist purchased a lot in the middle of the site and built a one-story, 2,000 square foot concrete block building to house their growing "Plastics for Industry" company (Building #1).[183] The brothers manufactured foundry patterns and prototypes from plastic resins and aluminum for a number of companies including General Mills and Minneapolis Moline.[184] The company continued to grow throughout the late 1940s and early 1950s, producing a number of specialized bakeware pans and irons that revived old baking traditions.[185]

In 1950 the Dalquists purchased Northland Aluminum Products, carrier of the Nordic Ware product line, from Leonard Nordquist and officially adopted the name for their product line.[186] Northland Aluminum Products is best known for their development of the Bundt Pan and pioneering the use of non-stick coatings on cookware. In 1950 the company trademarked the Bundt Pan, a heavy cast-aluminum fluted pan that was originally used in Europe.[187] The decorative pan was successful because of its unique shape and because it reminded many of "old world cakes."[188] By 1960 the Bundt Pan was "America's #1 selling cake pan."[189] The pan became a national sensation in 1966 when a Teflon coated Bundt Pan was used to create the "Tunnel of Fudge Cake," the winner of the Annual Pillsbury Bake-Off Contest.[190] A partnership with Pillsbury, who would make a cake mix to be sold with the pan, was born in the 1970s and dramatically increased Northland Aluminum Product's profitability as Americans were "eager and ready for a delicious cake mix baked in a novel shape."[191]

During the mid-1960s, Northland Aluminum Products was also developing the use of Teflon coatings on different products for medical, industrial, and commercial application and on the specialty bake and cookware. In 1964 DuPont, inventors of Teflon, licensed Northland Aluminum to use of the coating on

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182 The Peavy-Haglin Experimental Concrete Grain Elevator is listed as a National Historic Landmark and in the National Register of Historic Places.

183 David Dalquist, *The Nordic Ware Saga* (Minneapolis: Kirk House Publishers, 2006), 13.

184 Dalquist, 11-12.

185 "History of Northland Aluminum Products," (n.p: 1975). Available from St. Louis Park Historical Society "Nordic Ware" clippings files, St. Louis Park, Minn.

186 "History of Northland Aluminum Products," 16-17.

187 "History of Northland Aluminum Products," 38.

188 Dalquist, 40.

189 "History of Northland Aluminum Products," 219.

190 "History of Northland Aluminum Products," 39; *The Florence Times Daily* (Alabama), 25 September 1966, 18.

191 Dalquist, 42.

Nordic Ware products. Teflon coatings on Nordic Ware would let a housewife "cook, bake and make delicious molded salads with quick-cleaning ease and gourmet results."[192]

Growth of the company in the 1950s and 1960s called for additional manufacturing, office, and warehouse space. Building #1 was expanded in 1953 to a 3,900-square-foot building and a second story was added.[193] Steadily, the building expanded as the company continued to grow with building additions in 1958, 1959, 1961, and 1962. An existing 3,500 warehouse located east of Building #1 was purchased from the Renner Well Company and a 7,000-square-foot prestressed concrete addition was added connecting the warehouse to Building #1. In 1967 two additional building expansions of unknown size were undertaken, further expanding Building #1. The largest addition occurred in 1968, when a 26,000-square-foot addition of prestressed concrete and a defining glass wall tower at the northwest corner of the building were added.[194] The addition, which featured prestressed concrete panels, ribbons of vertically stacked windows, and glass vestibules, set the design aesthetic for future buildings.

Due to Teflon coated cookware and a partnership with Pillsbury, sales of Nordic Ware dramatically increased through the 1970s, with peak production at 30,000 Bundt Pans produced per day.[195] This amount of production and development of coating techniques required a larger building and new manufacturing space. In 1970 a 5,600-square-foot manufacturing building south of Building #1 was constructed (Building #2). In 1973 another 7,000-square-foot facility (Building #3) directly to the east of Building #2 was built and in 1974 an additional warehouse (Building #5) west of Building #2 was erected.

Throughout the 1970s and 1980s, Northland Aluminum Products developed innovative plastic and aluminum casting methods, including products that were designed to work in microwaves.[196] Expansion of the company continued, and in 1982 Buildings #2 and #5 were enclosed (Building #6) to allow for greater flexibility of space.[197] Throughout the last two decades Northland Aluminum Products has focused on maintaining their product line and exploring innovations in cookware, including grill-safe, non-stick cookware. In the early 1990s the company was recognized as the world's leading applicator of commercial non-stick coatings.[198]

A single-story brick structure adjacent to Northland Aluminum Product's headquarters, located at 4925 Highway 7, was acquired and incorporated into the site as Building #4 in 2006. This structure was built in 1950 as a veterinarian clinic and pet hospital by Bennett Porter.[199] Alterations to the structure at an

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[192] *Chicago Tribune* (Chicago), 19 April 1965, 17.

[193] Dalquist, 30.

[194] "History of Northland Aluminum Products."

[195] Dalquist, 42.

[196] Dalquist, 219.

[197] Bette Danielson of Northland Aluminum Products, email message to Mead & Hunt, 5 April 2010.

[198] Bette Danielson of Northland Aluminum Products, email message to Mead & Hunt, 5 April 2010.

[199] "Park Veterinarians," St. Louis Park Historical Society, www.slphistory.org (accessed 13 April 2010).

unknown time include the addition of a modern vestibule and parapet on the facade, replacement of windows, and filling in of windows and doors on the rear and side elevations.

In 2009 a 60,000-square-foot building addition to the east of Building #3 was added to the site. The addition draws its aesthetic inspiration from Building #1 and features modular prestressed concrete paneling and a large glass window entry on both the northeast and southeast corners of the structure.

The number of alterations, building additions, and expansions in the last 60 years is a testament to the growth and prosperity of the Northland Aluminum Products but the evolution of the site and buildings on the site is not easily discernable due to the continuity in design aesthetic. In particular, the original structure of Building #1 was enveloped by building additions in the 1950s and 1960s. The additions remove most of the early context of the Northland Aluminum Products story. Buildings #2 through #6, which post-date the significant achievements of the company, have been relatively unaltered over the years and retain original windows and doors.

Evaluation

The Northland Aluminum Products site was evaluated under *Criterion A* at the national level in the area of *Invention*. Northland Aluminum Products is a significant industry in Minnesota and the nation because it developed the Bundt Pan, which brought "old world" decorative cakes to the American public, and pioneered the first non-stick coatings for cookware and bakeware which allowed for ease of cooking and cleaning of pans. The period of significance includes two dates, 1950 for the design of the Bundt Pan and 1964 for the development of non-stick cookware.

To best understand the significant inventions of the Bundt Pan and Teflon coatings, the building in which these inventions took place between 1950 and 1964 should embody the historic period and convey a sense of place and time. Therefore, retaining integrity of location, setting, feeling, and association are especially important. While integrity of location and setting is retained, due to the number of alterations and additions to Building #1 after 1964, where the development of the Bundt Pan and Teflon coatings occurred, integrity of feeling and association have been lost. The design aesthetic applied in 1968 conveys a feeling of time not associated with the period of significance when historic events defining the company occurred. The overall historic character of the building has been lost with the alterations and the property does not possess integrity.

Recommendation

While the Northland Aluminum Products site is significant under *Criterion A: Invention* for the development of the Bundt Pan and non-stick cookware, the site does not retain the historic integrity needed to convey this significance and is recommended not eligible for the National Register.

4.4.5 Motor Travel Services Building

MnSHPO Inventory Number: HE-SLC-055
Address: 3907 Highway 7
City/Township: St. Louis Park

Description

Located at 3907 Highway 7, the Motor Travel Services Building is a round, formed concrete, commercial building.[200] Designed by James R. Dresser and Associates between 1959 and 1961 and built by Arkay Builders for Motor Travel Services and Hoffman Callan Printing in 1962 and 1963, the building has been continuously used for commercial purposes.[201] It is located on 1.17 acres and is surrounded by similarly aged single-and multi-family residences to the east and south and commercial businesses to the west.[202]

This commercial building is 24 feet tall with a 116-foot-diameter circular plan and features a flat roof (see Figure 81).[203] The building is defined by walls constructed of formed concrete and has a concrete foundation. The wall pattern is inset and geometric in nature (see Figure 82). Entrance into the building is on the west side, facing the adjacent lot to the west. A projecting wood canopy shelters the glass and aluminum entrance door. The front of the building faces Highway 7 and features a horizontal band of 12 single-light fixed windows located at grade (see Figure 83). Above and to the west end of the horizontal band of windows is a larger window with two sets of four-light fixed windows separated by aluminum panels. Two sets of four-light fixed windows are located on the east side of the building facing France Avenue.

The south side of the building faces a parking lot and features an additional modern steel access door and a loading platform. The platform projects away from the building and rests on a concrete foundation. Formed concrete walls that match the building are located on the east, west, and south sides of the platform (see Figure 84). A smaller wood frame loading dock is located on the east side of the platform and may not be original to the building. Metal stairs adjacent to the building are also located on the east side of the platform. A concrete block utility shed is located to the south of platform.

It appears that the windows on the east and west sides of the building have been replaced with modern windows to fit the openings, while the band of at grade 12 single-light fixed windows appear to be original. The original design featured a cantilever deck on the east side of the building. The cantilever deck is no

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[200] This is the legal address for the property. The physical address indicated on the building is 3000 France Avenue South.

[201] "3000 France Ave.," *St. Louis Park History*, www.slphistory.org (accessed 20 April 2010); Permit Number 1157, "Application for Building Permit and Certificate of Occupancy," 8 August 1962, City of St. Louis Park building permits, St. Louis Park, Minn.

[202] Hennepin County Assessors Property Tax Web Database, www.16.co.hennepin.mn.us (accessed 20 April 2010).

[203] Permit Number 1157, "Application for Building Permit and Certificate of Occupancy," 8 August 1962, City of St. Louis Park building permits, St. Louis Park, Minn.

longer extant and the original patio doors have been replaced with fixed windows. Few other exterior alterations to the building have been made.

Figure 80. Front of the Motor Travel Lodge Building, view facing south.

Figure 81. Detail view of the geometric formed concrete pattern.

Figure 82. Front portion of the building, view facing southeast.

Figure 83. Loading dock on the south portion of the building, view facing southeast.

History

The building located at 3907 Highway 7 was designed and constructed to house the offices of Motor Travel Services Company and Hoffman Callan Printing Company. Research revealed little information about the Motor Travel Services Company. According to Dresser, the Motor Travel Services Company was an early competitor of the American Automobile Association, also known as AAA.[204]

At the request of the building's other primary tenant Hoffman Callan Printing Company, Dresser designed the building round to create efficiency in the printing process. The printing process would begin at the entrance to the lower level and continue around the building in a circular pattern with the printing process ending at the loading dock entrance. From there, the product could easily be sent to waiting trucks for shipping. The upper level of the building was reserved for executive officers, accountants, and secretarial work.

St. Louis Park Historical Society files indicate the original development plan for this property was a two-story office building and 45-unit motel. Research did not reveal why the motel portion of the design was not constructed though it has been speculated by the designer that funding fell through for the motel.[205] The building has housed a number of commercial businesses, including Motor Travel Services Company, Hoffman Callan Printing, Maritz Laboratories, Galaxy Film Service, and the Country Club Market. The building is currently occupied by ASAP, a printing and design company.[206]

Figure 84. East side of the Motor Travel Services Building under construction (Image from St. Louis Park Historical Society website, www.slphistory.org).

Architect James Dresser was a protégé of Frank Lloyd Wright, studying with Wright as a Taliesin Fellowship architect in Spring Green, Wisconsin, in 1945.[207] Taking Prairie School design ideals with him,

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[204] Mr. James Dresser, telephone interview by Mead & Hunt, Minneapolis, Minn., 13 July 2010.

[205] Mr. James Dresser, telephone interview by Mead & Hunt, Minneapolis, Minn., 13 July 2010.

[206] "3000 France Ave.," *St. Louis Park History*, www.slphistory.org (accessed 20 April 2010).

[207] Rovie Rep, "Splendid Example of Wrightian Architecture in Monroe," *Green County Spotlight*, www.greencountyspoltight.com (accessed 19 April 2010); "The Fellows Roster," *Taliesin Fellows Newsletter*, 15 October 2001, 4.

Dresser began designing commercial and residential buildings primarily in the Wisconsin area. Dresser's designs typically feature Prairie School aesthetics, including low roof-lines, organic building materials, wide-eave overhangs, extensive use of glass to bring the outdoors in, and horizontal lines. Interior finishes, furniture, and lighting are also often custom designed by Dresser for his buildings.

An article discussing Dresser's worked heralded his designs as "artfully combining one of a kind architecture and closeness with nature" and "simultaneously intriguing and pleasing to the eye."[208] His portfolio includes a number of restaurants in Wisconsin Dells, Wisconsin. The Lake Geneva Public Library and two residences in Shorewood Hills are located in National Register-listed Historic Districts in Wisconsin.

Evaluation

The Motor Travel Services Building was evaluated for the National Register under *Criterion C: Architecture* as an example of distinctive characteristics of type, period, and method of construction of the Modern architecture style. The building was designed by architect James Dresser and expresses the postwar modernist movement. Postwar modernist architecture featured the use of new building materials and experimentation with form to create of one-of-a-kind buildings. In particular, 1960s modern architecture was about the combination of "science and art."[209] The Motor Travel Services Building displays characteristics of Modern architectural styles and the less formal postwar futurism as defined by striking shapes, dynamic lines, contrasts, and use of advanced materials.[210]

Contemporary architects were developing innovative public buildings throughout the 1950s and 1960s, which emphasized unique forms, the use of mathematics, and application of experimental materials. Round structures were also a popular design during this period, including Frank Lloyd Wright's Guggenheim Museum, which may have influenced the architect. Other examples of postwar modern and futurist architecture include Welton and Becket's Capitol Records Building, CA (1956); Oscar Niemeyer's Brazilian National Museum, Brazil (1960); and the Montreal Biosphere (1967). The round form and emphasis of geometric patterning of the Motor Travel Services Building make a striking and unique appearance expressive of mid-century modernist architecture. The period of significance is 1963 to reflect the year the building's construction was completed.

The Motor Travel Services Building retains integrity of location, setting, feeling, and association and continues to reflect mid-twentieth modern and futurist design aesthetics. Although few alterations have been made to the building, the windows have been replaced reducing the building's integrity of materials. Because the building retains its sense of place and reflects a mid-century design aesthetic, the Motor Travel Services Building retains overall historic integrity.

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[208] Rovie Rep, "Splendid Example of Wrightian Architecture in Monroe." "Del-Bar History," *The Del-Bar*, www.del-bar.com (accessed 19 April 2010).

[209] J. M. Richards, *An Introduction to Modern Architecture* (Baltimore: Penguin Books, 1970), 11.

[210] "Post-war Futurism," *Essential Architecture*, www.essential-architecture.com (accessed 20 April 2010).

Recommendation

The Motor Travel Services Building is recommended eligible for the National Register under *Criterion C: Architecture* as a distinctive characteristic of type, period, and method of construction when it reaches 50 years of age.

5.0 Recommendations

Mead & Hunt conducted a Phase II Evaluation of 13 historic-age properties within the APE. Of those Phase II evaluations, eight properties were recommended not eligible, two properties are recommended eligible when they reach 50 years of age, and two properties and one district are recommended eligible for the National Register. In addition, the Peavey-Haglin Experimental Concrete Grain Elevator (HE-SLC-009), included within the Northland Aluminum, Inc. property, is listed in the National Register. See Table 6 for additional information.

Eligible and listed properties within the APE will be assessed for potential effects.

Table 6. Southwest Transitway Historic Properties

Survey zones: Eden Prairie, Minnetonka, Hopkins, St. Louis Park (excluding railroad-related properties)

Property Name (Historic)	Property Address	SHPO Inventory Number	NRHP Status	Project Segment(s)
Minnetonka Survey Zone				
Lang House	5038 Dominick Spur, Minnetonka	HE-MKC-101	Recommended eligible when it is 50 years old (2016)	1
Minneapolis Sewer Pipe Works/ Red Wing Sewer Pipe Company	11303 Excelsior Boulevard, Minnetonka	HE-MKC-102	Recommended not eligible	1, 3, 4
Hopkins Survey Zone				
Hopkins City Hall	1010 1st Street South, Hopkins	HE-HOC-026	Recommended eligible	4
Hopkins Downtown Commercial Historic District	800 to 1000 block of Mainstreet, Hopkins	HE-HOC-027	Recommended eligible	4
Minneapolis Moline Company	11111-11119 Excelsior Boulevard, Hopkins	HE-HOC-028	Recommended not eligible	1, 3, 4
Prodel, Inc. Building	30 8th Avenue South, Hopkins	HE-HOC-029	Recommended not eligible	4
Nygren Building	50 9th Avenue South, Hopkins	HE-HOC-030	Recommended not eligible	4
Oakridge Investment Co. Building	15 10th Avenue South, Hopkins	HE-HOC-031	Recommended not eligible	4
St. Louis Park Survey Zone				
St. Louis ParkHigh School	6300 Walker Street, St. Louis Park	HE-SLC-051	Recommended not eligible	4
Woodmark Industries Building	4601 Highway 7	HE-SLC-052	Recommended eligible	4

Table 6. Southwest Transitway Historic Properties

Survey zones: Eden Prairie, Minnetonka, Hopkins, St. Louis Park (excluding railroad-related properties)

Property Name (Historic)	Property Address	SHPO Inventory Number	NRHP Status	Project Segment(s)
Union Congregational Church	3700 Alabama Avenue South, St. Louis Park	HE-SLC-053	Recommended not eligible	4
Northland Aluminum, Inc.	5005 Highway 7, St. Louis Park	HE-SLC-054	Recommended not eligible	4
Motor Travel Services Building	3907 Highway 7, St. Louis Park	HE-SLC-055	Recommended eligible when it is 50 years old (2013)	4, A, C1, C2
Peavey-Haglin Experimental Concrete Grain Elevator	Highway 7 and Highway 100 on the Northland Aluminum, Inc. property	HE-SLC-009	Listed – National Historic Landmark	4

Bibliography

"1880s map," Minnetonka Historical Society, www.minnetonka-history.org (accessed 27 April 2010).

"3000 France Ave." *St. Louis Park History.* www.slphistory.org (accessed 20 April 2010).

"A rare folding rule of aluminum – Woodmark." Worthopeida – Premier Price Guide. http://worthpoint.com, (accessed 4 April 2010).

Anderson, Helen. *Eden Prairie the First 100 Years.* Eden Prairie, Minn.: Viking Press, 1979.

Andreas, A.T. *Hennepin County Minnesota 1874 Atlas*. Available at the Borchert Map Library, University of Minnesota, Minneapolis, Minn.

Angell, Madeline. *Red Wing Minnesota, Saga of a River Town.* Minneapolis: Dillum Press, 1977.

"Application for Building Permit." Permit no. 64-314 (April 28, 1964). City of Minnetonka building permit files, Minnetonka, Minn.

"Application for Building Permit and Certificate of Occupancy." Permit Number 1157, 8 August 1962. Available at City of St. Louis Park building permit files, St. Louis Park, Minn.

"Application for Building Permit and Certificate of Occupancy." Permit Number 1781, 12 August 1963. Available at St. Louis Park City Hall building permit files, St. Louis Park, Minn.

"Application for Building Permit and Certificate of Occupancy," Permit Number 1989, 20 November 1963. Available at St. Louis Park City Hall building permit files, St. Louis Park, Minn.

"Application for Garage Permit." Permit no. 3660,1972. City of Minnetonka building permit files, Minnetonka, Minn.

Bradley, B.H. "Survey for Lincoln Tool & Die Co., Proposed Building, 4601 State Hwy. No. 7." 8 October 1945. Available at St. Louis Park City Hall building permit files, St. Louis Park, Minn.

"Building Elevations," Lang, Raugland, and Brunet architectural drawings of Hopkins City Hall, Sheet 6 of 14, 17 October 1963. Available at Northwest Architecture Archives, Elmer Anderson Library, University of Minnesota, Minneapolis, Minnesota.

"Building Permit number B-61-138A." 15 10th Avenue South, Hopkins, Minn. Available at City of Hopkins permit files, Hopkins, Minn.

"Building Permit number B62-74." 50 9th Avenue South, Hopkins, Minn. Available at City of Hopkins permit files, Hopkins, Minn.

"Building Permit number B62-84." 50 9th Avenue South, Hopkins, Minn. Available at City of Hopkins permit files, Hopkins, Minn.

Business Organization Inquiry. "Woodmark Industries, Inc." Minnesota Secretary of State Online Access. http://da.sos.state.mn.us/minnesota/corp_inquiry-entity.asp (accessed 20 April 2010).

Carlberg, Caren E. "Minutes of a Special Meeting of the Executive Committee of the General Building Commission." 27 November 1949. Available at Union Congregational Church site files, St. Louis Park, Minn;

"Certificate of Occupancy for 4601 Highway #7, Building Permit 3553." October 1945. Available at St. Louis Park City Hall building permit files, St. Louis Park, Minn.

Chicago Tribune (Chicago), 19 April 1965.

Ching, Francis. *A Visual Dictionary of Architecture.* New York: John Wiley & Sons, Inc., 1997.

"Churches in St. Louis Park." N.P, c.1959. Available at Union Congregational Church site files, St. Louis Park, Minn.

"City Hall." St. Louis Park Historical Society. http://www.slphistory.org/history/cityhall.asp (accessed 20 April 2010).

City of Hopkins. "About Hopkins." http://www.hopkinsmn.com/about/history.php (accessed 2 April 2010).

City of Minnetonka. "About Minnetonka." http://www.eminnetonka.com/about_minnetonka.cfm (accessed 8 April 2010).

City of Minnetonka. "History." http://www.eminnetonka.com/about_minnetonka/history.cfm (accessed 23 April 2010).

City of Minnetonka. "Minnetonka History Timeline." http://www.eminnetonka.com/about_minnetonka/history/timeline/timeline3.pdf (accessed 21 April 2010).

City of St. Louis Park. "Land & Climate." http://www.stlouispark.org/land_climate.htm (accessed 6 April 2010).

"Conditions from the Atlantic to the Pacific as Reported by Our Expert Observers." *Brick* Vol. XXIX, No. 3. September (1908): 47.

Dalquist, David. *The Nordic Ware Saga.* Minneapolis: Kirk House Publishers, 2006.

"Del-Bar History." *The Del-Bar*. www.del-bar.com (accessed 19 April 2010).

"Dedication September 14-21, 1941." N.p., c.1941. Available at Union Congregational Church site files, St. Louis Park, Minn.

Dominick Spur subdivision plat, City of Minnetonka site files, Minnetonka, Minn.

Dresser, Mr. James Dresser. Telephone interview by Mead & Hunt. Minneapolis, MN., 13 July 2010.

Ewing, Beverly O., ed. *Hopkins, Minnesota Through the Years*. Hopkins, Minn: The Hopkins Historical Society, 2002.

"Goodrich Farm Platted." *Journal*, 1 November 1913. Available at St. Louis Park Historical Society, "General" files, St. Louis Park, Minn.

Haskell, Douglas. "Googie Architecture." *House and Home*, February 1952. www.spaceagecity.com/googie/ (accessed 13 April 2010).

Hennepin County Assessors property information database. www.16.co.hennepin.mn.us (accessed 12 April 2010).

Hennepin County Review, 24 December 24 1964. Available at Hopkins City Hall site files, Hopkins, Minn.

Hennepin County Review, 14 January 1965. Available at Hopkins City Hall site files, Hopkins, Minn.

"History of Northland Aluminum Products." N.p: 1975. Available from St. Louis Park Historical Society "Nordic Ware" files, St. Louis Park, Minn.

"Hopkins Elks to Dedicate New Home Oct. 28-29," 27 October 1966. Available at the City of Hopkins building permit files, Hopkins, Minn.

"Improve All City Services," c.1963. Available at Hopkins City Hall site files, Hopkins, Minnesota.

"Lang and Raugland Papers." Available at Northwest Architecture Archives, Elmer Anderson Library, University of Minnesota, Minneapolis, Minnesota.

Lang, Mrs. Keith. Interview by Mead & Hunt. Minnetonka, Minn., 30 March 2010.

MacDonald, Angus MacDonald. *Structure and Architecture.* Oxford: Architectural Press, 2001.

Martinson, E. M. "Minutes of the Executive Committee." 20 December 1949. Available at Union Congregational Church site files, St. Louis Park, Minn.

Millais, Malcom. *Exploding the Myths of Modern Architecture.* New York: Frances Lincoln Ltd, 2009.

"Minneapolis Gets Sewer Pipe Co." *The Wall Street Journal*, 1 April 1908. Available online at http://pqasb.pqarchiver.com/djreprints/access/108653904.html?dids=108653904:108653904&FMT=ABS&FMTS=ABS:AI&type=historic&date=Apr+01%2C+1908&author=&pub=Wall+Street+Journal&desc=Minneapolis+Gets+Sewer+Pipe+Co.&pqatl=google (accessed 13 April 2010).

"Minneapolis Sewer Pipe Works." *The Hopkins News,* 9 July 1908. Available at Minnesota Historical Society, Microfilm Archives, St. Paul, Minn.

Minnesota Historical Society. "Red Wing Sewer Pipe Company." http://www.mnhs.org/school/online/communities/occupations/POTdoc1T.htm (accessed 13 April 2010).

"New Hopkins Office Building Work Starts," 22 June 1961. Available at the City of Hopkins building permit files, Hopkins, Minn.

"Park Veterinarians." St. Louis Park Historical Society. www.slphistory.org (accessed 13 April 2010).

"Post-war Futurism." *Essential Architecture*. www.essential-architecture.com (accessed 20 April 2010).

Professional Instruments Company. "Established 1946." http://www.airbearings.com/history1946 (accessed 20 April 2010).

"Pump and Meter Service Company Building History," Available at Pump and Meter Service Company Inc. building permit files, Hopkins, Minn.

"Red Wing Sewer Pipe Co., James Park, Supt." *The Hopkins News,* 1915. Available at Minnesota Historical Society, microfilm archives, St. Paul, Minn.

Rep, Rovie. "Splendid Example of Wrightian Architecture in Monroe." *Green County Spotlight*, www.greencountyspoltight.com (accessed 19 April 2010).

"Resolution 88-16," (1988), Hopkins City Hall site files, Hopkins, Minn.

Richards, J. M. Richards. *An Introduction to Modern Architecture*. Baltimore: Penguin Books, 1970.

Rosenblatt, D.B. and Co., Inc. Factory building blueprints. "Commission 0681," 1946. Available at "Lang and Raugland Papers," Northwest Architectural Archives, Elmer Anderson Library, University of Minnesota, Minneapolis, Minn.

Sauter, Mary Kay. Interview by Mead & Hunt, Inc. St. Louis Park, Minn., 30 March 2010.

Shuldhiess, Ernie. *Eden Prairie Book of Days.* Eden Prairie, Minn.: Published by the author, 2003. Available at the Eden Prairie Historical Society.

St. Louis Park Historical Society, "Central Junior High School." http://slphistory.org/history/central.asp (accessed 24 March 2010).

St. Louis Park Historical Society. "Grain Elevators." http://www.slphistory.org/history/grainelevators.asp (accessed 29 March 2010).

"The Brookside Timeline." http://www.jeanneandersen.net/timeline.html#postwar (accessed 30 March 2010).

"The Fellows Roster." *Taliesin Fellows Newsletter.* 15 October 2001.

The Florence Times Daily (Alabama), 25 September 1966.

The Story of Minnie Moline Minneapolis-Moline Power Implement Company, 1941. Available at the Minneapolis Historical Society, St. Paul, Minn.

Thomas, Norman. "St. Louis Park: A Story of a Village." http://www.slphistory.org/history/normanthomas.asp (accessed 16 April 2010).

Tibbits, Mickey. "Miracle Mile celebrates 40 years of business success," 11 September 1991. Available at the St. Louis Park Historical Society, Miracle Mile clippings folder, St. Louis Park, Minn.

"Union Congregational Church Has Seen Numerous Changes in 110 Years." Newspaper clipping, available at Union Congregational Church files, St. Louis Park, Minn.

Union Congregational Church: United Church of Christ, "History of Union Congregational Church," http://www.unionslp.com/history.html (accessed 24 March 2010);

United States Census Bureau. "St. Louis Park, Minnesota." http://quickfacts.census.gov/qfd/states/27/2757220.html (accessed 30 March 2010).

"Vesely to Give City Hall Dedication Speech Sunday." *Beltline Newspaper*, 14 January 1965.

Wagner, Jeff, ed. *Hopkins Centennial Album 1887-1987*. Minneapolis, Minn: Hopkins Centennial Committee, 1987.

Wittenberg, Marie. *Images of America: Eden Prairie.* Charleston, SC.: Arcadia Publishing, 2003.

Appendix A. Research Design for Cultural Resources

Southwest Transitway: A Research Design for Cultural Resources

12 February 2010, updated 16 March 2010, 2 April 2010

Prepared by
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INTRODUCTION

The Hennepin County Regional Rail Authority is proposing to construct the Southwest Light Rail Transit (SWLRT) facility, linking the Intermodal Station in downtown Minneapolis with the central business area in suburban Eden Prairie. The line is located within the cities of Minneapolis, St. Louis Park, Hopkins, Minnetonka, and Eden Prairie.

The Federal Transit Administration (FTA) has determined that the proposed project is an undertaking as defined by the National Historic Preservation Act (NHPA) and is subject to the provisions of Section 106 of the NHPA. Section 106 requires that federal agencies take historic properties into account as part of project planning. The Cultural Resources Unit (CRU) of the Minnesota Department of Transportation (MnDOT) is acting on behalf of FTA for many aspects of the Section 106 review process for SWLRT. The FTA has also determined that the SWLRT is subject to the National Environmental Policy Act (NEPA) and a Draft Environmental Impact Statement (DEIS) is being prepared by Hennepin County under the direction of the FTA.

Through the NEPA scoping process, four build alternatives were identified. To streamline subsequent analysis, these alternatives were divided into five segments. The following table, which was included in the draft “Southwest LRT Technical Memorandum No. 9: Environmental Evaluation” (September 9, 2009), outlines the segments that are associated with each of the alternatives:

Alternative	*Segments*
LRT 1A	1, 4, A
LRT 3A	3, 4, A
LRT 3C-1 (Nicollet Mall)	3, 4, C-1 (Nicollet Mall)
LRT 3C-2 (11^{th}/12^{th} Street)	3,4, C-2 (11^{th}-12^{th} Streets), C-2A (Blaisdell Avenue), C-2B (1^{st} Avenue)

Segment 1 extends northeast from a station in Eden Prairie at TH 5 along a former rail corridor owned by the Hennepin County Railroad Authority (HCRRA) to a station at Shady Oak Road, on the border between Minnetonka and Hopkins.

Segment 3 creates a new corridor, running east from a station at Mitchell Road in Eden Prairie and turning northerly to terminate at the Shady Oak Station.

Segment 4 follows an existing rail corridor east-northeasterly from the Shady Oak Station through Hopkins and Saint Louis Park to the West Lake Station in Minneapolis, near that city's western border.

Segment A continues northeast from the West Lake Station, mostly using an existing rail corridor, to the Intermodal Station on the western edge of downtown Minneapolis.

Segment C also begins at the West Lake Station, traveling east along a former rail corridor (now the Midtown Greenway), north along one of several alternative courses under and on city streets, to and through downtown Minneapolis, and ultimately ending at the Intermodal Station or South Fourth Street. (For the purpose of this cultural resources assessment, all of the "C" variations will be considered as a single group.)

It should be noted that the above segments overlap at three points: the Shady Oak Station, the West Lake Station, and the Royalston/Intermodal Stations. When the results of the cultural resource surveys are sorted by segment, there will be redundancy in the findings at these three points. This redundancy is inevitable if the effects of each segment are to be analyzed. When a single alternative is selected, it will be necessary to eliminate duplicated properties to obtain an accurate representation of the effects of that alternative.

PROPOSED METHODOLOGY FOR ARCHAEOLOGICAL RESOURCES SURVEY

Christina Harrison, Archaeological Research Services
Mike Justin and Mike Madsen, HDR Engineering

This work plan outlines a program to identify archaeological properties which meet the criteria of the National Register of Historic Places in the project's area of potential effect (APE), to be used in assessing potential effects to those properties. Three primary tasks comprise the work plan. First, in order to provide a uniform assessment of available data across the five project segments discussed in the DEIS, the project team will prepare a report (by project segment within a broad APE) to include: results of the literature search, an archaeological probability assessment, and a field survey strategy (Task 1). It is expected that a limited amount of field investigation/sampling may occur as part of this task depending upon the weather. Second, an archaeological inventory/evaluation of the selected alternative will be completed, using a refined APE based on proposed construction (Task 2). Finally, a report of the field investigations of the selected alternative and an assessment of effects will be prepared (Task 3).

Task 1 will involve archaeologists from both HDR and ARS. Support will be provided, as needed, by Hess Roise research staff as well as by geomorphologists and other paleoenvironmental experts provided by HDR. Division of responsibilities will partly depend on what survey needs are identified by the background research, but primary responsibility for precontact and contact period archaeology will rest with Christina Harrison (ARS) and Michael Justin (HDR), and for historic archaeology with Michael Madson (HDR). The personnel for Tasks 2 and 3 are pending.

The survey will be conducted in accordance with all federal, state, and local requirements, including the Minnesota Field Archaeology Act and the Minnesota Private Cemeteries Act.

Area of Potential Effect (APE)

The APE for archaeological resources is generally defined as the anticipated limits of construction activities. At this stage in the project development, factors influencing those limits have not yet been fully identified. The APE, starting with a broad area at first, will be refined as the engineering design advances.

For Task 1, the APE for the literature search and probability assessment will be based, as appropriate, on the project limits as defined in the project engineering drawings used to prepare the DEIS. This will include the full width of existing railroad right-of-way corridors as well as the area within 100 feet on either side of the current engineering alignments. The APE near station areas also includes any undeveloped and/or vacant property within 500 feet that could potentially be utilized for construction/development activities. Depending on the station location, these may include open, green spaces (particularly in suburban areas) and paved parking lots (particularly in urban areas).

If the literature search/probability assessment identifies potentially significant historic features or high probability areas immediately adjacent to the above-referenced APE parameters, and if the significance of potential sites in these areas is expected to relate to National Register criteria A, B, and/or C, the APE for the field strategy for the Phase I-II survey may be adjusted to include these locations.

During Task 2, the APE will be reviewed in light of more detailed engineering plans. Throughout the design phase of the project, the adequacy of the APE will be periodically evaluated and expanded or retracted as necessary as project elements are added or modified. The survey report specified in Task 3 will provide a clear delineation of the surveyed APE, including all additions, so that the adequacy of survey efforts can be readily determined when project changes are proposed.

It should be noted that, generally, the APE for archaeological resources is a smaller area located within the APE for history/architecture resources.

Task 1. Report of Archival Review/Site Probability/Field Strategy

This task will uniformly represent the readily available information across the five project segments discussed in the DEIS. In general the report will be a desktop analysis of existing archaeological research data supplemented by a discussion of probability for previously unidentified archaeological properties. Field inspections may be utilized to confirm existing conditions, particularly to inform the discussion on field survey strategies.

The desktop analysis will utilize documents on file at the State Historic Preservation Office (SHPO) and the Office of the State Archaeologist (OSA). Historic maps and aerial photographs, local histories, and other archival information on file at the Minnesota Historical Society, the Borchert Map Library (at the University of Minnesota), and local libraries and historical societies may also be reviewed.

The task will review:

- archaeological survey reports on file at SHPO, OSA and other repositories in order to establish what segments of the project routes have already been inventoried according to current standards;
- known archaeological sites and/or (if applicable) recommendations/confirmations of NRHP eligibility;
- relevant USGS topographic maps and soil surveys as well as any Mn/Model information and other environmental and paleoenvironmental data pertinent to the assessment of pre-contact archaeological site probability, including land use histories;
- Historic maps and aerial photographs to identify localities with historic-period archaeological site potential.

A preliminary field review will be conducted. The survey team will document visible indications of topographic and hydrological features as well as past and current land use with concomitant loss of soil integrity. The information from field observations will be combined with the data gathered during the archival review to propose archaeological site probability along the five segments.

Pre-contact and historic-period contexts will be briefly reviewed, with a focus to inform the discussion of site types and assessment of probability. The probability assessment will be organized by the five project segments (1, 3, 4, A, and C). For each of the five segments the report will include:

- a general description of the APE;
- a discussion of previous surveys and previously identified sites;
- a discussion of historic site types and the associated conditions that may indicate a historic property;
- a discussion of archaeological probability (for pre-contact/contact period and historic-period), and;
- a survey strategy and methods, including specific places targeted for field investigation.

The survey strategy for precontact and contact period evidence will be guided by Native American and early Euro-American settlement and land use patterns identified by previous archaeological investigations in the vicinity including, for example, the 1992-1994 city-wide cultural resource survey of Eden Prairie, the corridor surveys conducted for Trunk Highway 212 and Trunk Highway 12, and a number of smaller scale compliance surveys conducted within the Nine Mile, Minnehaha and Purgatory Creek watersheds.

The results of Task 1 will be summarized in the DEIS.

Task 2. Inventory/Evaluation (Phase I-II) Survey

For the Inventory/Evaluation survey, the APE will be refined to reflect the updated engineering design. That refined APE will be surveyed in a manner consistent with the recommendations presented in the Task 1 report. Field methods outlined in the Minnesota SHPO and MnDOT CRU guidelines will be generally followed; any exception, as well as more detail specific to the existing conditions along each segment, will have been documented in the Task 1 report.

In the case of precontact/contact period Native American evidence, the field sampling will involve standard methods for identification and the preliminary assessment of horizontal and vertical site dimensions, integrity, and National Register potential. In addition, the survey may utilize targeted geomorphological testing and analysis in areas likely to feature deeply buried archaeological evidence.

Artifacts will be collected and analyzed in a manner consistent with contemporary standards. Artifacts from private property will be collected with written permission of the landowner. Historic period artifacts will only be collected if they appear to represent a potentially significant archaeological property.

Archaeological sites determined to have National Register potential will then require more comprehensive Phase II formal testing. As the Phase I review more than likely will have identified a wide range of site types associated with highly varied environmental settings and precontact to historic period contexts, the scope, research questions, field and analytic needs will be more appropriately defined at that stage of the investigation.

Task 3. Analysis and Reporting

A technical report of the Phase I and Phase II investigations, including the methodology, field work results, and recommendations, will be prepared in accordance with the guidelines of MnDOT's CRU, the Secretary of the Interior's Standards for Identification and Evaluation, and other applicable state and federal guidelines. This includes submittal of Geographic Information Systems (GIS) data per the CRU guidelines. All sites documented during the survey will be recorded on new or updated Minnesota Archaeological Site Forms.

Collected artifacts will be processed and analyzed in compliance with the survey guidelines of the SHPO and the Mn/DOT CRU. Artifacts will be curated at an approved facility as stipulated in the consultant's archaeology license.

PROPOSED METHODOLOGY FOR HISTORY/ARCHITECURE RESOURCES SURVEY

Charlene Roise, Hess, Roise and Company

Area of Potential Effect (APE)

Generally, the APE for history/architecture resources extends 300 feet on either side of the centerline of the alignment of each corridor. Around each station, the APE includes property within a quarter-mile radius. This area addresses anticipated project-related infrastructure work and reasonably foreseeable development.

The APE is illustrated in maps of the five project segments. Exceptions to the parameters outlined above include the following:

- The APE for the Intermodal Station (in segments A and C) includes all property within the boundaries adopted for the "Downtown Minneapolis Transit Hub" Environmental Screening Report (October 28, 2009 review draft) prepared for Hennepin County by Kimley-Horn and Associates. The area shown in the report is extended northeast of Washington Avenue to and across the Mississippi River to include the first tier of properties on Nicollet Island, to provide adequate APE coverage for the three-block potential station area and related developments such as rail storage yards. This area addresses infrastructure work associated with the SWLRT project as well as cumulative effects related to the development of the Intermodal station. (See below for discussion about splitting responsibility for survey of this area between the SWLRT project and the Intermodal Station project.)

- The APE for the 4th Street, 8th Street, 12th Street, Harmon Place, Hawthorne Avenue, Lyndale, and Uptown Stations (in segment C) includes the adjacent blocks in all directions from the station. This area is proposed for the stations in the more densely-built urban area, in comparison to the larger quarter-mile radius for other stations in outlying areas.

- The APE for the proposed tunnel area under Blaisdell, Nicollet, or First Avenues, including the 28th Street and Franklin Stations (in segment C), extends from one-half block west of Blaisdell Avenue to one-half block east of First Avenue. If this alternative is selected, the APE may need to be expanded in light of the design and construction methods for the tunnel.

- Along some portions of the corridor, the 300 foot APE may be extended to take into account visual effects. For example, if the 300 foot area comprises open space, and a row of buildings is located beyond, these buildings may be included in the APE.

- In some station areas, there are known areas of project related work and/or anticipated development outside of the quarter-mile radius, and these areas are included in the APE. This includes areas in downtown Hopkins.

The APE may also be adjusted if a field surveyor recommends that the project may affect a property or properties not included in the established APE boundaries.

As project planning proceeds, additional factors will be assessed to determine if there are other effects (direct, visual, auditory, atmospheric, and/or changes in use) which could require an expansion of the above APE. These factors include:

- Noise analysis, including areas where the use of bells and whistles is anticipated.
- Vibration analysis, including vibration related to project construction and operations.
- The specific locations of project elements, including operations/maintenance facilities, park-and-ride facilities, traction power substations, signal bungalows, and other infrastructure.

Survey Approach

Survey Zones

The project cuts through a number of distinct communities, each with a unique history. As a result, these communities, which share similar physical and historical characteristics, can serve as a framework for conducting the survey. The survey will be organized around the following zones (related project segments and stations are listed in parenthesis):

- Eden Prairie (Segments 1 and 3; Highway 5, Highway 62, Mitchell Road, Southwest Station, Eden Prairie Town Center, Golden Triangle, City West Stations)
- Minnetonka (Segments 1 and 3; Rowland, Opus, Shady Oak Stations)
- Hopkins (Segment 4; Shady Oak, Hopkins, Blake Stations)
- Saint Louis Park (Segment 4; Louisiana, Wooddale, Beltline Stations)
- Minneapolis west residential, including parts of Bryn Mawr, Lowry Hill, East Isles, Kenwood, Cedar-Isles-Dean, and West Calhoun neighborhoods (Segments A and C; West Lake, 21st Street, Penn Stations)
- Minneapolis south residential/commercial, including parts of the Stevens Square/Loring Heights, Whittier, Lowry Hill East, East Isles, and Cedar-Isles-Dean neighborhoods and the Midtown Greenway (Segment C; Uptown, Lyndale, 28th Street, Franklin Stations)
- Minneapolis downtown north of I-94 (Segment C; 12th Street, 8th Street, 4th Street, Harmon Place, Hawthorne Avenue Stations)
- Minneapolis industrial (Segments A and C; Van White, Royalston Stations)
- Minneapolis warehouse (Segments A and C; Intermodal Station)

In addition, there are four railroad corridors that traverse these community boundaries. These corridors will be considered as four individual zones. The corridors (by historic names) are:

- Minneapolis and Saint Louis Railway (Chicago and North Western Railway). Part of the main line is in the APE (Segments 1, 4, A and C). A segment of this line between downtown Minneapolis and Merriam Junction has recently been evaluated by the Surface Transportation Board as not eligible to the National Register; however, the SHPO did not concur with this finding. The line will be further evaluated, focusing on the section within the APE.
- Chicago, Milwaukee and Saint Paul Railway (Milwaukee Road), Benton Cutoff. Part of the CM&SP Benton Cutoff is in the APE (Segments 4, A, and C). Except for the Chicago, Milwaukee and Saint Paul Railroad Grade Separation Historic District, which is listed in the National Register, the Benton Cutoff has previously been determined as not eligible to the National Register by the Federal Highway Administration, with concurrence by the SHPO.
- Saint Paul and Pacific Railway (Great Northern Railway). Part of the main line is in the APE (Segment A). This line will be evaluated.
- Minneapolis, Northfield and Southern Railway. Part of the Auto Club-Luce Line Extension of the MN&S is in the APE (Segment 4). This line has been previously evaluated by Mn/DOT CRU, and the Auto Club-Luce Line Extension has been recommended as not eligible to the National Register. This determination has not been submitted to SHPO for concurrence. The Mn/DOT CRU evaluation will be summarized and incorporated into this survey by reference.

All of the above lines, including those which have been evaluated as not eligible, will be inventoried and evaluated to identify any railroad related features in the APE that are potentially significant in their own right. The statewide railroad context developed by Mn/DOT CRU will serve as a basis for evaluation of railroad resources.

The survey of the above thirteen zones will be completed by three consultants. Hess Roise will complete the surveys for the five zones in Minneapolis, Mead & Hunt will complete the surveys for St. Louis Park, Hopkins, Minnetonka, and Eden Prairie, and Summit Envirosolutions will complete the surveys for the four railroad zones. Each consultant will prepare a report for the Phase I-II survey of the zones completed. An overall summary, integrating the survey results from all thirteen zones, will be prepared for the analysis of effects, within the framework of the five project segments.

The survey will include properties built in 1965 and earlier. Although National Register guidelines use a 50-year cut-off for eligibility (except for properties of exceptional importance), adopting a 45-year cut-off for this survey provides 5 years for project planning before the survey becomes outdated.

NOTE ON RESPONSBILITY FOR SURVEYS IN THE INTERMODAL STATION AREA: There is an overlap of the APEs for the SWLRT project and the Intermodal Station project (currently in the planning stage). The SWLRT survey effort will complete survey work for only a portion of the SWLRT APE in the vicinity of the Intermodal Station, including where SWLRT construction is anticipated. The remainder of this area will be surveyed as part of the planning for the Intermodal Station project. The survey results from the Intermodal Station survey will be included in the consideration of cumulative effects as part of the SWLRT Section 106 review. (See map for the division of survey responsibilities in this portion of the SWLRT APE.)

Phase I Survey (Reconnaissance Survey)

The primary goal of Phase I is to identify properties that appear to have the potential to qualify for the National Register and merit further analysis. This will eliminate from further consideration any properties that have little or no potential to meet National Register criteria. The Phase I survey will also verify that properties already listed or officially determined eligible for listing in the National Register still retain integrity.

Literature Search

The literature search will focus on areas within the APE, with broader contextual information procured as needed. The literature search will begin by collecting existing reports and research for each zone. Maps, atlases, and other information that can provide specific information about property within the APE for archaeology will be a high priority. Additional research will be conducted for specific areas, and occasionally on specific properties, as appropriate. The literature search will produce:

- A working set of research files, including maps and related materials, for each zone. A copy of these files will be provided to the archaeological team.
- For each zone, a brief context (perhaps with subcontexts) will be developed that is approximately two to five pages in length and comprises a brief narrative, an annotated list of relevant property types, and a preliminary period of significance. (This assumes that extensive narrative contexts will not be developed during this phase.) A similar context will also be prepared for each railway, focusing specifically on segments in the APE. These contexts will also be provided to the archaeological team.

Fieldwork

A project-specific inventory form will be developed. Prior to the onset of fieldwork, a draft inventory form will be submitted to the client for review and approval.

The Hennepin County property database provides building construction dates for tax parcels. These dates will be assumed to be generally reliable for properties erected in the last half of the twentieth century, and will therefore be used to eliminate properties built after 1965 from the survey. During fieldwork, however, surveyors will be observant of properties eliminated from the inventory to identify:

- Inaccuracies: Properties not included in the survey that appear to date from 1965 and earlier (in other words, instances where the county date appears to be incorrect);
- Incomplete data: Properties not included in the survey that contain multiple buildings or other features, where the county date may refer to a newer feature—but older features are also present;
- Exceptional properties: Properties dating from 1966 or later that might be of exceptional importance.

Fieldwork will be conducted by zones. The methodology for each zone is as follows:

- Using information from the Hennepin County database, surveyors will be provided with a spreadsheet listing all properties in the zone built in 1965 or earlier. In addition to the address and year built, the spreadsheet will include the property's use and the name of the owner and taxpayer. The survey will include properties listed or officially determined eligible for listing in the National Register (including those in historic districts) to verify that they retain integrity. Map books will be prepared for reference in the field.
- Surveyors will conduct site visits for each property, recording observations from public rights-of-way with field notes and digital photographs. At a minimum, surveyors will record information on noteworthy features and the property's integrity. Using the data categories for functions and uses outlined in the National Register bulletin *How to Complete the National Register Registration Form*, and with reference to the context information for each zone, the surveyor will suggest data categories that seem the most appropriate for evaluating the property's National Register potential. The surveyor will also provide a preliminary recommendation—and a justification for that recommendation—stating that 1) the property does not appear to be eligible for the National Register, or 2) the property should be evaluated in Phase II.
- All field surveyors will meet the Secretary of the Interior's Professional Qualifications Standards.

Deliverables for Phase I survey

- For each zone:
    - Synopsis for each zone, including the context and property type information.
    - Table of surveyed properties including recommendations for intensive level survey, with justification.
    - Inventory form (2 copies) for each property in the APE built in 1965 or earlier. In addition to the data collected in the field, the inventory forms will incorporate information on the property's location (UTM reference, township/range/section) from the county database. At least one color digital photograph of the property will be included on each form. (NOTE: For properties which go to a Phase II evaluation, the same survey form should incorporate the evaluation information.)
    - Map of zone with properties recommended for intensive-level survey identified.

Phase II Survey (Intensive)

The goal of Phase II is to evaluate properties, as recommended in Phase I, to determine which meet the criteria of the National Register of Historic Places. As with Phase I, the work will be organized by zones.

Literature Search

The literature search will focus on individual properties and districts that have potential to meet National Register criteria. To provide a framework for evaluating some properties, it may be necessary to expand the context synopses developed in Phase I to address specific physical areas, eras, and/or property types.

Fieldwork

Additional field work may be needed to evaluate the physical characteristics of individual properties and districts. It might be necessary to obtain permission to enter some properties for this evaluation—if, for example, there is the potential for a significant interior space, or if a parcel is large and contains a number of buildings and these buildings cannot be adequately evaluated from the public right-of-way, aerial photographs, or other means.

Deliverables for Phase II survey

- For each zone:
  - Table of Phase II properties, including recommendations on eligibility.
  - More detailed inventory form, including the narrative evaluation of eligibility, for each property included in this phase.
  - Map of zone, showing properties that appear to qualify for the National Register identified, along with listed and previously determined eligible properties.
- A Phase I-II survey report (for all zones completed by the same consultant) conforming to Mn/DOT CRU Architecture/History Report requirements and other applicable federal and state guidelines.

At the conclusion of all Phase II history/architecture survey work, a consolidated summary/table incorporating the work from all thirteen zones will be prepared for the analysis of effect. This summary will be organized by the five project segments.

Appendix B. Table of Surveyed Properties

Southwest Transitway Historic Properties

Survey Zones: Eden Prairie, Minnetonka, Hopkins, St. Louis Park

EDEN PRAIRIE

Property Name (Historic)	Property Address		SHPO Inventory Number	NRHP Status	Project Segment(s)
Culvert	South of Valley View Road along pedestrian bridge		HE-EPC-163	Not eligible	1
Business	14101	62ND ST W	HE-EPC-153	Not eligible	1
Building	14301	62ND ST W	HE-EPC-160	Not eligible	1
House	6613	CANTERBURY LA	HE-EPC-161	Not eligible	1
Business	6300	CARLSON DR	HE-EPC-152	Not eligible	1
Business	6390	CARLSON DR	HE-EPC-151	Not eligible	1
House	6574	FLYING CLOUD DR	HE-EPC-167	Not eligible	3
House	6685	FLYING CLOUD DR	HE-EPC-166	Not eligible	3
Business	6851	FLYING CLOUD DR	HE-EPC-165	Not eligible	3
Business	6871	FLYING CLOUD DR	HE-EPC-164	Not eligible	3
Business	6282	INDUSTRIAL DR	HE-EPC-159	Not eligible	1
Warehouse	6283	INDUSTRIAL DR	HE-EPC-158	Not eligible	1
Business	6330	INDUSTRIAL DR	HE-EPC-157	Not eligible	1
Business	6331	INDUSTRIAL DR	HE-EPC-156	Not eligible	1
Business	6340	INDUSTRIAL DR	HE-EPC-155	Not eligible	1
Business	6350	INDUSTRIAL DR	HE-EPC-154	Not eligible	1
House	14315	STRATFORD RD	HE-EPC-162	Not eligible	1
Emerson	12001	TECHNOLOGY DR	HE-EPC-169	Not eligible	3
Eaton Corp.	14900	TECHNOLOGY DR	HE-EPC-170	Not eligible	1, 3
House	10580	VALLEY VIEW RD	HE-EPC-168	Not eligible	3

Property Name (Historic)	Property Address		SHPO Inventory Number	NRHP Status	Project Segment(s)
St. Margarets Cemetery	Bren Rd. East, East of Shady Oak Rd.		HE-MKC-189	Not eligible	3
Business	11300	47TH ST W	HE-MKC-190	Not eligible	1, 3, 4
Business	11301	47TH ST W	HE-MKC-191	Not eligible	1, 3, 4
Business	11421	47TH ST W	HE-MKC-192	Not eligible	1, 3, 4
House	5303	BAKER RD	HE-MKC-122	Not eligible	1
House	5319	BAKER RD	HE-MKC-123	Not eligible	1
House	5331	BAKER RD	HE-MKC-124	Not eligible	1
House	5339	BAKER RD	HE-MKC-125	Not eligible	1
House	5411	BAKER RD	HE-MKC-126	Not eligible	1
House	5501	BAKER RD	HE-MKC-127	Not eligible	1
Hennepin County Home School	14300	CO RD NO 62	HE-MKC-121	Not eligible	1
House	4925	DIANE DR	HE-MKC-103	Not eligible	1
House	4933	DIANE DR	HE-MKC-104	Not eligible	1
House	5025	DOMINICK SPUR	HE-MKC-105	Not eligible	1
House	5031	DOMINICK SPUR	HE-MKC-106	Not eligible	1
Lang House	5038	DOMINICK SPUR	HE-MKC-101	Eligible	1
House	5039	DOMINICK SPUR	HE-MKC-107	Not eligible	1
Minneapolis Sewer Pipe Works/Red Wing Sewer Pipe Company	11303	EXCELSIOR BLVD	HE-MKC-102	Not eligible	1, 3, 4
Business	11351	EXCELSIOR BLVD	HE-MKC-195	Not eligible	1, 3, 4
Business	11415	EXCELSIOR BLVD	HE-MKC-194	Not eligible	1, 3, 4
Strip Mall	11509	EXCELSIOR BLVD	HE-MKC-193	Not eligible	1, 3, 4
House	5600	GLEN MOOR CIR	HE-MKC-163	Not eligible	1
House	5603	GLEN MOOR CIR	HE-MKC-164	Not eligible	1
House	5616	GLEN MOOR CIR	HE-MKC-165	Not eligible	1
House	5619	GLEN MOOR CIR	HE-MKC-166	Not eligible	1
House	5635	GLEN MOOR CIR	HE-MKC-167	Not eligible	1
House	5651	GLEN MOOR CIR	HE-MKC-168	Not eligible	1
House	5733	GLEN MOOR CIR	HE-MKC-169	Not eligible	1
House	5750	GLEN MOOR CIR	HE-MKC-170	Not eligible	1
House	5751	GLEN MOOR CIR	HE-MKC-171	Not eligible	1
House	5764	GLEN MOOR CIR	HE-MKC-172	Not eligible	1
House	5765	GLEN MOOR CIR	HE-MKC-173	Not eligible	1
House	5778	GLEN MOOR CIR	HE-MKC-174	Not eligible	1

MINNETONKA

Property Name (Historic)	Property Address		SHPO Inventory Number	NRHP Status	Project Segment(s)
House	5601	GLEN MOOR RD E	HE-MKC-148	Not eligible	1
House	5602	GLEN MOOR RD E	HE-MKC-149	Not eligible	1
House	5618	GLEN MOOR RD E	HE-MKC-150	Not eligible	1
House	5633	GLEN MOOR RD E	HE-MKC-151	Not eligible	1
House	5634	GLEN MOOR RD E	HE-MKC-152	Not eligible	1
House	5649	GLEN MOOR RD E	HE-MKC-153	Not eligible	1
House	5650	GLEN MOOR RD E	HE-MKC-154	Not eligible	1
House	5665	GLEN MOOR RD E	HE-MKC-155	Not eligible	1
House	5666	GLEN MOOR RD E	HE-MKC-156	Not eligible	1
House	5681	GLEN MOOR RD E	HE-MKC-157	Not eligible	1
House	5682	GLEN MOOR RD E	HE-MKC-158	Not eligible	1
House	5701	GLEN MOOR RD E	HE-MKC-159	Not eligible	1
House	5734	GLEN MOOR RD E	HE-MKC-160	Not eligible	1
House	5752	GLEN MOOR RD E	HE-MKC-161	Not eligible	1
House	5775	GLEN MOOR RD W	HE-MKC-162	Not eligible	1
House	5524	GLENAVON AVE	HE-MKC-175	Not eligible	1
House	5525	GLENAVON AVE	HE-MKC-176	Not eligible	1
House	5536	GLENAVON AVE	HE-MKC-177	Not eligible	1
House	5537	GLENAVON AVE	HE-MKC-178	Not eligible	1
House	12800	JORISSEN RD	HE-MKC-119	Not eligible	1
House	12808	JORISSEN RD	HE-MKC-120	Not eligible	1
House	5503	MAYVIEW RD	HE-MKC-182	Not eligible	1
House	5504	MAYVIEW RD	HE-MKC-183	Not eligible	1
House	5303	MINNETOGA TER	HE-MKC-140	Not eligible	1
House	5304	MINNETOGA TER	HE-MKC-139	Not eligible	1
House	5311	MINNETOGA TER	HE-MKC-138	Not eligible	1
House	5316	MINNETOGA TER	HE-MKC-136	Not eligible	1
House	5319	MINNETOGA TER	HE-MKC-137	Not eligible	1
House	5326	MINNETOGA TER	HE-MKC-135	Not eligible	1
House	5327	MINNETOGA TER	HE-MKC-134	Not eligible	1
House	5336	MINNETOGA TER	HE-MKC-133	Not eligible	1
House	5339	MINNETOGA TER	HE-MKC-132	Not eligible	1
House	13318	NORTH ST	HE-MKC-031	Not eligible	1
House	13322	NORTH ST	HE-MKC-179	Not eligible	1
House	13326	NORTH ST	HE-MKC-180	Not eligible	1

Property Name (Historic)	Property Address		SHPO Inventory Number	NRHP Status	Project Segment(s)
House	13401	NORTH ST	HE-MKC-181	Not eligible	1
House	5312	ROGERS DR	HE-MKC-128	Not eligible	1
House	5326	ROGERS DR	HE-MKC-129	Not eligible	1
House	5327	ROGERS DR	HE-MKC-130	Not eligible	1
House	5335	ROGERS DR	HE-MKC-131	Not eligible	1
House	5400	ROWLAND RD	HE-MKC-141	Not eligible	1
House	5416	ROWLAND RD	HE-MKC-142	Not eligible	1
House	5417	ROWLAND RD	HE-MKC-143	Not eligible	1
House	5424	ROWLAND RD	HE-MKC-144	Not eligible	1
House	5425	ROWLAND RD	HE-MKC-145	Not eligible	1
House	5432	ROWLAND RD	HE-MKC-146	Not eligible	1
House	5433	ROWLAND RD	HE-MKC-147	Not eligible	1
House	11605	SHADY OAK DR	HE-MKC-114	Not eligible	1
House	11613	SHADY OAK DR	HE-MKC-115	Not eligible	1
House	11621	SHADY OAK DR	HE-MKC-116	Not eligible	1
House	11709	SHADY OAK DR	HE-MKC-117	Not eligible	1
House	11717	SHADY OAK DR	HE-MKC-118	Not eligible	1
House	11810	SHADY OAK LA	HE-MKC-113	Not eligible	1
House	11814	SHADY OAK LA	HE-MKC-112	Not eligible	1
House	11828	SHADY OAK LA	HE-MKC-111	Not eligible	1
House	11829	SHADY OAK LA	HE-MKC-110	Not eligible	1
House	11833	SHADY OAK LA	HE-MKC-109	Not eligible	1
House	11900	SHADY OAK LA	HE-MKC-108	Not eligible	1
House	4908	SHADY OAK RD	HE-MKC-184	Not eligible	1
House	4910	SHADY OAK RD	HE-MKC-185	Not eligible	1
House	4914	SHADY OAK RD	HE-MKC-186	Not eligible	1
House	4918	SHADY OAK RD	HE-MKC-187	Not eligible	1
House	4932	SHADY OAK RD	HE-MKC-188	Not eligible	1

HOPKINS

Property Name (Historic)	Property Address		SHPO Inventory Number	NRHP Status	Project Segment(s)
Hopkins Downtown Commercial Historic District	800-1000 blocks of Main Street		HE-HOC-027	Eligible	4
Interlachen Park Neighborhood	Roughly bound by Excelsior Blvd, Meadowbrook Rd, Boyce St, and Ashley Rd		HE-HOC-147	Not eligible	4
Oakridge Investment Co. Building	15	10TH AVE S	HE-HOC-031	Not eligible	4
Business	17	10TH AVE S	HE-HOC-070	Not eligible	4
Business	32	10TH AVE S	HE-HOC-071	Not eligible	4
Business	34	10TH AVE S	HE-HOC-072	Not eligible	4
Business	410	11TH AVE S	HE-HOC-036	Not eligible	1, 3, 4
House	130	17TH AVE S	HE-HOC-081	Not eligible	1, 3, 4
House	136	17TH AVE S	HE-HOC-080	Not eligible	1, 3, 4
House	135	18TH AVE S	HE-HOC-079	Not eligible	1, 3, 4
House	136	18TH AVE S	HE-HOC-078	Not eligible	1, 3, 4
Hopkins City Hall	1010	1ST ST S	HE-HOC-026	Eligible	4
Gas Station	1102	2ND ST N E	HE-HOC-083	Not eligible	4
Business	600	2ND ST N E	HE-HOC-130	Not eligible	4
Business	800	2ND ST N E	HE-HOC-131	Not eligible	4
Business	607	2ND ST S	HE-HOC-058	Not eligible	4
Business	201	3RD ST S	HE-HOC-038	Not eligible	4
Apartment Building	19	5TH AVE S	HE-HOC-163	Not eligible	4
Apartment Building	22	5TH AVE S	HE-HOC-041	Not eligible	4
Apartment Building	29	5TH AVE S	HE-HOC-164	Not eligible	4
Apartment Building	39	5TH AVE S	HE-HOC-165	Not eligible	4
Business	1202	5TH ST S	HE-HOC-037	Not eligible	1, 3, 4
Business	1415	5TH ST S	HE-HOC-032	Not eligible	1, 3, 4
Building	1515	5TH ST S	HE-HOC-033	Not eligible	1, 3, 4
House	15	6TH AVE S	HE-HOC-050	Not eligible	4
House	19	6TH AVE S	HE-HOC-049	Not eligible	4
House	27	6TH AVE S	HE-HOC-048	Not eligible	4
Apartment Building	28	6TH AVE S	HE-HOC-051	Not eligible	4
House	31	6TH AVE S	HE-HOC-047	Not eligible	4
House	35	6TH AVE S	HE-HOC-046	Not eligible	4
Apartment Building	38	6TH AVE S	HE-HOC-052	Not eligible	4
House	39	6TH AVE S	HE-HOC-045	Not eligible	4

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Property Name (Historic)	Property Address		SHPO Inventory Number	NRHP Status	Project Segment(s)
House	40	6TH AVE S	HE-HOC-053	Not eligible	4
House	43	6TH AVE S	HE-HOC-044	Not eligible	4
House	46	6TH AVE S	HE-HOC-054	Not eligible	4
House	47 1/2	6TH AVE S	HE-HOC-043	Not eligible	4
House	50	6TH AVE S	HE-HOC-055	Not eligible	4
House	54	6TH AVE S	HE-HOC-056	Not eligible	4
Apartment Building	57	6TH AVE S	HE-HOC-042	Not eligible	4
Business	62	6TH AVE S	HE-HOC-057	Not eligible	4
House	21	7TH AVE S	HE-HOC-064	Not eligible	4
House	31	7TH AVE S	HE-HOC-063	Not eligible	4
House	37	7TH AVE S	HE-HOC-062	Not eligible	4
House	41	7TH AVE S	HE-HOC-061	Not eligible	4
House	53	7TH AVE S	HE-HOC-060	Not eligible	4
Business	65	7TH AVE S	HE-HOC-059	Not eligible	4
Strip Mall	15	8TH AVE S	HE-HOC-065	Not eligible	4
Prodel, Inc. Building	30	8TH AVE S	HE-HOC-029	Not eligible	4
Business	15	9TH AVE S	HE-HOC-067	Not eligible	4
Building	23	9TH AVE S	HE-HOC-068	Not eligible	4
Business	31	9TH AVE S	HE-HOC-069	Not eligible	4
Business	5	9TH AVE S	HE-HOC-066	Not eligible	4
Nygren Building	50	9TH AVE S	HE-HOC-030	Not eligible	4
House	10	ASHLEY RD	HE-HOC-111	Not eligible	4
House	16	ASHLEY RD	HE-HOC-110	Not eligible	4
House	20	ASHLEY RD	HE-HOC-109	Not eligible	4
House	29	ASHLEY RD	HE-HOC-114	Not eligible	4
House	35	ASHLEY RD	HE-HOC-113	Not eligible	4
House	42	ASHLEY RD	HE-HOC-108	Not eligible	4
House	46	ASHLEY RD	HE-HOC-107	Not eligible	4
Business	126	BLAKE RD N	HE-HOC-091	Not eligible	4
Business	325	BLAKE RD N	HE-HOC-090	Not eligible	4
Business	415	BLAKE RD N	HE-HOC-106	Not eligible	4
House	11	BLAKE RD S	HE-HOC-128	Not eligible	4
Blake School	110	BLAKE RD S	HE-HOC-006	Not eligible	4
House	29	BLAKE RD S	HE-HOC-127	Not eligible	4
House	33	BLAKE RD S	HE-HOC-126	Not eligible	4

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Property Name (Historic)	Property Address		SHPO Inventory Number	NRHP Status	Project Segment(s)
House	1313	BOYCE RD	HE-HOC-125	Not eligible	4
Business	10801	EXCELSIOR BLVD	HE-HOC-035	Not eligible	1, 3, 4
Business	11001	EXCELSIOR BLVD	HE-HOC-034	Not eligible	1, 3, 4
Minneapolis Moline Company	11111	EXCELSIOR BLVD	HE-HOC-028	Not eligible	1, 3, 4
Business	8098	EXCELSIOR BLVD	HE-HOC-129	Not eligible	4
Apartments	8311	EXCELSIOR BLVD	HE-HOC-112	Not eligible	4
Strip Mall	8490	EXCELSIOR BLVD	HE-HOC-095	Not eligible	4
Strip Mall	8594	EXCELSIOR BLVD	HE-HOC-094	Not eligible	4
Business	8660	EXCELSIOR BLVD	HE-HOC-093	Not eligible	4
Vacant parcel	8700	EXCELSIOR BLVD		Not eligible	4
Business	8870	EXCELSIOR BLVD	HE-HOC-098	Not eligible	4
Business	8890	EXCELSIOR BLVD	HE-HOC-099	Not eligible	4
Business	8900	EXCELSIOR BLVD	HE-HOC-100	Not eligible	4
Modern building	8940	EXCELSIOR BLVD		Not eligible	4
Strip Mall	9092	EXCELSIOR BLVD	HE-HOC-101	Not eligible	4
Apartment Building	9850	EXCELSIOR BLVD	HE-HOC-040	Not eligible	4
Apartment Building	9900	EXCELSIOR BLVD	HE-HOC-166	Not eligible	4
Apartment Building	9930	EXCELSIOR BLVD	HE-HOC-167	Not eligible	4
Business	21	HARRISON AVE N	HE-HOC-132	Not eligible	4
Apartment Building	1110	HIAWATHA AVE	HE-HOC-088	Not eligible	4
Apartments	1120	HIAWATHA AVE	HE-HOC-089	Not eligible	4
Business	1009	HILL ST	HE-HOC-092	Not eligible	4
House	10	JACKSON AVE S	HE-HOC-102	Not eligible	4
House	14	JACKSON AVE S	HE-HOC-103	Not eligible	4
Business	101	JEFFERSON AVE S	HE-HOC-082	Not eligible	4
Kokesh Hardware	1001	MAIN STREET	HE-HOC-146	Eligible	4
State Bank of Hopkins	1004	MAIN STREET	HE-HOC-155	Eligible	4
Business	1007	MAIN STREET	HE-HOC-148	Eligible	4
Business	1008	MAIN STREET	HE-HOC-154	Eligible	4
Business	1010	MAIN STREET	HE-HOC-153	Eligible	4
Business	1011	MAIN STREET	HE-HOC-149	Eligible	4
Business	1016	MAIN STREET	HE-HOC-152	Eligible	4
Saloon	1022	MAIN STREET	HE-HOC-151	Eligible	4
Dahlberg Brothers Ford	1023	MAIN STREET	HE-HOC-150	Eligible	4
Business	801	MAIN STREET	HE-HOC-133	Eligible	4

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Property Name (Historic)	Property Address		SHPO Inventory Number	NRHP Status	Project Segment(s)
Business	802	MAIN STREET	HE-HOC-162	Eligible	4
Business	805	MAIN STREET	HE-HOC-134	Eligible	4
Business	808	MAIN STREET	HE-HOC-077	Eligible	4
Business	809	MAIN STREET	HE-HOC-135	Eligible	4
Grocery Store	810	MAIN STREET	HE-HOC-076	Eligible	4
Business	811	MAIN STREET	HE-HOC-136	Eligible	4
Business	815	MAIN STREET	HE-HOC-137	Eligible	4
Opera Hall	816	MAIN STREET	HE-HOC-075	Eligible	4
Business	819	MAIN STREET	HE-HOC-138	Eligible	4
Business	820	MAIN STREET	HE-HOC-074	Eligible	4
International Order of Odd Fellows Lodge	821	MAIN STREET	HE-HOC-139	Eligible	4
Olson Grocery Store	824	MAIN STREET	HE-HOC-073	Eligible	4
Business	901	MAIN STREET	HE-HOC-140	Eligible	4
Montgomery Ward Catalog Order Store	903	MAIN STREET	HE-HOC-141	Eligible	4
Olson Building	906	MAIN STREET	HE-HOC-161	Eligible	4
Albert Pike Masonic Lodge	907	MAIN STREET	HE-HOC-142	Eligible	4
Nelson Meat Market	910	MAIN STREET	HE-HOC-160	Eligible	4
Business	911	MAIN STREET	HE-HOC-143	Eligible	4
Maetzold Hardware and Garage	913	MAIN STREET	HE-HOC-144	Eligible	4
Charleston Clothing	914	MAIN STREET	HE-HOC-159	Eligible	4
Smetana Drug Store	916	MAIN STREET	HE-HOC-158	Eligible	4
Anderson Dry Goods	920	MAIN STREET	HE-HOC-157	Eligible	4
Building	921	MAIN STREET	HE-HOC-145	Eligible	4
Business	922	MAIN STREET	HE-HOC-156	Eligible	4
House	13	MONROE AVE S	HE-HOC-105	Not eligible	4
House	9	MONROE AVE S	HE-HOC-104	Not eligible	4
House	1301	PRESTON LA	HE-HOC-118	Not eligible	4
House	1310	PRESTON LA	HE-HOC-115	Not eligible	4
House	1311	PRESTON LA	HE-HOC-119	Not eligible	4
House	1318	PRESTON LA	HE-HOC-116	Not eligible	4
House	1319	PRESTON LA	HE-HOC-120	Not eligible	4
House	1325	PRESTON LA	HE-HOC-121	Not eligible	4
House	1326	PRESTON LA	HE-HOC-117	Not eligible	4
House	1401	PRESTON LA	HE-HOC-122	Not eligible	4

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Property Name (Historic)	Property Address		SHPO Inventory Number	NRHP Status	Project Segment(s)
House	1409	PRESTON LA	HE-HOC-123	Not eligible	4
House	1417	PRESTON LA	HE-HOC-124	Not eligible	4
Business	18	TYLER AVE N	HE-HOC-097	Not eligible	4
House	218	TYLER AVE N	HE-HOC-084	Not eligible	4
House	226	TYLER AVE N	HE-HOC-085	Not eligible	4
House	228	TYLER AVE N	HE-HOC-086	Not eligible	4
House	304	TYLER AVE N	HE-HOC-087	Not eligible	4
Business	41	TYLER AVE N	HE-HOC-096	Not eligible	4
Business	140	WASHINGTON AVE S	HE-HOC-039	Not eligible	4

Property Name (Historic)	Property Address		SHPO Inventory Number	NRHP Status	Project Segment(s)
Peavey Haglin Concrete Grain Elevator - Located on Northland Aluminum, Inc. property	Southeast corner of Hwy 7 and 100		HE-SLC-009	Listed	4
House	3907	31ST ST W	HE-SLC-113	Not eligible	4
House	3917	31ST ST W	HE-SLC-114	Not eligible	4
House	3921	31ST ST W	HE-SLC-115	Not eligible	4
Apartment Building	4009	31ST ST W	HE-SLC-116	Not eligible	4
House	4013	31ST ST W	HE-SLC-117	Not eligible	4
House	4101	31ST ST W	HE-SLC-118	Not eligible	4
House	4105	31ST ST W	HE-SLC-119	Not eligible	4
House	4117	31ST ST W	HE-SLC-120	Not eligible	4
House	4125	31ST ST W	HE-SLC-121	Not eligible	4
House	5820	34TH ST W	HE-SLC-158	Not eligible	4
House	5900	34TH ST W	HE-SLC-058	Not eligible	4
House	5905	34TH ST W	HE-SLC-156	Not eligible	4
House	5906	34TH ST W	HE-SLC-057	Not eligible	4
House	5912	34TH ST W	HE-SLC-154	Not eligible	4
House	5913	34TH ST W	HE-SLC-155	Not eligible	4
House	5916	34TH ST W	HE-SLC-151	Not eligible	4
House	5917	34TH ST W	HE-SLC-059	Not eligible	4
House	5921	34TH ST W	HE-SLC-153	Not eligible	4
House	5922	34TH ST W	HE-SLC-150	Not eligible	4
House	5925	34TH ST W	HE-SLC-152	Not eligible	4
House	6001	34TH ST W	HE-SLC-148	Not eligible	4
House	6005	34TH ST W	HE-SLC-147	Not eligible	4
House	6009	34TH ST W	HE-SLC-146	Not eligible	4
House	6013	34TH ST W	HE-SLC-145	Not eligible	4
Business	5708	35 1/2 ST W	HE-SLC-071	Not eligible	4
Business	5720	35 1/2 ST W	HE-SLC-070	Not eligible	4
Business	4905	35TH ST W	HE-SLC-133	Not eligible	4
Business	4906	35TH ST W	HE-SLC-132	Not eligible	4
Business	4930	35TH ST W	HE-SLC-134	Not eligible	4
Business	5100	35TH ST W	HE-SLC-135	Not eligible	4
Modern Building	5912	35TH ST W		Not eligible	4
Apartments	5918	35TH ST W	HE-SLC-199	Not eligible	4
Apartments	5924	35TH ST W	HE-SLC-198	Not eligible	4

Property Name (Historic)	Property Address		SHPO Inventory Number	NRHP Status	Project Segment(s)
Apartments	6000	35TH ST W	HE-SLC-196	Not eligible	4
Apartments	6005	35TH ST W	HE-SLC-195	Not eligible	4
House	6012	35TH ST W	HE-SLC-193	Not eligible	4
Apartments	6017	35TH ST W	HE-SLC-194	Not eligible	4
House	6018	35TH ST W	HE-SLC-192	Not eligible	4
House	6024	35TH ST W	HE-SLC-191	Not eligible	4
House	6212	35TH ST W	HE-SLC-186	Not eligible	4
House	6216	35TH ST W	HE-SLC-187	Not eligible	4
House	6228	35TH ST W	HE-SLC-188	Not eligible	4
House	6300	35TH ST W	HE-SLC-189	Not eligible	4
House	6304	35TH ST W	HE-SLC-190	Not eligible	4
American Legion	5605	36TH ST W	HE-SLC-066	Not eligible	4
Business	5701	36TH ST W	HE-SLC-064	Not eligible	4
Strip Mall	5708	36TH ST W	HE-SLC-067	Not eligible	4
Business	5721	36TH ST W	HE-SLC-063	Not eligible	4
Business	5724	36TH ST W	HE-SLC-068	Not eligible	4
Business	5727	36TH ST W	HE-SLC-062	Not eligible	4
Strip Mall	5802	36TH ST W	HE-SLC-069	Not eligible	4
House	6213	37TH ST W	HE-SLC-301	Not eligible	4
House	6225	37TH ST W	HE-SLC-302	Not eligible	4
House	3365	ALABAMA AVE S	HE-SLC-149	Not eligible	4
House	3425	ALABAMA AVE S	HE-SLC-231	Not eligible	4
House	3459	ALABAMA AVE S	HE-SLC-230	Not eligible	4
House	3463	ALABAMA AVE S	HE-SLC-229	Not eligible	4
Business	3600	ALABAMA AVE S	HE-SLC-291	Not eligible	4
Union Congregational Church	3700	ALABAMA AVE S	HE-SLC-053	Not eligible	4
House	3751	ALABAMA AVE S	HE-SLC-279	Not eligible	4
House	3761	ALABAMA AVE S	HE-SLC-280	Not eligible	4
House	3762	ALABAMA AVE S	HE-SLC-281	Not eligible	4
House	3401	BRUNSWICK AVE S	HE-SLC-144	Not eligible	4
House	3407	BRUNSWICK AVE S	HE-SLC-143	Not eligible	4
House	3413	BRUNSWICK AVE S	HE-SLC-142	Not eligible	4
House	3419	BRUNSWICK AVE S	HE-SLC-141	Not eligible	4
House	3450	BRUNSWICK AVE S	HE-SLC-140	Not eligible	4
House	3456	BRUNSWICK AVE S	HE-SLC-139	Not eligible	4

ST. LOUIS PARK

Property Name (Historic)	Property Address		SHPO Inventory Number	NRHP Status	Project Segment(s)
House	3462	BRUNSWICK AVE S	HE-SLC-138	Not eligible	4
House	3468	BRUNSWICK AVE S	HE-SLC-137	Not eligible	4
House	3700	BRUNSWICK AVE S	HE-SLC-303	Not eligible	4
House	3708	BRUNSWICK AVE S	HE-SLC-304	Not eligible	4
House	3751	BRUNSWICK AVE S	HE-SLC-285	Not eligible	4
Business	6408	CAMBRIDGE ST	HE-SLC-241	Not eligible	4
Business	6425	CAMBRIDGE ST	HE-SLC-310	Not eligible	4
Business	6521	CAMBRIDGE ST	HE-SLC-309	Not eligible	4
Business	6530	CAMBRIDGE ST	HE-SLC-308	Not eligible	4
House	3708	COLORADO AVE S	HE-SLC-306	Not eligible	4
House	3712	COLORADO AVE S	HE-SLC-305	Not eligible	4
House	3742	DAKOTA AVE S	HE-SLC-232	Not eligible	4
House	7401	EDGEBROOK DR	HE-SLC-242	Not eligible	4
House	7405	EDGEBROOK DR	HE-SLC-243	Not eligible	4
House	7409	EDGEBROOK DR	HE-SLC-244	Not eligible	4
House	7415	EDGEBROOK DR	HE-SLC-245	Not eligible	4
House	7419	EDGEBROOK DR	HE-SLC-246	Not eligible	4
House	7425	EDGEBROOK DR	HE-SLC-247	Not eligible	4
House	7429	EDGEBROOK DR	HE-SLC-248	Not eligible	4
House	7435	EDGEBROOK DR	HE-SLC-249	Not eligible	4
House	7501	EDGEBROOK DR	HE-SLC-250	Not eligible	4
House	7505	EDGEBROOK DR	HE-SLC-251	Not eligible	4
House	7511	EDGEBROOK DR	HE-SLC-252	Not eligible	4
House	7515	EDGEBROOK DR	HE-SLC-253	Not eligible	4
House	7519	EDGEBROOK DR	HE-SLC-254	Not eligible	4
House	7525	EDGEBROOK DR	HE-SLC-255	Not eligible	4
House	7531	EDGEBROOK DR	HE-SLC-256	Not eligible	4
House	7601	EDGEBROOK DR	HE-SLC-257	Not eligible	4
House	7605	EDGEBROOK DR	HE-SLC-258	Not eligible	4
House	7609	EDGEBROOK DR	HE-SLC-259	Not eligible	4
House	7613	EDGEBROOK DR	HE-SLC-260	Not eligible	4
House	7705	EDGEBROOK DR	HE-SLC-261	Not eligible	4
House	7709	EDGEBROOK DR	HE-SLC-262	Not eligible	4
House	7713	EDGEBROOK DR	HE-SLC-263	Not eligible	4
House	7717	EDGEBROOK DR	HE-SLC-264	Not eligible	4

Property Name (Historic)	Property Address		SHPO Inventory Number	NRHP Status	Project Segment(s)
House	7721	EDGEBROOK DR	HE-SLC-265	Not eligible	4
House	7725	EDGEBROOK DR	HE-SLC-266	Not eligible	4
House	7729	EDGEBROOK DR	HE-SLC-267	Not eligible	4
House	7801	EDGEBROOK DR	HE-SLC-268	Not eligible	4
House	7807	EDGEBROOK DR	HE-SLC-269	Not eligible	4
House	7813	EDGEBROOK DR	HE-SLC-270	Not eligible	4
House	7825	EDGEBROOK DR	HE-SLC-271	Not eligible	4
House	7831	EDGEBROOK DR	HE-SLC-272	Not eligible	4
House	7837	EDGEBROOK DR	HE-SLC-273	Not eligible	4
Business	3825	EDGEWOOD AVE S	HE-SLC-238	Not eligible	4
Business	3831	EDGEWOOD AVE S	HE-SLC-239	Not eligible	4
Business	3855	EDGEWOOD AVE S	HE-SLC-240	Not eligible	4
Park Nicollet Methodist Hospital	6500	EXCELSIOR BLVD	HE-SLC-300	Not eligible	4
House	2920	FRANCE AVE S	HE-SLC-122	Not eligible	4, A, C1, C2
House	2924	FRANCE AVE S	HE-SLC-123	Not eligible	4, A, C1, C2
House	5806	GOODRICH AVE	HE-SLC-299	Not eligible	4
House	5812	GOODRICH AVE	HE-SLC-298	Not eligible	4
House	5818	GOODRICH AVE	HE-SLC-297	Not eligible	4
House	5826	GOODRICH AVE	HE-SLC-296	Not eligible	4
House	5900	GOODRICH AVE	HE-SLC-295	Not eligible	4
House	5906	GOODRICH AVE	HE-SLC-294	Not eligible	4
House	5912	GOODRICH AVE	HE-SLC-293	Not eligible	4
House	5918	GOODRICH AVE	HE-SLC-292	Not eligible	4
House	5912	HAMILTON ST	HE-SLC-166	Not eligible	4
House	5915	HAMILTON ST	HE-SLC-164	Not eligible	4
House	5916	HAMILTON ST	HE-SLC-167	Not eligible	4
House	5920	HAMILTON ST	HE-SLC-168	Not eligible	4
House	5921	HAMILTON ST	HE-SLC-165	Not eligible	4
House	6000	HAMILTON ST	HE-SLC-169	Not eligible	4
House	6001	HAMILTON ST	HE-SLC-172	Not eligible	4
House	6005	HAMILTON ST	HE-SLC-173	Not eligible	4
House	6006	HAMILTON ST	HE-SLC-170	Not eligible	4
House	6009	HAMILTON ST	HE-SLC-174	Not eligible	4
House	6012	HAMILTON ST	HE-SLC-171	Not eligible	4
House	6015	HAMILTON ST	HE-SLC-175	Not eligible	4

Property Name (Historic)	Property Address		SHPO Inventory Number	NRHP Status	Project Segment(s)
House	6018	HAMILTON ST	HE-SLC-178	Not eligible	4
House	6019	HAMILTON ST	HE-SLC-176	Not eligible	4
House	6025	HAMILTON ST	HE-SLC-177	Not eligible	4
House	6026	HAMILTON ST	HE-SLC-179	Not eligible	4
House	6200	HAMILTON ST	HE-SLC-180	Not eligible	4
House	6206	HAMILTON ST	HE-SLC-181	Not eligible	4
House	6210	HAMILTON ST	HE-SLC-182	Not eligible	4
Apartments	6211	HAMILTON ST	HE-SLC-184	Not eligible	4
House	6214	HAMILTON ST	HE-SLC-183	Not eligible	4
Motor Travel Services Building	3907	HIGHWAY 7	HE-SLC-055	Eligible	4, A, C1, C2
Business	4301	HIGHWAY 7	HE-SLC-112	Not eligible	4
Apartment Building	4405	HIGHWAY 7	HE-SLC-111	Not eligible	4
Apartments	4516	HIGHWAY 7	HE-SLC-102	Not eligible	4
Business	4521	HIGHWAY 7	HE-SLC-107	Not eligible	4
Woodmark Industries Building	4601	HIGHWAY 7	HE-SLC-052	Eligible	4
Business	4725	HIGHWAY 7	HE-SLC-106	Not eligible	4
Park Towers Apartments	4810	HIGHWAY 7	HE-SLC-105	Not eligible	4
Northland Aluminum, Inc.	5005	HIGHWAY 7	HE-SLC-054	Not eligible	4
St. Louis Park Roadside Parking Area	5025	HIGHWAY 7	HE-SLC-017	Not eligible	4
Vacant parcel	3059	JOPPA AVE S		Not eligible	4
Modern Building	7102	LAKE ST W		Not eligible	4
Business	7201	LAKE ST W	HE-SLC-234	Not eligible	4
Building	7317	LAKE ST W	HE-SLC-056	Not eligible	4
Modern Building	3745	LOUISIANA AVE S		Not eligible	4
Business	3900	LOUISIANA CIR	HE-SLC-274	Not eligible	4
Business	3920	LOUISIANA CIR	HE-SLC-275	Not eligible	4
House	3046	LYNN AVE S	HE-SLC-103	Not eligible	4
Business	3113	LYNN AVE S	HE-SLC-108	Not eligible	4
Business	3119	LYNN AVE S	HE-SLC-109	Not eligible	4
Business	3200	LYNN AVE S	HE-SLC-110	Not eligible	4
Business	3954	MEADOWBROOK RD	HE-SLC-061	Not eligible	4
Business	3900	MINNETONKA BLVD	HE-SLC-307	Not eligible	4, A, C1, C2
St. Louis Park City Hall	5005	MINNETONKA BLVD	HE-SLC-311	Not eligible	4
Business	3725	MONITOR ST	HE-SLC-233	Not eligible	4

ST. LOUIS PARK

Property Name (Historic)	Property Address		SHPO Inventory Number	NRHP Status	Project Segment(s)
House	3024	MONTEREY AVE S	HE-SLC-094	Not eligible	4
House	3028	MONTEREY AVE S	HE-SLC-095	Not eligible	4
House	3029	MONTEREY AVE S	HE-SLC-088	Not eligible	4
House	3033	MONTEREY AVE S	HE-SLC-089	Not eligible	4
House	3034	MONTEREY AVE S	HE-SLC-096	Not eligible	4
House	3037	MONTEREY AVE S	HE-SLC-090	Not eligible	4
House	3041	MONTEREY AVE S	HE-SLC-091	Not eligible	4
House	3044	MONTEREY AVE S	HE-SLC-097	Not eligible	4
House	3045	MONTEREY AVE S	HE-SLC-092	Not eligible	4
House	3048	MONTEREY AVE S	HE-SLC-098	Not eligible	4
House	3049	MONTEREY AVE S	HE-SLC-093	Not eligible	4
House	3100	MONTEREY AVE S	HE-SLC-099	Not eligible	4
House	3104	MONTEREY AVE S	HE-SLC-100	Not eligible	4
House	3108	MONTEREY AVE S	HE-SLC-101	Not eligible	4
Vacant lot	3130	MONTEREY AVE S		Not eligible	4
House	3029	NATCHEZ AVE S	HE-SLC-084	Not eligible	4
House	3037	NATCHEZ AVE S	HE-SLC-083	Not eligible	4
House	3040	NATCHEZ AVE S	HE-SLC-085	Not eligible	4
House	3041	NATCHEZ AVE S	HE-SLC-082	Not eligible	4
House	3044	NATCHEZ AVE S	HE-SLC-086	Not eligible	4
House	3045	NATCHEZ AVE S	HE-SLC-081	Not eligible	4
House	3049	NATCHEZ AVE S	HE-SLC-080	Not eligible	4
House	3052	NATCHEZ AVE S	HE-SLC-087	Not eligible	4
House	3100	NATCHEZ AVE S	HE-SLC-079	Not eligible	4
House	3101	NATCHEZ AVE S	HE-SLC-078	Not eligible	4
House	3105	NATCHEZ AVE S	HE-SLC-077	Not eligible	4
House	3109	NATCHEZ AVE S	HE-SLC-076	Not eligible	4
House	3036	OTTAWA AVE S	HE-SLC-131	Not eligible	4
House	3040	OTTAWA AVE S	HE-SLC-130	Not eligible	4
House	3041	OTTAWA AVE S	HE-SLC-127	Not eligible	4
House	3044	OTTAWA AVE S	HE-SLC-129	Not eligible	4
House	3049	OTTAWA AVE S	HE-SLC-126	Not eligible	4
House	3050	OTTAWA AVE S	HE-SLC-128	Not eligible	4
House	3053	OTTAWA AVE S	HE-SLC-125	Not eligible	4
House	3057	OTTAWA AVE S	HE-SLC-124	Not eligible	4

ST. LOUIS PARK

Property Name (Historic)	Property Address		SHPO Inventory Number	NRHP Status	Project Segment(s)
House	5901	OXFORD ST	HE-SLC-276	Not eligible	4
Apartments	5911	OXFORD ST	HE-SLC-277	Not eligible	4
House	5919	OXFORD ST	HE-SLC-278	Not eligible	4
House	6005	OXFORD ST	HE-SLC-282	Not eligible	4
House	6011	OXFORD ST	HE-SLC-283	Not eligible	4
House	6016	OXFORD ST	HE-SLC-290	Not eligible	4
House	6017	OXFORD ST	HE-SLC-284	Not eligible	4
House	6030	OXFORD ST	HE-SLC-289	Not eligible	4
House	6200	OXFORD ST	HE-SLC-286	Not eligible	4
House	6208	OXFORD ST	HE-SLC-287	Not eligible	4
House	6216	OXFORD ST	HE-SLC-288	Not eligible	4
Warehouse	6425	OXFORD ST	HE-SLC-235	Not eligible	4
Business	6500	OXFORD ST	HE-SLC-236	Not eligible	4
Business	6600	OXFORD ST	HE-SLC-237	Not eligible	4
Business	7800	POWELL RD	HE-SLC-060	Not eligible	4
Apartments	3030	RALEIGH AVE S	HE-SLC-104	Not eligible	4
Business	3501	STATE HWY NO 100 S	HE-SLC-136	Not eligible	4
Business	3536	STATE HWY NO 100 S	HE-SLC-074	Not eligible	4
Strip Mall	3700	STATE HWY NO 100 S	HE-SLC-065	Not eligible	4
Skippy Plant	5725	STATE HWY NO 7	HE-SLC-228	Not eligible	4
Vacant parcel	5925	STATE HWY NO 7		Not eligible	4
Business	6010	STATE HWY NO 7	HE-SLC-197	Not eligible	4
Vacant parcel	6015	STATE HWY NO 7		Not eligible	4
Central Junior High School	6300	WALKER ST	HE-SLC-051	Not eligible	4
Business	3525	WEBSTER AVE S	HE-SLC-073	Not eligible	4
House	3456	WOODDALE AVE	HE-SLC-007	Not eligible	4
House	3460	WOODDALE AVE	HE-SLC-185	Not eligible	4
Vacant parcel	3506	WOODDALE AVE		Not eligible	4
Business	3565	WOODDALE AVE	HE-SLC-075	Not eligible	4
House	3400	XENWOOD AVE S	HE-SLC-160	Not eligible	4
House	3406	XENWOOD AVE S	HE-SLC-161	Not eligible	4
House	3412	XENWOOD AVE S	HE-SLC-162	Not eligible	4
House	3416	XENWOOD AVE S	HE-SLC-163	Not eligible	4
Business	3520	XENWOOD AVE S	HE-SLC-072	Not eligible	4
House	3372	YOSEMITE AVE S	HE-SLC-159	Not eligible	4

ST. LOUIS PARK

Property Name (Historic)	Property Address		SHPO Inventory Number	NRHP Status	Project Segment(s)
House	3400	YOSEMITE AVE S	HE-SLC-218	Not eligible	4
House	3401	YOSEMITE AVE S	HE-SLC-215	Not eligible	4
House	3406	YOSEMITE AVE S	HE-SLC-219	Not eligible	4
House	3409	YOSEMITE AVE S	HE-SLC-216	Not eligible	4
House	3412	YOSEMITE AVE S	HE-SLC-220	Not eligible	4
House	3413	YOSEMITE AVE S	HE-SLC-217	Not eligible	4
House	3417	YOSEMITE AVE S	HE-SLC-221	Not eligible	4
House	3418	YOSEMITE AVE S	HE-SLC-224	Not eligible	4
House	3424	YOSEMITE AVE S	HE-SLC-225	Not eligible	4
House	3425	YOSEMITE AVE S	HE-SLC-222	Not eligible	4
House	3430	YOSEMITE AVE S	HE-SLC-226	Not eligible	4
House	3431	YOSEMITE AVE S	HE-SLC-223	Not eligible	4
House	3450	YOSEMITE AVE S	HE-SLC-227	Not eligible	4
House	3400	ZARTHAN AVE S	HE-SLC-157	Not eligible	4
House	3401	ZARTHAN AVE S	HE-SLC-214	Not eligible	4
House	3407	ZARTHAN AVE S	HE-SLC-213	Not eligible	4
House	3413	ZARTHAN AVE S	HE-SLC-212	Not eligible	4
House	3419	ZARTHAN AVE S	HE-SLC-211	Not eligible	4
House	3420	ZARTHAN AVE S	HE-SLC-208	Not eligible	4
House	3425	ZARTHAN AVE S	HE-SLC-210	Not eligible	4
House	3426	ZARTHAN AVE S	HE-SLC-207	Not eligible	4
House	3431	ZARTHAN AVE S	HE-SLC-209	Not eligible	4
House	3450	ZARTHAN AVE S	HE-SLC-203	Not eligible	4
House	3451	ZARTHAN AVE S	HE-SLC-204	Not eligible	4
House	3456	ZARTHAN AVE S	HE-SLC-202	Not eligible	4
House	3457	ZARTHAN AVE S	HE-SLC-205	Not eligible	4
House	3463	ZARTHAN AVE S	HE-SLC-206	Not eligible	4
House	3464	ZARTHAN AVE S	HE-SLC-201	Not eligible	4
House	3470	ZARTHAN AVE S	HE-SLC-200	Not eligible	4

PHASE I/PHASE II ARCHITECTURE HISTORY INVESTIGATION FOR THE PROPOSED SOUTHWEST TRANSITWAY PROJECT HENNEPIN COUNTY MINNESOTA

VOLUME TWO:
MINNEAPOLIS WEST RESIDENTIAL SURVEY ZONE
MINNEAPOLIS SOUTH RESIDENTIAL/COMMERCIAL SURVEY ZONE
MINNEAPOLIS DOWNTOWN SURVEY ZONE
MINNEAPOLIS INDUSTRIAL SURVEY ZONE
MINNEAPOLIS WAREHOUSE SURVEY ZONE
(EXCLUDING RAILROAD PROPERTIES)

Authorized and Sponsored by:
Hennepin County Regional Rail Authority
And
Metropolitan Council

Prepared by:
Charlene Roise, Principal Investigator
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The Foster House
100 North First Street
Minneapolis, Minnesota 55401

February 2012

Management Summary

The Hennepin County Regional Rail Authority and the Metropolitan Council are proposing to construct the Southwest Transitway facility, linking the intermodal station area in downtown Minneapolis with the central business area in suburban Eden Prairie. The line is located in the cities of Eden Prairie, Minnetonka, Hopkins, Saint Louis Park, and Minneapolis.

In general, the Area of Potential Effect (APE) for history/architecture properties extends 300 feet on either side of the centerline of the alignment of each corridor. Around each station, the APE includes properties within a quarter-mile radius. Several circumstances when the APE departs from these parameters are noted in the APE description in the Research Design for Cultural Resources (see Appendix A).

In March 2010, Hess, Roise and Company (Hess Roise) was retained to complete a Phase I Architecture/History survey (Phase I Survey) of properties in the APE in the city of Minneapolis and a Phase II Evaluation of properties in this area that may be eligible for inclusion in the National Register of Historic Places (National Register). The Phase I Survey did not include railroad-related resources, which are documented in Volume 3. All properties in the APE built before 1966 were included in the Phase I inventory, as well as any more recent properties that had the potential to be considered exceptionally important.

The Minneapolis APE was divided into five zones: 1. West Residential, 2. South Residential/Commercial, 3. Downtown, 4. Industrial, and 5. Warehouse. The following table shows the number of properties included in Phase I and Phase II:

Zone	Phase 1	Phase II*
1. West Residential**	628	34
2. South Residential/Commercial**	446	34
3. Downtown	128	33
4. Industrial	62	9
5. Warehouse***	0	0

Notes:
*Potential historic districts are counted as a single property in this count.
**The APEs for two alternative routes overlapped at the proposed West Lake Station, so six properties were included in the Phase I Surveys for both the West and South Residential/Commercial zones.
***This zone comprises sections of the Minneapolis Warehouse Historic District and the Saint Anthony Falls Historic District, which are listed in the National Register. As a result, no survey work was undertaken in this zone.

Hess Roise's project team consisted of Principal Investigator Charlene Roise, architectural historians Elizabeth Gales, Stephanie Atwood, and Linda Pate, and researcher Penny Petersen.

As a result of the Phase II Evaluation, the following properties are recommended eligible for listing in the National Register (SHPO inventory numbers are included in parenthesis):

- Minneapolis West Residential Survey Zone
  - The Minikahda Club, 3205 Excelsior Boulevard (HE-MPC-17102)
  - The Parklake, 3100–3128, 3134–3136, 3140–3144 West Calhoun Boulevard, and 3121 Excelsior Boulevard (HE-MPC-16371)
  - Calhoun Beach Apartments, 2901-2905-2915 Dean Parkway (HE-MPC-6125)
  - Xerxes Avenue Historic District, 2700 and 2800 Blocks of Xerxes Avenue South, 3020 West Twenty-eighth Street, and 2825 Cedar Lake Parkway (HE-MPC-16667)
  - Helen and Mac Martin House, 1828 Mount Curve Avenue (HE-MPC-8763)
  - Miller Publishing Company Building, 2501 Wayzata Boulevard (HE-MPC-17079)
  - Lustron House, 2436 Mount View Avenue (HE-MPC-16728)

- Minneapolis South Residential/Commercial Survey Zone
    - The Mall Apartment Historic District, bounded by the Mall, the alley between Knox and James Avenues South, Lagoon Avenue, and the alley between Holmes and Hennepin Avenues with additional properties on south side of Lagoon Avenue (HE-MPC-7854)
    - The Buzza Company Building, 1006 West Lake Street (HE-MPC-6324)
    - Calvary Baptist Church, 2608 Blaisdall Avenue South, HE-MPC-6027)
    - Rowhouses, 1-11 East Twenty-fifth Street (HE-MPC-16145)
    - Hardware Mutual Fire Insurance Company Building, 2344 Nicollet Avenue (HE-MPC-6514)
    - First Christian Church, 2300 Stevens Avenue S. (HE-MPC-16981)
    - Apartment Building, 2312 Blaisdell Avenue S. (HE-MPC-16304)
    - Humboldt Institute, 2201 Blaisdell Avenue S. (HE-MPC-16299)
    - Franklin Nicollet Liquor Store, 2012 Nicollet Avenue (HE-MPC-16752)
    - Minneapolis and Saint Louis Railway Company Main Office, 111 Franklin Avenue East (HE-MPC-16487)
    - Plymouth Congregational Church, 1900 Nicollet Avenue (HE-MPC-6511)
- Minneapolis Downtown Survey Zone
    - The Happy Hour Bar and Cafe, 1523 Nicollet Avenue (HE-MPC-7959)
    - Loring Park Development District Historic District, bounded by South Twelfth Street, Marquette Avenue, First Avenue South, East Fourteenth Street, LaSalle Avenue, West Grant Street, Loring Park, and Yale Place (HE-MPC-16390)
    - Peavey Plaza, 1101 Nicollet Mall (HE-MPC-3620)
    - Orchestra Hall, 1100 Marquette Avenue (HE-MPC-0459)
    - Minneapolis Film Exchange Historic District, 1000, 1015, 1019, and 1025 Currie Avenue North (HE-MPC-16980)
    - First Baptist Church and Jackson Hall, 1020 Harmon Place and 1026 Harmon Place (HE-MPC-0432)
    - Young-Quinlan Building, 901 Nicollet Mall (HE-MPC-2999)
    - Lincoln Bank Building, 730 Hennepin Avenue (HE-MPC-0437)
    - Dayton’s Department Store, 700 Nicollet Mall, 730 Nicollet Mall, 26 South Eighth Street ((HE-MPC-5099)
    - Murray’s Restaurant and Cocktail Lounge, 24 South Sixth Street (HE-MPC-0353)
    - Gluek’s Bar, 16 North Sixth Street (HE-MPC-0350)
    - Northern States Power Company, 15 South 5th Street (HE-MPC-0338)
    - Northern States Power Company, 414 Nicollet Mall (HE-MPC-0450)
- Minneapolis Industrial Survey Zone
    - Dunwoody Institute, 818 Dunwoody Boulevard (HE-MPC-6641)
    - Glenwood Redevelopment Area Industrial Zone Historic District, bounded by Glenwood Avenue North, East Lyndale Avenue, Lakeside Avenue, Olson Memorial Highway, and Royalston Avenue North (HE-MPC-16263)
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1.0 Introduction

The proposed Southwest Transitway is a high-frequency train serving the rapidly growing southwest metro area—Eden Prairie, Minnetonka, Edina, Hopkins, and Saint Louis Park, as well as Minneapolis neighborhoods and the Minneapolis downtown area. The line will connect to other rail lines (Hiawatha, Central, and Northstar) and high-frequency bus routes. Through these connections, the Southwest Transitway will also provide access to the University of Minnesota, Minneapolis-Saint Paul International Airport, Mall of America, Minnesota State Capitol, and downtown Saint Paul.

The Federal Transit Administration (FTA) has determined that the proposed project is an undertaking as defined by the National Historic Preservation Act (NHPA) and is subject to the provisions of Section 106 of the NHPA. Section 106 requires that federal agencies take historic properties into account as part of project planning. The Cultural Resources Unit (CRU) of the Minnesota Department of Transportation (Mn/DOT) is acting on behalf of FTA for many aspects of the Section 106 review process for the Southwest Transitway. This survey report is part of the identification/evaluation of historic properties required under the Section 106 review. The results of this survey will be submitted to the Minnesota State Historic Preservation Office (SHPO) for review. Effects to properties that are listed in or eligible for the National Register of Historic Places (National Register) will be assessed in consultation with the SHPO and other interested parties. It is expected that mitigation measures for these effects will be addressed in a Programmatic Agreement.

Through the scoping process of the National Environmental Policy Act, four build alternatives have been identified. To streamline subsequent analysis, these alternatives were divided into five segments. The following table outlines the segments that are associated with each of the alternatives:

Build Alternatives and Segments	
Build Alternatives	**Segments**
LRT 1A	Segment 1, Segment 4, Segment A
LRT 3A	Segment 3, Segment 4, Segment A
LRT 3C-1 (Nicollet Mall)	Segment 3, Segment 4, Segment C-1 (Nicollet Mall)
LRT 3C-2 (11th/12th Street)	Segment 3, Segment 4, Segment C-2 (11th/12th Streets via Nicollet Avenue Tunnel)
	Segment 3, Segment 4, Segment C-2A (11th/12th Streets via Blaisdell Ave Tunnel)
	Segment 3, Segment 4, Segment C-2B (11th/12th Streets via 1st Ave Tunnel)

Source: HDR, Engineering, 2009

Segment 1 extends northeast from a station in Eden Prairie at Trunk Highway (TH) 5 along a former rail corridor owned by the Hennepin County Railroad Authority (HCRRA) to a station at Shady Oak Road, on the border between Minnetonka and Hopkins.

Segment 3 creates a new corridor, running east from a station at Mitchell Road in Eden Prairie and turning northerly to terminate at the Shady Oak Station.

Segment 4 follows an existing rail corridor east-northeasterly from the Shady Oak Station through Hopkins and Saint Louis Park to the West Lake Station in Minneapolis, near that city's western border.

Segment A continues northeast from the West Lake Station, mostly using an existing rail corridor, to the Intermodal Station on the western edge of downtown Minneapolis.

Segment C also begins at the West Lake Station, traveling east along a former rail corridor (now the Midtown Greenway), north along one of several alternative courses under and on city streets, to and through downtown Minneapolis, and ultimately ending at the Intermodal Station or the Fourth Street Station.

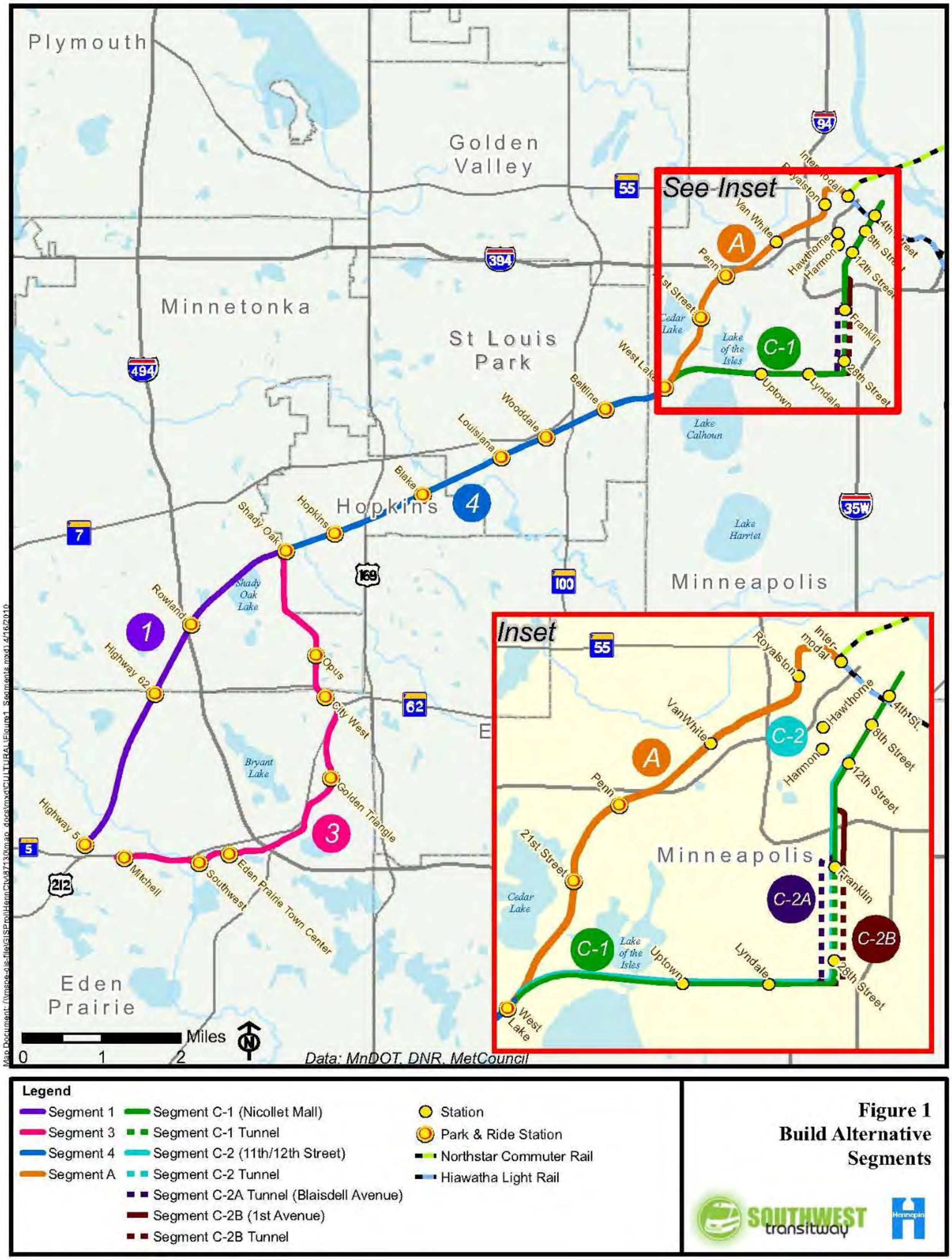


Figure 1
Build Alternative Segments

2.0 Methods and Research Design

The Research Design for Cultural Resources for the Southwest Transitway project is included as an appendix to this report. This research design includes separate sections for archaeology and architecture/history surveys.

The methodology for the architecture/history survey is built around thirteen survey zones, which are based on a historical and physical analysis of the project area. A historical context for each of these zones has been developed to serve as a framework for identifying and evaluating potential historic properties in the zone. Volume One of the survey report includes four survey zones encompassing areas of the project within the cities of Eden Prairie, Minnetonka, Hopkins, and Saint Louis Park. Volume Two of the survey report includes project areas in five survey zones within the city of Minneapolis (western residential, southern residential/commercial, downtown, industrial, and warehouse). Volume Three of the survey report includes project areas in four survey zones encompassing four railroad corridors.

A table at the conclusion of each survey report (including this one) summarizes the results of the evaluation of properties in the survey zones included in that report.

A separate report of the archaeological site probability assessment and field strategy has also been prepared, with archaeological field surveys of the selected alignment to follow.

3.0 Literature Search

3.1 Minneapolis West Residential Survey Zone

3.1.1 Literature search

Repositories consulted to obtain historical information about this zone include:

- Minnesota Historical Society Library
- Minnesota State Historic Preservation Office
- Hennepin County Central Library, including Minneapolis Collection
- Hennepin County Assessor's Office (online access)
- Minneapolis Development Review Service Center
- Minneapolis Heritage Preservation Commission
- University of Minnesota Libraries, including John B. Borchert Map Library and Northwest Architectural Archives

Primary and secondary sources included:

- Minneapolis building permits
- Hennepin County deed records
- Sanborn Insurance Company maps, the 1940 *Atlas of the City of Minneapolis*, and other maps and atlases
- Historic photographs
- City directories
- Newspapers and other publications
- Inventory forms and other reports on file at the Minnesota State Historic Preservation Office

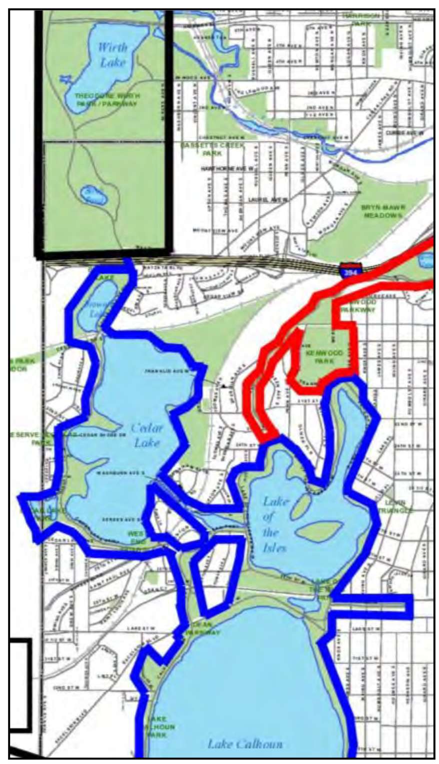
3.1.2 Previously evaluated properties in the APE

The following properties in the zone are listed in the National Register:

- Frieda and Henry J. Neils House, 2305 West Twenty-first Street (HE-MPC-6068)
- Calhoun Beach Club, 2730 West Lake Street (HE-MPC-6126)

The following properties in the zone have been determined eligible for the National Register:

- Grand Rounds Historic District (XX-PRK-001)
  - Lake Calhoun (HE-MPC-1811)
  - CM&StP RR Bridge over Dean Parkway (HE-MPC- 5341)
  - Dean Parkway (HE-MPC-8727)
  - Cedar Lake Parkway (HE-MPC-1833)
  - Kenilworth Lagoon (HE-MPC-1822)
  - Kenilworth Lagoon Railroad Bridges (HE-MPC-1850 and HE-MPC-1851)
  - Cedar Lake (HE-MPC-1820)
  - Kenwood Parkway (HE-MPC-1796)
  - Kenwood Park (HE-MPC-1797)
  - Kenwood Water Tower, HE-MPC-6475 (eligible)
  - Lake Calhoun-Lake of the Isles Channel, The Lagoon (HE-MPC-1823)
  - Lake of the Isles (HE-MPC-1824)
  - Lake of the Isles Parkway (HE-MPC- 1825)
- Lake of the Isles Residential District



Part of Grand Rounds Historic District, with segments highlighted (Theodore Wirth, Kenwood, Chain of Lakes)

3.1.3 Historic context

Minneapolis was founded in 1856 on the west bank of the Mississippi River. Initial development was centered around the Falls of Saint Anthony, a source of power. For the first two decades, the city slowly grew to the west, annexing land in 1866 and 1867. Another settlement, Saint Anthony, was on the east side of the river. It had been established in 1849 and was annexed by Minneapolis in 1872. Most of the residential, commercial, and industrial activity in the city in the first two decades was centered in the area that is now the city's downtown. Farms were located further out on the city's periphery.[1]

In 1883 and 1887, Minneapolis annexed large areas of land that brought its borders close to the present-day dimensions.[2] The annexation was spurred by rapid growth in local industry. Flour mills edged the riverfront at the falls and railroad lines spread throughout the city, which was developing as a regional commercial center. From 1880 to 1890, the population exploded from 46,887 people to 164,738. Recently annexed land was developed to support the new residents and their increasing wealth. This pattern was further encouraged by an expanding streetcar system that provided access to new areas.[3]

West of downtown, agricultural land was gradually sold off for industrial and residential use in an area that would become known as Bryn Mawr. One history reported that "a clock company, a beekeepers' supply company, two bottlers of spring water, a mill, and a macaroni factory all appeared between 1890 and 1920. Even Burma Shave Company got its start here." The area was served by a horse car line starting in 1880 and streetcars by 1892. This access to downtown Minneapolis stimulated residential construction, although the majority of houses were built in the 1910s and 1920s. "Most of the early residents had English or American backgrounds," the history noted. "Foreign-born residents were from Sweden or Finland." [4]

Commercial nodes appeared along Cedar Lake Road and Superior Boulevard. The latter was subsequently renamed Wayzata Boulevard, U.S. Highway 12, and Interstate 394 as it was transformed into a major regional transportation corridor. During the post-World War II era, it attracted businesses fleeing increasing urban blight in downtown Minneapolis including the Miller Publishing Company (2501 Wayzata Boulevard) and a branch of the National Cash Register Company (2523 Wayzata Boulevard).[5]

Today, the Bryn Mawr neighborhood is delineated by natural features: Bassett's Creek to the north, Theodore Wirth Park to the west, Cedar Lake to the south, and Bryn Mawr Meadows to the east. Interstate 394 runs east-west, bisecting the neighborhood. Bryn Mawr's character was recently summarized by an article in *Minnesota Monthly*: "Composed . . . of cottages, mostly pre–World War II bungalows and Tudors, plus a smattering of 1½-story post-war homes—nearly uniformly encircled by tidy yards and gardens tended to a fare-thee-well—Bryn Mawr bills itself as a neighborhood within a park."[6]

South of Bryn Mawr is the Lake District, comprised primarily of residential neighborhoods wrapping around three large lakes. Some development had taken place on the land between Lake of the Isles, Lake Calhoun, and Cedar Lake prior to its annexation by Minneapolis in 1883. An 1873 atlas of Hennepin County shows the property divided into large parcels with no residential platting. Crossing the landscape were railroad lines and some roadways. Lake of the Isles was in its original form with four islands, a swampy shoreline, and a narrow isthmus of land between it and Lake Calhoun. The strip of land was built

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[1] Lucile M. Kane, *The Falls of St. Anthony: The Waterfall that Built Minneapolis* (1966; repr., Saint Paul: Minnesota Historical Society, 1987), 60-61.
[2] The land south of Fifty-fourth Street was annexed in 1927.
[3] Marjorie Pearson and Charlene K. Roise, "South Minneapolis: An Historic Context," 2000, 12, prepared by Hess, Roise and Company for the Minneapolis Heritage Preservation Commission.
[4] Judith Martin and David Lanegran, *Where We Live: The Residential Districts of Minneapolis and Saint Paul* (Minneapolis: University of Minnesota Press, 1983), 113, 116, 118; John Diers and Aaron Isaacs, *Twin Cities by Trolley: The Streetcar Era in Minneapolis and Saint Paul* (Minneapolis: University of Minnesota Press, 2007), 213-214.
[5] Martin and Lanegran, *Where We Live*, 118.
[6] Chris Lee, "Best Places to Live," *Minnesota Monthly*, April 2010.

up in 1884 when the Chicago, Milwaukee, and Saint Paul Railroad added fill between the two lakes, which reduced the number of islands in Lake of the Isles to two.[7]

Much of the land east of Cedar Lake and north of Lake of the Isles was on the “Devil’s Back Bone,” a raised area that was renamed Lowry Hill and transformed into residential neighborhoods by local land speculator Thomas Lowry. Development proceeded slowly on the hill and land to the west because of a lack of good roads. Subdivisions in this area included the Lakeview Addition to Minneapolis (1870s), which had Mount Curve Avenue as a major street, and the Kenwood Addition to Minneapolis (1886) with its winding Kenwood Boulevard (now Kenwood Parkway). Development was restricted on the west by the tracks of the Saint Paul, Minneapolis, and Manitoba Railway, with Cedar Lake beyond. Some houses were built in this area in the 1880s, mostly towards the north end of Lowry Hill.[8]

After improvements to the roads, extension of the streetcar lines, and the development of the park around Lake of the Isles, residential construction increased rapidly in the 1890s and 1900s. The houses in these neighborhoods were designed by Minneapolis’s leading architects and prominent builders. A mix of Queen Anne and other Victorian-era styles can be found along with Colonial Revival, Craftsman, and Prairie School. Houses along Mount Curve Avenue and Kenwood Boulevard, which had larger lots, tended to be bigger and showier than those on neighboring streets. In the early twentieth century, new houses gradually replaced some of the older stock. The trend has continued to the present, although a significant number of nineteenth-century houses remain. The neighborhood, still affluent, has witnessed a number of older buildings undergoing modification, expansion, and restoration in recent years.[9]

The Kenwood neighborhood benefited from the efforts of the Minneapolis Board of Park Commissioners, which was formed in 1883. The board immediately began to purchase property to create a park system around the western lakes. Land acquisition took several years, and improving Cedar Lake, Lake of the Isles, and Lake Calhoun through dredging and lakeshore stabilization also took time. As parks were created, the area became more desirable, and speculators platted around the lakes, correctly envisioning the city expanding to meet these new areas. Plats included the West End Divisions located directly south of Cedar Lake. The first division, located near the lake’s south shore, formed a triangular parcel bounded by what is now Cedar Lake Parkway, the west side of Chowen Avenue South, and the tracks of the Great Northern Railway Company. The second division sat south of that line and extended to the Minneapolis and Saint Louis Railway tracks to the south. By the turn of the century, the land west of these plats was still undeveloped and owned by the Women’s Christian Association, which operated the Jones-Harrison Home. The home, established in 1888, was built on land donated by Judge Edwin S. Jones, constructed with a $30,000 donation by Jane Harrison, and dedicated to the care of elderly women.[10]

South of Kenwood between Cedar Lake and Lake of the Isles, the West End Subdivision was platted in 1888 by Joseph and Alfred Dean and their wives. The year before Joseph Dean filed the plat, he and adjacent property owners donated a swath of land to the park board to connect the west shore of Lake of the Isles with the north shore of Lake Calhoun. The road that was subsequently constructed on this land was christened Dean Boulevard (now Dean Parkway). In 1911, after acquiring the final piece of land around Lake Calhoun, the park board began a fourteen-year dredging program.[11]

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[7] Charlene K. Roise, Denis Gardner, Abigail Christman, and Cynthia deMiranda, “Lake of the Isles and Kenwood Park: An Assessment of Significance,” 1999, prepared by Hess, Roise and Company for Minneapolis Park and Recreation Board; George B. Wright, *Map of Hennepin County, Minnesota* (Privately printed, 1873), 20–21.
[8] Pearson and Roise, “South Minneapolis,” 6, 8; plat map for Kenwood Addition to Minneapolis, July 1886, available at the Hennepin County Government Center, Minneapolis.
[9] Pearson and Roise, “South Minneapolis,” 20.
[10] Roise, et al, “Lake of the Isles”; “Jones-Harrison: Who We Are,” Jones-Harrison Residence, http://www.jones-harrison.org/WhoWeAre/HistoryMission.htm (accessed June 18, 2010); *Atlas of the City of Minneapolis* (Minneapolis: C. M. Foote Publishing Company, 1898), plate 46.
[11] Theodore Wirth, *Minneapolis Park System 1883-1944* (Minneapolis: Board of Park Commissioners, 1945), 122, 126; Minneapolis Board of Park Commissioners (hereafter cited “MBPC”), *Eighth Annual Report, 1890*, 126, *Ninth Annual Report, 1891*, 5, and *Tenth Annual Report, 1892*, 5.

Residential development tended to follow park development, but the movement toward the lakes was assisted by the expansion of the streetcar system. One of the first lines was on Hennepin Avenue, stimulating the construction of many large houses east of Lake of the Isles by the early twentieth century. Around that time, the sparsely populated area south and west of the lake began attracting development. Soon, apartment buildings were being constructed south of the park board's Mall, which extending west from Hennepin at Twenty-ninth Street. Development continued west, following the streetcar line along Lake Street.[12]

Although completely platted, much of the area that was not within easy walking distance of streetcar stops languished until after World War I, when postwar prosperity and the availability of private automobiles led to a surge of residential construction. Lots were filled along the prestigious park boulevards including Lake of the Isles, which became a mansion district after extensive dredging turned the lake from a swamp into an attraction. Soon wealthy residents were building houses designed by nationally renowned architects. While some houses edged the lake as early as 1899, the majority of the extant residences were built between 1915 and 1928.[13]

West of the lake, the Great Northern Railway Company's former tracks across the West End Divisions had been removed and converted into Sunset Boulevard by 1914. The Women's Christian Association sold its tract along the boulevard in 1926, and it was quickly platted as Sunset Gables. Houses built there were not as grand as the mansions surrounding Lake of the Isles, but they were significantly larger than houses in most parts of the city. Most houses south of Sunset Boulevard were erected between 1925 and 1935 and incorporated elements of popular revival styles—Spanish Colonial, Colonial, and Tudor. Some were designed by prominent local architects such as Liebenberg and Kaplan.[14]

Apartments were a popular option for those who wished to be by the lakes but could not afford to buy a house or did not want to deal with maintenance. One of the most notable construction projects launched in the 1920s was the Calhoun Beach Apartments and Hotel, located northeast of the intersection of Dean Parkway and West Lake Street. Boxing coach and insurance executive Harry Goldie envisioned an apartment and hotel complex where residents of any background could enjoy the amenities of lakeside living in facilities that rivaled the great apartment hotels of Chicago. He was able to successfully build two twenty-two-unit apartment buildings and the shell of a large hotel before the stock market crash knocked the bottom out of the economy. Due to wartime restraints, the hotel did not open until 1946, but the apartments have remained in constant use since their completion in 1925.[15]

By the end of the 1920s, development had slowed and was mostly limited to filling in empty lots. The Great Depression brought the real estate market to a near standstill. Samuel and Louis Fleisher and their families were an exception to this trend. Beginning in 1931, they developed many of the apartment buildings on the 2700 and 2800 blocks of Xerxes Avenue South. Most were constructed in late 1938 to 1939, the same time that the Parklake was built on the northwest shore of Lake Calhoun. Developed by the James Leck Construction Company, the Parklake offered a lakeside location with an innovative design that followed guidelines for garden apartments adopted by the Federal Housing Administration. The Parklake was designed by prominent Minneapolis architects Magney and Tusler. At the same time,

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[12] MBPC, *Twenty-seventh Annual Report, 1909*, 22; Wirth, 84.
[13] Muriel Nord, "Lake of the Isles Historic District," 1984, National Register of Historic Places Registration Form, available at the State Historic Preservation Office, Minnesota Historical Society, Saint Paul.
[14] Margaret Herrick Burton, *One Hundred Years for Jones-Harrison Residence* (Minneapolis: The Residence, 1988), 23.
[15] Diane Trout-Oertel and Marjorie Pearson, "Calhoun Beach Club," 2003, National Register of Historic Places Registration Form, available at the State Historic Preservation Office, Minnesota Historical Society, Saint Paul, 8:2–8:6; "Minneapolis on Wheels! 3,500 Families Moving to New Homes While Influx of New Residents Brings Construction of 35 Apartments," *Minneapolis Tribune*, June 28, 1925; "Hubert Humphrey, Harry Goldie and Walter Mondale at the Grand Opening of the Calhoun Beach Club," 1946, photograph, Minnesota Reflections at Minnesota Digital Library, http://reflections.mndigital.org/cdm4/item_viewer.php?CISOROOT=/jhs&CISOPTR=391&CISOBOX=1&REC=2 (accessed June 24, 2010).

the firm was preparing plans for Sumner Field, the city's first public housing project, and the two projects share many of the same architectural elements.[16]

Undeveloped land could still be found along the west side of Lake Calhoun by the end of the World War II, but postwar prosperity soon eliminated any that remained. Most notably, high-rise buildings to rival the Calhoun Hotel appeared, such as the West Calhoun Apartments at 3146 West Calhoun Boulevard (1950), which left the Parklake in its shadow, and Calhoun Towers at 3430 List Place (1962). The West Lake Street corridor became prime commercial real estate. The Ministers Life and Casualty Union Building at 3100 West Lake Street (1954) and the American Hardware Mutual Insurance Company Building at 3033 Excelsior Boulevard (1955) housed companies in Minneapolis's thriving insurance industry.[17]

Near the insurance buildings on the west edge of the city was the Minikahda Club. Established in 1899, the club was not only the first golf course in Minneapolis but it remained the only golf course in south Minneapolis until 1934. The club became a prestigious social center for the city's upper middle class. Its sprawling greens continue the park-like setting of the lakes to the city's border with Saint Louis Park.[18]

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[16] Miles L. Colean, "Multiple Housing under FHA," *Architectural Record* 84 (September 1938): 96; Christine A. Curran, Jeffrey A. Hess, and Charlene K. Roise, "Sumner Field Homes, HABS No. MN-160," prepared by Hess, Roise and Company, September 1997, 8–11.
[17] Lawrence M. Briggs, ed., *Minneapolis, City of Opportunity: One Hundred Years of Progress in the Aquatennial City* (Minneapolis: T. S. Denison and Company, 1956), 204.
[18] *Minikahda Club Twenty-fifth Anniversary* (Minneapolis: Thomas A. Clark, 1923), 4; Pearson and Roise, "South Minneapolis," 18.

3.2 Minneapolis South Residential/Commercial Survey Zone

3.2.1 Literature search

Repositories consulted to obtain historical information about this zone include:

- Minnesota Historical Society Library
- Minnesota State Historic Preservation Office
- Hennepin County Central Library, including Minneapolis Collection
- Hennepin County Assessor's Office (online access)
- Minneapolis Development Review Service Center
- Minneapolis Heritage Preservation Commission
- University of Minnesota Libraries, including John B. Borchert Map Library and Northwest Architectural Archives

Primary and secondary sources included:

- Minneapolis building permits
- Hennepin County deed records
- Sanborn Insurance Company maps, the 1940 *Atlas of the City of Minneapolis*, and other maps and atlases
- Historic photographs
- City directories
- Newspapers and other publications
- Inventory forms and other reports on file at the Minnesota State Historic Preservation Office

3.2.2 Previously evaluated properties in the APE

The following properties in the zone are listed in the National Register:

- Walker Branch Library, 2901 Hennepin Avenue South (HE-MPC-6284)
- Chicago, Milwaukee and Saint Paul Railroad Grade Separation Historic District (HE-MPC-9959)
- Washburn-Fair Oaks Mansion Historic District (HE-MPC-4900)
- Stevens Square Historic District (HE-MPC-4965)
- Abbott Hospital, 110 East Eighteenth Street (HE-MPC-4745)
- Anne C. and Frank B. Semple House, 100 West Franklin Avenue (HE-MPC-6173)
- George W. and Nancy B. Van Dusen House, 1900 LaSalle Avenue (HE-MPC-6434)

The following properties in the zone have been determined eligible for the National Register:

- Grand Rounds Historic District (XX-PRK-001)
  - Lake of the Isles (HE-MPC-1824)
  - Lake of the Isles Parkway (HE-MPC-1825)
  - Lake Calhoun-Lake of the Isles Channel (HE-MPC-1823)
  - Park Board Bridge No. 3 (HE-MPC-6900)
  - Park Board Bridge No. 2 (HE-MPC-1835)
  - Park Board Bridge No. 1 (HE-MPC-6896)
  - Railroad Bridge over East Calhoun Parkway (HE-MPC-5335)
  - Lake Calhoun Parkway (HE-MPC-1834)
  - Lake Calhoun (HE-MPC-1811)
  - The Mall (HE-MPC-1827)
- Lake of the Isles Residential Historic District (HE-MPC-9860)
- Buzza Company Building, 1006 West Lake Street (HE-MPC-6324)
- Lyndale Corners Historic District (HE-MPC-7855)
- The Carlton, 2820 First Avenue South (HE-MPC-5011)
- Despatch Laundry Building, 2611 First Avenue South (HE-MPC-4839)
- Washburn-Fair Oaks Historic District (HE-MPC-8362)

3.2.3 Historic context

Minneapolis was founded in 1856 on the west bank of the Mississippi River. Initial development centered on the Falls of Saint Anthony, a source of power. Another settlement, Saint Anthony, was on the east side of the river. It had been established in 1849 and was annexed by Minneapolis in 1872. Most of the residential, commercial, and industrial activity in the city in the first two decades took place in the area that is now the city's downtown. The southern boundary of the city of Minneapolis originally extended to Franklin Avenue. The land south of what is now downtown Minneapolis was a broad prairie, with a hardwood forest to the east and a series of lakes to the west and farther south. Agriculture, especially dairy farming, was a major land use in south Minneapolis prior to residential development.[1]

For the first two decades, the city grew slowly, annexing land in 1866 and 1867. As the city expanded southward away from the initial core, the street grid shifted from its original orientation to the Mississippi and adopted a true north-south, east-west pattern. In 1878, a horse-drawn street railway was inaugurated along Fourth Avenue South as far as Twenty-fourth Street. A car barn and stable were built at the terminus. Beginning in 1879, the Lyndale Railway Company (also known as the Motor Line) operated steam locomotives from downtown along Lyndale Avenue as far as Thirty-first Street, turning to the east shore of Lake Calhoun as the ultimate destination. The line stimulated construction along Lyndale Avenue.[2]

In 1880, an era of great expansion began in Minneapolis, manifested in geographic boundaries, numbers of residents, and building activity. The residential areas of south Minneapolis largely assumed their present form during this period. In 1883 and 1887, Minneapolis annexed large areas of land that brought its borders close to the present-day dimensions. The annexation was spurred by rapid growth in local industry. Flour mills edged the riverfront at the falls and railroad lines spread throughout the city, which was developing as a regional commercial center. From 1880 to 1890, the population exploded from 46,887 to 164,738. Recently annexed land was developed to support the new residents and their increasing wealth. This pattern was further encouraged by an expanding streetcar system that provided access to new areas.[3]

Development in south Minneapolis was slow in the 1880s but soon picked up with the extension of the streetcar lines. Due to the lack of geographic barriers, the area south of the original core was easily accessible. The Minneapolis Street Railway (MSR), which had begun horsecar service in 1875, acquired the Motor Line in 1887. In 1889, the Minneapolis City Council authorized the company to experiment with electrifying its lines. With the passage of the Electric Ordinance in 1890, the MSR proceeded to electrify its entire system over the course of several years.[4]

New residential development in the area of the south Minneapolis survey zone took two forms: single-family residences and multiple dwellings. Both were typically modest in size prior to 1900, but became increasingly larger in the twentieth century. An exception is the vicinity of what is now Washburn-Fair Oaks Park, where the city's elite built lavish mansions in the late nineteenth century.

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[1] Lucile M. Kane, *The Falls of St. Anthony: The Waterfall That Built Minneapolis* (1966; repr., Saint Paul: Minnesota Historical Society Press, 1987), 60–61; George E. Warner and Charles M. Foote, eds., *History of Hennepin County and the City of Minneapolis* (Minneapolis: North Star Publishing Company, 1881), 343, 378.

[2] John W. Diers and Aaron Isaacs, *Twin Cities by Trolley: The Streetcar Era in Minneapolis and St. Paul* (Minneapolis: University of Minnesota Press, 2007), 18, 28; "Our Street Railways," *Minneapolis Tribune*, May 31, 1880; Warner and Foote, *History of Hennepin County*, 344, 430; "Sub-Context: Street Railways, 1873–1954," 4–5, in Thomas R. Zahn, "Preservation Plan for the City of Minneapolis," 1990 and 1991, prepared for the City of Minneapolis.

[3] The land south of Fifty-fourth Street was annexed in 1927. Marjorie Pearson and Charlene K. Roise, "South Minneapolis: An Historic Context," prepared by Hess, Roise and Company for the Minneapolis Heritage Preservation Commission, August 2000, 12.

[4] "Subcontext: Street Railways," in Zahn, "Preservation Plan," 4–7, 15–16.

Commercial development usually followed streetcar lines. Nodes at strategic intersections offered stores for groceries, hardware, and other household needs, as well as local services such as seamstresses and tailors. The intersections of Lyndale Avenue and Lake Street, and Hennepin Avenue and Lake Street were prominent transfer points. Nicollet Avenue was another busy corridor. Neighborhood commercial buildings tended to follow a certain pattern, often rising two or three stories with shops on the ground story and flats above. Some structures were masonry; others were frame with false-front parapets that concealed lower roofs.[5]

The intersection at Hennepin and Lake was particularly prosperous, supporting numerous retail businesses as early as 1900. Phillip Kent Wagner explains: "In a city (or portion of a city) heavily dependent on fixed-rail transit, people . . . desire[d] to live close to the transit lines. . . . Higher-valued land uses—multifamily versus single-family housing, for example . . . locate[d] along streetcar lines."[6] The land north of Lagoon Avenue between Hennepin and Knox Avenues was primarily empty until the park board converted it into the picturesque Twenty-ninth Street Mall, saving it from industrial infringement. Soon after came the construction of apartment buildings in the vacant area—seventeen between 1914 and 1916 alone—which encouraged the development of the area into multiple-unit housing. Another noteworthy concentration of multifamily buildings appeared around Stevens Square, just south of downtown.[7]

The Chicago, Milwaukee and Saint Paul Railway (CM&SP) extended its Hastings and Dakota line from Saint Paul to Minneapolis on a bridge across the Mississippi River at East Twenty-sixth Street in 1880. The route was eventually extended west across south Minneapolis at grade level north of Twenty-ninth Street to meet a line running southwest from downtown Minneapolis between Cedar Lake and Lake of the Isles. After many years of debate and lawsuits, work was finally begun in 1912 on a trench twenty-two feet below grade to separate the trains from surface-level traffic. New bridges carried north-south streets over the trench. Designed by CM&SP engineer H. C. Lothholz, the project was completed in 1916. With the creation of the grade separation trench for the railroad tracks, a number of structures, mostly for industrial use, were constructed immediately adjacent to the trench.[8]

One of the most impressive examples of the industrial corridor is the former Buzza Company Building located at the northwest corner of Lake Street and Colfax Avenue South. Originally built as a factory for self-threading needles, the building was purchased in 1922 by George Buzza, a successful printer who needed room for his expanding business. The plant, which came to be known as "Craftacres," underwent numerous expansions, and by 1927, Buzza's company was the second-largest producer of greeting cards and related paper goods in the country.[9]

In the early twentieth century, residential areas were improved by a program of the Minneapolis Board of Park Commissioners to plant trees along streets and boulevards. Charles M. Loring, the first president of the Board of Park Commissioners, is credited with implementing a tree-planting program that made Minneapolis "one of the most uniformly tree-adorned cities of the country." The board was authorized to

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[5] Nicholas Westbrook, ed., *A Guide to the Industrial Archeology of the Twin Cities* (Saint Paul and Minneapolis: Society for Industrial Archeology, 1993), 16–17, 25; Carole Zellie, "Context: Neighborhood Commercial Centers, 1885–1963," in Zahn, "Preservation Plan."

[6] Phillip Kent Wagner, "The Historical Geography of Apartment Housing in Minneapolis, Minnesota, 1870 to 1930" (Ph.D. thesis, University of Minnesota, September 1991), 225.

[7] Pearson and Roise, "South Minneapolis: An Historical Context," 23; Information from Grand Rounds Database, HE-MPC-01827.

[8] Westbrook, *A Guide to the Industrial Archeology of the Twin Cities,* 55; "Milwaukee Road Prepares for Lowering Its Tracks," *Minneapolis Tribune*, April 6, 1913; "Old Flagmen to Go with Lowering of Twenty-ninth Street Tracks; Familiar Little Shacks with Garden Plots Doomed to Disappear," *Minneapolis Tribune*, July 13, 1913.

[9] David Wood, "The Buzza Greeting Card Co., 1910–1942," *Minneapolis Lake Area*, October 1983; "$1,150,000 Merger Links Buzza Firm with N.Y. Concern," *Minneapolis Journal*, February 21, 1928; "Buzza Clark Art Publishing Firm Formed," *Minneapolis Tribune*, February 22, 1928; "A Few Historical Facts about the Buzza Company," 1928 flyer printed by Buzza Company, Minneapolis Collection, Hennepin County Central Library.

plant trees along the streets or issue permits for tree planting and to assess adjacent property owners for the cost.[10]

During this period, the streetcar system remained a major presence in the city, but its dominance waned as automobiles became more affordable and commonplace. The Depression of the 1930s further reduced transit ridership. The Twin City Rapid Transit Company (TCRTC) created competition for its own streetcars by expanding a motor bus system that had been launched in 1918 to serve some areas that did not have streetcar lines. The first independent bus route was established in 1921. Streetcar tracks and the poles to carry power wires overhead were obstacles to the bustling automobile traffic. In 1937, TCRTC announced that it would substitute buses on streetcar routes that had damaged tracks rather than repair the tracks. Internal conflict further weakened the transit company, resulting in a takeover by New York financier Charles Green in 1949. A subsequent lack of investment brought an end to the streetcar system in 1954. Motor buses completely replaced streetcar and the cars were sold or destroyed.[11]

Automobiles caused dramatic changes to south Minneapolis. Retailers such as the Franklin Nicollet Liquor Store adopted aggressive signage with jet-age graphics to attract the faster traffic. Freeways sliced through the city, establishing new neighborhood boundaries and making suburbs more accessible. Many families moved away from the urban core, and those who took their place sometimes needed more services. Churches and other local institutions stepped in to help with the transition. As the back-to-the-city movement gained momentum in the late twentieth century, the area's aging residential and commercial buildings drew redevelopment, generating substantial neighborhood revitalization.

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[10] [?] Lindgren, "Early History of Gas Street and Building Lighting," typescript, compiled by Mrs. Lester J. Eck, Minneapolis, 1956, Minneapolis Collection, Hennepin County Central Library; Theodore Wirth, *Minneapolis Park System, 1883–1944* (Minneapolis: Board of Park Commissioners, 1945), 39, 207.
[11] "Subcontext: Street Railways," 9–10, in Zahn, "Preservation Plan."

3.3 Minneapolis Downtown Survey Zone

3.3.1 Literature search

Repositories consulted to obtain historical information about this zone include:
- Minnesota Historical Society Library
- Minnesota State Historic Preservation Office
- Hennepin County Central Library, including Minneapolis Collection
- Hennepin County Assessor's Office (online access)
- Minneapolis Development Review Service Center
- Minneapolis Heritage Preservation Commission
- University of Minnesota Libraries, including John B. Borchert Map Library and Northwest Architectural Archives

Primary and secondary sources included:
- Minneapolis building permits
- Hennepin County deed records
- Sanborn Insurance Company maps, the 1940 *Atlas of the City of Minneapolis*, and other maps and atlases
- Historic photographs
- City directories
- Newspapers and other publications
- Inventory forms and other reports on file at the Minnesota State Historic Preservation Office

3.3.2 Previously evaluated properties in the APE

The following properties in the zone are listed in the National Register:
- Basilica of Saint Mary and Basilica School, 1600 Hennepin Avenue
- Farmers and Mechanics Savings Bank, 88 South Sixth Street
- Masonic Temple, 524 Hennepin Avenue
- Ogden Apartment Hotel, 66 South Twelfth Street
- Orpheum Theater, 910 Hennepin Avenue
- Pence Automobile Company Building, 800 Hennepin Avenue
- Swinford Townhouses and Apartments, 1213 Hawthorne Avenue
- Sam S. Shubert Memorial Theatre, 516 Hennepin Avenue
- Westminster Presbyterian Church, 1200 Marquette Avenue

The following properties in the zone have been determined eligible for the National Register:
- Handicraft Guild Building, 1000 Marquette Avenue
- IDS Center, 701 Nicollet Mall
- Northwestern National Life Insurance, 20 Washington Avenue South
- Warner Brothers Picture Distribution Corporation Building, 1000 Currie Avenue North

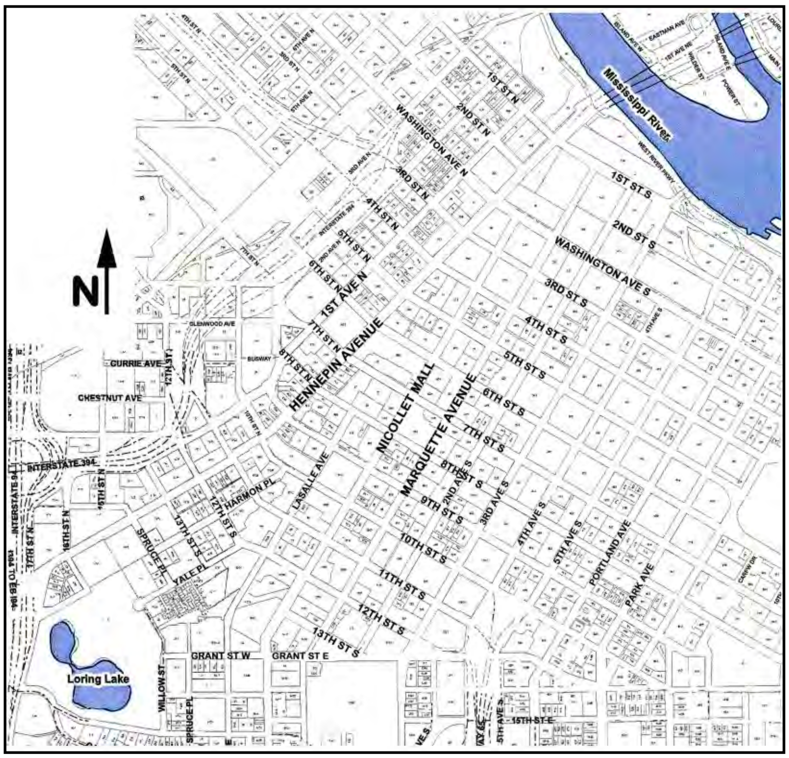
3.3.3 Historic context

The city of Minneapolis was founded on the west bank of the Falls of Saint Anthony, the only waterfall on the Mississippi River. The falls were valued by the Dakota and Ojibwe as spiritual sites. Europeans first saw the falls in 1680, when French explorers Antoine Auguelle and Father Louis Hennepin canoed down the Mississippi River as prisoners of a group of Dakota. Hennepin published a written account of his travels in North America in 1683, spreading the word about the falls, which he named in honor of his patron saint. The area did not see permanent settlement by Europeans or Americans for the next 165 years. After the Revolutionary War, the United States government took possession of the land east of the Mississippi River. The west side was acquired as part of the Louisiana Purchase in 1803, but was withheld from open settlement and protected as a military reservation. In 1849, the town of Saint Anthony was platted on the east side of the falls. Squatters occupied the land on the west side during the 1850s and, after Congress legalized settlement, the town of Minneapolis was platted in 1856. A financial panic in

1857 and the Civil War from 1861 to 1865 slowed the town's growth, but after the war the pace picked up and in 1867 Minneapolis was incorporated as a city. The town of Saint Anthony merged with Minneapolis in 1872.[1]

In the 1870s and 1880s, the milling industry fueled the city's growth. Sawmills were the first to take advantage of the waterpower at the falls. As the North Woods were cleared and the Great Plains were settled and planted with wheat, sawmills gave way to flour mills. By 1880, flour milling had overtaken sawmilling as the prominent industry in Minneapolis, and the city could claim the title of national flour capital. The mills and support industries, like foundries and machine shops, dominated the riverfront. Railroads were also vital to the city's success, and rail lines ran along the downtown riverfront and eventually throughout the city. As early as 1862, the first line from Saint Paul to the east side of the river was completed by the Saint Paul and Pacific Railway. A bridge was built to carry the line across the river to the west side in 1867, using Nicollet Island as a stepping stone. Other railroads were founded in the next two decades to convey goods to and from the city, which was becoming a regional business center.[2]

Minneapolis began to spread away from the river during this period. The downtown area was originally a motley mix of wood-frame residential and commercial buildings. In the 1870s, three- and four-story masonry commercial buildings began to replace the first generation of building stock, and residential development began to move out of downtown. The ready financial capital in the city and the railroad connections encouraged the development of wholesale businesses to supply communities in outstate Minnesota. Dry goods, notions, leather products, groceries, tobacco, and clothing retailers built stores along Hennepin Avenue and Nicollet Avenue. Banks also boomed during this time and were located on Hennepin Avenue, Nicollet Avenue, and Marquette Avenue (originally known as First Avenue South).[3]



Downtown Minneapolis
(adapted from a City of Minneapolis map)

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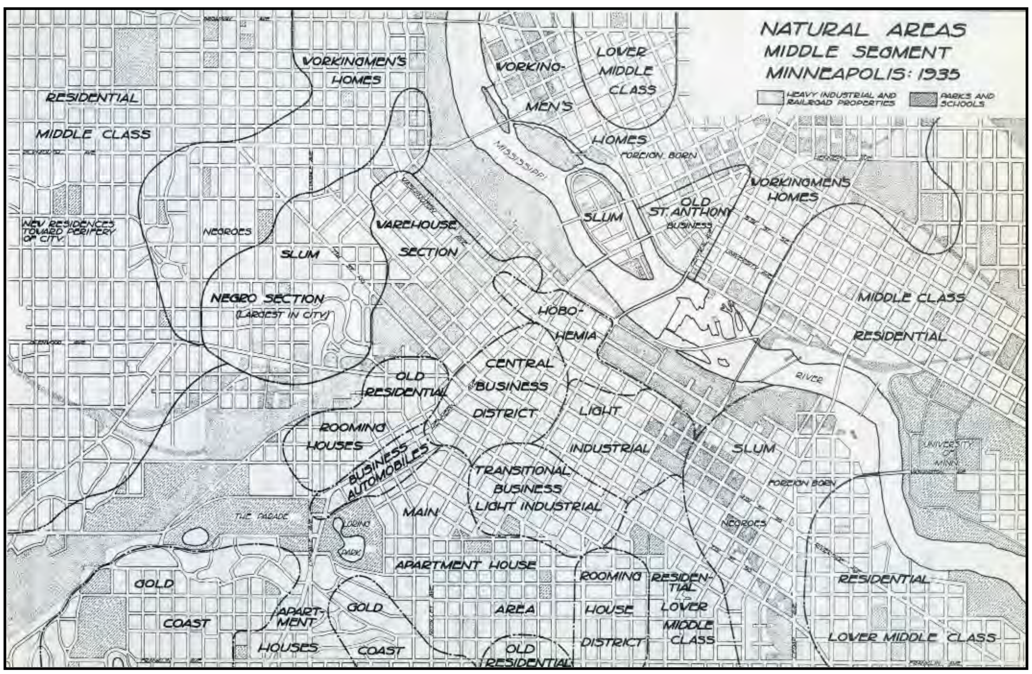
[1] Lucile M. Kane, *The Falls of St. Anthony: The Waterfall That Built Minneapolis* (Saint Paul: Minnesota Historical Society Press, 1966, 1987), 1–4, 12–21, 30–39, 77; Marjorie Pearson and Charlene K. Roise, "Downtown Minneapolis: An Historic Context," August 2000, prepared for the Minneapolis Heritage Preservation Commission, 6.
[2] Kane, *The Falls of St. Anthony*, 58–59, 98–99; Pearson and Roise, "Downtown Minneapolis," 6; Don Hofsommer, *Minneapolis and the Age of Railways* (Minneapolis and London: University of Minnesota Press), 9-11.
[3] Pearson and Roise, "Downtown Minneapolis," 7–8.

The city's population increased rapidly from 200 in 1855 to 46,887 in 1880 and 164,738 by 1890. To transport these new residents, a streetcar system was founded in 1875, and over the next few decades it expanded its lines beyond settled areas. This helped pull housing construction away from the downtown core. While a few new multifamily townhouse and apartment blocks were built on the downtown's south edge and some older residences in this area were converted into boardinghouses, most people chose to live in the new residential neighborhoods.[4]

Commercial, retail, and entertainment businesses spread throughout downtown. The pace of commercial construction picked up from the 1890s through the 1920s as smaller masonry buildings were replaced with larger, taller structures. Businesses tended to cluster together, and downtown streets took on distinct characteristics based on the types of businesses that were found there. North of Hennepin Avenue, massive warehouses were constructed to serve the wholesaling industry. Entertainment venues were built along Hennepin Avenue, and early automotive enterprises occupied the south end of the street. Nicollet Avenue was dominated by a variety of retailers ranging from small specialty stores to massive department stores. The financial industry became concentrated in office buildings along Marquette Avenue. More office buildings, including those for the city and county governments, were constructed on Second, Third, and Fourth Avenues South. By the time that construction slowed during the 1930s as the Great Depression settled over the region, the style and scale of Minneapolis's downtown buildings proclaimed the wealth and success it had achieved by the early twentieth century.



Downtown Minneapolis, 1935
(from Calvin F. Schmid, *Social Saga of Two Cities*)

The depression exacerbated the decline of an area between the vibrant downtown core and the river that was dubbed "Hobohemia." The land and older buildings had been left behind as new construction moved to the blocks farther south. The run-down area held flophouses and saloons that served transients and the city's less affluent citizens. In some ways, the city contributed to the conditions in the area when it passed an ordinance creating liquor patrol limits in 1884 as an attempt to crack down on saloons. The liquor patrol limits ran along both sides of the river and extended to Sixth Street including First Avenue North, Hennepin Avenue, Nicollet Avenue, and Marquette Avenue. Only businesses within the patrol limits could obtain licenses to sell liquor, and the city kept license fees high to try to limit the number of bars and saloons. The tactic worked: Between 1884 and 1893, the number of saloons dropped from 555 to 280. Land values within the liquor patrol limits stagnated, however, and few new buildings were

[4] Ibid., 11–12.

constructed, reinforcing the area's tawdry reputation. Prohibition did not improve conditions. The patrol limits were later expanded, and were finally eliminated in the 1970s.[5]

Efforts to improve Hobohemia began in 1910, when the city's first urban renewal campaign created Gateway Park near the intersection of Hennepin and Nicollet Avenues. The initiative had a short period of success before the park was adopted by homeless men in the 1930s as a favored hangout. The problems in the Gateway area only worsened after World War II, and the rest of downtown began to join the decline.

Flour production in the city peaked in 1930, when new milling centers across the country began to draw a significant share of that business. At the same time, transportation shifted from rail to automobile. As people gained more independence with their own cars, housing developed on the edges of the city and lured residents to new suburbs. Businesses soon followed. When General Mills announced plans to move out of downtown to a new corporate campus in Golden Valley in 1955, this became a catalyst that stimulated efforts to revitalize the city. The Minneapolis Housing and Redevelopment Authority, with the support of the newly formed Downtown Council, razed over sixty-eight acres of Hobohemia for redevelopment. New government buildings, including the Public Health Building and the Minneapolis Public Library, served as beachheads, encouraging private investment to follow. High-rise apartment towers were built near the river, and a new corporate headquarters for Northwestern National Life Insurance Company was constructed at the north end of Nicollet Avenue. Despite these successes, many lots remained vacant for years.[6]

While the Gateway area was being razed and rebuilt, the Downtown Council investigated the possibility of turning Nicollet Avenue into a transitway or pedestrian mall. The idea was first brought to the council in 1956 by Leslie Park, the president of Baker Properties, a prominent downtown developer. The council hired consultants to analyze vehicular and pedestrian traffic downtown. This led to the transformation of Nicollet Avenue into a pedestrian mall from Washington Avenue South to South Tenth Street. Prominent California landscape architect Lawrence Halprin designed the landscape, which included a gently curving street flanked by wide sidewalks with trees, planters, and public art. The eight-block Nicollet Mall was completed in 1967 at a cost of $3.8 million. The project was so successful that the mall was expanded to the south in the 1970s. While Nicollet Mall was developing, so was the skyway system, which moved pedestrian traffic off of downtown streets and into buildings. Second-floor corridors were connected by enclosed pedestrian bridges over the streets. Restaurants and stores opened along the skyways, making it possible for office workers to avoid going outside. The system was enhanced with the construction of the Philip Johnson–designed IDS Center and its Crystal Court in 1973.[7]

In the 1960s and 1970s, the downtown was separated from residential areas to the south by the construction of Interstates 35W and 94. A fringe of low-density, deteriorating apartment buildings and small-scale commercial buildings remained on the south edge of downtown. Civic leaders felt that this area did not complement the dense commercial core and established the Loring Park Development District in the mid-1970s. The district and its linear park, the Loring Greenway, encouraged the private development of high-rise apartment and condominium towers between Nicollet Mall and Loring Park. The development was completed in the mid-1980s and succeeded in bringing more residents into downtown. In addition to the residential construction, a new Orchestra Hall and neighboring Peavey Plaza were built

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[5] "Patrol Limits," *Minneapolis Tribune*, February 13, 1893; Jay Edgerton, "Patrol Limits Shackle Modern Police," *Minneapolis Star,* September 27, 1956; Harley Sorensen, "Minneapolitans Soon May Tipple in Expanded Area," *Minneapolis Tribune*, July 15, 1974.
[6] Charlene Roise and Erin Hanafin Berg, "Farmers and Mechanics Savings Bank," National Register nomination form, July 2005, available in the Minnesota State Historic Preservation Office, Minnesota Historical Society, Saint Paul.
[7] Frank Premack, "How It All Happened . . . ," *Minneapolis Tribune*, November 19, 1967; Abe Altrowitz, "Mall Planner Promises Relief from Downtown Bustle," *Minneapolis Star*, February 13, 1964; Robert A. Wright, "Mall Stirs Downtown Minneapolis Revival," *New York Times*, March 24, 1973; David Anger, "Mr. Halprin's Dance: Remembering the Original Nicollet Mall," *Hennepin History* 56 (Summer 1997): 11; Charlene Roise, "Death of a Thousand Patches," *Landscape Architecture* 94 (September 2004): 30, 32, 34-37.

on Nicollet Mall to draw people downtown. A real estate boom at the end of the twentieth century produced a cluster of new skyscrapers, including some by superstar architects such as Cesar Pelli (Norwest Bank/Wells Fargo Tower) and I. M. Pei (First Bank Place/Cappella Tower).

Downtown Minneapolis is a mix of buildings and landscapes dating from the nineteenth to the twenty-first centuries. These properties reflect the efforts by the public and private sectors to maintain downtown's vitality.

3.4 Minneapolis Industrial Survey Zone

3.4.1 Literature search

Repositories consulted to obtain historical information about this zone include:

- Minnesota Historical Society Library
- Minnesota State Historic Preservation Office
- Hennepin County Central Library, including Minneapolis Collection
- Hennepin County Assessor's Office (online access)
- Minneapolis Development Review Service Center
- Minneapolis Heritage Preservation Commission
- University of Minnesota Libraries, including John B. Borchert Map Library and Northwest Architectural Archives

Primary and secondary sources included:

- Minneapolis building permits
- Hennepin County deed records
- Sanborn Insurance Company maps, the 1940 *Atlas of the City of Minneapolis*, and other maps and atlases
- Historic photographs
- City directories
- Newspapers and other publications
- Inventory forms and other reports on file at the Minnesota State Historic Preservation Office

3.4.2 Previously evaluated properties in the APE

No properties in the zone are listed in the National Register. The following property in the zone has been determined eligible for the National Register:

- Grand Rounds—The Parade

3.4.3 Historic context

The Industrial Zone is situated to the west of downtown Minneapolis. In the first decades after the founding of Minneapolis in the mid-nineteenth century, it appeared possible that this area might become established as a popular residential district. The Oak Lake Addition was platted in 1873 between Glenwood (originally Western), Lyndale, and Sixth Avenues. The area was known as Gale's Grove after one of the property owners, Samuel C. Gale, a prominent local businessman. The plat featured curvilinear streets, triangular parks, and two small lakes, and initially attracted upscale homeowners. Another amenity was promised by landscape architect Horace Cleveland's 1883 plan for the Minneapolis park system, which showed Lyndale as a future parkway. Oak Lake residents "were a substantial upper middle-class type of people engaged in such occupations as those of bank cashiers, newspaper editors, attorneys, doctors, and real estate men," sociologist Calvin Schmid reported.[1]

A number of factors, however, conspired against the neighborhood's pretensions. The Lyndale Parkway never came to fruition, and that road instead became a busy thoroughfare. Geology struck another blow. The Mississippi River had run through the area in the pre-glacial period and unstable soil filled its former bed. This condition would plague many who erected buildings there. It did not bother the railroads, though, which sought corridors to connect the mills on the Mississippi with the rich agricultural lands to the west. The Saint Paul and Pacific Railway (later the Great Northern) was the first to install a line south of the Oak Lake Addition. In 1871, the Minneapolis and Saint Louis Railway came on the scene. The

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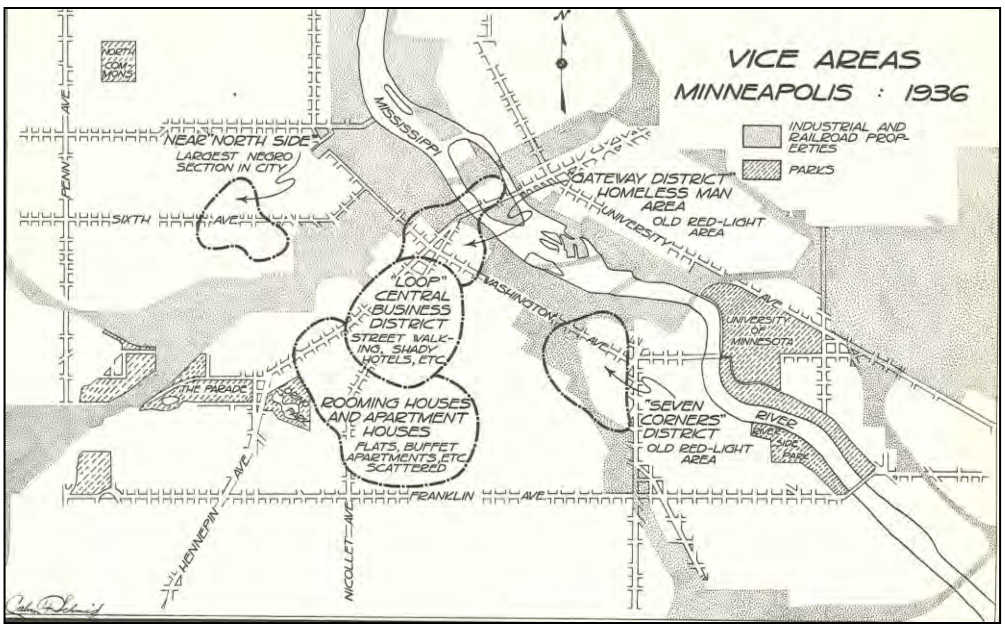
[1] Warren Upham, *Minnesota Geographic Names: Their Origin and Historic Significance* (1920; repr., Saint Paul: Minnesota Historical Society, 1969), 605; "New Additions," *Minneapolis Tribune*, August 6, 1873; "Gales & Co." (advertisement), *Minneapolis Tribune*, February 20, 1874; Calvin Schmid, *Social Saga of Two Cities: An Ecological and Statistical Study of Social Trends in Minneapolis and Saint Paul* (Minneapolis: Minneapolis Council of Social Agencies, Bureau of Social Research, 1937), 77.

M&SL leased “rights to construct and operate a line parallel to StP&P from near that company’s Minneapolis station (Holden Street) to its Cedar Lake Station,” according to rail historian Don Hofsommer. Soon, this corridor was carrying traffic from a number of rail lines that converged to the west.[2]

Changing social patterns helped to seal the area’s fate. The residential neighborhood deteriorated into a slum as waves of immigrants and minorities moved through. An expanding concentration of Jewish immigrants north of downtown pushed “south from Eighth Avenue North to Sixth Avenue North and then to Lyndale Avenue. By 1900 the presence and pressure of the Jews began to be felt in Oak Lake. At first there was bitter opposition to the Jewish invasion,” according to Schmid. “Many of the Jews were small dealers, some rag peddlers, some fruit men, and still others dealers in junk.” As the houses aged, they “were kept habitable only with increasing attention,” but “with the influx of Jews the property and buildings were allowed to deteriorate.” A wave of African Americans followed, moving into the residences vacated by the Jews as they moved west. Schmid noted that “by 1920, a time when Minneapolis had a total Negro population of 3,927, Oak Lake was almost completely Negro.” Writing in 1937, Schmid concluded that the Oak Lake neighborhood “exemplifies a type of change resulting mainly from the invasion of an exclusive residential community by alien cultural and racial groups of relatively low economic and social status. The commodious though dilapidated houses located on winding streets with over-hanging trees bear mute evidence of better days.” He added: “As is characteristic of areas undergoing transition a certain amount of vice and crime exists in Oak Lake. Prostitutes practice their profession in varying degrees, depending on police pressure, and the crime rate is one of the highest in the city.” [3]

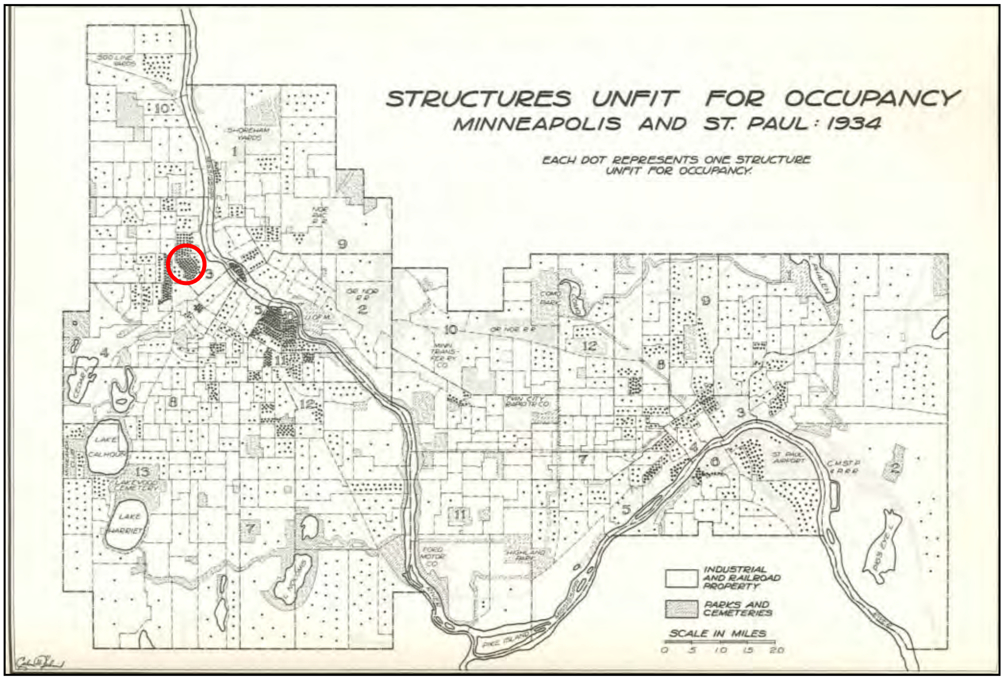


Vice areas Minneapolis, 1936.
The Oak Grove Addition is south of Sixth Street, in the area labeled “Near North Side.”
(from Calvin Schmid, *Social Saga of Two Cities*, 363)

Industry and facilities for utilities were initially clustered along the rail corridor. By the early twentieth century, though, a lack of zoning allowed incompatible industrial and commercial uses to be interspersed throughout this declining neighborhood. “The Munsingwear mills were built as the century turned, as well as the Kistler building on Sixth Avenue,” Schmid reported. “The Minnesota-Western railroad extended its trackage along the south side of Glenwood Avenue in 1912. In 1913 the Cedar Lake Ice Company built their plant on Lyndale. About 1916 a very large coal yard between Seventh Street and Royalston was established. Since the War many small stores have sprung up along Sixth Avenue. Today within the

[2] George M. Schwartz and George A. Thiel, *Minnesota’s Rocks and Waters: A Geological Story*, rev. ed. (Minneapolis: University of Minnesota Press, 1976), 320-321; Don L. Hofsommer, *The Tootin’ Louie: A History of the Minneapolis and Saint Louis Railway* (Minneapolis: University of Minnesota Press, 2005), 10.
[3] Schmid, *Social Saga of Two Cities*, 77-79.

residential section there are two small groceries, a beer wholesale office, two machine shops, and an ice cream plant—all of which have developed since 1919."[4]



Structures unfit for occupancy, 1934. The Oak Grove Addition and vicinity are circled.
(from Calvin Schmid, *Social Saga of Two Cities*, 221)

The area had the advantage of being well-served by public transportation, which carried laborers to the factories and warehouses and downtown workers to pleasanter residential districts to the west. A streetcar line started operation on Sixth Avenue North in 1891. The Western Avenue streetcar line went into service the same year; its name was changed to the Glenwood line in 1927, following the lead of the street that it traversed. "The Northwestern Knitting Works, later Munsingwear, at Glenwood and Lyndale Avenues became a major employer and traffic generator along with any number of smaller factories and lumberyards," historians John Diers and Aaron Isaacs noted. "Passenger traffic, through the 1920s, was so heavy that [the Twin City Rapid Transit Company] operated two-car trains during rush hours."[5]

The Parade, part of the Grand Rounds park and parkway system, provided a buffer between the urban core and upscale residential neighborhoods to the south. A site just north of the Parade was chosen as the location for a private technical school funded by the bequests of local philanthropists William and Kate Dunwoody. The school had occupied part of a downtown public school when it opened in 1914, moving to its new campus three years later. Plumbers, electricians, wallpaper hangers, and bakers were among the many tradesmen trained at this school, which developed a national reputation under the leadership of Dr. Charles Prosser, one of the era's primary authorities on vocational education.

Closer to the urban core were clusters of businesses tied to local commerce. A film exchange district grew along Western/Glenwood and Currie Avenues between the 1920s and the 1940s to store and transfer combustible nitrate films for the movie palaces on Hennepin Avenue and nearby streets. Wholesalers of jewelry, bakery goods, and other commodities found cheaper locations, easier access, and higher visibility than they would have in a downtown building while remaining in reasonable proximity to their customers.

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[4] Ibid., 79.
[5] John W. Diers and Aaron Isaacs, *Twin Cities by Trolley: The Streetcar Era in Minneapolis and St. Paul* (Minneapolis: University of Minnesota Press, 2007), 214-216.

In the late 1930s, the city created a municipal market where wholesalers could distribute produce—and this also provided an excuse to clear out some of the blight in the Oak Lake Addition. It was not enough to turn the area around, though, so a more substantial urban renewal strategy was implemented after World War II. By the mid-1950s, the city had drawn up plans for the Glenwood Redevelopment Area and received federal support to implement them. Work commenced first on the residential zone west of Lyndale. The industrial zone east of Lyndale, an in-town industrial park to compete with similar areas in the suburbs, was stalled until the path of a new interstate freeway was determined, but new factories and warehouses had filled the vacant lots by 1966. The construction of Interstate 94 was not completed until the following decade. It, along with the later Interstate 394, required swaths of buildings to be destroyed and created visual and functional barriers that influence the area's character today.

3.5 Minneapolis Warehouse Survey Zone

3.5.1 Literature search

The repository consulted to obtain historical information about this zone was:

- Minnesota State Historic Preservation Office

The secondary sources consulted were:

- Minneapolis Warehouse Historic District National Register nomination
- Saint Anthony Falls Historic District National Register nomination

3.5.2 Previously evaluated properties in the APE

The following properties in the zone are listed in the National Register:

- Minneapolis Warehouse Historic District
- Saint Anthony Falls Historic District

3.5.3 Historic context

The waterpower offered by Saint Anthony Falls drew Euro-American settlers here in the mid-nineteenth century, leading to the establishment of the communities of Saint Anthony on the east bank in 1849 and Minneapolis on the west bank in 1855. Minneapolis expanded more rapidly and absorbed Saint Anthony in 1872. Sawmills, then flour mills, harnessed the waterpower at the falls, propelling the rapid growth of the city. By 1880, Minneapolis was the nation's flour-milling capital. The construction of a railroad bridge brought the Saint Paul and Pacific line to the west bank in 1867, fostering a warehouse district upstream from the flour mills and Bridge Square, Minneapolis's commercial core. The warehouses held farm implements, wholesale goods, and other commodities destined for new agricultural settlements on the western plains. Many of these buildings survive and are included in the Minneapolis Warehouse District, which was listed in the National Register in 1989. The Saint Anthony Falls Historic District was listed in the National Register in 1971. It extends along both banks of the Mississippi River and includes Nicollet and Hennepin Islands. Properties range from massive mills to single-family houses. The two historic districts overlap for several blocks northwest of Hennepin Avenue along North First Street and North Second Street.

As the twentieth-century progressed, flour milling and warehousing became less profitable, resulting in the decline of the area. Sections were slated for urban renewal in the decades after World War II, and other buildings were lost through fire or decay. By the late twentieth century, though, the value of the historic structures was again appreciated and many were renovated for new uses.

4.0 Results

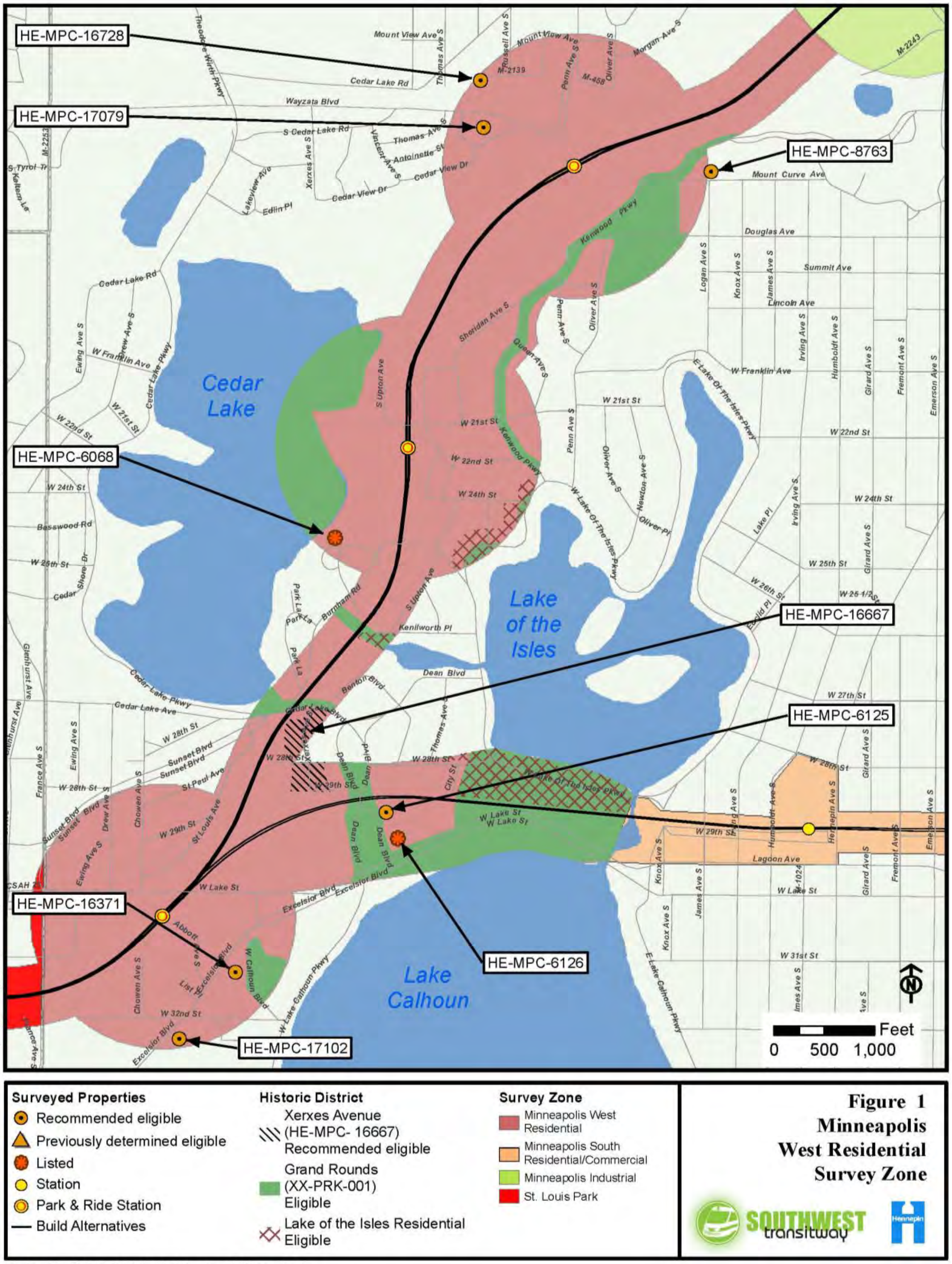
4.1 Minneapolis West Residential Survey Zone

A total of 628 properties were surveyed in this survey zone (see Appendix B for the complete list of these properties). Of the surveyed properties, 34 warranted Phase II evaluation. Four properties were listed in or previously determined eligible for the National Register of Historic Places. Table 4.1 provides information on Phase II properties in this survey zone. The Phase II evaluation of each property follows.

Table 4.1—Phase II Properties in Minneapolis West Residential Survey Zone

Historic Property Name	*Address (Minneapolis)*	*SHPO Inventory Number*	*NRHP Status*	*Project Segment(s)*
The Minikahda Club	3205 Excelsior Boulevard	HE-MPC-17102	Recommended eligible	A, C, 4
Calhoun Towers	3430 List Place	HE-MPC-6442	Recommended not eligible	A, C, 4
West Calhoun Apartments	3146 West Calhoun Boulevard	HE-MPC-16932	Recommended not eligible	A, C, 4
The Parklake	3100–3128, 3134–3136, 3140–3144 West Calhoun Boulevard, and 3121 Excelsior Boulevard	HE-MPC-16371	Recommended eligible	A, C, 4
Minister's Life and Casualty	3100 West Lake Street	HE-MPC-16659	Recommended not eligible	A, C, 4
Calhoun Beach Apartments	2901-2905-2915 Dean Parkway	HE-MPC-6125	Recommended eligible	C
Xerxes Avenue Historic District	2700 and 2800 Blocks of Xerxes Avenue South, 3020 West Twenty-eighth Street, and 2825 Cedar Lake Parkway	HE-MPC-16667	Recommended eligible	A, C
Gertrude Purdy House	2831 Benton Boulevard	HE-MPC-6020	Recommended not eligible	A
House	2429 Sheridan Avenue South	HE-MPC-6625	Recommended not eligible	A
House	2215 Sheridan Avenue South	HE-MPC-6624	Recommended not eligible	A
E. G. Wallof House	2200 Sheridan Avenue South	HE-MPC-6623	Recommended not eligible	A
Willard Morse House	1976 Sheridan Avenue South	HE-MPC-16567	Recommended not eligible	A
House	1973 Sheridan Avenue South	HE-MPC-16896	Recommended not eligible	A
House	1960 Sheridan Avenue South	HE-MPC-16374	Recommended not eligible	A
Franklin-Kelly House	2405 West Twenty-second Street	HE-MPC-6766	Recommended not eligible	A
Klein-Peterson House	2305 West Twenty-first Street	HE-MPC-6761	Recommended not eligible	A
Frank W. and Julia C. Shaw House	2036 Queen Avenue South	HE-MPC-6603	Recommended not eligible	A
House	2117 Kenwood Parkway	HE-MPC-16644	Recommended not eligible	A
Spencer Davis House	2104 Kenwood Parkway	HE-MPC-6481	Recommended not eligible	A
House	2001 Kenwood Parkway	HE-MPC-16625	Recommended not eligible	A
Charles H. and Mary E. Ross House	2000 Kenwood Parkway	HE-MPC-6480	Recommended not eligible	A
House	1971 Kenwood Parkway	HE-MPC-16622	Recommended not eligible	A
House	1960 Kenwood Parkway	HE-MPC-16742	Recommended not eligible	A
House	1937 Kenwood Parkway	HE-MPC-16257	Recommended not eligible	A
Nella Y. and Walter J. Keith House	1908 Kenwood Parkway	HE-MPC-6477	Recommended not eligible	A

Historic Property Name	*Address (Minneapolis)*	*SHPO Inventory Number*	*NRHP Status*	*Project Segment(s)*
House	1726 Kenwood Parkway	HE-MPC-16604	Recommended not eligible	A
Ruth and Sim E. Heller House	1916 Mount Curve Avenue	HE-MPC-6503	Recommended not eligible	A
House	1903 Mount Curve Avenue	HE-MPC-8717	Recommended not eligible	A
Helen and Mac Martin House	1828 Mount Curve Avenue	HE-MPC-8763	Recommended eligible	A
Working-class housing	1108 Kenwood Parkway	HE-MPC-16599	Recommended not eligible	A
National Cash Register Building	2523 Wayzata Boulevard	HE-MPC-17080	Recommended not eligible	A
Miller Publishing Company Building	2501 Wayzata Boulevard	HE-MPC-17079	Recommended eligible	A
Lustron House	2436 Mount View Avenue	HE-MPC-16728	Recommended eligible	A
Bryn Mawr Park	2131 Wayzata Boulevard	HE-MPC-17078	Recommended not eligible	A



Data: MnDOT, DNR, MetCouncil, Hess Roise

4.1.1 The Minikahda Club

MnSHPO Inventory Number: HE-MPC-17102
Address: 3250 Excelsior Boulevard, Minneapolis

Property Description

The Minikahda Club is an eighteen-hole championship golf course located on the west side of Lake Calhoun. It is bounded on the west by France Avenue South and on the south by West Thirty-eighth Street. On the east, it is edged by private residential property, Zenith and Abbott Avenues South, and Calhoun Parkway West. West Thirty-second Street forms the western half of the northern boundary; the eastern half is lined by private property along the same street and along Ivy Lane. Excelsior Boulevard runs on a diagonal through the property, isolating the northwest corner. Most of the property is occupied by an eighteen-hole golf course. A large Colonial Revival clubhouse approached by a circular driveway is situated at the northeast corner of the course. A kidney-shaped pool is adjacent. Parking lots and tennis courts are further to the northeast. A number of smaller support buildings are scattered around the property.

Minikahda Golf Links and Clubhouse, Minneapolis, 1905
Sweet photograph—Minnesota Historical Society Collections

Minikahda Golf Club, Minneapolis, 1913
Postcard—Minnesota Historical Society Collections

History

Establishing the Course

By the end of the nineteenth century, Americans were getting involved in organized sports at an unprecedented rate. This " 'safety valve' of an industrial society" was indicative of a rising middle class with increasing wealth and free time for recreation. One of these outlets was the game of golf, which had appeared on the American scene by the 1870s. By 1888, interest had reached the Twin Cities, resulting in the establishment of the Town and Country Club in Saint Paul.[1]

Civic rivalry notwithstanding, it would be another decade before Minneapolis had its first golf course, a local manifestation of a huge surge in golf's popularity across the nation. In 1896, there were only eighty golf courses across the country; by 1900, the number had skyrocketed to 980. In the spring of 1898, the Minneapolis Golf Club (later the Bryn Mawr Club) was established by a group of enthusiasts, but they lacked a convenient course. As the story goes, another popular pastime, biking, led to the Minikahda's inception. In the fall of 1898, some bicyclists in search of a place to picnic came upon a steep incline near the west side of Lake Calhoun that had been owned, but not developed, by the proprietor of a long-gone resort nearby. Two of the bicyclists, C. T. Jaffray and Walter Tiffany, had been involved in the creation of the Minneapolis Golf Club. After much discussion, they realized that the land on which they stood was well suited for a golf course. A meeting of "prominent men of the city" at the West Hotel was held later, and the general consensus was in support of the idea. Fifty-thousand dollars was subscribed for purchasing land and erecting a clubhouse. The venture was given the name "Minikahda," which W. C. Edgar said was a combination of American Indian words meaning "by the side of water." Judge M. B. Koon was elected as the club's first president.[2]

The course's first nine holes were designed by Robert Foulis, a native of Saint Andrews, Scotland, who came to the United States in 1896. He became well known for "tour[ing] the small towns of the Midwest teaching golf and staking out courses." Foulis's assistant, Willie Watson, also Scottish, immigrated in 1898 especially to help Foulis lay out and construct the Minikahda. Watson stayed on at Minikahda to work as a "pro-greenkeeper during the summer months."[3]

The club's first acquisition of property included the land on which the clubhouse and the first, second, and fourteenth through eighteenth holes now sit. Once the land for the nine-hole course was secured, progress was rapid: "So active and enthusiastic was the new organization that in the winter ground was broken for a Club House." The Colonial Revival clubhouse, designed by architects Franklin B. and Louis L. Long, was completed the following year. The "full complement" of six hundred members was reached quickly and fifty more were on a waiting list. The club officially opened on July 15, 1899, with President Koon hitting the ceremonial first ball. The club was immediately successful and became a nucleus of social events in Minneapolis. Tennis, a sport that grew in popularity at the same time as golf, was played by many members. Consequently, the board approved the construction of two turf courts in 1904, and the $525 contract for their completion was let the following year. The Minikahda was one of the seven founding clubs of the Minnesota Golf Association (MGA). C. T. Jaffray served as the MGA's president from 1903–1904.[4]

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[1] Bertha L. Heilbron, "Minnesotans at Play," *Minnesota History* 36 (September 1958).

[2] George E. Brown, *One Hundred Years of Minnesota Golf: Our Great Tradition* (Edina, Minn.: Minnesota Golf Association, 2001), 11; "Minikahda Club Twenty-fifth Anniversary," booklet (Minneapolis: Thomas A. Clark, 1923), 4–5; undated manuscript from folder "Typescripts re Club grounds, lake front, n.d.," from "Minikahda Club—Papers," Minneapolis Special Collections, Hennepin County Central Library, Minneapolis.

[3] Geoffrey S. Cornish and Ronald E. Whitten, *The Architects of Golf: A Survey of Golf Course Design from Its Beginnings to the Present, with an Encyclopedia Listing of Golf Course Architects and Their Courses* (New York: Harper Collins Publishers, 1993), 265, 429.

[4] *Twenty-first National Amateur Golf Championship, August 22–27, 1927* (program) (Minneapolis: Bureau of Engraving, 1927), 39; "Minikahda Club Twenty-fifth Anniversary," 5–6; Undated manuscript from folder "Typescripts re Club grounds, lake front, n. d.; Marjorie Pearson and Charlene K. Roise, "South Minneapolis: An Historic Context," August 2000, report prepared for the Minneapolis Heritage

“It seems to have been the habit of the Club—possibly a necessity—to acquire its property by piece meal,” a club history observed. At the time of its opening, the club had yet to own all the property that the golf course occupied. “In anticipation of acquiring such property, the course was laid out over lots in which the only right was one of trespass.” Most notably, the ninth (now eighteenth) hole sat entirely on land not owned by the club. Much to the club’s relief, Harvey Brown brought the property, graciously allowing the club to use it free of charge. At the time of his death, the club acquired the land at Brown’s cost.[5]

Soon, repeating nine holes for a full game was no longer sufficient for players, and the governing committee began plans to expand to eighteen holes. Thus, more property was purchased between Chowen and France Avenues and south to Thirty-eighth Street. Robert Foulis, C. T. Jaffray, and Robert Taylor designed the new holes. Construction work began in the fall of 1906 and was completed the following summer.[6]

At the same time, the Minneapolis Board of Park Commissioners was eying the west side of Lake Calhoun with the intent to complete a circumferential parkway around the lake. The club and course were on top of a steep incline that looked out on the lake. Minikahda’s land along the lakeshore was of no use to the club, so it conveyed the entire frontage to the park board for the parkway. After the road was finished, though, the park board assessed the club $55,000 for the improvement work completed “on the theory that the Boulevard was a benefit to [Minikahda’s] property.” This was not well received by the club, but “in the negotiations and controversy arising, the Club was told by the city politicians that if it resisted the assessment, streets would be opened through the golf course.”[7]

In 1923, the year of its twenty-fifth anniversary, the club made its last major purchase of land, acquiring twenty acres near the eighteenth fairway. The acreage included land along Baird Avenue and Thirty-eighth Street. The purchase protected the course from encroachment by development.[8]

The Evolving Design

The National Open Tournament came to the Minikahda Club in June 1916—the first time the event was held west of Chicago. At the tournament’s awards ceremony, amateur golfer and tournament champion Charles “Chick” Evans chose to donate his winnings, allowing him to retain his amateur status. With the money, he established the Evans Scholarship Fund to provide full college tuition and housing for student caddies. By 2001, over six thousand youths had received the scholarship, four hundred of which were from Minnesota. Each year, 850 students on average are awarded the scholarship.[9]

There were other repercussions from the 1916 tournament as well. In its aftermath, word spread that golfers from the East Coast had called the greens “absolutely rotten.” This may have been part of the impetus that inspired the club to enlist prestigious golf architect Donald Ross to redesign its course and create “links which [could] not be equaled.” When golf first came to the United States, courses were not designed as much as they were laid out following the land’s natural topography. This was derived from golf’s original Scottish roots where a game was completely controlled by the landscape. Impediments such as fences or cliffs were an inherent part of the sport and defined a player’s skill. In the United States, few areas set aside for golf courses resembled the Scottish shoreline, and many were monotonous

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Preservation Commission, 18; “Minikahda Club—History,” The Minikahda Club, http://www.minikahdaclub.org (accessed June 10, 2010); Brown, *One Hundred Years of Minnesota Golf*, 15, 17.

[5] “Minikahda Club Twenty-fifth Anniversary,” 8.

[6] Ibid., 10, 42–44; undated manuscript from folder “Typescripts”; Phil Sokol, “Golf Course Review – The Minikahda Club,” *Seattle Post-Intelligencer*, January 30, 2007.

[7] Undated manuscript from folder “Typescripts”; Theodore Wirth, *Minneapolis Park System 1883–1944* (Minneapolis: Board of Park Commissioners, 1945), 119.

[8] “Minikahda Club Twenty-fifth Anniversary,” 10.

[9] Brown, *One Hundred Years of Minnesota Golf*, 15, 50; Evans Scholar Network, “About the Evans Scholars Program,” http://www.evansscholars.net/Docs/Articles/2.htm (accessed November 11, 2010).

landscapes. Therefore, as golf courses became more common in the early twentieth century, the concept of “golf architect” as an occupation started to take root.[10]

Donald Ross reached acclaim as the country’s preeminent golf architect in the early twentieth century. He helped define what constituted an American golf course during the first decades of the twentieth century, when course design was becoming standardized. Some attributed his success to the belief that he had golf in his blood. Ross grew up in North Scotland and played golf at the Royal Dornoch, considered to be “one of the world’s purest links.” He also studied at Saint Andrew’s University under British Open champion Tom Morris. After arriving in the United States in 1899, he built and managed the Oakley Golf Club in Massachusetts. Minikahda was one of the fortunate courses that Ross saw in person, for he often redesigned courses sight unseen—a necessity for a man whose services were so in demand. He is claimed to have worked on more than six hundred new courses and remodelings, including several in Minnesota. He designed the courses at the White Bear Yacht Club in White Bear Lake (the first nine in 1912 and the second in 1916), the Northland Country Club in Duluth, and the Interlachen Country Club in Minneapolis, which hosted the 1930 U.S. Open. He remodeled the course at the Woodhill Country Club in Orono in 1934. He first toured that course in the 1910s when it was new, on the same trip that he visited the Minikahda course.[11]

Ross did not agree with the Easterners comments about Minikahda’s poor quality, but he did see ways to improve the greens. One of his trademarks was to have very little walking between holes, and so, when Minikahda’s course was overhauled, the green for the first hole sat very near the tee for the second hole. The same arrangement was followed at subsequent holes, and the first, ninth, tenth, and eighteenth holes were conveniently situated near the clubhouse. The former seventeenth hole was removed and the total yards increased by two hundred. More land was purchased (part of the area on which the sixth and seventh greens now sit). Work began immediately to implement Ross’s plans for $7,380, but it was quickly halted by the United States’ entry into World War I. It was not until 1920 that the Ross design was fully completed.[12] The course was soon attracting national tournaments. In 1927, for example, the Twenty-first U.S. Amateur Open was held at Minikahda, the first time the event was held in Minnesota.[13]

As the 1920s progressed, golf entered its “ ‘golden era’ of Classic American course design.” The postwar economic prosperity encouraged many to take up recreational activities, and the sport became ever more popular. In addition to the Glenwood Golf Course, the Minneapolis Park Board opened the Columbia Golf Course in 1920 and the Gross Golf Course in 1925 and proposed the construction of a course at Lake Hiawatha in 1923—all of which, like the park system itself, were open to the public. The Minikahda continued improvements on its course as well. As automobile traffic increased on Excelsior Boulevard, a bridge was built to provide access to the fifteenth, sixteenth, and seventeenth holes at the northwest

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[10] Samuel Crothers, “Marion Golf Club, East and West Courses,” 1989, National Register of Historic Places Registration Form/National Historic Landmark Nomination, available at http://nrhp.focus.nps.gov/natreghome.do?searchtype=natreghome (accessed June 10, 2010); “Past Champions,” United States Golf Association, http://usga.usopen.com/2009/history/pastchamps/1916.html (accessed June 10, 2010).
[11] Golf course “landmark period” glossary page of The Cultural Landscape Foundation website (http://tclf.org/content/landmark); Brown, *One Hundred Years of Minnesota Golf*, 11; Yale H. Squire, “Donald Ross, Famous Golf Architect, to Change Minikahda Course,” *Minneapolis Tribune*, September 1, 1916; “About Donald Ross,” Donald Ross Society, http://www.donaldross.org/About_Donald_Ross; “Donald Ross, Famous Golf Architect, to Change Minikahda Course”; Kevin Mendik, “The Challenges of Restoring a Classic American Golf Course,” in *Preserve and Play: Preserving Historic Recreation and Entertainment Sites*, edited by Deborah Slaton, Chad Randl, and Lauren Van Damme, 227–232 (Washington, D. C.: Historic Preservation Education Foundation, 2006), 228; Patrick Reusse, “Open Will Showcase the Genius of Golf Course Architecture,” *Minneapolis Star Tribune*, June 15, 1999.
[12] “About Donald Ross”; Squire, “Donald Ross, Famous Golf Architect,” undated manuscript from folder “Typescripts”; “Minikahda Club—History.”
[13] “Minikahda Club Twenty-fifth Anniversary,” 10.

corner of the course. A strip of land was also purchased to protect the course from the widening of Excelsior's roadbed.[14]

The construction of golf courses, like so many other luxuries Americans indulged in during the 1920s, was brought to a near halt by the Great Depression. The courses in Minneapolis, though, persevered and were even improved. The first nine holes of Hiawatha Golf Course were opened in 1934—the first course opened by the park board in South Minneapolis—and the remaining nine were completed the following year. Also in 1935, 111 members of the Minikahda Club, looking to promote family use of the club, spent $30,000 for the construction of a kidney-shaped swimming pool at the rear of the clubhouse. The onset of World War II again stalled golf course development, but the Minikahda, ever seeking protection from outside development, acquired lots along Thirty-sixth and Thirty-seventh Streets South "purely for protection to prevent the opening [of the streets] and not for golf purposes."[15]

After World War II, golf again exploded as a national pastime, and Minneapolis was no exception. Through his "initial effort and influence," Totton Heffelfinger, a board member of the MGA since 1932, brought the 1957 Walker Cup Matches to Minikahda, "the first time that they had been played west of the Mississippi River and only the second time [they were] staged away from the Atlantic Seaboard."[16]

In the post-war era, there were no major alterations to the landscape until the Dutch elm scourge of the 1960s and 1970s triggered the loss of some of the course's older elms. The club then undertook an "aggressive tree planting program." The course's landscape became even more verdant as the trees matured.[17]

Preserving Minikahda

Just as the early twentieth century introduced the concept of a golf architect to the United States, the 1980s raised the idea of historic golf course preservation. Six decades had passed since Ross's plan was implemented at Minikahda, and with the natural progress of time, his original vision for the landscape had become clouded. Various young architects such as Geoffrey Cornish expressed ideas about work that should be done to the club. In 1962, golf architect Ralph Plummer did some remodeling to Minikahda's course, and in 1990, Craig Shreiner assisted Michael Hurdzan in further remodeling work.[18]

By 1997, though, problems with the course's infrastructure mandated that work be done, and a committee was appointed to identify the issues. First and foremost, the course's irrigation system needed replacement. Other problem areas were identified, most of which related to the Ross-designed bunkers that were crumbling after years of use, and the course's trees and shrubs, which had grown so large that they were narrowing the fairways.[19]

These "major maintenance and design issues" had to be addressed right away to ensure the viability of the club and course. Fortunately, a set of original Ross blueprints was discovered in the clubhouse's attic, which served as an invaluable reference. Kip Colwell, then the greens chairman, remarked, "Ross was remarkably thorough. There was a precise drawing of every hole with measurements and contours for the

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[14] Golf course glossary page of The Cultural Landscape Foundation website (http://tclf.org/content/golf-course); Mendik, "The Challenges of Restoring," 228; Wirth, *Minneapolis Park System*, 176, 255, 258; undated manuscript from folder "Typescripts."
[15] Pearson and Roise, "South Minneapolis," 18; Mendik, "The Challenges of Restoring," 228; Wirth, 258; "Minikahda Club—History"; Undated manuscript from folder "Typescripts."
[16] James E. Kelly, *Minnesota Golf: Ninety Years of Tournament History* (Edina, Minn. Minnesota Golf Association, 1991), 21.
[17] "Course Restoration Plan," booklet for members of Minikahda Club, Summer–Fall 2001, from "Minikahda Club—Papers," Minneapolis Special Collections, Hennepin County Central Library, Minneapolis.
[18] Mendik, "The Challenges of Restoring," 228; "Minikahda Club—History"; Cornish and Whitten, *Architects of Golf*, 299, 397.
[19] Patrick Reusse, "Back on Course," *Minneapolis Star Tribune*, August 8, 2003; "Course Restoration Plan"; "Course Restoration Plan."

greens and bunkers." With these drawings, planners realized that nearly 20 percent of the greens' surface had been lost due to years of mowing. Twenty-five bunkers had also vanished.[20]

The club sought the assistance of Ron Prichard, a thirty-year professional in golf course restoration and a specialist in Ross designs. With the blueprints, he was able to assess Ross's original intent for the fairways and course landscaping. "The process used by Mr. Prichard . . . [involved] presenting initial assessment in general terms, developing a specific course plan, detailing hole-by-hole recommendations, and ultimately, creating specific details drawings from which the course [was] re-shaped to its original design."[21]

As a result of this process, some minor changes were made to the original design, such as repositioning fairway traps to incorporate the longer distances that characterize the modern game. Any moved bunkers were recreated with Ross's original contours. Such meticulous work reflects the club's interest in, and appreciation of, its history—a quality in short supply at many courses, where a complete overhaul of the original design is undertaken in the name of modernization.[22]

In 1927, the Minikahda Club boasted that "the course has always been so kept that properly placed touches of landscape gardening, trees and shrubbery add much to the natural attractiveness." This mindset did not change over subsequent decades, but problems with the florae did emerge. Trees planted to replace the lost elms had grown too close together and blocked light from the turf, resulting in the club's belief that the course was "overplanted with trees." While many in the community were opposed their removal, Ross would likely have approved. Although he did not agree with fellow golf architect Walter Travis, who thought that "trees had no place on a golf course," he felt that the use of trees should be limited. All in all, only a couple hundred of the course's three thousand trees were removed.[23]

Today, the Minikahda Club remains the fixture in South Minneapolis's landscape that it has been for over one hundred years, and the restoration work has done much to preserve the historic appearance of the golf course.

Evaluation

As Minneapolis's first golf course, the Minikahda Club introduced the city to the sport that had become wildly popular across the country since its introduction in the late nineteenth century. Although the Minikahda was not the first course opened in the state, its urban location and the influence of its members soon made it the most prominent. This distinction enabled it to be the first course in Minnesota to host the National Open Tournament (1916), the U.S. Amateur Open (1927), and the Walker Cup Matches (1957). At the first of these tournaments, "Chick" Evans established a scholarship for caddies in his name, which has helped thousands of young people receive college degrees and continues to do so. The Minikahda, therefore, has an indelible place in Minnesota's golf history and was a product of the era when golf exploded as a popular national pastime across the United States.

The design of Minikahda's golf course should be analyzed in the context of the body of work by its architect, Donald Ross. Golf architects Geoffrey Cornish and Ronald Whitten consider him to be one of the premier golf architects of his time, with the 1920s as his most active period. He was well-known and designed courses all over the country, including six of the eight courses that hosted the National Open between 1919 and 1926. "Each new course gained him more attention, and it became a symbol of status to have a Donald Ross layout." For example, although Willie Watson designed a fine course for the Northland Country Club in Duluth, members demanded a Ross design, even though Ross encouraged them to accept Watson's design.[24]

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[20] Reusse, "Back on Course."
[21] "Course Restoration Plan."
[22] Reusse, "Back on Course"; Mendik, "The Challenges of Restoring," 227.
[23] *Twenty-first National Amateur Golf Championship* (program), 41; Reusse, "Back on Course"; Mendik, "The Challenges of Restoring," 228.
[24] Cornish and Whitten, *Architects of Golf*, 93.

Because Ross was in such high demand, often working on eight courses at one time, he frequently designed courses in absentia. Their execution would then be overseen by local architects or landscapers. Without Ross's supervision or that of his trusted crew of supervisors, changes were often made to the plans, and Ross "often commiserated over the fact that layouts credited to him were not as he had intended."[25] Ross did, however, visit the Minikahda to personally design the course. There is no indication that Ross returned to personally oversee the work's completion, which was interrupted by World War I. While no historic records clearly indicate how closely the finished project adhered to his original design, the original plans that were recently discovered and were used in the course's restoration suggest that there were no major deviations.

Cornish and Whitten note that the Minikahda received remodeling work from Ralph Plummer in 1962 as well as by Michael Hurdzan in 1990. The extent of this work was not well documented. When Ron Prichard restored the course in 1997, his goal was to return it to the appearance detailed in Ross's plans. The plans were adjusted, however, to be compatible with advances in the game of golf since Ross's day. Such alterations, as an example, included repositioning fairway traps. Changes that involve altering historic materials to incorporate modern technology and advancements could be compared to a historic building that has been wired for electricity and given indoor plumbing.

While the Minikahda Club has served as one of Minneapolis's premiere social venues since its establishment, the clubhouse and related facilities have been modified over time, weakening its claim under Criterion A for significance in the area of Entertainment/Recreation.

Although it was designed by Ross, it does not have a strong claim to qualify under Criterion C as "the work of a master." According to historians in this field, Ross was the premier golf designer during his career, particularly during the 1920s. One course of the purported six hundred with which he was associated comes to the forefront as his masterpiece: Pinehurst No. 2 in North Carolina. The slowdown in demand for his services during the Great Depression in the 1930s allowed him to focus on this project.[26]

Pinehurst No. 2, along with the other Pinehurst courses and a large portion of the surrounding area, is part of the Pinehurst Historic District, a National Historic Landmark. The Village of Pinehurst was designed by the firm of Olmstead, Olmstead and Eliot. Famed landscape architect Frederick Law Olmstead was involved in the "conceptual planning of the major design work," while his assistant, Warren H. Manning, implemented the plan and maintained his relationship with Pinehurst for decades. Pinehurst was designed as recreational destination, and the popular sport of golf was, of course, part of the design.[27]

Ross's relationship with Pinehurst began in 1900, and he maintained his relationship with the course until his death in 1948. His first project was the redesign of Pinehurst No. 1. He also designed Pinehurst No. 3 and No. 4 as well as a basic course for employees and caddies. His real masterwork, though, was Pinehurst No. 2, "a championship course with sand greens and a natural, gently rolling topography." He completed No. 2's redesign in 1935, and the following year, it hosted the PGA Championship. Some alterations were made in the 1970s, but the course has since been restored.[28]

Many golf authorities have called Pinehurst No. 2 one of the top ten golf courses in the United States, and *Golf Magazine* declared it "one of the twelve most outstanding golf courses in the world." Most importantly, Ross himself, as evidenced by his nearly fifty-year-relationship with Pinehurst, considered the course to be his greatest achievement. About No. 2, Ross would say: "I sincerely believe this course to be

[25] Ibid., 93–94.
[26] Ibid., 105.
[27] National Historic Landmark Nomination Form, "Pinehurst Historic District," 1996, available at http://nchp.focus.nps.gov, 5
[28] Cornish and Whitten, *The Architects of Golf*, 105; Pinehurst Resort, "Our Story," http://www.pinehurst.com/nc-luxury-hotel-story.php (accessed November 12, 2010); "Pinehurst Historic District," 65.

the fairest test of championship golf I have ever designed." Although golf was his passion, course design was also Ross's bread and butter. Pinehurst was more than just a commission to Ross; it was his magnum opus.[29]

While the Minikahda Club is not his masterwork, however, it is a well-preserved local example of his work. As such, it is a locally significant example of golf course design in the early twentieth century, a period when golf was blossoming as a national pastime. Its recent restoration and the club's commitment to its long-term preservation make it an excellent representation of a property type that has had a noteworthy impact on the Minneapolis landscape. As a result, it appears eligible for the National Register under Criterion C.

Recommendation

The Minikahda Club Golf Course is recommended as eligible for the National Register under Criterion C for its significance in Landscape Architecture. Its period of significance begins in 1920 with the completion of the work on Ross's design and ends in 1961 (the National Register's fifty-year cut-off). Alterations to the course over time were not adverse, but a natural part of the evolution of historic material, especially those found a landscape. All were overseen by golf architects and were responses to changes in the game of golf. Historic and current-day aerial and plat maps show that the course has maintained its basic layout. Most of the changes are due to the natural plant growth as well as infringement from outside sources (e.g. road expansion). The Minikahda Club maintains integrity of location, design, setting, materials, feeling, and association.

[29] "Pinehurst Historic District," 65.

4.1.2 Calhoun Towers

MnSHPO Inventory Number: HE-MPC-6442
Address: 3430 List Place, Minneapolis

Property Description

Calhoun Towers is a twenty-one-story, reinforced-concrete, high-rise apartment building. Its south facade is flat, but the east, north, and west facades have projecting bays at each floor that hold balconies. The top floor is appears to be an enclosed common area. A circular driveway is in front of the main entrance on the south facade, and a red Torii gate stands over the driveway's entrance. There is underground parking beneath the building, which has a total of 108 apartments.

History

In July 1962, the city issued a permit for the construction of twenty-one-story apartment building near the northwest corner of Lake Calhoun. The building was about 83 feet square in plan and 191 feet high, while a "fore court" was 97 feet long, 111 feet wide, and 12 feet high. The D'Arcy Leck Company served as the contractor, and Gerhard Brandhorst was the architect. The cost was put at $3,250,000, and the estimated completion date was February 15, 1965. A Norton and Peel photograph from March 18, 1964, shows the building fully constructed, indicating that the 1965 date of completion was an overestimation. At the time of its construction, it was the tallest building in the city southwest of the downtown, a title it holds to this day.[30]

Architect Gerhard Walter Brandhorst was born in Saint Paul on April 15, 1915 to Lewis (Louis) G. and Ida Brandhorst. He attended the Mechanic Arts High School in Saint Paul from 1928 to 1932 and the School of Architecture at the University of Minnesota from 1932 to 1938. His son, Robert Donald, was born on April 14, 1940. Gerhard worked in various offices during World War II doing "war work."[31] He had a private architectural practice in Minnesota from September 1946 until October 1, 1952, when he formed a partnership with J. M. Leadholm, who had worked as a draughtsman for Minneapolis architects Magney and Tusler. By 1962, they had an office at 3381 Gorham Avenue in Minneapolis.[32]

In 1950, a residence designed by Gerhard was featured in the *Eugene (Oregon) Register-Guard*. The article said: "Extensive use of glass, a distinguishing mark of contemporary architecture, calls attention to this home designed by Gerhard W. Brandhorst, Minneapolis architect." The house, which was also featured in *American Architect*, had an "imaginatively designed window wall."[33]

Brandhorst married Violet Franzeen on February 6, 1966. He died in San Mateo, California, on January 21, 1986.[34]

Evaluation

Completed in 1964, the Calhoun Towers is less than fifty years old. National Register Bulletin 15, *How to Apply the National Register Criteria for Evaluation*, says that the criteria "exclude properties that achieved significance within the last fifty years unless they are of exceptional importance."[35] Although Calhoun Towers is possibly the most dynamic of the post-World War II apartment buildings constructed around Lake Calhoun, it cannot be argued that the building is of "exceptional importance" historically. Although impressive architecturally, it does not possess any elements that set it apart from other 1960s high-rises.

Recommendation

Because the property is less than fifty years old and is not exceptionally important, it does not appear to qualify for the National Register under any criterion.

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[30] Minneapolis Building Permit B379366 (dated July 25, 1962).
[31] Gerhard W. Brandhorst, Application for Corporate Membership to the American Institute of Architects, November 14, 1952, Brandhorst architect file at Northwest Architectural Archives, Elmer L. Andersen Library, University of Minnesota, Minneapolis.
[32] Ibid.; 1920 United States Federal Census; George S. Koyl, ed., *American Architects Directory,* 1st ed. (New York: R. R. Bowker Company, 1955), 59–60, 322, available at http://communities.aia.org/sites/hdoaa/wiki/Wiki%20Pages/1956%20American%20Architects%20Directory.aspx, and *American Architects Directory*, 2nd ed. (New York: R. R. Bowker Company, 1962), 75, available at http://communities.aia.org/sites/hdoaa/wiki/Wiki%20Pages/1962%20American%20Architects%20Directory.aspx; Minnesota Birth Index No. 1940-MN-024561.
[33] "Interior Design Advice Offered," *Eugene* (Ore.) *Register-Guard*, November 5, 1950.
[34] Minnesota Marriage Collection, 1958–2001; California Death Index, 1940–1997.
[35] Patrick W. Andrus and Rebecca H. Shrimpton, eds., *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation* (Washington, D.C.: Government Printing Office, 1991), 41.

4.1.3 West Calhoun Apartments

MnSHPO Inventory Number: HE-MPC-16932
Address: 3146 West Calhoun Boulevard, Minneapolis

Property Description

West Calhoun Apartments is a flat-roofed, reinforced-concrete apartment building with brick curtain walls. It is seven stories tall, but the ground floor sits slightly below grade. The main axis of the cross-shaped plan runs due east-west. Situated in the crux of the north and west wings is a flat-roofed, one-story, brick-walled entranceway. The north, west, and south sides of the building are encircled by a parking lot. The windows range from large, three-paned picture windows to side-by-side sliding windows to narrow single-pane double-hung windows. With its simple brick design and the vertical emphasis of the window bays, the building is vaguely reminiscent of the International Style.

History

In August 1950, West Calhoun Apartments, Incorporated, took out a building permit for an 87-foot by 126-foot by 57.5-foot apartment building. Designed by prominent local architect Perry Crosier, it would house sixty-two apartments and cost $400,000 to construct. The permit also included two 20-foot by 40-foot by 81-foot frame garages. Lovering Construction served as contractor.[36]

Evaluation

A photograph from 1958 shows that the top sashes of the original double-hung windows had one-over-two lights. The openings with picture windows held asymmetrical lights, with moveable panels on one side of the large panes. The openings holding the current air-conditioning units are not original but a later alteration. Because this building has such a minimal design, much of its appearance is dependent on its windows. The coping at the roofline is also not original. The alterations are not sympathetic to the original design.

Architect Perry Crosier, who was prolific during the 1930s and 1940s, is best known for designing movie theaters. Fair Oaks Apartments in Minneapolis is a celebrated example of his apartment design and is architecturally more significant than West Calhoun Apartments.[37]

Recommendation

Because West Calhoun Apartments had been significantly altered and because a better example of Crosier's apartment design exists, this building is recommended as not eligible for the National Register.

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[36] Minneapolis Building Permit B315739 (dated August 29, 1950).
[37] "Perry E. Crosier Papers," Northwest Architectural Archives, Elmer L. Andersen Library, University of Minnesota, http://special.lib.umn.edu/findaid/xml/naa121.xml (accessed June 24, 2010).

4.1.4 The Parklake

MnSHPO Inventory Number: HE-MPC-16371
Address: 3100–3128, 3134–3136, 3140–3144 West Calhoun Boulevard, and 3121 Excelsior Boulevard, Minneapolis

Property Description

The Parklake is a group of four apartment buildings, one townhouse building, and two garage structures on West Calhoun Boulevard overlooking an athletic field at the northwest corner of Lake Calhoun. The two-story townhouses and two three-story apartment buildings front directly on the boulevard. One of the apartment buildings abuts the south wall of the townhouses. This apartment building has a C-shaped plan and faces an identical building to its south. To the west is a three-story apartment building that is rectangular in plan. A smaller apartment building (3121 Excelsior Boulevard) is west of the townhouses. The buildings are connected by straight sidewalks, which are edged by lawns. The two one-story garages are behind the main complex.

All the buildings have flat roofs. Some walls of the apartment buildings are finished in stucco with bands of red brick, and some are painted brick. In some places, bricks form decorative panels. The entrances on the townhouses have flat-roofed canopies, and bricks along the roofline create a corbelled effect. The exterior walls are faced with a combination of stucco and red brick.

3100–3128, 3134–3136, 3140–3144 West Calhoun Boulevard

3121 Excelsior Boulevard

Detail of brickwork on apartment buildings

History

In an effort to attract "middle-class and upper-middle-class families desiring to move out of Manhattan without leaving the city," Edward Archibald MacDougall of the Queensboro Realty Company developed an area of Queens that came to be known as "Jackson Heights." In designing the housing and landscape, MacDougall looked to the "Garden City" concept developed by Sir Ebenezer Howard, founder of England's garden-city movement, who "believed that 'town and country must be married, and out of this joyous union will spring a new hope, a new life, a new civilization.' " Even with the approach of the twentieth century, older European and East Coast cities still dealt with the ironic problem of unsanitary tenements crowded into cities surrounded by acres of untouched land. His "garden cities" were an amalgam of what he considered to be the best qualities of urban and rural living.[38]

It is generally believed that the construction of Jackson Heights led to the creation of the term "garden apartments," which was first found in a 1917 reference to the Queensboro's corporation's first important apartment complex, the "Garden Apartments." Unlike what would later come to be known as "garden apartments," this complex, composed of fourteen ornamental Gothic Revival buildings, had only small lawns in front of the buildings.[39]

These ideas were a natural step in the development of multifamily housing during the Progressive Era. Like Howard, many developers and city planners associated social problems with overcrowded tenements and believed that fresh air and green space were essential for people to become upstanding citizens. The expanding mass transportation systems of many cities and the growing popularity of the automobile allowed residents to live further from the city center. As a result, the comparatively bucolic landscapes surrounding cities could be successfully converted into multifamily housing that promoted fresh air circulation, welcomed plenty of natural light, and allowed landscaped courtyards with lawns and trees.

"Garden apartments" grew in popularity in the United States, especially during the 1920s when urban populations increased. Postwar prosperity also led to a real estate and development boom. The onset of the Great Depression, however, brought the real estate market to a screeching halt. When the Federal Housing Administration (FHA), created in 1934, turned its attention to multifamily housing, the construction standards it promoted led to an adaptation of the design that had come to be known as garden apartments. The FHA's policies attempted to create pleasant, sanitary housing that would be economical to build and maintain. In 1940, *The Architectural Forum* wrote that the FHA's Large Scale Rental Housing Division had adopted cost-cutting design elements that would allow rent to be kept low. Such a move would see the "low rent housing market cracked wide open. . . .The FHA [was] encouraging the construction of lower rent projects along similar basic principles by lowering its minimum construction, design, and property requirements." Some of these elements included using the front entrance as a multi-functional access point, which took the place of service doors and stairs and eliminated public corridors. Longer, low-rise buildings had lower utility and construction costs than traditional multi-story apartment structures.[40]

Miles L. Colean, who was initially FHA's technical director and later its deputy administrator, was responsible for shaping the requirements for the large-scale housing program. Although not calling them garden apartments, Colean wrote about this new design in an article for *Architectural Record* in 1938. He identified four key characteristics:

> 1. The buildings formed "large, cohesive and efficiently organized groups" that "provide a measure of community identity." Such unity would result in community pride and prevent neighborhood decay.

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[38] Ines M. Miyares, "From Exclusionary Covenant to Ethnic Hyperdiversity in Jackson Heights, Queens," *American Geographical Society* 94 (October 2004): 462, 467.
[39] Ibid., 469.
[40] "Garden Apartments," *The Architectural Forum* 72 (May 1940): 310.

2. The ratio of occupants to land was very low in comparison to earlier apartments, allowing for fresh air, light, and recreation space.

3. The low height, reduced scale, and "domestic character" of the complexes avoided an "institutional atmosphere."

4. While the buildings were constructed with a limited budget, the interiors were inviting and the exteriors were attractive. The buildings were "designed to be operated efficiently and are thus able to offer a bargain relationship between the merchandise offered and the price charged for it."

He credited the FHA requirements as having "broader social and economic implications" that were "insurance against future slums."[41]

The Parklake

In December 1938, the *Minneapolis Journal* ran an advertisement for apartments to rent at "The Parklake." The new complex was located at the northwest corner Lake Calhoun along the segment of West Calhoun Boulevard that travels away from the lake towards Excelsior Boulevard. On the opposite side of the boulevard from the new development was land that was formerly part of Lake Calhoun. It had since been converted into a meadow as a result of a fifteen-year campaign by the Minneapolis Board of Park Commissioners to dredge the lake and improve the shoreline. In 1935, the land had been leveled off with loam and a drain was installed to control run-off. This created more lakeside property, which was becoming increasingly valuable as public transportation, and later automobiles, allowed residents to live further from the city center.[42]

The Parklake was built on Lots 12 to 16 of Auditor's Subdivision No. 164. Most of this land was owned by the estate of the James Leck, who died in 1928. Leck, a successful contractor in Minneapolis, had been involved in a number of noteworthy projects of national recognition including Memorial Stadium at the University of Minnesota and the University of Michigan Stadium. At the time of his death, it appears that his children received an undivided interest in the Calhoun property and his son, Stuart, became president of the construction company. In 1936, daughter Ethel M. Stoltzfus and her husband deeded their share of the land to Stuart.[43]

On June 1, 1938, Parklake Homes was incorporated, with its office at 202 Foshay Tower in Minneapolis. That same day, Stuart, his sister Grace Leck Williams, their spouses, and A. E. and Blanche G. Benjamin deeded their interests in the Calhoun property to the new corporation. The next day, Parklake Homes took out a mortgage on the property from the Prudential Insurance Company of America for $315,000 on the property. The mortgage included "all the hereditaments and appurtenances." One of the witnesses to the mortgage's indenture was architect Wilbur Tusler.[44]

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[41] Federal Housing Administration, *The FHA Story in Summary* (Washington, D.C.: Federal Housing Administration, 1959), 5, 11; Miles L. Colean, "Multiple Housing Under FHA," *Architectural Record* 84 (September 1938): 96.

[42] Christine A. Curran, Jeffrey A. Hess, and Charlene K. Roise, "Sumner Field Homes, HABS No. MN-160," September 1997, 8–10, prepared by Hess, Roise and Company, 10; Parklake advertisement, *Minneapolis Journal*, December 1, 1938; *1903 City of Minneapolis Atlas* (Minneapolis: Minneapolis Real Estate Board, 1903): Plate 12; Theodore Wirth, *Minneapolis Park System 1883–1944* (Minneapolis: Board of Park Commissioners, 1945), 84, 121; Minneapolis Board of Park Commissioners, *Fifty-third Annual Report, 1935*, 119.

[43] "James Leck, City Contractor, Dies; Rites Tomorrow," *Minneapolis Journal*, October 31, 1928; "Stuart Leck, President of Construction Company, 94," *Minneapolis Star Tribune*, October 25, 1995; Hennepin County, Minn., Deed Book No. 1339, pg. 483 and No. 1440, pg. 636; Minnesota Death Record No. 521323 dated October 30, 1928; T. E. Steward, "University of Minnesota: Memorial Stadium," program (Byron and Learned Company, November 15, 1924).

[44] "Parklake Homes, Incorporated," Filing No. D-848 dated June 1, 1938; Hennepin County, Minn., Deed Book No. 1440, pg. 637; Hennepin County Mortgage Book 1935, pg. 275, Parklake Homes to Prudential Insurance, No. 1932291, filed June 7, 1938.

On June 9, Parklake Homes took out permits for construction on lots 12 through 16. Lots 12, 13, and 14 (3100–3144 West Calhoun Boulevard) would hold three buildings extending along West Calhoun Boulevard. A two-story brick and frame townhouse structure, 242' long and 27' deep, was estimated to cost $40,000. To the southwest would be two three-story brick apartment buildings, one measuring about 53' by 130' and the other 127' by 35.5', both costing $80,000. A three-story brick apartment building on lot 15 (Building "C", 3115 Excelsior Boulevard) would be about 64' by 34', and another on lot 16 (Building "B", 3121 Excelsior Boulevard) would be 127' by 35.5'. These buildings, along with two one-story concrete-block garages—one 20' by 136' and the other 40' by 110'—were estimated to cost $70,000. All of the permits list Magney and Tusler as the architect except for 3100–3144, but this was presumably an oversight.[45]

Despite the inclusion of garages, public transit was still important to the Parklake's developers. The city's mass transit system was undergoing change during 1938 and the streetcar line along West Lake Street, which intersected with Excelsior Boulevard northwest of Lake Calhoun, was slated for removal. In June, the *Minneapolis Journal* reported that Parklake Homes was lobbying the city to ensure that the area would still be served: "Builders of the new apartment, in order to see that transportation facilities for their development are protected, have written city officials asking that adequate streetcar or bus service be provided." Their requests may have been unnecessary. Earlier that year, the city council approved a resolution permitting the "operation of bus service upon certain avenues in the City of Minneapolis." The route began at the intersection of France Avenue South and West Lake Street near the Parklake complex.[46]

The building permits for all of the Parklake buildings noted that construction was to be completed by October 1, but it appears that the project fell behind schedule. A classified advertisement running in the October 9 edition of the *Minneapolis Journal* encouraged renters to begin to "Live on Beautiful Lake Calhoun" on November 1, when the complex was ready for occupancy. It continued, "Discriminating people are choosing these most modern of modern apartments because of the beautiful location—landscaped grounds—every modern convenience." Also noted were the lack of corridors and a design that promoted adequate ventilation. By November 8, the townhomes appear to have been completed, but the apartments lagged by a month. A model unit was set up to give prospective tenants "a clear perspective of room and furniture arrangement" of the apartments, in what was touted as "the most beautiful location in the Northwest."[47]

By December 1, all unit types were available. Tenants could choose from three-, four-, or five-room apartments and five- and six-room townhouses. Rent began at $60. Interestingly, a classified advertisement running on October 9 noted that a two-bedroom apartment on the nearby 2700 block of Xerxes Avenue South was going for $70 per month. By comparison, one would reason, lakefront living in a new apartment at that cost was a deal.[48]

Stylistically, the Parklake joined its contemporary, the PWA-built Sumner Field project, in following the FHA's garden apartment prototype. Considering that Magney and Tusler were involved in both projects, this is not surprising. Like Sumner Field, the Parklake has units in townhouses and low-rise apartment buildings. The footprints are simple, but the rectangular forms are varied by small bump-outs on the facades and vertical projections at the rooflines. Most units are accessed by a series of linear walkways and face onto a central lawn.

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[45] Minneapolis Building Permits B253538, B253639, and B253640 (dated June 9, 1938).
[46] "West Calhoun Area Seeks Better Loop Transportation," *Minneapolis Journal*, June 12, 1938; Minneapolis City Council Regular Meeting, Resolution, April 29, 1938; John W. Diers and Aaron Isaacs, *Twin Cities by Trolley: The Streetcar Era in Minneapolis and Saint Paul* (Minneapolis: University of Minnesota Press, 2007), 257.
[47] Permits B253538, B253639, and B253640; Parklake advertisements, *Minneapolis Journal*, October 9 and 30 and November 8, 1938.
[48] Parklake advertisements, *Minneapolis Journal*, October 9 and December 1, 1938.

The key difference between the two projects is in the articulation of the exterior walls. While the buildings at Sumner Field were required to be so utilitarian that even a second brick color was considered too extravagant, the Parklake complex displays a combination of stucco, brick, and painted brick. These materials and colors articulate the complex's Streamlined Moderne design. The overall design is simple, but not utilitarian.

Despite this, the country was still in the depths of an economic depression, and Minneapolitans were not immediately lured into renting at the Parklake. According to the 1939 Minneapolis city directory, only four of the townhouses had occupants, while nearly 50 percent of the apartments were vacant. Although more tenants seem to have moved in during 1939, the project was failing financially. Parklake Homes made its last mortgage payment on December 5, 1939 while still owing over $320,107. By late January, appliances from the units—"five Autocraft oil burns, sixty-seven 'Vesta 30' gas stoves, sixty-six 'Sanicold' electric refrigerators, and one Frigidaire five-foot refrigerator cabinet"—were up for sale at public auction. The following month, Prudential Insurance received a sheriff's deed for the property. In 1941, Prudential transferred the property to the Federal Housing Administration. (The FHA might have guaranteed the mortgage.) The FHA held onto the property until June 1944, when it sold the Parklake to Minneapolis Lake Homes. The latter paid off its mortgage in 1964.[49]

It is unclear why the Parklake did not succeed when so many other apartment buildings had no difficulty securing tenants. Part of the problem may have been an oversaturation of the higher-rent apartments. According to the rates given in the classified advertisement, rent began at $60 per month and the smallest unit had three rooms, meaning that rent averaged $20 per room. Only eighteen months later, the average rent for FHA apartments was "uncomfortably high at $15.50 per room per month," according to an article in *Architectural Forum*. The article explained that only 10 percent of families in rental housing in the United States could afford $15 per room, and the FHA figured that these residents were "transitory" and would purchase houses when the economy improved. This group had no difficulty finding apartments as "this market [was] well supplied." The FHA explained that "builders and building investors habitually aim at the highest possible rents in hope of making a quick financial killing, overlook[ing] the cold forbidding facts of rental experience." That was a particularly risky decision in the 1930s, as the Parklake investors discovered.[50]

Over the long run, though, the Parklake has proven the real estate adage: location, location, location. The complex is well maintained, and the buildings and landscape retain good integrity.

Evaluation

At the time of its construction, the Parklake was part of a wave of garden apartment complexes in the Twin Cities. Two of the most prominent were designed by local architect Perry Crosier. One, the Fair Oaks Apartments, was built in the Whittier neighborhood at the northeast corner of Third Avenue South and East Twenty-fifth Street, across the street from the Minneapolis Institute of Arts and Washburn Fair Oaks Park. At the time of its construction, the property was lauded as "finer living for 224 families." Designed so that only two apartments had to use the same entrance, the "modern design allow[ed] self-expression in interior decoration."[51]

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[49] *Minneapolis Directory Company's Minneapolis (Minnesota) City Directory,1939* (Minneapolis: Minneapolis Directory Company); *Minneapolis Directory Company's Minneapolis (Minnesota) City Directory,1940* (Minneapolis: Minneapolis Directory Company); Hennepin County, Minn., Deed Book No. 1261, pg. 247, Deed Book No. 1490, pg. 436, Deed Book No. 2433, pg. 473, and Contract Book 58, pg. 177.

[50] December 1 Parklake advertisement; "Garden Apartments," 309.

[51] Northwest Architectural Archives, "Perry E. Crosier Papers," Elmer L. Andersen Library, University of Minnesota, Minneapolis, http://special.lib.umn.edu/findaid/xml/naa121.xml (accessed November 10, 2010); Marjorie Pearson, Penny Petersen, and Charlene Roise, "The Evolution of the Whittier Neighborhood," December 2009, report prepared by Hess, Roise and Company for the Whittier Alliance, Appendix B, pg. 22; Bill Beyer, "An Apartment Idyll: Five Decades of Light and Air at the Fair Oaks," *Architecture Minnesota* (May–June 1987): 56.

At the same time, the Highland Village Apartments were being built near the commercial center of Saint Paul's Highland Park neighborhood. The 285-unit complex also boasted a "wide selection of apartment homes" that drew in an "ever increasing number of new Saint Paul residents. . . . For nowhere in the city [could] the newcomer find such a large rent range, such a wide selection of exposures from which to choose, so many facilities for the enjoyment of favorite sports." Unlike Fair Oaks, which was located in one of Minneapolis's oldest neighborhoods, Highland Village promoted its "suburban" location "midway between St. Paul and Minneapolis" that allowed "extensive landscaping." Like Fair Oaks, the apartments at Highland Village were meant to reflect the occupants' taste and each was "decorate[d] . . . to harmonize with the furnishings of a new tenant."[52]

As garden apartments, both Fair Oaks and Highland Village promoted their healthful designs that encouraged "cross-ventilation," as well as exposure to an "abundance of fresh air and sunshine." This, in addition to modern amenities, provided Depression-era tenants with a higher standard of living.[53]

A third prominent garden apartment complex from the 1930s was Sumner Field, the first public housing project in Minneapolis. As early as the 1920s, Minneapolis's City Planning Commission had recognized the problems in the Sumner Field area, which was considered to be the worst residential slum in the city. In the summer of 1935, the Housing Division of the Public Works Administration (PWA) approved plans for the construction of new multifamily buildings to replace around fifty acres of substandard dwellings. Gottlieb R. Magney and Wilbur F. Tusler, prominent Minneapolis architects who were best known for designing the Foshay Tower, were the leaders of Sumner Field's design committee. Their plans for Sumner Field were heavily influenced by the first federal Housing Division project in Boston in 1933, which set the standard for other developments by that agency. This served as a prototype to the FHA garden apartment and served as a benchmark in apartment design. In 1940, *The Architectural Forum* wrote, "The late Thirties . . . wrought a fundamental change in new multi-family housing. Thus, in the past five years the garden apartment has come of age."[54]

Sumner Field, which opened in December 1938, typified that era's garden apartment design. The site had multiple small buildings covering only 20 percent of the site. "Reflecting the PWA's garden apartment ideal, most residential buildings were set back from the street in L- and U- shaped clusters, sharing a common front lawn and an extended backyard that formed a central spine for each block." The rest of the land held open grass and walkways. Heavy through and internal traffic was discouraged, and garages or parking areas were to accommodate at least one car per household. Most units were only one or two rooms deep to provide adequate light and air flow.[55]

These elements are also found at the Parklake and, for the most part, at Fair Oaks and Highland Village apartments. What made the Parklake different, though, was how much it adhered to the "minimalist" style that the FHA had adopted by the late 1930s, even though it was privately built. This is due to Magney and Tusler, the architects for both projects. In addition to being economical, this design reflected the cutting-edge aesthetic of the International Style. When the United States first ventured into the realm of public housing after World War I, architects gravitated towards Beaux Arts planning. Europe, on the other hand, had adopted the Modern Movement in its design. By the early 1930s, younger architects, spurred on by the "Modern Architecture" exhibit at the Museum of Modern Art, began incorporating European housing design. In 1934, Harold Ickes, the PWA's administrator, centralized the program's activities, and soon the Housing Division was in charge of the design and construction of housing instead of leaving those tasks to local sponsors. Plans were streamlined by removing luxuries, such as closet doors. In October, work began in the creation of a "permanent and comprehensive housing program on European lines.

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[52] "Village Attracts New Residents," *Saint Paul Pioneer Press*, August 15, 1939; "Highland Grounds Are Attractive," *Saint Paul Pioneer Press*, May 11, 1941; "Village Has Own Newspaper," uncited March 1941 newspaper advertisement, http://www.highlandvillageapts.com/our-history.php.
[53] "Apartment Renters," uncited March 1941 newspaper advertisement, http://www.highlandvillageapts.com/our-history.php.
[54] Curran, Hess, and Roise, "Sumner Field Homes," 8–10; "Garden Apartments," 309.
[55] Curran, Hess, and Roise, "Sumner Field Homes," 9; Colean, "Multiple Housing under FHA," 100.

Eventually such policies were reflected in the Wagner Housing Act of 1 September 1937, which established the United States Housing Authority."[56]

Therefore, while Sumner Field might have appeared to be a minimalist design at first glance, it in fact followed the Modernist trend of Continental-style housing that had seeped into New Deal garden apartment construction, a major shift from the early twentieth-century Howardian "garden city" or Beaux Arts style popular in America the previous decades. The cantilevered flat-roofed canopies over entryways, found at both Sumner Field and the Parklake, were a particularly noteworthy Modernist flourish. According to a later interview with Elizabeth Close, an Austrian emigrant who had studied architecture at MIT, "the canopies were a modernist statement that reflected the sentiments of younger staff in the Magney and Tusler office, including herself."[57] The Parklake's stucco alone with the geometric brick designs seem to borrow from the Streamline Moderne style, but the flat roofs, lack of curvilinear design elements, and simple asymmetry also classify it as Modernist.

By contrast, both Fair Oaks and Highland Village, while having a "stripped down" design, hearken toward the traditional styles that were popular at the time. Colonial Revival is evident in both complexes' wood canopies and surrounds at the entry doors, which have a broken or solid pediment and decorative side pilasters. The arched dormers and brick quoins also allude to this type. Both complexes have hipped roofs with red tile, a nod to the Spanish Colonial Revival style.

The settings of these apartment complexes also differed greatly. Fair Oaks was set within a well-developed area of Minneapolis. Highland Village, though in a "suburb," was adjacent to the Ford Plant in Highland Park, which was a rapidly growing area of Saint Paul. The Parklake, however, was set beyond the outskirts of south Minneapolis, far enough that the owners had to appeal for access to public transportation. Because of their populated settings, the layout of both Fair Oaks and Highland Park create central courtyards, turning the buildings into a type of barrier to block the city out of the central green space. While the Parklake does have central courtyards, the building "barrier" is only three-sided. One opens up onto Excelsior Boulevard, while the other, along with the row of townhouses, focuses on an exterior green space—the playing field across West Calhoun Boulevard. Lake Calhoun, itself, is also an importance amenity.

Constructed within a year of each other, the Parklake, Fair Oaks, and Highland Village complexes are all important early examples of privately built garden apartment complexes, and each has historical significance. Fair Oaks and Highland Village are both significant for their scale as well as their landscape and building design, which epitomize the ideals of the garden apartment. Their Revivalist styles are indicative of the builders' attempts to introduce a modern yet identifiable and appealing type of apartment living. The Parklake, on the other hand, broke new ground with its cutting-edge design.

Recommendation

With the demolition of Sumner Field, the Parklake takes on new importance as the lone representative example of a privately built garden apartment complex that has taken its design directly from the minimal Modernist style popularized by the Public Works Administration and the Federal Housing Administration in the 1930s. The Parklake is recommended as eligible under Criterion C for its significance in Architecture. Its period of significance begins in 1938, the year of its construction and completion, and ends with the fifty year cut-off in 1961, in conformance with National Register guidelines. The Parklake retains integrity of location, design, setting, materials, workmanship, feeling, and association.

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[56] Richard Pommer, "The Architecture of Urban Housing in the United States during the Early 1930s," *Journal of the Society of Architectural Historians* 37 (December 1978): 235–237.
[57] See images from "Garden Apartments." Curran, Hess, and Roise, "Sumner Field Homes," 8–11 and note 17.

4.1.5 Ministers Life and Casualty

MnSHPO Inventory Number: HE-MPC-16659
Address: 3100 West Lake Street, Minneapolis

Property Description

The Minister's Life and Casualty Union Building is a flat-roofed brick and stone-faced office building located at the juncture of West Lake Street and Excelsior Boulevard. The building has a modified L-plan. The 210-foot-long front wing of the building is four stories in height and parallels West Lake Street, which angles northwest-southeast. The rear wing is two stories in height and runs due north-south. Most of the exterior walls are faced in variegated reddish-brown brick. A three-story section on the front wing is faced in Kasota stone and projects slightly, holding continuous bands of windows on each floor. The windows are not the original and most have single panes, but every third window has a lower hopper section. Windows on the first story are modern two-over-two-light fixed units set separately in the wall. A five-story brick tower sits at the east end of the wing. A cornerstone dated "1953" is also at the east end by the building's main entry, which is protected by a flat, cantilevered hood. The area in front of the building has been landscaped with stepped brick retaining walls topped with yellow stone and decorated with a stylized Greek key design at each end.

Ministers Life and Casualty Union, 1955
Norton and Peel, photographers—Minnesota Historical Society Collections

History

Ministers Life and Casualty Union was founded in 1900 by Walter Hobart as a "cooperative assessment insurance company" exclusively for clergymen. Initially, it only provided accident insurance, but it later expanded to include "sickness insurance." When Hobert retired in 1920, his son Mell took over the business, and in 1924, the company began offering life insurance policies. Soon, the company prided itself on providing "life, accident and sick benefit insurance at cost for clergymen only."[58]

The company established a Canadian office in 1935 and became a mutual legal reserve company in 1950, a move that allowed it to expand to other states. As the company continued to grow, its offices at LaSalle and Franklin Avenues just south of downtown Minneapolis were no longer sufficient. In October, President Mell Hobart announced that Ministers Life was going to erect a new office building at 3100 West Lake Street. The $574,000 building (the *Minneapolis Tribune* reported the cost at $900,000) was designed by prominent local architects Oscar Lang and Arnold Raugland. The building, constructed by the H. N. Leighton Company, would have 30,000 square feet of interior space, some of which would be available for rent. It was estimated that the building would be completed by October 1953.[59]

In July 1953, a ceremony was held where historic items were placed in the cornerstone, which was then dedicated. W. G. Calderwood, named as the "oldest living incorporator" of the company, took part, and Dr. William J. Bell officiated the ceremony. Other clergymen as well as Mell Hobart participated in the event.[60]

The new building may not have been finished until early 1954, as the *Minneapolis Tribune* ran a photograph on June 13 of that year showing the "new home" of Ministers Life and Casualty Union.[61] In October, the company took out a permit to construct a twelve-car masonry garage for the use of tenants. Measuring 22 feet by 119 feet, the garage was anticipated to cost $13,000. In 1959, Mell Hobart retired and was succeeded by Oakley R. Tripp.[62]

In 1961, Wisconsin passed the Unauthorized Insurance Law, which prevented "unauthorized insurers from operating in the state." Residents could only buy insurance from out-of-state companies if that type of coverage was not available in Wisconsin and if the policy was purchased from a licensed agent. Ministers Life, which sold insurance via the mail, was opposed to the new regulation and "sought a declaratory judgment to void the law." Although the matter went all the way to the Supreme Court, the law was not revoked.[63]

Regardless, Ministers Life continued expanding. It built two additions onto its building in late 1967.[64] In 1975, Arthur E. Bell became president of the company when Andrew Hobart, who had served in that position since 1959, retired. At that time, it was reported that the company had 83,000 members and "certificate holders" and over $654 million worth of insurance policies "in force." Subsidiaries of the company that offered services other than insurance were the Ministers Life Marketing Corporation, Ministers Life Information Services Corporation, and Ministers Life Resources.[65]

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[58] "Last of Three Hobarts to Retire as President of Ministers Life," *Minneapolis Star*, July 19, 1975; "Ministers' Insurance Firm Gets Cornerstone," *Minneapolis Star*, July 22, 1953; "Charles Fremont Dight," Minnesota Historical Society Library, http://www.mnhs.org/library/findaids/P1628.xml (accessed June 24, 2010).

[59] "Ministers' Insurance Firm Gets Cornerstone"; "Last of Three Hobarts to Retire"; "New Office Home," *Minneapolis Tribune*, October 5, 1952; Minneapolis Building Permit B331383 (dated October 21, 1952).

[60] "Ministers' Insurance Firm Gets Cornerstone," *Minneapolis Star*, July 22, 1953.

[61] Photograph of Ministers Life and Casualty Building, *Minneapolis Tribune*, June 13, 1954.

[62] Minneapolis Building Permit B344027 (dated October 21, 1954); "Last of Three Hobarts to Retire."

[63] Kenneth J. Meier, *Political Economy of Regulation: The Case of Insurance* (Albany, N.Y.: State University of New York Press, 1988), 113.

[64] Minneapolis Building Permits B405980 (dated October 16, 1967) and B406773 (dated November 27, 1967).

[65] "Last of Three Hobarts to Retire."

In 1993, the company, now called Ministers Life Insurance, announced plans to merge with Minnesota Mutual Life of Saint Paul after concerns grew as to whether it could remain a " 'viable organization' over the long term."[66] In 2002, the company changed its name to Securian Life Insurance Company.[67]

Evaluation

For the Ministers Life and Casualty Union to be eligible under Criterion A, the company itself would have to be of particular significance either locally or nationally. Ministers Life's purpose of providing insurance for clergymen was not revolutionary when the company began in 1900. For example, a *New York Times* article in June 26, 1870, reported that a bill had just passed the state's legislature that "charter[ed] an association whose object . . . is to secure a cheap life insurance for Protestant ministers." Ministers Life joined a well-established industry in Minneapolis, which had attracted insurance companies by 1859. By 1956, the Twin Cities was the "seventh largest insurance center in the United States with more than $7,500,000,000 of life insurance in force." A book published in 1956, *Minneapolis, City of Opportunity: A Century of Progress in the Aquatennial City,* listed some of the earliest and largest insurance companies that had started in Minneapolis as well as other companies with local branch offices. Ministers Life was mentioned, but not prominently. It does not appear to have been a major force in the area's insurance industry.[68]

The building was designed by Lang and Raugland, a Minneapolis architectural firm that was prolific from the 1930s through the 1950s. The firm was well known for its "large corporate and institutional designs, such as banks, factories, office buildings, and churches." It was responsible for a highly visible insurance headquarters for the North American Life and Casualty Company at 1750 Hennepin Avenue (1946-1947; demolished), as well as the former Greyhound Bus Depot on First Avenue North in Minneapolis. Although the Ministers Life Building was impressive, it was overshadowed by the American Hardware Mutual Building, constructed around the same time across Excelsior Boulevard by a much larger insurance company. That building has since been significantly altered so that it retains very little of its original appearance. While the Ministers Life Building has not experienced such a substantial transformation, its integrity has been damaged by the replacement of the original windows, which were a character-defining feature. Historic photographs show that the original windows had light-colored metal frames and muntins. Some units had lower hopper sections that established a visual rhythm on the facade. The profile of the windows also appears to have been deeper than that of the current windows.[69]

Recommendation

Ministers Life, therefore, does not appear to have been among the most significant of the numerous insurance companies based in the city, making it ineligible under Criterion A. The original windows, a key feature of the original facade, have been replaced by windows that are inappropriate in color, style, and profile. As a result, although the building might have qualified under Criterion C for its architectural design, it is recommended as not eligible for the National Register because of its poor integrity.

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[66] Neal St. Anthony, "Ministers Life Plans to Merge with Minnesota Life, *Minneapolis Star Tribune*, January 16, 1993.
[67] "Corporate Changes: The Consolidation of Life/Health Industry Continued in 2002," Goliath Service for the Gale Group, http://goliath.ecnext.com/coms2/gi_0199-2853026/Corporate-changes-the-consolidation-of.html (accessed June 24, 2010).
[68] "Life Insurance for Clergymen," *New York Times*, June 26, 1870; Lawrence M. Briggs, ed., *Minneapolis, City of Opportunity: One Hundred Years of Progress in the Aquatennial City* (Minneapolis: T. S. Denison and Company, 1956), 204.
[69] Alan K. Lathrop, *Minnesota Architects: A Biographical Dictionary* (Minneapolis: University of Minnesota Press, 2010), 135; Norton and Peel photographs 230248 and 230249, April 27, 1955, Minnesota Historical Society Collections.

4.1.6 Calhoun Beach Apartments

MnSHPO Inventory Number: HE-MPC-6125
Address: 2901-2905-2915 Dean Parkway, Minneapolis

Property Description

The Calhoun Beach Apartments are two identical, three-story brick apartment buildings. Single-story stone entryways project from the center of each front facade. The front facades and front side bays of both buildings are ornamented with red-tiled mansard-like projections, a denticular cornice, multicolored tile panels, and brickwork in herringbone, header, and polychrome diamond patterns.

Calhoun Beach Apartments under construction, 1925
Hibbard Studio photograph—Minnesota Historical Society Collections

Calhoun Beach Apartments shortly after completion, 1925
Hibbard Studio photograph—Minnesota Historical Society Collections

History

Minneapolis's population grew dramatically in the early twentieth century—increasing by almost 178,000 during the first two decades. A large portion of this increase came from the "burgeoning faction of middle-class professionals." Also shaping the distribution of the population was the advent of the automobile, accessible to more consumers after Henry Ford introduced the Model T in 1908. "Before the automobile became commonplace, Minneapolis residents could settle only as far out of the city as the streetcar lines allowed. As routes spread into outlying areas, the exodus from downtown increased and demand for housing along the urban fringe mounted."[70]

Part of this "fringe" included the land between Lake of the Isles and Lake Calhoun, which had seen little development outside of the park-owned Dean Boulevard. The apartments built along the Mall during the 1910s had raised awareness of the potential for constructing multiple-dwelling buildings in this prestigious area.

The most notable example was the Calhoun Beach Club, which was the brainchild of Harry Goldie. Born in Minneapolis as Harry Goldberg to Russian-Jewish immigrants, Goldberg became a boxer, and by 1914, he was a star featherweight and had won Minneapolis's amateur tournament's diamond medal more than once. He fought under the name "Harry Goldie." His brother, John "Stonewall Jackson" Goldberg was also a fighter but does not appear to have been as successful as Harry, who was "a real champion when it [came] to taking down the dough . . . . Harry's services [were] in such demand that some nights he appear[ed] before several audiences." Harry, then a member of the Typographical Union No. 42, was also known for living the good life, preferring to take taxicabs instead of streetcars to his fights.[71]

His plan at that time was to continue as a professional boxer. If that career failed, he reported that he would fall back on his typographical credentials and work as a printer. It appears he had continued success in the boxing arena, for in 1918, the *Minneapolis Tribune* reported that Goldie, "a well known local boxer," had been engaged as a boxing instructor for the University of Minnesota. During this period, he set up a boxing training camp on the north shore of Lake Calhoun. While working there, he formulated the idea of constructing a modern apartment building and club like those found in other large cities. "Goldie's dream for the club entailed an egalitarian social and athletic space that would welcome members regardless of race, religion, or sex."[72]

In 1923, Goldie was working as an insurance executive and officer at the Continental Finance and Mortgage Company when plans for the development really began to take shape. In July of that year, he purchased Lots 1 to 10 of the Lagoon Heights Additions to Minneapolis, which composed the east side of Dean Parkway between the railroad crossing and West Lake Street. Interestingly, just prior to his acquisition of the property, the Minneapolis City Council received a communication from the Bricklayers and Masons Union "favoring the erection of a hotel on Dean Boulevard."[73] He spent much of the year at City Planning Commission meetings presenting his idea for what he would call the Calhoun Beach Hotel.

[70] Christine Curran and Charlene K. Roise, "Nokomis Knoll Residential Historic District," National Register of Historic Places Registration Form, available at the State Historic Preservation Office, Minnesota Historical Society, Saint Paul, 8:2–8:3.
[71] "Minneapolis, Minn." *Typographical Journal* 44 (January 1914): 492; Diane Trout-Oertel and Marjorie Pearson, "Calhoun Beach Club," National Register of Historic Places Nomination Form, March 2003, 8-2.
[72] "Hubert Humphrey, Harry Goldie and Walter Mondale at the grand opening of the Calhoun Beach Club," 1946 Photograph, Minnesota Reflections at Minnesota Digital Library, http://reflections.mndigital.org/cdm4/item_viewer.php?CISOROOT=/jhs&CISOPTR=391&CISOBOX=1&REC=2 (accessed May 5, 2010).
[73] Minneapolis City Council, communication (dated July 1923).

In November, Harry, his brother, John, and Edward T. Morris of Chicago formed a corporation named the Calhoun Beach Holding Company.[74]

Also that fall, Minneapolis architect and engineer Alexander F. Rose drafted plans for the Calhoun Beach Hotel. Alexander Fraser Rose was born in Crieff, Scotland, on June 26, 1875 to David and Mary (Fraser) Rose, a family that claimed to be direct descendants of William the Conqueror. After immigrating to the United States, he took bridge and mechanical courses schools in Scranton, Pennsylvania. In 1902, He worked as a draftsman for the Right of Way Department of the Great Northern Railway. Later, he was employed by the Minneapolis Steel and Machinery Company for ten years. It was at this point that he went into private practice as a structural engineer (1912), later opening an "architectural office in conjunction with an engineering office." This marked his partnership with successful contractor Samuel Fleischer. Together, they designed various hotels, apartment buildings, and movie theaters around Minneapolis as well as projects around the states, in Iowa, and in other states. Rose married Maude G. Patten in 1904, with whom he had three children.[75]

Rose's plans for the Calhoun Beach Hotel show a complex with a wide, sprawling plan. Two 120-foot-long wings angle out from a central 238-foot-long ell with a perpendicular 46-foot-wide front hall. The large plan of this hotel indicates that it was designed to take up the all ten lots on the east side of Dean Boulevard. The six-story hotel also included a roof promenade, a ball room with a decorative paneled ceiling and an orchestra pit, and an underground garage. Elevators show an elaborate facade rendered in the 1920s Exotic Revival style including Palladian windows, relief sculpture, sgraffito panels, and rope columns. Terra cotta finials sitting on stone bases and topped with "electric globes" would sit in a row along the short tiled Mansard roof.[76]

This version of the hotel, however, was never constructed and the reasons why are not available. Perhaps Goldie had difficulty rousing public or investor interest in the fairly revolutionary project. Maybe Goldie himself was unhappy with the design. Regardless, any work on these lots stalled for almost two years until May 1925, when the Calhoun Beach Holding Company received permits for two twenty-two-unit apartment buildings of brick and tile, a completely new direction for the site, but not for the area in general, where apartment buildings where being constructed along the Mall located just to the east. Each new building would measure 64 feet by 103.5 feet and rise 40 feet. Alexander F. Rose was architect of both, while the contract for the construction had not yet been awarded. The June 6 issue of the *Improvement Bulletin* announced that the Calhoun Beach Holding Company had two apartment buildings under construction. Fleisher Engineering and Construction Company was the contractor. This was not surprising. The company had erected many large apartment buildings around South Minneapolis in the previous years and, as noted, its president, Samuel Fleisher, had a long-standing professional relationship with Alexander Rose, having at one point been in business with him. Excavation was undertaken by S. J. Groves and Sons. The *Improvement Bulletin* reiterated that the buildings would be three stories tall, include basements, be of brick and tile construction, and have tile baths. The cost for both was estimated at $165,000.[77]

On June 28, the *Minneapolis Tribune* reported that the "New Calhoun Beach Apartment hotel [was] . . . just completed by the Fleisher Construction Company for the Calhoun Beach Holding Company." This report was erroneous, as it was not possible for the buildings to be completed after six weeks. Building

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[74] Trout-Oertel and Pearson, "Calhoun Beach Club," 8:2; City of Minneapolis, Deeds Book 1003, 364–365, November 14, 1923; Articles of Incorporation of Calhoun Beach Holding Company (dated November 19, 1923).
[75] John William Leonard, *Who's Who in Engineering: A Biographical Dictionary of Contemporaries, 1922–1923, Vol. 1* (New York: John W. Leonard Corporation, 1922), 1079.
[76] Alexander Fraser Rose, "The Calhoun Beach Hotel, September 21, 1913," architectural plans, available at Northwest Architectural Archives, Elmer L. Andersen Library, University of Minnesota, Minneapolis.
[77] Minneapolis Building Permits B188547 and B188548 (dated May 18, 1925); "Oak Grove Apartment Hotel," advertisement, *Minneapolis Tribune*, June 15, 1920; "$290,000 Apartment Building Planned," *Minneapolis Tribune*, October 15, 1922; "Large Apartments Feature New Building Being Constructed at Cost of $225,000," *Minneapolis Tribune*, November 26, 1922; *Improvement Bulletin*, June 6, 1925, 9–11.

permits show that bathroom fixtures were installed in mid-June, but plaster work started one month later. Both buildings had electrical work in late September, which seems to indicate that the apartments were ready by winter.[78]

The *Tribune* article highlighted the forty-car garage available for tenants. The same month that the Calhoun Beach Holding Company had taken out a permit for the construction of the apartment buildings, it petitioned the city council for permission to build a 50-foot by 66-foot private concrete garage 150 feet from the property line; the request was granted. In 1927, a 54-foot by 37-foot concrete-block addition, designed by prominent architect Perry Crosier, was added to the garage for storage. The garage appears on the 1931 Sanborn map and has a footprint with an area larger than the adjacent apartment building. The garage was removed in December 1990 and replaced with the current garage, which has a similar footprint. There was a streetcar line on Lake Street when the apartments were built, providing access to the Lake Calhoun and Lake of the Isles as well as the Calhoun Beach Apartments. To have a parking garage to serve an apartment building was still a new idea for 1925, when streetcar usage was just past its peak. This, no doubt, was indicative of the clientele Goldie expected would be attracted to the Calhoun Beach Apartments.[79]

The apartment buildings, designed in an ornate Exotic Revival style, are aesthetic complements to the hotel that Rose envisioned, borrowing such elements are arched doorways, embellished cornices, tiled mansard roofs, and carved stone entrances. It can be reasoned that this was an indication that they were to form a complex with the future Calhoun Beach Hotel, if it were designed in the Exotic Revival style of Rose's vision. The *Tribune* article, though, also stated that the two apartment buildings "comprise[d] the initial units of a contemplated seven story family hotel" and were "built with footings for the other four stories." This, along with the report mentioned earlier that stated how the "apartment *hotel*" had been completed, indicates that there were plans to incorporate the apartment buildings into the Calhoun Beach Club not just stylistically but also *structurally*, but it is not clear how this would have been done. No structural connection is readily evident on the 1925 plans for the apartments nor in the later plans of the Calhoun Beach Hotel as drafted by Chicago architect Charles Wheeler Nicol who designed the building that was built beginning in 1928. Perhaps at the time of the apartments' construction, and at the writing of the *Tribune* article, a structural connection between the apartments and the future hotel was planned but never came to fruition. What is also unknown is why Rose was not ultimately the architect of the Calhoun Beach Hotel. His last appearance in the Minneapolis city directory is in 1926, implying that a relocation may have prohibited him from continuing on the project. This is not a strong explanation, however, as Nicol, an out-of-town architect himself, designed the hotel.[80]

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[78] "Minneapolis on Wheels! 3,500 Families Moving to New Homes While Influx of New Residents Brings Construction of 35 Apartments," *Minneapolis Tribune*, June 28, 1925; Minneapolis Building Permits D173422 and D173423 (dated June 18, 1925), K18955 and K18956 (dated July 17, 1925), and F197353 and F197354 (dated September 2, 1925).

[79] Minneapolis City Council Proceedings, May 18, 1925; Minneapolis Building Permit B207773 (dated October 31, 1927) and B575010 (dated December 12, 1990); Perry E. Crosier, "Addition to Garage, Calhoun Beach Apartments, Calhoun Beach Holding Co.," architectural plans, available at Northwest Architectural Archives, Elmer L. Andersen Library, University of Minnesota, Minneapolis.

[80] "Minneapolis on Wheels!"; Alexander Fraser Rose, "The Calhoun Beach Hotel," and "Calhoun Beach Apartments" April 17, 25, and 29, 1925, architectural plans, available at Northwest Architectural Archives, Elmer L. Andersen Library, University of Minnesota, Minneapolis. According to historian Alan Lathrop, in 1930, Rose, "possibly a victim of the Great Depression, . . . was employed as a gardener in Alameda, California. Nothing more is known of his life and career after that and his place and date of death are unknown" (Alan K. Lathrop, *Minnesota Architects: A Biographical Dictionary* [Minneapolis: University of Minnesota Press, 2010], 187). Articles in the *New York Times*, however, indicate that Alexander F. Rose, the architect, conducted business in Minnesota and New York simultaneously, like Samuel Fleischer, who also had a branch of his company in New York. According to the *Times*, Rose opened an architectural firm in White Plains, New York, in 1911. It was later taken over by his son, William Allen, and by the 1960s was known as Rose, Beaton, Corsbie, Dearden and Crowe. After William's son, William Allen, Jr., joined his father, the firm was renamed Rose, Beaton, and Rose. ("Rent Brooklyn Suites," July 4, 1937, "William A. Rose," obituary, August 26, 1987, and "Miss Rose Is Wed to S. K. Musgrave," October 28,

Advertisements for the Calhoun Beach Apartments boasted that they "offer[ed] all the pleasures of a real lake home, bathing, boating and fishing at your very door" as well as "exclusive features including garage service." The wording of this advertisement underscores the importance of the Calhoun Beach Apartments in the development of the Chain of Lakes area. Now the upwardly mobile middle-class could enjoy living right on—not just within walking distance of or a streetcar ride from—the lakes, a privilege that had previously been reserved for the upper class.[81]

Among this middle class invited to move to the Chain of Lakes by Goldie area were Jewish residents like him. There had been a long-standing Jewish presence in the Twin Cities. The first synagogue was established in Saint Paul in 1856. Minneapolis's first synagogue, Temple Israel, was founded twenty-two years later. These pioneering residents were German Jews, and it was not until the 1880s that Russian and Eastern European Jews, fleeing persecution abroad, began to settle in the cities. Relations between the established Jews and their new brethren were tenuous at first, yet by 1900, Minneapolis had five thousand Jewish residents. Their settlement, however, was not met without conflict. By the turn of the twentieth century, Jews in Minnesota, especially those from Russia and Eastern Europe, had become accustomed to anti-Semitism. Part of this hostile mindset was manifested in *Caesar's Column*, a science-fiction novel written by Minnesota Populist leader Ignatius Donnelly that "characterized Jewish middlemen as social enemies." Also fanning the flames were fundamentalist religious leaders, such as Minnesotan evangelists William Bell Riley and Luke Rader, who preached hatred and fear.[82]

Although it could be found to some degree in Saint Paul, anti-Semitism was much more pronounced in Minneapolis. Unlike the economy of the capital city, which relied on outside investors, Minneapolis's "Yankee middle and upper classes stubbornly held themselves apart from immigrant newcomers, both in business and in social interaction, fostering the development of separately functioning ethnic subeconomies." Although Minneapolis's anti-Semitism was always present, Carey McWilliams, a lawyer and author of social issues, argued that "the exclusionist policy" barring Jews from many aspects of city life manifested itself after World War I. The timing of these policies, he explained, indicated a fear that social power would be taken from the "indigenous people." Jews, therefore, were essentially being prevented from benefiting as fully from the postwar prosperity as other citizens were.[83]

One particular way that the Jewish residents were excluded was by restricting the membership of social clubs and organizations. About this method, McWilliams explained: "[Social clubs] organize and regulate upward social mobility. . . . by refusing to admit certain individuals who wished to join it, [which] might prevent their rise into a higher society than they at the time occupied." Rabbi Maurice H. Lefkovits, who relocated to Minneapolis after World War I, astutely observed: "Minneapolis Jewry enjoys the painful distinction of being the lowest esteemed community in the land so far as the non-Jewish population of the city is concerned."[84]

1990, all from *New York Times*; John F. Gane, ed., *American Architects Directory,* 3rd ed. (New York: R. R. Bowker Company, 1955), 779, available at http://communities.aia.org/sites/hdoaa/wiki/Wiki%20Pages/1970%20American%20Architects%20Directory.aspx).

[81] "Before You Decide," classified advertisement, *Minneapolis Journal*, July 26, 1925.

[82] Albert G. Minda, *The Story of Temple Israel, Minneapolis, Minnesota: A Personal Account* (Minneapolis: Lund Press, 1971), 3; Hyman Berman, "Jews," in *They Chose Minnesota: A Survey of the State's Ethnic Groups*, edited by June Drenning Holmquist, 489–510 (Saint Paul: Minnesota Historical Society Press, 1981), 491–493, 500–501.

[83] Mary Lethert Wingerd, *Claiming the City: Politics, Faith, and the Power of Place in St. Paul* (Ithaca, N. Y.: Cornell University Press, 2001), 36, 38; Carey McWilliams, *A Mask for Privilege: Anti-Semitism in America* (Boston: Little, Brown and Company, 1948), 123–124.

[84] McWilliams, *A Mask for Privilege*, 116, 121; Berman, "Jews," 500–501; Lethert Wingerd, *Claiming the City*, 38; Rhoda Levin, *Images of America: Jewish Community of North Minneapolis* (Chicago: Arcadia Publishing, 2001), 40; Carey McWilliams, "Minneapolis: The Curious Twin," *Common Ground* (Autumn 1946): 61; Laura E. Weber, " 'Gentiles Preferred': Minneapolis Jews and Employment," *Minnesota History* 52 (Spring 1991): 170.

Jewish residents were also “kept in place” in certain neighborhoods by developers and owners who refused to sell to them. As a demand of—and a protection from—the rampant anti-Semitism, most Jewish residents of Eastern European and Russian descent lived in North Minneapolis during the early twentieth century. Therefore, Goldie’s “open-door” policy towards tenants was not without controversy. Many did not take kindly to the thought of having Jewish residents in the prestigious Chain of Lakes area. This is reflected in a 1946 letter to Goldie in which W. O. Watson of the American National Insurance Company wrote: “It was intimated to me that you were under considerable pressure for leases to Jewish people – while it should be no concern of mine I do think that leases to these people will certainly be detrimental to the operation of your property. . . . I think if you let one Jewish family in you are going to create a dissention among your other tenants which will react very unfavorably to your rental situation.”[85] It was economics, though, that stalled the work on the Calhoun Beach Hotel, now called the Calhoun Beach Club, so that it did not open until after World War II—in the thick of one of Minneapolis’s worst periods of anti-Semitism. Regardless, the Club was open to all.

With the Calhoun Beach Club, and with the apartments two decades earlier, Goldie achieved his goal of a housing development where many were welcome. The 1930 Minneapolis city directory lists names of various ethnicities, and at least seven of the units had heads of household that were Jewish and of Eastern European or Russian descent. This reflects the transition between the two world wars when the city’s Jewish population, which had been concentrated in North Minneapolis, began living in other neighborhoods, including the desirable areas near the lakes in South Minneapolis. After World War II, many moved to the western suburbs. With the Calhoun Beach Apartments, he also introduced the concept of high-end apartment hotel apartment living in the Chain of Lakes for Minneapolis residents of the Roaring Twenties—a plan he intended to continue with the Calhoun Beach Hotel, but which was frozen in place by the Great Depression’s financial effects on real estate speculation.

Evaluation

Much about the history of the Calhoun Beach Apartments is unknown. The two buildings are literally and figuratively in the shadow of the imposing and far more architecturally impressive Calhoun Beach Hotel. Considered particularly important for its design, the hotel was listed in the National Register in 2003 under *only* Criterion C as an architecturally significant example of an apartment hotel. Unfortunately, the historical merit of the building, its relationship to the neighboring buildings to the north, and the whole block’s connection to Harry Goldie as addressed in this evaluation was not considered in the nomination.

Much can be said about the role all three buildings played in the city’s history from the Roaring 1920s to the Post-World War II boom. The Calhoun Beach Apartment Buildings represent the first portion of Goldie’s vision for an egalitarian, upscale housing complex in the prestigious and exclusive Chain of Lakes area. Goldie, a Jew, appears to have been a popular and successful man in Minneapolis—a city known for its rampant anti-Semitism—first as a champion boxer, then as a boxing coach, then as a successful businessman. He worked as an insurance executive, an industry that usually had a closed door policy to Jews. He purchased land in the Chain of Lakes area, an area not welcoming to Jewish residents. Most impressively of all, he did this during the 1920s, a time of particularly intense anti-Semitism in Minneapolis. Restrictions that held others back seemed irrelevant to the gregarious Goldie as he envisioned a development on Lake Calhoun that was open to everyone regardless of background and that focused on health and wellness.

The apartments and hotel also provided upscale housing near the lakeshore with amenities, such as a parking garage, that appealed to middle-class tenants. It also promoted the revolutionary idea of an egalitarian housing development where a variety of people—especially Jewish residents like Goldie himself—could live without discrimination during a period where anti-Semitism in Minneapolis was steadily intensifying. As indicated by the 1946 letter from W. O. Watson, this is a policy he continued

[85] W. O. Watson to Harry S. Goldie, May 14, 1945, Jewish Historical Society of the Upper Midwest Archives.

twenty years later with the completion of the Calhoun Beach Hotel portion of the complex, even when the city was labeled the “capitol of anti-Semitism” in the United States.

Given the interrelationship between the Calhoun Beach Apartments and the Calhoun Beach Club, they should be considered together as eligible for the National Register under Criterion A with Social History as the area of significance. The Calhoun Beach Club is already listed in the National Register under Criterion C for the significance of its design.

The property has integrity of location, design, setting, materials, workmanship, and feeling.

Recommendation

The Calhoun Beach Apartments and the Calhoun Beach Club are recommended as eligible for the National Register under Criterion A with Social History as the area of significance. The period of significance extends from the construction of the apartments in 1925 to 1946, the year that the Calhoun Beach Club was completed.

4.1.7 Xerxes Avenue Historic District

Address: 2700 and 2800 Blocks of Xerxes Avenue South, 3020 West Twenty-eighth Street, and 2825 Cedar Lake Parkway, Minneapolis.

Property Description

The Xerxes Avenue Historic District is composed of the 2700 and 2800 residential blocks of Xerxes Avenue South, 2825 Cedar Lake Parkway, and 3020 West Twenty-eighth Street. This area is between Cedar Lake, Lake Calhoun, and Lake of the Isles. The 560-foot-long 2700 block, the north portion of the district, runs south from Cedar Lake Parkway, curving slightly to the west before intersecting with Twenty-eighth Street West. The 2800 block is 275 feet long and is straight, running due north and south. Its south end terminates at West Twenty-ninth Street.

Although there are no single-family houses in the district, the area is residential in feel because the apartment buildings are set back at least thirty feet from the street, are small in scale, and have space in between them. The landscape is dotted with large trees. The district contains twenty-three apartment buildings, all of which are contributing. Eleven have detached garages; six have attached garages. Four of the apartment buildings have detached garages that appear to have been built after the period of significance.

The apartment buildings are mostly two stories in height and exhibit a variety of styles. The majority of the buildings have five apartments, while the larger buildings on the 2800 block have nine apartments. Common facade materials are brick and stucco. All of the buildings have simple rectangular footprints. Most roofs are flat except for 2794, 2798, and 2816 Xerxes, which have hipped roofs, and 2800 Xerxes, which has end-gabled bays.

All of the properties within the Xerxes Avenue Historic District are contributing; however, the entire district does not fall within the survey area set by the APE. The following properties are within the district and the APE, and have been inventoried (historic names, if available, are used).

Map	Property Name	Address	Date
A	Apartment Building	2770 Xerxes Avenue	1938
B	Apartment Building	2776 Xerxes Avenue	1938
C	Apartment Building	2780 Xerxes Avenue	1938
D	Apartment Building	2786 Xerxes Avenue	1937
E	Apartment Building	2790 Xerxes Avenue	1936–1937
F	Duplex	2794 Xerxes Avenue	1936
G	Duplex	2798 Xerxes Avenue	1936
H	Apartment Building	2800 Xerxes Avenue	1922
I	Apartment Building	2806 Xerxes Avenue	1931
J	Cedar Apartments	2812 Xerxes Avenue	1931
K	Apartment Building	2816 Xerxes Avenue	1924
L	Le Rel Apartments	2817 Xerxes Avenue	1931
M	Alberton Apartments	2811 Xerxes Avenue	1931
N	Fleisher Duplex	2805 Xerxes Avenue	1936
O	Fleisher Duplex	2801 Xerxes Avenue	1936
R	Apartment Building	2793 Xerxes Avenue	1938
S	Apartment Building	2789 Xerxes Avenue	1938
T	Kenilworth Apartments	2783 Xerxes Avenue	1938
U	Kenilworth Apartments	2779 Xerxes Avenue	1938
V	Kenilworth Apartments	2775 Xerxes Avenue	1938
W	Apartment Building	2825 Cedar Lake Parkway	1938

The following properties are within the Xerxes Avenue Historic District, but are outside of the APE. As a result, they were not inventoried.

Map	Property Name	Address	Date
P	Apartment Building	3020 West Twenty-Eighth Street	1938
Q	Kenilworth Apartments	2797 Xerxes Avenue	1929

Map showing the boundaries of the Xerxes Avenue Historic District.
The properties are keyed into the list above.

Street view, 2700 Block of Xerxes Avenue South

Street view, 2800 Block of Xerxes Avenue South

2783 Xerxes Avenue South

2786 Xerxes Avenue South

2800 Xerxes Avenue South

2806 Xerxes Avenue South

History

The 1914 Minneapolis atlas indicates that, prior to World War I, there was no development on what are now the 2700 and 2800 blocks of Xerxes Avenue South. The first construction came in 1922 when John A. Nelson, president of the Nelson Brothers Paving and Construction Company, pulled a permit to build a stucco and brick apartment building at 2800 Xerxes. Although the building was not erected immediately, his decision would shape this section of Xerxes Avenue.[86]

The following year, Nelson submitted a plat for the “Nelson Bros. Addition to Minneapolis” that included his new apartment building, the land from the alley behind it east to Dean Parkway, and the land between West Twenty-eighth to West Twenty-ninth Streets. A group of people, including Alfred and Carrie Dean, platted the 2700 block the following year as the “Dean Boulevard Addition to Minneapolis.” Nelson built another apartment building three lots south of the first one, which was designed in a similar style by architect Perry Crosier.[87]

For some reason, building along this stretch of Xerxes Avenue stopped until C. A. Hansen constructed the C. W. Farnham-designed apartment building at 3020 West Twenty-eighth Street in 1929. The lack of development could possibly have been due to competition; apartments were being constructed at a feverish pace during the 1920s. The relatively out-of-the-way location might have been seen as a negative attribute for those dependent on the streetcar system. Another possible deterrent may have also been the neighborhood’s location at the juncture of two busy railroad lines.[88]

Two more years would pass before the area’s value as a residential location near the lakes would be fully appreciated and exploited. In 1931, a small building boom took place on the 2800 block of Xerxes Avenue, again led by John Nelson. Four new apartments were built at 2806, 2811, 2812, and 2817 Xerxes, three of which were owned by the Nelson-Enblom Company. The other was erected by apartment manager E. A. Beauchaine. All four were designed by Perry Crosier. Three are similar in style, while the building at 2806 is larger and particularly decorative.[89]

The Fleisher Brothers

The contractor for all four buildings, as well as for 2816 Xerxes five years previous, was the Fleisher and Son Company. This was one of the many ventures of Minneapolis contractor Louis Fleisher, a Jewish resident of North Minneapolis whose family emigrated from Eastern Europe around the turn of the century. His younger brother, Samuel, was also a contractor and ran a successful business, often working in partnership with architect Alexander F. Rose. The latter collaboration claimed to be “builders of Theaters, Apartments, Business Blocks, Warehouses . . . We are engineers, we make our own plans, we do our own construction work. We are prepared to figure on all forms of buildings, regardless of size or price.” Among its projects were the Lagoon and Axion Theaters.[90]

By 1917, Louis Fleisher had formed his own company, first called Fleisher and Huffman and, later, the Louis Fleisher Company. By the late 1910s and early 1920s, both brothers were involved in the construction of large apartment buildings in South Minneapolis. Most notably, Harry Goldie hired the

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86 *Atlas of Minneapolis Hennepin County Minnesota, Including parts of St. Louis Park and Golden Valley Township in Hennepin County, Also Part of Ramsey County Known as the Midway District* (Minneapolis: Minneapolis Real Estate Board, 1914), 57; Minneapolis Building Permit B165358 (dated December 4, 1922).

87 Plat information for “Nelson Brothers Addition to Minneapolis,” recorded June 5, 1923, and “Dean Boulevard Addition to Minneapolis,” recorded July 13, 1924; Minneapolis Building Permit B175029 (dated November 14, 1923).

88 Minneapolis Building Permit B217164 (dated July 9, 1929).

89 Minneapolis Building Permits B226157 (dated March 20, 1931), B226692 (dated April 15, 1931), B226891 (dated April 23, 1931), and B227991 (dated June 17, 1931).

90 *Davison’s Minneapolis City Directory, 1915* (Minneapolis: Minneapolis Directory Company); Fleisher Construction Company advertisement, *Minneapolis Tribune*, June 3, 1916.

Fleisher Construction Company, of which Samuel served as president, to build the Calhoun Beach Apartments, the first step in Goldie's plans for the Calhoun Beach Club.[91]

The Fleishers continued their construction work through the booming real estate years of the 1920s. While Louis's efforts focused on the Twin Cities area, Samuel extended his business to other cities. His business disappears from the city directories starting in 1927, and the 1930 U.S. Federal Census indicates that he was living in Chicago. His given occupation is "Contractor of Apartment Buildings." Meanwhile, Louis was living in Minneapolis and working as a house contractor.[92]

After John Nelson built 2790 Xerxes in 1937, Louis and Samuel Fleisher and their families developed all of the remaining apartments along these two blocks of Xerxes Avenue. Fanny Fleisher, wife of Louis, is listed as the owner on the building permits for the two stucco duplexes at 2801 and 2805 Xerxes. The 1936 buildings, which are mirror images of each other, were designed by Perry Crosier in the Streamline Moderne style. Two years later, Perry Crosier designed the duplexes at 2794 and 2798 for Harry S. Vermes, a Minneapolis jeweler married to Louis's daughter, Frances. Most of the development on the 2700 block was undertaken by Dean Boulevard Apartments.[93] The company's president was Seymour Katz. The vice president was his wife, Lillian, who was Samuel Fleisher's daughter. Some of the buildings were designed by William M. Purdy, a prominent Minneapolis architect. This was a notable departure from Crosier, with whom the Fleishers had a long-standing professional relationship. With the exception of 2783 Xerxes, Dean Boulevard Apartments took out the permits for all of its apartment buildings between October and December 1937. At times more than one permit was issued in a day.[94]

Small Apartment Buildings

The timing of this explosion of construction seems to coincide with events that created a perfect storm in Minneapolis for building small-scale apartments. Construction work during the Depression would have come to a complete standstill had Washington D. C. not recognized that reinvigorating the stagnated real estate market could help the economy. Part of the problem lay in the structure of mortgages prior to the 1930s. Most were short-term with very high interest rates and typically covered only a portion of the appraised value. This all changed in 1934 when the National Housing Act was passed and the Federal Housing Administration (FHA) was created. Its "Congressional popularity was due to the hope that it would alleviate unemployment in the construction industry." The FHA's key focus was single-family, owner-occupied houses.[95]

In 1937, the National Realty Appraisal Company of Philadelphia and New York surveyed various urban areas including Minneapolis and found that the real estate market was in "an upward trend." Although labor strikes had slowed sales over the previous months, that situation was "clearing up" and the fall months showed promise. The survey also noted that there was an "acute housing shortage" and rents were rising between 5 and 15 percent. The demand highlighted by this survey was very real. Between 1931 and 1935, the construction of multiple-unit structures averaged only 21,600 buildings per year.

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[91] *Davison's Minneapolis City Directory, 1917* (Minneapolis: Minneapolis Directory Company); "Louis Fleisher Company," advertisement, *Minneapolis Tribune*, March 19, 1922; "Oak Grove Apartment Hotel," advertisement, *Minneapolis Tribune*, June 15, 1920; Buckingham Apartment Hotel advertisement spread, *Minneapolis Tribune*, August 8, 1920; "Garfield Court Apartments," advertisement, *Minneapolis Tribune*, September 30, 1921; "$290,000 Apartment Building Planned," *Minneapolis Tribune*, October 15, 1922; "Large Apartments Feature New Building Being Constructed at Cost of $225,000," *Minneapolis Tribune*, November 26, 1922; "Minneapolis on Wheels! 3,500 Families Moving to New Homes While Influx of New Residents Brings Construction of 35 Apartments," *Minneapolis Tribune*, June 28, 1925.

[92] 1930 U.S. Federal Census, District 1934, Chicago, Cook County, Illinois, 2A; 1920 U.S. Federal Census, District 321, Minneapolis, Hennepin County, Minnesota, 3A.

[93] 2770, 2775, 2776, 2779, 2780, 2783, 2789, 2793, and 2797 Xerxes and 2825 Cedar Lake Parkway.

[94] Minneapolis Building Permits B242994 and B242995 (dated November 21, 1935); Articles of Incorporation of Dean Boulevard Apartments (dated October 14, 1937).

[95] Kenneth T. Jackson, "Federal Subsidy and the Suburban Dream: The First Quarter-Century of Government Intervention in the Housing Market," *Records of the Columbia Historical Society, Washington, D. C.* 50 (1980): 426.

Multiple-family housing starts had also dropped from 26.7 percent of total starts in 1928 to 13 percent in 1935.[96]

Noting this and the demand for rental housing, on February 3, 1938, the FHA "was given its first legislative authorization to assist in financing multifamily housing through the enactment of section 207 of the National Housing Act, as amended." The amendment allowed the FHA to insure the financing of multiple-property developments when the loans were obtained and work commenced, rather than after completion. Up to 80 percent of the total would be insured, but each loan could not be more than $200,000. This new legislation was explicitly meant to encourage the construction of rental properties that would help alleviate the housing shortage. The change had its intended effect with the Dean Boulevard Apartments group. Its articles of incorporation were amended to add another objective: to "apply for and obtain . . . from the Federal Housing Administration, pursuant to the National Housing Act, as amended, a Contract or Contracts of Mortgage Insurance covering bonds, notes, and other evidences of indebtedness.[97]

After Dean Boulevard Apartments completed the construction of its apartment houses, all but one of the lots on the 2700 and 2800 blocks were occupied by a small apartment building or duplex. In 1940, shortly after the completion of all construction, only ten of the 104 units were vacant. In 1946, that number had dropped to one vacancy.

Anti-Semitism in Minneapolis

The apartments on Xerxes were apparently a good investment for the Fleisher brothers, who, like most of the city's Jewish population, resided in North Minneapolis in the 1920s and early 1930s. Yet even with their long-standing presence in the city, Minneapolis's Jews had to contend with long-standing and intense anti-Semitism. Jews have a long-standing presence in the Twin Cities, with a synagogue being established as early as 1856 in Saint Paul. Immigration picked up after the Civil War, but it was not until the 1880s that Russian and Eastern European Jews, fleeing persecution abroad, began to settle in the cities. Relations between the established Jews and their new brethren were tenuous at first, yet by 1900, Minneapolis had five thousand Jewish residents. Their settlement, however, was not met without conflict. By the turn of the twentieth century, Jews in Minnesota had become accustomed to anti-Semitism. Part of this hostile mindset was manifested in *Caesar's Column*, a science-fiction novel written by Minnesota Populist leader Ignatius Donnelly that "characterized Jewish middlemen as social enemies." Also fanning the flames were fundamentalist religious leaders, such as Minnesotan evangelists William Bell Riley and Luke Rader, who preached hatred and fear.[98]

Although it could be found to some degree in Saint Paul, anti-Semitism was much more pronounced in Minneapolis. Unlike the economy of the capital city, which relied on outside investors, Minneapolis's "Yankee middle and upper classes stubbornly held themselves apart from immigrant newcomers, both in business and in social interaction, fostering the development of separately functioning ethnic subeconomies." Although Minneapolis's anti-Semitism was always present, Carey McWilliams, lawyer and author of social issues, argued that "the exclusionist policy" barring Jews from many aspects of city life truly manifested itself after World War I. The timing of these policies, he explained, indicated a fear that social power would be taken from the "indigenous people." Jews, therefore, were being prevented from benefiting from the postwar prosperity, lest they become too powerful a minority.[99]

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[96] "Finds Real Estate on Upward Trend," *New York Times*, August 15, 1937; Richard F. Babcock and Fred P. Bosselman, "Suburban Zoning and the Apartment Boom," *University of Pennsylvania Law Review* 111 (June 1963): 1050.

[97] B. T. Fitzpatrick, "FHA and FNMA Assistance for Multifamily Housing," *Law and Contemporary Problems* 32 (Summer 1967): 439; "Benefits for Home Owners," *New York Times*, February 5, 1938; Articles of Amendment to Articles of Incorporation of Dean Boulevard Apartments (dated August 31, 1938).

[98] Berman, "Jews," 491–493, 500–501.

[99] Mary Lethert Wingerd, *Claiming the City: Politics, Faith, and the Power of Place in St. Paul* (Ithaca, N. Y.: Cornell University Press, 2001), 36, 38; Carey McWilliams, *A Mask for Privilege: Anti-Semitism in America* (Boston: Little, Brown and Company, 1948), 123–124.

One particular way that the Jewish residents were excluded was by restricting the membership of social clubs. About this method, McWilliams explained: "[Social clubs] organize and regulate upward social mobility. . . . By refusing to admit certain individuals who wished to join it, [which] might prevent their rise into a higher society than they at the time occupied." He pointed out that, not only did such exclusion handicap economic development, it also deepened existing prejudice. Clubs with closed-door policies included the Kiwanis, the Lions, the Rotary, and the Toastmasters. The Minneapolis Automobile Club refused membership to Jews—a policy in direct contrast to the Saint Paul branch, which had a Jewish president. Although the Minneapolis Athletic Club did not go so far as to expel its current Jewish members, it did refuse to transfer memberships to the sons of deceased members. Such exclusion forced Jewish residents to start their own organizations, leading to the creation of the Oak Ridge Country Club. Rabbi Maurice H. Lefkovits, who relocated to Minneapolis after World War I, astutely observed: "Minneapolis Jewry enjoys the painful distinction of being the lowest esteemed community in the land so far as the non-Jewish population of the city is concerned."[100]

Exclusionism was practiced in other ways, such as through employment. Rarely were Jews given jobs as laborers nor were they allowed on the corporate ladder. Seldom, if ever, were they employed in retail or banking. As a result, many Jewish residents went into "independent careers" becoming doctors, small retail businessmen, or other professionals, yet even this was stifled when possible. Jewish businesses were boycotted and "many Jewish businessmen couldn't buy property insurance because of their supposed 'well-known tendency' to burn down their own businesses to collect." Others were refused business space in office buildings, and the Board of Realtors refused to accept Jewish agents.[101]

This anti-Semitism intensified during the 1920s and 1930s, fed partially by sensationalized media coverage of Minneapolis's "Jewish hoodlums and gangsters," such as Kid Cann, but the worst was yet to come. While Jews were excluded during an era of post-war prosperity, they were viciously attacked when the economy went sour. Anti-Semitism became a powerful weapon during the Depression, and Jews were often made a scapegoat for the failing economy and collapsed social system. This is most notably seen in example of the Silver Shirts, a pro-Nazi group organized in 1932 that had a "lusty approval of Adolph Hitler . . . and an appeal for an intensive anti-Jewish movement in this country"—a sentiment that found root in the soil of Minneapolis, which boasted eight hundred members. The group not only blamed Jews for the Depression but also for "unemployment, bank failure, Prohibition, racketeering, and widespread poverty." The conspiracy theories reached to the highest state government, particularly the gubernatorial term of Floyd B. Olson—a North Minneapolis resident who not only had Jewish state employees and office members but who also had the strong support of Jewish Minneapolitans. The Silver Shirts, along with Father Charles Coughlin's Social Justice movement, "attempted to equate Jewishness with radicalism and Communism." In 1938, a "whispering campaign" about incumbent governor Elmer Benson's supposed 'Jewish connections' helped elect Harold Stassen governor." In Minneapolis itself, Jews were almost entirely barred from local government.[102]

Even though Minneapolis's economy started to improve by 1936, Jewish residents saw no improvement in their treatment. Rather, according to historian Leonard Dinnerstein, anti-Semitism in the U. S. "reached its zenith" in the years leading up to World War II.[103]

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[100] McWilliams, *A Mask for Privilege*, 116, 121; Berman, "Jews," 500–501; Lethert Wingerd, *Claiming the City*, 38; Rhoda Levin, *Images of America: Jewish Community of North Minneapolis* (Chicago: Arcadia Publishing, 2001), 40; Carey McWilliams, "Minneapolis: The Curious Twin," *Common Ground* (Autumn 1946): 61; Laura E. Weber, " 'Gentiles Preferred': Minneapolis Jews and Employment," *Minnesota History* 52 (Spring 1991): 170.

[101] McWilliams, *A Mask for Privilege*, 124; Weber, " 'Gentiles Preferred,' " 170, 179; Levin, *Jewish Community of North Minneapolis*, 40; Berman, "Jews," 500–501.

[102] Weber, " 'Gentiles Preferred,' " 170, 172, 179; "Stand of Silver Shirts Outlined," *Spokane* (Wash.) *Daily Chronicle*, July 19, 1938; Berman, "Jews," 501; Levin, *Jewish Community of North Minneapolis*, 40; McWilliams, *A Mask for Privilege*, 40–46 and "The Curious Twin," 62.

[103] Weber, " 'Gentiles Preferred,' " 172, 179.

Jewish residents were also “kept in place” in certain neighborhoods by developers and owners who refused to sell to them. Calvin F. Schmid’s *Social Saga of Two Cities* noted that by 1934, the Jewish population was heavily concentrated in North Minneapolis, with smaller clusters near the intersections of Franklin and Cedar Avenues South and Hennepin and Thirty-fifth Avenues South. In the area that includes the 2700 and 2800 blocks of Xerxes Avenue South, the Jewish population was less than 1 percent, while that of “native-white of native parentage” was 50 to 59 percent. Schmid observed that the spatial distribution of the latter population was “in direct contrast” to that of the foreign-born population. The “native-whites” were most heavily concentrated in southwest Minneapolis and were typically “two or more generations removed from immigration . . . [and] had more time and opportunities to succeed economically.”[104]

Although the Depression was a particularly rough time for Jewish residents, it was also one of the forces that began to reshape long-standing residential boundaries. Discrimination did not pay the bills, and money was far too precious a commodity to reject because of social ideology dripping down from the upper class. As a result, “Jewish families shared fully in the general economic recovery [starting in 1936] and in the consequently improved standard of living.” Nearly 250 families left the north side to settle in the prestigious southwest portion of the city. Many, like the Fleishers, constructed new residences.[105]

The 1930s was also the tail end of the period of the country’s heavy immigration. Many Jewish residents, such as Frances Vermes and Lillian Katz, were second-generation Jewish citizens—people typically more Americanized than their immigrant parents. “As [Jewish] immigrants . . . assimilated into American life and improve[d] their economic status they tend[ed] to move away from these original settlements to more expensive and more desirable residential sections farther out.”[106]

Another notable feature of the apartment buildings on Xerxes is that many were built with detached or attached garages. As the nearest streetcar line ran along Lake Street, only two blocks away, these garages were indicative of the decline of the streetcar in favor of private automobiles. It also signified that the Xerxes clientele could afford to own a car. Residents would also be served by the bus lines that were rapidly expanding around the city. The apartment rates were another sign of middle-class occupants. A classified advertisement that ran in the *Minneapolis Journal* in October 1938 lists an open apartment at 2775 Xerxes renting for $70 per month, which, when adjusted for inflation, is equivalent to $1,082 in 2010.[107]

The design of the buildings is also important, especially when compared to the larger apartments erected a decade or two earlier along the Mall near the southeast end of Lake of the Isles. The Xerxes buildings are very small-scale—most having around five apartments and none having more than ten. Rather than filling the lot, each building has an attractive lawn surrounding it, giving the neighborhood a residential feel. Because the same architects designed many of the buildings, their appearance is compatible. The architects, though, made a point of giving each building a sense of individuality through the use of decorative elements on what would otherwise be a nondescript box. Even those with identical designs are varied by reversing the floor plan.

The city directories for Minneapolis give a good indication of who was living in the apartment buildings on Xerxes Avenue—in a word, everyone. While there is no predominate ethnicity, by 1935, many of the occupants are Jewish and of Eastern European-Russian descent. A number of them had lived on the north side in 1930. This trend continued until at least 1946.

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[104] Calvin F. Schmid, *Social Saga of Two Cities* (Minneapolis: Minneapolis Council of Social Agencies, 1937), 151–152, 164.
[105] Charles I. Cooper, “The Jews of Minneapolis and Their Christian Neighbors,” *Jewish Social Studies* 8 (January 1946): 34.
[106] Schmid, Social Saga of Two Cities, 153.
[107] “2775 Xerxes Ave. S,” classified advertisement, *Minneapolis Journal*, October 9, 1938. The 1930 census records for 2800 Xerxes note that the household of salesman George Anderson and his wife, Nan, employed Filipino immigrant Sixto Runez as a servant (1930 U.S. Federal Census, Minneapolis District 163, Hennepin County, Minnesota, Sheet 30A).

The city directories also reveal commercial activity in the area. In March 1938, Louis Fleisher went before the city council to request that a lot on West Twenty-Eighth Street be included in a commercial district rather than a multiple dwelling district. This was eventually approved. At this same meeting, his wife, Fanny, and a group of others requested that West Twenty-Eighth be extended across the Minneapolis and Saint Louis Railroad's tracks. Although referred to a committee, this never occurred. On the rezoned lot, Louis's son, Manuel, built a 75-foot by 6-foot by 12-foot brick-veneered store building at a cost of $4,000. The 1939 directory indicates that this address (3112 West Twenty-Eighth) was a grocery store run by Robert Leventhal. Benjamin Tolchiner ran a pharmacy and resided in an identical building at 3114–3116 West Twenty-Eighth. Both Leventhal and Tolchiner were in their late twenties, Jewish, of Russian descent, and had been residents of the north side in 1930.[108]

On August 29, 1938, Manuel Fleisher received a permit for a building at 3130 West Twenty-eight Street, near the railroad tracks. This 14-foot by 28-foot by 9-foot frame building became the office of the Calhoun Building Company, another one of Louis Fleisher's business ventures. He served as president, Manuel was vice-president, and Louis's daughter, Marion, was secretary. Manuel was also the manager of the Fleisher Engineering and Construction Company, his uncle Samuel's successful business. The patriarchs also lived in the neighborhood. In the late 1930s, Louis resided at 2797 Xerxes Avenue, one of the many apartment buildings constructed by Dean Boulevard Apartments, while Samuel was apparently at 2775 Xerxes in 1946.[109]

Manuel did additional work on West Twenty-eighth Street in 1938, obtaining building permits on October 4 to construct two one-story, brick-veneered store buildings with dwellings at the rear. Both buildings were 62 feet long and 10 feet tall. The front facade of 3116–3118 was 25 feet wide, while 3120 was 30.5 feet wide. The 1939 directory notes that Stuart Bertram lived at 3118 and Julia Reichel ran a beauty parlor at 3120.[110]

The Calhoun Building Company stopped appearing in the directory around 1943, having either closed or relocated outside of the city. That same year, Samuel Fleisher and F. S. Sigal were authorized by the stockholders of Dean Boulevard Apartments to liquidate the company's property and assets among its stockholders.[111]

According to Minneapolis city directories, by 1940, Manuel, Louis, and Marion Fleisher as well as Harry and Frances Vermes had relocated to Saint Louis Park—a suburb adjacent to the city's southwest boundary. It is not surprising that Jewish residents left Minneapolis in droves after World War II. Part of this exodus was motivated by the countrywide suburban building boom, but the main reason appears to have been more troublesome. Anti-Semitism in Minnesota had eased during World War II, yet, ironically, after returning from fighting a war against the Nazis, whose genocidal plans for the Jews were well-known, anti-Semitism in Minneapolis returned to prewar intensity. Many of the social clubs still practiced exclusionism. Jewish doctors had so much difficulty receiving residencies that, in 1948, the community was compelled to build Mount Sinai, a Jewish hospital. It was in this postwar environment that Carey McWilliams wrote the infamous line that affirmed and publicized the degree of the city's anti-Semitism. In

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[108] Minneapolis Building Permit B252563 (dated April 1, 1938); *Minneapolis Directory Company's Minneapolis (Minnesota) City Directory* (Minneapolis: Minneapolis Directory Company). Ben Morris Tolchiner graduated from the University of Minnesota with a pharmaceutical degree in the winter of 1932 (University of Minnesota Digital Conservancy, "Commencement Convocation Winter Quarter, 1932," pamphlet, http://conservancy.umn.edu/bitstream/57549/1/1932-commencement.pdf (accessed December 8, 2010), 17).

[109] Minneapolis Building Permit B254706 (dated August 29, 1938); *Minneapolis Directory Company's Minneapolis (Minnesota) City Directory, 1939* (Minneapolis: Minneapolis Directory Company).

[110] Minneapolis Building Permits B255341 and B255342 dated (October 4, 1938); 1939 Minneapolis City Directory.

[111] *Minneapolis Directory Company's Minneapolis (Minnesota) City Directory* (Minneapolis: Minneapolis Directory Company, 1941); Certificate of Adoption of Resolution for Dissolution of Dean Boulevard Apartments, Inc. (dated April 20, 1943).

his 1946 article, “Minneapolis: The Curious Twin,” McWilliams unfavorably described the American city with terminology saved for the country’s communist enemies, stating: “On might even say, with a measuring of justification that Minneapolis is the capitol [*sic*] of anti-Semitism in the United States. In almost every walk of life, an ‘iron curtain’ separates Jews from non-Jews in Minneapolis. Nor is this ‘iron curtain; a matter of recent origin; on the contrary it seems to have always existed.”[112]

In response to this information, Minneapolis Mayor Hubert H. Humphrey appointed a task force to investigate these claims. The allegations of anti-Semitism, as well as discrimination against African Americans and Indians, were confirmed. Humphrey thus transformed the task force into the Mayor’s Council on Human Relations, which passed ordinances prohibiting discrimination, yet many Jewish families had already left the city. Saint Louis Park, which lacked the exclusionist policies found in other suburbs, was a popular destination, earning it the tongue-in-cheek nickname “Saint Jewish Park.” There, the Jewish population, no longer a minority, was able to exist in a community free of the anti-Semitism under which they had so long been constrained.[113]

Evaluation

The properties on the 2700 and 2800 blocks of Xerxes Avenue and the blocks to the west on Twenty-eighth Street are significant under Criterion A for Social History. Since World War I, the construction of apartments allowed renters to live in the prestigious Chain of Lakes area. The Xerxes Avenue Historic District represents an era when residents were moving to southwest Minneapolis from other areas of the city. Some of the new arrivals were members of religious and ethnic groups that were not previously welcome. These residents included real estate developers in the area, such as the Fleisher brothers, who were Jewish residents of North Minneapolis. They and their families were heavily involved in the development of the district, which served as a stepping stone between Jewish-populated North Minneapolis and the suburbs.

Although not in the Southwest Transitway’s APE, the apartment buildings at 2797 Xerxes Avenue South and 3020 West Twenty-eighth Street are included in the district and appear to be contributing.

A 1938 aerial photograph shows four buildings along the 3100 block of West Twenty-eighth Street. A small building west of 3120, which is presumably 3130, is no longer extant. The photograph also shows a large garage at the rear of 3112. A garage is currently in this location. Although Hennepin County gives this structure a construction date of 1938, no building permits are available to verify this. The existing garage has a much shorter footprint than the garage in the aerial photograph, indicating that if it is the original garage, it has been drastically altered. Because the original owner is not known, the construction date is uncertain, and alterations appear to have affected the building’s integrity, it is not included in the district.

The small commercial strip along West Twenty-eighth Street was considered for inclusion in the district because of its relationship to the apartment buildings along Xerxes and the story it told about the development of the district. Unlike retail nodes in older neighborhoods, such as the Lyndale-Lake area, this small commercial district did not grow organically around a busy streetcar stop. Rather, it was strategically placed for the convenience of local residents by those involved in developing the neighborhood—an early forerunner of retail centers in suburbia. Unfortunately, the integrity of this commercial area is compromised. The building at 3112 West Twenty-eighth Street, the first constructed by Manuel Fleisher, received a substantial addition along its east wall in 1974. Only the brick front facade of the commercial building at 3114 (which originally had the address 3116) still stands; a new house has been erected further back on the lot. The two storefronts at 3120 appear to have been altered at an unknown date. As a result of these integrity issues, the commercial area was excluded from the historic district.

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[112] 1941 Minneapolis City Directory; Weber, “ ‘Gentiles Preferred,’ ”179; Berman, “Jews,” 500–501; McWilliams, “The Curious Twin,” 61.
[113] Saint Louis Park Historical Society, “Jewish Migration to St. Louis Park,” http://www.slphistory.org/history/jewishmigration.asp (accessed January 17, 2010).

The Xerxes Avenue Historic District demonstrates the evolving role of Jewish residents in Minneapolis during the 1930s. Decades of anti-Semitic practices in Minneapolis increased after World War I and came to a head in the 1930s. Although groups such as the Silver Shirts placed the blame for the Depression on Jews, thereby intensifying their mistreatment, the Depression was also a catalyst for changes in the social structure. Many Jewish families left the north side and moved to areas of the city not previously open to them.

Persecution was still a problem in the years leading up to World War II, and Xerxes Avenue, as well as its adjacent commercial district gives evidence of a tight-knit community that had many members coming from North Minneapolis. The district is a snapshot in time when Jewish residents were beginning to experience freedoms previously barred to them—such as living in the Chain of Lakes area of which Xerxes Avenue is part—yet who chose to build a community as a protection against the city's ingrained anti-Semitic policies. The time period is truncated by the rise of anti-Semitism after the Second World War, which drove many Jewish residents outside of city's boundaries.

Recommendation

The Xerxes Avenue Historic District is recommended as eligible for the National Register. The district is significant under Criterion A for Social History. The period of significance is 1936 to 1946, which encompasses the period of construction in which the Fleischers were most heavily involved and ends after World War II, when the exodus to the suburbs began.

4.1.8 Gertrude Purdy House

MnSHPO Inventory Number: HE-MPC-6020
Address: 2831 Benton Boulevard, Minneapolis

Property Description

The Gertrude Purdy House is two-story single-family stucco dwelling that is Tudor Revival in style. The wood-shingle roof is side-gabled with dormers and has curved eaves that resemble a thatched roof. A large chimney with some stone inlays sits on the west side of front (north) facade. Stone is also inlaid around the main entrance and along some parts of the foundation. Most windows are two lights wide and of varying heights.

History

The house's building permit, dated March 4, 1925, listed "G. F. Purdy" as the owner and described the dwelling as a 45-foot by 29-foot "tile dwelling." William W. Purdy, a prominent local architect, is the house's architect and builder. Neither "Gertrude Purdy" nor "G. F. Purdy" appears in the 1920 or 1930 United States federal census as living anywhere in the Twin Cities. The name is also absent from Minneapolis and Saint Paul city directories.[114]

A building permit dated July 12, 1928, notes that the house was to receive a 15-foot by 14-foot two-story stucco addition at its rear. "H. E. Prudy" (presumably a misspelling) is named as the owner, William W. Purdy is again the architect, and construction was to be undertaken by the J. L. Robinson Company. The 1926 Minneapolis city directory confirms that a Harold E. Purdy lived at 2831 Benton Boulevard. Harold, a supervisor at the Standard Oil Company, lived in the house at the time the new addition was constructed. The 1930 census, however, shows Edward Sullivan, an automobile salesmen, his wife, Magdaline, their two children, and a twenty-year-old servant renting 2831 Benton Boulevard.[115]

Evaluation

No information could be found about Gertrude Purdy, so she does not appear to have played an important role in Minneapolis's history. None of the other owners or occupants appear to be significant.

Although the house has very high integrity and the design is an interesting interpretation of the early twentieth-century Tudor Revival style, it is one of many Tudor Revival houses constructed in the Chain of Lakes area during the 1920s, some of which are located on the same street. William Purdy was responsible for the design of many houses in Minneapolis, adopting a wide range of styles. Without conducting a definitive study of his work, it is not possible to evaluate the house in relationship to his other houses, but it seems unlikely that it is the best example of his practice. It has not been possible to determine his relationship to the Purdys who occupied the house.

Recommendation

This property does not appear to meet any of the National Register criteria and is not recommended for designation.

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[114] Minneapolis Building Permit B185843 (dated March 4, 1925).
[115] Minneapolis Building Permit B211683 (dated July 12, 1928).

4.1.9 House

MnSHPO Inventory Number: HE-MPC-6625
Address: 2429 Sheridan Avenue South, Minneapolis

Property Description

The house is one-and-one-half stories with a steep side-gabled roof with exposed rafter tails. The partial front porch is tucked under the sweeping roof. The porch has stuccoed walls and batten wood posts that extend to a heavy wood cornice. Part of the wall projects out from the building and slopes down to a slightly curved staircase wall. The staircase leads up to the porch. The other part of the first story has a group of four sixteen-over-one windows. Two dormers project from the roof. One has a hipped roof and a pair of windows. The other has a front-gabled roof with a large opening for a recessed balcony edged by a balustrade of narrow spindles; it looks out of character and may have been added later. The lower half of the house is stuccoed and the upper portion has narrow clapboard siding. A large, stuccoed chimney rises from the roof.

A small, gable-roofed, free-standing garage is located at the rear of the property.

History

This house was built in 1909 by contractor J. H. James and Company. Apparently, Mr. and Mrs. S. Howard Brown, along with Mrs. A. E. Brown, were the first residents of this house. S. Howard was a music teacher at the Kimball Building. In 1915, a concrete-block garage was added to the property. By 1930, Charles H. and Ida Wingate lived there. No occupation was listed for Charles in the directory.[116]

Evaluation

The house is an example of Craftsman style, but is not particularly noteworthy.

Recommendation

The property is recommended as not eligible for listing in the National Register.

[116] *Dual City Blue Book for 1911–1912* (Saint Paul: R. L. Polk and Company, 1911); *Minneapolis Directory Company's Minneapolis (Minnesota) City Directory* (Minneapolis: Minneapolis Directory Company, 1930); Minneapolis Building Permits B80787 (dated April 17, 1909), B115653 (dated May 18, 1915), and B316256 (dated September 18, 1950).

4.1.10 House

MnSHPO Inventory Number: HE-MPC-6624
Address: 2215 Sheridan Avenue South, Minneapolis

Property Description

The house is two stories and is in the Prairie Style. The walls are clad in cream-colored stucco with raised decoration under the first and second stories. Large stucco-covered piers flank the stairs leading up to the entrance stoop, which is centered in the facade. The entry projects out slightly from the rest of the building. It is protected by broad, flat eaves topped by a stuccoed parapet. Two sets of two windows flank the entrance. On the north end of the building, a one-story addition, which is set back from the facade, also has two windows. Like the entrance bay, the roofline of the addition has broad, flat eaves with a parapet wall. Engaged, stucco-covered piers sit on the first-story corners of the building. The windows on the second story are in two symmetrical groups of three. All of the windows appear to be casement sash with multiple lights in a rectangular pattern. The storm windows, which have a lighter-colored frame, are noticeable. Like the lower stories, the top of the building is capped by a parapet wall and wide eaves. A brick chimney projects from the south end of the roof.

A small, flat-roofed, stuccoed garage is located at the rear of the property.

History

The house and a matching garage were built in 1916 by M. M. Rosenstein, who acted as the contractor. A room was added to the rear of the dwelling in 1985, but the original design is otherwise extant. The first owners were Mr. and Mrs. John Z. Young and H. M. Young. John was secretary of the Central Western Credit Union. By 1930, Albert and Ruth Scriver owned the house. Albert was a partner in the Scriver-Andrews Warehouse at 740 North Washington Avenue. The Scrivers owned the house into the late 1960s and have the longest association with the property.[117]

Evaluation

This Prairie-style house stands out in Kenwood where most houses exhibit Queen Anne, Craftsman, or various period revival styles. Because the architectural style is rare in the neighborhood, the property was evaluated under Criterion C for architectural significance. No architect is listed on the building permit, making it unlikely that the house was designed by one of the more prominent Prairie-style architects. It is difficult to assess the significance of the property in the local context of Prairie-style architecture because there is not sufficient scholarly research and evaluation covering that period of design in Minneapolis. The building also shows signs of deferred maintenance, which affects its historic integrity. As a result, a case cannot be made for considering the building significant under Criterion C.

Recommendation

The house is recommended as not eligible for listing in the National Register for architectural significance under Criterion C.

[117] *Dual City Blue Book for 1917–1918* (Saint Paul: R. L. Polk and Company, 1917); *Minneapolis Directory Company's Minneapolis (Minnesota) City Directory*, 1930 (Minneapolis: Minneapolis Directory Company); Minneapolis Building Permits B119676 (dated January 8, 1916), B123314 (dated July 26, 1916), and B539722 (dated October 2, 1985).

4.1.11 E. G. Wallof House

MnSHPO Inventory Number: HE-MPC-6623
Address: 2200 Sheridan Avenue South, Minneapolis

Property Description

The house is two-and-one-half stories with a large front-gabled roof that is intersected by several roof dormers and a conical roof above an engaged tower on the front corner. The front facade is dominated by a large porch that wraps around from the front to the side of the house, curving around the base of the tower section. The porch walls are stone and are topped by small columns, some of which have carved capitals, that support the porch roof. Brackets line the underside of the porch eaves. The same brackets are also used on the eaves of the main roof. The first story of the front facade is clad in the same stone as the porch. Large openings hold plate-glass windows with leaded-glass transoms. The second story, which flares out from the first story, is covered with narrow clapboard siding painted a reddish-pink. The upper light of the one-over-one sash windows is shorter than the lower sash. A recessed opening centered above the entrance to the house holds a shallow balcony. Double doors, topped by a large transom window, lead out to the balcony. Beneath the gable, a round-arched window is flanked by two smaller rectangular windows. All of the windows have leaded glass. The round arch is repeated in wood trim that extends above the openings. Windows in the tower and roof dormers are one-over-one sash. These upper sections are also sided with clapboards that vary in width from narrow to wide.

The building was enlarged in 2006–2007 with a two-story addition to the rear that nearly doubled the footprint of the house. The addition was executed in the same style of the house and blends with the original seamlessly. The house, however, appears much larger than a late-nineteenth century house would have been, especially in the Kenwood area. A two-story garage that resembles a carriage house was added to the rear of the property in 1996.

2200 Sheridan today (above) and in about 1895 (below).
The historic photograph was taken by William Wallof.
(Minnesota Historical Society Collections)

History

According to architectural historian Elizabeth Vandam, this house was designed by architect Harry Wild Jones and built for Edward and Ida Wallof and their family in 1891. Contractor N. Campbell erected the house and a barn on the property. Wallof was president of the E. G. Wallof Machine Works. The family had moved on by the 1930s when Dr. Kristian R. Egilsrud, an instructor at the University of Minnesota, lived in the house. In 1957, the dwelling was converted into a duplex with sleeping rooms on the third floor only. The house was converted back to a single-family residence in 2005. As noted in the building description, the most recent owners, the Noel Family, added a large addition to the rear of the property in 2005.[118]

Evaluation

The house was built shortly after Kenwood was platted, making it part of the first wave of development in the area. Vandam's book contains photographs of this handsome Queen Anne style house under construction and completed. While the original part of the structure has been meticulously restored, the large addition to the rear, including a single-story porch extension on the prominent north side, has doubled its size. This radical change of scale has altered the historic character and design of the house. Furthermore, the addition so carefully copies the design of the original that it is indistinguishable, violating Secretary of the Interior's Standard 9, which requires new work to be differentiated from the old to avoid creating a false sense of history.

Recommendation

The house is recommended as not eligible for listing in the National Register because its integrity has been compromised by alterations.

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[118] Elizabeth A. Vandam, *Harry Wild Jones: American Architect* (Minneapolis: Nodin Press, 2008), 44, 128; *Davison's Minneapolis City Directory for 1894–1895* (Minneapolis: C. R. Davison, 1894); *Minneapolis Directory Company's Minneapolis (Minnesota) City Directory, 1930* (Minneapolis: Minneapolis Directory Company); Minneapolis Building Permits B26375 (dated October 2, 1891), B27797 (dated May 10, 1892), B117032 (dated July 21, 1915), B358935 (dated August 27, 1957), B631845 (dated July 29, 1996), REM3037999 (dated September 28, 2005), and REM3040550 (dated March 30, 2006).

4.1.12 Willard Morse House

MnSHPO Inventory Number: HE-MPC-16897
Address: 1976 Sheridan Avenue South, Minneapolis

Property Description

The house is two-and-one-half stories with a cross-gabled roof. The front facade is dominated by a full-width front porch on the first story that supports a smaller screened porch on the second story. The front-gabled roof of the house rises directly from the roof of the second-story porch. The walls are clad in two widths of clapboard siding painted a light gray-green. The trim on the house is painted white and gray. Most of the windows on the house are one-over-one sash. A large plate-glass window surrounded by a transom and sidelights is also located on the first story. A substantial bay-window addition was built in 1991, and a third story appears to have been added to the rear of the house in 1997.

A double-car garage with a front-gabled roof is situated at the rear of the property.

History

The house was built in 1889 for B. R. Coppage by contractor T. P. Healy. Coppage also built a barn later that year. By 1894, the Willard Morse family occupied the house. Morse was the proprietor of the Minneapolis Towel Exchange. By 1907, Willard had died but his widow, Lydia, was still living in the house with her daughter. The building was converted into a duplex by owner S. E. Griswold in 1923. By 1930, Henry Danforth and his wife, Alice, lived in the house. Danforth was a salesman for the Krauter Surgical Company. They added a free-standing garage in 1932.[119]

Evaluation

The house is a good example of the Queen Anne style as constructed by local building T. P. Healy, but better examples of Healy's work exist in a historic district in another part of the city. There are also better examples of the Queen Anne style in the Kenwood area.

Recommendation

The property is recommended as not eligible for listing in the National Register.

[119] *Davison's Minneapolis City Directory for 1894–1895* (Minneapolis: C. R. Davison, 1894); *Minneapolis Directory Company's Minneapolis (Minnesota) City Directory*, 1930 (Minneapolis: Minneapolis Directory Company); Minneapolis Building Permits B18834 (dated May 22, 1889), B18835 (dated May 22, 1889), B166148 (dated February 20, 1923), B230960 (dated January 21, 1932), and B243928 (dated April 29, 1936).