4 Transportation Analysis and Effects

4.0 Introduction

This chapter discusses the transportation-related analysis and effects associated with the No Build Alternative and the Southwest Light Rail Transit (LRT) Project (Project).[1] This chapter includes six sections, each of which provides an overview of applicable methods and regulations, a description of the affected environment, an analysis of the transportation-related consequences that will result from the Project, and committed mitigation measures to address transportation-related adverse impacts. The analysis of impacts in each section covers long-term and short-term (construction) direct and indirect impacts. Section 3.17 addresses transportation-related cumulative impacts related to the Project. This chapter includes the following sections:

4.1 Transit
4.2 Roadway and Traffic
4.3 Parking
4.4 Freight
4.5 Pedestrian and Bicycle
4.6 Safety and Security

Chapter 2 provides a description of the No Build Alternative and of the Project, both of which were used as the basis for the analysis within this chapter. Construction activities that will be associated with the Project are also described in Chapter 2. Chapter 3 addresses the environmental-related analysis and effects associated with the No Build Alternative and the Project that are not directly related to transportation. Appendix E includes the Preliminary Engineering Plans for the Project and illustrates the extent of long-term and temporary construction-related improvements that will result from the Project.

Following is a list and definition of key terms used throughout this chapter:

- ***Long-term impacts*** will continue to occur after construction is complete
- ***Short-term impacts*** will be associated with construction activities and will be temporary
- ***Direct impacts*** will occur at the same time and place as the proposed action
- ***Indirect impacts*** will occur later in time or will be further removed in distance from the proposed action
- ***Study area*** is the area where the impact analysis focused on, specific to each transportation category
- ***Limits of disturbance*** is the area where the Project will result in permanent or temporary ground disturbances
- ***Avoidance*** is the act of avoiding impacts to or keeping away from something or someone
- ***Minimization*** is a measure to reduce the severity of adverse impacts
- ***Mitigation*** is a measure to alleviate adverse impacts that remain after minimization

A. Overview of the Project's Impacts

Table 4.0-1 provides a summary of the Project's impacts for each transportation category within this chapter. Long-term and short-term impacts, project avoidance and minimization commitments, and

[1] The Project, as evaluated in this Final EIS, includes both the Locally Preferred Alternative (LPA) and the Locally Requested Capital Investments (LRCIs) described in Sections 2.1.1 and 2.1.2. Exhibit 2.1-6 conceptually shows the components of the Project. As described in Section 2.1.1, the Eden Prairie Town Center Station and associated improvements are deferred and are not expected to be in place when the Project opens in 2020. The station and associated improvements are planned to be in place by 2040.

mitigation measures are identified for each transportation category. See the corresponding sections of Chapter 4 for a more detailed description of the Project's anticipated impacts, avoidance and minimization commitments, and mitigation measures, as well as exhibits illustrating geographic features referenced in the table. Unless otherwise noted in this chapter's sections, there have been no major changes in the environmental analyses since publication of the Supplemental Draft EIS.

B. Overview of the No Build Alternative's Impacts

This section provides a consolidated discussion of the No Build Alternative.[2] It includes an overview by transportation category of changes in existing conditions compared to conditions under the No Build Alternative in 2040. The No Build Alternative represents future conditions in 2040 within the corridor if the Project is not implemented and it provides the basis against which the Project is compared. The definition of the No Build Alternative includes all the proposed and funded projects in the TPP[3] except the Project. That is, the No Build Alternative only differs from the Project in that the No Build Alternative does not include the construction and operation of the Project. Section 2.1.2 provides a more detailed description of the No Build Alternative, and Chapters 5 and 6 of the TPP list and illustrate respectively the funded highway and transit projects in the 2040 TPP that are included in the No Build Alternative (identified as Current Revenue Scenario Investments).

Following are some of the projects included in the No Build (2040) transportation networks that are used for travel demand forecasting and related analyses but that are not included in the existing (2010) transportation networks:

- Highways
  - I-35W Southbound from I-94 to 46th Street
  - Highway 100 from 36th Street to Cedar Lake Road
  - I-494 Capacity Enhancements
  - Reconstruction of the I-494/Highway 169 Interchange
- Transit
  - METRO Gold Line
  - METRO Red Line Extension
  - A-Line, Snelling Avenue Arterial Bus Rapid Transit
  - C-Line, Penn Avenue Arterial Bus Rapid Transit
  - Chicago Emerson-Fremont Arterial Bus Rapid Transit

Following is a summary of conditions under the No Build Alternative for the transportation categories addressed in this chapter, assessing differences under the No Build Alternative compared to the Project and describing key changes from existing conditions to conditions under the No Build Alternative in 2040.[4]

- **Public Transportation.** Annual transit vehicle hours and miles would increase by nearly 1 percent per year between the existing level of service and the 2040 No Build Alternative. While many routes in the corridor would undergo no change or changes in service frequency, Routes 12, 17, 604, and 614 would see major changes. For Routes 12 and 17, service frequency would increase and service hours would be

[2] This section addresses conditions under the No Build alternative for the six transportation categories addressed in this chapter. Sections 4.1 Public Transportation and 4.2 Roadways and Traffic also provide a quantitative comparison of the Project and the No Build Alternative. Chapter 3 addresses 16 environmental categories under the No Build Alternative and the Project.

[3] If those projects are implemented, the sponsors of those projects would be responsible for complying with applicable federal and state environmental requirements, such as the National Environmental Policy Act (NEPA) and the Minnesota Environmental Policy Act (MEPA), including disclosure of the projects' environmental impacts.

[4] The study areas referenced in this summary are defined in the transportation categories' respective *Regulatory Context and Methodology* sections.

extended. For Route 604, weekend service would be added. For Route 614, Sunday service would be added. Additionally, one new crosstown route (Route 620) to connect Hopkins and Eden Prairie, one new circulating loop route (Route 26) in North Minneapolis, and three new arterial bus rapid transit (BRT) lines would be added to existing service. SouthWest Transit (Routes 684 – 699) would add service on seven routes. See Exhibit 4.1-4, which illustrates the No Build Alternative bus operation plan. The introduction of arterial bus rapid transit on the C line and on Fremont and Emerson Avenues would decrease the frequency of service on Route 5 and 19 to every 30 minutes.

As noted in Table 4.1-2, there would be approximately 94,340 regional average weekday transit trips (originating rides) in 2040 under the No Build Alternative, compared to approximately 56,910 transit trips in 2010. And as noted in Table 4.1-4, overall average weekday peak direction transit mode share between the corridor and downtown Minneapolis should increase from approximately 18 percent in 2010 to approximately 25 percent under the No Build Alternative in 2040. Existing and future travel times for trips connecting Eden Prairie, Minnetonka, Hopkins, and St. Louis Park with each other and Minneapolis confirm the adverse effects of congestion and circuitous travel on reliable bus service as compared to private vehicle travel. Examples of existing (2010) and No Build Alternative (2040) average weekday bus and automobile travel times in the peak evening travel hour can be found in Table 1.6-1.

- **Roadways and Traffic.** The Metropolitan Council 2040 TPP indicates that the existing roadway network is expected to experience a substantial increase in vehicle demand by the year 2040. In 2010, the regional vehicle miles traveled (VMT)[5] on the regional roadway network was approximately 72.9 million daily VMT. By 2040, the regional VMT is forecast to increase approximately 23 percent to 89.4 million daily VMT. Table 4.2-2 shows the existing regional population and regional travel demand on the roadway network in 2010 (actual)[6] and 2040 (forecast), in terms of average weekday vehicle trips, daily VMT, and daily VMT per resident. Exhibit 4.2-2 illustrates the substantial increase in congestion on principal arterials in the region by 2040, compared to 2013. Exhibit 4.2-3 illustrates existing and No Build Alternative average daily traffic volumes in the study area (2013 and 2040, respectively); all of those traffic volumes are projected to increase from 2013 to 2040.

  According to the Metropolitan Council Transportation Division, travel times from Eden Prairie for cars are expected to increase by over 10 percent under the No Build Alternative, from 30 minutes in 2010 to 34 minutes in 2040 during peak periods. For example, an automobile trip during the p.m. peak hour from downtown Minneapolis or St. Paul to Eden Prairie is estimated to increase by approximately 9 percent and 15 percent by 2040, respectively, compared to existing conditions (changing from approximately 27.0 minutes to 29.5 minutes and from 35.3 to 60.1 minutes, respectively). Further, a reverse commute from the Opus development in Minnetonka and Eden Prairie to North Minneapolis during the p.m. peak hour in 2040 is projected to increase by approximately 15 percent and 18 percent, respectively (changing from 25.7 minutes to 29.7 minutes and from 30.8 minutes to 36.4 minutes, respectively). As shown in Table 4.2-3, nine intersections in the study area would operate at level of service (LOS) E or F in 2040 under the No Build Alternative, compared to two intersections in 2014.

- **Parking.** Under the No Build Alternative, there would be no displacement of on-street and off-street parking spaces, because the Project would not be constructed. There would also be no new park-and-ride lots associated with new light rail stations in the corridor. Other transportation and development projects that would occur under the No Build Alternative could affect existing on-street and off-street parking supply and demand, depending on the type and location of the project. Development projects will be required to comply with applicable related regulations, such as minimum off-street parking requirements for commercial developments.

[5] VMT is a measurement of miles traveled by vehicles in a specified region for a specified time period. One vehicle traveling one mile equals one VMT.

[6] Based on data included in the 2040 TPP (2015). The base year for the analysis in this document is 2010.

- **Freight Rail.** Under the No Build Alternative, there would be no direct changes to freight rail facilities and operations in the corridor, because the light rail would not be implemented in the corridor. Existing freight rail facilities and operating conditions would continue (see Table 4.4-1), and changes to those conditions under the No Build Alternative in 2040 would be the result of changes in freight movement market conditions and decisions by freight railway owners and operators.
- **Pedestrian and Bicycle.** Under the No Build Alternative, there would be no direct changes to the study area's pedestrian and bicycle facilities, because light rail would not be implemented in the corridor. Other pedestrian and bicycle improvements, roadway and transit projects, and development projects that would occur under the No Build Alternative would change pedestrian and bicycle facilities in the corridor, compared to existing conditions, depending on the scope and location of the projects. In particular, there will be improved and new pedestrian facilities in the corridor as per the Council's 2040 TPP and local capital improvement programs. Development projects will be required to comply with applicable related local requirements, which could result in improved or new pedestrian and/or bicycle facilities.
- **Safety and Security.** Under the No Build Alternative, there would be no additional light rail at-grade crossings of roadways, because the Project would not be constructed and the light rail alignment would not be extended into the corridor. As a result, there would be no additional potential delay for emergency vehicles at new light rail at-grade crossings, and due to continued growth in population and employment in the study area, there would be increases in public services demands, compared to existing conditions.

TABLE 4.0-1
Project Impacts, Commitments, Mitigations by Transportation Category[a]

Transportation Category		Summary of Impacts, Commitments, and Mitigation Measures
4.1 Transit	Long-term Direct Impacts	• Changes to Metro Transit or SouthWest Transit facilities and service to accommodate and coordinate with the proposed light rail extension • No adverse impacts
	Long-term Indirect Impacts	• Beneficial effects: - Increase in transit trips - Ridership and operations changes to the existing local bus system - Demand for pedestrian and bicycle access to new light rail stations will increase - Anticipate additional increase in transit ridership due to potential increases in development density or redevelopment in areas surrounding light rail stations • No adverse impacts
	Short-term impacts	• Intermittent impacts to bus operations on routes within the construction area, such as temporary stop relocations or closures, route detours, or suspensions of service on segments of routes operating on streets where light rail facilities are constructed
	Commitments	Short-term: • Reevaluate transit routes and construction plans to minimize disruption to transit service
	Mitigation Measures	Long-term: • Follow Federal and local procedures for route modifications or the suspension of transit service, including completing a Title VI analysis and outreach plan to determine how service changes would affect low-income and minority communities and communicate these changes prior to implementation Short-term: • Develop and implement the Construction Mitigation Plan and a Construction Communication Plan. Strategies may include: - Issue construction updates and post them on the Project website - Provide advance notice of roadway closures, driveway closures and utility shutoffs - Conduct public meetings - Establish a 24-hour construction hotline - Prepare materials with information about construction - Address property access issues - Assign staff to serve as liaisons between the public and contractors during construction - Post information at bus stops indicating temporary stop closures and/or detour details - Publish information in advance of bus detours on Metro Transit's website and in its on-board information brochure • Develop and implement a construction staging plan, which will be reviewed with the appropriate jurisdictions and railroads. Components of a construction staging plan include traffic management plans and a construction timeline.
4.2 Roadways and Traffic	Long-term Direct Impacts	• Physical modifications that will affect local circulation • No adverse impacts
	Long-term Indirect Impacts	• Beneficial effects: – Decrease in auto trips on surrounding roadway network as people switch from auto to transit – Additional vehicle traffic from anticipated new development surrounding the light rail stations • No adverse impacts due to capacity upgrades and improvements in locations that could realize increased traffic generated in station areas
	Short-term Impacts	• Short-term traffic impacts from construction activities such as: - Relocation of existing utilities

Transportation Category		Summary of Impacts, Commitments, and Mitigation Measures
		- Removal of existing surface features within the right-of-way or between the curbs - Excavation and construction of new subsurface features required for the LRT system and adjacent roadways including stormwater drainage systems and various electrical facilities - Construction of new light rail track, stations, electrical power systems, roadways, and bridges - Installation of above ground light rail system operation facilities • Temporary, partial and full closures of existing streets and driveways
	Commitments	Long-term: • Implement roadway and intersection improvements to avoid any new or worsened congested intersections, compared to the No Build Alternative in 2040
	Mitigation Measures	Short-term: • Develop and implement the Construction Mitigation Plan, Construction Communication Plan, and construction staging plan (see 4.1) • Comply with applicable state and local regulations related to the roadway closures and the effects of construction activities, including MnDOT, Hennepin County, and all municipalities • Contractor compliance with all guidelines established in the Minnesota Manual on Uniform Traffic Control Devices (2015) • Appropriate jurisdictions to review construction staging and mitigation documents • Secure required permits • Contractor to develop traffic control plans based on information identified in the construction documents and the Construction Mitigation Plan. Traffic control plans will be reviewed by appropriate jurisdictions and the Council prior to initiation of construction activities.
4.3 Parking	Long-term Direct Impacts	• Removal of 692 off-street parking spaces at 16 properties • Removal of an existing publicly owned park-and-ride lot (52 spaces) • Addition of 98 on-street parking spaces at five locations • Removal of 252 on-street parking spaces at nine locations • New park-and-ride lots at nine light rail stations, for a combined addition of 2,487 new park-and-ride spaces
	Long-term Indirect Impacts	• Could affect supply of and demand for off-street and on-street parking around station areas as a result of development/redevelopment • Spillover parking could occur at stations where there are no park-and-ride lots planned • Spillover parking could occur in the vicinity of the proposed SouthWest and Beltline Stations
	Short-term Impacts	• Temporary removal of on-street parking spaces to facilitate construction
	Commitments	None
	Mitigation Measures	Long-term: • Compensate business owners for loss of off-street parking spaces, based on the terms of the purchase agreement between the Council and property owner • Complete a Regional Park-and-Ride System Report on an annual basis. As part of this effort, the Council and Metro Transit will collaborate with regional transit partners, local governments, and MnDOT to conduct an annual regional park-and-ride survey, which tracks facility use and emerging travel patterns by park-and-ride users across the region to identify the appropriate mitigation, as needed and where feasible. The results of this survey are published in the annual report. • Develop a joint use agreement to share parking with SouthWest Transit for the park-and-ride lot adjacent to the station • Identify suitable replacement locations prior to any displacement of on-street handicap parking spaces or on-street truck loading zones Short-term:

Transportation Category		Summary of Impacts, Commitments, and Mitigation Measures
		• Develop a Construction Mitigation Plan that will address temporary on-street parking loss during the construction of the Project (see 4.1)
4.4 Freight	Long-term Direct Impacts	• Changes to existing freight rail infrastructure, such as shifting the freight mainline up to 45 feet, removing siding track, and reconstruction of existing freight rail bridges • No adverse impacts as there are no substantial changes to freight rail operations
	Long-term Indirect Impacts	• None[b]
	Short-term Impacts	• Impacts to freight rail operations resulting from construction activities along the three freight rail corridors adjacent to the Project, including multiple stoppages
	Commitments	• Develop specifications for the contractor to follow in developing and implementing construction staging and sequencing plans
	Mitigation Measures	Short-term: • Develop and implement freight rail operation coordination plans to facilitate coordination between the Project and the affected freight railroads during construction activities affecting freight rail operations - Provide provisions in construction contract to identify how the contractor will interact with railroads - Work with affected freight rail owners and operators to sequence construction to minimize effects on freight movements and to identify optimal periods for closing the rail service and reducing speeds - Use flaggers to allow freight rail operations to continue
4.5 Bicycle and Pedestrian	Long-term Direct Impacts	• Changes to pedestrian and bicycle facilities including intersection modifications, new station area platform access points, new at-grade sidewalk and trail crossings of LRT tracks, and modifications to trail widths • Additions or modifications of facilities that will have a positive impact on pedestrian and bicycle travel, such as signalization of currently unsignalized roadway intersections, construction of new sidewalks or continuation of existing sidewalks around station areas, and geometry changes to roadways which may result in reduced pedestrian crossing distances • Adverse impacts may include relocation of public trails, trail and station area conflicts, Kenilworth Trail widths, displacement of private trails, and a loss of queuing space for the at-grade LRT and freight crossing near Penn Station
	Long-term Indirect Impacts	• Increase in pedestrian and bicycle activity in the station areas and along the regional trails
	Short-term Impacts	• Changes to pedestrian and bicycle facilities, including intersection modifications, reconstruction of freight rail crossings, and trail and sidewalk detours • Indirect impacts include reduced pedestrian and bicycle volumes on existing facilities
	Commitments	Long-term: • Apply the following to changes to pedestrian and bicycle facilities based on the manuals, standards, and engineering best practices: - Construct ADA-compliant curb ramps and detectable warnings to the latest standard at light rail stations, at-grade crossings of LRT tracks, as well as at roadway intersections that will be modified - Update pedestrian change interval times at signalized intersections to allow additional crossing time; by the appropriate jurisdiction with the assistance from the Council - Conform modifications to roadway geometry and local jurisdiction's changes to signalized intersections to the *Minnesota Manual of Uniform Traffic Control Devices*, 2015 Edition, as appropriate and in coordination with the applicable jurisdiction - Provide stairs and ramps to make the pedestrian and bicycle connections possible at the Opus, West Lake, and Penn light rail stations in areas where grades inhibit pedestrian and bicycle access to stations - Follow the recommendations from the AASHTO *Bike Design Guide*, where appropriate - Provide elevators at the West Lake and Penn stations

Transportation Category		Summary of Impacts, Commitments, and Mitigation Measures
		- Replace all existing public regional and local trails relocated by the Project with similar facilities that will provide the same connectivity; in some cases trail relocations include the addition of grade-separation where a trail crosses a roadway under existing conditions • Include wayfinding, regulatory and warning signage, and markings of trail intersections to address conflicting movements at station areas Short-term: • Provide a trail detour route or facility prior to construction activity at locations where existing trails and sidewalks may be obstructed by construction activity. Pedestrian and bicycle facilities will be maintained during construction in one of the following ways: - Trail detour route. A signed route along other trails or roadways that provides a bicycle and pedestrian connection around an obstruction of the existing trail. Bicycle connections could be on another trail or on an existing street (with or without bike lanes). Pedestrian connections could be on another trail or on a sidewalk along an existing street. - Trail detour facility. A temporary trail facility built to re-route bicycle and pedestrian traffic around an obstruction, usually located close to the existing trail. - Sidewalk detour route. A signed route that provides pedestrian access to an area where access currently exists via another nearby sidewalk, frequently on the opposite side of a roadway. Where feasible, these temporary facilities will be as ADA compliant as the existing facilities. • Sidewalk detour facility. A temporary paved facility built to re-route pedestrian traffic in areas where another nearby sidewalk does not exist. Where feasible, these temporary facilities be as ADA compliant as the existing facilities. An exception to the above is an unforeseen safety issue during construction that would obstruct the trail or sidewalk and necessitate an immediate, short term closure. In this case, the trail or sidewalk may be closed and remain closed for five days or less without an available detour route or facility.
	Mitigation Measures	Long-term: • Any measures to address the removal of the trail between Flying Cloud Drive and West 70th Street (e.g., replacement of the trail), will be determined by the property owner as part of the Project's property acquisition process Short-term: • Develop and implement the Construction Mitigation Plan, Construction Communication Plan, and construction staging plan (see 4.1)
4.6 Safety and Security	Long-term Direct Impacts	• Modifications to existing freight rail facilities, introduction of light rail stations and related facilities, new at-grade LRT crossings of roadways, potential changes to emergency vehicle access and response times, light rail service in the vicinity of freight rail service, and new light rail tunnels. • No adverse impacts based on the incorporation of safety and security-related design and operational elements into the Project.
	Short-term Impacts	• Potential for temporary delays in emergency response resulting from construction activities
	Commitments	Long-term: • Conform to FTA's Rail Fixed Guideway Systems; State Safety Oversight Program for Safety and Security Guidance for Recipients with Major Capital Projects (Circular C 5800.1), covered under 49 CFR Part 633 – Project Management Oversight • Coordinate with, as applicable, the State of Minnesota railroad and pipeline safety regulations that went into effect in July 2014 as part of MN Chapter 312 • Implement the Project's Safety and Security Management Plan (SSMP) and the Metro *Light Rail Transit Design Criteria* to avoid potential safety issues at new light rail stations, including emergency equipment and appropriate lighting for public areas • Install fencing near at-grade trail or sidewalk crossing, in station areas, and between light rail and freight rail alignment when adjacent to a trail or sidewalk, where possible • Design at-grade LRT crossings of sidewalks and trails per the Metro Light Rail Transit Design Criteria to include flashing light signals with an audible warning to notify pedestrians of a train's arrival and detectable warnings and signs • Design shared freight rail and light rail crossings to meet FRA requirements for at-grade crossings, including requirements for train horn quiet zones as described in the Train Horn Quiet Zone Final Rule (49 CFR Part 222), where applicable • Maintain emergency vehicle access to areas within the vicinity of the Project

Transportation Category		Summary of Impacts, Commitments, and Mitigation Measures
		• Coordinate with affected emergency service providers including identification of alternative crossing routes • Implement safeguards from the Metro *Light Rail Transit Design Criteria* including emergency guardrails • Install intrusion detection for possible freight derailment where clearance between the centerline of the LRT tracks and the centerline of the freight tracks is less than 50 feet • Install corridor protection barriers between freight rail and light rail tracks where clearance between centerlines is less than 25 feet • Include safeguards in the catenary system for the Project to help minimize the possibility of sparking occurring in the overhead catenary wires • Regularly inspect pantographs for grooves along the pantograph's carbon strip, which could cause arcing • Where the light rail alignment will be adjacent to a freight rail alignment, the light rail alignment will be primarily on segregated right-of-way, in accordance with the National Electric Safety guidelines • Participate in the planning, performance, and evaluation of emergency simulations on the system in coordination with the LRT FLSSC • Implement Metro Light Rail Transit Design Criteria, as well as National Fire Protection Association 130: Standard for Fixed Guideway Transit and Passenger Rail Systems, and Circular C 5800.1, Safety and Security Guidance for Recipients with Major Capital Projects in the shallow tunnel in the Kenilworth Corridor and at Highway 62 to provide security and/or enhanced safety Short-term: • Coordinate with emergency service providers to provide schedule for construction activities and identify detour routes to minimizing delay for emergency response vehicles • Maintain required access during established periods or keep one lane of traffic open on main arterials as described in the Construction Mitigation Plan • Maintain federal Occupational Safety and Health Administration (OSHA) and Minnesota OSHA standards for safety of construction site personnel to minimize and/or avoid injury to construction workers • Contractors will prepare a project safety and health program along with a site-specific safety plan to ensure that, while on the work site and construction activities, contractor and subcontractor personnel comply with the specified safety practices, codes, and regulations as described in the Project's SSMP • Use construction safeguards, such as horizontal and vertical movement and settlement monitoring for both existing freight rail infrastructure and light rail tunnel in support of excavation • Collect and analyze monitoring data (by construction staff) and coordinate with freight railroad operations staff to verify that safe freight rail operations can be maintained through the construction area at all times • Develop and implement freight rail operation coordination plans to facilitate coordination between the Project and the affected freight railroads during construction activities affecting freight rail operations (see 4.4)
	Mitigation Measures	Short-term: • Develop a Construction Mitigation Plan, Construction Communication Plan, and construction staging plan (see 4.1)

[a] This table summarizes the anticipated impacts and mitigation measures for the Project as identified in the Final EIS. All data in the table are approximate. See the corresponding sections of Chapter 4 for a more detailed description of the anticipated impacts and mitigation measures. "Mitigation measures" are specific actions that will be incorporated into the project to address anticipated adverse impacts (see also 40 CFR 1508.20). "Commitments" are general actions that will be incorporated into the project that may not be tied to anticipated adverse impacts, such as the use of best management practices (BMPs) or public outreach strategies. If there are no mitigation measures identified for a specific type of impact area, it means that the avoidance measures identified for that transportation category will avoid any adverse impacts for that category, and, therefore, no mitigation measures are warranted.

[b] See Section 4.4.4.2 for a description of unavailable and unobtainable information on the effect that the proposed Southerly Connection could have on freight rail operations.

Note: Data are approximate. ADA = Americans with Disabilities Act; AASHTO = American Association of State Highway and Transportation Officials; BMP = best management practice; FLSSC = Fire Life Safety and Security Committee; FRA = Federal Railroad Administration; HCRRA = Hennepin County Regional Railroad Authority; LOS = level of service; CFR = Code of Federal Regulations; LRT = light rail transit; LRV = light rail vehicle; MnDOT = Minnesota Department of Transportation; MN&S = Minneapolis, Northfield, and Southern Railway; OSHA = Occupational Safety and Health Administration; SSMP = Safety and Security Management Plan; TPSS = traction power substation; TC&W = Twin Cities and Western Railway Company, Uniform Relocation Act = Uniform Relocation Assistance and Real Property Acquisition Policies Act.

Source: Council, 2015.

4.1 Public Transportation

This section describes long-term direct and indirect and short-term (construction) direct and indirect effects of the Project on transit service (see Section 3.17 for cumulative impacts). This section provides an overview of the regulatory context and methodology used for the analysis; an assessment of the existing built environment; a description of the anticipated impacts related to transit services; and a description of mitigation measures to implement with the Project.

4.1.1 Regulatory Context and Methodology

The public transportation[7] analysis study area consists of the Southwest Light Rail Transit (LRT) Corridor where public transportation service changes will occur as a result of the Project (see Exhibit 4.1-1). This analysis addresses public transportation service provided by two different transit agencies: Metro Transit and SouthWest Transit. Metro Transit is the primary fixed-route transit agency serving the Twin Cities metropolitan area. SouthWest Transit provides transit service to the southwest metropolitan area, including the cities of Carver, Chaska, Chanhassen, and Eden Prairie, with express service to downtown Minneapolis and the University of Minnesota.

The analysis compares transit service, transit ridership, access to transit, and transit travel times for the existing service (2010[8]), the No Build Alternative (2040), and the Project (2040). Exhibit 4.1-1 illustrates the transportation analysis corridor and study area. The Council's regional travel demand model served as the primary data source for this analysis. Refer to the *Draft Travel Demand Methodology & Forecast, Revision 3, Southwest LRT Technical Report* (*Technical Report*) listed in Appendix C for a more detailed description of the travel demand forecasting methodology.

The regional travel demand model forecasts travel on the transit and highway systems within the Twin Cities metropolitan area. The transit system includes categorization of existing and planned rail and bus lines, as well as details on service frequency, routing, travel time, and fare for each rail and bus line. Section 4.2 documents the model's highway traffic forecasts.

The regional travel demand model provides detailed information on transit ridership demand, estimates of passenger boardings, and other critical and relevant information used to evaluate the performance of the Project in relation to the No Build Alternative. See the *Technical Report* listed in Appendix C for a detailed description of the forecasting methodology.

4.1.2 Affected Environment

This section describes the existing and planned transit system in the public transportation study area.

4.1.2.1 Existing Transit System

Existing transit service within the study area consists of express and local bus service. Transit service ridership within the study area is generally high, with most routes operating at or above optimal capacities with steady ridership volumes. Within the transportation analysis corridor area, there are 28 bus routes providing service to hundreds of bus stops, park-and-ride lots, and transit centers. Exhibit 4.1-2 illustrates existing transit service in the study area.[9]

The majority of weekday transit service in the transit study area is express, with some local and suburban services. Two of the routes (Routes 12 and 17; see Exhibit 4.1-2) within the corridor are considered "primary corridor routes" which run parallel to significant segments of LRT in the corridor and provide all-day, local service seven days a week. "Connecting corridor routes" are those routes within the corridor that provide connections to the primary corridor routes or service (Routes 5, 19, and 22, which connect to the Project at Royalston Station). "Express corridor routes" provide weekday peak-period express service between the

[7] Public transportation modes considered in this analysis include passenger rail, fixed catenary system (LRT), fixed route bus service, and bus rapid transit

[8] The Council used 2010 data as the base year for the travel demand model.

[9] Many of the bus routes in Minneapolis unaffected by the Project are not shown on Exhibit 4.1-2.

EXHIBIT 4.1-1
Transportation Analysis Corridor

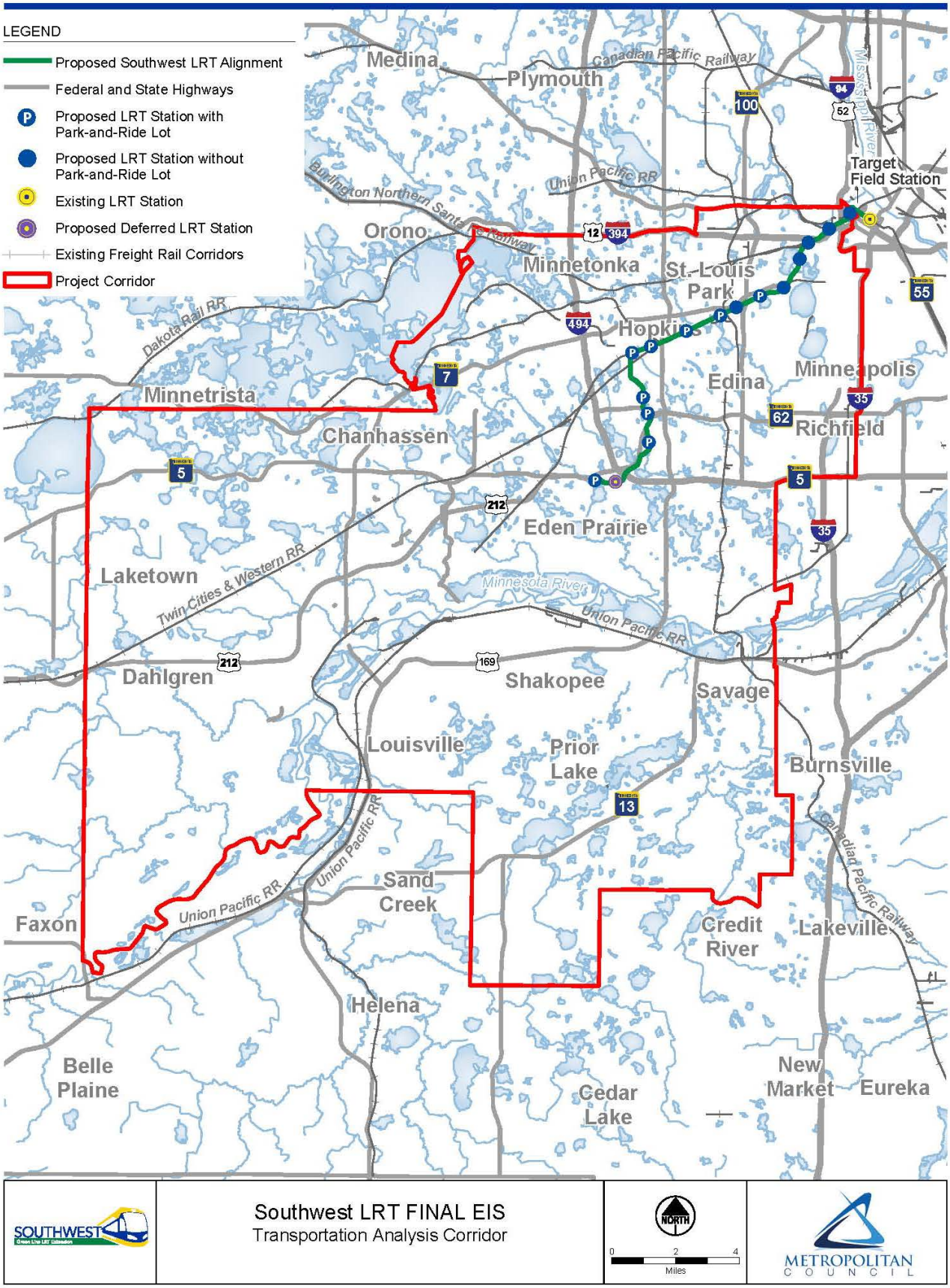
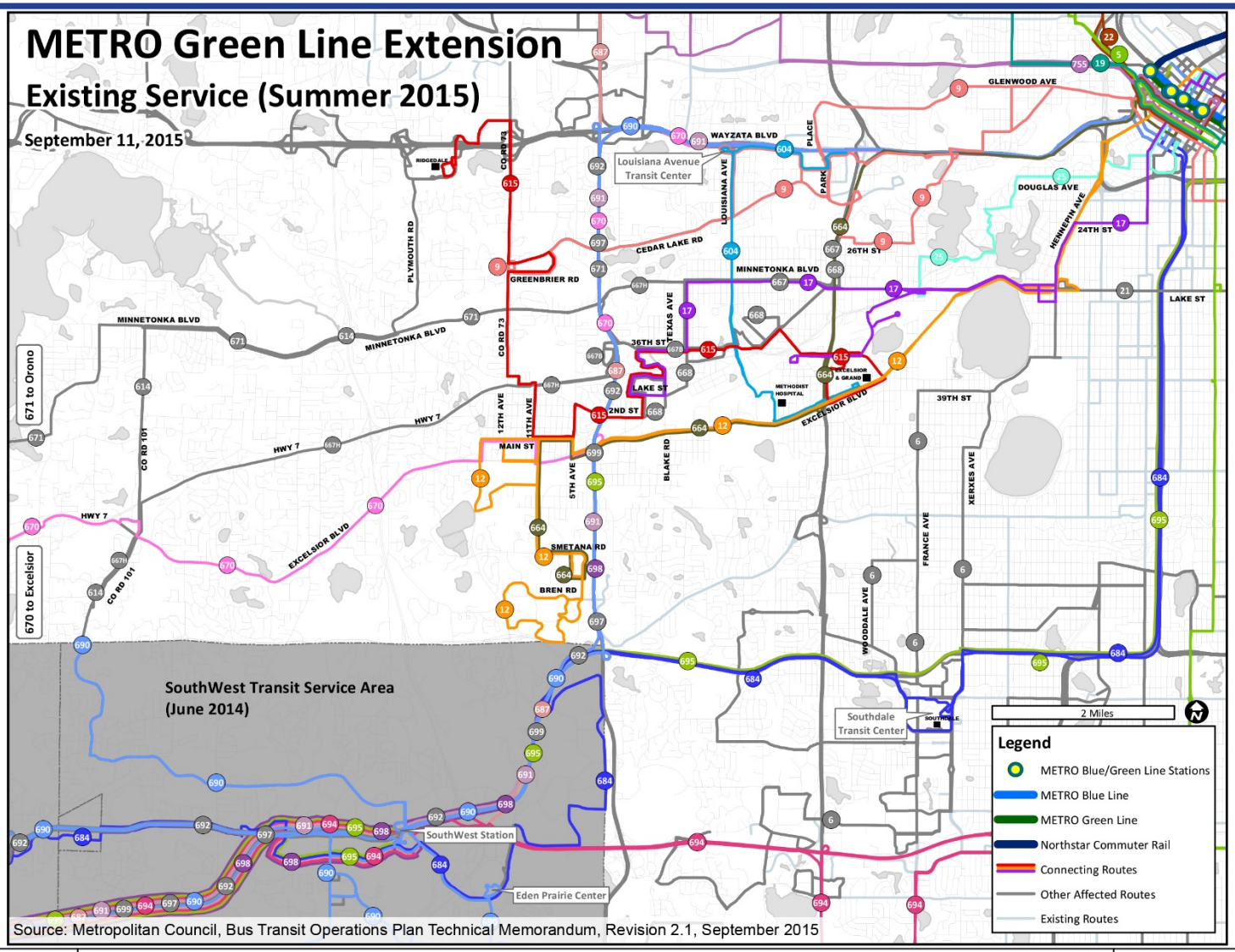


EXHIBIT 4.1-2
Southwest Study Area Existing Service



Source: Metropolitan Council, Bus Transit Operations Plan Technical Memorandum, Revision 2.1, September 2015

Southwest LRT FINAL EIS
Southwest Study Area Existing Transit Service
Southwest LRT Project

corridor and downtown Minneapolis (Routes 664, 667, 668, 670, and 671). "Other affected routes" are routes not in the immediate corridor but are in the study area and are affected (Routes 6, 21, and 614). The "Other operators" section outlines the service provided by SouthWest Transit in the Eden Prairie portion of the corridor.[10]

The type of service provided is reflective of the trip-making behaviors of transit users in the study area, predominantly commuters making either home-based work or school trips. On weekends, transit service is available on a limited basis in the suburban portions of the study area, serving home-based work and shopping trips. Most of the express routes operate during the weekday morning and afternoon peak periods, although some off-peak early morning, mid-day, and evening express service is provided at reduced frequencies. While transit service headways[11] vary, most current express routes operate at approximately 30-minute headways (or less) during peak periods. Off-peak service is provided by the local and suburban routes, running at headways typically between 30 and 60 minutes apart. Directionally, most of the express routes provide inbound service to downtown Minneapolis during the morning peak period, with outbound service provided in the afternoon peak period. SouthWest Transit provides one reverse-commute bus route during weekday peak periods (Route 684). Metro Transit provides two reverse-commute bus routes (Routes 12 and 17).

Downtown Minneapolis is both a high-demand and a well-served transit market, with service offered by both transit providers. More than 100 bus routes and two light rail lines serve hundreds of downtown bus stops, transit centers, and stations. On several downtown streets, more than 20 bus routes provide a mixture of local or express services. Most of Metro Transit's high-frequency bus routes serve the downtown core, and future service planning indicates increasing transit services in downtown Minneapolis is a priority. Major transit thoroughfares include Nicollet Mall, Hennepin Avenue, Marquette Avenue, 2nd Avenue South, 4th Street, 5th Street, 6th Street, 7th Street, 8th Street, 11th Street, and 12th Street. In addition, improvements around the Twin Cities metropolitan area have included over 300 miles of bus-only shoulders, approximately 10 miles of bus-only lanes, ramp meter bypass lanes, high-occupancy vehicle (HOV) lanes, high-occupancy toll (HOT) lanes, and a small network of exclusive transitways.

4.1.2.2 Long-Range Planning

The Council adopted its current long-range plan on January 14, 2015. This plan, called the 2040 Transportation Policy Plan (2040 TPP), documents the transportation goals of the region (Council, 2015b).

According to the 2040 TPP, local bus route coverage in the region (including the corridor) will expand, including modifications to some routes and the addition of new routes by 2040. Any expansion of transit service will help meet the demands of a growing region, which is forecast to increase by 824,000 residents by 2040. The 2040 TPP identifies the need for expanded passenger facilities and transit infrastructure as a catalyst for attracting new riders. It identifies the potential for expansion of several existing and a number of new transit facilities, including park-and-ride lots, transit centers, and transit advantages. The 2040 TPP includes the construction of the Southwest LRT Project (referred to as METRO Green Line Extension) in both its current (fiscally constrained) revenue and expanded revenue scenarios. Exhibit 4.1-3 illustrates the major transit investments that will be in place as part of the 2040 TPP.

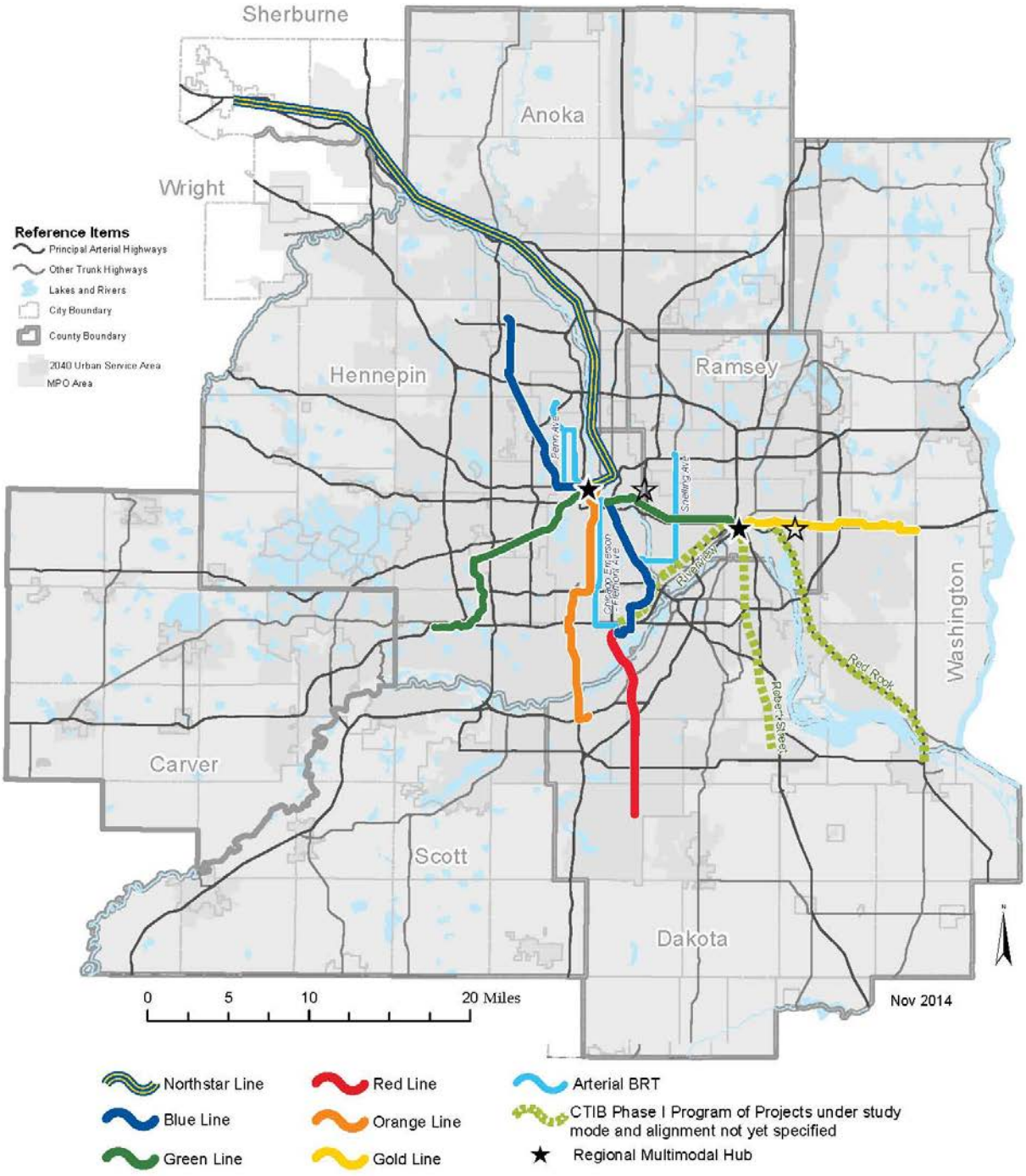
4.1.2.3 No Build Alternative

The following is a description of the changes in transit service that would occur under the 2040 No Build Alternative. Annual transit vehicle hours and miles would increase by nearly 1 percent per year between the existing level of service and the 2040 No Build Alternative. While many routes in the corridor would undergo no change in service frequency, Routes 12, 17, 604, and 614 would see major changes. For Routes 12 and 17, service frequency would increase and service hours would be extended. For Route 604 weekend service would be added. For Route 614, Sunday service would be added. For both routes, service frequency would increase, and service hours would be extended. Additionally, one new crosstown route (Route 620) to

[10] Denoted in gray shading on the exhibits.

[11] Headway is the frequency of service.

EXHIBIT 4.1-3
Major Transit Investments Identified in the TPP



Source: Metropolitan Council, 2040 TRANSPORTATION POLICY PLAN | Version 1.00

SOUTHWEST	Southwest LRT FINAL EIS Planned Transitways Southwest LRT Project	METROPOLITAN COUNCIL

connect Hopkins and Eden Prairie, one new circulating loop route (Route 26) in North Minneapolis, and three new arterial bus rapid transit (BRT) lines would be added to existing service. SouthWest Transit (Routes 684 – 699) would add service on seven routes. See Exhibit 4.1-4.

Exhibit 4.1-4 illustrates the No Build Alternative bus operation plan. The introduction of arterial bus rapid transit on the C line and on Fremont and Emerson Avenues would decrease the frequency of service on Route 5 and 19 to every 30 minutes.

4.1.3 Environmental Consequences

This section identifies the long-term and short-term direct and indirect impacts on transit from the Project. The Project will introduce new light rail service in the public transportation study area, which will increase the overall transit service demand in the study area. Bus service will be modified as appropriate to meet demand and provide connections to the proposed Southwest LRT stations. Exhibit 4.1-5 illustrates the Project bus operation plan (Council, 2014). In particular, this section describes how the Project will change transit travel times and transit ridership, including forecast ridership on the proposed METRO Green Line Extension. Additional information on how the Project will affect transit service and demand can be found in the *Draft Travel Demand Methodology & Forecast, Revision 3, Southwest LRT Technical Report* (see Appendix C for instructions on how to access the report).

4.1.3.1 Long-term Direct Impacts on Transit

Transit Travel Time

Table 4.1-1 compares average weekday (2040 No Build Alternative and Project) in-vehicle travel time for transit during the PM peak-hour travel times, to and from select locations, where at least one trip end is in the public transportation study area. The PM peak hour is assessed because it is generally the worst case from a congestion standpoint. The select trips are grouped into *regular commute trips* (i.e., trips taken outbound from the central business district in the evening) and *reverse commute trips* (i.e., trips taken inbound to the central business district in the evening). As shown, with the exception of the commute trips from Eden Prairie to downtown Minneapolis, travel times under the Project will generally improve over existing conditions and the No Build Alternative.

TABLE 4.1-1
Average Weekday Total Transit Travel Times (minutes) during the PM Peak Period – No Build Alternative and Project (2040)[a]

Origin/Destination Pair	No Build (2040)	Project (2040)
Commute Trip – from Downtown Minneapolis (408)[b] to:		
West Lake Calhoun (332)	36.62	36.62
To Downtown Hopkins (567)	59.37	54.52
To Eden Prairie (551)[c]	58.83	58.83
Reverse commute trip - From Opus (594) to:		
Downtown St Paul (815)	108.85	97.25
Downtown Minneapolis (408)	76.75	65.15
North Minneapolis (433)	97.29	85.69
West Lake Calhoun (332)	74.66	69.10

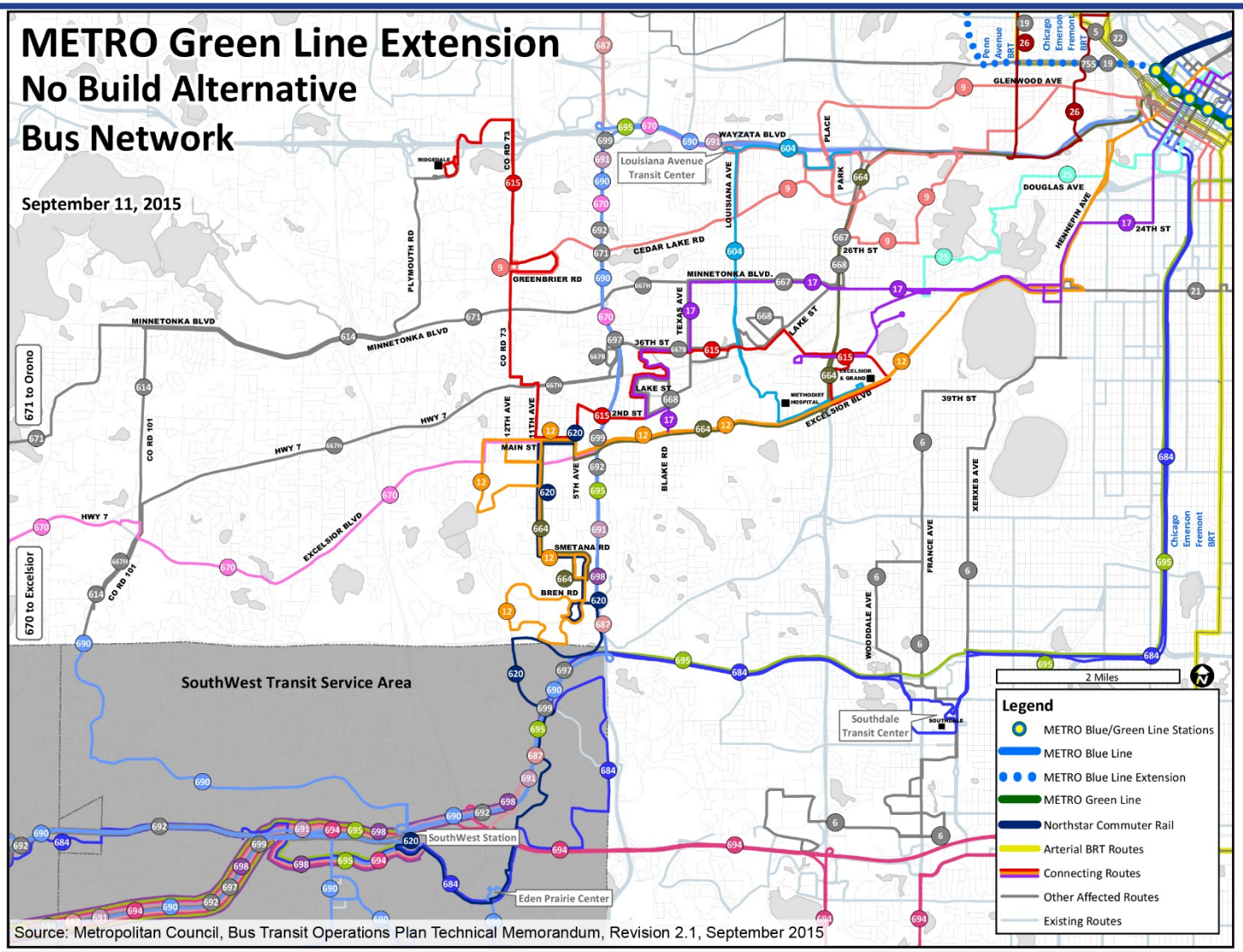
[a] Total time is the sum of in-vehicle time and other time related to completing the trip, including walking and waiting time.

[b] (nnn) = transportation analysis zone number.

[c] Based on presence of the Eden Prairie Town Center Station in 2040, which is deferred until after 2020. If the Eden Prairie Town Center Station is not in place by 2040, this travel time would be reduced by 37 seconds, due to the elimination of the acceleration, deceleration, and dwell times at the deferred station location.

Source: Council. 2015a. Draft Travel Demand Methodology & Forecast, Revision 3, Southwest LRT Technical Report listed in Appendix C.

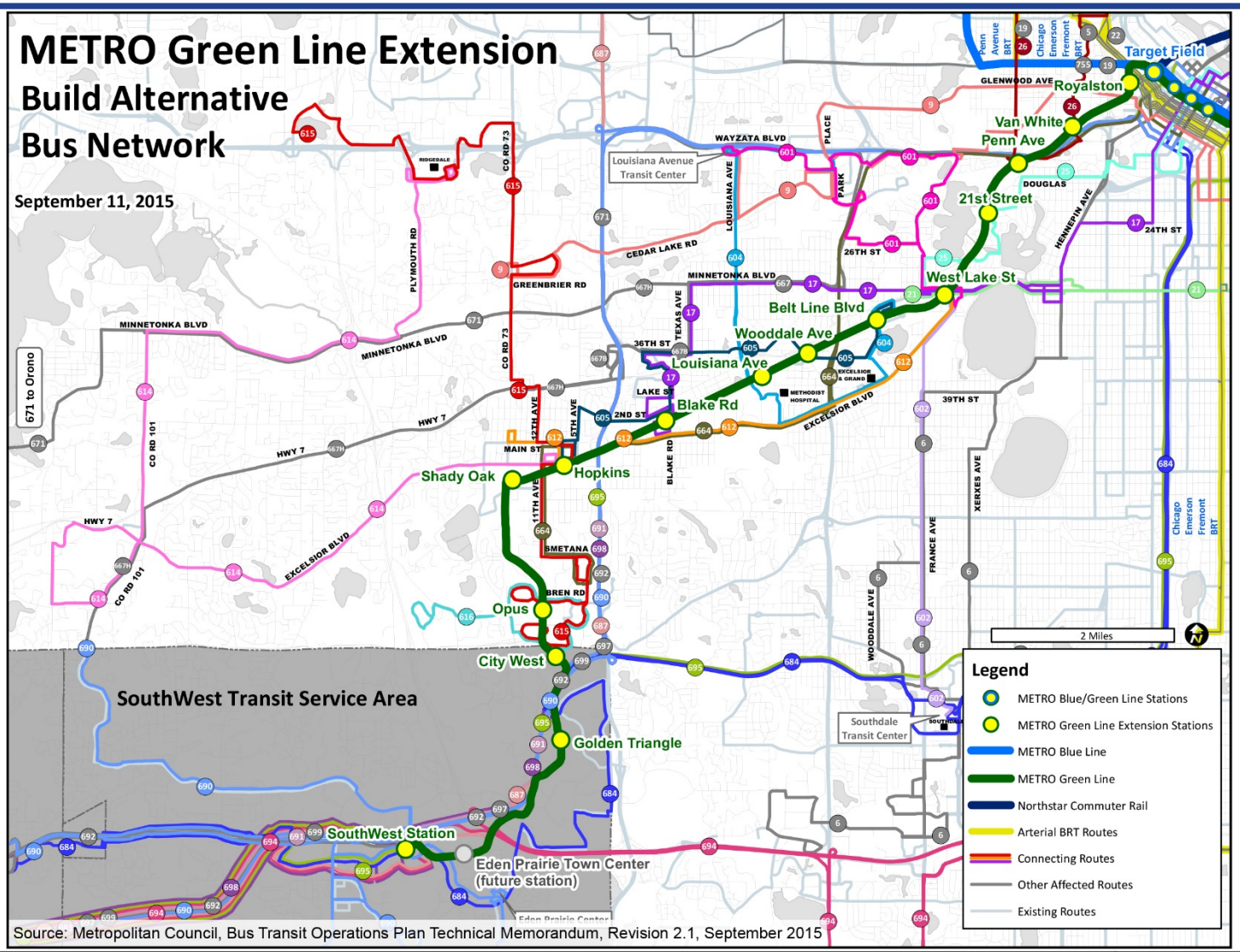
EXHIBIT 4.1-4
No Build Alternative Bus Operations Plan



Source: Metropolitan Council, Bus Transit Operations Plan Technical Memorandum, Revision 2.1, September 2015

Southwest LRT FINAL EIS
No Build Alternative Bus Operations Plan
Southwest LRT Project

EXHIBIT 4.1-5
Corridor Bus Routes Under the Project (average weekday, 2040)



Source: Metropolitan Council, Bus Transit Operations Plan Technical Memorandum, Revision 2.1, September 2015

Southwest LRT FINAL EIS
Corridor Bus Routes Under the Project (average weekday, 2040)
Southwest LRT Project

Transit Ridership

Table 4.1-2 shows the average number of weekday transit trips under existing conditions, the No Build Alternative and the Project. Trips quantified in Table 4.1-2 are transit trips that will occur in the study area and systemwide. As shown, a 14 percent increase (13,000 new trips) is forecast in weekday transit trips within the study area with the Project, compared to the No Build Alternative.

TABLE 4.1-2
Average Weekday Total Systemwide and Project Corridor Transit Trips, Year 2040

	Existing (2010)	No Build (2040)	Project (2040)
Total Corridor Transit Trips[a] (originating rides)	56,914	94,339	107,354
Change from Existing	NA	37,425	50,440
% Change from Existing	NA	66%	89%
Change from No Build Alternative	NA	NA	13,015
% Change from No Build Alternative	NA	NA	14%
Total Systemwide Transit Trips	204,483	330,899	344,139[b]

[a] Transit trips are one-way linked trips from an origin (e.g., home) to a destination (e.g., place of work or school), independent of whether the trip requires a transfer or not. A person traveling from home, to work, and back, counts as two trips. Total corridor transit trips include all light rail and bus trips produced in or attracted to the SW LRT Corridor.

[b] As described in Section 2.1.1, the Eden Prairie Town Center Station and associated roadway improvements are deferred and are not expected to be in place when the Project opens in 2020. If the station and associated roadway improvements are not in place by 2040, there would be a reduction of approximately 465 transit trips (corridor and systemwide).

N/A = not applicable

Table 4.1-3 shows average weekday commuter rail and light rail boardings under the No Build Alternative and the Project. As shown in Table 4.1-3, average weekly ridership and PM peak-hour loadings are forecast to increase on in-place commuter rail and light rail lines, once the Project is implemented. A 39 percent increase is forecast for average weekday boardings (nearly 34,000 additional boardings), and an 8 percent increase is forecast for PM peak-hour boardings in the peak direction (over 200 additional boardings).

Table 4.1-4 outlines the mode share for the Project's work and non-work transit trips that have a trip destination in downtown Minneapolis. The table compares the Project (2040) to the existing conditions (2010) and the No Build Alternative (2040).

As shown, for home-based work trips, 31,287 transit trips are forecast to occur on the average weekday, representing 48 percent of all trips to downtown Minneapolis. This will be a four percentage-point increase in home-based, downtown-destined trips, compared to the 2040 No Build Alternative. There is also an anticipated increase in the number of non-work trips forecast to occur with Project implementation, with 2 percent more non-work trips forecast with Project implementation than the number that would occur under the 2040 No Build Alternative. The overall number of trips destined for downtown with Project implementation is 39,725, which is 3,541 trips more than those forecast for the 2040 No Build Alternative.

Table 4.1-5 summarizes individual station use, trip levels, and mode of access to the light rail stations. The most frequently used station will be West Lake Station, which will account for 13 percent of Project boardings.

TABLE 4.1-3
Average Weekday Light Rail and Commuter Rail Boardings, Year 2040

	No Build (2040)	Project (2040)
Average Weekday Boardings[a]		
Green Line[b c]	33,902	66,581
Blue Line	52,356	53,280
Total Light Rail System	86,258	119,861
Northstar[d]	145	159
Total Rail System	86,403	120,020
PM Peak-Hour, Peak-Direction Peak Load Point[e]		
Green Line[b c]	1,497	1,649
Blue Line	1,358	1,435
Total Light Rail System	2,855	3,084
Northstar[d]	65	71
Total Rail System	2,920	3,155

[a] Boardings are rides per line. Linked trips are counted twice if the passenger transfers from one LRT line to another LRT line or a bus line.

[b] Southwest LRT will be an extension of the Green Line (segment between St. Paul and Minneapolis opening June 2014). For the Project, 36,162 of these boardings will be from new riders at the Project stations

[c] As described in Section 2.1.1, the Eden Prairie Town Center Station and associated roadway improvements are deferred and are not expected to be in place when the Project opens in 2020. If the station and associated roadway improvements are not in place by 2040, there would be a reduction of approximately 713 transit boardings.

[d] Northstar Rail has low ridership in this table, because the model does not cover the entire length of the rail line.

[e] The peak load point is the location of maximum utilization of a transit line, or the station-to-station segment with the highest passenger loads.

Source: Council. 2015a. Draft Travel Demand Methodology & Forecast, Revision 3, Southwest LRT Technical Report listed in Appendix C.

TABLE 4.1-4
Average Weekday Work and Nonwork Corridor Transit Trips and Transit Mode Share to Downtown, Year 2040

	Existing (2010)	No Build (2040)	Project (2040)
Home-Based Work[a]			
Transit	15,349	28,849	31,287
Transit Mode Share %	32%	44%	48%
Nonwork[c]			
Transit	4,703	7,335	8,438
Transit Mode Share %	8%	9%	11%
Total			
Transit	20,052	36,184	39,725[b]
Transit Mode Share %	18%	25%	27%

[a] Home-based work trips are defined as trips taken directly between one's home and one's place of work

[b] As described in Section 2.1.1, the Eden Prairie Town Center Station and associated roadway improvements are deferred and are not expected to be in place when the Project opens in 2020. If the station and associated roadway improvements are not in place by 2040, there would be a reduction of approximately 260, 142, and 713 home-based, non-work, and total transit trips, respectively. The transit mode shares in this table would not change appreciably.

[c] Nonwork trips are defined as all trips that are not home-based work trips.

TABLE 4.1-5
Average Weekday Station Usage (Ons and Offs) by Mode of Access, Year 2040

Station	Station Ons (Offs)	% of Total Ons (Offs)	% by Mode of Access	
SouthWest Station	3,104 (1579)	10% (8%)	33% (48%)	Walk
			35% (52%)	Transfer
			33% (0%)	Park-and-Ride
Eden Prairie Town Center Station[a]	1,502 (916)	5% (5%)	89% (79%)	Walk
			11% (21%)	Transfer
			0% (0%)	Park-and-Ride
Golden Triangle Station	1,263 (1844)	4% (10%)	56% (69%)	Walk
			8% (31%)	Transfer
			36% (0%)	Park-and-Ride
City West Station	790 (565)	3% (3%)	52% (100%)	Walk
			0% (0%)	Transfer
			48% (0%)	Park-and-Ride
Opus Station	1,032 (1717)	3% (9%)	83% (100%)	Walk
			1% (0%)	Transfer
			16% (0%)	Park-and-Ride
Shady Oak Station	2,087 (485)	7% (3%)	25% (100%)	Walk
			0% (0%)	Transfer
			75% (0%)	Park-and-Ride
Downtown Hopkins Station	2,890 (1227)	9% (7%)	6% (31%)	Walk
			79% (69%)	Transfer
			15% (0%)	Park-and-Ride
Blake Station	1,316 (576)	4% (3%)	71% (95%)	Walk
			14% (5%)	Transfer
			16% (0%)	Park-and-Ride
Louisiana Station	2,232 (1155)	7% (6%)	56% (88%)	Walk
			8% (12%)	Transfer
			36% (0%)	Park-and-Ride
Wooddale Station	1,817 (546)	6% (3%)	100% (100%)	Walk
			0% (0%)	Transfer
			0% (0%)	Park-and-Ride
Beltline Station	2,653 (1333)	8% (7%)	77% (100%)	Walk
			0% (0%)	Transfer
			23% (0%)	Park-and-Ride
West Lake Station	4,028 (1453)	13% (8%)	36% (30%)	Walk
			64% (70%)	Transfer
			0% (0%)	Park-and-Ride
21st Street Station	1,641 (361)	5% (2%)	100% (100%)	Walk
			0% (0%)	Transfer
			0% (0%)	Park-and-Ride

Station	Station Ons (Offs)	% of Total Ons (Offs)	% by Mode of Access	
Penn Station	1,024 (263)	3% (1%)	100% (100%)	Walk
			0% (0%)	Transfer
			0% (0%)	Park-and-Ride
Van White Station	332 (246)	1% (1%)	100% (100%)	Walk
			0% (0%)	Transfer
			0% (0%)	Park-and-Ride
Royalston Station	1,430 (1819)	5% (10%)	6% (17%)	Walk
			94% (83%)	Transfer
			0% (0%)	Park-and-Ride
Interchange Station	2,308 (2670)	7% (14%)	53% (67%)	Walk
			27% (33%)	Transfer
			20% (0%)	Park-and-Ride
	Total Station Ons (Offs) by Mode of Access		% of Total Ons (Offs)	
Walk	16,830 (12,759)		54% (68%)	
Transfer	8,561 (5,996)		27% (32%)	
Park-and-Ride	6,058 (0)		19% (0%)	
Total Station Ons/Offs	**31,449 (18,755)**		**100% (100%)**	

[a] Based on presence of the Eden Prairie Town Center Station in 2040, which is deferred until after 2020. If the Eden Prairie Town Center Station is not in place by 2040, ridership activity at that location would be eliminated and ridership levels at other stations would be slightly reduced.

4.1.3.2 Long-term Indirect Impacts on Transit

The areas of indirect impact on transit include ridership forecasts and operational changes. Ridership forecasts for the Project show an increase in new transit trips, which will be associated with a decrease in auto trips resulting from people switching from auto to transit for the first time. While the intent of implementing light rail is to attract new riders, this would nevertheless be an indirect impact because people may choose to use the new light rail service once it is constructed based on its benefits in relation to their transportation needs.

Implementation of the Project will also result in a redistribution of ridership and operational changes to the existing local bus system. Trips via bicycle and pedestrian modes will increase in direct relation to the increase in transit trips because a certain number of transit riders will access the transit system by foot and/or bicycle. It is likely that demand for pedestrian and bicycle access to light rail stations will increase as an indirect result of the Project.

Another potential indirect effect of the Project would be the potential increases in development density or redevelopment in areas surrounding proposed light rail stations (see Section 3.1 for additional information on land uses within future station areas) could result in an increase in number of people that use transit. This would have a positive effect on the Project and other elements of the transit system.

4.1.3.3 Short-term Impacts on Transit

Construction of the Project may result in intermittent impacts to bus operations on routes within the construction area. Impacts may include temporary stop relocations or closures, route detours, or suspensions of service on segments of routes operating on streets where light rail is being constructed. As engineering advances, transit routes will be reevaluated and transitway construction will be planned to minimize disruption to transit service.

4.1.4 Mitigation Measures

This section describes the measures the Council will implement to mitigate the Project's long-term and short-term transit impacts. For each mitigation measure or set of associated mitigation measures, this

section generally notes the anticipated impact or associated impacts that the mitigation measures will address (see Section 4.1.3.3 for additional information on the identified transit impacts and minimization measures).

4.1.4.1 Mitigation Measures for Long-term Impacts

No mitigation measures are warranted for long-term impacts to transit because there will be no long-term adverse impacts to transit service due to the Project's expansion of transit service. However, the Project will affect fixed-route bus service. The Council will follow federal and local procedures for route modifications or suspension of transit service, which will include a Title VI analysis to determine how service changes affect low-income and minority communities. This will include a community outreach process for designing route changes, a public hearing for the proposed service changes, and ongoing outreach efforts to communicate service changes prior to implementation.

4.1.4.2 Mitigation Measures for Short-term Impacts

Specific mitigation measures for short-term impacts to bus service will be identified in the Construction Mitigation Plan, which includes a Construction Communications Plan and construction staging plan (staging plan) for implementation by the Council prior to and during construction. The purpose of the Construction Communication Plan is to prepare Metro Transit and SouthWest Transit riders, project-area residents, businesses, and commuters for what to expect during construction, listen to their concerns, and develop plans to minimize disruptive effects. Strategies may include:

- Issue construction updates and post them on the Project website
- Provide advance notice of roadway closures, driveway closures, and utility shutoffs
- Conduct public meetings
- Establish a 24-hour construction hotline
- Prepare materials with information about construction
- Address property access issues
- Assign staff to serve as liaisons between the public and contractors during construction
- Post information at bus stops indicating temporary stop closures and/or detour details
- Publish information in advance of bus detours on Metro Transit's website and in its on-board information brochure

In addition, the Council will develop and implement a construction staging plan (staging plan), which will be reviewed with the appropriate jurisdictions and railroads, and the contractor will be required to secure the necessary permits and follow the staging plan, unless otherwise approved. Components of a staging plan include traffic management plans and a detailed construction timeline.

4.2 Roadways and Traffic

This section describes the long-term direct and indirect and short-term (construction) direct and indirect effects of the Project on the roadway system and traffic operations (see Section 3.17 for cumulative impacts).[12] This section includes an overview of the regulatory context and methodology used for traffic impacts analysis; an assessment of the existing built environment as it relates to roadways and traffic; a description of the anticipated impacts to roadways and traffic; and a description of mitigation measures to implement with the Project.

[12] The analysis of roadway system and traffic operations applies to general vehicle traffic, which includes freight transportation via trucking. Refer to Section 4.4, Freight, for a discussion on freight rail.

4.2.1 Methodology

Refer to the *PEC-West Traffic Memorandum* (2015) and *PEC-East Traffic Memorandum* (2015) for additional detail on the traffic analysis, including a more detailed description of the roadways and traffic methodology (see Appendix C).

4.2.1.1 Data Collection

Data were collected to provide base information for existing conditions including: 13-hour weekday multimodal traffic counts at intersections; freight rail train lengths and crossing times; geometric and traffic operations data; timing and coordination plans for traffic signals; existing gate timings along the METRO Blue Line (Hiawatha LRT); and existing bus routes, stops, and passenger loading and unloading.

4.2.1.2 Travel Demand Forecasting Methodology

The Council's regional travel demand model was used to forecast 2040 systemwide average weekday vehicle trips, VMT, congested lane miles, VHT, vehicle hours of delay (VHD), and person trips (see Section 4.1.1 for a description of the regional travel demand model). Preliminary 2040 socioeconomic data prepared by local communities and consistent with the Metropolitan Council's *Thrive MSP 2040*[13] were used as input to the Metropolitan Council's regional travel demand model. The outputs were compared to existing and historic traffic counts, as well as to the previously-prepared 2030 forecast roadway volumes in the 2030 comprehensive plans of Eden Prairie, Minnetonka, Hopkins, St. Louis Park, Minneapolis, and Hennepin County.

For the Cities of Eden Prairie, Minnetonka, Hopkins, and St. Louis Park, information from the regional travel demand model was combined with expected changes in land use and density and anticipated developments to derive growth rates (ranging from 0.5 to 4.0 percent) used to calculate 2040 peak hour turning movement forecasts at each intersection for the No Build Alternative. In Minneapolis, which is a fully built-out community where lower growth is expected, annual growth rates of 0.3 to 0.4 percent per year were utilized based on typical practices by the City of Minneapolis and Hennepin County.

Vehicle trip generation rates for planned park-and-ride lots were based on data collected from other park-and-ride lots in the region. These trip generation rates were applied to the number of spaces planned for each proposed park-and-ride facility. The traffic forecast to be generated by the park-and-ride lots was added to the No Build Alternative forecasts to produce the Project forecasts, without any reduction in forecast traffic volumes due to light rail transit ridership, based on the results of sensitivity testing within the regional travel demand model. This method produced relatively conservative projections on the roadway network that will be affected by park-and-ride trips.

4.2.1.3 Roadways and Traffic Analysis Methodology

Traffic operations analyses were completed for key intersections within the study area for existing conditions, the No Build Alternative (2040) and the Project in 2040. Methodologies documented in the *Highway Capacity Manual* (HCM) (Transportation Research Board, 2010) were followed to complete traffic operations analyses. Synchro/Sim Traffic and VISSIM software packages[14] were used to develop the traffic analysis models. The inputs into the software included lane geometrics, traffic volumes, pedestrian volumes, light rail stations, freight rail and light rail alignments, freight rail and light rail vehicle volumes, intersection and at-grade crossing control devices, and signal phasing and timing characteristics.

The Project has the potential to improve traffic conditions and roadway system performance by upgrading intersections with added turn lanes and the addition or modification of traffic signals. In addition, by prompting a shift in the mode of travel from private automobiles to public transit, the Project has the potential to reduce traffic congestion. While these changes would represent relatively small changes on a regional level, they would represent appreciable improvements over the No Build Alternative within the corridor. The potential regional traffic benefits of the Project were evaluated based on the change in daily

[13] See http://www.metrocouncil.org/Planning/Projects/Thrive-2040/Thrive-MSP-2040-Plan.aspx?source=child.

[14] Synchro, Sim Traffic and VISSIM are traffic simulation software packages used to analyze existing and simulate future traffic conditions using HCM methodologies.

vehicle trips, vehicle miles traveled (VMT), roadway operating speeds, intersection level of service LOS, and representative travel times. These areas are discussed in the *Traffic Memorandum* (2015), with key findings summarized in the following sections.

Traffic operations for this analysis are characterized by intersection LOS, which is based on delay and available capacity. LOS for an intersection is classified into ratings that range from "A" to "F," where "A" represents the least congested operations and "F" represents the most congested operations. Intersections that operate between LOS A and LOS D meet applicable state and local standards for performance, while intersections that operate at LOS E or LOS F designate lower levels for performance. In addition, vehicular queuing (i.e., cars lined up waiting at an intersection) at intersections was evaluated. A queuing issue was identified when the forecasted queue length exceeded 500 feet at a stop-controlled intersection or when a queue length exceeds the length of a turn lane at a signal-controlled intersection. In areas where the light rail alignment will be located adjacent to an existing freight rail alignment, existing at-grade roadway/freight crossings will also include at-grade light rail crossings (see Section 4.6, Table 4.6-2 for a list of existing at-grade freight rail crossings). For these locations, the evaluation of traffic operations for existing conditions (2013), the No Build Alternative (2040), and the Project (2040) includes an analysis of LOS both without and with a freight train crossing event. In general, freight train crossing events are not expected to occur in the peak hours under typical conditions, and therefore are not considered in this traffic impacts analysis; however, they were evaluated to present a sensitivity analysis for impacts to roadways and traffic if they were to occur during peak hours. Refer to the *PEC-West Traffic Memorandum* (2015) and *PEC-East Traffic Memorandum* (2015) for more information (refer to these memoranda in Appendix C).

The study area for the traffic analysis includes intersections at or adjacent to a proposed at-grade light rail/roadway crossings or at roadways/driveways associated with a proposed light rail station or park-and-ride lot, as illustrated on Exhibit 4.2-1. The study area generally falls within a 300-foot radius of the Project alignment.

4.2.2 Affected Environment

This section describes the performance of the regional roadway system and the local roadway network.

4.2.2.1 Regional Highway Network

The regional highway and roadway network comprises interstate and other federal highways, state highways, county highways, and other selected roadways throughout the Twin Cities Metropolitan Area.[15] The Twin Cities Metropolitan Area has 17,500 miles of roads, including 2,600 miles of principal and A-minor arterials, which constitute the region's federal-aid highway system. These roadways make up only 15 percent of the roadway miles but carry 75 percent of the region's traffic.

The Metropolitan Council 2040 Transportation Policy Plan (TPP) (2015) indicates that the existing roadway network is expected to experience a substantial increase in vehicle demand by the year 2040. In 2010, the regional VMT on the roadway network was approximately 72.9 million daily VMT.[16] By 2040, the regional VMT is forecast to increase approximately 23 percent to 89.4 million daily VMT.

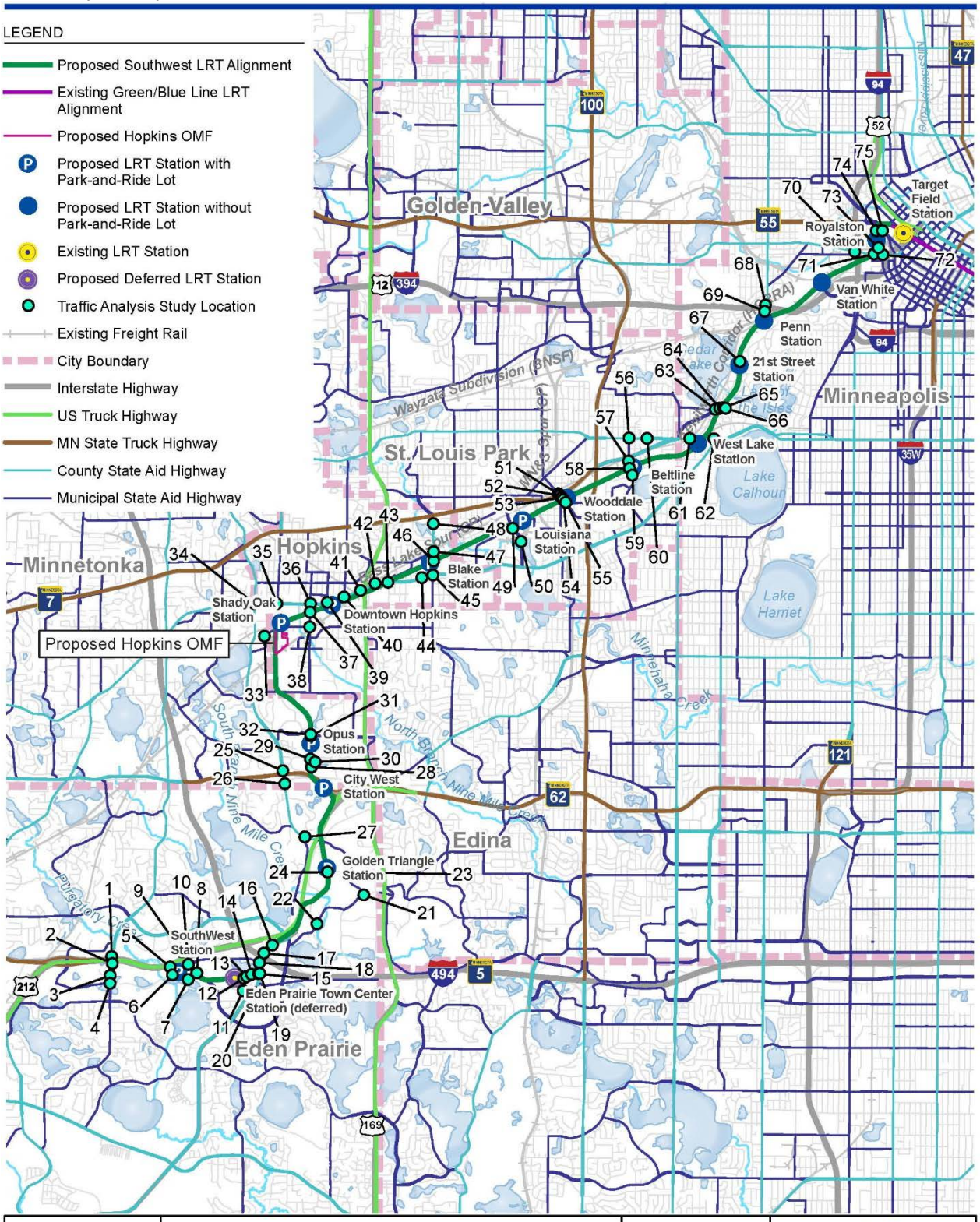
Table 4.2-1 shows the existing regional population and regional travel demand on the roadway network in 2010 (actual)[17] and 2040 (forecast), in terms of average weekday vehicle trips, daily VMT, and daily VMT per resident. The forecast travel behavior is based on the operation of all planned transit service in 2040, including the Southwest LRT (METRO Green Line extension), the METRO Blue Line Extension, and other transit improvements. This increase in transit service, along with other changes in travel behavior, is forecast to result in an increase in average weekday transit ridership, which in turn is forecast to result in a decrease in average weekday VMT per resident in the metro region. Exhibit 4.2-2 illustrates the congestion levels on principal arterials in 2013, and the forecasted congestion levels on principal arterials in 2040.

[15] The Twin Cities Metropolitan Area includes seven counties: Hennepin County, Ramsey County, Dakota County, Anoka County, Washington County, Scott County, and Carver County.

[16] VMT is a measurement of miles traveled by vehicles in a specified region for a specified time period. One vehicle traveling one mile equals one VMT.

[17] Based on data included in the 2040 TPP (2015). The base year for the analysis in this document is 2010.

EXHIBIT 4.2-1
Traffic Analysis Study Area



Portions of many of the principal arterial roadways near the proposed Project are projected to experience congestion in 2040, including I-494, I-35W, I-394, Highway 7, Highway 169, Highway 100, Highway 62, and Highway 212.

TABLE 4.2-1
Average Weekday Vehicle Trips and Vehicle Miles Traveled in 2010 and 2040, Region Wide

Travel Demand Metric	2010	2040	Change	Percent Change
Population	2,850,000	3,673,860	+823,860	+29%
Daily Vehicle Trips	6,600,000	9,776,000	+2,152,000	+28%
Daily VMT	72,900,000	89,420,000	+16,520,000	+23%
Daily VMT per Resident	25.6 miles per resident in 7-county metro region	24.3 miles per resident in 7-county metro region	-1.3 mile per resident in 7-county metro region	-5%

Source: 2040 TPP (Council, 2015).

4.2.2.2 Local Roadways and Intersections

The regional highway system is supplemented by a network of county and city roadways throughout the Project study area. These roadways provide for short to medium length trips in the study area as well as access to/from proposed park-and-ride facilities. Existing daily traffic volumes for key roadways in the study area are illustrated in Exhibits 4.2-3 and 4.2-4.

A traffic operations analysis was completed for the existing conditions for the key intersections within the study area. Traffic operations were evaluated based on two criteria: overall intersection LOS, which is based on average vehicle delay, and traffic queues. Table 4.2-2 shows the existing traffic operations for each of the traffic analysis areas evaluated. This includes an evaluation of existing intersection LOS for the AM and PM peak hour (see Section 4.2.1.3 for a description of methodology). For a detailed description of the traffic operations analysis for the existing condition (2014), including a description of the location of traffic movements with queuing issues, refer to the *PEC-West Traffic Memorandum* (2015) and *PEC-East Traffic Memorandum* (2015). As shown in Table 4.2-2, all of the intersections evaluated operate at LOS D or better in the existing AM and PM peak hour conditions, with the following exceptions:

- Flying Cloud Drive and Valley View Road (AM peak hour)
- Bren Road East and Red Circle Drive (AM peak hour)

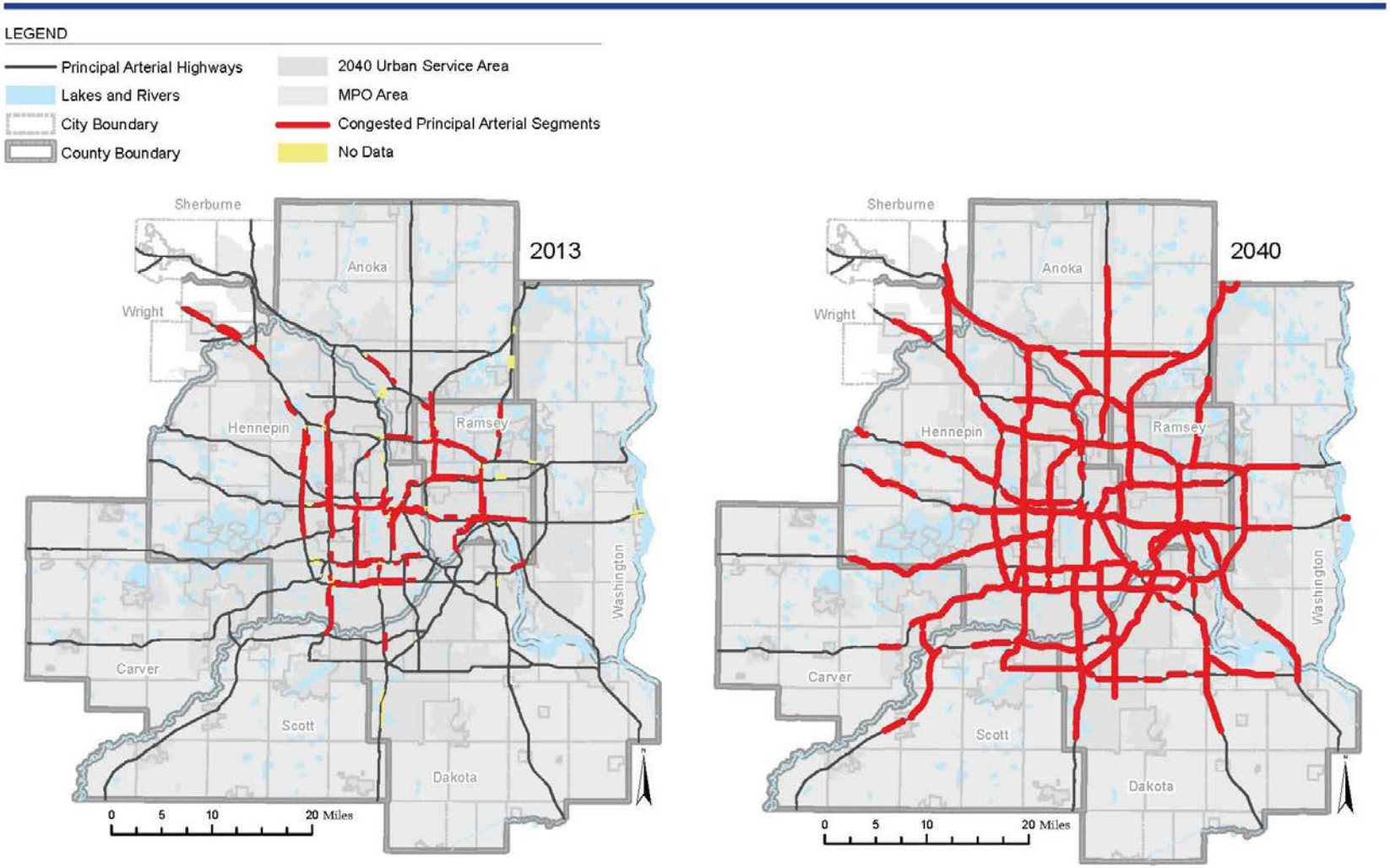
4.2.2.3 No Build Alternative

The analysis of the No Build Alternative is based on the average daily traffic volumes for the 2040 forecast year (see Exhibits 4.2-3 and 4.2-4), existing roadway geometrics and freight rail crossing treatments, existing signal operations, and currently programmed projects, as included in the Council's *2040 Transportation Policy Plan* (2015). The No Build Alternative traffic analysis is based on optimized signal timing in 2040, but no changes were made to the existing signal phasing.

Refer to Section 2.1.4.1.C for a list of programmed improvements included in the No Build Alternative. The *PEC-West Traffic Memorandum* (May 2015) and *PEC-East Traffic Memorandum* (May 2015) (see Appendix C) include intersection schematics showing the changes in roadway geometry over existing conditions included in the 2040 No Build Alternative. Refer to Table 4.2-2 for the 2040 No Build traffic operations analysis, which includes an evaluation of 2040 No Build intersection LOS for the AM and PM peak hour. For a detailed description of the traffic operations analysis for the No Build Alternative (2040), including a description of the location of traffic movements with queuing issues, refer to the *PEC-West Traffic Memorandum* (2015) and *PEC-East Traffic Memorandum* (2015). As shown in Table 4.2-2, all of the intersections evaluated operate at LOS D or better in the forecasted 2040 No Build Alternative AM and PM peak-hour conditions, with the following exceptions:

- Technology Drive and SouthWest Station East Driveway (PM peak hour)
- Prairie Center Drive and Technology Drive (PM peak hour)
- Prairie Center Drive/Technology Drive and WB Highway 5/Highway 212 Ramp (PM peak hour)
- Prairie Center Drive/Technology Drive and EB Highway 5/Highway 212 Ramp (PM peak hour)

EXHIBIT 4.2-2
Congested Principal Arterials



Source: http://www.metrocouncil.org/Transportation/Planning-2/Key-Transportation-Planning-Documents/Transportation-Policy-Plan-(1)/The-Adopted-2040-TPP-(1).aspx

Southwest LRT FINAL EIS
Congested Principal Arterials
in 2013 and 2040

EXHIBIT 4.2-3
Existing and Forecast (No Build) Average Daily Traffic Volumes – Eden Prairie, Minnetonka, and Hopkins

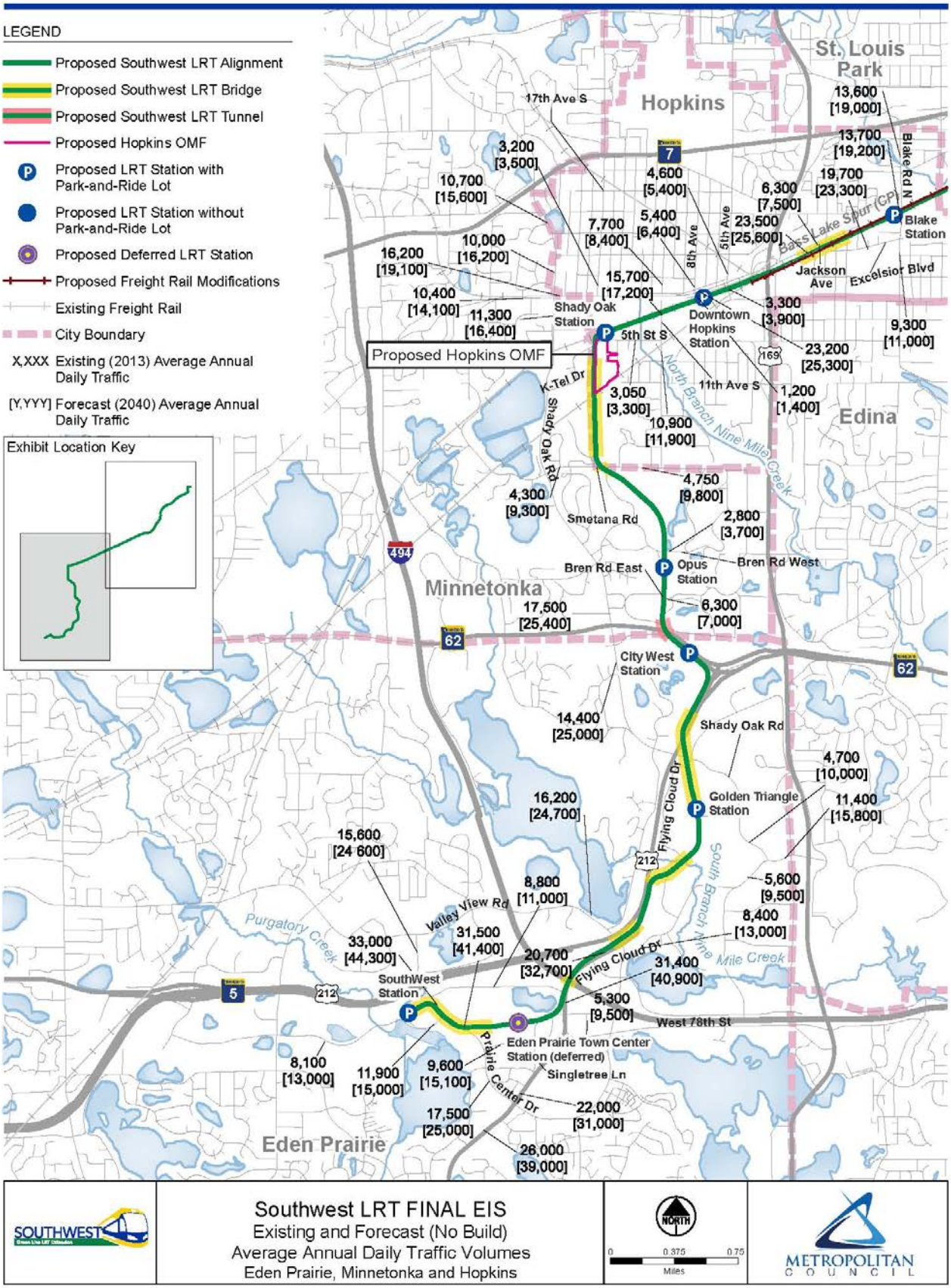


EXHIBIT 4.2-4
Existing and Forecast (No Build) Average Daily Traffic Volumes – St. Louis Park and Minneapolis

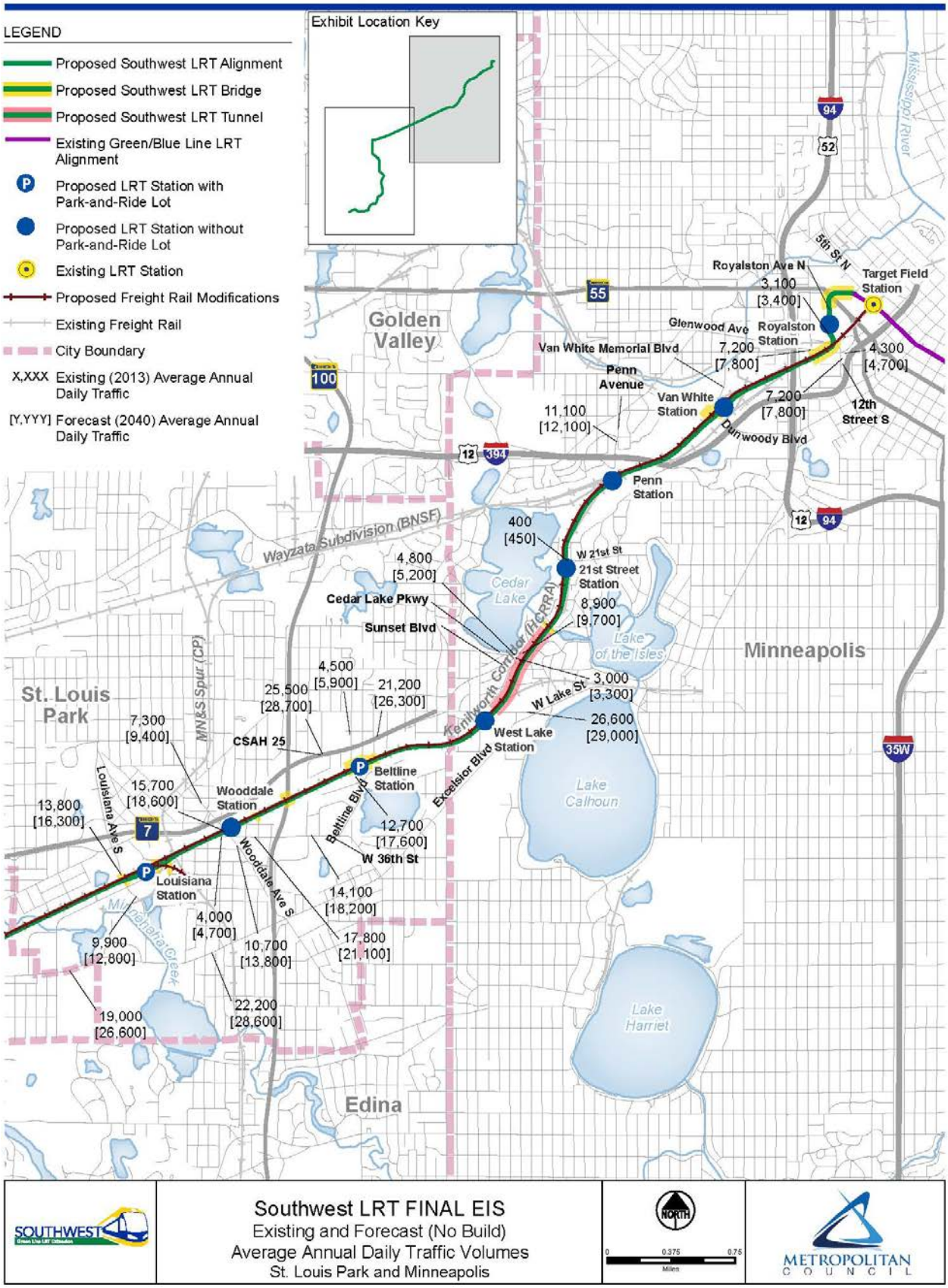


TABLE 4.2-2
Peak-hour Traffic Operations Analysis for Existing Conditions (2014), No Build Alternative (2040), and the Project (2040)

Map ID[a]	Intersection or LRT Crossing	Existing Conditions (2014)[a]		No Build Alternative (2040)[a]		Project (2040)[a]	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
1	Mitchell Rd//WB Hwy 5/Hwy 212 Ramp	B	C	B	C	B	C
2	Mitchell Rd//EB Hwy 5/Hwy 212 Ramp	A	B	B	B	B	B
3	Mitchell Rd/Lone Oak Rd	A	A	A	B	A	C
4	Mitchell Rd/Technology Dr	C	C	C	D	C	D
5	Technology Dr/SouthWest Station Bus Access	A	A	A	A	A	A
6	Technology Dr/SouthWest Station West Access	A	A	A	C	A	C
7	Technology Dr/SouthWest Station East Access	A	A	A	E	B	E
8	Technology Dr/Prairie Center Dr	C	C	B	E	C	E
9	Prairie Center Dr/Technology Dr (and WB Hwy 5/Hwy 212 ramp)	C	C	D	F	C	F
10	Prairie Center Dr/Technology Dr (and EB Hwy 5/Hwy 212 ramp)	B	C	C	F	C	E
11	Main St/Singletree Lane	A	A	A	B	A	C
12	Eden Road/Main St[b]	N/A	N/A	N/A	N/A	C	D
13	Eden Rd/Eden Extension/Redstone Driveway[c]	N/A	N/A	N/A	N/A	C	D
14	Eden Rd/Glen Lane	A	A	A	A	A	A
15	Eden Rd/Leona Dr/Flying Cloud Dr	A	B	B	C	B	C
16	Flying Cloud Dr/Valley View Dr	E	C	E	C	E	C
17	Flying Cloud Dr/Viking Dr	A	C	C	D	C	B
18	Flying Cloud Dr/WB I-494 Ramp	B	C	B	D	C	D
19	Flying Cloud Dr/ EB I-494 Ramp	A	B	B	C	C	D
20	Flying Cloud Dr/Eden Rd/Leona Dr	A	B	B	C	B	C
21	Flying Cloud Dr/Singletree Lane	B	C	B	D	B	D
22	Shady Oak Rd/Valley View Rd	A	A	B	E	B	C
23	Shady Oak Rd/70th St	A	A	B	F	B	F
24	Proposed 70th St LRT Grade Crossing[c]	N/A	N/A	N/A	N/A	A	A
25	Shady Oak Rd/WB Hwy 62 Ramp	B	B	C	C	C	C
26	Shady Oak Rd/EB Hwy 62 Ramps/W 62nd St	B	A	D	D	D	D
27	Shady Oak Rd/City West Pkwy	C	C	C	C	C	C
28	Yellow Circle Dr/Red Circle Dr[c]	N/A	N/A	N/A	N/A	A	A
29	Bren Rd East/Red Circle Dr/Proposed LRT Grade Crossing	F	A	F	A	A	A
30	Yellow Circle Dr/Yellow Circle Dr[c]	N/A	N/A	N/A	N/A	A	A
31	Bren Rd E/Bren Rd W[c]	A	A	A	A	A	A
32	Bren Rd W LRT Grade Crossing[c]	N/A	N/A	N/A	N/A	A	A
33	K-Tel Dr/5th St S Crossing[c]	N/A	N/A	N/A	N/A	A	A
34	Excelsior Blvd/Shady Oak Rd	C	C	D	D	D	D
35	Excelsior Blvd/17th Ave S	A	B	A	B	B	B
36	Excelsior Blvd/11th Ave S	B	C	C	C	B	C
37	Proposed 11th Ave S LRT Grade Crossing[c]	N/A	N/A	N/A	N/A	A	A
38	11th Ave S/5th St S	A	B	A	B	A	B
39	Excelsior Blvd/8th Ave S	B	C	B	C	C	C
40	Excelsior Blvd/5th Ave S	B	C	C	C	C	C
41	Excelsior Blvd/Hwy 169 Southbound Ramps	C	B	C	B	C	B
42	Excelsior Blvd/Hwy 169 Northbound Ramps	D	C	D	C	D	C

Map ID[a]	Intersection or LRT Crossing	Existing Conditions (2014)[a]		No Build Alternative (2040)[a]		Project (2040)[a]	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
43	Excelsior Blvd/Jackson Ave/Milwaukee St	D	C	D	C	D	D
44	Excelsior Blvd/Pierce Ave	A	A	A	A	B	B
45	Excelsior Blvd/Blake Rd	D	D	D	D	D	D
46	Blake Rd/Rail Crossing	A	A	A	A	A	A
47	Blake Rd/2nd St NE	B	B	B	B	B	C
48	Blake Rd/Cambridge St	B	B	B	B	B	C
49	Louisiana Ave/Oxford St	A	A	A	B	B	B
50	Louisiana Ave/Louisiana Circle	A	A	A	A	B	B
51	Wooddale Ave/Hwy 7 Westbound Ramps	A	A	A	A	B	B
52	Wooddale Ave/Hwy 7 Eastbound Ramps	A	A	A	D	A	B
53	Wooddale Ave/Hwy 7 South Frontage Rd	A	A	A	B	A	B
54	Wooddale Ave/Rail Crossing	A	A	A	A	A	A
55	Wooddale Ave/W 36th St	B	B	B	B	C	C
56	Beltline Blvd/West Lake Street	C	D	C	D	C	D
57	Beltline Blvd/Hwy 7 South Frontage Rd	B	C	B	**F**	A	B
58	Beltline Blvd/Rail Crossing	A	A	A	D	A	A
59	Beltline Blvd/Park Glen Rd	A	A	B	D	C	A
60	West Lake Street/Lynn Ave	A	A	A	A	A	B
61	W Lake St/Drew Ave	A	A	A	A	A	A
62	W Lake St/Market Plaza	C	C	C	C	C	C
63	Cedar Lake Pkwy/Sunset Blvd	A	A	A	A	A	A
64	Cedar Lake Pkwy/Rail Crossing/Burnham Rd	A	A	A	A	A	A
65	Cedar Lake Pkwy/Xerxes Ave	A	A	A	A	A	A
66	Cedar Lake Pkwy/ Benton Blvd	A	A	A	A	A	A
67	21st St W/Rail Crossing	A	A	A	A	A	A
68	Penn Ave/I-394 Westbound Ramps	B	B	B	B	B	B
69	Penn Ave/I-394 Eastbound Ramps	A	B	B	B	B	B
70	Glenwood Ave/E Lyndale Ave	C	C	C	C	B	C
71	Glenwood Ave/LRT Crossing[c]	N/A	N/A	N/A	N/A	A	A
72	Glenwood Ave/Royalston Ave/12th St N/Twins Way	C	C	C	C	B	C
73	Royalston Ave/Holden St	A	A	A	A	B	B
74	Royalston Ave/5th Ave N	A	A	A	A	A	A
75	7th St N/5th Ave N	A	A	A	A	C	B

[a] Map ID corresponds to the labeling on the map presented in Exhibit 4.2-1.

[b] LOS = level of service; LOS A – D are characterized as uncongested and LOS E – F are characterized as congested. **Bold** text indicates congestion.

[c] New roadway or new at-grade roadway/LRT crossing built with the Project. Not applicable to existing conditions or the No Build Alternative. N/A = not applicable.

Source: *PEC-West Traffic Memorandum*, 2015 and *PEC-East Traffic Memorandum*, 2015.

- Flying Cloud Drive/Valley View Road (AM peak hour)
- Shady Oak Road and Valley View Road (PM peak hour)
- Shady Oak Road and West 70th Street (PM peak hour)
- Bren Road East and Red Circle Drive (AM peak hour)
- Beltline Boulevard and Highway 7 south frontage road

4.2.3 Environmental Consequences

4.2.3.1 Long-term Direct Impacts on Roadways and Traffic

This section identifies the long-term and short-term direct and indirect impacts on roadways and traffic from the No Build Alternative and the Project.

The Project will result in physical modifications to existing roadways and intersections that will affect local circulation patterns. None of these modifications are anticipated to have an impact on the regional roadway system as these changes will occur on the local roadway systems. A complete list of roadway and intersection modifications that will be implemented with the Project is included in the Roadway Improvements Table and Preliminary Engineering Plans found in Appendix E.

The analysis of the traffic impacts for the Project is based on the average daily traffic volumes for the forecast year (see Exhibits 4.2-3 and 4.2-4), proposed traffic control at intersections and rail crossings, existing and proposed signal operations, and other roadway and geometric improvements included in the Project. Locally Requested Capital Investments (LRCIs) were also included in the traffic operations analysis for the Project (refer to Appendix E for a description of LRCIs). A sensitivity analysis that discusses the traffic implications of not implementing the LRCIs with the Project is included at the end of this section.

At proposed light rail stations, additional pedestrian volumes were incorporated into the modeling and additional vehicle traffic was added to the roadway network to account for traffic generated by park-and-ride lots. The control of each of the proposed light rail crossings was identified based on the proximity to the freight rail alignment and adjacent signalized intersections. Refer to Section 4.6, Safety and Security, (see Table 4.6-1) for a description of the existing and proposed traffic control for intersections and light rail crossings affected by the Project.

Signal phasing was also modified at several locations to provide protected-only turn phasing for turn movements across the tracks and to provide the ability to run signal phases to clear the tracks when a train is approaching where signal preemption was modeled. Signal timing in the traffic model was optimized for all traffic signals with the Project.

Impact Avoidance and Minimization Measures

As noted in Section 4.2.1.3, roadway and intersection improvements were incorporated into the Project to avoid new or worsened congested intersections, compared to the No Build Alternative in 2040, and the proposed improvements are reflected in the traffic operations analysis. These roadway and intersection improvements included in the Project are shown in Table 2.1-3 and are illustrated in the Preliminary Engineering Plans (see Appendix E).

A series of intersection schematics for each of the intersections included in the traffic operations analysis, showing the existing conditions and changes in intersection geometrics for the 2040 No Build Alternative and the Project are included in Appendix B of the *PEC-West Traffic Memorandum* (2015) and *PEC-East Traffic Memorandum* (2015).

Traffic Operations Analysis

Traffic operations for the Project in 2040 (average weekday) were evaluated based on overall intersection LOS and traffic queues (refer to Section 4.2.1 for a description of methodology). Refer to Table 4.2-2 for a summary of the traffic operations analysis for the Project in 2040; the table includes a summary of intersection LOS for average weekday a.m. and p.m. peak hours. For comparison, the table also includes a summary of traffic operations for the No Build Alternative in 2040. For a detailed description of the traffic

operations analysis for the Project, including a description of the location of traffic movements with queuing issues, refer to the *PEC-West Traffic Memorandum* (2015) and *PEC-East Traffic Memorandum* (2015). In summary, of the 75 intersections analyzed:

- No intersections that would operate at LOS A to D under the No build Alternative will operate at LOS E or F under the Project.
- Three intersections that would operate at LOS E or F under the No Build Alternative will be improved to LOS A through D under the Project.
- Six intersections that would operate at LOS E or F under the No Build Alternative will continue to operate at LOS E or F under the Project.

Operations and Maintenance Facility

An OMF will be constructed as part of the Project and will be located in the southwest quadrant of the K-Tel Drive and 15th Avenue South intersection in the city of Hopkins. When the OMF is constructed, 16th Avenue South will be permanently vacated between 5th and 6th Streets South and a cul-de-sac will be constructed on 6th Street South, south of Sixth Street. A new street (5½ Street) will be constructed between Fifth Street and Sixth Street. The partial acquisition of the parcel at 510 15th Avenue South will eliminate one access point to the property on 16th Avenue South, and this will be replaced from the new 5½ Street South. The parcel will continue to have one access on 6th Street South and one access on 15th Avenue South.

A traffic analysis was completed for the OMF to determine if it would create any traffic impacts. The existing land use is industrial park with an existing 223,000-square foot building. Trips that will be generated by the OMF were compared to trips generated by the existing uses at full capacity. Based on this comparison, the OMF will generate fewer trips than the existing land uses.

The OMF will not substantially impact any arterial roadways and will not result in changes to any signalized intersections. In addition, the OMF will not substantially change traffic patterns in the area as it will have similar characteristics to the industrial uses currently in place and is expected to decrease trip generation over the current use. Therefore, the OMF will not generate long-term traffic impacts.

Locally Requested Capital Investments

The potential long-range impacts of several LRCI improvements requested and funded by local agencies were analyzed as part of the Project. These LCRI projects include:

- Construction of Main Street from Singletree Lane to Eden Road
- Construction of 17th Avenue extension to K-Tel Drive
- Intersection capacity improvements at the Beltline Boulevard/West Lake Street intersection

The traffic analysis showed that all intersections would continue to operate at LOS D or better in 2040 if the LCRI improvements are not constructed. The only notable difference in intersection operations if the LRCI improvements are not completed at Beltline Boulevard will be that the westbound approach on Beltline Boulevard at Highway 25 will have more delay and queuing, but the intersection would still operate at a LOS D or better during the AM and PM peak hour and queuing would not exceed available storage.

4.2.3.2 Long-term Indirect Impacts on Roadways and Traffic

The Project will have an indirect effect on the roadway network. The areas of indirect impact on roadways and traffic include additional vehicle traffic from the anticipated new development surrounding the light rail stations, and a decrease in auto trips on the surrounding roadway network as people switch from auto to transit.

The traffic assessment described in Section 4.2.3.1 was based on the regional travel demand model (refer to Section 4.2.1 for a description of the methodology) which includes 2040 population and employment forecasts that include current and reasonably foreseeable future actions, such as station area development. Based on this information, the Project includes capacity upgrades and improvements in locations that could realize the indirect impact of increased traffic generated in station areas.

4.2.3.3 Short-term Impacts on Roadways and Traffic

Construction of the Project will require activities that may result in short-term impacts, such as:

- Relocation of existing utilities
- Removal of existing surface features within the right-of-way or between the curbs
- Excavation and construction of new subsurface features required for the LRT system and adjacent roadways including stormwater drainage systems and various electrical facilities
- Construction of new light rail track, stations, electrical power systems, roadways, and bridges
- Installation of above ground light rail system operation facilities

Construction of the Project will result in temporary partial, and full closures of existing streets as well as material and equipment deliveries, worker arrivals and departures, and hauling of excavation and borrow materials. Locations where temporary traffic impacts are expected to occur during construction of the Project are shown in Table 4.2-3 (see Section 4.2.4 for mitigation measures). Construction of the Project will also result in temporary, partial, and full closures of driveways while construction is occurring at those locations.

TABLE 4.2-3
Short-term Roadway and Traffic Impacts during Construction

Location	Short-term Impact	Related Construction Activity
Hwy 212/Prairie Center Dr Interchange Ramps	Turn lane closures	Adjacent track and retaining wall construction
Hwy 212/Prairie Center Dr/Bus Only Access Ramp	Lane closure or shift	Maintaining bus only access to SouthWest Station during construction
Prairie Center Dr	Lane closures or shifts	Bridge, roadway, signal, utility construction
Eden Rd/Glen Lane	Lane closures or shifts or medium term closures or detours	Road reconstruction, track, signal, utility construction
Flying Cloud Dr (Eden Rd to Valley View Rd)	Lane closures/shifts	Widening and reconstruction, track, utility, bridge construction
Technology Dr (west of Flying Cloud Dr)	Lane closures or medium term closures or detours[a]	Road reconstruction, track, signal, utility construction
I-494	Shoulder closures and short-term closures[a]	Bridge construction
Valley View Rd	Lane closures or shifts and short term closures[a]	Bridge and utility construction
Hwy 212 (north of Valley View Rd)	Shoulder closures and short-term closures[a]	Retaining wall, track, utility construction
Flying Cloud Dr (near Nine Mile Creek and Shady Oak Rd interchange)	Lane closures or shifts and short-term closures[a]	Utility and bridge construction
W 70th St	Lane closures or shifts	Road, track, station site, utility construction
Shady Oak Rd at Valley View Rd intersection	Lane closures or shifts	Intersection control and driveway relocation improvements
Shady Oak Rd at W 70th St intersection	Lane closures or shifts	Intersection control
Shady Oak Rd	Shoulder closures and short-term closures[a]	Bridge, track, utility construction
Hwy 212 (north of Shady Oak Rd)	Shoulder closures and short-term closures[a]	Bridge, track, utility construction
W 62nd St	Lane closures or shifts[b]	Track, tunnel, roadway, station site, utility construction
Hwy 62	Shoulder closures and traffic bypasses	Tunnel construction
Bren Rd W, Bren Rd E, Red Circle Dr, Yellow Circle Dr	Lane closures or shifts; possible longer term closures of roadway segments	Bridge, track, and utility construction[c]

Location	Short-term Impact	Related Construction Activity
Feltl Rd	Lane closures or shifts; bypasses; possible longer term closure	Bridge, track, and utility construction
Smetana Rd	Lane closures or shifts; bypasses; possible longer term closure	Bridge, track, and utility construction
16th Ave	Full closure	Roadway no longer exists with OMF
15th Ave	Lane closures or shifts	OMF construction
6th St	Lane closures or shifts	OMF construction
K-Tel and 5th	Lane closures or shifts; bypasses; possible longer term closure	Track, road, utility construction
Excelsior Blvd	Lane closures or shifts	Turn lane widening, utility construction
17th Ave	Lane closures or shifts	Turn lane widening, signal construction
11th Ave	Lane closures or shifts	Widening and reconstruction, signal, utility, track construction
8th Ave S	Lane closures or shifts	At-grade gated crossing and reconstruction
Excelsior Blvd at 8th Ave S	Lane closures or shifts	Reconstruction of intersection
5th Ave S	Lane closures or shifts	At-grade gated crossing and reconstruction
Hwy 169 EB and WB Ramps at Excelsior Blvd	Traffic impacts due to construction traffic	Adjacent intersection reconstruction west and east of this location
Excelsior Blvd at Jackson Ave N/Milwaukee St	Lane closures or shifts	Bridge construction, at-grade freight rail crossing and reconstruction
St. Louis St	Traffic impacts due to construction traffic	Adjacent track and retaining wall construction and intersection construction
Blake Rd	Lane closures or shifts	At-grade gated rail crossings and reconstruction
Excelsior Blvd at Pierce Ave	Lane closures or shifts	Construction of Pierce Ave access road and traffic signal
Louisiana Ave S	Lane closures or shifts	Bridge reconstruction
Oxford St/Edgewood Ave S	Lane closures or shifts	Bridge and roadway reconstruction
Wooddale Ave S	Lane closures or shifts	At-grade gated rail crossings and reconstruction
Hwy 7	Traffic impacts due to construction traffic	Adjacent intersection reconstruction and traffic signals
Yosemite Ave S/W 35th St	Lane closures or shifts	Sidewalk construction
Hwy 100	Lane closures or shifts	Bridge construction
Beltline Blvd	Lane closures or shifts	At-grade gated rail crossings and reconstruction
Hwy 25	Lane closures or shifts	Add turn lane; Beltline Blvd reconstruction
Lynn Ave/Hwy 7 service road/Hwy 25	Lane closures or shifts	Reconfiguration of intersection
W Lake St	Lane closures or shifts	Add barrier and sidewalk on bridge, pedestrian facility upgrades
Excelsior Blvd (W 32nd St to Market Plaza)	Lane closures or shifts	Pedestrian facility updates and sidewalks
Abbott Ave/Chowen Ave/W 32nd St	Lane closures or shifts	LRT tunnel, reconstruction
Cedar Lake Pkwy/Burnham Rd	Lane closures or shifts	At-grade gated rail crossings, reconstruction
W 21st St	Lane closures or shifts	At-grade gated rail crossings, reconstruction, station construction

Location	Short-term Impact	Related Construction Activity
W 22nd St/Thomas Ave S/West 24th St	Lane closures or shifts	Intersection reconstruction, sidewalks
Penn Ave S	Lane closures or shifts	Add sidewalks, remove SB right-turn lane at I-394 ramps, pedestrian ramp upgrades
S Wayzata Blvd/I-394 ramps	Lane closures or shifts	Add sidewalk and passenger drop-off connection to Penn Station
Van White Blvd	Lane closures or shifts	Reconstruct access road and Luce Line pedestrian bridge
Dunwoody Blvd	Traffic impacts due to construction traffic; lane closures and shifts	Pedestrian facility upgrades, sidewalks and pedestrian lighting
Glenwood Ave	Full closure	Bridge and retaining wall construction
Royalston Ave	Lane closures or shifts	Intersection and station construction
Holden St N	Lane closures or shifts	Roadway and intersection reconstruction
Border Ave	Lane closures or shifts	Roadway and intersection reconstruction
3rd Ave N at Border Ave	Lane closures or shifts	Intersection reconstruction
Cesar Chavez Ave at Border Ave	Lane closures or shifts	Intersection reconstruction
Lakeside Ave at Border Ave	Lane closures or shifts	Intersection reconstruction
E Lyndale Ave	Traffic impacts	Reconstruction of Holden St and closure of Glenwood Ave
N 7th St	Lane closures or shifts	Bridge construction
6th Ave N	Traffic impacts due to construction traffic	Adjacent track and retaining call construction
5th Ave N	Lane closures or shifts	Roadway and bridge construction
N 12th St/11th St N	Traffic impacts due to construction traffic	Roadway and intersection reconstruction
Olson Memorial Highway	Traffic impacts due to construction traffic	Adjacent track and retaining call construction
N Fremont Ave	Lane closures or shifts	Roadway reconstruction
N 7th St/10th St N	Lane closures or shifts	Construction of protected bike lane

[a] Up to approximately overnight or weekend.

[b] Closure for duration of light rail construction if the United Health Group campus improvements occur after completion of Project construction in the area.

[c] The City of Minnetonka will reverse traffic flow on Red Circle Drive to support the needs of the Project.

Source: Council, 2015.

4.2.4 Mitigation Measures

This section describes the measures the Council will implement to mitigate the Project's long-term and short-term roadway and traffic impacts. For each mitigation measure or set of associated mitigation measures, this section generally notes the anticipated impact or associated impacts that the mitigation measures will address (see Section 4.2.3 for additional information on the identified roadway and traffic impacts and avoidance measures).

4.2.4.1 Long-term Mitigation Measures

No mitigation measures are warranted for long-term impacts to roadways and traffic because there will be no adverse impacts, due to the effectiveness of identified avoidance measures. As described in Section 4.2.3.1, the Project includes a variety of roadway modifications that will avoid any new congested intersections, and the Project will not worsen conditions at intersections that would be congested under the No Build Alternative in 2040 (see Appendix E for a listing of those roadway modifications).

4.2.4.2 Short-term Mitigation Measures

Impact. Project construction will result in temporary partial and full closures of existing streets as well as material and equipment deliveries, worker arrivals and departures, and hauling of excavation and borrow materials.

> ***Mitigation.*** Mitigation measures for short-term (construction) impacts to roadways and traffic will be implemented by the Council prior to and during construction through the Construction Mitigation Plan, which includes a Construction Communication Plan and a construction staging plan. MnDOT, Hennepin County, and all municipalities affected by construction activities related to the Project will require compliance with applicable state and local regulations related to the closing of roadways and the effects of construction activities. Contractors will be required to comply with all guidelines established in the *Minnesota Manual on Uniform Traffic Control Devices* (2015). Construction staging and mitigation documents will be reviewed by appropriate jurisdictions, and required permits will be secured. Traffic control plans will be developed by the contractor based on information identified in the construction documents and the Construction Mitigation Plan. Traffic control plans will be reviewed by appropriate jurisdictions and the Council prior to the initiation of construction activities.

4.3 Parking

This section describes the long-term direct and indirect and short-term (construction) direct and indirect effects of the Project on personal automobile parking, based on an assessment of changes to on-street and off-street parking (see Section 3.17 for cumulative impacts). This section includes an overview of the regulatory context and methodology used for the analysis; an assessment of the existing built environment as it relates to parking; a description of the anticipated impacts related to on- and off-street parking; and a description of mitigation measures to implement with the Project.

4.3.1 Regulatory Context and Methodology

The Project is consistent with the Council's 2040 Transportation Policy Plan and its goal to partner with local jurisdictions to implement travel demand management strategies, which include promoting multimodal travel options and alternatives to single-occupant vehicle travel on congested highway corridors and corridors served by regional transit service, such as avoiding the oversupply of parking. Local municipalities have regulatory controls available to them in the form of comprehensive plans and city zoning codes guiding development, which may include parking requirements. There are no other specific laws or executive orders regulate the consideration of parking impacts as part of preparing federal environmental review documents.

The study area for the parking analysis includes the limits of disturbance for the Project (See Appendix E). Existing on-street and off-street parking spaces the Project will directly affect were inventoried based on preliminary engineering information and a review of aerial photography. Existing loading zones and handicapped parking spaces were also considered in this evaluation. The number of parking spaces that will be provided at new park-and-ride facilities included in the Project are also described.

Parking impacts in the study area are classified as either permanent or temporary. Permanent parking effects consist of permanent loss of parking spaces that will not be reconstructed in their existing location or replaced at another location. Temporary parking effects consist of parking spaces that will be temporarily lost due to construction and will be unavailable for some duration during construction but would be available after construction or relocated to another location.

4.3.2 Affected Environment

This section describes the existing conditions for parking within the parking study area. Parking for personal automobiles consists of a mix of privately-owned, off-street parking; on-street public parking; and publicly-owned surface parking lots (e.g., park-and-ride lots, bus stops, and trailhead locations).

The majority of the parking spaces within the parking study area are located within off-street surface parking lots. Off-street parking is typically associated with privately-owned businesses, such as office complexes, commercial retail businesses, industrial sites, and residential complexes. There are also some

publicly-owned off-street parking lots within the study area (e.g., existing public park-and-ride lots and trailhead locations).

In addition to off-street parking lots, some areas within the parking study area permit on-street parking. On-street parking is typically located on local streets and can be metered or not metered. Most of the on-street parking within the parking study area is located within the City of Minneapolis, but there are some areas where on-street parking is permitted in the Cities of Hopkins and St. Louis Park.

Table 4.3-1 shows the total number of existing parking spaces within the parking study area, by city, including both off-street parking lots (public and private) and on-street parking spaces. There are 20,915 on- and off-street parking spaces in the parking study area.

TABLE 4.3-1
Existing Parking within the Study Area

City	Total Parking Spaces[a]
Eden Prairie	8,572
Minnetonka	4,327
Hopkins	2,686
St. Louis Park	3,161
Minneapolis	2,169
Total	**20,915**

[a] Includes the total number off-street and on-street parking spaces within the parking study area

4.3.3 Environmental Consequences

This section identifies the long-term and short-term direct and indirect impacts on parking from the Project.

4.3.3.1 Long-term Direct Impacts on Parking

Under the Project, there will be some changes to on- and off-street parking. Changes to off-street parking will be related to land acquisitions (refer to Section 3.4 for additional information on acquisitions), and changes to on-street parking will occur in some areas where changes to existing roadways are needed to accommodate the Project. Overall, the Project will reduce the supply of off-street parking by eliminating 692 spaces and the supply of on-street parking will be reduced by 57 spaces (see Exhibits 4.3-1 and 4.3-2).

Off-Street Parking

Potential changes to off-street parking under the Project are illustrated in Exhibits 4.3-1 and 4.3-2. The overall effect of the Project on off-street parking spaces along the corridor was evaluated in terms of proposed changes to available parking supply. This analysis considers reductions in off-street parking spaces related to acquisitions where the building and business will remain.[18]

The Project will have a long-term direct effect on off-street parking, as it will reduce off-street parking supply within 16 properties in the Cities of Eden Prairie, Minnetonka, and Hopkins. All of these properties are currently under commercial (e.g., office, retail) or industrial use, with the exception of one mixed-use (i.e., commercial/residential) property in Eden Prairie. Because the existing buildings and businesses could remain, the demand for off-street parking at these locations could exceed supply (see Exhibits 4.3-1 and 4.3 2).[19]

[18] Demand for parking is generated based on land use. For instances where a parcel of land will be fully acquired and the existing uses eliminated, the related demand for parking will also be eliminated. Because the demand for parking will be removed, there will be no overall loss of parking supply resulting from these acquisitions. Therefore, this analysis excludes changes in off-street parking related to full parcel acquisitions.

[19] For partial acquisitions that reduce off-street parking supply, the property acquisition process will determine whether a particular affected business will remain at its current location or whether the business will be relocated or displaced (i.e., due to inadequate parking supply to support that particular business and/or for some other reason). See Section 3.4 for additional information on the property acquisition process, including a listing of full and partial property acquisitions.

EXHIBIT 4.3-1
Parking Changes

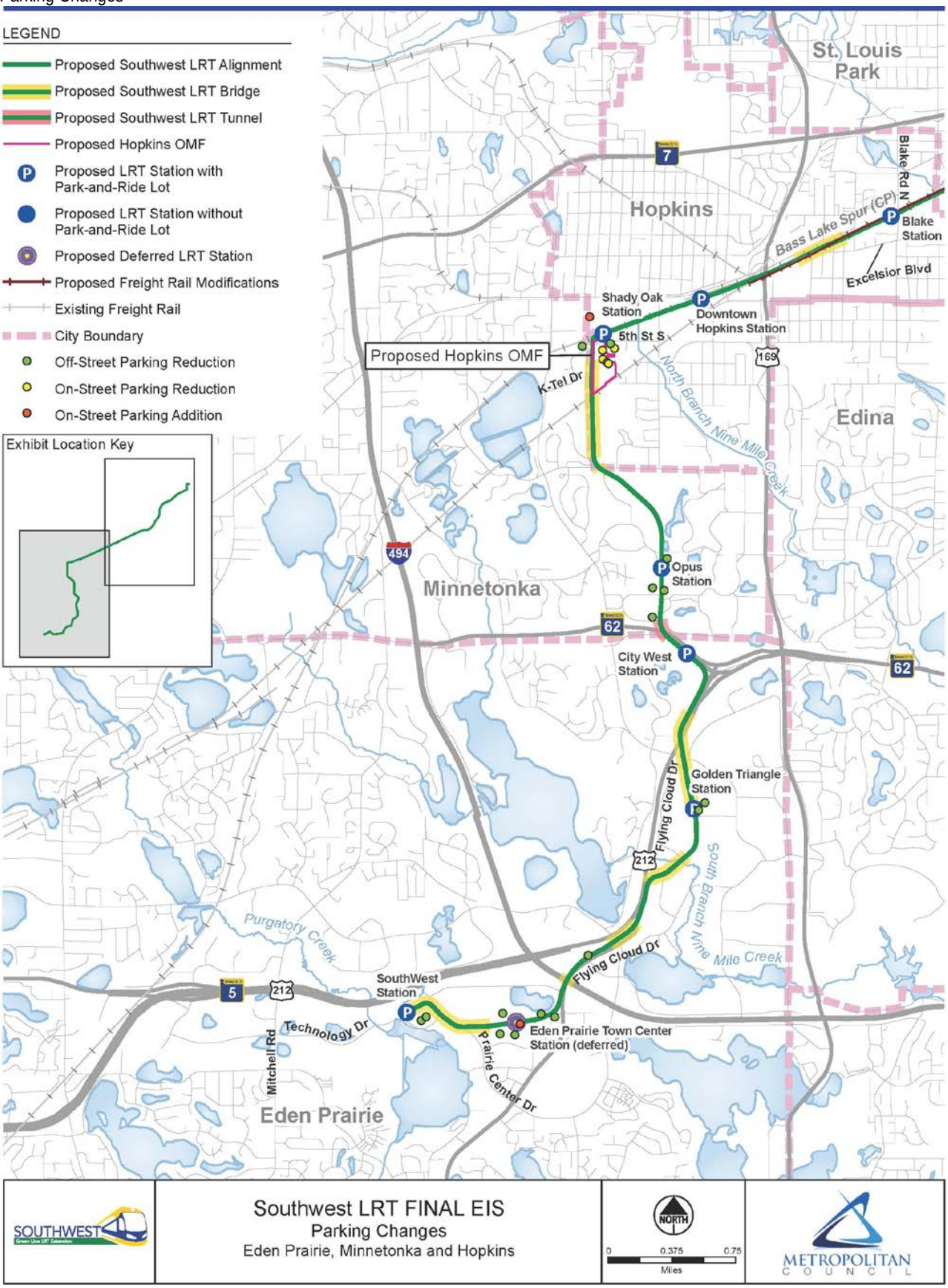
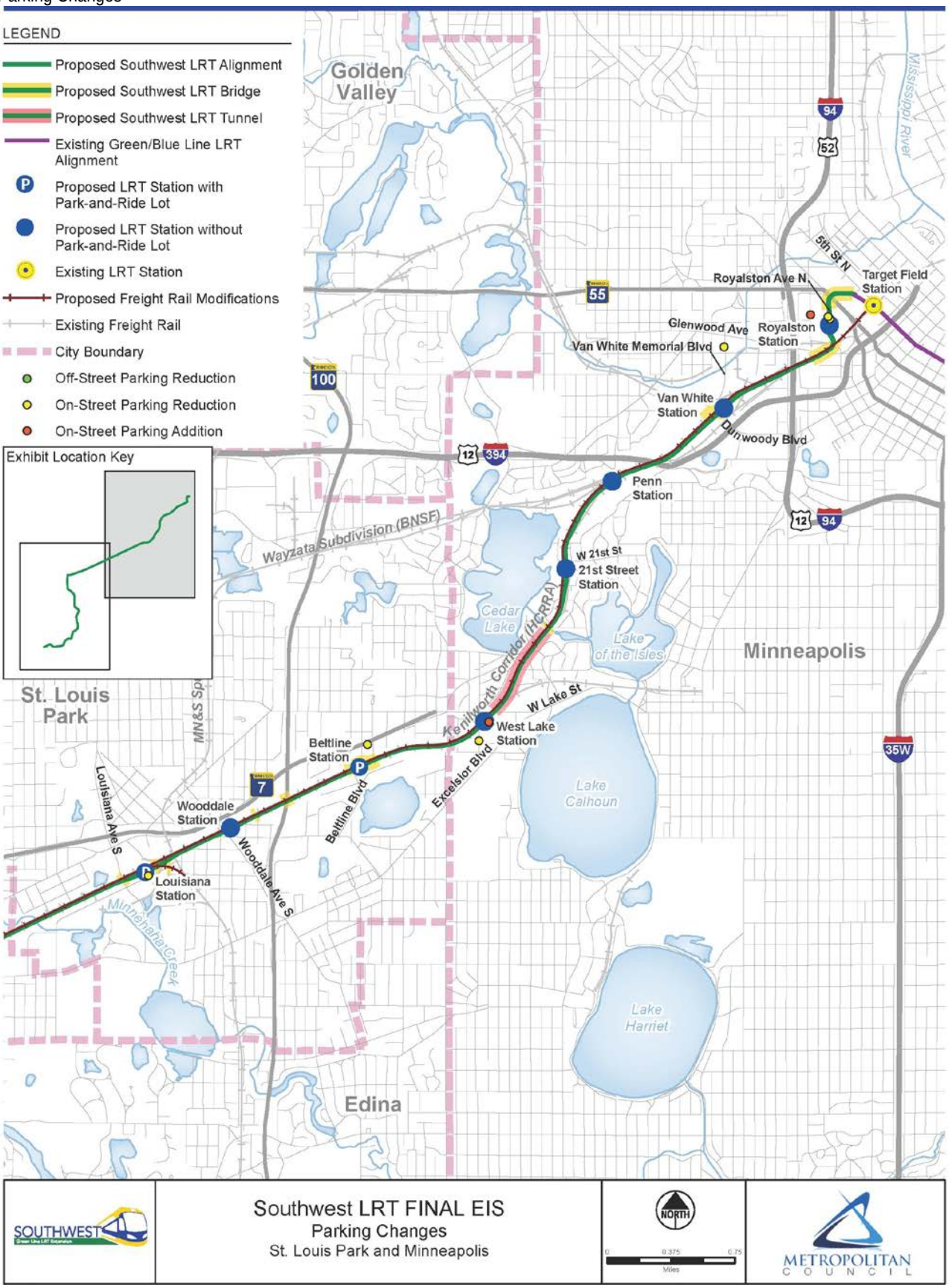


EXHIBIT 4.3-2
Parking Changes



The overall reduction in parking resulting from the Project will amount to a net loss of 692 off-street parking spaces, as follows:

- 18 spaces in the SouthWest Station area
- 131 spaces in the Eden Prairie Town Center Station area[20]
- 3 spaces east of the Eden Prairie Town Center Station toward the proposed Golden Triangle Station
- 237 spaces in the Golden Triangle Station area
- 81 spaces in the area between the City West Station and the Opus Station
- 136 spaces in the Opus Station area
- 86 spaces in the Shady Oak Station area

The Project will also remove the existing publicly-owned parking lot (52 spaces) located at the southeast quadrant of the intersection between Excelsior Boulevard and 8th Avenue South, in Hopkins. This location serves as a Metro Transit Park-and-Ride Lot and provides parking for an existing trailhead location (i.e., public trail access location) for the existing Cedar Lake LRT Regional Trail.

On-Street Parking

As illustrated on Exhibits 4.3-1 and 4.3-2, the Project will have a long-term direct effect on the supply of on-street parking in the vicinity of the proposed light rail alignment, as it will increase or decrease the supply of on-street parking at select locations. In summary, the Project will add 98 on-street parking spaces at five locations (213 on-street spaces, if Eden Prairie Town Center Station is built by 2040) and eliminate 252 on-street parking spaces at nine locations, for an overall reduction in on-street parking supply of 154 spaces (reduction of 39 on-street spaces, if Eden Prairie Town Center Station is built by 2040).[21] All of the locations where on-street parking will be reduced are on streets that currently serve commercial (e.g., office, retail) or industrial uses, with the exception of the Abbot Avenue/Chowen Avenue/West 32nd Street area near the proposed West Lake Station, which serves commercial and high-density residential uses.

Park-and-Ride Lots

As shown in Table 4.3-2, the Project will include new park-and-ride lots at nine light rail stations, for a combined addition of approximately 2,487 new park-and-ride spaces.

As described in Section 4.3.2, there is an existing publicly-owned park-and-ride lot located along Excelsior Boulevard at 8th Avenue South (southeast quadrant of the intersection), which is currently served by Metro Transit buses (route 670). This park-and-ride lot will be closed and replaced with a new park-and-ride lot constructed as part of the Project, in the northwest quadrant of the intersection between Excelsior Boulevard and 8th Avenue South, adjacent to the proposed Downtown Hopkins Station.

Based on the travel demand forecasts completed for the Project (see Section 4.1 for more detail), the cumulative supply of park-and-ride lot spaces will meet and exceed the forecasted demand for park-and-ride lot parking spaces in the Project's opening year (2020). However, the travel demand forecasts show a deficit of approximately 650 park-and-ride spaces in the Project's forecast year (2040). This forecast deficit is predominantly concentrated at the proposed SouthWest and Beltline Stations, with most (about two-thirds) of the deficit occurring at the SouthWest Station. Following is a description of the general land use and parking characteristics of each of these areas:

[20] As described in Section 2.1.1, the Eden Prairie Town Center Station and associated roadway improvements are deferred and are not expected to be in place when the Project opens in 2020. The station and associated roadway improvements are planned to be in place by 2040. If the station and associated roadway improvements are not in place by 2040, there would not be a reduction of 51 off-street parking spaces in the vicinity of the station by 2040, and thus the overall reduction in off-street parking supply resulting from the Project would be 561 spaces, rather than 641 spaces.

[21] The Project will increase the supply of on-street parking at select locations (see Exhibits 4.3-1 and 4.3-2) as a result of changes to local roadway alignments or geometry needed to provide access to proposed light rail stations, which create more space for on-street parking.

TABLE 4.3-2
Planned Park-and-Ride Lots and Spaces under the Project

Proposed Light Rail Station	City	Number of New Spaces
SouthWest[a]	Eden Prairie	450
Eden Prairie Town Center	Eden Prairie	0
Golden Triangle	Eden Prairie	200
City West	Eden Prairie	160
Opus	Minnetonka	80
Shady Oak	Hopkins	700
Downtown Hopkins	Hopkins	190
Blake[b]	Hopkins	89
Louisiana	St. Louis Park	350
Wooddale	St. Louis Park	0
Beltline[b]	St. Louis Park	268
West Lake	Minneapolis	0
21st Street	Minneapolis	0
Penn	Minneapolis	0
Van White	Minneapolis	0
Royalston	Minneapolis	0
Total		**2,487**

[a] Includes new parking spaces provided for Southwest LRT and not replacement parking.
[b] Additional parking for joint development opportunity addressed in Chapter 9.
Source: Council, 2015.

- **SouthWest Station**. The area within the vicinity of SouthWest Station generally comprises office, retail, and open space land uses. Parking in this area is generally provided in off-street parking lots, and there is no on-street parking in the immediate vicinity of the station.
- **Beltline Station.** The area within the vicinity of Beltline Station is generally occupied by light industrial and commercial uses, with some residential land use (predominantly larger multifamily complexes) farther to the south and north of the station. Parking in this area is generally provided in off-street parking lots, and on-street parking is limited to the local streets north of Highway 25 and south of the station area along Park Glen Road.

4.3.3.2 Long-term Indirect Impacts on Parking

The Project could affect the supply of and demand for off-street parking in the areas surrounding the proposed new light rail stations as a result of station area development/redevelopment. Light rail lines can advance the timing and increase the intensity of development surrounding proposed station areas. Any development would be required to comply with the parking requirements of the local jurisdiction, which would tend to ensure a long-term balance of parking supply and demand.

The Project could also lead to indirect impacts related to "spillover" parking in neighborhoods adjacent to proposed light rail stations. Spillover parking is unwanted parking by light rail riders in off-street parking lots or at on-street parking spaces adjacent to a light rail station. Spillover parking can result from a lack of park-and-ride lot capacity relative to demand for park-and-ride lot spaces, and can affect both businesses and residences by limiting available parking spaces for residents, visitors, customers, and employees. Based on preliminary engineering, the Project will directly acquire parking from 15 commercial/retail businesses located along the alignment, and one mixed use residential property. The economic impact associated with this loss of parking is discussed in greater detail in Section 3.2 of this Final EIS.

Spillover parking could occur at stations where there are no park-and-ride lots planned or if there is a shortage of park-and-ride spaces along the light rail alignment or at a particular station. Because of the potential deficit in park-and-ride capacity in the forecast year near SouthWest and Beltline Stations (see Section 4.3.3.1), there is an increased risk for spillover parking to occur within the vicinity of the proposed SouthWest and Beltline Stations.

4.3.3.3 Short-term Impacts on Parking

Temporary removal of on-street parking spaces could occur at locations to facilitate construction of the Project (e.g., to facilitate truck movement, to provide a temporary truck loading zone). These potential temporary removals of on-street parking spaces will be identified as part of a construction staging plan, prior to construction. Refer to Section 3.2.3.3 for a discussion of short-term impacts to businesses resulting from construction of the Project, including temporary loss of parking.

4.3.4 Mitigation Measures

This section describes the measures the Council will implement to mitigate the Project's long-term and short-term parking impacts. For each mitigation measure or set of associated mitigation measures, this section generally notes the anticipated impact or associated impacts that the mitigation measures will address (see Sections 4.3.3.1, 4.3.3.2, and 4.3.3.3 for additional information on the identified parking impacts and avoidance measures).

4.3.4.1 Mitigation Measures for Long-term Impacts

Impact. Loss of off-street parking spaces where buildings and businesses will remain.

> ***Mitigation.*** The Council will compensate business owners for the loss of off-street parking spaces based on the terms of the purchase agreement between the Council and property owner, in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Uniform Act). Refer to Section 3.4.1 for additional information on the Uniform Act.

Impact. Potential spillover parking in neighborhoods adjacent to proposed light rail stations, particularly in the areas within the vicinity of the proposed SouthWest and Beltline Stations.

> ***Mitigation.*** The Council will complete a Regional Park-and-Ride System Report on an annual basis. As part of this effort, the Council and Metro Transit will collaborate with regional transit partners, local governments, and the Minnesota Department of Transportation to conduct an annual regional park-and-ride survey, which tracks facility use and emerging travel patterns by park-and-ride users across the region to identify the appropriate mitigation, as needed and where feasible. The results of this survey are published in the annual report.
>
> ***Mitigation.*** The Council will develop a joint use agreement to share parking with SouthWest Transit for the park-and-ride lot adjacent to the station.

Impact. Potential displacement of on-street handicap parking spaces or on-street truck loading zones.

> ***Mitigation.*** The Council will identify suitable replacement locations, prior to displacement of the parking spaces.

4.3.4.2 Mitigation Measures for Short-term Impacts

Impact. Temporary removal of on-street parking spaces at select locations throughout the parking study area to facilitate construction of the light rail improvement and associated roadway and freight rail modifications (e.g., to facilitate truck movement, to provide a temporary truck loading zone). Refer to Section 3.2.4 for a discussion of mitigation measures for short-term impacts to businesses resulting from construction of the Project, including temporary loss of parking.

> ***Mitigation.*** The Council will develop a Construction Mitigation Plan that will address temporary parking loss during the construction of the Project. The Council will phase construction activities;

therefore, many of the spaces lost during construction will only be for a portion of the Project's construction phase.

4.4 Freight Rail

This section identifies the long-term direct and indirect and short-term (construction) direct and indirect impacts of the Project on freight rail (see Section 3.17 for cumulative impacts). This section includes an overview of the regulatory context and methodology used for the analysis; a review of agency and railway coordination; an assessment of the existing built environment; a description of the anticipated impacts related to rail and truck freight facilities and operations; and a description of mitigation measures to implement with the Project.

4.4.1 Regulatory Context and Methodology

This section describes regulatory context and methodology for the freight analysis. This section includes a summary of relevant laws and executive orders, an overview of the methodology, and a description of the study area for the analyses completed as part of the land use evaluation.

The study area for the freight analysis included the area approximately one half-mile on either side of the proposed light rail alignment centerline. The focus of this evaluation is on freight rail lines in the freight study area.

To initiate the freight rail analysis in this Final EIS, the operators of freight rail in the freight study area were identified, along with all freight rail routes. All proposed physical changes to freight rail lines were identified and long-range direct and indirect impacts to freight operations were evaluated. Further, all existing at-grade freight rail/roadway crossings affected by the Project were identified, as well as any operational changes to freight rail. Long-term direct impacts include any changes to track or crossing controls and any changes to right-of-way which is currently used for freight rail purposes. Long-term indirect impacts include changes to freight travel times, access, and/or safety. See Section 3.2 for a discussion of economic effects related to freight rail.

4.4.2 Agency and Freight Rail Owner/Operator Coordination

This section describes the agency and railway coordination conducted for the Project. This section includes a summary of coordination undertaken with participating agencies, freight rail owners, and freight operators along the proposed light rail alignment.

4.4.2.1 Surface Transportation Board

As the Project's lead federal agency, FTA invited the federal Surface Transportation Board (STB) to be a Cooperating Agency, in accordance with Title 40 of the Code of Federal Regulations (40 CFR 1508.5). As documented in the Draft EIS, the STB agreed to become a Cooperating Agency in August 2012 because several alternatives under evaluation at the time would have required STB approval to be implemented. Subsequent to the publication of the Draft EIS, the Project definition changed (see Section 2.1.1) and the proposed freight rail modifications incorporated into the Project can be implemented without STB approval. As such, FTA and the STB agreed that STB would participate in the Project's NEPA process as a Participating Agency rather than a Cooperating Agency. (See Appendix N, Agency Coordination Letters, for documentation related to the agency's status.)

4.4.2.2 Federal Railroad Administration

The FRA is the federal agency with jurisdictional authority over railroad safety, except "rapid transit operations in an urban area that are not connected to the general railroad system of transportation" (49 U.S.C. § 103, 49 U.S.C. § 20102). In October 2014, FRA provided a preliminary jurisdiction determination for the proposed Project which concluded that the proposed Southwest LRT Project will be an urban rapid transit (URT) operation, and therefore, FRA will not exercise its safety jurisdiction over the Southwest LRT Project, except to the extent that it is necessary to ensure railroad safety at any limited shared connections between the Southwest LRT Project and freight rail. This applies to the shared at-grade light rail/freight rail roadway crossings included in the Project (see Section 4.6.2). The Project will be subject to FRA regulations,

including 49 CFR Parts 214, 219, 220, 222, 225, 228, 233, 234, 235, and 236 and 49 CFR §229.125, as well as the hours of service laws, but only at the points of connection between the Southwest LRT Project and the general railroad system. See Appendix N for a copy of correspondence between the Council and FRA regarding FRA's jurisdictional determination.

4.4.2.3 Hennepin County Regional Railroad Authority

HCRRA is the current owner of the Kenilworth Corridor (see Exhibit 4.4-1). Future long-term ownership of the Kenilworth Corridor has not been determined and will be decided as a result of negotiations between the Council and HCRRA, prior to construction of the Project.[22] As part of these negotiations, TC&W's operating rights within the Kenilworth Corridor will be maintained per the terms of the existing trackage rights agreement.[23] See Appendix N for a summary of correspondence between the Council and HCRRA regarding long-term ownership of the Kenilworth Corridor.

4.4.2.4 Freight Rail Owners and Operators

The Council has and will continue to coordinate with freight rail owners and operators affected by the Project. Following is a summary of relevant coordination efforts:

- **Canadian Pacific Railway**. Canadian Pacific Railway (CP Railway) is the owner of the 6.8-mile Bass Lake Spur freight railroad (see Exhibit 4.4-1). As part of the Project, the Council intends to purchase all of the 6.8-mile Bass Lake Spur from CP Railway. See Appendix N for the relevant correspondence with CP Railway regarding the purchase of the Bass Lake Spur.[24]
- **BNSF Railway**. BNSF Railway is the owner of the Wayzata Subdivision (see Exhibit 4.4-1). As part of the Project, the Council intends to acquire a permanent easement of approximately 1.5 acres of land owned by BNSF Railway. See Appendix N for a summary of correspondence between the Council and BNSF regarding the purchase of an easement in the Wayzata Subdivision.
- **Twin Cities & Western Railroad.** TC&W operates freight trains in the Bass Lake Spur, Kenilworth Corridor, and the Wayzata Subdivision. TC&W's operating rights within the Kenilworth Corridor will be maintained per the terms of the existing trackage rights agreement, and TC&W will be granted operating rights within the Bass Lake Spur as part of the purchase agreement between the Council and CP Railway. See Appendix N for a summary of correspondence between the Council and TC&W.

4.4.3 Affected Environment

This section describes the existing environment conditions for freight rail within the study area. As shown in Exhibit 4.4-1, there are currently four active freight rail lines within the freight study area: the Bass Lake Spur; the Kenilworth Corridor; a short segment of Wayzata Subdivision; and the Minneapolis, Northfield, and Southern Railway (MN&S) Spur. Trains make the connection between the MN&S Spur and the Bass Lake Spur using the existing Skunk Hollow switching wye. Table 4.4-1 includes a summary of the existing characteristics of the four freight rail lines. Freight rail operations can change in the future, depending on factors such as market conditions and operational adjustments that are at the discretion of the freight rail owners and operators. Refer to Section 4.6 (see Table 4.6-1) for a description of existing at-grade freight rail crossings of roadways and trails in the study area.

[22] The Council will take all reasonable actions to keep the Kenilworth Corridor in public ownership while it is being used for rail transportation of any kind, per the terms of the Memorandum of Understanding between the Council and the City of Minneapolis (2014; refer to Appendix D).

[23] Source: Trackage Rights Agreement Between Soo Line Railroad Company, TC&W Railroad Company, and Hennepin County Regional Railroad Authority, August 3, 1998, and supplemented July 30, 2002. This agreement grants TC&W Railroad Company non-exclusive rights to conduct railroad operations within the Kenilworth Corridor, including the operation of freight trains, occasional passenger trains, locomotives, cabooses, rail cars, maintenance-of-way equipment, and other rail equipment.

[24] The purchase agreement between the Council and CP Railway for the acquisition of the Bass Lake Spur will be negotiated and executed after the publication of the Project's Record of Decision.

EXHIBIT 4.4-1
Existing Freight Rail Operations

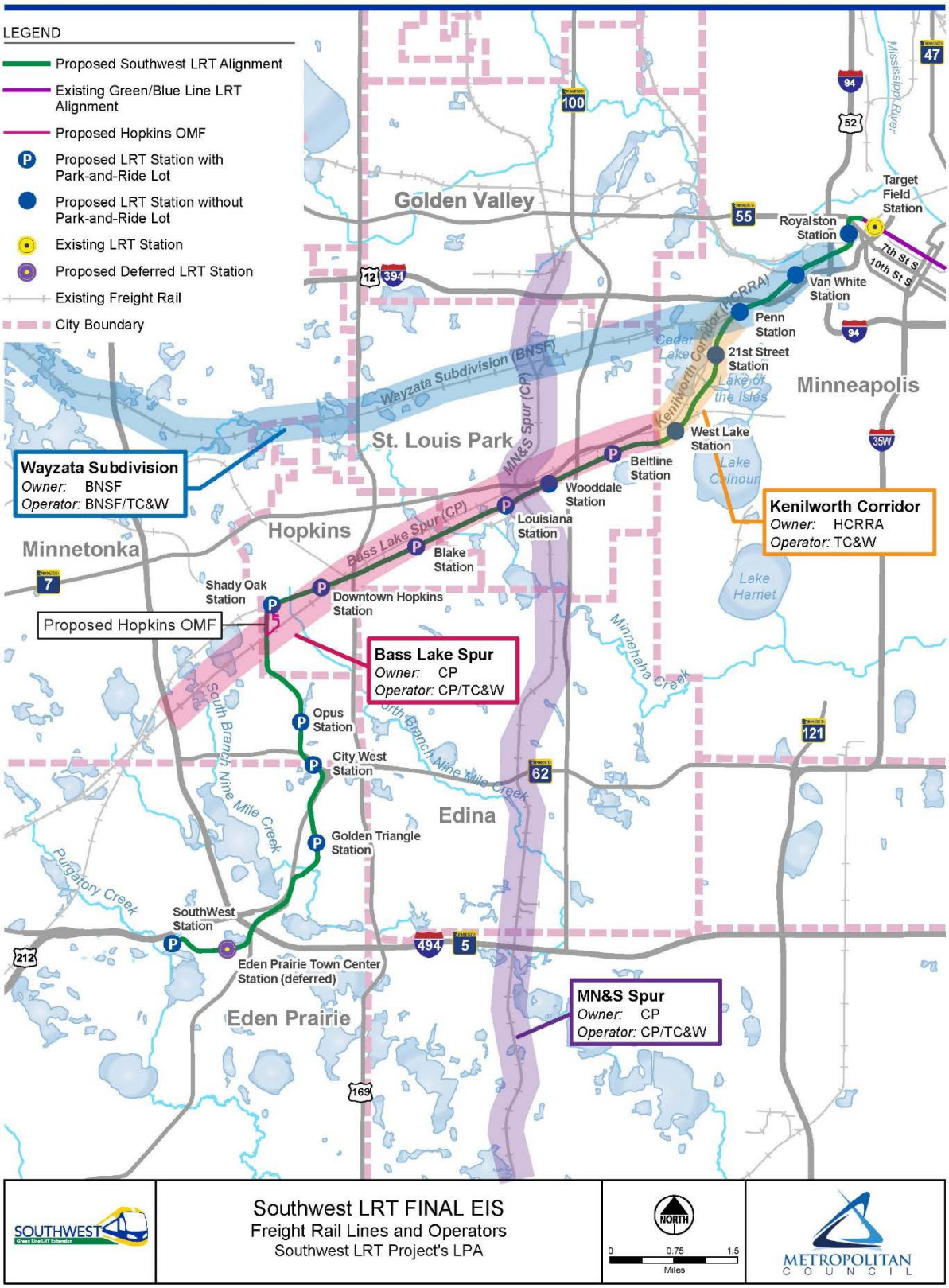


TABLE 4.4-1
Existing Freight Rail Operating Conditions in the Wayzata Subdivision, Kenilworth Corridor, Bass Lake, and MN&S Spurs[a]

Freight Rail Characteristic	Wayzata Subdivision	Kenilworth Corridor	Bass Lake Spur	MN&S Spur
Current Owner	BNSF	HCRRA	CP	CP
Freight Rail Operator	BNSF/TC&W	TC&W	CP/TC&W	CP/TC&W
Maximum Design Speed	25 mph	25 mph	25 mph	10 mph
Maximum Operating Speed	25 mph	10 mph	25 mph	10 mph
10-25 Car Trains per Week	0	0	0	10 (CP Railway)
65-75 Car Trains per Week	14 (TC&W)	14 (TC&W)	14 (TC&W)	0
80-125 Car Trains per Week	91 (TC&W and BNSF)	5-6 (TC&W)	5-6 (TC&W)	0
Typical Commodities Carried	Wide variety	Agra-goods, grain, coal, ethanol	Agra-goods, grain, coal, ethanol	Local Services

[a] Refer to Exhibit 4.4-1 for a map showing the location of the Kenilworth Corridor, Bass Lake Spur, MN&S Spur, and Wayzata Subdivision.

Source: TC&W/CP Railway, 2013. BNSF Railway, 2013

4.4.4 Environmental Consequences

This section identifies the long-term and short-term (construction) direct and indirect freight rail impacts that will result from the Project. Direct freight rail impacts are defined as physical changes to the trackage itself, such as track realignment, relocation, reconstruction, or removal. See Section 3.2.3.1 for a discussion on economic impacts to freight rail operations. Long-term indirect impacts on freight rail considered include the potential changes in operation related to ownership and operational agreements, as well as changes in operation related to market expansion.

4.4.4.1 Long-term Direct Impacts on Freight Rail

As part of the Project, changes to existing freight rail infrastructure will be required within the Bass Lake Spur, Kenilworth Corridor, and the Wayzata Subdivision. Table 4.4-2 summarizes the proposed freight rail modifications. A more detailed description of proposed freight rail modifications is included in Section 2.1.1.3. Preliminary Engineering Plans showing the proposed changes to freight rail infrastructure are included in Appendix E.[25] Refer to Section 4.6 (see Table 4.6-1) for a description of existing at-grade freight rail crossings of roadways and trails in the study area.

Additional information on freight rail is included in multiple locations within this Final EIS, as follows: Section 3.2, economic effects on freight rail operations; Section 3.4, right-of-way impacts on freight rail corridors; Section 3.12, noise impacts and mitigation measures related to freight rail; and Section 4.6, railroad crossing safety measures.

4.4.4.2 Long-term Indirect Impacts on Freight Rail

While the Project will require freight rail track modifications, these modifications will not substantially alter operations and will not open access to new freight rail markets. However, with the elimination of the northern branch of the existing Skunk Hollow switching wye and replacement with a new Southerly Connector (see Exhibit 2.1-5) to accommodate the light rail alignment, the proposed Louisiana station will likely reduce freight rail travel times for switching movements between the Bass Lake Spur and the MN&S Spur. As a result of these freight rail modifications, the Project could contribute indirectly to increases in the frequency and/or length of freight trains traveling along the MN&S Spur, which could result in indirect adverse impacts on the human environment, which could be significant.

Future freight rail operations are subject to a range of market forces and are dependent on the business plans of freight railroad operators, both of which are outside of the jurisdiction of the FTA and the Council. Pursuant to 40 CFR 1502.22 and Minnesota Statute 4410.2500, the Final EIS does not evaluate potential

[25] Refer to Section 2.2 for a description of alternatives previously considered and the design adjustment process.

adverse effects on the human environment related to the potential indirect impact of increased freight rail frequency and/or length for the following reasons:

1. In order to evaluate this potential impact, the Council and FTA would need information related to freight rail market analysis in the area and operational plans, which are proprietary information that are subject to change based on a number of factors that are unknown and unavailable. FTA and the Council cannot compel the freight rail operators to disclose their business plans for future service.
2. In order to evaluate reasonably foreseeable impacts, FTA and the Council would need access to private market analysis information for freight operators in the region, and short- and long-term business plans for the railroads. Such information is protected under Title 49, Subtitle IV, Part A of U.S. Code.
3. There is no existing credible scientific evidence or data which can be used to evaluate the potential for related adverse impacts on the human environment related to future market demands placed on freight rail cargo in the Project's study area, or the operational efficiencies that the railroads would accrue with the new wye. Operational efficiencies are dependent on many factors, such as technology, infrastructure quality and asset quality.
4. The FTA and the Council are aware of no theoretical approaches or research methods generally accepted in the scientific community to derive the information required for this analysis without the cooperation of the freight rail operators in sharing the proprietary information.

As demonstrated in Table 4.4-2, no long-term indirect impacts on freight rail related to other aspects of the Project (excluding the Southerly Connector as described above) are anticipated.

4.4.4.3 Short-term Impacts on Freight Rail

A number of short-term impacts to freight rail operations will result from construction activities along the three freight rail corridors adjacent to the Project. These impacts are described in Table 4.4-3. Refer to Section 2.1.1.2 for a more detailed description of construction activities related to the Project.

In order to minimize the potential for freight rail disruption, the Council, in coordination with the affected freight railroad owners and operators, will develop specifications for the contractor to follow in developing and implementing construction staging and sequencing plans. The plan will facilitate coordination between the Project and the affected freight railroad owners and operators during construction activities affecting freight railroad operations to help ensure the Project does not create unreasonable constraints during construction. See Section 4.4.5.2-A for additional information on mitigation measures for short-term (construction) impacts to freight rail.

4.4.5 Mitigation Measures

This section describes the measures the Council will implement to mitigate the Project's long-term and short-term impacts on freight transportation. For each mitigation measure or set of associated mitigation measures, this section generally notes the anticipated impact or associated impacts that the mitigation measures will address (see Sections 4.4.4.1, 4.4.4.2, and 4.4.4.3 for additional information on the identified freight rail impacts and avoidance measures).

4.4.5.1 Long-term Mitigation Measures

No mitigation measures are warranted for long-term impacts to freight rail because there will be no adverse impacts due to the effectiveness of identified avoidance measures.

Additional information on mitigation measures for long-term impacts to other environmental resources associated with freight rail are included, as follows: Section 3.2, economic impacts on freight rail operations; Section 3.4, acquisition of railroad right-of-way; Section 3.12, noise impacts, including train horn quiet zones; and Section 4.6, safety related to light rail operation within the vicinity of freight rail operation and railroad crossing safety measures.

TABLE 4.4-2
Long-term Changes to Freight Rail Infrastructure[a]

Freight Rail Corridor	Freight Rail Modification	General Location	Description of Changes
Bass Lake Spur	Freight rail/light rail swap	East of Excelsior Blvd to east of Beltline Station	Physical Changes Shift freight rail mainline approximately 45 feet north. Light rail alignment will be located south of the freight rail, generally on what is now CP Railway right-of-way. Cedar Lake LRT Regional Trail will be relocated north of its current location, within the HCCRA owned right-of-way (see Exhibit 2.1-5) Operational Changes None
	Southerly Connector/ Skunk Hollow switching wye	Intersection of Bass Lake Spur and MN&S Spur	Physical Changes Eliminate the northern branch of the existing Skunk Hollow switching wye and replacement with a new Southerly Connector (see Exhibit 2.1-5) Operational Changes Provides TC&W trains continued access between the Bass Lake Spur eastbound to the southbound MN&S Spur and the reverse Improves freight rail travel times, making the movement more efficient for trains that make this connection. This will not change access to existing freight rail markets or open access to new freight rail markets, but could contribute indirectly to increases in the frequency/length of freight trains traveling along the MN&S Spur to the south of the Southerly Connector, depending on the business plan of freight rail operators
	Siding track removal	West of Excelsior Blvd to east of Beltline Blvd	Physical Changes Remove approximately 11,770 feet of freight rail siding track Operational Changes Eliminates the bi-directional maneuvering and parking of TC&W freight trains in siding areas at the Wooddale Ave and Bass Lake Spur freight rail crossing that occurs under existing conditions
	Freight Rail Bridge Reconstruction[b]	Intersection of Bass Lake Spur with Minnehaha Creek and Louisiana Ave	Physical Changes Reconstruction of existing freight rail bridges at Minnehaha Creek and Louisiana Ave Operational Changes None
Kenilworth Corridor	Freight rail reconstruction	East of Beltline Blvd to West of Cedar Lake Pkwy	Physical Changes Minor adjustments to and reconstruction of the freight tracks Operational Changes None
	Freight rail reconstruction	North of Cedar Lake Pkwy to south of Burnham Rd	Physical Changes Existing freight tracks will be moved approx. 40 feet north to accommodate light rail alignment Operational Changes None
	Freight Rail Bridge Reconstruction	Kenilworth Corridor/ Kenilworth Lagoon Crossing	Physical Changes Reconstruction of existing freight rail bridge at the Kenilworth Lagoon crossing Operational Changes None
Wayzata Subdivision	Freight rail reconstruction	Wayzata Subdivision/west of the I-94 bridge and east of Royalston Avenue	Physical Changes Shift an approximately 3,560-foot section of the BNSF mainline up to 25 feet north to accommodate light rail alignment Operational Changes None

[a] See Appendix E for preliminary engineering drawings showing the proposed changes.

[b] The existing Bass Lake Spur bridge over Highway 100 is being reconstructed as part of a separate MnDOT project. The Southwest LRT Project will construct a new light rail bridge over Highway 100.

Source: Council, 2015.

TABLE 4.4-3
Short-term Impacts on Freight Rail

Freight Rail Corridor	Short-term (Construction) Impacts[a]
Bass Lake Spur	Multiple 8- to 10-hour stoppages for track shifts moving existing railroad operations to the proposed alignment One 24- to 36-hour stoppage to shift the bridge over Highway 100 from its location along the current alignment to a location north of the light rail mainline; it is anticipated that this will be performed over a long weekend.
MN&S Spur	One 8- to 10-hour stoppage for construction of the new Southerly Connector
Kenilworth Corridor	Multiple 8- to 10-hour stoppages for track shifts moving existing railroad operations to the proposed alignment One 18-hour stoppage at Cedar Lake Parkway for freight rail crossing modifications One 18 hour stoppage at 21st street for shared LRT and freight rail crossing modifications
Wayzata Subdivision	Multiple 8- to 10-hour stoppage in the vicinity of I-94 and Royalston Avenue during the completion of the freight rail shift One 18-hour stoppage in the vicinity of Royalston Station to allow for construction of LRT bridge over the freight rail alignment

[a] Freight rail stoppage locations and durations may be refined based on consultation with freight rail operators, as appropriate.
Source: Council, 2015.

4.4.5.2 Short-term Mitigation Measures

Impact. Short-term impacts to freight rail operations resulting from construction activities along the three freight rail corridors adjacent to the Project.

Mitigation. In order to mitigate short-term impacts to freight rail operations related to construction activities, the Council will develop and implement freight rail operation coordination plans. The purpose of these plans is to facilitate coordination between the Project and the affected freight railroads during construction activities affecting freight rail operations. As part of this effort, Council staff will also work with affected freight rail owners and operators to provide provisions in the construction contract to identify how the contractor will interact with the railroads. Further, Council staff will work with affected freight rail owners and operators to sequence construction to minimize effects on freight movements and to identify optimal periods for closing the rail service and reducing speeds. Dates and times for all stoppages will be determined through coordination with the railroad owners and operators.

During construction activities, flaggers will be used to allow freight rail operations to continue. The use of flaggers will require construction activities adjacent to active freight rail to halt while freight trains traverse the construction area.

4.5 Pedestrian and Bicycle

This section describes the long-term direct and indirect and short-term (construction) direct and indirect effects of the Project[26] on pedestrian and bicycle transportation in the corridor (see Section3.17 for cumulative impacts). This section includes an overview of the regulatory context and methodology used for the analysis; an assessment of existing pedestrian and bicycle facilities; a description of the anticipated impacts related to pedestrian and bicycle facilities; and a description of mitigation measures to implement with the Project.

4.5.1 Regulatory Context and Methodology

The study areas for the pedestrian and bicycle facilities evaluation include a 1/2-mile radius around the center point of proposed light rail stations for pedestrian facilities and a one-mile radius for bicycle facilities,

[26] The Project includes all pedestrian and bicycle improvements included in the Memorandum of Understanding between the Metropolitan Council and the City of Minneapolis. Instructions on how to access this document (Metropolitan Council and City of Minneapolis (Council and City). 2014. *Proposed Redesign of a Portion of Southwest Light Rail Project*. Memorandum of Understanding) can be found in Appendix D.

based on industry standards.[27] All of the public trails assessed in this analysis (aside from the Opus development trail network) are located within a transportation right-of-way—either HCRRA-owned right-of-way or a roadway right-of-way—and as such are not eligible for protection under Section 4(f); the Section 4(f) assessment of the Opus development area trail network is provided in Section 6.7.1.4 of this Final EIS.

Existing sidewalks, trails, on-street bike lanes, and marked crossings[28] within the pedestrian and bicycle study areas were identified using geographic information system (GIS) data, aerial photography, and field review. For the purposes of this analysis, these facilities are defined as follows:

- **Sidewalks**. Linear features for pedestrian travel along the roadway. Generally at least five feet wide and typically paved with concrete.
- **Trails**. Linear features for pedestrian or bicycle travel, either along the roadway or in an exclusive right-of-way. Generally at least eight feet wide and typically paved with asphalt (unless otherwise noted in the analysis). Trails may have shared or separated spaces for pedestrians and bicyclists.
- **On-street bike lanes**. Marked linear features for bicycle travel on the roadway.
- **Marked Crossings**. Signalized and unsignalized marked crosswalks at roadway intersections or mid-block locations. These also include trail crossings of railroad tracks and roadways.

Long-term direct and indirect impacts to the pedestrian and bicycle environment were evaluated based on a review of the Project's Preliminary Engineering Plans (see Appendix E) and the *Metro Light Rail Transit Design Criteria* (Council, 2015b). The design criteria indicate the Project's conformance with other manuals, standards, and engineering best practices, including national and local guidelines that are relevant to pedestrian and bicycle design.

For the Kenilworth Trail, where the Project will result in a reduced trail width, *Shared-Use Path Level of Service* (LOS) *Calculator: A User's Guide* (FHWA, 2006) was used to determine the level of effect the Project would have on bicycle and pedestrian travel on that trail. *Shared-Use Path LOS* was calculated using a spreadsheet that applies the FHWA methodology to analyze shared-use paths based on their width and travel mode splits (e.g., biking, walking, rollerblading).[29] All other trails affected by the Project will be rebuilt to their current width, so *Shared-Use Path LOS* did not need to be calculated.

4.5.2 Affected Environment

There are numerous existing bicycle and pedestrian facilities within the Southwest LRT corridor. This section describes the following: the existing pedestrian and bicycle facilities in the respective study areas; land use context; pedestrian and bicycle volumes on select facilities; and the accessibility of the proposed light rail stations relative to the existing pedestrian and bicycle networks (see Table 4.5-1). This section includes an evaluation of existing sidewalks, trails, on-street bike lanes, and marked crossings (see Section 4.5.1 for definitions of these facilities). The presence, design, and condition of these facilities varies throughout the pedestrian and bicycle study areas, depending on development patterns, community policies,

[27] The Draft EIS methodology used pedestrian and bicycle counts for regional trails within the limits of disturbance. The revised methodology expands the study area to ½ mile for walking and one mile for bicycling and includes all pedestrian and bicycle facility types. The pedestrian study area was chosen because FTA New Starts/Small Starts applications consider a ½-mile area around a station, and pedestrians are typically willing to walk ½ mile to access transit services. The state of the bicycle network within one mile of a station is a key consideration for bicyclists' willingness and ability to access transit services.

[28] Pedestrians and bicycle users are legally allowed to use facilities that are not designated specifically for their use. For example, at intersections with no marked crossings, vehicle drivers must stop and yield the right-of-way to pedestrians crossing the roadway. Typically, pedestrians are also allowed to cross roadways between intersections, but must yield the right-of-way to all vehicles on the roadway. In locations where there are no trails or on-street bike lanes present, bicycle users are generally permitted to share the roadway with motor vehicles, unless explicitly prohibited. See Section 4.2 for a discussion of the impacts of the Project on roadways.

[29] FHWA. 2006. *Shared-use Path Level of Service Calculator-A User's Guide.*

TABLE 4.5-1
Pedestrian and Bicycle Facilities, Station Access, and Usage Counts by Light Rail Station Area

Light Rail Station Area	Pedestrian and Bicycle Facilities and Access (by pedestrian and bicycle study areas)	Usage Count Location[a]	2-hour Count[a]		Count Source[a]
			Bicycle	Pedestrian	
SouthWest Station	*Pedestrian study area:* This area is comprised of retail, residential, and open space land uses. Retail land uses are oriented around the existing SouthWest Transit park-and-ride parking structure. Sidewalks and trails are present on at least one side of all roads within the study area. The trail and sidewalk along Technology Dr provide the primary access to the area from the east and west. Trail connections along the south side of Technology Dr also provide access to open space areas in the southern portion of the pedestrian study area. Sidewalks on the Prairie Center Dr bridge over US 212 provide limited connectivity to the north. Prairie Center Dr provides a connection across US 212. There are five signalized intersections with at least one pedestrian crosswalk along Prairie Center Dr and Technology Dr. There is an unsignalized marked crossing on Technology Dr, located midway between Mitchell Rd and Prairie Center Dr. *Bicycle study area:* There are trails on at least one side of major roadways. The Purgatory Creek Park trail is a 3-mile loop and passes within 1 mile of the proposed station. In addition, an unnamed paved asphalt trail parallels the north side of US 212 and provides bicycle- and pedestrian-specific access through the bicycle study area. Similar to pedestrian access, the trail along the north side of Technology Dr provides the primary bicycle access to the station from the east and west. Trail connections along the south side of Technology Dr provide access to residential land uses to the south by way of the network of open-space trails along Purgatory Creek and neighborhood roadways. The Prairie Center Dr overpass of US 212, northeast of the proposed station provides the only trail crossing of US 212. There are signalized, marked crossings at each end of the bridge. North of US 212, a network of trails provides access to office, commercial and residential land uses. However, the network is often discontinuous through office and commercial areas, and there are many locations where trails connect to sidewalks instead of other trails.	No data	N/A	N/A	N/A
Eden Prairie Town Center Station	*Pedestrian study area:* This area includes suburban office, retail, and some multi-family residential land use. Sidewalks are currently present on both sides of Singletree Ln, Eden Rd, and Glen Ln. There is also a trail on one side of Technology Dr. There are nine signalized intersections with at least one pedestrian crosswalk along Prairie Center Dr and Flying Cloud Dr. There is a lack of connectivity between the proposed station and Technology Dr that limits direct pedestrian access to the north. Pedestrians must use a circuitous route to access businesses along Technology Dr north and west of the station. Further north, US 212 and I-494 are barriers to pedestrian connectivity north of the station. The only pedestrian crossing over I-494 is on Flying Cloud Dr. *Bicycle study area:* There are trails on at least one side of major roadways. The trail connections constructed along the station entrance road will also provide bicycle access to the proposed station from the east and connect to an existing trail network south and east of the station. There is no direct bicycle access to the proposed station from the north, south, or west. US 212 and I-494 are barriers to bicycle connectivity north of the station. The trail on Prairie Center Dr provides access across US 212 including signalized marked crossings at each end of the bridge. A barrier-separated trail crossing is provided on the Flying Cloud Dr overpass over I-494 northeast of the proposed station, with a signalized, marked crossing at the south end of the bridge. Once across I-494, the trail continues to the east, but does not connect to the office and commercial land uses along Flying Cloud Dr. An unnamed paved asphalt trail parallels the north side of US 212 and provides bicycle- and pedestrian-specific access from Prairie Center Dr to the west.	No data	N/A	N/A	N/A
Golden Triangle Station	*Pedestrian study area:* Low-rise, low-density office and light-industrial land uses within the area are served by a network of roadways that do not include sidewalks or pedestrian crossings. There are four signalized intersections with at least one pedestrian crossing along Shady Oak Rd and one unsignalized pedestrian crossing on Flying Cloud Dr. There is a trail on Flying Cloud Dr which provides limited connectivity to the west side of the pedestrian study area, primarily through open space areas. US 212 is a barrier to east-west travel in the study area, and can only be crossed on Shady Oak Rd. Currently, signage at the interchange indicates that pedestrian crossings are prohibited in every direction. However, the interchange is being reconstructed by Eden Prairie (opens in 2016) and will include a sidewalk and trail that cross US 212. The	No data	N/A	N/A	N/A

Light Rail Station Area	Pedestrian and Bicycle Facilities and Access (by pedestrian and bicycle study areas)	Usage Count Location[a]	2-hour Count[a]		Count Source[a]
			Bicycle	Pedestrian	
	lack of pedestrian infrastructure within the pedestrian study area makes pedestrian access to the proposed station difficult. *Bicycle study area:* There are trails on Valley View Rd, Flying Cloud Dr, Shady Oak Dr, and Bryant Lake Dr that provide access for bicyclists to businesses and residential land uses on the west side of the bicycle study area. However, bicyclists must share the roadway with motor vehicles in order to access businesses on the east side of the study area. The limited access highways surrounding the site are a barrier to bike access from the north, east, and west.				
City West Station	*Pedestrian study area:* This area includes suburban office, retail, and some multi-family residential land use. There are very few sidewalks, trails, or existing signalized crossings. There are two signalized intersections with at least one pedestrian crosswalk on Shady Oak Rd. There are five unsignalized marked crossings on West 62nd St, Optum Way, City West Pkwy and Blue Circle Dr. There is no pedestrian access to the proposed station from the north and east due to the Hwy 62 and US 212 interchange. A trail connection currently under construction on West 62nd St is expected to provide access from the west. *Bicycle study area:* There are trails along one side of Flying Cloud Dr, Bryant Lake Dr, and Old Shady Oak Rd. In addition, there is a trail system that extends from Hwy 61 eastward to a point where it passes underneath Bren Rd E, then continues northward and runs adjacent to the Opus Creek Station, passes underneath Bren Rd W, then continues northward into the Opus Woods office park area. This trail system connects various office buildings and tends to have grade-separated crossings at the one-way circulator roads (e.g., Bren Rd E and Bren Rd W). The trail system has limited connectivity to the larger transportation system outside the development. This network of trails provides pedestrian access between the station and the surrounding office and retail land uses. These trails connect various office buildings and tend to have grade-separated crossings at the one-way circulator roads (e.g., Bren Rd E and Bren Rd W). The trails have limited connectivity to the larger transportation system outside the office park. There is no bicycle access to the proposed station from the north and east due to the Hwy 62 and US 212 interchange.	No data	N/A	N/A	N/A
Opus Station	*Pedestrian study area:* There are currently sidewalks along one or both sides of W 62nd St, Shady Oak Rd, and Bren Rd. There are two signalized intersections with at least one pedestrian crosswalk along Shady Oak Rd and two unsignalized pedestrian crossings on West 62nd St and Blue Circle Dr. There is a trail system that extends from Hwy 61 eastward to a point where it passes underneath Bren Rd E, then continues northward and runs adjacent to the Opus Creek Station, passes underneath Bren Rd W, then continues northward into the Opus Woods office park area. These trails connect various office buildings and tend to have grade-separated crossings at the one-way circulator roads (e.g., Bren Rd E and Bren Rd W). The trail system has limited connectivity to the larger transportation system outside the development. This network of trails provides pedestrian access between the station and the surrounding office and retail land uses. *Bicycle study area:* The same network of trails will provide bicycle access between the station and surrounding office and retail land uses. Outside the immediate vicinity of the station, the trail network provides connectivity to office/commercial and residential land uses located between the station and US 169. Bren Rd E includes a grade-separated crossing over US 169 with signalized marked crossings at each end of the bridge. The trail terminates immediately east of US 169, and does not provide connectivity to residential land uses east of US 169. A portion of the Nine Mile Creek Regional Trail is located northeast of the station. There is a trail present along one side of Shady Oak Rd, and an unnamed asphalt trail provides bicycle- and pedestrian-specific access west from Shady Oak Rd through Lone Lake Park.	No data	N/A	N/A	N/A
Shady Oak Station	*Pedestrian study area:* Much of the land use within the pedestrian study area is low-rise, low-density office/light industrial, and connectivity is limited. Sidewalks are present along some, but not all roadways. On Excelsior Blvd, there is a sidewalk on one side and a trail on the other. Roadways such as 17th Ave S and 5th St S have sidewalks on one side. There are three signalized intersections with at least one pedestrian	11th Ave/Cedar Lake LRT Regional Trail	357	19	TRPD, Sunday, Aug 14, 2011

Light Rail Station Area	Pedestrian and Bicycle Facilities and Access (by pedestrian and bicycle study areas)	Usage Count Location[a]	2-hour Count[a]		Count Source[a]
			Bicycle	Pedestrian	
	crosswalk along Excelsior Blvd. There are many unsignalized, marked pedestrian crossings in the north section of the study area. There are no sidewalks on 15th Ave S and 16th Ave S. Pedestrians can access the proposed station from the west using the Minnesota River Bluffs Regional Trail and the east from the Cedar Lake LRT Regional Trail. The existing trail is grade-separated from Shady Oak Rd west of the station. 17th Ave S will be extended between Excelsior Blvd and the station to provide access from the north. The Project also includes a pedestrian connection to the existing sidewalk system along 5th Ave. S. and the proposed Hopkins OMF. *Bicycle study area:* There are trails along one side of Excelsior Blvd, Shady Oak Dr and 11th Ave. In addition, the Minnesota River Bluffs/Cedar Lake LRT Regional Trails provide east–west bicycle- and pedestrian-specific access through the middle of the bicycle study area. The Lake Minnetonka LRT Regional Trail connects to Excelsior Blvd from the northwest via 8th Ave S, and a portion of the Nine Mile Creek Regional Trail is located southwest of the station, but does not connect to the trail on 11th Ave. Bicycle access within the immediate vicinity of the proposed station is the same as pedestrian access. There is a limited trail network at Shady Oak Beach Park at the far southern portion of the bicycle study area that provides access across Shady Oak Lake and connections to some neighborhoods to the south.	17th Ave/Lake Minnetonka LRT Regional Trail	18	34	TRPD; Wednesday, June 20, 2012
		Hwy 7/Lake Minnetonka LRT Regional Trail	80	4	TRPD, Saturday, May 29, 2010
		11th Ave/Lake Minnetonka LRT Regional Trail	106	9	TRPD; Thursday, June 3, 2010
Downtown Hopkins Station	*Pedestrian study area:* Much of the land use immediately south of the proposed station area is low-rise, low-density office/light industrial, and pedestrian connectivity to the station is limited. Sidewalks are present on both sides of most roadways, except for in the residential neighborhoods in the south of the study area. There are many signalized intersections with at least one pedestrian crosswalk along Excelsior Blvd and Main St. Additionally, there are many marked crosswalks at unsignalized intersections north of the station. Existing railroad tracks and Hopkins Honda site immediately south of the light rail alignment further limit access south of the station. The Cedar Lake LRT Regional Trail provides pedestrian access to the Downtown Hopkins Station from the east and west. From the north, pedestrians will access the station on an extension of 8th Ave S which connects to the existing sidewalk network along Excelsior Blvd and to the north. US 169 is a barrier for east-west travel to the proposed LRT station. The Minnesota River Bluffs Regional Trail and the sidewalk along Excelsior Blvd provide the only crossings. *Bicycle study area:* There are trails along Shady Oak Dr, 11th Ave, and a portion of Excelsior Blvd (i.e., from Blake Rd to Shady Oak Dr). The Cedar Lake LRT Regional Trail provides east–west bicycle- and pedestrian-specific access through the middle of the bicycle study area including a grade-separated crossing of US 169. Additionally, the Lake Minnetonka LRT Regional Trail connects to Excelsior Blvd from the northwest via 8th Ave S, and a portion of the Nine Mile Creek Regional Trail is located southwest of the station, but does not connect to the trail on 11th Ave. Bicycle access within the immediate vicinity of the Downtown Hopkins Station is the same as pedestrian access. The Cedar Lake LRT Regional Trail connects to the Cedar Lake LRT Regional Trail east of US -169, and provides further access to the north. Aside from these regional trails, however, there are no dedicated bicycle facilities serving existing residential and commercial areas. There is a limited trail network at Shady Oak Beach Park at the far southern portion of the bicycle study area that provides access across Shady Oak Lake and connections to some neighborhoods.	Depot Coffee House/Cedar Lake LRT Regional Trail	194	118	TRPD; Monday, July 5, 2010
		11th Ave/ Cedar Lake LRT Regional Trail	357	19	TRPD; Sunday, Aug 14, 2011
		Excelsior Blvd Crossing (High)/Cedar Lake LRT Regional Trail	189	12	TRPD; Friday, June 1, 2012
		N Cedar Lake Regional Trail/2nd St	337	34	TRPD; Sunday, May 27, 2012
		N Cedar Lake Regional Trail/Madison Ave	119	14	TRPD; Saturday, Aug 20, 2011
		17th Ave/ Lake Minnetonka LRT Regional Trail	18	34	TRPD; Wednesday, June 20, 2012
		11th Ave/Lake Minnetonka LRT Regional Trail	106	9	TRPD; Thursday, June 3, 2010
Blake Station	*Pedestrian study area:* Land uses within the pedestrian study area are predominantly commercial, with some residential and open space in the southern and northern quadrants. Sidewalks are present on both sides of most roadways. There are no sidewalks in the residential subdivision just north of the proposed station or in the industrial area just south of the station. There are four signalized intersections with at least one pedestrian crosswalk along Blake Rd and Jackson Ave N. Additionally, there are seven unsignalized intersections with at	Blake Rd/Cedar Lake LRT Regional Trail	340	44	TRPD; Sunday, July 29, 2012

Light Rail Station Area	Pedestrian and Bicycle Facilities and Access (by pedestrian and bicycle study areas)	Usage Count Location[a]	2-hour Count[a]		Count Source[a]
			Bicycle	Pedestrian	
	least one marked crosswalk along 2nd St NE, Excelsior Blvd, and Blake Rd. The Cedar Lake LRT Regional Trail provides pedestrian access to the Blake Station from the east and west. A signalized, marked crossing provides a connection from the station to north-south sidewalks along Blake Rd N. A trail connection is also provided to Tyler Ave N, near the west end of the pedestrian study area. *Bicycle study area:* There is a trail along a portion of Excelsior Blvd east of Blake Rd. The Cedar Lake LRT Regional Trail provides east–west bicycle- and pedestrian-specific access through the middle of the bicycle study area. The North Cedar Lake Regional Trail also provides north–south bicycle- and pedestrian-specific access on the west side of the bicycle study area, including a grade-separated crossing of Hwy 7. The Cedar Lake LRT Regional Trail provides bicycle access to the Blake Station from the east and west. Blake Rd N is the only means of access to the southern portions of the bicycle study area and provides the most direct access to the north, but the roadway does not include a dedicated bicycle facility. The North Cedar Lake LRT Regional Trail west of the station also provides access to the north. There are existing on-street bike lanes along Blake Rd S in the southern portion of the bicycle study area and the bike lanes end just south of Excelsior Blvd.	Depot Coffee House/Cedar Lake LRT Regional Trail	194	118	TRPD; Monday, July 5, 2010
		Edgebrook Park Connections/ Cedar Lake LRT Regional Trail	514	26	TRPD; Sunday, June 17, 2012
		Excelsior Blvd Crossing (High) /Cedar Lake LRT Regional Trail	189	12	TRPD; Friday, June 1, 2012
		Tyler Ave Spur/Cedar Lake LRT Regional Trail	144	8	TRPD; Monday, July 23, 2012
		N Cedar Lake Regional Trail/2nd St	337	34	TRPD; Sunday, May 27, 2012
		N Cedar Lake Regional Trail/Madison Ave	119	14	TRPD; Saturday, Aug 20, 2011
		N Cedar Lake Regional Trail/36th St	286	34	TRPD; Saturday, July 11, 2009
Louisiana Station	*Pedestrian study area:* Much of the land use within the pedestrian study area is low-rise, low-density office/light industrial, and connectivity is limited. There are residential uses in the east, west and north quadrants of the study area. Sidewalks are present on one side of Louisiana Ave S and W Lake St. There are two signalized intersections with at least one marked crosswalk along Louisiana Ave S. In addition, there are six unsignalized intersections with at least one marked crosswalks along Louisiana Ave S, Walker St, and W Lake St. The Cedar Lake LRT Regional Trail provides pedestrian access to the Louisiana Station from the east and west. An east-west sidewalk is provided along Oxford St, just south of the station. The sidewalk terminates at Louisiana Ave to the west of the station. A freight railroad spur south of the station is a barrier to pedestrian access, and sidewalks along Louisiana Ave comprise the only north-south connection within the pedestrian study area. There are sidewalks in the residential neighborhoods in the north and east quadrants of the study area. Hwy 7 is a barrier for pedestrian access to the proposed LRT station, an underpass on Louisiana Ave S is the only crossing.	Edgebrook Park Connections/ Cedar Lake LRT Regional Trail	514	26	TRPD; Sunday, June 17, 2012
		Louisiana Ave Spur/Cedar Lake LRT Regional Trail	376	43	TRPD; Sunday, May 27, 2012

Light Rail Station Area	Pedestrian and Bicycle Facilities and Access (by pedestrian and bicycle study areas)	Usage Count Location[a]	2-hour Count[a]		Count Source[a]
			Bicycle	Pedestrian	
	Bicycle study area: There is a north-south trail along the west side of Louisiana Ave that provides bicycle-specific access under the Cedar Lake LRT Regional Trail and freight rail tracks, although this trail ends at a driveway south of Lake St. Similarly, a trail on the east side of Louisiana Ave provides north-south bicycle access across Hwy 7 but transitions to a sidewalk at a driveway south of Lake Street and does not connect to the trail on the west side of Louisiana. The Cedar Lake LRT Regional Trail provides east–west bicycle- and pedestrian-specific access through the middle of the bicycle study area, including grade-separated crossings of Louisiana Ave and US 100. The Cedar Lake LRT Regional Trail provides bicycle access to the Louisiana Station from the east and west. Access from the trail to the north entrance of the station is provided on a grade-separated trail crossing over the parallel freight rail tracks. The trail is grade-separated to the east and west of the station above Louisiana Ave and under a perpendicular freight rail track, respectively. A trail connection is provided from the Cedar Lake LRT Regional Trail to the commercial parking lot on the east side of Louisiana Ave. Multiple rail lines and spurs preclude bicycle access to the commercial and residential areas south and east of the proposed station. Bicycle facilities are generally not present in the northern half of the bicycle study area. There is a limited trail network on park land at the northwestern portion of the bicycle study area. However, the trail network does not connect to other facilities outside of the park.				
Wooddale Station	*Pedestrian study area:* The central portion of the pedestrian study area contains a mix of commercial, low-rise, low-density office/light industrial, and high density residential land uses. The north and south portions of the area are primarily low-density residential neighborhoods. Commercial and residential areas are generally served by sidewalks, but sidewalks are commonly lacking in the more industrial areas. The sidewalk network is intermittent in residential areas to the north and northwest of the proposed station. Wooddale Ave is the only pedestrian crossing across Hwy 7. There is one signalized intersection with at least one marked crosswalk on Wooddale Ave. There are marked crosswalks at five unsignalized intersections along W Lake St and Dakota Ave S. The Cedar Lake LRT Regional Trail provides pedestrian access to the Wooddale Station from the east and west. The single north-south connection across the parallel railroad tracks and Hwy 7 north of the station is provided via sidewalks and trails along Wooddale Ave S. Hwy 100 is a barrier for pedestrians on the east side of the area. 36th St W and the Cedar Lake LRT Regional Trail are the only crossings across Hwy 100. *Bicycle study area:* There are trails on one side of Beltline Blvd and Monterey Dr. The Cedar Lake LRT Regional Trail provides east-west bicycle and pedestrian specific access through the middle of the bicycle study area and is grade separated from Hwy 100. There is a pedestrian and bicycle bridge that provides a north-south connection across Hwy 7 between Beltline Blvd and Raleigh Ave S. There is also an unnamed asphalt trail in Bass Lake Park. Similar to pedestrian access, the Cedar Lake LRT Regional Trail provides bicycle access to the Wooddale Station from the east and west, including one of the only crossings of Hwy 100. Bicycle access from the proposed station to the north is provided via a trail along the west side of Wooddale Ave S; however, the trail terminates just north of Hwy 7 and transitions to a sidewalk.	Cedar Lake LRT Regional Trail, east of Beltline Blvd	394	N/A	TLC; Weekday in Sept 2013
		Wooddale Ave/Cedar Lake LRT Regional Trail	571	64	TRPD; Sunday, Aug 23, 2009
		Louisiana Avenue Spur/Cedar Lake LRT Regional Trail	376	43	TRPD; Sunday, May 27, 2012
		Lilac Park Spur /Cedar Lake LRT Regional Trail	501	28	TRPD; Saturday, Aug 2, 2011
Beltline Station	*Pedestrian study area:* The area contains a mix of commercial, low-rise, low-density office/light industrial, and high density residential land uses. The sidewalk network is intermittent throughout much of the pedestrian study area. There is a sidewalk on one side of Beltline Blvd, and a signalized crossing at the intersection of Beltline Blvd/CR-25 that provides access across County Rd 25 but not Beltline Blvd. There are seven signalized intersections with at least one marked crosswalk along Beltline Blvd and Minnetonka Blvd. Sidewalks are available on both sides of Minnetonka Blvd, in addition to unsignalized marked crosswalks on five roadways along Minnetonka Blvd. A marked trail crossing is provided at Beltline Blvd near the proposed station entrance. A marked crossing is provided at the four-way stop at Beltline Blvd/Park Glen Rd. In	Cedar Lake LRT Regional Trail, east of Beltline Blvd	394	N/A	TLC; Weekday in Sept 2013

Light Rail Station Area	Pedestrian and Bicycle Facilities and Access (by pedestrian and bicycle study areas)	Usage Count Location[a]	2-hour Count[a]		Count Source[a]
			Bicycle	Pedestrian	
	addition, there is a pedestrian and bicycle bridge that provides north-south access across Hwy 7/County Rd 25 between Beltline Blvd and Raleigh Ave S. The Cedar Lake LRT Regional Trail provides pedestrian access to the proposed Beltline Station from the east and west. A grade-separated crossing over the light rail tracks is provided immediately east of the station where the trail shifts from the north to the south side of the light rail alignment. The trail along Beltline Boulevard provides pedestrian access to the station from the north and south. Hwy 100 is a barrier for pedestrians on the west side of the study area, with the only crossing available on the Cedar Lake LRT Regional Trail. *Bicycle study area:* There are trails on one side of Beltline Blvd and Monterey Dr. The Cedar Lake LRT Regional Trail provides east-west bicycle and pedestrian specific access through the middle of the bicycle study area. Similar to pedestrian access, the realigned Cedar Lake LRT Regional Trail provides bicycle access to the Beltline Station from the east and west. A trail with marked crossings is also provided along W 36th St/Monterey Dr east of the station. The grade-separated crossing over Hwy 7/County Rd 25 provides access to the north but the trail connection terminates at the intersection of Toledo Ave S and Minnetonka Blvd. South of the proposed station, the trail connection along Beltline Blvd turns to the east along W 36th St/Monterey Dr, and ultimately terminates at Park Commons Dr. There is a limited trail network in Bass Lake Park that connects to the Cedar Lake LRT Regional Trail to the east and to a residential neighborhood south of Bass Lake Park.	Beltline Blvd/ Cedar Lake LRT Regional Trail	469	92	TRPD; Saturday, Aug 6, 2011
		Lilac Park Spur / Cedar Lake LRT Regional Trail	501	28	TRPD; Saturday, Aug 2, 2011
West Lake Station	*Pedestrian study area:* The station area contains a mix of commercial, high rise office, and high and low density residential land uses. The sidewalk network is reasonably complete in the commercial and high density residential areas south and east of the station, but is intermittent in low-density residential areas north and west of the proposed station. There are six signalized intersections with at least one marked crosswalk along France Ave S, W Lake St, Excelsior Blvd, and Minnetonka Blvd. The Cedar Lake LRT Regional Trail provides pedestrian access to the proposed West Lake Station from the southwest and northeast. The trail crosses under W Lake Street immediately east of the station, and connects to the Midtown Greenway Trail near the east edge of the pedestrian study area. The parallel freight rail tracks northwest of the proposed station present a barrier to pedestrian access to the north, and users must take stairs or an elevator to access W Lake St and proceed to the west. There are also trails around the perimeter of Lake Calhoun and Cedar Lake. *Bicycle study area:* There is a bike lane on Sunset Blvd and a trail on one side of Cedar Lake Pkwy and Calhoun Pkwy. The Cedar Lake LRT Regional Trail provides east–west bicycle- and pedestrian-specific access through the middle of the bicycle study area and connects to the Midtown Greenway and the Kenilworth Trail. Similar to pedestrian access, the Cedar Lake LRT Regional Trail provides bicycle access to the proposed West Lake Station from the southwest and northeast. The parallel freight rail tracks northwest of the station present a barrier to bicycle access to the northwest and users must take stairs/elevator to access W Lake St and proceed west.	Cedar Lake LRT Regional Trail, east of Beltline Blvd	394	N/A	TLC; Weekday in Sept, 2013
		Cedar Lake Pkwy, East of Kenilworth Trail	122	50	DEIS; Wednesday, Sept 15, 2009
		Cedar Lake Pkwy, West of Kenilworth Trail	161	76	City of Mpls, Weekday in Sept 2014
		West Lake Calhoun Pkwy S north of Rose Lane W	304	418	City of Mpls, Weekday in Sept 2013
		Market Plaza S south of Lake St W	20	102	City of Mpls, Weekday in Sept 2014
		Lake St W east of Market Plaza S	10	54	City of Mpls, Weekday in Sept 2014
21st Street Station	*Pedestrian study area:* The proposed 21st Street Station is situated on a narrow strip of land between Cedar Lake and Lake of the Isles, and is surrounded by residential land uses. Sidewalks are available on both sides of the roadways. There are no existing signalized pedestrian crossings. There are four unsignalized, marked crosswalks along Penn Ave, W 21st St and Cedar Lake Ave. The Kenilworth Trail provides access from the	Kenilworth Trail, north of Cedar Lake Pkwy	419	73	City of Mpls, Weekday in Sept 2013

Light Rail Station Area	Pedestrian and Bicycle Facilities and Access (by pedestrian and bicycle study areas)	Usage Count Location[a]	2-hour Count[a]		Count Source[a]
			Bicycle	Pedestrian	
	north and south, which connects to the Cedar Lake Trail to the north of the proposed station. The network of sidewalks within the residential land uses to the east provide east/west access, with W 21st St providing the most continuous route. A trail connection to East Cedar Beach on Cedar Lake is provided immediately west of the proposed station. A trail around the perimeter of Lake of the Isles provides an additional pedestrian connection to the proposed LRT station. *Bicycle study area:* There is a bike lane on Sunset Blvd, and a trail on one side of each of the following roadways: Theodore Wirth Pkwy, Cedar Lake Pkwy, Lake of the Isles Pkwy, and Calhoun Pkwy. The Kenilworth Trail provides north-south bicycle- and pedestrian-specific access through the middle of the bicycle study area. Southeast of the station, the Kenilworth Trail connects to the Midtown Greenway and the Cedar Lake LRT Regional Trail, both of which provide east–west access in the southern portion of the bicycle study area. In addition, the North Cedar Lake Regional Trail and the Cedar Lake Trail provide east–west access through the northern portion of the bicycle study area. The Cedar Lake Trail includes a grade-separated crossing of I-394. The Kenilworth Trail provides bicycle access to the proposed 21st Street Station from the north and south, but residential roadways must be used for access from the east. Dedicated bicycle facilities are not present within the residential portions of the bicycle study area. South of the station, the Kenilworth Trail connects to the Cedar Lake LRT Regional Trail which provides access to the southwest along the perimeter of Cedar Lake. There is no direct, dedicated bicycle connection to the trail along Lake of the Isles Pkwy.	Kenilworth Trail, south of Cedar Lake Pkwy	430	74	City of Mpls, Weekday in Sept 2013
		Cedar Lake Pkwy, West of Kenilworth Trail	161	76	City of Mpls, Weekday in Sept 2014
		21st St W west of Penn Av S	25	35	City of Mpls, Weekday in Sept 2014
		Penn Av S north of 21st St W	9	56	City of Mpls, Weekday in Sept 2014
Penn Station	*Pedestrian study area:* Land uses within the pedestrian study area are predominantly residential and open space, with a small amount of commercial use to the west of the station. Sidewalks are present in most areas. In the residential neighborhoods north of the station and southeast of the station, there are sidewalks on both sides of the roadway. The Project includes sidewalks on Wayzata Blvd as far west as Madirea Ave, and there are sidewalks crossing I-394 on Penn Ave. There are two signalized intersections with marked crosswalks at the Penn Ave/I-394 on/off ramps and three additional intersections with unsignalized, marked crosswalks along Penn Ave. There is a pedestrian and bicycle bridge along the south side of I-394 with a vertical connection to the Cedar Lake Trail. The Kenilworth Trail and Cedar Lake Trail provide pedestrian access to the station from the east and west. A trail around the perimeter of Lake of the Isles connects to other sidewalks in the area. As part of the Project, pedestrian access to the north would be provided by an elevated crossing connecting to Wayzata Blvd over the freight rail tracks. This crossing is accessed by stair or elevator. I-394 is a barrier with limited crossings for pedestrians traveling north-south in the area. There are three pedestrian crossings over/under I-394: Penn Ave, the Cedar Lake Trail, and a pedestrian bridge west of the proposed LRT station that connects S Wayzata Blvd and S Thomas Ave/N Wayzata Blvd. *Bicycle study area:* There are trails on one side of Theodore Wirth Pkwy, Lake of the Isles Pkwy, Kenwood Pkwy and Van White Memorial Blvd. The Cedar Lake Trail provides east–west bicycle- and pedestrian-specific access through the middle of the bicycle study area. The Kenilworth Trail also provides north–south bicycle- and pedestrian-specific access through the western portion of the bicycle study area. The Luce Line Regional Trail also provides east–west bicycle- and pedestrian-specific access through the northern portion of the bicycle study area. The Cedar Lake Trail and Kenilworth Trail provide bicycle access to the proposed station from the east and west. Bicycle access to the north is limited by the freight rail tracks and grade. Bicycle access to the south is limited due to the grade. East of the proposed station, there is a connection between the Kenilworth Trail and Kenwood Pkwy.	Cedar Lake Trail, under I-394	534	37	TLC; Weekday in Sept 2013
		Cedar Lake Trail west of Kenilworth Trail	540	84	City of Mpls, Weekday in Sept 2014
		Cedar Lake Road S east of Penn Av S	179	37	City of Mpls, Weekday in Sept 2012
		Cedar Lake Trail under I-394	307	58	City of Mpls, Weekday in Sept 2014
Van White Station	*Pedestrian study area:* Land uses within the pedestrian study area include light industrial to the north, open space to the west, and the Dunwoody College of Technology campus and Parade Stadium to the south and east of the station. There are also low-density residential neighborhoods on the northern, western, and southern edges of the area. There are sidewalks on at least one side of most roadways. There are four signalized intersections with at least one marked crosswalk along Glenwood Ave and Dunwoody Blvd. A pedestrian and bicycle bridge provides north–south access across the Cedar Lake Trail and the adjacent rail	7th St. N over I-94	33	N/A	TLC; Weekday in Sept, 2013
		Cedar Lake Trail under I-394	307	58	City of Mpls, Weekday in Sept 2014

Light Rail Station Area	Pedestrian and Bicycle Facilities and Access (by pedestrian and bicycle study areas)	Usage Count Location[a]	2-hour Count[a]		Count Source[a]
			Bicycle	Pedestrian	
	line. This bridge connects the Cedar Lake Trail and Van White Memorial Blvd to the Luce Line Regional Trail. I-94 and I-394 are barriers for pedestrians in the area. A pedestrian bridge crosses I-94/Lyndale Ave and provides an east-west pedestrian connection between Loring Park and Kenwood Pkwy. The Cedar Lake Trail provides pedestrian access to the proposed station from the southwest and northeast, crossing underneath I-94. A sidewalk under I-394 along Dunwoody Blvd connects the station to the college campus to the east. A trail along the east side of Van White Memorial Blvd provides access to the north. This trail on the bridge includes a grade-separated crossing over the proposed station and parallel railroad tracks north of the station. *Bicycle study area:* There are trails along one side of Kenwood Pkwy and Van White Memorial Blvd. The Cedar Lake Trail provides east–west bicycle- and pedestrian-specific access through the middle of the bicycle study area and connects to the Kenilworth Trail. There are on-street bike lanes on the east side of the bicycle study area, in downtown Minneapolis. Bicycle access to the proposed Van White Station generally utilizes the same connections as pedestrian access in the vicinity of the station; however, no bicycle connectivity is provided to the east of the station to the Dunwoody College of Technology campus. Luce Line Regional Trail, a signed bike route along N. Cedar Lake Rd. and, a trail along the east side of Van White Memorial Blvd provide bicycle connections to residential areas north of I-394. Areas east of the proposed station lack bicycle facilities.	Van White Memorial Blvd S over Cedar Lake Trail	34	10	City of Mpls, Weekday in Sept 2014
		Kenwood Pkwy W west of Spring Lake Trail	28	48	City of City of Mpls, Weekday in Sept 2013
		Spring Lake Trail north of Kenwood Pkwy W	43	31	City of Mpls, Weekday in Sept 2013
Royalston Station	*Pedestrian study area:* Within the pedestrian study area, the proposed Royalston Station is surrounded on all sides by a mix of commercial, low-rise, low-density office/light industrial, and heavy industrial land uses, which include the Target Field stadium at the east edge of the pedestrian study area and the Minneapolis Farmers Market on the west edge of the study area. There are sidewalks on at least one side of the roadways. There are signalized crossings at many intersections in the pedestrian area, primarily in the eastern portion, closer to the central business district of Minneapolis. Signalized crossings are also available at some intersections of Olsen Memorial Hwy, Glenwood Ave, N 7th St, and 6th Ave N. Access between the proposed station and the stadium is provided via a sidewalk connection along 5th Ave N to N 7th St, or via a longer, more circuitous route south of the station via Twins Way or the Cedar Lake Trail. Sidewalks along Royalston Ave N provide access to commercial areas south of the proposed station; however, sidewalks in this area are routinely obstructed by obstacles such as light poles and fire hydrants. There is not a direct connection between the proposed Royalston Station and the Minneapolis Farmers Market. Access between the station and the Minneapolis Farmers Market will be relatively circuitous, provided via a sidewalk connection along Royalston Ave N to Border Ave N. I-394 and I-94 are barriers for pedestrians, but crossings are available at many intersecting roadways in the study area. I-94 crossings include Glenwood Ave and Olsen Memorial Hwy, which both provide east-west connections toward the proposed station. *Bicycle study area:* There are many on-street bike lanes, primarily east of the station in downtown Minneapolis. The Cedar Lake Trail provides east–west bicycle- and pedestrian-specific access through the middle of the bicycle study area and connects to the West River Pkwy trail, which runs adjacent to the Mississippi River. There are also trails along one side of Kenwood Pkwy and Van White Memorial Blvd. The Cedar Lake Trail provide bicycle access to the proposed station from the southwest and northeast via a trail spur connection to Royalston Ave N. Bike lanes along Glenwood Dr south of the proposed station provide a connection to the western portions of the bicycle study area, and to a trail along Van White Memorial Blvd near the west edge of the study area. The eastbound bike lane along Glenwood Dr continues east of the station, across I-394, and terminates at 10th St N. There is no corresponding westbound crossing of I-394. With the exception of these trail and bike lane connections, the western portion of the bicycle study area is largely served by sidewalks, and there are no other bicycle facilities.	Cedar Lake Trail, east of Royalston	580	27	TLC; Weekday in Sept 2013
		Glenwood Ave, west of Royalston Ave	51	N/A	TLC; Weekday in Sept 2013
		7th St N over I-94	33	N/A	TLC; Weekday in Sept 2013
		Cedar Lake Trail, west of Royalston exit	534	N/A	TLC; Weekday in Sept 2013
		Cedar Lake Trail north of Royalston Ave N	556	84	City of Mpls, Weekday in Sept 2014

[a] Sources: City of Minneapolis (Mpls), 2014, Bicycle and pedestrian counts. Available at: http://minneapolismn.gov/www/groups/public/@publicworks/documents/images/wcms1p-135319.pdf. Accessed: February, 2015. Transit for Livable Communities (TLC). 2013. Bike Walk Twin Cities 2013 Report. Available at: http://www.bikewalktwincities.org/sites/default/files/bwtc-2013-count-report-final-lowres.pdf. Accessed: February, 2015. Three Rivers Park District (TRPD). 2015. Bicycle and pedestrian counts. Available from the Park District.

N/A = not available; TLC = Transit for Livable Communities; TRPD = Three River Park District.

land use characteristics, and the roadway network near the station areas. This section also includes a summary of trail ownership and trail Section 4(f) eligibility.

4.5.2.1 Existing Pedestrian and Bicycle Networks

Pedestrian and bicycle facilities must be evaluated in the context of their larger network in order to understand the impact the Project may have on this resource area. Land use context is an important component of the walkability and bikeability of a given station area. Walkability and bikeability are qualitative measures of how conducive an area is to walking and biking, respectively. Land use influences the quality of pedestrian and bicycle networks; for example, by affecting frequency of connectivity through block size. In addition, pedestrians require somewhere to walk to or from within the walking range of a light rail station in order to consider accessing the station by foot. While bicycle users will typically travel a longer distance than pedestrians, connectivity and directness of route also influence bicycle access to a light rail station. A longer, more circuitous route between the station and their destination may discourage people from considering accessing the station by bicycle. Existing land use and potential impacts to land use associated with the Project are described in greater detail in Section 3.1.

Table 4.5-1 includes a description of the existing pedestrian and bicycle facilities and usage for the pedestrian and bicycle study areas, by station area. These features are discussed in the context of station access and how they would be used by pedestrians or bicyclists to reach the station. Usage counts are provided to illustrate the magnitude of current pedestrian and bicycle activity in the study areas. Exhibits 4.5-1 and 4.5-2 illustrate the pedestrian and bicycle study areas.

4.5.2.2 Trail Ownership

Following is a description of the ownership and purpose of regional and local trails that may be affected by the Project.

A. Regional Trails

Seven trails within the pedestrian and bicycle study areas comprise a relatively unified trail system that extends from Chanhassen in the south to the Mississippi River riverfront in downtown Minneapolis.[30] Each trail, except for the North Cedar Lake Regional Trail and a portion of the Cedar Lake Trail, is within HCRRA-owned right-of-way, except at a few connections across roadways or where geographic features require the trails to deviate from that right-of-way.

As noted in the Project's Draft EIS (Section 7.4) and Supplemental Draft EIS (Section 3.4.1.4), trails built within HCRRA-owned right-of-way have temporary permit agreements in place between HCRRA and the trail owner. Those temporary permit agreements specify that the trail is a temporary permitted use within a portion of the HCRRA-owned right-of-way. The temporary permit agreements specify that the primary purpose of the right-of-way is for the future construction of light rail and other transportation purposes (the HCRRA permit agreements are provided in Appendix I). As documented in each trail's temporary permit agreement, HCRRA permitted these trails as temporary uses with the stipulation that they may be used by the permittee until HCRRA develops their right-of-way for a light rail system or other permitted transportation use. The temporary permit agreements are consistent with the HCRRA's Interim Use Policy. The temporary lease agreements may be terminated by HCRRA at their discretion. There are no other easements, leases, or agreements associated with these trails on the HCRRA-owned right-of-way. In summary, FTA has determined that Section 4(f) does not apply to these trails as per 23 CFR 7744.11(h), because (1) the primary purpose and function of the HCRRA right-of-way is for transportation, not park, recreation, or wildlife/waterfowl refuge; and (2) the trail use is designated as a temporary use within that transportation right-of-way. (See Chapter 6 for additional information on Section 4[f]).

[30] This regional trail system is described in the Metropolitan Council's *2040 Regional Parks Policy Plan* (Council, 2015c); however, the Metropolitan Council is not the owner of any of the trails.

EXHIBIT 4.5-1
Existing Bicycle and Pedestrian Facilities

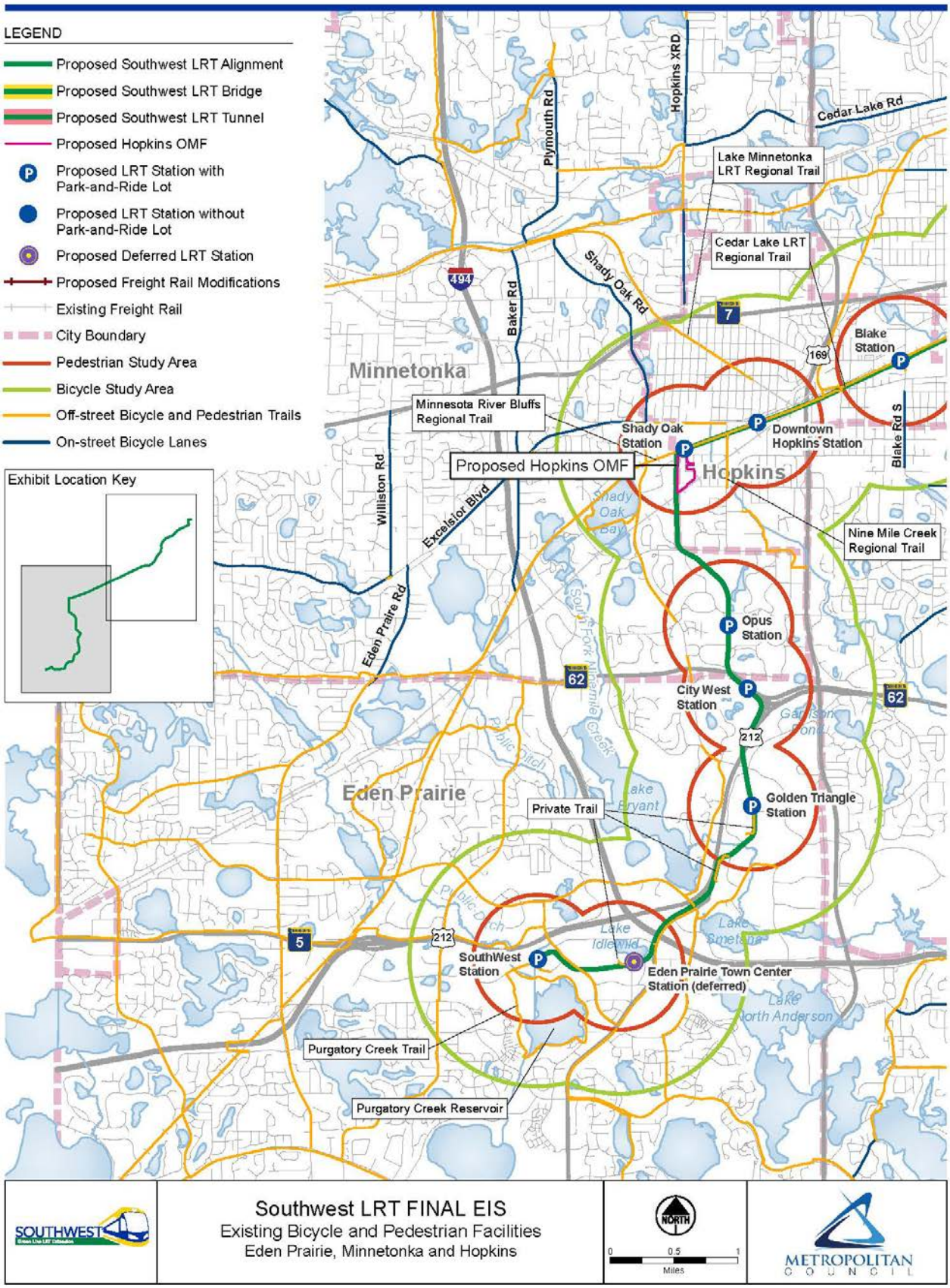
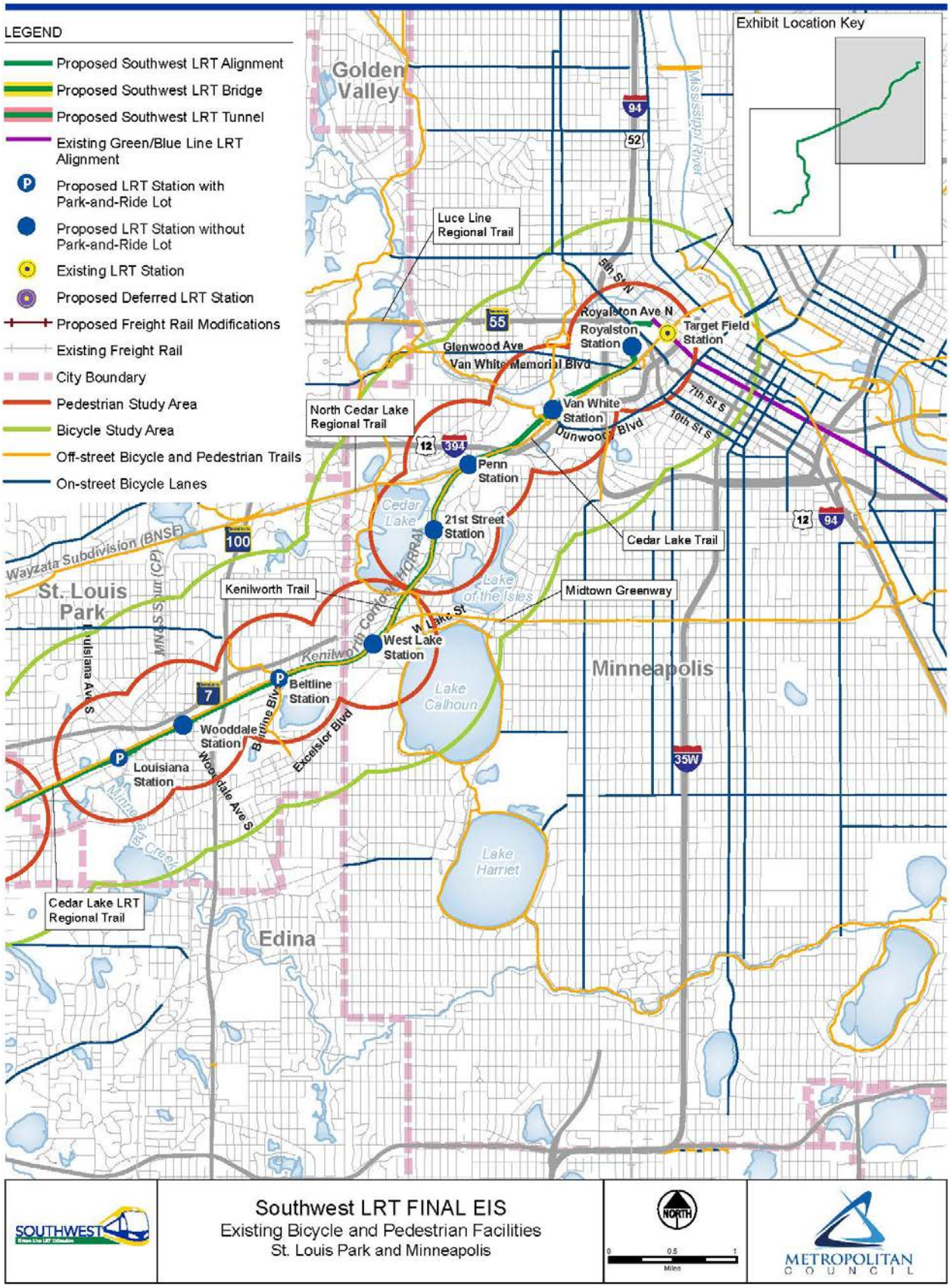


EXHIBIT 4.5-2
Existing Bicycle and Pedestrian Facilities



The regional trails located inside the study area are described below:

- **Minnesota River Bluffs Regional Trail**, which extends from Flying Cloud Drive in Chanhassen in the south to 11th Avenue South in Hopkins where it connects to the Cedar Lake LRT Regional Trail. The Minnesota Bluffs Regional Trail is located on property owned by HCRRA and operated/maintained by the TRPD.
- **Cedar Lake LRT Regional Trail**, which extends from 11th Avenue South in Hopkins (connecting to the Minnesota River Bluffs Regional Trail) to a point approximately 0.10 mile northeast of West Lake Street, where the trail continues as the Kenilworth Trail. The Cedar Lake LRT Regional Trail is located on property owned by HCRRA and is operated/maintained by TRPD.
- **Kenilworth Trail**, which begins approximately 0.10 mile northeast of West Lake Street and terminates near Highway 2, where the trail continues as the Cedar Lake Trail. The Kenilworth Trail is located on property owned by HCRRA; the trail is owned by the City of Minneapolis and is operated/maintained by the Minneapolis Parks and Recreation Board (MPRB).
- **Midtown Greenway**, which connects to the Kenilworth Trail and Cedar Lake LRT Regional Trail in the vicinity of West Lake Street. The Midtown Greenway is approximately 5.5 miles in length, connecting to paths along the Mississippi River. In the pedestrian and bicycle study areas, the Midtown Greenway is on property owned by HCRRA and is dually operated/maintained by the City of Minneapolis and Hennepin County.
- **Cedar Lake Trail**, which extends eastward and westward from its connection to the Kenilworth Trail at the Kenilworth Trail's northernmost point (adjacent to the northeast corner of Cedar Lake Park). West of the Kenilworth Trail, the Cedar Lake Trail is within the Cedar Lake Park,[31] on property owned by MPRB. From I-394 to a point approximately 400 feet west of I-94, the Cedar Lake Trail is on property owned by the City of Minneapolis. The remainder of the trail is on property owned by HCRRA. The trail is owned by the City of Minneapolis and is operated/maintained by the MPRB. The Cedar Lake Trail is part of the Grand Rounds Scenic Byway.
- **North Cedar Lake Regional Trail**, which continues westward from its junction with the Cedar Lake Trail, extends through St. Louis Park and then arcs southward where it connects to the Cedar Lake LRT Regional Trail just east of Highway 169 in Hopkins. In the pedestrian and bicycle study areas, the North Cedar Lake Regional Trail is owned and maintained by the Three Rivers Park District west of Cedar Lake Park.
- **Luce Line Regional Trail,** which connects to the Cedar Lake Trail by way of a pedestrian and bicycle bridge over the freight rail just west of Van White Memorial Boulevard, extends west to outside the city limits of Minneapolis where it connects to Theodore Wirth Parkway and the Grand Rounds Scenic Byway. It is owned and maintained by the MPRB.

B. Local Trails

Table 4.5-2 lists local public trail segments that will be affected by the Project. The information in Table 4.5-2 was derived from a review of applicable jurisdictions' comprehensive plans and official park/trail maps, in tandem with real property research conducted by MnDOT and subsequent assessment of proposed property acquisitions; unaffected trails within the pedestrian and bicycle study areas are not listed in the table.

Based on property ownership research conducted for the Project, each of the trail segments listed in Table 4.5-2, aside from ID numbers 5 and 6, are located on publicly owned transportation right-of-way (i.e., road, highway); because the continuity of these trails located inside transportation right-of-way will be maintained they are exempted from Section 4(f) requirements per 23 CFR 774.13(f)(3). The applicability of Section 4(f) to the respective publicly owned trail segments affected by the Project are noted in Table 4.5-2.[32]

[31]See Section 3.6 for additional information on Cedar Lake Park.

[32] See Chapter 6 for additional information on Section 4(f) requirements and Section 4(f) properties.

Per 23 CFR 774.17, a Section 4(f) park/recreation property must be "publicly owned." The *Section 4(f) Policy Paper* (FHWA, 2012), provides further guidance, as follows: "When private institutions, organizations, or individuals own parks, recreational areas or wildlife and waterfowl refuges, Section 4(f) does not apply, even if such areas are open to the public. However, if a governmental body has a permanent proprietary interest in the land (such as a permanent easement, or in some circumstances, a long-term lease), FHWA will determine on a case-by-case basis whether the particular property should be considered publicly owned and, thus, if Section 4(f) applies (*See* Questions 1B and 1C)." Per 23 CFR 774.17 and the Section 4(f) Policy Paper guidance, privately owned trails with no underlying public recreational easements are exempted from Section 4(f). Each of the private trails affected by the project are listed in Table 4.5-3; those trails which are privately owned and contain no public access easements for recreation purposes are not considered Section 4(f) properties.

Section 4.5.3 describes long-term and short-term impacts to local trails.

TABLE 4.5-2
Summary Information about Local Public Trails Affected by the Project

ID#	Trail Segment Location	Owner	Section 4(f) Property?[a]
1	North side of Technology Dr, south of SouthWest Station	City of Eden Prairie	No
2	Outside the northeast boundary of Purgatory Creek Park on City-owned land	City of Eden Prairie	No
3	South side of Technology Dr west of Flying Cloud Dr	City of Eden Prairie	No
4	East and west sides of Flying Cloud Dr between Technology Dr and Prairie Center Dr	City of Eden Prairie	No
5	East of Bren Rd E near the proposed Opus Station (Opus development trail network)	City of Minnetonka	Yes
6	North of Bren Road W, south of Smetana Rd (Opus development trail network)	City of Minnetonka	Yes
7	East side of 11th Ave S where 11th Ave S intersects the Project and existing freight tracks	City of Hopkins	No
8	West side of Blake Rd N south of where Blake Rd N intersects the Project and existing freight tracks	City of Hopkins	No
9	East side of Wooddale Ave S where Wooddale Ave S intersects the Project and existing freight tracks	City of St. Louis Park	No
10	West side of Beltline Blvd north of the Cedar Lake Regional LRT Trail	City of St Louis Park	No
11	East side of Beltline Blvd where Beltline Blvd intersects the Project and existing freight tracks	City of St. Louis Park	No
12	Located adjacent to Cedar Lake Pkwy where Cedar Lake Pkwy intersects existing freight tracks	Minneapolis Park and Recreation Board	No
13	Segment of Luce Line Regional Trail that extends between Bryn Mawr Meadows Park (across existing freight line) and the Cedar Lake Trail	Minneapolis Park and Recreation Board	No

[a] See Chapter 6 for information on Section 4(f) and for FTA's determinations for Section 4(f) properties.

TABLE 4.5-3
Summary Information about Local Private Trails Affected by the Project

Trail Segment Location	Owner
An approximately 500-foot trail connecting a parking lot to an outdoor pavilion between the Eden Prairie Town Center station and Lake Idlewild	Private
An approximately 1/4-mile trail connecting office buildings to Flying Cloud Drive along US 212, north of Valley View Rd.	Private
An approximately 1/2-mile trail between Flying Cloud Drive and W 70th Street	Private

4.5.3 Environmental Consequences

This section identifies the long-term and short-term direct and indirect impacts on pedestrian and bicycle transportation from the Project. Direct pedestrian and bicycle impacts occur where physical encroachments into pedestrian and bicycle travel ways, proposed realignments of these travel ways, and other modifications will occur. Indirect impacts occur where the Project will result in a change to the pedestrian and bicycle environment that will have implications for how pedestrians and bicyclists travel in their respective study areas.

4.5.3.1 Long-term Direct Pedestrian and Bicycle Impacts

The Project will result in long-term direct changes to the pedestrian and bicycle facilities in the respective study areas.[33] Direct changes may include intersection modifications, new station area platform access points, new at-grade sidewalk and trail crossings of LRT tracks, and modifications to trail widths.

In some cases, the Project will include the addition of facilities or modification of the existing environment in ways that will have a positive long-term direct impact on pedestrian and bicycle travel. For example:

- Signalization of currently unsignalized roadway intersections will improve pedestrian and bicyclist safety and the ability of pedestrians and bicyclists to cross roadways, resulting in a positive effect on pedestrian and bicycle circulation. Eight new signalized crossings are included in the Project, as follows:
  - Eden Road east of the Eden Prairie Town Center Station[34]
  - The intersection of Flying Cloud Drive and Viking Drive
  - The intersection of Excelsior Boulevard and Pierce Avenue
  - Two at the interchange of Wooddale Avenue and Highway 7
  - The intersection of Highway 25 and Lynn Avenue
  - The intersection of Royalston Avenue and Holden Street
  - The intersection of 7th Street North and 5th Avenue North
- Construction of new sidewalks or continuation of existing sidewalks around station areas will improve general pedestrian circulation and provide station access. Where appropriate, sidewalks will connect the light rail stations to off-site pedestrian origination and destination points within 1/2 mile of the platform.
- Geometry changes to roadways (e.g., new or modified medians, driveway modifications, or curb extensions) may result in reduced pedestrian crossing distances and, therefore, reduced potential for conflict with motor vehicles. For example, these types of geometry changes and reduced pedestrian crossing distances will occur near the proposed Downtown Hopkins Station.

In some cases, the Project will include the modification of the existing environment in ways that may have a long-term direct effect on pedestrian and bicycle travel that could be adverse. These impacts will be minimized or avoided as part of the Project. These changes, which are described in detail below, include at-grade sidewalk and/or trail crossings, intersection and facility designs, relocation of public trails, trail and station area conflicts, Kenilworth Trail widths, displacement of private trails, and a loss of queuing space for the at-grade LRT and freight crossing near Penn Station.

[33] The Project also includes LRCIs, which generally result in long-term positive impacts to the pedestrian and bicycle network due to added/upgraded facilities for bicycle and pedestrian use, removal of conflict points between pedestrians/bicycles and motor vehicles, and creation of a more inviting space for pedestrian and bicycle use.

[34] As described in Section 2.1.1, the Eden Prairie Town Center Station and associated roadway improvements are deferred and are not expected to be in place when the Project opens in 2020; however, the traffic signal at this intersection will be installed with or without the station. The station and associated improvements are planned to be in place by 2040.

At-grade Sidewalk and/or Trail Crossings

Crossings of the LRT tracks will occur at the following locations:

- Each station area, providing access from the platform across the tracks[35]
- Eden Road / Redstone Driveway
- Technology Drive / Flying Cloud Drive
- Viking Drive / Flying Cloud Drive
- West 70th Street
- 5th Street South
- 11th Avenue South
- 8th Avenue South
- 5th Avenue South
- Blake Road
- Wooddale Avenue
- Beltline Avenue
- Cedar Lake Avenue
- 21st Street
- Cedar Lake Trail west of Penn Station
- Royalston Avenue North / Holden Street North

Pedestrian and bicycle crossings of these track locations have been designed based on current industry standards. Industry standards include, but are not limited to, flashing light signal assemblies with an audible warning to notify pedestrians and bicyclists of a train's arrival at crossing locations.[36] These crossing treatments may also include detectable warnings[37] and signs.[38]

The at-grade LRT crossing for trail users on the Cedar Lake Trail west of Penn Station is near an existing at-grade freight rail crossing. Two-way, two-hour trail volumes along the Cedar Lake Trail were measured to be 540 bicycles in this area, so a review of the new crossing here merits additional attention.[39] Freight crossings occur approximately two to three times a day and block the trail. The freight and LRT at-grade crossings will be separated, with the freight crossing located approximately 200 feet west of the LRT crossing at this location. Based on trail volumes at this crossing, a queue of 30 to 40 bicyclists is expected during a freight rail crossing. Exhibit 4.5-3 shows an excerpt from the Preliminary Engineering Plans (see Appendix E), the total area of the trail in this space is 2,400 square feet, room for at least 100 bicyclists to stand comfortably. By shifting the freight rail crossing west, the space available for queuing between the two crossings is more than sufficient for an average amount of people with bicycles to stand and wait.

[35] Specific to access to the West Lake Station, the *West Lake Multimodal Transportation Study* was completed in February 2016. The goal of the study was to identify opportunities to address non-motorized and motorized travel within the West Lake LRT Station area with projects that can be implemented as a part of the construction of the Southwest LRT or as part of other capital initiatives. Information about the study can be found at http://www.ci.minneapolis.mn.us/cip/all/WCMS1P-138480

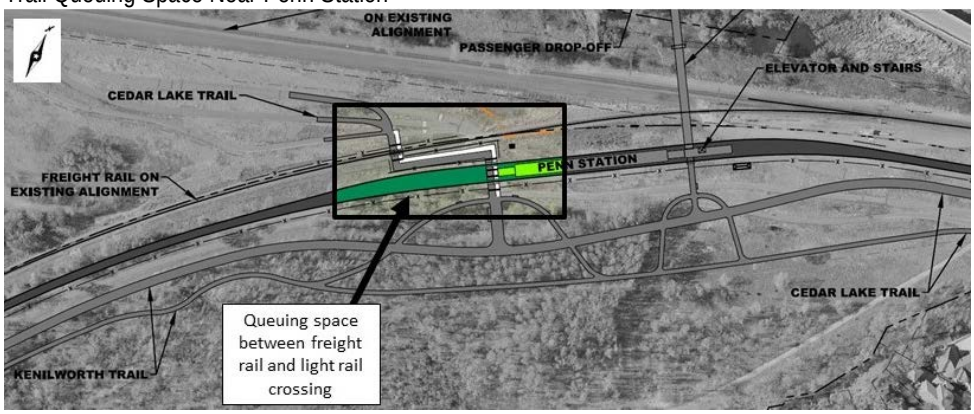
[36] Source: Transit Cooperative Research Program Report 17: Integration of Light Rail Transit into City Streets, 1996.

[37] Detectable warnings are a distinctive surface pattern of domes detectable by cane or underfoot that alert people with vision impairments of their approach to street crossings and hazardous drop-offs. Source: US Access Board.

[38] Refer to Transit Cooperative Research Program Report 17 for an example crossing treatment (Transit Cooperative Research Program, 1996).

[39] Source: City of Minneapolis. 2014. *Bicycle and pedestrian traffic counts.* Available at: http://minneapolismn.gov/bicycles. Accessed: February 2015.

EXHIBIT 4.5-3
Trail Queuing Space Near Penn Station



As a result, trail users waiting for a freight train to pass will not interact with the light rail tracks or the intersection of Cedar Lake Trail and Kenilworth Trail to the south. Therefore, the Project will not result in an adverse long-term direct impact to the existing pedestrian and bicycle network at this location.

Intersection and Facility Design

Based on the manuals, standards, and engineering best practices used as part of the Project, the following will apply to changes to pedestrian and bicycle facilities (see Section 4.5.1 for a list of design references):

- ADA-compliant curb ramps and detectable warnings have been designed and will be constructed to the latest standard at light rail stations, at-grade crossings of LRT tracks, as well as at roadway intersections that will be modified (e.g., accommodating light rail crossing, widening roadway for vehicle traffic).[40]
- Widening intersections to provide additional vehicle capacity will result in increased pedestrian crossing distance. At signalized intersections, pedestrian change intervals (flashing don't walk) times will be updated by the appropriate jurisdiction to allow additional crossing time with the assistance from the Council. As appropriate and in coordination with the applicable jurisdiction, the Project's modification to roadway geometry and local jurisdiction's changes to signalized intersections will conform to the Minnesota Department of Transportation's *Minnesota Manual of Uniform Traffic Control Devices, 2015 Edition*.

Stairs, Ramps, and Elevators

At the Opus, West Lake, and Penn light rail stations, grades may inhibit direct pedestrian and bicycle access to the station from all directions. In these areas, stairs and ramps will be provided to make pedestrian and bicycle connections possible. In these cases, ramps have been designed for the safe and comfortable use by both pedestrian and bicycle users in addition to being to be ADA compliant. Where appropriate, the Project will follow the recommendations from the AASHTO Bike Design Guide.[41] Elevators will be provided at the West Lake and Penn stations.

Relocation of Public Trails

Beginning in the City of Hopkins, and continuing to its terminus at the existing Target Field Station in Minneapolis, portions of the proposed light rail alignment will be located within or adjacent to a combination of three active existing freight rail corridors (refer to Exhibit 4.4-1 in Section 4.4), as well as portions of the regional trail system, including the Cedar Lake LRT Regional Trail, Kenilworth Trail, and Cedar Lake Trail. In addition, throughout the proposed light rail alignment, the Project interacts with portions of the local trail

[40] U.S. Department of Justice Americans with Disabilities Act (ADA) Standards for Accessible Design; US Department of Transportation ADA Standards for Transportation Facilities

[41] This guide includes horizontal curve standards for shared use paths. Following these standards allows for safe two-way bicycle use.

systems. See Section 4.5.2.2 for information about affected trail ownership and Section 4(f) eligibility for regional and local trails.

All existing public regional and local trails that will be relocated by the Project will be replaced with similar facilities[42] that will provide the same transportation connectivity. Trail relocation generally involves shifting portions of a trail within its existing right-of-way, either along a roadway or within HCRRA right-of-way, in order to provide space for Project elements (see Appendix E for specific locations). The Project will not result in adverse impacts as a result of public trail relocation.

In some cases, these trail relocations include the addition of grade-separation where a trail crosses a roadway under existing conditions. Locations where grade separation is added as part of the Project include:

- Cedar Lake Regional LRT Trail under Blake Road
- Cedar Lake Regional LRT Trail under Wooddale Avenue
- Cedar Lake Regional LRT Trail over Beltline Avenue

Trail and Station Area Conflicts

In areas where the proposed light rail alignment will follow an existing trail alignment, portions of the existing trail network have clearly marked separation for bicyclists and pedestrians, either by pavement marking or landscaped buffer. In areas where the trails are unmarked, pedestrians and bicyclists usually "keep right" and pass on the left. In addition, due to the limited-access nature of the trails, all of these trail users are currently traveling in parallel, so it is unlikely for a bicyclist to encounter a pedestrian crossing their path, or vice versa. In locations where the station platform is proposed to be adjacent to the existing trail, conflicting movements will be introduced (i.e., pedestrian/bicycle conflicts). Exhibit 4.5-4 illustrates the existing conditions and conflicts that are introduced at an example station.

EXHIBIT 4.5-4
Example Conflict Area – West Lake Station

Transit users will cross through traffic (e.g., pedestrians and bicyclists) on the trail to access parking lots, sidewalks, or bus facilities or will connect to trails directly from station platforms at the following stations:

- Shady Oak Station
- Downtown Hopkins Station
- Blake Station
- Louisiana Station
- Wooddale Station

[42] As a result of the project, approximately a 1/2 mile of the Minnesota River Bluffs Regional Trail between K-Tel Drive and 11th Avenue South will be converted from unpaved to paved surface, and the boundary between the Minnesota River Bluffs Regional Trail and the Cedar Lake LRT Regional Trail will be shifted a 1/2 mile west.

- Beltline Station
- West Lake Station
- 21st Street Station
- Penn Station
- Van White Station

Wayfinding, regulatory and warning signage, and markings of trail intersections will be included in the Project to address these conflicting movements. A clearly defined through route will be identified for bicyclists in areas where the trail travels through a plaza or large paved area, either with pavement markings or distinctive pavement. Therefore, the Project will not result in an adverse long-term direct impact to the existing pedestrian and bicycle network at these locations.

Kenilworth Trail Widths

In select locations along the Kenilworth Trail,[43] the existing bicycle trail will be reconstructed as part of the Project. The bicycle trail width will be narrower than the existing trail width and, in some cases, multiple bicycle trails will be combined into one trail. In general, this reduction in trail width is designed to minimize impacts to private or other property (see Section 3.4) and/or trees/vegetation along the corridor (see Section 3.6).[44] Note this trail is not a Section 4(f) resource (see Section 4.5.2.2 for information about affected trail ownership and Section 4(f) eligibility).

Table 4.5-4 summarizes the changes in trail widths and separation to the Kenilworth Trail under the Project, as well as hourly bicycle volumes collected on a fall weekday. The information in this table was used to calculate a Shared Use Path LOS for various points along the Kenilworth Trail using the FHWA methodology described in Section 4.5.1. The analysis is based on existing bicycle volumes. According to FHWA methodology, a bicycle LOS of C or better is generally considered acceptable. The proposed changes resulting from the Project will result in operations along the trail at LOS B or better. While there are no specific forecasts available for changes in bicycle volumes, demand may increase between opening year (2020) and 2040. Based on this analysis, the trail at its proposed width could accommodate bicycle volumes up to 400 percent greater than existing volumes before operations were reduced to LOS D.

Displacement of Private Trails

Table 4.5-3 lists the existing private trails that will be displaced by the Project. Replacement of these trails will be at the discretion of the property owner, to be determined through the property acquisition process. Two of these trails would not have provided direct access to a proposed light rail station, and their removal is not considered adverse.

However, the private trail between Flying Cloud Drive and West 70th Street would have provided a direct pedestrian and bicycle connection from Flying Cloud Drive to the Golden Triangle Station if it were not removed to accommodate the light rail alignment. This trail is not being replaced as part of the Project. In the absence of this trail, an alternative bicycle route to access the station through a nearby parking lot will result in a ½-mile longer trip. In addition, without this trail, an alternative pedestrian route with either a sidewalk or trail will not be not available. Pedestrians seeking to access the station from Flying Cloud Drive would most likely walk in the drive aisle of a nearby parking lot to access the station. Therefore, the Project will result in an adverse long-term direct impact to the existing pedestrian and bicycle network at this location.

[43] The Kenilworth Trail connects the Midtown Greenway, Cedar Lake Regional LRT Trail, and the Cedar Lake Trail. It passes through the 21st Street and Penn Station areas.

[44] Trail widths in the Project are consistent with guidance provided by MPRB in their comments on the Draft EIS for this project.

TABLE 4.5-4
Kenilworth Trail Widths and Level of Service[45]

Location	Hourly One-way Bicycle Volume[a]	Existing Width	Existing LOS[b]	Width with Project	LOS with Project
Kenilworth Trail at Penn Ave station	105	**Two one-way bicycle trails – 10 feet wide each**	A	**One two-way bicycle trail – 16 feet wide**	B
Kenilworth Trail ¼ mile west of the Penn Ave station	105	Two one-way bicycle trails – 9 feet wide each	A	One two-way bicycle trail - 16 feet wide	B
Kenilworth Trail 500 feet north of 21st St	105	Two one-way bicycle trails – 9 feet wide each	A	One two-way bicycle trail – 14 feet wide	B
Kenilworth Trail north of 21st Street	105	Two one-way bicycle trails – 10 feet wide each	A	One two-way bicycle and pedestrian combined trail – 16 feet wide	B
Kenilworth Trail at 21st St station	105	Two one-way bicycle trails – 10 feet wide each	A	One two-way bicycle trail – 14 feet wide	B
Kenilworth Trail under Burnham Rd	105	Two one-way bicycle trails – 9 feet wide each	A	One two-way bicycle trail – 14 feet wide	B

[a] Volumes obtained from City of Minneapolis, 2015.

[b] LOS = Level of Service (see Section 4.5.1 for methodology).

Source: Metropolitan Council, 2015.

4.5.3.2 Long-term Indirect Pedestrian and Bicycle Impacts

The Project will result in long-term indirect impacts to pedestrian and bicycle facilities and travel patterns. Generally, the introduction of light rail transit into a transportation system results in increased pedestrian and bicycle activity as some light rail users walk or bike to access the new light rail stations.[46] In this manner, the Project is likely to create additional demand for pedestrian and bicycle facilities. Over time, this could result in the need for new or expanded pedestrian and bicycle facilities, in order to provide adequate non-motorized access to proposed light rail stations.

This increased demand for pedestrian and bicycle facilities would be concentrated around the stations. In particular, the Project will increase pedestrian and bicycle demand along the Cedar Lake LRT Regional Trail, the Kenilworth Trail, and the Cedar Lake Trail where the stations are immediately adjacent to the existing trail facility. Biking and walking trips to these stations may use this existing trail to access the stations. Over time, additional capacity may be needed on these trails to address this demand.

4.5.3.3 Short-term Direct and Indirect Pedestrian and Bicycle Impacts

The construction of the Project will result in short-term direct and indirect changes to the pedestrian and bicycle facilities.[47] Potential direct short-term impacts include intersection modifications, reconstruction of freight rail crossings, and trail and sidewalk detours. Potential indirect short-term changes include reduced pedestrian and bicycle volumes on existing facilities. This analysis assumes that, where appropriate, pedestrian and bicycle facilities will be maintained during construction in one of the following ways:

[45] Federal Highway Administration, Shared Use Path Level of Service Calculator, 2006.

[46] Based on travel demand forecasts for an average weekday in 2040 (see Section 4.1), 51 percent of passengers will access the Project's light rail stations by walking or biking, and 69 percent of departures from the Project's light rail stations by walking or biking, generating over approximately 30,000 new one-way walking or biking trips. The travel demand forecasts do not distinguish between walking and biking trips.

[47] The inclusion of the LRCIs in the project does not result in any unique short-term direct impacts. They do increase the number or duration of the already expected short-term direct impacts discussed in this section. There will be additional trail and/or sidewalk detours due to the construction of the LRCIs.

- **Trail detour route**. A signed route along other trails or roadways that provides a bicycle and pedestrian connection around an obstruction of the existing trail. Bicycle connections could be on another trail or on an existing street (with or without bike lanes). Pedestrian connections could be on another trail or on a sidewalk along an existing street.
- **Trail detour facility**. A temporary trail facility built to re-route bicycle and pedestrian traffic around an obstruction, usually located close to the existing trail.
- **Sidewalk detour route**. A signed route that provides pedestrian access to an area where access currently exists via another nearby sidewalk, frequently on the opposite side of a roadway. Where feasible, these temporary facilities will be as ADA compliant as the existing facilities.[48]
- **Sidewalk detour facility**. A temporary paved facility built to re-route pedestrian traffic in areas where another nearby sidewalk does not exist. Where feasible, these temporary facilities will be as ADA compliant as the existing facilities.[49]

During the normal course of construction, some existing trails and sidewalks will be obstructed by construction activity, in which case a detour route or facility will be provided prior to construction activity. An exception to this is an unforeseen safety issue during construction that would obstruct the trail or sidewalk and necessitate an immediate, short term closure. In this case, the trail or sidewalk may be closed and remain closed for five days or less without an available detour route or facility.

Detour routes and facilities are applicable to the following features of the existing pedestrian and bicycle environment: regional trails, freight rail crossings, sidewalks and trails along roadways, and intersection crosswalks. The short-term effects and efforts to minimize or avoid short term impacts to each of these features are described below.

Regional Trails

The Project's proposed light rail alignment will generally be located parallel and adjacent to with the regional trail system throughout much of the corridor between the Shady Oak and Royalston stations. As noted above, these are not Section 4(f) resources. The trails in this area carry heavy bicycle and pedestrian traffic and serve as a major bicycle commuter route, with volumes approaching 200 bicycle trips per hour during weekday peak periods. There are also a number of popular destinations along the trails, which serve to further increase bicycle and pedestrian volumes on nearby trail segments. As a result of the Project, the trails will be reconstructed parallel to their existing alignment. There are three trail detours of note in this area:

- In Minnetonka, Hopkins, and Saint Louis Park, the Minnesota River Bluffs Regional Trail and the Cedar Lake LRT Regional Trail will be maintained on temporary detour facilities within the exiting right-of-way for portions of the construction period. Construction of the Project will be phased in such a way that a paved surface[50] will be maintained for use by pedestrians and bicyclists proximate to the existing trail. At the trail crossings of Minnehaha Creek and Louisiana Avenue, trail and freight bridge construction will be phased such that a bridge will be available for pedestrian and bicycle usage during construction.
- In Minneapolis, the Kenilworth Trail will be maintained on detour routes on roadways surrounding the trail. The roadways in this area are predominantly low speed, low volume residential roads with sidewalks.

[48] Sidewalk detour routes and facilities will comply with the Minnesota MUTCD, which requires a Temporary Pedestrian Access Route (TPAR) for construction zones. These state requirements go beyond those in the Federal MUTCD, and address ADA compliance. Construction specifications provided to the contractor will include special provisions referencing MnDOT TPAR requirements for accessibility.

[49] Source: City of Minneapolis, 2014.

[50] Exception: the Minnesota River Bluffs Trail between 11th Avenue and Shady Oak Road is currently an unpaved, crushed aggregate trail. Connectivity of this trail segment may be maintained on a similar, unpaved surface.

- In Minneapolis, the Cedar Lake Trail crossing of Glenwood Avenue may be maintained in the corridor or on roadways surrounding the trail. Many of the roadways in this area have existing bicycle lanes and all have sidewalks.

As a result, short-term impacts to the regional trails will be minimized and/or avoided.

Sidewalks and Trails along Roadways

Over the course of construction, some sidewalks and trails along roadways will become obstructed. As described above, detour routes or facilities will be provided to provide temporary access around these areas, where appropriate. In these cases, pedestrian detour routes frequently take advantage of the sidewalk or trail on the opposite side of the roadway, utilizing a marked crosswalk at an intersection to make the transition. On roadways where a sidewalk obstruction may occur on both sides of the roadway, construction will be staged such that only one side is detoured at a time. In cases where there is not an existing facility on the other side of the roadway, or the path to that facility results in an excessively long walk, temporary detour facilities may be constructed. Trails along roadways frequently only exist on one side, so bicycle detour routes may involve the use of shared travel lanes. These routes would be appropriately signed to warn motor vehicle traffic of the increased likelihood of encountering bicyclists. As a result, short-term impacts to sidewalks and trails along roadways will be minimized and/or avoided.

Freight Rail Crossings

There are several locations where the proposed light rail alignment will cross major roadways. In many cases, sidewalks and trails along those roadways (or the roadways themselves) provide the only means within reasonable walking distance for pedestrians and bicyclists to cross the existing freight rail lines. During construction, pedestrians' and bicyclists' ability to use these routes to cross the existing freight rail lines may be limited. The complete detour of these routes (e.g., diverting traffic from Wooddale Avenue to Beltline Boulevard) would result in an unreasonable increase in travel time for pedestrians and bicyclists. These existing freight rail crossings occur at the following locations:

- Excelsior Boulevard at Jackson Avenue
- Blake Road at the proposed Blake Station
- Louisiana Avenue at the proposed Louisiana Station
- Wooddale Avenue at the proposed Wooddale Station
- Beltline Boulevard at the proposed Beltline Station
- Cedar Lake Parkway at Burnham Road
- 21st Street at the proposed 21st Street Station

Two existing grade separated freight rail crossings would also be affected by construction of the Project. These two freight rail crossings occur at the following locations:

- West Lake Street bridge, north of the proposed West Lake Station
- Glenwood Avenue bridge, south of the proposed Royalston Station

The Council will develop and implement a construction staging plan (staging plan), which will be coordinated with the appropriate jurisdictions and railroads, and the contractor will be required to secure the necessary permits and follow the staging plan, unless otherwise approved. As part of the staging plan, construction activities at freight rail crossings will be phased so that at least one sidewalk or trail will remain open across the freight rail tracks to maintain pedestrian access. Similarly, a trail will remain open, or a temporary trail provided across the freight rail tracks to maintain bicycle access.

Pedestrian and Bicycle Undercrossings

Near the Opus station in Minnetonka, there is an isolated network of trails that connects various office buildings and tends to have grade-separated crossings from the one-way circulator roads. The circulator roads lack sidewalks. As a result, using these roadways for pedestrian and bicycle detour routes may prove challenging. Bicycle and pedestrian undercrossings will be constructed or modified at three locations around the Opus station, including:

- The proposed light rail alignment between Red Circle Drive and Bren Road East, south of the proposed Opus Station
- Bren Road East and Red Circle Drive, south of the proposed Opus Station
- The proposed light rail alignment, between Bren Road and Smetana Road

These trails will either remain open or detour facilities will be constructed adjacent to the existing trail during construction. As a result, short-term impacts to pedestrian and bicycle undercrossings will be minimized and/or avoided.

Intersection Crosswalks

There are several locations where existing crosswalks will be replaced or reconfigured to accommodate road and sidewalk/trail improvements in the vicinity of the stations (see Appendix E for illustrations of those locations). In these locations, pedestrian traffic may be temporarily detoured to other crosswalks either at the same intersection or another nearby location. Construction specifications provided to the contractor will include special provisions referencing MnDOT Temporary Pedestrian Access Route (TPAR) requirements for crosswalk detours such that access to existing destinations is maintained and accessible.

4.5.4 Mitigation Measures

This section describes the measures the Council will implement to mitigate the Project's long-term and short-term pedestrian and bicycle impacts. For each mitigation measure or set of associated mitigation measures, this section generally notes the anticipated impact or associated impacts that the mitigation measures will address (see Section 4.5.2 for additional information on the identified pedestrian and bicycle resource impacts and avoidance measures).

4.5.4.1 Long-term Mitigation Measures

Impact. Removal of private trail between Flying Cloud Drive and West 70th Street.

> ***Mitigation.*** Any measures to address the removal of the trail (e.g., replacement of the trail) will be determined by the property owner as part of the Project's property acquisition process. Private property will be acquired by the Council in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act (see Section 3.4.4).

4.5.4.2 Short-term Mitigation Measures

Impact. Potential short-term closure of a sidewalk, trail, or roadway (typically up to approximately three to five days), during which detour routes or facilities may not be provided.

> ***Mitigation.*** Mitigation strategies to be taken in the event of temporary closures are identified in the Construction Mitigation Plan, which includes a Construction Communication Plan and staging plan for implementation by the Council prior to and during construction. The purpose of the Construction Communication Plan is to prepare project-area residents, businesses, and commuters for construction; listen to their concerns; and develop plans to minimize disruptive effects. Strategies may include:
>
> - Issuing and distributing regular construction updates
> - Providing advance notice of roadway closures, driveway closures, and utility shutoffs
> - Conducting public meetings
> - Establishing a 24-hour construction hotline
> - Preparing materials with information about construction
> - Addressing property access issues
> - Assigning staff to serve as liaisons between the public and contractors during construction

4.6 Safety and Security

This section describes long-term direct and indirect and short-term (construction) direct and indirect effects of the Project on safety and security (see Sections 3.17 for cumulative impacts). This section includes an overview of the regulatory context and methodology used for the analysis, an assessment of existing conditions related to safety and security, a description of the anticipated impacts related to the Project, and a description of mitigation measures to implement with the Project.

4.6.1 Regulatory Context and Methodology

This section summarizes the regulatory context and methodology related to the assessment of safety and security under the Project.

4.6.1.1 Light Rail

The Council, as the owner and operator of the Southwest LRT Project, follows safety and security policies that establish minimum requirements for facilities based on local, state, and federal codes or standards; the Council's guidance; and the *Safety and Security Management Plan* (SSMP) for the Project. These codes, standards, and guidance include, but are not limited to, the applicable parts of:

- The National Fire Protection Association 130, Standard for Fixed Guideway Transit or Passenger Rail Systems
- International Fire Code, 2012 Edition, as amended
- The 2015 Minnesota State Building Code, as amended by the Cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis
- The National Fire Protection Association 101 Life Safety Code as well as ISO standards
- American National Standards Institute and American Society for Testing and Materials Standards
- 49 CFR Parts 214, 219 220, 222, 225, 228, 233, 234, 235, and 236, and 49 CFR § 229.125
- Minnesota Chapter 312 (HF 3172/SF 2785), Section 299A.017, "State Safety Oversight" establishes an Office of State Safety Oversight in the Department of Public Safety for safety oversight of rail fixed guideway public transportation systems within the state of Minnesota.
- 49 CFR Part 674, State Safety Oversight Final Rule.
- Circular C5800.1, *Safety and Security Guidance for Recipients with Major Capital Projects*, governing the safety and security process from planning through commencement of revenue service
- Metropolitan Council's *Regional Transitway Guidelines* (2012a), *Station and Support Facility Design Guidelines User Guide Supplement* (2012b), and *Metro Light Rail Transit Design Criteria* (Council, 2015), which provide technical guidance for the design of transitway facilities
- Metro Transit's *SSMP* for the Project (refer to Appendix C for instructions on how to access this document), which covers safety and security requirements and actions during operation of the Project

4.6.1.2 Freight Rail

The Secretary of Transportation has authority over all areas of railroad transportation safety (federal railroad safety laws, principally 49 U.S.C. chapters 201–213), and delegates this authority to the Federal Railroad Administration (FRA) under 49 CFR 1.89. In October 2014, the FRA provided a safety jurisdiction determination for the proposed Project in its regulatory role over the implementation of the proposed light rail at-grade crossings of roadways in the vicinity of existing freight rail at-grade crossings (see Appendix E for the Preliminary Engineering Plans showing the shared highway-rail grade crossings). In that safety jurisdiction determination, FRA concluded that the proposed Southwest LRT Project will be an urban rapid transit (URT) operation and, therefore, FRA will exercise its safety jurisdiction and regulations over the five

shared highway-rail grade crossings for the Project.[51] Regulation over the safety of freight rail operations are outside of the jurisdiction of the Council and FTA; FRA safety jurisdiction applies to the five shared highway-rail grade crossings.

The study area for the safety and security evaluation includes planned facilities within the limits of disturbance for the Project, as illustrated in the Project's Preliminary Engineering Plans (see Appendix E).

4.6.2 Affected Environment

This section describes the existing conditions of the study area, including an overview of existing freight rail crossings and a summary of existing emergency service providers in the study area.

4.6.2.1 Emergency Service Providers

Public safety and security within the study area is provided by the police departments, fire departments, and emergency response units of the Cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis. Emergency medical services are located in each city. Through the municipal police and fire departments, each community within the affected area has developed an Emergency Operations Plan for all types of emergencies. In addition, Three Rivers Park District Department of Public Safety and Minneapolis Park and Recreation Board Police Department are the law enforcement agencies responsible for providing a safe environment on the regional trails within the study area, such as the Cedar Lake LRT Regional Trail and the Kenilworth Trail.

4.6.2.2 Transit Service and Facilities

Within the safety and security study area, Metro Transit and SouthWest Transit provide safety and security services for their respective bus service and facilities, which are described in Section 4.1. In particular, Metro Transit has its own licensed police force, which is made up of approximately 110 full-time officers, 90 part-time officers, four community service officers and five administrative staff. Metro Transit also has an extensive community service officer (CSO) program. CSOs are studying law enforcement but are not yet sworn officers. These future licensed officers monitor closed-circuit TV and assist with traffic and crowd control.

4.6.2.3 Freight Railroads

There are currently four active freight rail corridors in the study area: the Bass Lake Spur, the Kenilworth Corridor, the Wayzata Subdivision, and the MN&S Spur. The fourth freight rail line, the MN&S Spur, intersects the Bass Lake Spur within the study area (refer to Section 4.4.3 for more information on existing freight rail operations). There are three freight rail owners/operators: Canadian Pacific Railway; BNSF Railway; and Twin Cities and Western Railroad (see Section 4.4.2.4 for additional information on these freight rail owners/operators). In addition, HCRRA is the current owner of the Kenilworth Corridor, which includes existing freight rail tracks (see Section 4.4.2.3 for additional information on HCRRA). Final ownership of these rights-of-way will be determined as the Project advances, but it is likely that portions of the railroad corridors will be transferred to public ownership, with continued operating rights for the railroads that currently operate in the area (see Section 2.1.1.3 for additional detail). Responsibility for compliance with freight rail operational and safety regulations will be the responsibility of the railroad owner or operator. Ownership of the freight rail infrastructure and right of way will be determined as part of the acquisition process and subsequent agreements.

As part of the Project, changes to existing freight rail infrastructure will be required within the Bass Lake Spur, Kenilworth Corridor, and the Wayzata Subdivision in order to accommodate the proposed light rail alignment. See section 4.6.3.1 for additional information. The design and operations of the shared highway-rail grade crossings subject to FRA's safety jurisdiction will be subject to FRA regulations, including 49 CFR Parts 214, 219, 220, 222, 225, 228, 233, 234, 235, and 236, and 49 CFR § 229.125, as well as the hours of

[51] Refer to Appendix N for a copy of correspondence between the Council and FRA regarding FRA's safety jurisdiction determination and a description of the five shared highway-rail grade crossings.

service laws, at the points of connection between the Project and the general railroad system.[52] According to Minnesota Chapter 312 (HF 3172/SF 2785) with respect to freight railroads in Minnesota, MnDOT has oversight responsibilities for freight railroad infrastructure including at-grade roadway crossings and the Minnesota Department of Public Safety has responsibilities to work with freight railroad companies to develop safety protocols with local public agencies, assist local governments with including emergency response information in local plans, and to participate in and monitor emergency response training and preparedness. The FRA and State of Minnesota's jurisdiction applies only to the shared at-grade light rail/freight rail roadway crossings included in the Project (see Section 4.4.2.2 for more information). There are nine existing locations within the study area where either roadways or multiuse trails cross freight railroads; see Table 4.6-1 for the locations of these existing at-grade crossings.

In addition, in March 2016, FTA issued a final rule for state safety oversight of rail fixed guideway public transportation systems not regulated by the FRA (49 CFR Part 674). This final rule replaces existing regulations and significantly strengthens state safety oversight agency (SSOA) authority to prevent and mitigate accidents and incidents on rail transit systems to help ensure the safety of riders and workers. Under this final rule, each SSOA is required to have the enforcement authority, legal independence and financial and human resources for overseeing the rail transit agencies within their jurisdiction. In addition, SSOAs must train and certify personnel responsible for performing safety oversight activities and will continue to conduct triennial audits of the safety programs established by each rail transit system. States have three years from the effective date of the final rule to implement an approved State Safety Oversight Program. All Metro Transit LRT lines fall under the jurisdiction of the Minnesota SSOA, which is part of the Minnesota Department of Public Safety, and are governed by 49 CFR, Part 659.

4.6.3 Environmental Consequences

This section identifies the long-term and short-term direct impacts on safety and security from the Project.

4.6.3.1 Long-term Direct Impacts on Safety and Security

This section describes proposed design elements and other measures to increase safety and security that will be implemented as part of the Project. The following safety and security related topics are addressed in this section: modifications to existing freight rail facilities to accommodate light rail; light rail stations and other facilities; new at-grade light rail crossings; emergency vehicle access and response times; light rail service in the vicinity of freight rail; and light rail tunnel safety.

Modifications to Existing Freight Rail Facilities

The Project will include modifications to freight rail facilities to accommodate the introduction of light rail facilities, including shifting the realignment and reconstruction of freight railroad track, the placement of light rail tracks in relatively close proximity to freight rail tracks, and several shared at-grade light rail and freight railroad crossings of roadways or trails (that are currently only freight rail crossings); removing the northern leg of the existing Skunk Hollow switching wye between the Bass Lake Spur and the MN&S Spur and construction of a new connection; modifications to the freight rail alignment in the Kenilworth Corridor to accommodate the proposed light rail tunnel, at-grade sections of light rail tracks, and light rail stations; and modifications to the freight rail alignment in the Wayzata Subdivision to accommodate the light rail tracks and light rail stations. Refer to Sections 4.4.4.1 and 2.1.1.3 for a detailed description of the freight rail infrastructure modifications included in the Project. Freight rail modifications are also illustrated in Exhibit 2.1-5.

As described in the *Metro Light Rail Transit Design Criteria* (Council, 2015), the design of freight rail facilities and elements that interface with freight rail facilities will comply with applicable safety design standards including the Manual for Railway Engineering, American Railway Engineering and Maintenance of Way Association (AREMA) and other owner/operator railroad standards and guidelines, where appropriate.

[52] The Council may petition FRA's Safety Board for a waiver of those regulations under the procedures set forth in 49 CFR Part 211.

Light Rail Stations and Other Facilities

The Project is being developed to conform to FTA's Rail Fixed Guideway Systems; State Safety Oversight Program for Safety and Security Guidance for Recipients with Major Capital Projects (Circular C 5800.1), covered under 49 CFR Part 633 – Project Management Oversight. The Project will be designed to meet the following minimum objectives, in accordance with FTA guidance:

- Design for the identification, minimization, and elimination of hazards through the use of appropriate safety design concepts and/or alternative designs
- Use of fixed, automatic, or other protective safety devices, such as warning signals and devices to control hazards that cannot be eliminated
- Provide special procedures for hazards that cannot be minimized by the aforementioned devices

The Project will apply safety and security measures (e.g., station area security/crime, bicycle and pedestrian security) through the implementation of the Project's SSMP (Council, 2014) and the *Metro Light Rail Transit Design Criteria* (Council, 2015). The purpose of the SSMP is to document how Metro Transit will integrate safety and security into the Project. The plan covers requirements for safety and security design criteria, hazard analyses, threat and vulnerability analyses, construction safety and security, operational staff training, and emergency response measures. These plans and programs also specify actions and requirements of Metro Transit Police to maintain safety and security during Project phases. The purpose of the *Metro Light Rail Transit Design Criteria* (Council, 2015) is to establish basic design criteria to be used in the design of the Metro Transit's LRT system. The design criteria include design standards and specifications to provide security and/or enhance safety, such as guidance on fire and life safety protocols, track geometry and trackwork, station design, tunnel design, traffic engineering, and structural engineering.

In coordination with the Project's SSMP and the *Metro Light Rail Transit Design Criteria,* station areas will be designed to include best practices for safety and security, including lighting, emergency equipment, public address systems, video cameras, emergency telephones, and closed circuit television. The public address system, with both speakers and signs, will convey information to people with disabilities in compliance with ADA requirements. Lighting for proposed station areas and park-and-ride lots, as well as vehicular and pedestrian circulation areas, will be consistent with the *Metro Light Rail Transit Design Criteria* (Council, 2015). Emergency lighting will be provided in all public areas, including platforms, pedestrian facilities, vehicular traffic areas, bus loading zones, and park-and-ride lots. Fencing and railings will be designed for fall protection near substantial grade changes and for locations susceptible to pedestrian or bicycle encroachments onto the light rail tracks. Where possible, fencing will be located in the vicinity of at-grade trail or sidewalk crossings, in station areas, and between the light rail alignment or freight rail alignment when adjacent to a trail or sidewalk. The proposed Hopkins OMF will be secured by perimeter fencing to eliminate hazards that could cause risk to the public.

Safety and security within the proposed light rail right-of-way will be the joint responsibility of Metro Transit Police, and local law enforcement authorities. Metro Transit has its own licensed police force to address public safety on and near the transit system. Transit police will routinely patrol the proposed stations and LRT alignment, as well as nearby bus routes and bus stops. Transit police officers will provide security at light rail stations and in the light rail vehicles.

As the project progresses through construction and into integrated testing and revenue operations, the Light Rail Transit Fire Life Safety and Security Committee (LRT FLSSC), as described in the Project's SSMP (Council, 2014), will participate in the planning, performance and evaluation of emergency simulation on the system. The LRT FLSSC is a standing agency-wide committee with membership from local and county police and fire departments and other participating organizations. The LRT FLSSC provides input to and comments on the fire protection, emergency preparedness plans and procedures, safety plans, and security plans. These exercises will include discussion based (tabletop) drills, familiarization exercises, and operations-based (full-scale) exercises. After each training exercise, formal reviews and lessons learned will be incorporated into improvements in incident response and resolution procedures. These results will be tracked through

corrective actions plans that will be submitted to the Minnesota State Safety Oversight Agency and updated monthly.

To address adequate emergency vehicle access to restricted or elevated locations on the project, the Council will coordinate with emergency services providers by providing them with access routes and locations that will avoid the potential for emergency response delay. Additional coordination will occur through the LRT FLSSC. Many restricted or elevated locations on the project will be accessed from surrounding roadways or adjacent properties. In some locations such as light rail bridges over Prairie Center Drive, Valley View Road, Nine Mile Creek, Shady Oak Road and Highway 212, and the Minnetonka/Hopkins bridge (south of Shady Oak Station), or where light rail is located on retaining walls near the City West Station, access may be from surrounding properties or via emergency response access points on either end of the elevated areas. At other locations such as in the Kenilworth Corridor, adequate trail width for emergency vehicle access will be provided, including the trail bridge over the Kenilworth Channel. Discussions have also included confirming fire hydrant locations.

At-Grade LRT Crossings

As shown in Table 4.6-1, 14 new LRT crossings at-grade with existing roadways will be introduced as part of the Project. Light rail vehicles will sound horns or bells when entering a station and when approaching at-grade roadway crossings, except in locations where a quiet zone is implemented.[53] In quiet zone locations, additional safety measures (e.g., non-traversable medians), will be installed in accordance with the Quiet Zone Final Rule (49 CFR Part 222). See Section 4.2 for more information on roadways and Section 4.4 for more information on freight rail. The Project will also include one new light rail crossing at-grade with a multiuse trail. The trail crossing of light rail will be joined together with the station access sidewalk located at the end of the Penn Station platform. At-grade light rail crossings of sidewalks and multiuse trails have been designed based on the *Metro Light Rail Transit Design Criteria* (Council, 2015) and will include flashing light signals with an audible warning to notify pedestrians of a train's arrival and detectable warnings and signs. Refer to Section 4.5 for more information on pedestrian and bicycle facilities. Controls for all at-grade crossings are shown in Table 4.6-1.

Under the Project, there will be six shared light rail and freight railroad at-grade crossings. Five of the shared at-grade crossings will be of roadways and one will be of a trail, as noted above. Proposed controls for all new or modified crossings are shown in Table 4.6.1. In some cases, the roadway crossings will include crossings for sidewalks and trails. In these locations, the crossings and controls will be designed to promote pedestrian and bicycle safety and will include space between the freight tracks and the light rail tracks to allow sidewalk and trail users to have shelter space in the event of a freight and light rail train passing simultaneously. In addition, these crossings will be equipped with detectable warnings and fences lining the crossing paths to bring attention to the freight or light rail crossing locations. The design details of pedestrian and bicycle safety features will be made during Engineering and finalized prior to construction.

Emergency Vehicle Access and Response Times

Under the Project, emergency vehicle access to properties and areas within the vicinity of the Project will be maintained (except where the Council will fully acquire a parcel, thereby eliminating the need for access). In particular, access via public roadways will be maintained by providing either at-grade, above-grade, or below-grade light rail crossings of roadways. In the few areas where existing roadway connections or driveways to properties will be affected by the Project, alternate roadway connections or driveways will be provided for continued emergency vehicle access (see Table 4.6-2). Emergency vehicle access to individual properties, except where the property will be fully acquired by the Council, will also be maintained under the

[53] Quiet zones are locations where the routine sounding of horns has been eliminated because of safety improvements at at-grade crossings. Horns are not routinely sounded in quiet zones, unless under an emergency situation. Bells are sounded in quiet zones. Municipalities must apply to FRA for approval of quiet zones.

TABLE 4.6-1
At-Grade Railroad Crossings (Existing Conditions and Project)[a]

Location	Existing Conditions		Project	
	Crossing Type	Crossing Control[b]	Crossing Type	Crossing Control[b]
Redstone Driveway off Eden Road, Eden Rd, Eden Prairie	None	N/A	LRT	Flashing lights and gates
Technology Dr at Flying Cloud Dr, Eden Prairie	None	N/A	LRT	Flashing lights and gates
Viking Dr at Flying Cloud Dr, Eden Prairie	None	N/A	LRT	Flashing lights and gates
West 70th St, Eden Prairie	None	N/A	LRT	Flashing lights and gates
Bren Rd E/Red Circle Dr/Yellow Circle Dr, Minnetonka	None	N/A	LRT	Flashing lights and gates
Bren Rd West, Minnetonka	None	N/A	LRT	Flashing lights and gates
5th Street/K-Tel Dr, Hopkins	None	N/A	LRT	Flashing lights and gates
11th Ave S, Hopkins	None	N/A	LRT	Flashing lights and gates
8th Ave S, Hopkins	None	N/A	LRT	Flashing lights and gates
5th Ave S, Hopkins	Freight	Flashing lights	LRT and Freight	Flashing lights and gates
Monroe Ave S/Jackson Ave N/Excelsior Blvd, Hopkins	Freight	Flashing lights and gates, traffic signal	Freight	LRT on bridge; freight crossing same as existing
Blake Rd N, Hopkins	Freight	Flashing lights and gates	LRT and Freight	Flashing lights and gates
Wooddale Ave S, St. Louis Park	Freight	Flashing lights and gates	LRT and Freight	Flashing lights and gates
Beltline Blvd, St. Louis Park	Freight	Flashing lights and gates	LRT and Freight	Flashing lights and gates
Cedar Lake LRT Regional Trail, east of Beltline Blvd, St. Louis Park	Freight	At-grade with trail stop sign and pavement markings on trail	LRT and Freight	Grade separated with trail on bridge over LRT and freight
Cedar Lake Parkway, Minneapolis	Freight	Flashing lights	Freight	LRT in tunnel; freight crossing same as existing
21st St W, Minneapolis	Freight	Crossbucks and stop signs	LRT and Freight	Flashing lights and gates
Cedar Lake Trail just west of Penn Station, Minneapolis	Freight	Trail stop sign and pavement markings on trail	LRT and Freight	Flashing lights and pavement markings on trail: trail crossing of LRT at Penn Station platform
Glenwood Ave, Minneapolis	None	N/A	LRT	Flashing lights and gates
Royalston Ave, Minneapolis	None	N/A	LRT	Traffic signals

[a] Includes both the existing conditions and the Project condition. For the Project, includes LRT only, freight only, and shared LRT/freight crossings.

[b] Detectable warning devices and fencing may be provided at locations where sidewalks or trails will cross the LRT tracks. Design decisions will be made during Engineering and specific treatments will be determined prior to construction.

Note: N/A = not applicable.

Source: Council, 2015.

TABLE 4.6-2
Roadway and Driveway Access Changes

Roadway/Driveway Connection Affected	Alternate Connection
Redstone east driveway located along Eden Rd (Eden Prairie)	East driveway closed, west driveway shifts west approximately 160 feet
K-Tel Dr/5th St S (Minnetonka/Hopkins)	New roadway alignment/intersection approx. 115 feet northeast
Service Road between Beltline Blvd and Lynn Ave	Roadway being removed. Access to Monterey Ave via CSAH 25 and new Lynn Ave extension. Lynn Ave extended south and west to Monterey. Service Rd access to Lynn Ave east of Lynn Ave closed, but provisions for emergency access to Lynn Ave included.
Chowen Ave S/W 31st St/Abbott Ave S alignment (Minneapolis)	New roadway alignment creating W 31st St shifts Abbott Ave S and Chowen Ave S south approx. 160 feet south

Source: Council, 2015.

Project: (1) either the existing vehicular access to a property will be maintained; or (2) alternate vehicular access will be provided where existing vehicular access to a property will be closed to accommodate the Project.

In locations where there will be at-grade light rail crossings of roadways, the potential exists for increases in emergency response time as a result of delay to emergency vehicles while LRVs are in the crossing. During the peak weekday hour, up to 12 light rail trains (six in each direction) will pass through these at-grade crossings, causing approximately 50 seconds of delay per light rail train crossing. Because approaching light rail vehicles will have a higher priority at at-grade crossings than approaching emergency vehicles (which is consistent with existing light rail at-grade crossings in the system), these delays could increase fire, emergency medical services, and police response times on routes using the crossings. To help avoid or minimize delays to emergency vehicles at proposed at-grade light rail crossings, the Council will coordinate with emergency services providers by providing them with and the identification of alternative crossing routes that will avoid the proposed at-grade light rail crossings and the potential for delay. Additional coordination will occur through the LRT FLSSC.

Light Rail Service in the Vicinity of Freight Rail Service

Between the proposed Shady Oak Station in Hopkins and the existing Target Field Station in Minneapolis, portions of the proposed light rail alignment will be located within a combination of three active existing freight rail lines and the light rail alignment will generally be located parallel to the existing freight railroad corridors (described and illustrated in Section 4.4.3). As previously described, the Council will implement the Project's SSMP (Council, 2014) and the Metro *Light Rail Transit Design Criteria* (Council, 2015), to provide and maintain safety and security during operation of the Project within the vicinity of existing freight rail service. The *Design Criteria*, which includes design standards and specifications to provide security and/or enhance safety, includes safeguards to prevent LRT operational derailments including guardrails (i.e., a rail or other structure laid parallel with the running rails of the track to keep derailed wheels adjacent to the running rails of the track to keep derailed wheels adjacent to the running rails). In addition, corridor protection barriers (i.e., commonly referred to as "crash walls") will be placed between the freight rail and light rail tracks. Corridor protection barriers are thick walls placed between freight rail and light rail tracks where either light rail or freight rail will be: 1) elevated above the adjacent tracks; or 2) the clearance between the centerline of the light rail tracks and the centerline of the freight tracks is less than 25 feet. In addition, where clearance between the centerline of the at-grade light rail tracks and the centerline of the at-grade freight tracks is less than 50 feet, intrusion detection for possible freight derailment will be installed.

The design of the Project will include safeguards in the catenary system for the Project to help minimize the possibility of sparking occurring in the overhead catenary wires. Electrical sparks, or arcing, occurs when there is a gap between the overhead contact wire and the vehicles pantograph. Numerous safeguards are included in the design of the Project to address and minimize electrical sparking. Ice cutters will be utilized to maintain positive contact between the contact wire and pantograph during winter weather. Additionally, Metro Transit will regularly inspects pantographs for grooves along the pantograph's carbon strip (as it does

on its existing light rail lines), which could cause arcing. Included in the design of the Project to minimize arcing are contact wire gradients, which meet or exceed AREMA recommendations, staggering or zig-zags of the contact wire to ensure even wear, and overlaps between power sections. Finally, the design accounts for the Occupational Safety and Health Administration (OSHA) 10-foot zone of influence, and meets or exceeds National Electrical Safety Code (NESC)[54] requirements along the proposed shared light rail and freight rail corridor.

Where the light rail alignment will be adjacent to a freight rail alignment, the light rail alignment will be primarily on segregated right-of-way. In accordance with the NESC, this right-of-way configuration allows for contact wire height above rails as low as 16-foot for normal operations, and lower where required to clear vertical obstructions. To further maximize the separation between the light rail catenary and the freight corridor, a typical normal design contact wire height for the LRT is 18 feet 6 inches.

The Council's Operations Emergency Management Plan (OEMP) for light rail was developed to assist in identifying, responding to, and resolving emergency situations in an efficient, controlled and coordinated manner for the Project. The OEMP establishes the response process and responsibilities for departments and staff within Metro Transit, as well as outside agencies in the event of a rail emergency.

In addition, the Council maintains an emergency preparedness exercise plan, in compliance with the SSMP. The emergency preparedness exercise plan identifies emergency preparedness exercises, which will be carried out by the LRT FLSSC. In advance of operation of the Project, a number of drills will be planned, conducted, and documented in the emergency preparedness exercise plan. Emergency preparedness training exercises will be designed to address areas such as rail equipment familiarization, situational awareness, passenger evacuation, coordination of functions, communications, and hands-on instruction. The LRT FLSSC will coordinate training exercises with the Council and the freight railroad owners and operators, as appropriate. During normal revenue service, the LRT FLSSC will coordinate training exercises with the Council and freight rail operators, as appropriate, to evaluate emergency preparedness. The exact nature of emergency preparedness exercises will be developed in coordination with the LRT FLSSC prior to construction, but could include one tabletop and one full-scale emergency preparedness exercise, annually.

Light Rail Tunnel Safety

There are two locations where the light rail alignment will be located within a shallow tunnel as part of the Project. This includes a tunnel under Highway 62, between City West Station in Eden Prairie and Opus Station in Minnetonka, and a shallow tunnel within the Kenilworth Corridor in Minneapolis, between West Lake Station and the crossing of the Kenilworth Lagoon. Refer to Section 2.1.1 for more information on the design of the proposed shallow tunnels and Appendix E for design drawings.

In order to maintain safety and to provide security within the shallow tunnels, the Council will follow the *Metro Light Rail Transit Design Criteria* (Council, 2015), including the following:

- Ventilation infrastructure, including emergency ventilation fans that would direct fresh air into selected areas and remove smoke from areas during an emergency
- Rail heaters and other climate control systems to avoid ice build-up on rails due to temperature gradient at tunnel entrance
- Passenger evacuation infrastructure, such as cross passages to the opposing tunnel direction (i.e., connecting the inbound and outbound sides of the tunnel) spaced mid-tunnel with fire rated doors (i.e., opposing direction of the tunnel will be separated by a concrete wall), one emergency walkway per half-tunnel, and egresses at tunnel portals
- Signs within the tunnel to identify the locations of passages and tunnel openings

[54] The NESC covers provisions for safeguarding persons from hazards arising from the installation, operation, or maintenance of electric supply and communication lines and equipment (http://standards.ieee.org/about/nesc/index.html).

- Closed circuit monitors at tunnel portals, phones and blue lights (i.e., emergency beacons that identify telephones), and radio system connections to the rail control center
- Intrusion detection at each tunnel portal
- Normal and emergency tunnel lighting

In addition, the Project will comply with National Fire Protection Association 130: Standard for Fixed Guideway Transit and Passenger Rail Systems (2014) and Circular C 5800.1, *Safety and Security Guidance for Recipients with Major Capital Projects*. These guidelines and standards address fire prevention, ventilation and fire protection, evacuation.

4.6.3.2 Short-term Impacts on Safety and Security

This section describes proposed measures to increase safety and security that will be implemented as part of the construction of the Project. The following safety and security related topics are addressed in this section: light rail construction safety and security; emergency vehicle access and response times; freight rail operations; and light rail tunnel construction.

Light Rail Construction Safety and Security

The construction of the Project will be a major undertaking that will require changes along the proposed light rail alignment for the duration of the construction period. Major construction is expected to span approximately three years. Staging of construction activities will be further evaluated and updated as the construction process and phasing is better defined during Engineering and will include provisions to maintain safety and security for staging areas. Refer to Section 2.1.1.2 for more information on construction activities.

Both federal OSHA and Minnesota OSHA standards for safety of construction site personnel will be maintained in order to minimize and/or avoid construction workers' injuries. In addition, all contractors will prepare a project safety and health program along with a site-specific safety plan to ensure that, while on the work site and construction activities, contractor and subcontractor personnel comply with the specified safety practices, codes, and regulations as described in the Project's SSMP. As appropriate, access to construction sites may be limited by fencing and security gates where practical to prevent inadvertent access by those without access clearance. Specific construction safety and security management activities are identified in the Project's SSMP, which will be incorporated into construction contract specifications.

Emergency Vehicle Access and Response Times

Construction activities will result in temporary increased congestion along adjacent roadways as a result of temporary lane and roadway closures, shifts in roadway alignments, and detours. This temporary increase in roadway congestion could affect access and response times for emergency service providers. However, provisions will be made to maintain required access during established periods or to keep one lane of traffic open on main arterials as described in the Construction Mitigation Plan (see Section 4.6.4).
Increased delay for emergency response vehicles during construction of the Project will be minimized through coordination with the affected authority having jurisdictions, which generally includes local and county police and fire departments. The Council will work with emergency service providers to provide the general schedule for construction activities and identify detour routes, thereby minimizing potential increases in delay for emergency response vehicles because emergency responders will be aware of alternate routes prior to dispatch and can avoid light rail crossings as needed. Further, access for emergency response vehicles to parks and trails will be maintained at all times during construction and operation of the Project in accordance with all relevant laws and standards, as appropriate. Additional coordination will occur through the LRT FLSSC.

Freight Rail Operations

As part of the Project, construction activities will occur close to active freight rail corridors. The Council will develop and implement a freight rail operations coordination plan that will be based on and coordinated with the Project's construction documents. During the Project's construction, the Council will continue to

work closely with the railways concerning railway coordination. The Council will adopt and use the safety and construction specifications and standards of the Class 1 Railways: Canadian Pacific Railway (CP) and BNSF Railway for the entire Project when construction is adjacent or on railways' rights-of-way, in addition to all applicable OSHA Construction and other Safety Regulations. The railways' safety and construction specifications and standards are very specific and rigorous in their intent and execution. In addition, contractors' personnel, project engineering staff, Metro Transit staff, and all other support staff working on or adjacent to the railways' rights-of-way will be required to have completed and possess valid FRA Rule 214 Roadway Worker Training Certification, e-RAILSAFE and BNSF Contractor Orientation Training. Railway flaggers will be used to control freight train movements through construction limits. Qualified inspectors will be used to assess the operational safety condition of the right of way prior to the movement of a train through areas of railway trackage that may be disturbed by excavating and excavations, pile driving, crane lifts and related activities that may impact the safety of the site and rail operations through the construction limits. Short-term freight operational impacts and mitigation are addressed in Section 4.4.

Light Rail Tunnel Construction

As shown in the *Kenilworth Shallow LRT Tunnel Basis of Design Report*, appropriate sheet piling and bracing will be designed to safely support the open excavation for light rail tunnel construction, as well as to support adjacent freight rail infrastructure. Other construction safeguards, such as horizontal and vertical movement and settlement monitoring of both existing freight rail infrastructure and light rail tunnel support of excavation, will be used as construction of the tunnel progresses. Monitoring data will be collected and analyzed by construction staff and coordinated with freight railroad operations staff to verify that safe freight rail operations can be maintained through the construction area at all times.

4.6.4 Mitigation Measures

This section describes the measures the Council will implement to mitigate the Project's long-term and short-term Safety and Security impacts. For each mitigation measure or set of associated mitigation measures, this section generally notes the anticipated impact or associated impacts that the mitigation measures will address (see Sections 4.6.3.1 and 4.6.3.2 for additional information on the identified safety and security impacts and avoidance measures).[55]

4.6.4.1 Long-term Mitigation Measures

Based on the analysis and incorporation of identified safety and security-related design and operational elements into the Project, the Project will not adversely impact safety and security within the study area. Key safety and security measures described above that will be implemented under the Project include: designing freight rail modifications to meet applicable safety design standards; adherence with the Project's SSMP and *Metro Light Rail Transit Design Criteria* when designing light rail facilities and at-grade light rail crossings; continued coordination with emergency responders, including the LRT FLSSC; design components related to the location of light rail service operating in the vicinity of freight rail service; and implementation of design and operational safety measures for the proposed light rail tunnels.

4.6.4.2 Short-term Mitigation Measures

Most short-term adverse impacts to safety and security will be avoided through the implementation of measures outlined in Section 4.6.3.2, including compliance with OSHA standards, continued coordination with freight rail operators, and the implementation of applicable sections of the Project's SSMP. The remaining impact is described and will be mitigated as follows:

Impact. Temporary delays in emergency response resulting from construction activities.

> ***Mitigation.*** In order to mitigate temporary delays in emergency response resulting from construction activities, the Council developed a Construction Mitigation Plan, which includes a construction staging plan and a Construction Communications Plan. The construction staging plan identifies efficient detour routes; minimizes temporary lane, sidewalk, and trail closures; and addresses maintenance and timely removal of temporary traffic control devices. The Council will

[55] See Section 4.4 for additional information on freight rail operations and related mitigation measures.

coordinate with emergency service providers on required detour routes and lane closures in order to minimize increases in travel and response times.