6.0 TRANSPORTATION EFFECTS

This chapter describes the anticipated transportation impacts of the No Build, the Enhanced Bus Alternative, and the Build Alternatives described in Chapter 2. Evaluation of these alternatives is based on projected travel demand, transportation network capacity, **transportation system performance measures,** and impacts to the roadway network, parking, bicycle and pedestrian facilities, and freight movement. Forecasts for the Southwest Corridor were conducted using the Metropolitan Council's 2030 regional travel demand forecast model. In addition, traffic counts (peak period turning movements) were conducted in 2010 at intersections along the study area alignments. Level of service (LOS) analysis was performed using current traffic data as well as 2018 (opening day) and 2030 projected traffic assignments.

"Transportation system performance measures" - These include travel time, speed, hours of congestion, and similar measurements.

6.1 Transit Effects

6.1.1 Methodology

The transit analysis and ridership forecasts for each transit alternative were developed using the Metropolitan Council's regional travel demand model. The model uses what is known as the standard four-step transportation forecasting process of trip generation, trip distribution, mode choice, and traffic/transit assignment. All forecast future traffic data was derived by the project team using well established traffic modeling techniques. A key element in forecasting future travel demand and travel patterns is anticipated growth within the region. This project used regional growth assumptions from local governments that predict the magnitude and location of housing and job growth within the region. These growth assumptions and the resulting demographic and land use forecasts are reviewed by Metropolitan Council prior to adopting them officially. More information on these techniques, as well as more detailed traffic data, is contained in the Traffic Technical Report see Appendix H.

The forecast year for the model is 2030. The primary inputs used in the model are the study area population, employment, household socioeconomic characteristics, transit fares, automobile operating costs, tolls, and highway and transit networks. Population, household, employment, and socio-economic inputs are projected at the community level and allocated to a finer unit of geography known as the Transportation Analysis Zone (TAZ). The spatial extent of TAZs vary in geographic size. TAZs are often geographically larger in rural areas and sometimes as small as city blocks in densely populated areas, such as the central business district of a large city. A TAZ usually consists of one or more census blocks, block groups, or census tracts, and includes information on the approximate number of people, households, and employment within each zone. The regional travel demand model forecasts travel on the transit and highway system within the Twin Cities metropolitan area. As such, it contains all of the existing and planned rail and bus lines. The transit network contains service frequency (i.e., how often trains and buses arrive at any given transit stop), routing, travel time, and fares for all of these lines. In the highway system, all express highways, and principal arterial roadways, and many minor arterial and local roadways are included.

Results from the computer model provide detailed information relating to transit ridership demand. Estimates of passenger boardings on all of the existing and proposed transit lines can be obtained from the model output. The model also generates a number of statistics that can be used to evaluate the performance of a transportation system at several levels of geographic detail.

In the Draft EIS, the evaluation of the No Build, Enhanced Bus, and Build Alternatives were made by comparing daily **linked transit** trips, **unlinked trips** by transit mode, bus and rail ridership within the study area, daily **passenger miles** and passenger hours of travel, station boardings on LRT, and **transportation system user benefits** (TSUB).

An "unlinked trip" is one taken by an individual on one specific transit mode. A "linked trip" may involve two or more unlinked trips.

"Passenger miles" is a measure of service utilization. It is calculated by multiplying the passenger load by the distance between individual stops. For example, ten passengers riding in a transit vehicle for two miles equals 20 passenger miles.

"Transportation system user benefits" represent the changes in mobility for individual travelers that are induced by a project.

6.1.1.1 Model Steps

Figure 6.1-1 provides a schematic description of the four-step travel demand modeling process. All calculations in the travel model are performed at TAZ level. In the Twin Cities travel model, 1,201 TAZs make up the entire metropolitan area.

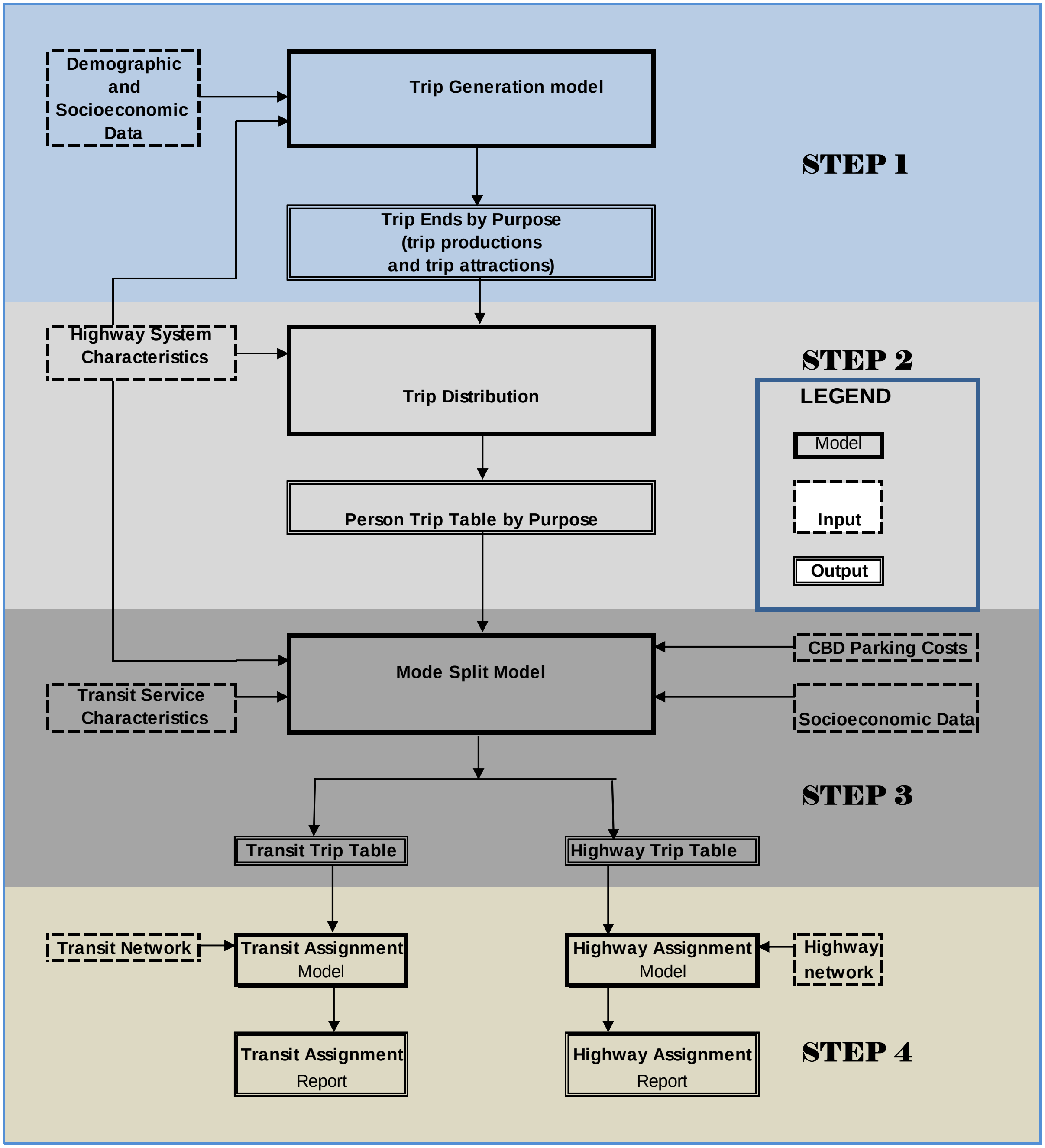
Trip generation is the first step in the conventional four-step transportation forecasting process followed by trip distribution, mode choice, and route assignment. The model is used for forecasting travel demands and it predicts the number of trips originating in, or destined for, a particular TAZ.

Trip Generation

The first step in the modeling process is to develop a trip generation model. The forecast year population is translated, using trip generation rates[1], to estimates of number of daily trips that would be made from all the TAZs comprising the Twin Cities metropolitan area—trip "productions," which do not have specified destinations. Similarly, projections of employment and development in all the TAZs are translated, again using trip generation rates, into estimates of number of daily trips that would be made to these zones from all places in the metropolitan area—trip "attractions," which do not have specified origins. Population, employment, and household characteristics data are needed to run this model. These data are developed by the Metropolitan Council using inputs from the communities in the region.

[1] The trip generation rates used in the model were specifically derived from the Metropolitan Council's home interview survey data.

Figure 6.1-1. Four Step Transportation Forecasting Process



Source: HDR Engineering, Inc, 2009.

Trip Distribution

The second step in the process is to develop a trip distribution model. This model is used to link the trip productions of all TAZs with the trip attractions in the central business district (CBD) and the rest of the zones of the metro area. The Metropolitan Council uses what is known as a "destination choice model" to perform the trip distribution. The output of the trip generation model, from step one, is used to distribute the trips into peak and off-peak periods. The result is a forecast of peak, off-peak, and total daily trips made between all possible combinations of zones in the metro area regardless of travel mode. The output of this second step is a set of trip tables, which determines the total demand for transportation in the region. It should be noted that the trip tables generated from this step are used to determine the transit demand for the Enhanced Bus and the Build Alternatives. In other words, the Trip Generation and Trip Distribution steps are run only once and the resulting trip tables are used to estimate the transit demand for the Enhanced Bus Alternative and the Build Alternatives. This was done to ensure the distribution of trips is held constant among different alternatives as the Federal Transit Administration (FTA) requires.

Mode Choice

The third step in the modeling process is to develop a mode choice sub-model that predicts how many of the daily trips would use transit, versus an automobile, for the entire trip. In making this forecast, the model considers the travel times and costs of each mode (most of which are derived from a computerized highway and transit network) and certain characteristics of the household[2] (whose numbers are estimated in the trip distribution step) such as the number of automobiles available to their households, income levels, etc. The Twin Cities regional travel model's mode choice component estimates non-motorized (walking and bicycle trips), as well as motorized trips. The model is run for peak and off-peak periods.

Trip Assignment

In the fourth and final modeling step, transit trip assignment—the transit trips that are forecast using the mode choice sub-model output (step three)—are assigned to specific transit lines represented in the network. The output of this final step is an estimate of the forecast-year daily transit trips that would be made in the Twin Cities region on all transit lines such as the local bus, express bus, and light rail lines. This step is performed for both peak and off-peak periods.
The output of trip assignment sub-model provides estimates of future rail and bus boardings at all stations throughout the Metro Transit system.

In the **computerized network** portion of the model set, each transit line in the system is represented according to its assumed future-year schedule frequency, travel time, fare, and routing. The highway component of the network model represents all interstate highways, major

The "computerized network" is an electronic (digital) representation of all the roadways (local streets, freeways, arterials, etc.) as well as the bus and rail routes in the transportation system, which is input into the transportation forecasting model.

[2] Household characteristics include number of persons in the household, persons by age, household income, car ownership etc.

and minor arterials, collectors, and a few local roads. The input data in the network includes free flow speeds (uncongested conditions), geometric details of the roadway, travel times, and roadway capacities[3]. The model calculates congested travel times on the roadway, which are subsequently used in calculating the transit demand.

In the travel demand model, passenger boardings at transit stations are estimated by three modes of access: walk access, drive access, and transfer from other transit services. The drive-access portion of the boardings is transformed into estimates of peak parked cars by applying a series of factors to them. First, drive-access trips are factored down to transform people into vehicles using average auto occupancy. Next, daily park & ride vehicles are factored down to account for turnover—the number of vehicles using a given parking space during the course of a day. These calculations yield a forecast of the number of vehicles that would be parked at a given station at the peak time of day.

6.1.1.2 Demographic Forecast Assumptions

The data used during the Southwest Transitway Alternatives Analysis (AA) process were based on the demographic and land use forecasts developed by Metropolitan Council in 2005 as part of its *2030 Regional Development Framework* and subsequently revised in 2006 for some selected communities prior to applying it to the AA.

In the past year, the population and employment forecasts for a few communities in the region have been updated by the Metropolitan Council using development plans submitted by local communities. In June 2009, the Metropolitan Council prepared a demographic data file based on all plans submitted and acted upon by the Council as of May 1, 2009. The current ridership forecasts reflect these updated demographic projections.

6.1.1.3 Transit Travel Times

With each of the Build Alternatives, light rail vehicles (LRVs) would operate in either exclusive or semi-exclusive rights-of-way, allowing for cross street traffic at signalized intersections. The travel times used to generate ridership forecasts are shown in Table 6.1-3. It should be noted that the LRVs are assumed to travel at a maximum speed of 55 miles per hour (mph), have a station dwell time ranging from 20 to 40 seconds, and that in the suburban area the line has signal preemption at at-grade intersections. Traffic signal preemption (TSP) allows traffic lights to be temporarily interrupted so that certain vehicles, usually emergency vehicles, can move through the intersection quickly. In this case, the TSP will give a green light to LRVs to make them more efficient in traffic and keep travel times to a minimum.

[3] The input data to develop the network were obtained from highway maps and GIS data base maintained by the Minnesota Department of Transportation.

Table 6.1-1. Light Rail Travel Times (in minutes)

Segment	LRT 1A	LRT 3A (LPA)	LRT 3A-1 (Co-location)[4]	LRT 3C-1 (Nicollet Mall)	3C-2 (11th/12th Street)
South end of the line to Shady Oak Station	7.4	12.9	12.9	12.9	12.9
Shady Oak Station to West Lake Station	10.7	10.7	10.7	10.7	10.7
West Lake Station to Downtown	7.9	7.9	7.9	15.9	17.2
End to end travel time	26.0 (to Target Field Station)	31.5 (to Target Field Station)	31.5 (to Target Field Station)	39.5 (to 4th St/Nicollet)	40.8 (to Target Field Station)

Source: HDR Engineering, Inc., 2012

6.1.1.4 Interlining Assumptions

System configuration and integration may be defined as the ability of the Southwest Transitway to physically connect (or integrate) with the Twin Cities regional transitway system. System integration helps the transit agency offer reliable and convenient transit service to passengers on high-demand corridors, which enables passengers to connect directly with desired regional destinations by minimizing the need to transfer between LRT lines or other transportation modes.

The current Twin Cities LRT system consists of the Hiawatha Line, which operates between Target Field in downtown Minneapolis and the Mall of America in Bloomington, Minnesota. At Target Field, the Hiawatha LRT line also connects with the Northstar Commuter Rail line.

The Central Corridor LRT line, currently under construction, will operate from the St. Paul Union Depot in downtown St. Paul to Target Field in downtown Minneapolis. The Hiawatha and Central Corridor LRT lines will merge at the intersection of 4th Street South and Kirby Puckett Place/Chicago Avenue, adjacent to the Hubert H. Humphrey Metrodome, and will use the same guideway from the Downtown East/Metrodome Station to the Target Field Station. The LRT 1A, LRT 3A (LPA), LRT 3A-1 (co-location alternative), and the LRT 3C-2 (11th/12th Street) alternatives would be fully integrated with both the Hiawatha and Central Corridor LRT lines.

The LRT 3C-1 (Nicollet Mall) Alternative is not integrated with either the Hiawatha or Central Corridor LRT guideway for daily operations.

Table 6.1-2 provides a synopsis of the identified regional transitways that would be capable of interlining or connecting directly with the Southwest Transitway. As

[4] Please see Section 2.1.2.1 of this Draft EIS for why LRT 3A-1(co-location alternative) is included in this Draft EIS.

displayed in the table, LRT 3C-1 (Nicollet Mall) is the only alternative that is not integrated with the regional system.

Table 6.1-2. System Interlining Capability

Criteria	Alternative				
	LRT 1A	**LRT 3A (LPA)**	**LRT 3A-1 (Co-location)**	**LRT 3C-1 (Nicollet Avenue)**	**LRT 3C-2 (11th/12th Street)**
Ability of the LRT alternatives to provide connectivity among LRT lines and other high-demand transit corridors	Fully integrated with Hiawatha and Central Corridor LRT lines	Fully integrated with Hiawatha and Central Corridor LRT lines	Fully integrated with Hiawatha and Central Corridor LRT lines	Not integrated with the Hiawatha or Central Corridor LRT for daily operations	Fully integrated with Hiawatha and Central Corridor LRT lines
Physical connection	Physically connects to combined Hiawatha and Central Corridor LRT at the Target Field Station	Physically connects to combined Hiawatha and Central Corridor LRT at the Target Field Station	Physically connects to combined Hiawatha and Central Corridor LRT at the Target Field Station	Physical connection to Hiawatha or Central Corridor would require one turnout, two crossovers, and ten trackway switches	Physically connects to combined Hiawatha and Central Corridor LRT at the Target Field Station
Passenger movement/ convenience	One-seat ride possible	One-seat ride possible	One-seat ride possible	Stand alone LRT line	One-seat ride possible
Minimizing non-revenue service miles	No additional non-revenue service miles	No additional non-revenue service miles	No additional non-revenue service miles	Requires additional non-revenue service miles to transfer vehicles between lines	No additional non-revenue service miles

Source: HDR Engineering, Inc., 2012

6.1.2 Existing and Planned Transit System

6.1.2.1 Existing Transit System

Existing transit service within the Southwest Corridor study area consists of express and local bus service. Transit service productivity within the study area is generally high, with most routes operating at optimal capacities with steady ridership volumes. Within the study area, a total of 31 bus routes provide service to more than 475 bus stops, park & rides, and transit centers.

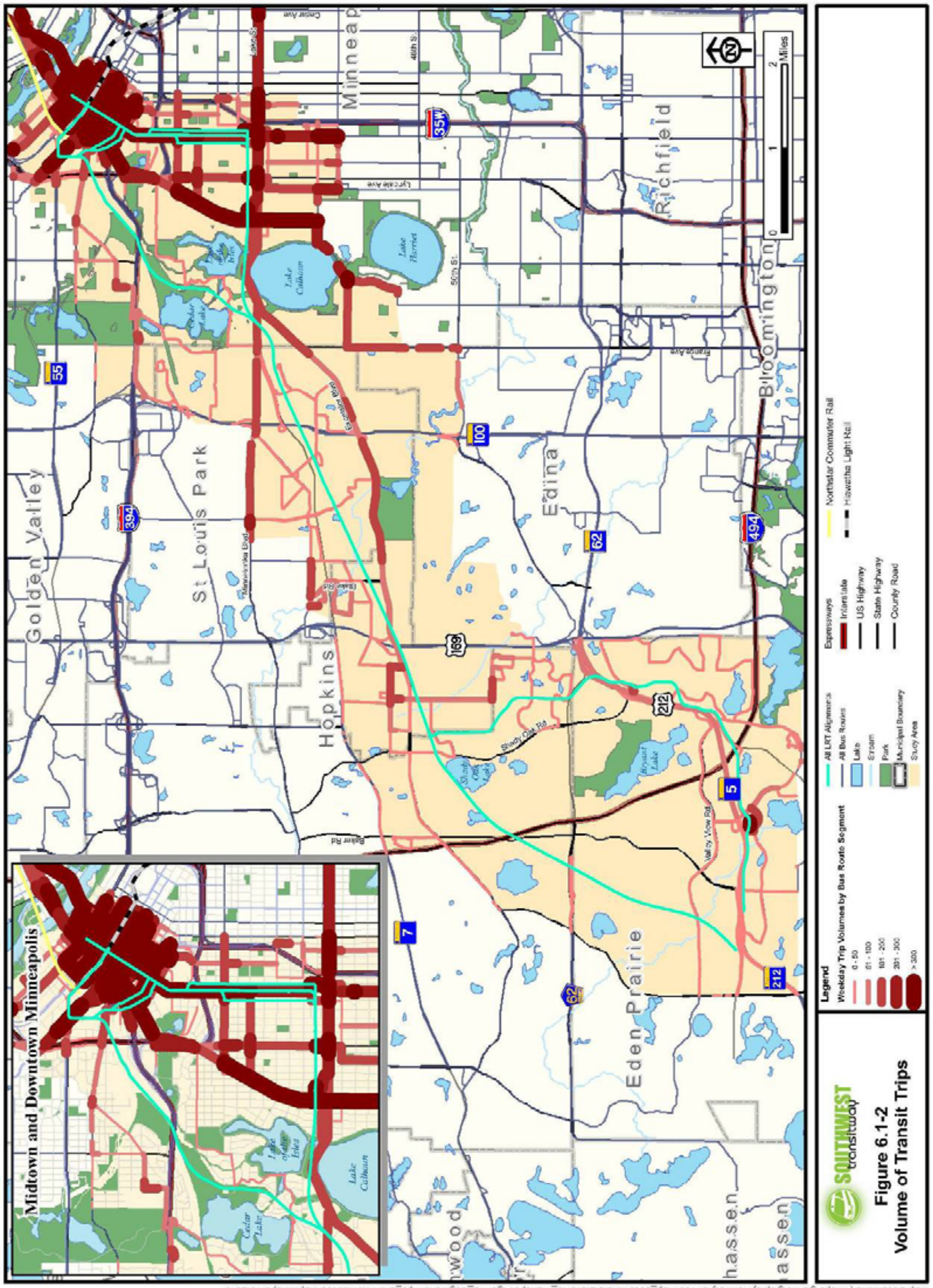
The principal type of weekday service is intercity express service, with some intercity local and circulating loop services. The type of service currently provided is reflective of the trip-making behaviors of transit users in the study area. Most are commuters making either home-based work or school trips. On weekends, transit service is available on a limited basis within the study area, and is intended to serve home-based work and shopping trips. Most of the express routes operate during the weekday morning and afternoon peak periods, and some off-peak early morning, mid-day, and evening express service is provided at reduced frequencies. Although service headways vary, the majority of the current routes operate at approximately 30-minute headways (or less) during peak periods. Off-peak service is provided by the local and circulating loop routes, running at increased headways, generally between 30 and 60 minutes apart. Directionally, most of the routes provide inbound service to downtown Minneapolis during the morning peak period, with outbound service provided in the afternoon peak period. SouthWest Transit[5] provides one reverse-commute bus route during weekday peak periods only and Metro Transit provides two reverse-commute bus routes (Routes 12 and 17).

Downtown Minneapolis is considered a well-served transit market, with service offered by multiple transit providers. More than 100 bus routes and one light rail line serve hundreds of downtown bus stops, parking garages, transit centers, and station platforms. 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 a priority focus on increasing transit services in downtown Minneapolis. Additionally, several transit infrastructure projects are currently being implemented or are planned for implementation in the near future. 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. Figure 6.1-2 displays the volume of transit trips in the Southwest Transitway Corridor.

6.1.2.2 Planned Transit System

A primary goal outlined in the Metropolitan Council's 2030 Transportation Policy Plan (2030 TPP) is to double current transit ridership levels by 2030. To achieve this goal, the 2030 TPP proposes two approaches: 1) maintain and expand the current bus system and ridership, and 2) develop a network of high-frequency bus and rail transitways.

[5] SouthWest Transit should not be confused with Southwest Transitway project. It is a separate carrier service operating between Chanhassen, Chaska and Eden Prairie and downtown Minneapolis.



Source: HDR Engineering, Inc.

According to the 2030 TPP, local bus route coverage is anticipated to expand, with the addition of new routes by 2030. As noted, the 2030 TPP suggests that route modifications may be made. However, with the region anticipated to grow by more than 1 million new residents it is likely that the existing bus network will grow.

In an effort to achieve the goal of doubling ridership levels by 2030, the 2030 TPP also identifies the need for expanded passenger facilities and transit infrastructure as a catalyst for attracting new riders. The 2030 TPP identifies several existing transit facilities for expansion and proposes the construction of new facilities. These new or expanded facilities include park & rides, transit centers, bus shoulders, and exclusive bus access ramps to major arterial roadways and highways.

In addition to the 2030 TPP, each of the cities in the Southwest Transitway study area have drafted or adopted new comprehensive plans that specify future transportation and transit improvements. Each of the plans generally support transit, and support maintaining the existing transit network while considering future modifications or additional services as warranted.

Capital projects already under construction or recently completed that will affect transit operations include:

- Marquette and 2nd Avenue Project (MARQ2): Recently completed, the project will result in two **contraflow** bus lanes on both Marquette and 2nd Avenues, along with improved pedestrian walkways, wayfinding features (such as maps and signs), passenger waiting and queuing areas, more attractive streetscapes, and public art. Once operational, the new bus lanes are anticipated to be capable of handling more than 180 buses per hour during peak periods, consolidating many downtown routes to these streets, and helping to improve automobile, pedestrian, and bicycle flows.

In bus transit, a "contraflow" lane is a bus-only lane in which the direction of bus traffic is opposite the flow of traffic in the other lanes.

- According to the 2030 TPP, bus routes 12 and 17 would warrant 15 minute headways during the peak period. So, it is likely these two routes would have slightly increased levels of service. However, no major changes in the routes are planned.
- Northstar Commuter Rail: This service is the Twin Cities' first commuter rail corridor, connecting Big Lake, Minnesota, with Minneapolis. The southern terminus point of this railway is the Target Field Stadium.
- Central Corridor Light Rail: This project will provide LRT service between Downtown St. Paul and Downtown Minneapolis and to the University of Minnesota, primarily in exclusive lanes in the center of University Avenue.
- Bus-Only Shoulders: Around the Twin Cities metropolitan region, 250 miles of bus-only shoulders have been added, 10 miles of bus-only lanes, ramp meter bypass lanes, high occupancy vehicle (HOV) lanes, and high occupancy toll (HOT) lanes, and a small network of exclusive transitways.

As part of the 2030 TPP, the Metropolitan Council has adopted policies that support the construction of new facilities and the expansion of existing facilities. The Council supports continued use of existing facilities to maximize the effectiveness of transit when competing with the travel time of the private automobile and for service reliability. The 2030 TPP contains a summary of the proposed transit improvements in the region.

6.1.3 Long-Term Effects

Table 6.1-3 presents a summary of some important travel demand statistics obtained from the travel forecasting model. According to the Metropolitan Council's socioeconomic data, the Twin Cities metropolitan area is expected to have 3.72 million residents and 2.14 million jobs by 2030. Using these input data, the ridership forecasting model estimates that there would be approximately 16.6 million trips in the region on a typical weekday. The transit share for the region[6] is projected at two percent, but the share is substantially higher for home based work trips destined for downtown Minneapolis at approximately 53 percent.

[6] "Region" is defined as the area containing the Minneapolis-St. Paul metropolitan region.

Table 6.1-3. Travel Model Results

(Applying Metropolitan Council's updated demographic forecasts dated May 1, 2009)

	Alternative						
	No Build	**Enhanced Bus**	**LRT 1A**	**LRT 3A (LPA)**	**LRT 3A-1 (Co-location)**	**LRT 3C-1 (Nicollet Mall)**	**LRT 3C-2 (11th/12th Street)**
Demographic Data							
Regional Population	3,720,049	3,720,049	3,720,049	3,720,049	3,720,049	3,720,049	3,720,049
Regional Employment	2,147,746	2,147,746	2,147,746	2,147,746	2,147,746	2,147,746	2,147,746
Total Trips in the Person Trip Table	**16,618,569**	**16,618,569**	**16,618,569**	**16,618,569**	**16,618,569**	**16,618,569**	**16,618,569**
System-wide Linked Transit Trips (Daily)							
Bus (Bus Only)	284,641	286,894	272,439	271,642	271,642	272,306	271,248
Rail (Rail only, Bus & Rail)	46,434	46,949	66,391	69,008	69,008	67,299	69,202
Total Linked Transit Trips (rounded)	**331,080**	**333,850**	**338,850**	**340,650**	**340,650**	**339,600**	**340,450**
Regional Transit Mode Share	1.99%	2.01%	2.04%	2.05%	2.05%	2.04%	2.04%
Minneapolis CBD Transit Share (Work Trips)	53.10%	53.30%	53.80%	53.80%	53.80%	53.70%	53.80%
New Transit Trips	**Not appl.**	**2,770** (compared to No Build)	**5,000** (compared to Enhhanced Bus)	**6,800** (compared to Enhhanced Bus)	**6,800** (compared to Enhhanced Bus)	**5,760** (compared to Enhhanced Bus)	**6,600** (compared to Enhhanced Bus)
Projected Project Boardings							
Southwest Transitway Boardings		NA	24,850	28,700	28,700	24,550	28,850
Enhanced Bus Boardings		13,000	NA	NA	NA	NA	NA
Reverse Commute LRT Ridership	Not appl.	Not appl.	5,650	7,150	7,150	7,000	7,050
Daily Transportation System User Benefits (hours)	**Not appl.**	**2,492** (compared to No Build)	**4,995** (compared to Enhhanced Bus)	**6,726** (compared to Enhhanced Bus)	**6,726** (compared to Enhhanced Bus)	**5,657** (compared to Enhhanced Bus)	**6,654** (compared to Enhhanced Bus)

Source: HDR Engineering, Inc., 2012

6.1.3.1 System-wide Impacts

As seen in Table 6.1-3, under the Enhanced Bus Alternative, 333,850 linked trips are projected on the transit system. The Enhanced Bus Alternative includes all the future transit and highway projects in the Metropolitan Council's 2030 Transportation Policy Plan, plus the two new limited-stop bus services, and a number of service modifications on existing routes in the study area.

For the purpose of ready reference and easy understanding, the following technical terms are defined.

Linked Transit Trips: Linked transit trips are trips made by a transit passenger, including all segments getting from the beginning of a trip to a final destination.

Unlinked trips: Unlinked trips are the segments of a linked transit trip. For example a linked transit trip may be made of one bus trip and a rail trip to get to the final destination.

New trips: New trips are those trips that got diverted from the automobile mode to the transit system.

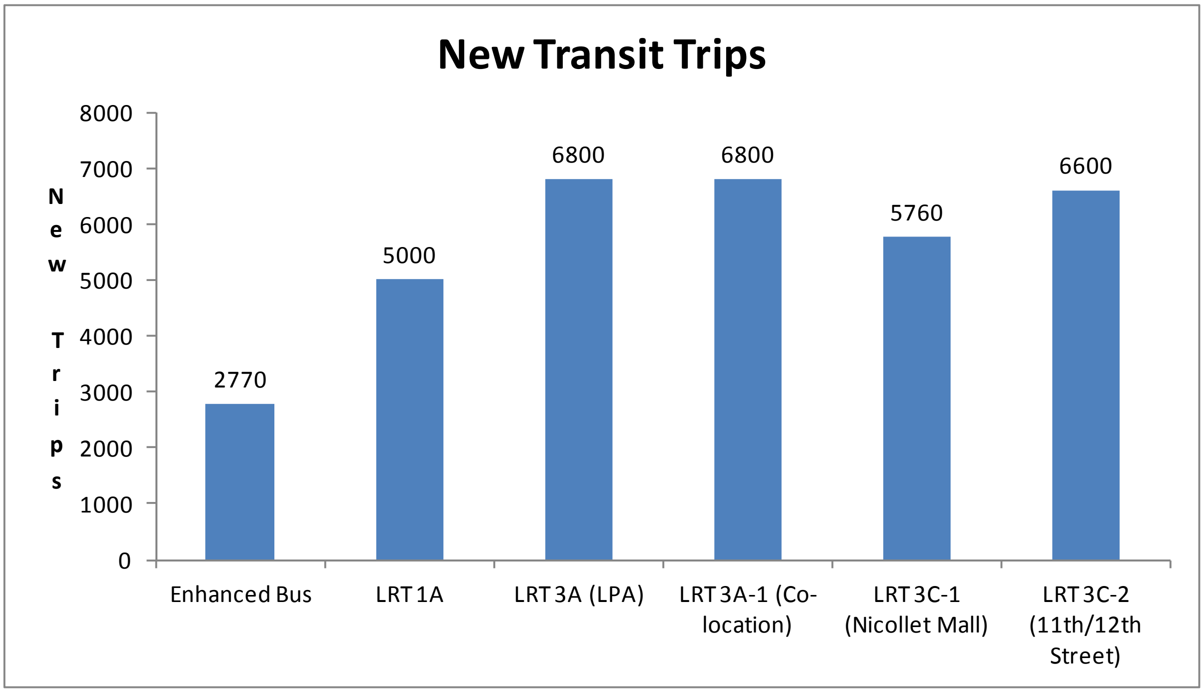
Person trip: Trip made by persons as opposed to vehicle trip which may be made up of more than one person.

Auto trips: vehicle trips made by auto mode.

User benefits: This is an estimate of travel time and cost savings enjoyed by the beneficiaries of the project when compared to the baseline alternative.

Under the Build Alternatives, the Enhanced Bus service would be replaced by a much faster light rail service. As a result, the transit usage in the corridor would increase. For LRT 1A, the system-wide linked transit trips are projected to increase by 5,000 trips a day when compared to the Enhanced Bus Alternative. The system-wide increase in linked transit trips would be accompanied by a similar decrease in auto trips because the total number of person trips in the entire system is held constant. The reduction in auto trips is referred to as "new transit trips" because they are the result of people switching from auto to transit mode for the first time. Figure 6.1-3 shows the magnitude of "new trips" generated by each of the LRT Build Alternatives. Most of the new trips would be generated within the Southwest Transitway corridor and therefore, most of the auto trip reduction would be seen in the Southwest Transitway corridor. As shown in the figure, LRT 3A (LPA) and LRT 3A-1 (co-location alternative) are projected to generate the highest number of new transit trips.

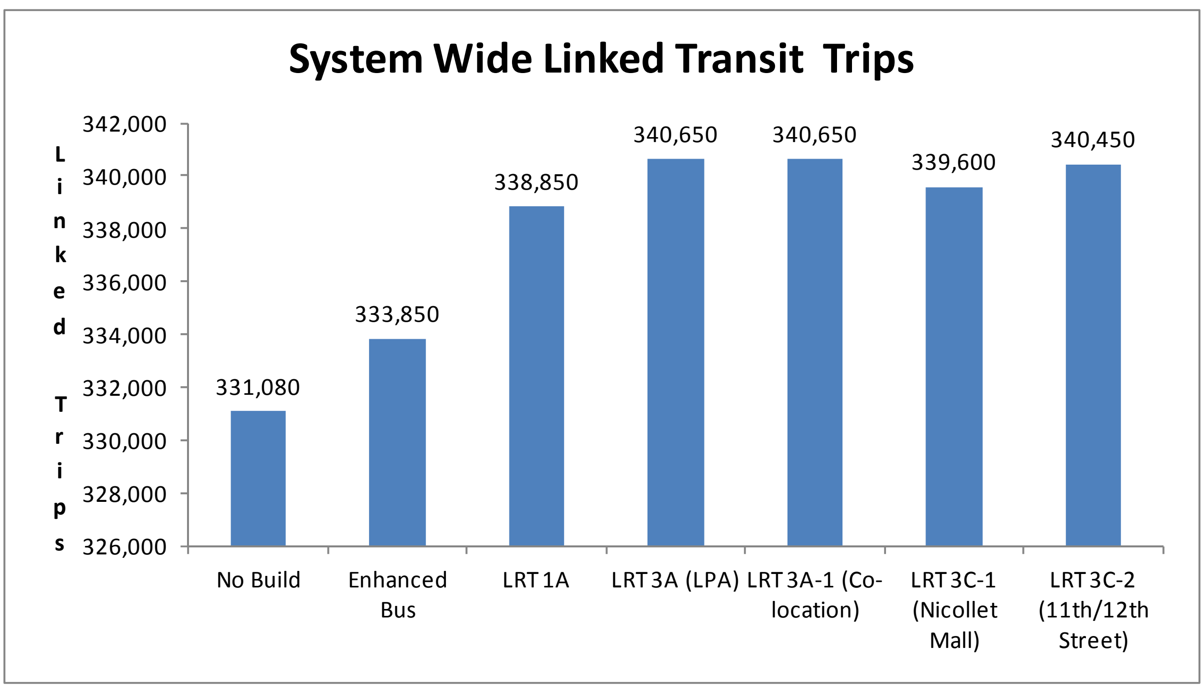
Figure 6.1-3. Forecast of New Transit Trips



Source: HDR Engineering, Inc., 2012

Figure 6.1-4 forecasts system-wide transit trips for all of the LRT alternatives. The model results indicate the LRT alternatives traversing the Golden Triangle alignment would, in general, result in higher system-wide transit usage than the LRT alternative using the Hennepin County Regional Railroad Authority (HCRRA) alignment (LRT 1A).

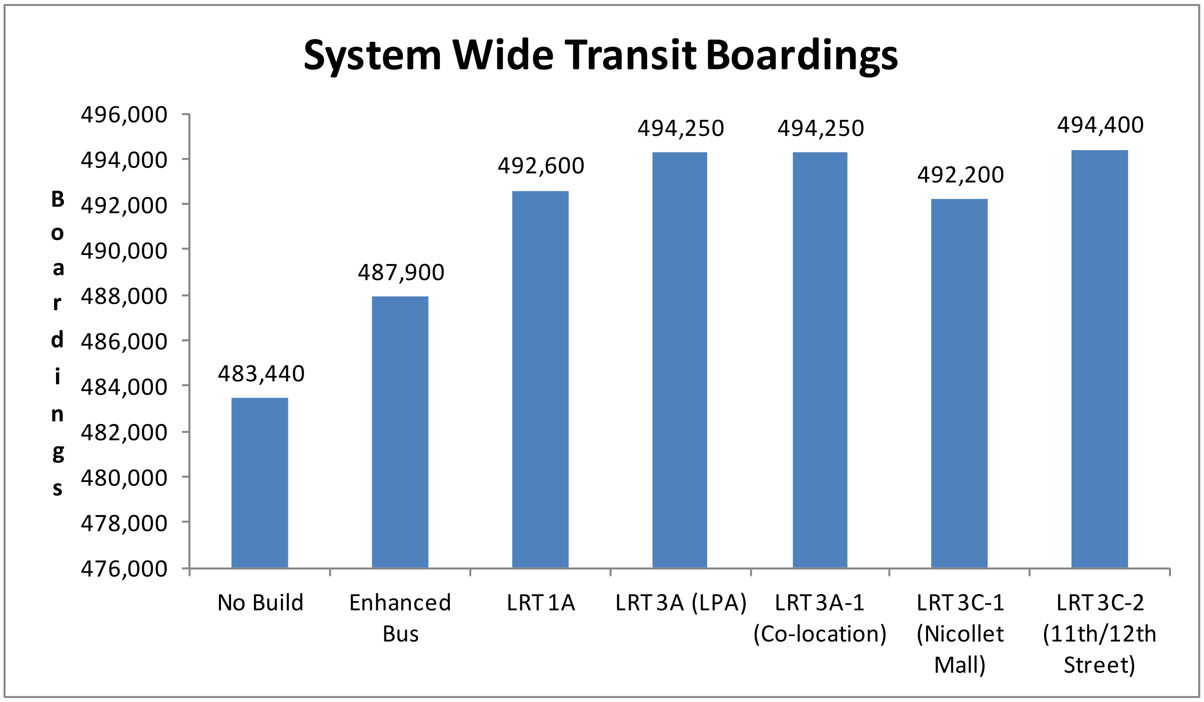
Figure 6.1-4. Forecast of System-wide Linked Transit Trips



Source: HDR Engineering, Inc., 2012

In terms of unlinked trips, the Enhanced Bus Alternative would carry about 488,000 trips (see Figure 6.1-5) in the entire system. Under the Build Alternatives, the unlinked transit trips would increase for LRT 1A, LRT 3A (LPA), LRT 3A-1 (co-location alternative), LRT 3C-1 (Nicollet Mall), and LRT 3C-2 (11^{th}/12^{th} Street) as the light rail attracts more riders, some of whom would transfer to other transit services in the system to reach their final destinations. Boardings and unlinked trips are synonymous.

Figure 6.1-5. Forecast of System-wide Transit Boardings (Unlinked Trips)



Source: HDR Engineering, Inc., 2012

In the travel demand model, passenger boardings at transit stations are estimated by three modes of access: walk access, drive access, and transfer from other transit services. The drive-access portion of the boardings is transformed into estimates of peak parked cars by applying a series of factors to them. First, drive-access trips are factored down to transform people into vehicles using average auto occupancy. Next, daily park & ride vehicles are factored down to account for turnover—the number of vehicles using a given parking space during the course of a day. These calculations yield a forecast of the number of vehicles that would be parked at a given station at the peak time of day. Detailed information on station boardings is presented in Appendix H.

6.1.4 Short-Term Construction Effects

Short-term construction activities may cause temporary bus route changes, temporary relocation of bus stops, or service delays. In the event bus route operations are affected by project construction, Metro Transit would follow normal procedures for notifying riders of temporary changes or possible affects to transit service, including posted information at bus stops or route detour notices. Temporary route modification notices or notices of detours would also be posted on Metro Transit's website and updated regularly.

6.1.5 Mitigation

For permanently modified fixed-route bus service, or for changes in service frequencies made to coordinate service with the LRT, Metro Transit will follow standard procedures for route modifications or the suspension of transit service. Metro Transit would communicate service changes along the corridor as part of its community outreach program.

6.2 Effects on Roadways

This section describes the potential effects associated with the construction and operation of the Southwest Transitway on the roadway network, including long-term and short-term impacts. This section will describe system-wide impacts to the roadway system, physical modifications to existing roadways, operational effects to intersections, transit station access, and access effects to buildings and facilities along the proposed alignments.

The Enhanced Bus Alternative and each Build Alternative were presented in Chapter 2. Each of the alternatives is broken into smaller segments to facilitate the analysis of effects. Some segments are shared by more than one alternative. In this section, impact assessment and mitigation discussion are organized by segment. The alternatives and associated segments are depicted in Chapter 2 in Figure 2.3-9 and summarized here in Table 6.2-1.

Table 6.2-1. Build Alternatives and Segments

Build Alternatives	Segments
LRT 1A	Segment 1, Segment 4, Segment FR, Segment A
LRT 3A (LPA)	Segment 3, Segment 4, Segment FR, Segment A
LRT 3C-1 (Nicollet Mall)	Segment 3, Segment 4, Segment FR, Segment C-1 (Nicollet Mall)
LRT 3C-2 (11th/12th Street)	Segment 3, Segment 4, Segment FR, Segment C-2 (11th/12th Streets via Nicollet Avenue Tunnel)
	Segment 3, Segment 4, Segment FR, Segment C-2A (11th/12th Streets via Blaisdell Avenue Tunnel)
	Segment 3, Segment 4, Segment FR, Segment C-2B (11th/12th Streets via 1st Avenue Tunnel)
LRT 3A-1 (Co-location alternative)	Segment 3, Segment 4, Segment A

Source: HDR Engineering, Inc., 2012

6.2.1 Existing and Planned Roadway System

The regional highway and roadway network comprises interstate and other federal highways, state highways, county roadways, and other roadways throughout the seven-county metropolitan area. The seven-county area includes 657 miles of principal arterials that carry 59 percent of the total vehicle miles traveled (VMT) in the region as well as 1,900 miles of **"A" minor arterials**.

"A" minor arterials supplement the mobility function of the principal arterials while also providing more land access than freeways or expressways.

The Metropolitan Council *2030 Transportation Policy Plan* (2009) indicates that the existing roadway network is expected to experience a substantial increase in automobile demand by the year 2030. In 2005, the regional VMT on the roadway network was approximately 66.5 million daily VMT. By 2030, the regional VMT is forecasted to increase to 91.2 million daily VMT, an increase of 37 percent.

Table 6.2-2 displays the travel demand on the roadway network in 2005, as well as the projected demand in 2030. Table 6.2-3 displays the metro area system congestion levels for 2005, as well as the anticipated congestion levels if the recommended projects from the *Transportation Improvement Program* (TIP) and *2004 Transportation Policy Plan* (TPP) are implemented.

Table 6.2-2. Roadway Travel Demand

	2005 (millions)	2030 est. (millions)	Change (millions)	Percent Change
Daily Vehicle Trips	7.0	10.7	+3.7	+53
Daily Vehicle Miles Traveled	66.5	91.2	+24.7	+37

Source: Metropolitan Council 2030 Transportation Policy Plan

Table 6.2-3. System Congestion Levels

Year and Scenario	Congested Lane-Miles of Principal Arterials	Vehicle-Hours of Delay on Principal Arterials
In 2005	1,200	300,600
In 2030 with existing system and TIP projects	2,000	531,400
In 2030 with existing system, TIP projects, and 2004 TPP projects	2,000	525,800

Source: Metropolitan Council 2030 Transportation Policy Plan

The Metropolitan Council has indicated in the TPP that more than $40 billion (2005 dollars) in highway investments would be needed by 2030 to "fix" congestion in the region, more than five times the total highway revenues expected to be available to MnDOT's Metro District between now and 2030. Potential capacity expansion of the principal arterial system is also limited by physical, social, and environmental constraints. The Metropolitan Council has concluded that it is not realistic to assume that congestion will be eliminated. Individual projects can be designed under the assumption that a congestion-free system will not exist sometime in the future. Portions of all of the principal arterial roadways near the

Southwest Transitway alignment are projected to experience congestion in 2030, including I-494, I-35W, I-394, TH 7, TH 169, TH 100, TH 62, and TH 212.

Although the opportunities for roadway expansion are limited within the study area, the 2030 TPP identifies several long-planned expansion projects to undergo additional analysis. Within the study area, these projects include:

- I-35W Southbound from I-94 to 46th Street – Adding HOT/transit priority lane and Lake Street Interchange with Bus Rapid Transit station
- TH 100 from 36thStreet to Cedar Lake Road – Replace the Tier 1 bridges and ancillary improvements
- I-494 from TH 77 to TH 100 – It is no longer thought that a full buildout as proposed in the 1997 EIS will occur by 2030. Instead, two projects in this area are included in the Highway Investment Plan: 1) Construction of an auxiliary lane between TH 100 and I-35W, programmed for 2011–2014, and 2) Construction of a flyover from NB I-35W to WB I-494 and interchange consolidation programmed for 2021–2030.

The study area and 2030 TPP also include the I-494/TH 169 Interchange, which will be reconstructed using recently secured funding.[7]

6.2.2 Long-Term Effects

6.2.2.1 Regional Vehicular Traffic

Table 6.2-4 shows the 2030 daily person trips by mode for the Enhanced Bus and Build Alternatives. The Build Alternatives are projected to divert an additional 5,100 to 6,800 person trips from auto to transit modes (including buses) compared to the Enhanced Bus Alternative, depending on the alignment. This reduction in auto person trips would primarily be diverted from the major interstate and trunk highways in the southwest metro area, such as I-494, I-394, I-35W, TH 62, TH 7, TH 169, TH 100, and TH 212. Preliminary estimates of total vehicle miles traveled daily in year 2030 by mode of transportation are shown in Table 6.2-5. As seen from the table, the vehicle miles travelled by the auto mode decrease in each build alternative when compared to the No-Build or Enhanced bus alternatives. The vehicle miles associated with the bus and rail modes are presented to illustrate the level of transit service provided in each alternative.

[7] Any project contemplated under the TPP will go through the required environmental clearance process separately and is not a part of this Project.

Table 6.2-4. 2030 Daily Person Trips by Mode LRT Alternatives

Alternative	Person Trips				Reduction in Auto Person Trips Compared to Enhanced Bus	Reduction in Auto Vehicle Trips Compared to Enhanced Bus
	Auto	Transit				
	(SOV and HOV)[a]	Bus	Rail	Total		
No Build	16,287,488	284,641	46,434	331,081	N/A	N/A
Enhanced Bus	16,284,719	286,894	46,949	333,850	2,770 (compared to No Build)	2,300 (compared to No Build)
LRT 1A	16,279,719	272,439	66,391	338,850	5,000	4,170
LRT 3A (LPA)	16,277,919	271,642	69,008	340,650	6,800	5,670
LRT 3A-1 (Co-location)	16,277,919	271,642	69,008	340,650	6,800	5,670
LRT 3C-1 (Nicollet Mall)	16,278,969	272,306	67,299	339,600	5,760	4,800
LRT 3C-2 ($11^{th}/12^{th}$ Street)	16,278,119	271,248	69,202	340,450	6,600	5,500

Source: HDR Engineering, Inc., 2012
[a] SOV = single occupancy vehicle; HOV = high occupancy vehicle

Table 6.2-5. 2030 Regional Daily Vehicle Miles Traveled by Mode

Alternative	Vehicle Miles Traveled		
	Auto	Bus	Rail
No Build	111,620,361	152,765	6,622
Enhanced Bus	111,604,886	156,024	6,622
LRT 1A	111,569,422	153,344	9,759
LRT 3A (LPA)	111,554,306	153,489	10,220
LRT 3A-1 (Co-location)	111,554,306	153,489	10,220
LRT 3C-1 (Nicollet Mall)	111,563,306	153,082	10,389
LRT 3C-2 (11th/12th Street)	111,558,641	153,254	10,535

Source: HDR Engineering, Inc., 2012

6.2.2.2 Physical Modifications to Existing Roadways

Conceptual designs indicate that construction of the Southwest Transitway is likely to result in minor physical modifications to existing roadways that may affect local circulation patterns. None of the expected modifications are anticipated to have significant regional impact. The impacts to existing roadways in Segment 1 and Segment 3 are shown on Figure 6.2-1. The impacts to existing roadways in Segment 4 are shown on Figure 6.2-2. The impacts to existing roadways in Segment A and Segment C are shown on Figure 6.2-3.

In Segment 1, about 1,000 feet of Venture Lane would be realigned to the southeast of the existing alignment to allow for the development of the TH 5 Station park-and-ride. The horizontal displacement of Venture Lane would be a maximum of approximately 500 feet south of the existing alignment. The alignment crosses Edenvale Boulevard, West 62nd Street, Baker Road, Rowland Road, and Dominick Drive at-grade. The 62nd Street grade crossing would necessitate the realignment of the intersection of W 62nd Street and Industrial Drive approximately 100 feet west of the existing intersection location.

In Segment 3, the alignment crosses through the intersection of Mitchell Road and the eastbound TH 5 ramps at-grade. This grade crossing would necessitate the reconstruction and realignment of the eastbound TH 5 ramps and Mitchell Road intersection approximately 50 feet north of the existing intersection. The SouthWest Metro Station park-and-ride currently has two direct access roadways on and off eastbound TH 5 that are used only by authorized transit vehicles. The Segment 3 alignment would cross both access ramps at-grade. The alignment crosses Technology Drive, Valley View Road, Flying Cloud Drive, W 70th Street, Bren Road East, Bren Road West, Smetana Drive, and K-Tel Drive at-grade. Construction would require minor modifications to the intersection of Valley View Road and Flying Cloud Drive, and would necessitate the realignment of approximately 800 feet of Flying Cloud Drive a maximum of approximately 100 feet to the east of the existing alignment. The alignment would require the realignment of approximately 1,500 feet of Yellow Circle Drive and Red Circle Drive, moving the intersection of these two roadways approximately 200 feet east of the existing intersection. Construction would involve the realignment of the intersection of Smetana Road and Feltl Road approximately 200 feet south of the current intersection.

In Segment 4, a new roadway would be constructed extending 16th Avenue north of K-Tel Drive to the existing intersection of Excelsior Boulevard and 17th Avenue. This new roadway would result in a substantial improvement in accessibility to the surrounding commercial properties. The alignment crosses 16th Avenue S, 11th Avenue S, 8th Avenue S, 5th Avenue S, Blake Road, Wooddale Avenue, and Belt Line Boulevard at-grade.

In Segment A, the alignment crosses 21st Street and the southbound lanes of Royalston Avenue North at-grade. Holden Street would be terminated approximately 300 feet west of the existing intersection of Holden Street and Royalston Avenue North. The removal of this intersection and the closing of Holden Street will reduce the overall accessibility of the surrounding area and will modify circulation patterns on surrounding streets, including Border Avenue, Lyndale Avenue N, 3rd Avenue North, Cesar Chavez Avenue, and Royalston Avenue North.

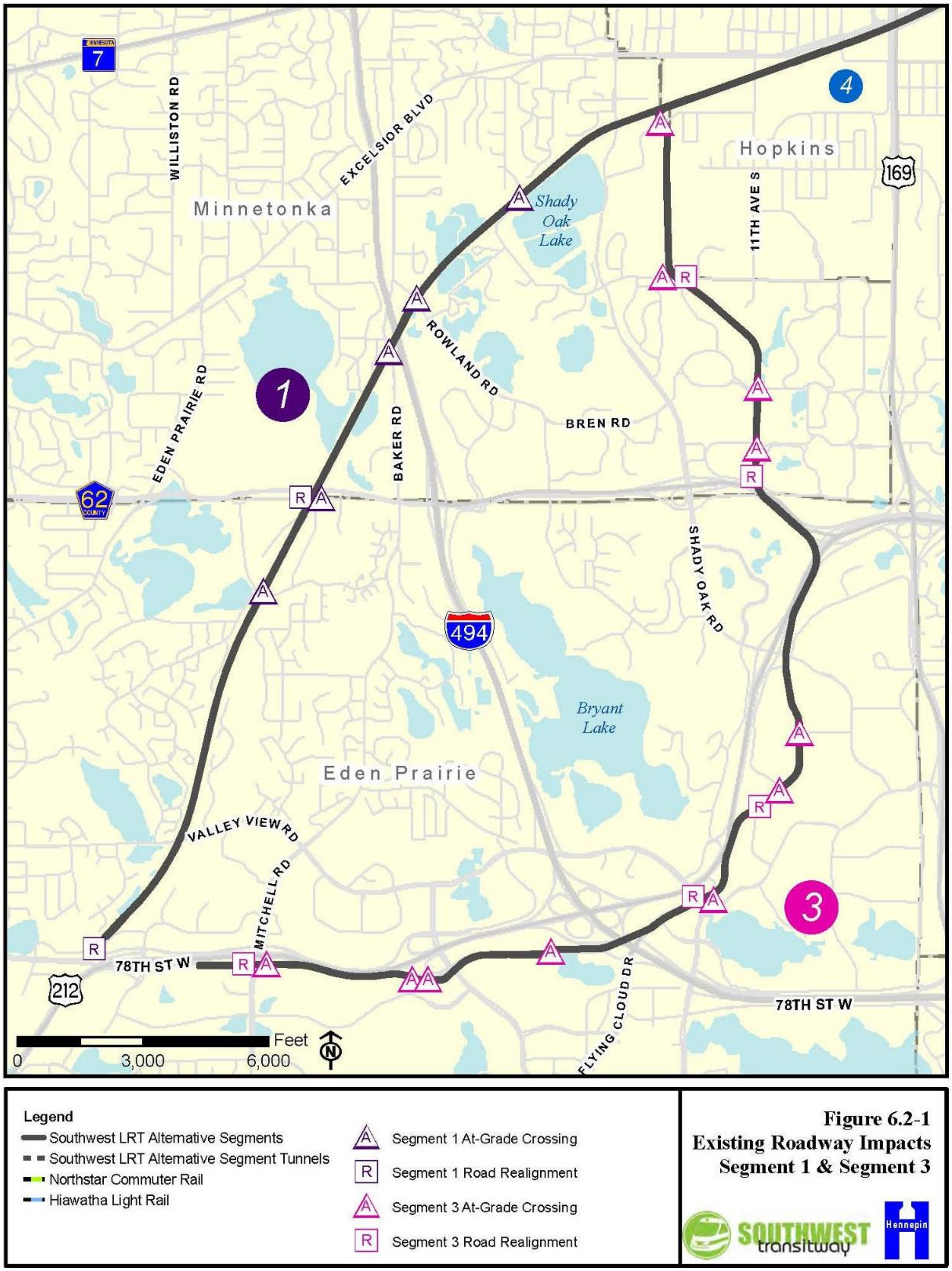


Figure 6.2-1
Existing Roadway Impacts
Segment 1 & Segment 3

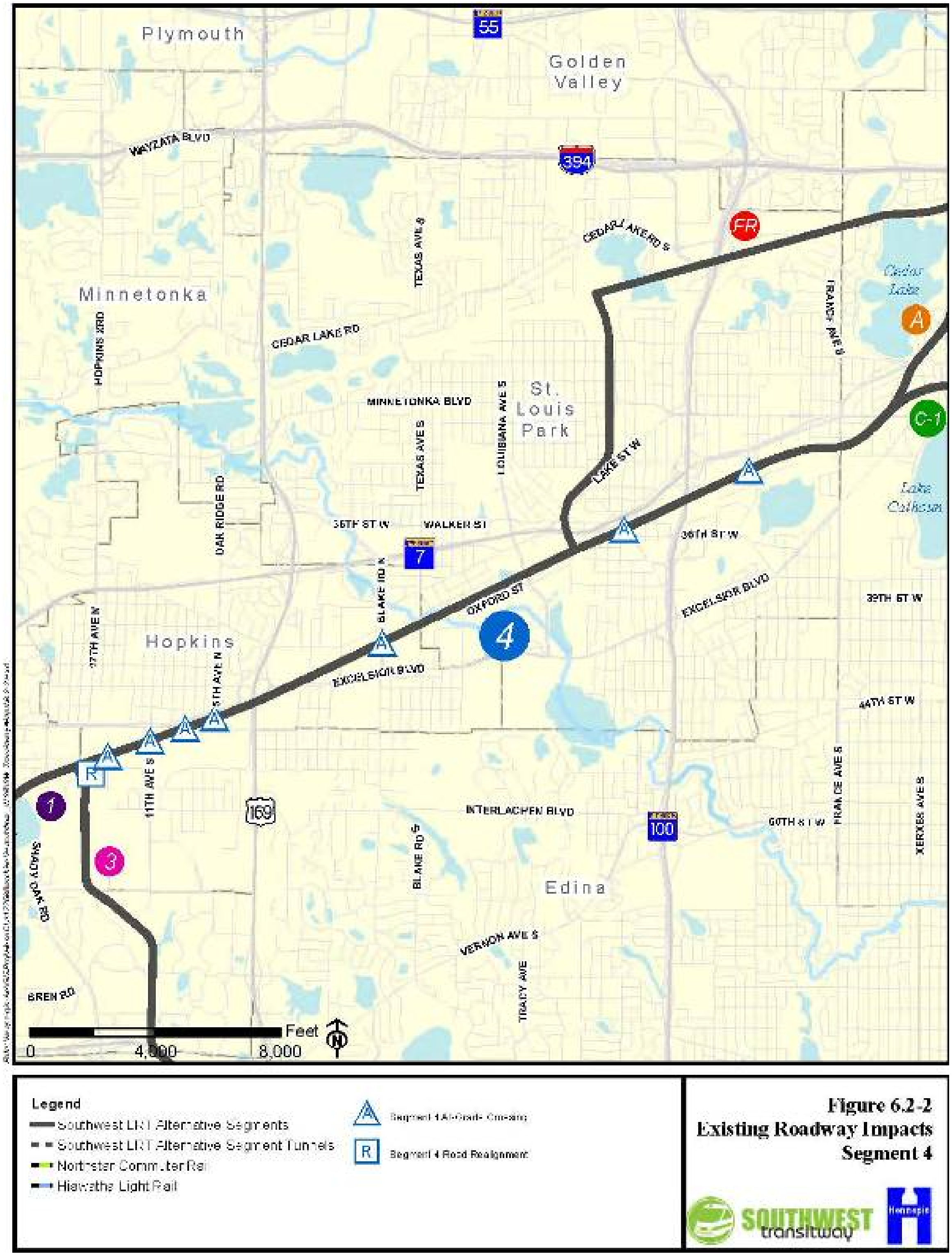

Plymouth
Golden Valley
Minnetonka
St. Louis Park
Hopkins
Edina
Cedar Lake
Lake Calhoun
WAYZATA BLVD
CEDAR LAKE RD
MINNETONKA BLVD
EXCELSIOR BLVD
INTERLACHEN BLVD
VERNON AVE S
OXFORD ST
LAKE ST W
36TH ST W
WALKER ST
39TH ST W
44TH ST W
50TH ST W
TEXAS AVE S
LOUISIANA AVE S
OAK RIDGE RD
HOPKINS XRD
BLAKE RD N
BLAKE RD S
11TH AVE S
5TH AVE N
17TH AVE N
SHADY OAK RD
TRACY AVE
FRANCE AVE S
XERXES AVE S
FR
A
C-1
1
3
4
R
55
394
7
169
100
Feet
0
4,000
8,000
Legend
Southwest LRT Alternative Segments
Southwest LRT Alternative Segment Tunnels
Northstar Commuter Rail
Hiawatha Light Rail
Segment 4 At-Grade Crossing
Segment 4 Road Realignment
Figure 6.2-2
Existing Roadway Impacts
Segment 4
SOUTHWEST transitway

Figure 6.2-3
Existing Roadway Impacts
Segment A & Segment C

Also in Segment A with LRT 3A-1 (co-location alternative) only, the ROW needed for this alternative will affect Burnham Road, which is adjacent to the corridor and accessed off of Cedar Lake Parkway. Burnham Road is the main access point for homes fronting on Cedar Lake. It will need to be reconstructed and realigned and its access off of Cedar Lake Parkway would be shifted west. The shift of Burnham Road may also cause the intersection of Cedar Lake Parkway with Burnham Road to be reconstructed.

In Segment C, the alignment crosses James Avenue, Irving Avenue, and Humboldt Avenue at-grade. Cecil Newman Lane between Nicollet Avenue and 1st Avenue South would be removed and 29th Street would be extended one block east of Nicollet Avenue, approximately 100 feet south of the existing Cecil Newman Lane.

In Segment C-1, the alignment travels under Nicollet Avenue in a tunnel and features two open-air stations. At station locations along Nicollet Avenue, one travel lane in each direction will be cantilevered over the open-air stations below. This will call for the removal of the center-turn lanes along Nicollet Avenue, as well as modifying the appearance of the roadway. The cantilevered roadway sections and open air tunnels extend from 250 feet south of 27th Street to 29th Street as well as from 200 feet north of 22nd Street to 200 feet north of Franklin Avenue.

In Segment C, the alignment follows a center-running alignment on Nicollet Avenue north of Franklin Avenue. Vehicles would not be permitted to cross the fixed LRT guideway except at signalized intersections. Access at unsignalized intersections would be restricted to right-in right-out turns only. The center-running alignment on Nicollet Avenue would result in the partial closure of several intersections, including 14th Street, 16th Street, 18th Street, Groveland Avenue, and 19th Street. This would entail the removal of the existing traffic signal at the intersection of Groveland Avenue and Nicollet Avenue. North of 13th Street, Nicollet Mall would be closed to all vehicles. Nicollet Mall is currently a two-lane roadway used only by authorized vehicles, including buses and taxis. The center-running Nicollet Mall alignment would result in grade crossings of all intersecting roadways, including South 12th Street, South 11th Street, South 10th Street, South 9th Street, South 8th Street, South 7th Street, South 6th Street, South 5th Street, South 4th Street and South 3rd Street.

In Segments C-2A (1st Avenue) and C-2B (Blaisdell Avenue), the physical impacts are similar to those described for the Nicollet Avenue portion of Segment C. Blaisdell Avenue is a two-lane, one-way southbound roadway with a bicycle lane and parking lane. 1st Avenue is a two-lane roadway with parking on one side. The Blaisdell Avenue alignment would require the fixed guideway to follow an at-grade alignment on Franklin Avenue between Blaisdell Avenue and Nicollet Avenue. The alignment returns to grade north of 22nd Street and traverses the intersection of Franklin and Blaisdell at grade. The intersection and traffic signals would be reconfigured to accommodate the guideway. The 1st Avenue alignment would not include a grade crossing of Franklin Avenue. The section of 1st Avenue north of Franklin would be closed to traffic, where LRT transitions from below-grade to an at-grade alignment. The right of way (ROW) is too narrow to allow the transition to take place along with adjacent roadway lanes. Sidewalks would be preserved. Access to all properties is accommodated from the rear or from side streets.

Segment C-2 (11th/12th Streets) would follow a side-running alignment along South 11th Street and South 12th Street resulting in grade crossings at LaSalle Avenue, Yale Place, Harmon Place, Hennepin Avenue, Hawthorne Avenue, North 12th Street, and Glenwood Avenue. The intersection of 5th Avenue North and Royalston Avenue North would be closed.

6.2.2.3 Operational Impacts at Intersections

"Intersection operations" - how well intersections function to move traffic and pedestrians.

An analysis was performed to quantify the impacts the Southwest Transitway would have on **intersection operations** in the study area. Implementation of any of the Southwest Transitway Build Alternatives will affect the operations of roadway intersections in the study area, as well as roadway operations at the many grade crossing locations. At locations where the alignment crosses a roadway at-grade, but not at an intersection, operations are not expected to be reduced to an unacceptable level. At each LRV crossing, each vehicle is anticipated to be delayed a maximum of 35 seconds. Where the alignment crosses a roadway at a currently unsignalized location, a flashing red light signal assembly mounted on an overhead structure or a cantilevered automatic gate would also be installed.

For alternatives that include the Segment C alignment, center running LRT within the median would necessitate the closure of all existing median openings except at signalized intersections. For all the Build Alternatives with center-running LRT, motorists desiring to turn left onto side streets and driveways would be required to continue to the next signalized downstream intersection and make a U-turn movement or use other parallel streets to reach their destination. Tractor trailers and buses would not be able to make U-turns at the signalized intersections and would have to use alternate routes to approach their destinations along the left side of the street.

Restricting left-turns and U-turns to signalized intersections along streets with center-running LRT would result in a slight increase in travel time for motorists entering/exiting side streets and driveways. The closure of median openings and restriction of left-turns along these streets, however, may improve traffic flow by reducing the number of conflicting movements.

Traffic Signal Priority (TSP) will be provided to LRVs at all signalized intersections where the guideway is operating in a street. All at-grade intersections along Segments 1, 3, and A would incorporate TSP. Intersections along Segment C between the West Lake Station and the Lyndale Station would also incorporate TSP. TSP would extend the green phase along the LRV's travel direction or would truncate the green phase of the cross-streets and give an early green phase to an approaching LRV. Thus, a green signal would minimize LRV delay while maintaining vehicular traffic flow along the travel lanes parallel to the guideway. A priority "request" would be generated upstream of a signalized intersection and it would be transmitted to the downstream intersections as the LRV travels along the corridor. The traffic signal controller would detect an LRV approaching the intersection, as well as all of the vehicles in adjacent driving lanes. When an LRV approaches, the system would shorten the green light phase for the cross street and then activate the green light phase for the LRV and the adjacent vehicle lanes. The signal would stay green until the LRV cleared the intersection. After the LRV passed, the traffic signal system would return to normal operation. The TSP function would be modeled and simulated using microscopic simulation software, which can emulate LRT operations with TSP functionality based on the LRT headways, speed, and dwell times at stations.

"Advance transit preemption" temporarily changes traffic lights to allow the LRV to safely proceed through the intersection with minimal delay.

Advance transit preemption will be used at all roadway and LRT at-grade crossings where the guideway is not operating within a street. Intersections along Segment 4 would incorporate preemption at traffic signals between the Blake Station and the West Lake Station. Preemption would allow the normal operation of traffic lights to be temporarily overridden by a signal phase (or phases) that allows the LRV to safely proceed through the intersection with minimal delay. After the LRV has cleared the intersection, the traffic signal would return to normal operations.

LRT in downtown Minneapolis was assumed to run with traffic, without TSP. It was assumed that when LRT was present along Nicollet Mall between 13th Street and Washington Avenue that only the LRT would operate along Nicollet Mall. Local bus service and taxis would be relocated to other streets. It was also assumed that when LRT was in-place along 11th Street and 12th Street, it would replace one traffic lane along each street, thus reducing the street's capacity. Future segment capacity analyses along 11th Street and 12th Street incorporated this width reduction.

<u>Methodology for Selecting Crossings for Evaluation</u>

Crossing locations were selected for analysis based on potential intersection impacts from LRT operations. All of the LRT crossings were identified and screened to determine the crossings needing further analysis. The screening process was as follows.

From a list of all the crossings, the grade-separated crossings were screened out and at-grade crossings were carried to the next step. The following intersections were analyzed Applying guidance in the Manual of Uniform Traffic Control Devices (MUTCD), Section 8C.10:

- Signalized intersections located within 200 feet of the grade crossing
- Intersections where a signal, roundabout, or stop sign controlling the roadway crossing the tracks was located within 600 feet of the LRT crossing
- Intersections where the roadway annual average daily traffic (AADT) is greater than 5,000 vehicles per day

All other crossings were not analyzed. A roadway crossing analysis decision tree is included in the Southwest Transitway Draft EIS – Traffic Analysis technical memorandum in Appendix H.

From this screening process, a list of crossings was selected for analysis. In addition to the intersections identified by the decision tree, other nearby intersections were also included if they were part of a coordinated network of signals that included the intersections identified. A total of 47 intersections, mostly signalized, were retained for analysis. The retained intersections were grouped into 12 traffic models to determine the impacts from implementation of LRT to the system of closely spaced intersections. No intersections were retained for analysis along Segments 1 and A.

Also, for the freight rail relocation segment through St. Louis Park, there were no signalized intersections near the freight rail crossings and all roadways crossing the tracks had daily traffic volumes of less than the benchmark 5,000 vehicles per day (refer to the crossing decision tree in Appendix H). Therefore, no at-grade crossings along the MN&S alignment were retained for LOS analysis.

Several at-grade intersections with the freight railroad along Segments FR and A were not analyzed for intersection LOS because their traffic volumes were below the 5,000 vehicle threshold. In addition, LOS is typically defined by the average control delay per vehicle, measured or computed over one hour. Because the volume of freight crossings along the FRR segment is estimated to be, at most, six trains per day, it would be extremely unlikely that there would ever be more than one train in any given hour. Estimating delays based on one train crossing in an hour did not seem to accurately capture the traffic impacts at these intersections because most vehicles in the hour would not be delayed at all—specifically, the difference in crossing block time between three minutes and five minutes would not be evident as an impact when looking at LOS. All of the intersections along the FR segment would operate at acceptable LOS.

The effect of the No Build and Build Alternatives on regional and local roadways was determined using travel demand forecasts developed from the Metropolitan Council Regional Travel Demand Model. The methodology used to develop 2030 peak hour turning movement forecasts for both the No Build and Build Alternatives is presented in the Southwest Transitway Draft EIS – Traffic Analysis technical memorandum in Appendix H.

Intersection LOS Analysis

The key periods of operational analysis are the times of greatest traffic volume and congestion—AM peak hour and PM peak hour. The AM peak hour characterizes the highest hourly volume of traffic for each group of intersections modeled together between 6:00 and 9:00 a.m. The PM peak hour characterizes an hour between 3:00 and 6:00 p.m. Turning-movement counts for the AM and PM peak hours were collected for the retained intersections. Groups of intersections being modeled together required that turning movements between intersections be balanced to account for subtle fluctuations between counts performed on different days, and to reflect an average number of vehicles performing that movement on an average day. Current signal timing patterns were also obtained and used in the analyses. Signal timing patterns were optimized for future conditions. The signal timings and count data were then used to simulate the effect of the proposed at-grade LRT on each group of intersections.

The operational evaluation of the intersections was based on an LOS analysis. LOS is used as a measure of the performance of at-grade intersections. Intersections are assigned a letter grade from A through F to indicate the operations at the intersection. LOS "A" represents the best LOS and LOS "F" represents the worst LOS. LOS "D" is typically considered an acceptable LOS in an urban area. The LOS for an intersection is determined using the average delay per vehicle at the intersection based on the designations presented in Table 6.2-6.

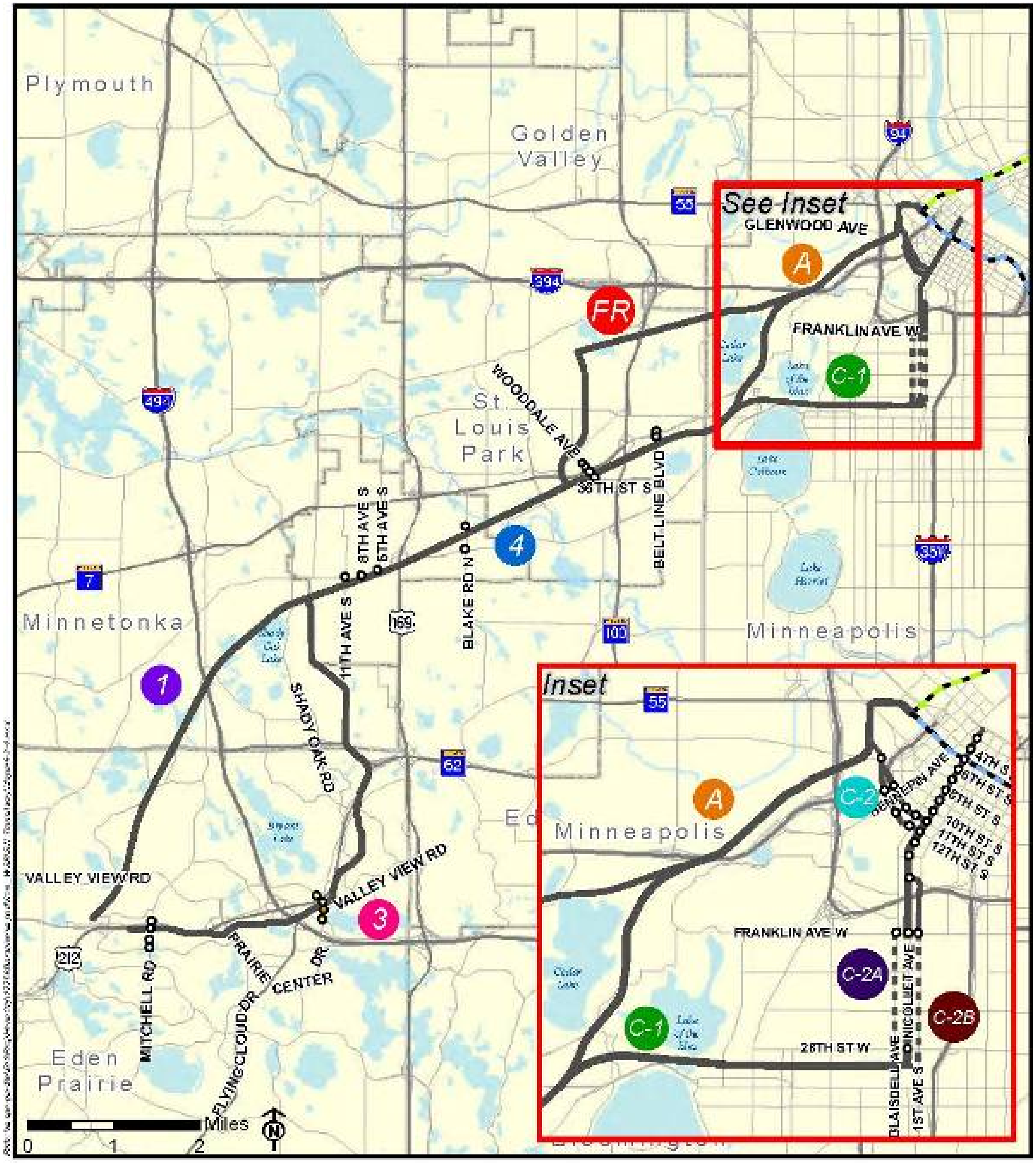
Table 6.2-6. LOS Thresholds for Intersections

Level of Service	Delay (seconds)					
	Signalized			Unsignalized		
A		<	10		<	10
B	10	≤ # <	20	10	≤ # <	15
C	20	≤ # <	35	15	≤ # <	25
D	35	≤ # <	55	25	≤ # <	35
E	55	≤ # <	80	35	≤ # <	50
F		≥	80		≥	50

Source: 2000 Highway Capacity Manual

These intersections were analyzed to obtain LOS conditions for existing traffic and for projected traffic volumes (2018 – opening year and 2030 – planning horizon year) under both the No Build and Build conditions. Intersection LOS analysis results may be found in the Southwest Transitway Draft EIS – Traffic Analysis technical memorandum in Appendix H and are displayed in Figure 6.2-44 through Figure 6.2-8.

For existing conditions during the AM peak hour, all intersections operate at an acceptable LOS. During the PM peak hour, one intersection, Valley View Road at Prairie Center Drive (east junction), operates below acceptable LOS (E/F) conditions.



Legend
Southwest LRT Alternative Segments
Southwest LRT Alternative Segment Tunnels
Northstar Commuter Rail
Hiawatha Light Rail

Level of Service
LOS A, B & C
LOS D
LOS E
LOS F

Note: LOS Depicted represents worst case peak hour conditions.

Figure 6.2-4
Existing Level of Service

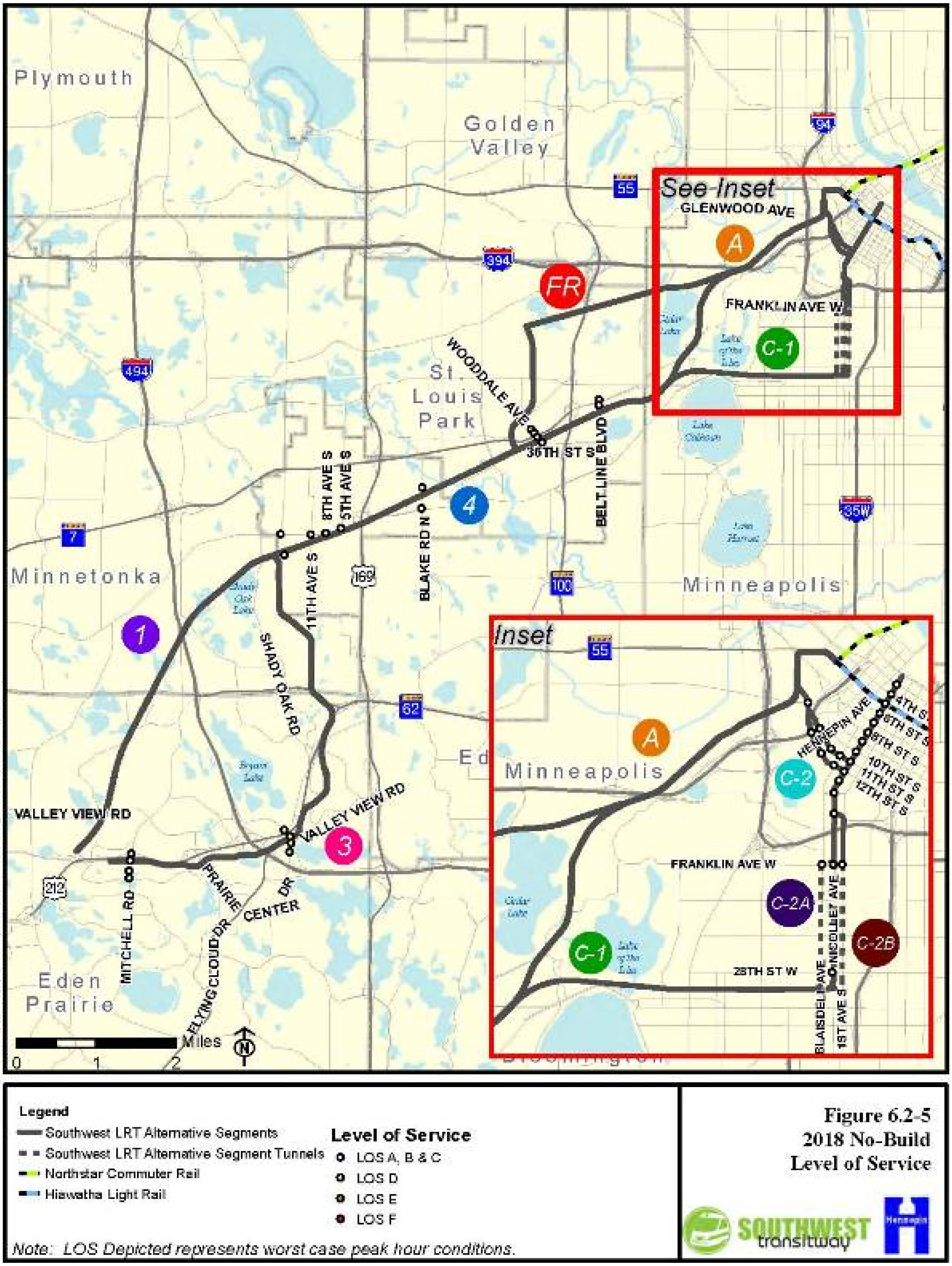
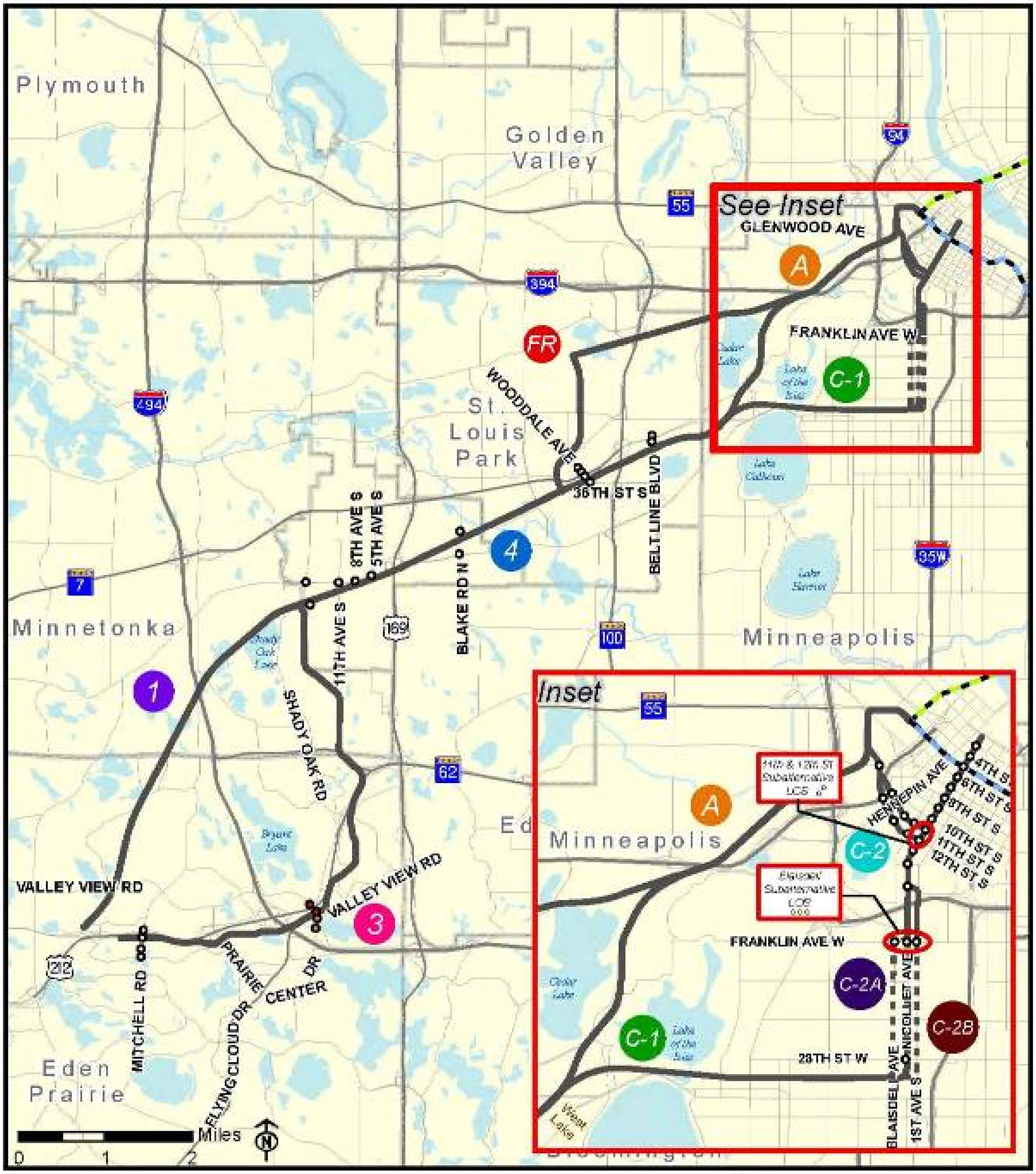


Figure 6.2-5
2018 No-Build
Level of Service

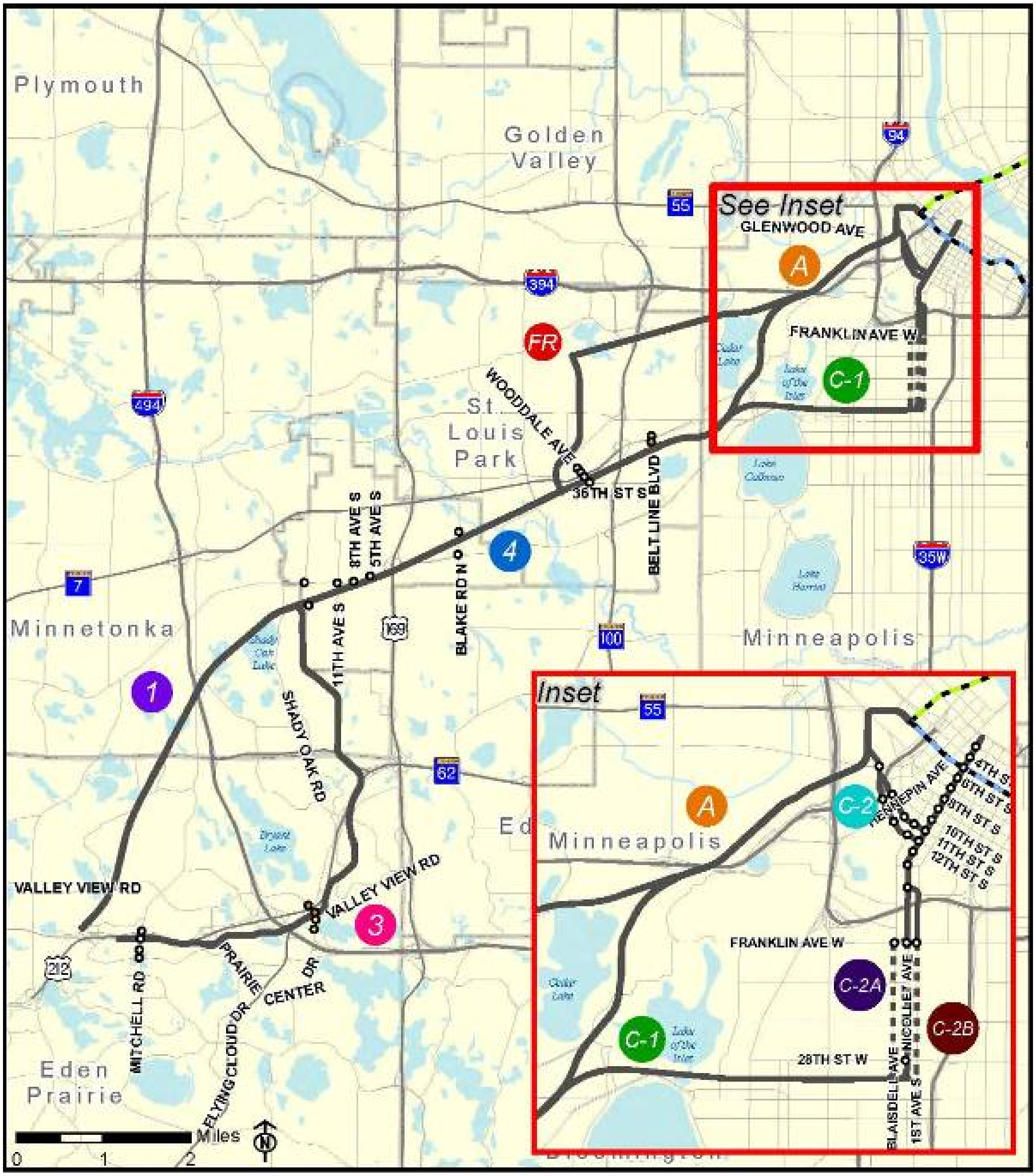


Legend
- Southwest LRT Alternative Segments
- Southwest LRT Alternative Segment Tunnels
- Northstar Commuter Rail
- Hiawatha Light Rail

Level of Service
- LOS A, B & C
- LOS D
- LOS E
- LOS F

Note: LOS Depicted represents worst case peak hour conditions.

Figure 6.2-6
2018 Build
Level of Service



Legend

- Southwest LRT Alternative Segments
- Southwest LRT Alternative Segment Tunnels
- Northstar Commuter Rail
- Hiawatha Light Rail

Level of Service

- LOS A, B & C
- LOS D
- LOS E
- LOS F

Note: LOS Depicted represents worst case peak hour conditions.

Figure 6.2-7
2030 No-Build
Level of Service

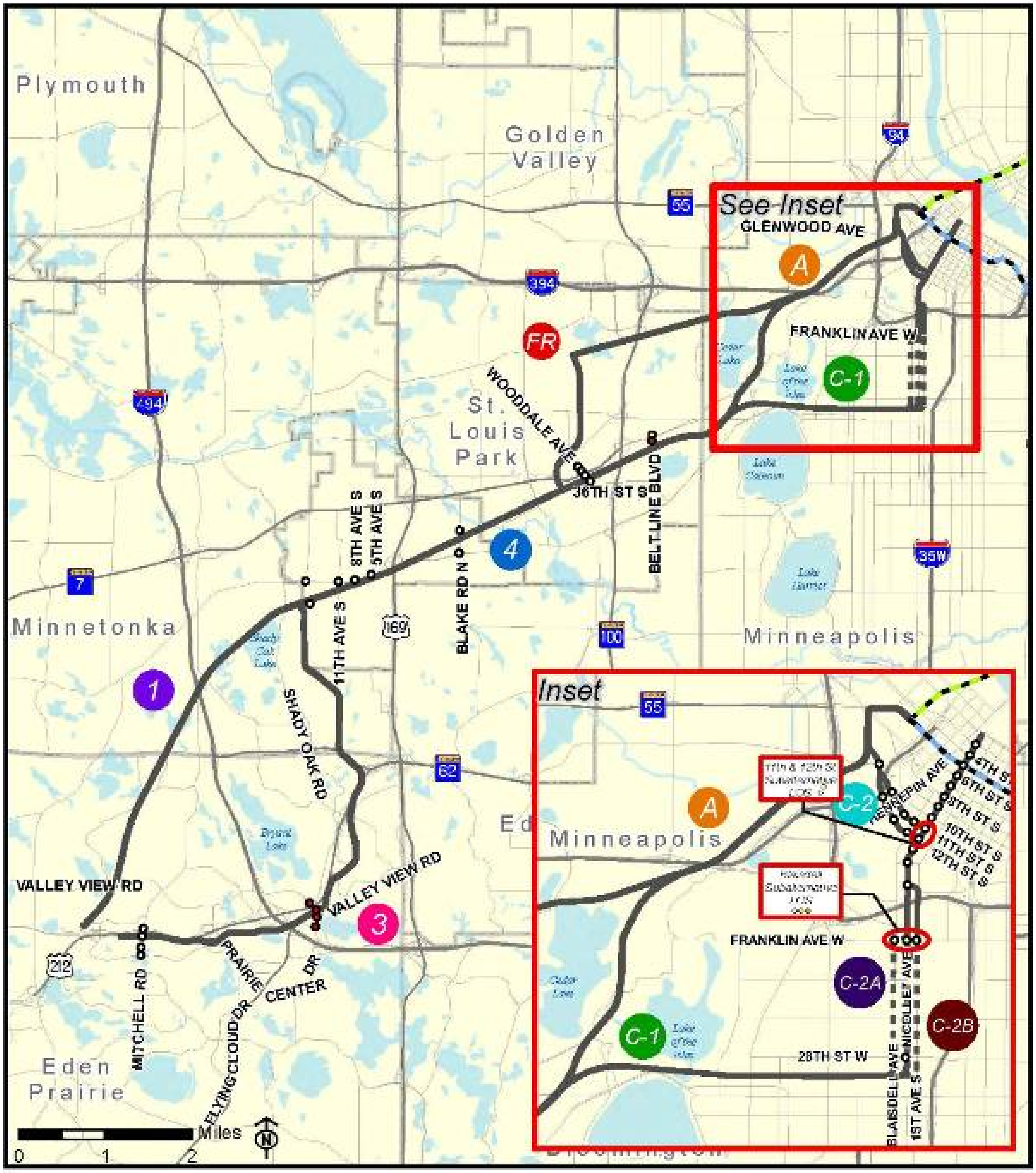


Figure 6.2-8
2030 Build
Level of Service

Committed transportation projects that would affect the future operational analysis were identified by reviewing MnDOT's Statewide Transportation Improvement Program (STIP) and Capital Improvement Programs (CIPs) for Hennepin County, Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis. The Wooddale Avenue interchange improvements at TH 7 in St. Louis Park are operational so these improvements were reflected in the existing and future analyses. Future improvements in Eden Prairie included modifications to the intersection of Valley View Road and Prairie Center Drive (east junction). These improvements were reflected in the 2018 and 2030 analyses. No other improvements along the Southwest Transitway corridor were assumed.

Under the 2018 No Build Alternative during the AM peak hour, all intersections operate at acceptable LOS conditions. Similarly, during the PM peak hour, all intersections also operate at acceptable LOS conditions. A planned geometric improvement that added capacity to the Valley View Road/Prairie Center Drive (east junction) intersection produced acceptable LOS conditions in 2018 compared to existing conditions.

The traffic analysis further shows that under the 2018 No Build Alternative, the LOS at four intersections would be degraded by one level as compared to the existing conditions for the AM peak hour and two intersections for the PM peak hour as a result of increases in vehicular traffic. In each of these cases, however, the LOS would remain at D or higher.

- AM peak hour
  - Valley View Road at Bryant Lake Drive (LOS C to LOS D)
  - Valley View Road at Prairie Center Drive (east junction) (LOS B to LOS C)
  - Prairie Center Drive at Viking Drive (LOS C to LOS D)
  - Wooddale Avenue at TH 7 Eastbound Off-ramp (LOS A to LOS B)
- PM peak hour
  - Wooddale Avenue at TH 7 Eastbound Off-ramp (LOS A to LOS B)
  - Belt Line Boulevard at CSAH 25 South Frontage Road (LOS A to LOS B)

Under the 2018 Build Alternatives during the AM peak hour, two intersections operate below acceptable LOS (E/F) conditions:

- Valley View Road at Bryant Lake Drive (LOS F)
- Valley View Road at Flying Cloud Drive (LOS F)

Similarly, during the PM peak hour, two intersections operate below acceptable LOS (E/F) conditions:

- Valley View Road at Prairie Center Drive (east junction) (LOS E)
- Prairie Center Drive at Viking Drive (LOS E)

Under the 2018 Build Alternatives, there would be eight intersections where the LOS would be reduced by one to two levels as compared to the 2018 No Build condition for the AM peak hour and two intersections that would operate below acceptable LOS conditions. For the PM peak hour, six intersections would be reduced by one LOS level as compared to the 2018 No Build condition with two intersections operating below acceptable LOS conditions:

- AM peak hour
  (2-Levels)
  - Valley View Road at Bryant Lake Drive (LOS D to LOS F)
  - Valley View Road at Flying Cloud Drive (LOS D to LOS F)

  (1-Level)
  - Mitchell Road at TH 5 North Ramp (LOS B to LOS C)
  - CSAH 3 at 8th Avenue (LOS A to LOS B)
  - CSAH 3 at 5th Avenue (LOS B to LOS C)
  - CSAH at Blake Road (LOS B to LOS C)
  - Nicollet Avenue at 12th Street South (LOS B to LOS C)
  - Glenwood Avenue at Royalston Avenue (LOS A to LOS B)
- PM peak hour
  (1-Level)
  - Mitchell Road at Technology Drive (LOS B to LOS C)
  - Valley View Road at Flying Cloud Drive (LOS c to LOS D)
  - Prairie Center Drive at Valley View Road (LOS D to LOS E)
  - Prairie Center Drive at Viking Drive (LOS D to LOS E)
  - Wooddale Avenue at TH 7 Westbound Off-ramp (LOS A to LOS B)
  - 11th Street at Hawthorne Avenue (LOS B to LOS C)

Under the 2030 No Build Alternative during the AM peak hour, two intersections operate at below acceptable LOS (E/F) conditions:

- Valley View Road at Bryant Lake Drive (LOS E)
- Valley View Road at Flying Cloud Drive (LOS E)

During the PM peak hour, one intersection, Beltline Boulevard at County State-Aid Highway (CSAH) 25 South Frontage Road, operates at below acceptable LOS (E/F) conditions (LOS E).

The traffic analysis further shows that under the 2030 Build Alternative, there would be six intersections where the LOS would be reduced by one level as compared to the 2030 No Build condition for the AM peak hour and two intersections operating below acceptable LOS conditions. For the PM peak hour, 12 intersections would be reduced by one to four levels and six intersections would operate below acceptable LOS conditions:

- AM peak hour
  (1-Levels)
  - Mitchell Road at TH 5 North Ramp (LOS B to LOS C)
  - Valley View Road at Bryant Lake Drive (LOS E to LOS F)
  - Valley View Road at Flying Cloud Drive (LOS E to LOS F)
  - CSAH 3 at 5th Avenue (LOS B to LOS C)
  - Nicollet Avenue at 12th Street South (LOS B to LOS C)
  - Glenwood Avenue at Royalston Avenue (LOS A to LOS B)

- PM peak hour
  (1-Levels)
  - Valley View Road at Bryant Lake Drive (LOS D to LOS E)
  - Valley View Road at Flying Cloud Drive (LOS D to LOS E)
  - CSAH 3 at 8th Avenue (LOS B to LOS C)
  - Belt Line Boulevard at CSAH 25 South Frontage Road (LOS E to LOS F)
  - Nicollet Avenue at Franklin Avenue (LOS C to LOS D)
  - 11th Street South at LaSalle Avenue (LOS C to LOS D)
  - 11th Street South at Hawthorne Avenue (LOS B to LOS C)
  - Glenwood Avenue at Royalston Avenue (LOS B to LOS C)

  (2-Levels)
  - Prairie Center Drive at Valley View Road (LOS D to LOS F)
  - Prairie Center Drive at Viking Drive (LOS D to LOS F)

  (3-Levels)
  - Nicollet Avenue at Franklin Avenue (LOS A to LOS D)

  (4-Levels)
  - 1st Avenue at Franklin Avenue (LOS A to LOS E)

Table 6.2-7 summarizes the intersection LOS analysis as detailed in the Southwest Transitway Draft EIS – Traffic Analysis technical memorandum in Appendix H.

Table 6.2-7. Summary of Level of Service Analysis

Scenario, Level of Service, and Peak Hour	LRT 1A	LRT 3A (LPA)	LRT 3A-1 (co-location alternative)	LRT 3C-1 (Nicollet Mall)	LRT 3C-2 (11th/12th Street)
	#/# Intersections				
Existing Conditions					
LOS A-B(AM/PM)	8/8	12/13	12/13	29/29	28/29
LOS C-D(AM/PM)	3/3	7/5	7/5	7/6	9/7
LOS E-F (AM/PM)	0/0	0/**1**	0/**1**	0/**1**	0/**1**
2018 No Build					
LOS A-B(AM/PM)	12/9	15/13	15/13	29/25	28/25
LOS C-D(AM/PM)	1/4	6/8	6/8	1/5	3/6
LOS E-F (AM/PM)	0/0	0/0	0/0	0/0	0/0
2018 Build					
LOS A-B(AM/PM)	10/11	13/14	13/14	27/26	28/26
LOS C-D(AM/PM)	3/2	6/5	6/5	3/4	6/8
LOS E-F (AM/PM)	0/0	**2/2**	**2/2**	0/0	0/0
2030 No Build					
LOS A-B(AM/PM)	10/7	13/10	13/10	27/21	25/20
LOS C-D(AM/PM)	3/5	6/10	6/10	3/8	6/10
LOS E-F (AM/PM)	0/**1**	**2/1**	**2/1**	0/**1**	0/**1**
2030 Build					
LOS A-B(AM/PM)	9/6	11/9	11/9	28/23	28/19
LOS C-D(AM/PM)	4/6	8/7	8/7	8/10	12/17
LOS E-F (AM/PM)	0/**1**	**2/5**	**2/5**	**2/5**	**2/6**

Queuing Analysis

To account for the disruption to traffic at at-grade intersections of freight track and roadways, a queuing analysis was performed. Queuing analysis simulates the length of the delayed vehicles queue when a freight train blocks an at-grade crossing. Because the blocking of at-grade crossing by freight trains is an infrequent occurrence along Segments FR and A, queuing analyses for the at-grade intersections along these segments were selected as the appropriate analysis to capture the effects of freight rail traffic on roadway traffic. The detailed queuing analyses may be found in Appendix H.

Freight Rail Segment

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

Based on the existing vehicle traffic volumes, traffic at the Lake Street and Walker Street at grade crossings would not be expected to reach mainline TH 7 unless the crossings were both blocked for more than 12.5 minutes, which is equivalent to a 120-car train traveling at 9.3 mph or an 80-car train traveling at 6.3 mph (worst-case scenario). The longest expected queue would occur in a scenario when a 120-car train arrived during school dismissal. Similar vehicle queuing would occur if a train arrived during the high school arrival period (8–8:15 a.m.). The queues on northbound Dakota Avenue would extend through the Dakota Avenue/Lake Street intersection, but would not be expected to reach the TH 7 intersections. The queues on southbound Dakota Avenue could cause increases in delay to traffic leaving the high school at dismissal time. In this case, vehicles would be primarily queued on W 33rd Street and Dakota Avenue, which would affect neighborhood traffic, but not any arterial roadways. Vehicles could choose to divert from southbound Dakota Avenue to Minnetonka Boulevard or Louisiana Avenue. The potential volume of diverted traffic could be higher than from the Lake Street and Walker Street crossings, but still would represent only a small change in traffic volumes on the adjacent roadways. Therefore, the potential impacts of diverted traffic from the at-grade crossings to the surrounding roadway network would not be expected to be significant.

Table 6.2-8 provides a summary of the queuing analysis for the Freight Rail Segment.

Table 6.2-8. Summary of Queuing Analysis for Freight Rail Segment

Location	Direction	Estimated Maximum Vehicle Queue at Crossing		
		Existing Condition	Build Condition	Worst Case
		30-car train @ 10 mph (2 per day)	50-car train @ 15 mph (4 per day)	120-car train @ 10 mph (3 per day)
28th Street	Northbound	4	5	16
	Southbound			
29th Street	Eastbound	1	Crossing assumed to be closed in Build Condition	
	Westbound			
Dakota Avenue	Northbound	19	21	76
	Southbound	17	19	68
Library Lane	Northbound	8	9	33
	Southbound	20	22	78
Lake Street	Eastbound	8	9	33
	Westbound	9	10	35
Walker Street	Eastbound	4	5	17
	Westbound	3	3	11

Source: Kimley-Horn, May 2011

Segment A (LRT 3A-1 Co-location Alternative)

The conceptual design for LRT 3A-1 (co-location alternative) includes the light rail and freight rail tracks crossing Cedar Lake Parkway at-grade. Therefore, a queuing analysis was performed for the Cedar Lake Parkway crossing including an analysis of impacts to Burnham Road and Xerxes Avenue in proximity to the Cedar Lake Parkway crossing. Burnham Road and Xerxes Avenue are close to the at-grade crossing of Cedar Lake Parkway and currently are blocked by traffic queuing on Cedar Lake Parkway when the crossing is blocked by a freight train. New counts along Cedar Lake Parkway at its intersections with Burnham Road and Xerxes Avenue were performed as part of this study. These counts were performed on February 16, 2010. A 20-year growth factor of 1.12, consistent with the Southwest Transitway Draft EIS Traffic Memorandum's growth factor (see Appendix H), was used to project existing traffic volumes to design year 2030.

The results of the queuing analysis are summarized in Table 6.2-9. Because the proximity of the intersections to the Cedar Lake Parkway freight rail crossing, under the co-location alternative, vehicle queuing is expected to block both the Burnham Road and Xerxes Avenue intersections while a freight train uses the Cedar Lake Parkway crossing. With the exception of when a freight train uses the Cedar Lake Parkway crossing, Cedar Lake Parkway, Burnham Road, and Xerxes Avenue operate at acceptable LOS with no queuing issues. Specifically, the maximum queue associated with the LRT passing through the Cedar Lake Parkway crossing would be 11 vehicles with a duration of about 30 seconds.

Table 6.2-9. Summary of Queuing Analysis for LRT 3A-1 (Co-location alternative) at Cedar Lake Parkway

Location	Direction	Estimated Maximum Vehicle Queue at Intersection (Vehicles)	
		Existing Condition	Co-location Build Condition (2030)
		50-car train @ 10 mph (2 per day)	50-car train @ 10 mph (2 per day)
AM Peak Hour			
Burnham Road at Cedar Lake Parkway	Southbound	2	3
	Eastbound	2	8
Xerxes Avenue at Cedar Lake	Northbound	2	7
Cedar Lake Parkway at railroad	Eastbound	-	22
	Westbound	-	33
PM Peak Hour			
Cedar Lake Parkway at railroad	Eastbound	-	53
	Westbound	-	21
Burnham Road at Cedar Lake Parkway	Westbound	-	2
	Southbound	2	6
	Eastbound	6	21
Xerxes Avenue at Cedar Lake Parkway	Northbound	2	5
	Westbound	-	15

Source: WSB, April 2010 and 2012

In addition to the queuing analysis for Cedar Lake Parkway, queuing impacts related to other at-grade crossings were considered relative to various train lengths and traffic volumes at two representative crossing. These crossings are Wooddale Avenue and Beltline Boulevard.

Based on the existing scenario (30-car train @ 10 mph) and the worst-case scenario (120-car train @ 10 mph), traffic queues at each crossing were evaluated for the highest volume 15-minute period of the day for year 2010 and year 2030. Traffic volumes in the AM peak hour and PM peak hour were reviewed and it was determined that the highest peak 15-minute volumes at both crossings occurred during the PM peak hour. For this queue analysis, it was assumed that one train crossed during the highest volume 15-minute period. Table 6.2-10 summarizes the results.

Table 6.2-10. Summary of Queuing Analysis for LRT 3A-1 (Co-location alternative) at Wooddale Avenue and Beltline Boulevard

Location	Direction	Estimated Maximum Vehicle Queue at Intersection (Vehicles)			
		Existing Condition		Worst Case (2030)	
		30-car train @ 10 mph (2 per day)		50-car train @ 10 mph (2 per day)	
PM Peak Hour		2010	2030	2010	2030
Wooddale Avenue at railroad	Northbound	27	40	94	132
	Southbound	28	37	95	139
Beltline Boulevard at railroad	Northbound	49	57	156	179
	Southbound	27	31	93	107

Source: WSB, 2012

6.2.2.4 Transit Station Access

LRT station access would vary. Depending on the alignment chosen, some of the proposed stations would not provide public parking for transit riders. Southwest Transitway users would access the following stations primarily by walking, bicycling, and transferring from another transit route:

- Van White Boulevard
- Royalston Avenue
- Hennepin Avenue (Uptown)
- Lyndale Avenue
- 28th Street
- Franklin Avenue
- 12th Street
- 8th Street
- 4th Street

The following stations would provide public parking. Access to the following stations would be by walking, bicycling, driving an automobile, or transferring from local bus services:

- TH 5
- TH 62
- Rowland Road
- Mitchell Road
- Southwest Station
- Eden Prairie Town Center
- Golden Triangle
- City West
- Opus
- Shady Oak Road
- Downtown Hopkins
- Blake Road
- Louisiana Avenue
- Wooddale Avenue
- Beltline Boulevard
- West Lake Street
- 21st Street
- Penn Avenue

The Southwest Station is currently a hub for existing bus services, and the Hennepin Avenue (Uptown) Station would be constructed adjacent to the existing Hennepin Avenue Station, which currently provides bus services. Riders at the 4th Street Station may transfer from the existing Hiawatha LRT. In addition, the interlining of the Southwest Transitway with the Central Corridor LRT may allow the riders of the existing LRT system to access the Southwest Transitway without transferring, but simply by staying on the same LRV for trips between Eden Prairie, downtown Minneapolis and downtown St. Paul.

6.2.2.5 Operation and Maintenance Facility

Four potential sites have been identified for an Operation and Maintenance facility (OMF). These sites include Eden Prairie 1, Eden Prairie 2, Eden Prairie 3, and Minneapolis 4. Additional information regarding these sites can be found in Chapter 2 and the OMF Site Evaluation technical memorandum in Appendix H.

<u>Eden Prairie 1 OMF</u>

The selection of the Eden Prairie 1 OMF option could have several potential traffic impacts. Some of the impacts would occur during the construction of the facility and are temporary in nature. There are, however, some potential long-term impacts from this alternative.

Temporary Construction Effects

Construction activities will also result in temporary adverse effects. During construction of the Eden Prairie 1 OMF option and associated trackage, there would be temporary impacts to Wallace Road, the eastbound TH 212 to Wallace Road exit ramp, and TH 212. Wallace Road and the eastbound TH 212 to the Wallace Road exit ramp may be subjected to lane restrictions or closures during construction of the tracks leading to and from the maintenance facility. TH 212 may be subjected to lane restrictions and/or closures during construction of the LRT bridge overpass.

Construction of this alternative could lead to additional construction traffic along Wallace Road, Technology Drive, Mitchell Road, West 78th Street/Arboretum Boulevard, Fuller Road, and Eden Prairie Road. Construction of the OMF may require the construction of temporary access roads from Fuller Road and/or Eden Prairie Road.

The additional construction traffic and potential lane closures and restrictions could affect access to several public facilities, including Central Middle School, Central Kindergarten Center, Eagle Heights Spanish Immersion School, the Eden Prairie School District bus garage, and the City of Eden Prairie Public Works building. Access and use of the Minnesota River Bluffs LRT Regional Trail could be affected during construction. Depending on the extent and timing of construction, some school bus routes may need to be rerouted. Walking and bicycling routes to the schools may also be affected during construction.

Long Term Effects

The LRT tracks to the Eden Prairie 1 OMF option would involve the removal of 60 parking spaces on the Eaton property. Several building access points to the north and east side of one of Eaton's buildings may be eliminated or reconfigured.

The tracks would cross Wallace Road, a sidewalk, and a multiuse path at grade at this location. The tracks would also cross the eastbound TH 212 to Wallace Road exit ramp at-grade. MnDOT may require that this crossing be grade separated. This could require an extension of the proposed TH 212 overpass to encompass the exit ramp. Due to slope limitations for LRT design and the short distances involved, the overpass may need to be extended past Wallace Road. Alternately, the exit ramp and track could be reconfigured similar to the Eden Prairie 2 OMF option (see below), thus avoiding interaction between the LRT and the exit ramp.

Potential delays to motorists and trail users could occur, especially at the beginning and ends of the peak periods when trains would be added or removed from service at the OMF. School buses would be required by law to stop before proceeding across the tracks. There is also the potential for safety issues when people are walking or bicycling along Wallace Road, especially students who would cross the tracks as part of their route to school.

Selection of the Eden Prairie 1 OMF option would necessitate the construction of new permanent access roads. These roads would provide connections to the OMF site from Fuller Road and/or Eden Prairie Road. Traffic operations on Fuller Road and/or Eden Prairie Road in the vicinity of the new access roads could be affected. Access to the interim-use trail could be altered, and users could be affected by additional delay if trains need to cross the trail when departing from and arriving at the OMF site.

Eden Prairie 2 OMF

The selection of the Eden Prairie 2 OMF option could have several potential traffic impacts. Many of the impacts would occur during the construction of the facility and are temporary in nature. There are, however, some potential long-term impacts from this alternative.

Temporary Construction Effects

Construction activities will also result in temporary adverse effects. During construction of the Eden Prairie 2 OMF option and associated tracks, there would be temporary impacts to Wallace Road, the eastbound TH 212 to Wallace Road exit ramp, and the western end of Technology Drive. Construction of this alternative would necessitate the demolition and removal of several private buildings. This would involve heavy use of Wallace Road and possibly Technology Drive and Mitchell Road by numerous trucks hauling debris away from the site during the building demolition and removal period. Wallace Road, Technology Drive, and Mitchell Road could have higher volumes of truck traffic during construction. Wallace Road and the eastbound TH 212 to the Wallace Road exit ramp may have lane restrictions or closures during construction.

The additional construction traffic and potential lane closures and restrictions could impact access to several public facilities, including Central Middle School, Central Kindergarten Center, Eagle Heights Spanish Immersion School, the Eden Prairie School District bus garage, and the City of Eden Prairie Public Works building. Depending on the extent and timing of construction, some school bus routes may need to be rerouted. Walking and bicycling routes to the schools may also be affected during construction.

Wallace Road would need to be relocated to the east to accommodate this option, and the geometry of the eastbound TH 212 to Wallace Road exit ramp would need to be reconfigured. The use of these facilities may be restricted during their reconstruction.

Long Term Effects

The LRT tracks to the Eden Prairie 2 OMF would call for the removal of dozens of parking spaces on the Eaton property. Several building access points to the north and east sides of one of Eaton's buildings may be eliminated or reconfigured. The proposed relocation of Wallace Road and the eastbound TH 212 to the Wallace Road exit ramp could have potential safety impacts. Under the current configuration, the intersection of the exit ramp from eastbound TH 212 and Wallace Road is unsignalized. This intersection is also located approximately 300 feet south of the West 78th Street/Arboretum Boulevard overpass. The proposed reconfiguration of this intersection would move it approximately 250 feet to the north—just south of the overpass. Vehicles coming off of the exit ramp may have increased difficulty in seeing vehicles arriving from the north on Wallace Road because oncoming vehicles may be in the shadow of the overpass. Certain lighting conditions could pose additional hazards to motorists exiting from TH 212 at this location.

The tracks would cross Wallace Road, a sidewalk, and a multi-use path at grade. Potential delays to motorists and trail users could occur, especially at the beginning and ends of the peak periods when trains would be added or removed from service at the OMF. School buses would be required by law to stop before proceeding across the tracks. There is also the potential for safety issues when people are walking or bicycling along Wallace Road, especially students who would cross the tracks as part of their route to school.

Eden Prairie 3 OMF

The selection of the Eden Prairie 3 OMF option could have potential traffic impacts primarily during construction.

Temporary Construction Effects

Construction activities will also result in temporary adverse effects. During construction of the Eden Prairie 3 OMF option there would be temporary impacts to Mitchell Road. Construction of this alternative would necessitate the demolition and removal of three private buildings. This would involve heavy use of Mitchell Road and possibly Technology Drive by numerous trucks hauling debris away from the site during the building demolition and removal period. Mitchell Road and possibly Technology Drive could have higher volumes of truck traffic during construction.

Long Term Effects

No long term roadway impacts are anticipated from OMF construction at the Eden Prairie 3 OMF site.

Minneapolis 4 OMF

The selection of the Minneapolis 4 OMF option could have several potential traffic impacts. Many of the impacts would occur during the construction of the facility and would be temporary in nature. There are, however, some potential long-term impacts from this alternative.

Temporary Construction Effects

Construction activities will also result in temporary adverse effects. During construction of the Minneapolis 4 OMF and associated tracks, there would be temporary impacts to 8th Avenue North, TH 55/6th Avenue North, 5th Street North, 7th Street North, and 10th Avenue North/Oak Lake Avenue. Construction of this alternative would necessitate the demolition and removal of several buildings and removal of asphalt and concrete pavement. This would likely entail heavy use of each of the previously mentioned roads by numerous trucks hauling debris away from the site during the demolition and removal period. Several of the roadways in the vicinity of the demolition site would also have lane restrictions and/or closures. The eastern end of 8th Avenue North and a segment of 5th Street North between 10th Avenue North and 6th Avenue North would likely be closed during the demolition phase.

During construction of the Minneapolis 4 OMF option and associated tracks, 8th Avenue North, TH 55/6th Avenue North, 5th Street North, 7th Street North, and 10th Avenue North/Oak Lake Avenue could have higher volumes of truck traffic. Each of these roadways could have lane restrictions or closures. Some of this additional traffic may use other nearby roadways, including Glenwood Avenue, I-94, and I-394.

There may be additional impacts to 10th Avenue North/Oak Lake Avenue, 8th Avenue North, TH 55/6th Avenue North, and 7th Street North, depending on how the connections to the OMF are made from the mainline. If the connection to the OMF is made from the mainline along 5th Street North, access to and along 6th Avenue North may be limited. It is also possible that the OMF may need a loop track, or tracks that may loop around the Metro Transit Heywood office and garage. This could significantly impact traffic operations on 7th Street North, 10th Avenue North/Oak Lake Avenue, and TH 55/6th Avenue North, especially if the tracks entail the removal of traffic lanes and/or a realignment and reconfiguration of the roadway.

The additional construction traffic and potential lane closures and restrictions could affect access to several facilities such as the Metro Transit Heywood office and garage, the Hennepin Energy Recovery Center, Target Field, and the Target Field Station. Access to numerous other destinations could potentially be affected because both 7th Street North and 6th Avenue North carry close to 10,000 vehicles per day and provide access to many destinations in the downtown area.

Long Term Effects

Construction of the Minneapolis 4 OMF option would necessitate the elimination of 5th Street North between 10th Avenue North, and 6th Avenue North, as well as the eastern end of North 8th Avenue. Access points to the Metro Transit Heywood office and garage may be eliminated and/or reconfigured.

6.2.2.6 Building/Facility Access

For the No Build and Enhanced Bus Alternatives, building and facility access would remain unchanged.

For the Build Alternatives, access to several buildings and facilities would need to be modified. In Segments 1 and 4, no changes to building and facility access would be required. In Segments 3 and A, the access to several private properties would be slightly realigned in the following locations:

- Technology Drive on the south side of the road
- Business entrances east of Prairie Center Drive
- South side of Flying Cloud Drive from just south of Viking Drive to Valley View Road
- Shady Oak Road on W 70th Street
- Yellow Circle Drive
- Bren Road East
- Cedar Lake Parkway and Burnham Road
- N 7th Street along 6th Avenue N

In some cases where a property has two access points, one of them may be removed. In all cases, automobile access would be maintained with minimal extra travel distance required. In Segment C, the open-median station areas along Nicollet Avenue and the at-grade portions of the alignment north of Franklin Avenue would not permit left turns from northbound or southbound vehicles. Drivers would need to make a U-turn at the end of the block then a right-turn to make the same movement.

6.2.3 Short-Term Construction Effects

The No Build and Enhanced Bus Alternatives would have no short-term construction effects on the existing and planned roadway system.

Some level of disruption would occur during the construction of any of the Build Alternatives and construction activities will also result in temporary adverse effects. Construction of the alternatives would necessitate some temporary modification of travel patterns by all roadway users. A traffic management plan would be developed and agreed upon by appropriate levels of administration including MnDOT, Hennepin County, and all municipalities along the construction alignment. The plan would include ways to maintain traffic flow, existing transit services, and pedestrian access along each disrupted roadway. During Final Design, a construction sequencing plan would be developed to schedule lane closures and temporary traffic control. Temporary lanes, sidewalks, driveways, and bus stops would be used where necessary.

Along each alignment, temporary disruptions to the roadway may be caused by the construction of an at-grade roadway crossing, the construction of a bridge above the roadway (grade separation), or the construction of a tunnel under the roadway. This includes the construction of bridges over I-494, TH 62, and TH 212 in Segment 3, and the construction of a bridge over Excelsior Boulevard in Segment 4. Construction of a bridge over a freeway or large roadway may create the need to temporarily restrict traffic on roadways below. The extent to which each of these construction activities would disrupt traffic on the roadway would be determined by local conditions. Where possible, and with the exception of overnight closures, traffic in both directions on any roadway would be maintained during construction. There would also be temporary disruptions to the roadways around construction staging areas.

The short-term effects of construction would be most disruptive along Nicollet Avenue between 29th Street and Franklin Avenue, where the construction of a shallow tunnel would close half of Nicollet Avenue at a time for extended periods; and along 1st Avenue, where a full closure between blocks may be needed due to the narrower ROW. The extensive nature of the construction involved would likely be more disruptive to normal traffic patterns than construction elsewhere along the proposed alignments.

6.2.4 Mitigation

Hennepin County, MnDOT, and all municipalities along the construction alignment would require compliance with appropriate state and local regulations concerning the closing of roadways and the effects of construction activities. Contractors must comply with all guidelines established in the Minnesota Manual on Uniform Traffic Control Devices. Construction staging and mitigation documents must be approved by all appropriate jurisdictions and the contractor would be required to secure all necessary permits. Traffic control plans must be approved by local traffic engineering authorities prior to the initiation of construction activities.

A detailed construction timeline would be developed before the initiation of construction that would inform roadway users and adjacent property owners about when construction activities will begin, the type of work being performed, an estimate of when work will be completed, and recommendations on how individuals and entities can minimize disruption to their activities.

In some cases, intersections may be modified to minimize vehicle delay. Potential mitigation measures may include the addition of turn-lanes, the construction of new traffic signals, or the revision of the existing traffic signal timing plans. Potential mitigation for queuing at the low volume, at-grade intersections along the Freight Rail segment could be the addition of signage warning motorists of an approaching freight rail train and directing the motorists to grade separated crossings.

As described in Chapter 4 of this Draft EIS, Quiet Zone upgrades along the freight rail relocation segment would be implemented as mitigation for noise impacts at all remaining at-grade crossings between Walker Street and 28th Street. The Quiet Zone design concept includes improved pedestrian safety at the study area grade crossings in the form of pedestrian gates at all existing and proposed sidewalk locations. Fencing will be included at all quiet zone at-grade crossings to control pedestrian movements at/around crossing signal gates.

A public authority may establish a Quiet Zone without approval from the Federal Railroad Administration (FRA) if they comply with one of the following conditions as defined in FRA Use of Locomotive Horns at Highway-Rail Grade Crossings; Final Rule (49 C.F.R. Parts 222 and 229):

- Install one or more approved supplementary safety measures (SSMs)
    - Temporary closure of grade crossing(s) during hours the Quiet Zone is in effect
    - Four-quadrant gate system at all grade crossing in the Quiet Zone
    - Gates with median or channelization devices
    - One-way streets with gate(s)
    - Permanent closure of grade crossing(s)
- A Quiet Zone may be established if its Quiet Zone Risk Index is at or below the Nationwide Significant Risk Threshold
- Install SSMs sufficient to reduce the Quiet Zone Risk Index at, or below, the Risk Index with Horns

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

6.3 Effects on Other Transportation Facilities and Services

This section identifies the effects construction of the Southwest Transitway would have on parking, freight rail, trucking, bicycling, and pedestrian facilities. This section also identifies existing facilities and services, as well as short-term and long-term effects.

6.3.1 Existing Facilities and Services

6.3.1.1 Parking

The majority of the parking spaces available along the alignment alternatives are provided in privately owned parking lots. Existing off-street parking spaces that are located along each of the potential alignment alternatives were counted. The count included all marked parking spaces on properties located immediately adjacent to the proposed alignment alternatives. Table 6.3-1displays the number of parking spaces along each alignment segment. (Appendix H contains the detailed parking inventory including the property address, the property owner, and the number of private and public parking spaces available at each location.) Underground parking available only to private residential tenants was not included in the inventory, but surface parking lots at the same location were included.

Table 6.3-1. Existing Parking

Segment	Alternatives	Private	Public	Total
Segment 1	LRT 1A	1,795	0	1,795
Segment 3	LRT 3A(LPA), LRT 3A-1 (co-location alternative), LRT 3C-1 (Nicollet Mall), LRT 3C-2 (11th/12th Street)	14,574	1,055	15,629
Segment 4	LRT 1A, LRT 3A(LPA), LRT 3A-1 (co-location alternative), LRT 3C-1 (Nicollet Mall), LRT 3C-2 (11th/12th Street)	10,575	120	10,695
Segment A	LRT 1A, LRT 3A(LPA), LRT 3A-1 (co-location alternative)	1,005	0	1,005
Segment C	LRT 3C-1 (Nicollet Mall), LRT 3C-2 (11th/12th Street)	10,938	2,034	12,812
Segment C – Sub-Alt 1st Avenue S	LRT 3C-2 (11th/12th Street)	353	0	353
Segment C – Sub-Alt Blaisdell Avenue S	LRT 3C-2 (11th/12th Street)	641	0	641
Segment C – Sub-Alt 11th/12th	LRT 3C-2 (11th/12th Street)	2,210	0	2,210
Study Area Totals		42,091	3,209	45,140

Source: WSB, 2010

On-street parking is permitted along several portions of the proposed fixed guideway. Some of the on-street parking within the City of Minneapolis is metered. On-street parking is metered on Nicollet Avenue between Franklin Avenue and Grant Street, as well as along 11th Street and 12th Street. Metered on-street parking rates range from $0.25 to $2.00 per hour. Where on-street parking is not metered, the number of spaces was determined by assuming that each parked car requires

22 feet of usable curb space. The number of existing on-street parking spaces along the proposed fixed guideway alignments is shown in Table 6.3-2.

Table 6.3-2. Existing On-Street Parking

Roadway	Existing Free Parking Spaces	Existing Metered Parking Spaces
Nicollet Avenue (Greenway to Franklin Avenue)	268	0
Nicollet Avenue (Franklin Avenue to Grant Street)	0	83
1st Avenue (Greenway to Franklin Avenue)	161	0
Blaisdell Avenue S (Greenway to Franklin Avenue)	154	0
11th Street W (Nicollet Avenue to Glenwood Avenue)	0	38
12th Street W (Nicollet Avenue to Glenwood Avenue)	0	96

Source: WSB, 2010

6.3.1.2 Freight Rail Operations

There are currently four active freight rail lines within the study area: the CP-owned Bass Lake Spur, the CP-owned MN&S Subdivision, the HCRRA's Cedar Lake Junction (locally referred to as the Kenilworth Corridor), and a short segment of the BNSF-owned Wayzata Subdivision from downtown Minneapolis to the MN&S Subdivision in St. Louis Park (Figure 6.3-1). According to data obtained from the Federal Railroad Administration (FRA) and the MN&S Freight Rail Study Environmental Assessment Worksheet (HCRRA, 5/2011), the number of trains operating in the study area is as follows:

- MN&S Spur - CP currently operates one local assignment (round trip) daily with a light tonnage train (10 to 30 car trains) on the MN&S Spur to serve local industries
- BNSF Wayzata Subdivision - eight to 20 trains run per day including TC&W.
- CP Bass Lake Spur and HCRRA Cedar Lake Junction TC&W operations include:
  - One freight train (round trip) with two to four locomotives and 50 cars operating six days per week
  - One freight train (round trip) with two to four locomotives and 20 cars operating three to four days per week
  - A unit ethanol train with two locomotives and 80 cars operating once every two weeks
  - A unit coal train with four locomotives and 120 cars, operating once every two weeks in one direction only

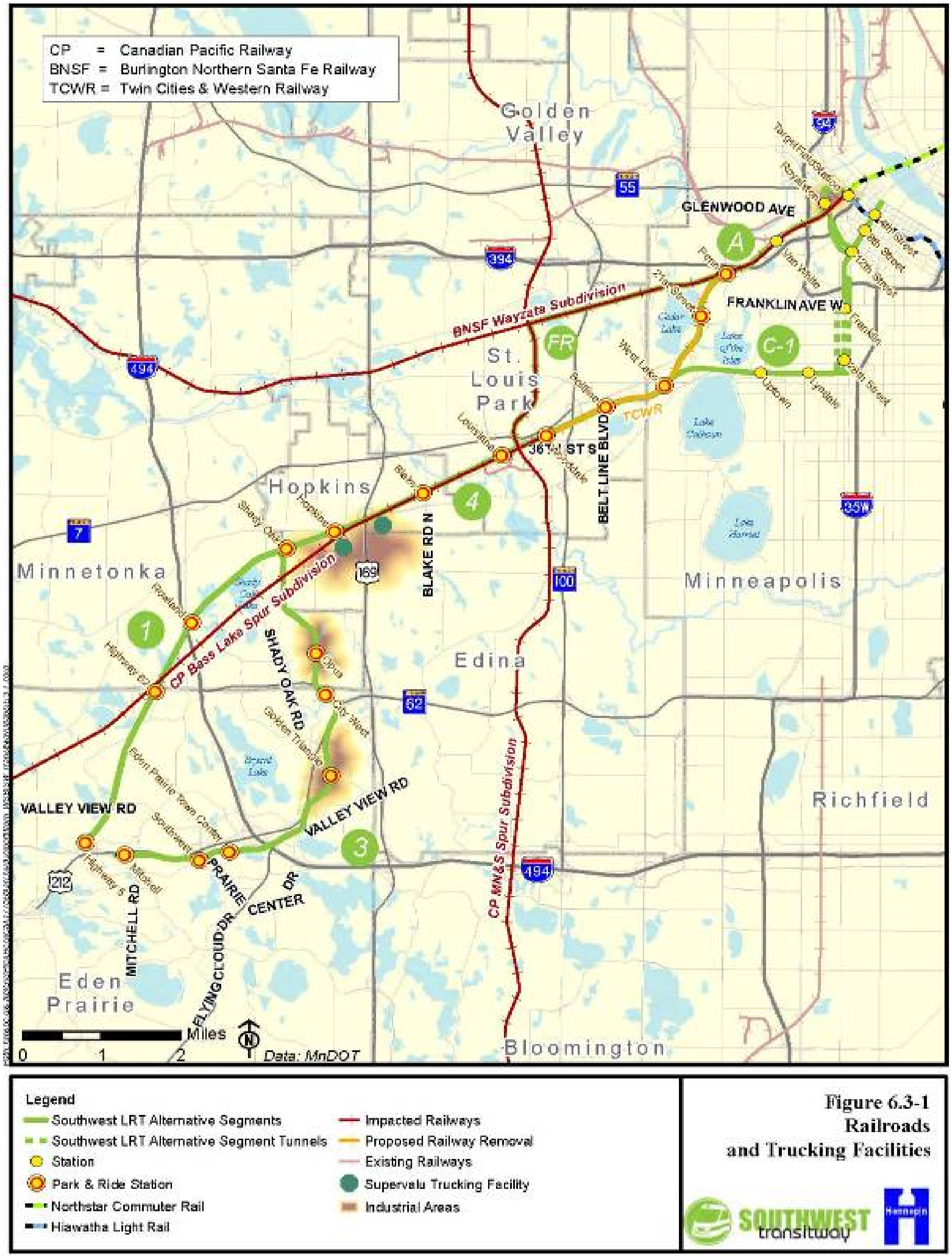


Figure 6.3-1 Railroads and Trucking Facilities

6.3.1.3 Trucking

The largest trucking operation along the proposed alignments is the Supervalu facility located in the City of Hopkins near Excelsior Boulevard. The Supervalu facility is located on two campuses with access from 5th Avenue South and Milwaukee Avenue South. In addition, many other smaller trucking facilities are located near proposed alignment or station areas. The proposed alignments pass through or near several industrial areas, particularly in Hopkins and the Golden Triangle, Opus, and Royalston areas of Eden Prairie, Minnetonka, and Minneapolis. For most businesses along the corridor, trucking is the primary mode used to transport products and supplies. Many businesses along the proposed alignments rely heavily on the trucking industry.

6.3.1.4 Bicycle and Pedestrian Facilities

The majority of the proposed alignments would be located within existing HCRRA property. Existing bicycle and pedestrian interim-use trails are located within the HCRRA corridors. Segments 1 and 4 are located almost entirely within the existing HCRRA ROW, which is currently used exclusively as the Minnesota River Bluffs LRT Regional Trail (Hopkins to Chaska) and the Cedar Lake LRT Regional Trail (Hopkins to Victoria). The Segment A alignment parallels the existing Kenilworth Trail and Cedar Lake LRT Regional Trail. The Segment C alignment is located in the Midtown Greenway trench and parallels the Midtown Greenway (Midtown Phase I/Phase II). These five trails are primary non-motorized corridors experiencing heavy use by bicycle and pedestrian commuters. The existing bicycle facilities along the proposed alignments are shown in Figure 6.3-2.

The City of Minneapolis and Transit for Livable Communities have conducted two-hour bicycle and pedestrian counts along these trails for the past several years. The annual counts are conducted in September and attempt to capture peak commuting hour traffic volumes. The two-hour bicycle and pedestrian volume counts are shown in Table 6.3-3. Although count data is not available, anecdotal accounts from many cyclists indicate that these weekday counts do not represent peak-hour trail volumes, which may occur on weekends when the trails are heavily used.

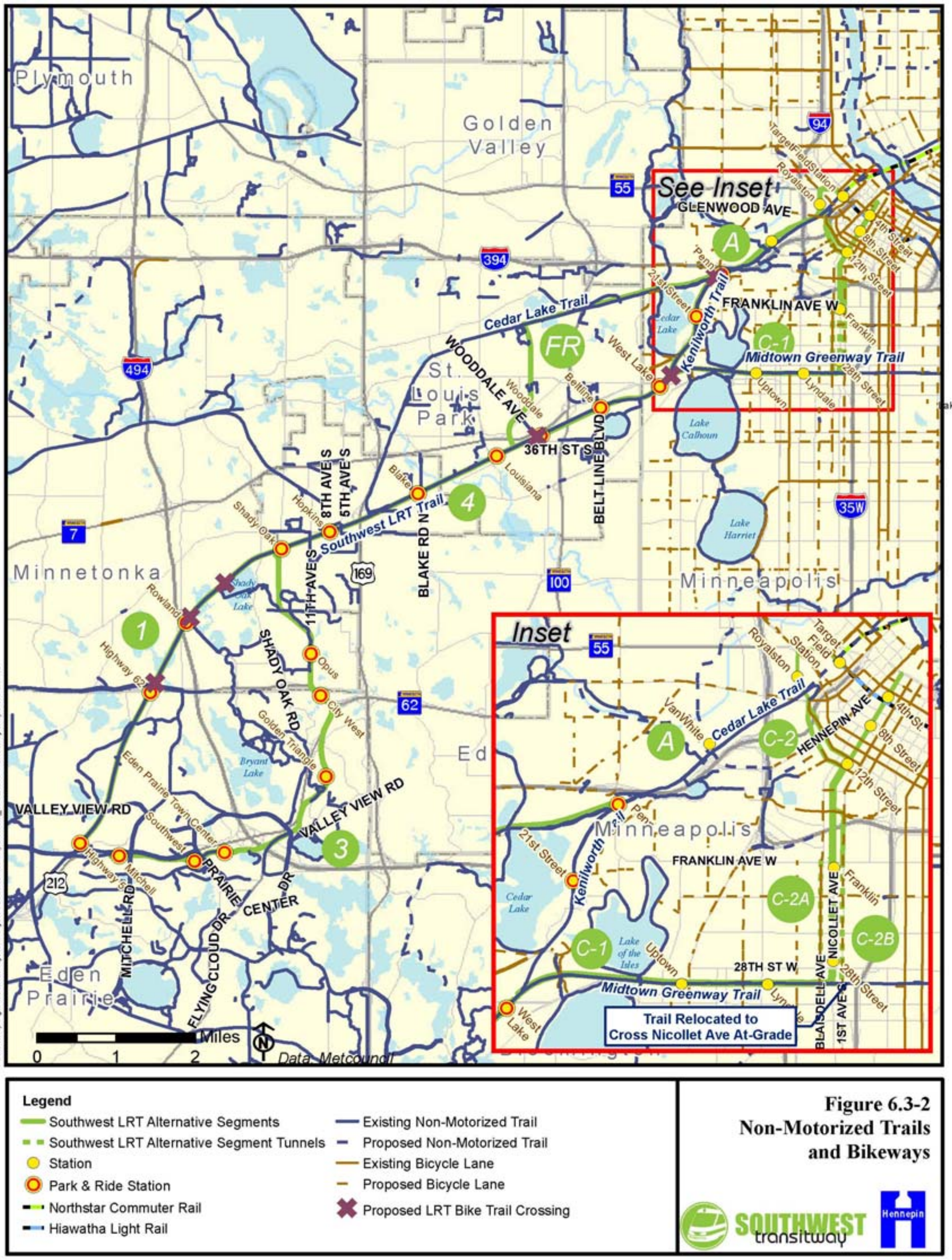


Figure 6.3-2
Non-Motorized Trails and Bikeways

Table 6.3-3. Two-Hour Bicycle and Pedestrian Counts

Location	Date	Two-Hour Counts		
		Bikes	Peds	Total
7th Street N, over I-94	9/8/2009	13	26	39
Cedar Lake Parkway, east of Kenilworth Trail	9/15/2009	122	50	172
Cedar Lake Parkway, west of Kenilworth Trail	9/15/2009	67	43	110
Cedar Lake Trail, east of Royalston	9/9/2009	154	8	162
Cedar Lake LRT Regional Trail, under I-394	9/17/2009	260	24	284
Cedar Lake LRT Regional Trail, west of Kenilworth Trail	9/17/2009	287	47	334
Franklin Avenue, west of Nicollet Avenue	9/8/2009	68	176	244
Glenwood Avenue, west of Royalston Avenue	9/9/2009	40	57	97
Kenilworth Trail, north of Cedar Lake Parkway	9/15/2009	359	51	410
Kenilworth Trail, south of Cedar Lake Parkway	9/15/2009	403	51	454
Midtown Greenway, west of Blaisdell Avenue	9/15/2009	698	60	758
Midtown Greenway, west of Hennepin	9/24/2009	564	81	645
N 1st Avenue, south of N 4th Street	9/17/2009	48	638	686
S 10th Street, east of S LaSalle Avenue	9/16/2009	74	981	1055
S 12th Street, south of S Harmon Place	9/15/2009	62	83	145
S Harmon Place, east of S 12th Street	9/15/2009	167	170	337
S LaSalle Avenue, south of S 10th Street	9/16/2009	144	436	580
SW LRT Trail, east of Beltline Boulevard	9/24/2009	364	44	408

SOURCE: City of Minneapolis, Transit for Livable Communities, Bike Walk Twin Cities

6.3.2 Long-Term Effects

The No Build and Enhanced Bus Alternatives would have no long-term effects on parking, freight rail, trucking, bicycle, and pedestrian movements. The Build Alternatives will have long-term effects on parking, freight rail, bicycle, and pedestrian movement along the Southwest Transitway alignment.

6.3.2.1 Build Alternatives

Parking Spaces Eliminated

Under the Build Alternatives, it is anticipated that parking would be eliminated at some locations along the transitway and the freight rail relocation alignments. The overall effect on parking spaces along the corridor can be evaluated in terms of the overall number of spaces removed relative to the effect of the transitway on the demand for parking. In some cases, the transitway alignment would necessitate the removal of existing buildings that generate demand for parking. If construction of the Southwest Transitway removes both the parking spaces and the buildings generating the demand for those parking spaces, there would be no overall effect on the available parking supply.

Review of conceptual construction limits along Segment 3 indicates that ROW acquisition and building removal would eliminate approximately 200 associated parking spaces. Along Segment 4, ROW acquisition and building removal would eliminate approximately 320 associated parking spaces. Construction of Segment C would involve the acquisition and removal of buildings on properties that currently provide off-street parking, as well as approximately 50 parking spaces associated with these properties. Because the demand for parking would be removed, there would be no overall loss of parking spaces relative to demand on these properties.

It is anticipated that the Build Alternatives would also reduce the number of parking spaces at some locations without also reducing the demand for parking. Segment 3 would remove some parking spaces at three additional properties (7400 Flying Cloud Drive – 44 spaces, 7075 Flying Cloud Drive – 22 spaces, and 11311 K-Tel Drive – 48 spaces). Segment A would affect parking at one property (173 Glenwood Avenue – 11 spaces). Segment FR would remove five parking spaces at 6980 Oxford Street in St. Louis Park. There may be additional locations determined during Preliminary Engineering where the alignment or station areas would reduce the number of existing off-street parking spaces, which will be included as part of the Final EIS.

On-street parking is currently permitted in locations where the LRT alignment would be at-grade within an existing roadway ROW. The number of on-street parking spaces, particularly around station areas, may be reduced along Nicollet Avenue (128 spaces), 1st Avenue South (56 spaces), Blaisdell Avenue (31 spaces), 11th Street (14 spaces), 12th Street (40 spaces), and Royalston Avenue (20 spaces).

The number of on-street and off-street parking spaces affected would be determined as more information becomes available during Preliminary Engineering and would be included in the Final EIS.

Parking Spaces Added for Build Alternatives

Additional parking would be added at many of the proposed stations as outlined in Section 2.2.3 of this Draft EIS. Depending on the number of spaces needed and the local constraints, parking may be in structures. The parking facilities are expected to generate additional traffic on local streets that provide access to the station areas. The estimated number of vehicle trips generated by the new parking facilities would be estimated using the trip rates from the most current edition of the Institute of Traffic Engineer's *Trip Generation Manual*. The total number of new spaces that would be provided at each station will be determined during Preliminary Engineering and reported in the Final EIS. Table 6.3-4 summarizes the number of parking spaces gained and lost by alternative.

Table 6.3-4. Summary of Parking Spaces Gained and Lost

	Spaces Gained	Spaces Lost
LRT 1A		
On-street parking	0	20
Off-street parking	2,050	11
LRT 3A (LPA)		
On-street parking	0	20
Off-street parking	1,950	650
LRT 3A-1 (Co-location alternative)		
On-street parking	0	20
Off-street parking	1,950	645
LRT 3C-1 (Nicollet Mall)		
On-street parking	0	128
Off-street parking	1,750	689
LRT 3C-2 (11th/12th Street)		
On-street parking	0	141
Off-street parking	1,750	689

Source: HDR, 2012, WSB 2010

6.3.2.2 Freight Rail Operations

With all of the Build Alternatives, irrespective of the freight rail relocation or co-location alternatives, some form of Surface Transportation Board (STB) oversight will be necessary with respect to freight rail operations. All actions taken at the direction of the STB will be documented in the Final EIS and, as appropriate, mitigation measures necessitated by the STB directed actions will also be documented.

Freight Rail Relocation

The freight rail relocation portion of the Southwest Transitway project would reroute freight rail traffic from the CP Bass Lake Spur Subdivision onto the CP MN&S Spur Subdivision. The freight rail relocation will include:

- The construction of direct northbound track connection elevated over the proposed SWLRT from the CP Bass Lake Spur to the CP MN&S Spur
- The construction of a direct track connection between the CP MN&S Spur and the BNSF Wayzata Subdivision
- Upgrade from 90-pound jointed to 136-pound continuously-welded track on the CP MN&S Spur between the new connection to the CP Bass Lake Spur on the south and the new connection to the BNSF Wayzata Subdivision on the north
- The construction of an 11,000-foot siding within the existing BNSF Wayzata Subdivision right-of-way

The physical improvements associated with the TC&W relocation in the City of St. Louis Park consist of needed track improvements to the existing CP Bass Lake Spur, CP MN&S Spur, and the BNSF Wayzata Subdivision to accommodate the TC&W freight rail traffic operations to and from St. Paul that currently operate in the

Kenilworth Corridor in Minneapolis. The proposed track improvements will primarily be within the City of St. Louis Park with some of the BNSF improvements crossing into the City of Minneapolis.

Currently, there is limited capacity in downtown Minneapolis on the BNSF Wayzata subdivision at the site of Target Field Stadium, also known as the Interchange. Constricted ROW at this location allows only two passenger tracks and one through-freight track, which carries significant volumes of train movements by BNSF and TC&W. Freight traffic through this area is expected to increase in the future with no easily accessed alternative for rerouting freight in this corridor. At the Target Field Stadium, the track configuration places a future capacity constraint on freight trains traveling from the south that need to continue to St Paul. As plans for additional passenger rail lines (commuter rail, intercity passenger rail, high speed rail) are implemented the capacity constraint at the Target Field site will be exacerbated and freight rail operations through this area will be extremely limited (*Minnesota Comprehensive Statewide Freight and Passenger Rail Plan*, 2009). Rerouting of the TC&W freight traffic from the Kenilworth corridor to the MN&S Spur would provide TC&W with an alternative route by way of CP's Humboldt Yards that bypasses the Interchange area.

<u>Freight Rail Co-location</u>

With LRT 3A-1 (co-location alternative) there would be associated freight rail modifications. Based on industry standards for BNSF, all new track constructed will call for a minimum 25-foot clearance offset for track centers from the LRT to freight line and from freight track center to the right-of-way line. In addition, according to AREMA a 25-foot clearance offset is required between bridge piers or other structural supports without needing a crash barrier.

Just west of Wooddale Avenue at approximately station 980+00 (see Conceptual Engineering in Appendix F), the location of the freight tracks would shift from the south side of the corridor to the north side and in doing so would pass under a proposed LRT overpass. The shift of the freight tracks would continue until just south of I-394 where the alignment would tie into existing BNSF tracks. This construction would also impact the multiuse pedestrian trail, shifting from the north to south side of the corridor and crossing at Wooddale Avenue. The shifting of the freight rail tracks would necessitate construction of new (115 pound) track and roadbed. For construction of the co-located TC&W freight line there would be bridge construction at TH-100, and the Cedar Lake-Lake of the Isles Channel. In locations where TC&W follows the existing freight railroad tracks, the project would include reconstruction providing upgraded (115 pound) track and roadbed.

6.3.2.3 Trucking

There are not anticipated to be significant long-term effects on trucking operations associated with any of the Build Alternatives. The largest trucking operation along the proposed alignments is the Supervalu facility located in the City of Hopkins near Excelsior Boulevard. The Supervalu facility is located on two campuses with access from 5th Avenue South and Milwaukee Avenue South. The Segment 4 alignment crosses 5th Avenue South at grade. All trucks using the 5th Avenue access point would be obliged to cross the fixed guideway near an existing freight rail crossing.

The grade crossing is not anticipated to have any significant long-term effects on large trucks accessing the Supervalu facilities. Other trucking facilities are likely to be similarly affected by grade crossings, but no significant impacts are anticipated.

6.3.2.4 Bikeways and Major Pedestrian Facilities

The largest impacts of the Build Alternatives on the pedestrian and cycling environment are those to the interim trails. Currently, there are five trails on HCRRA property that may be affected by a Southwest Transitway line. They are the Minnesota River Bluffs LRT Regional Trail, Cedar Lake LRT Regional Trail, the Kenilworth Trail, the Cedar Lake LRT Regional Trail, and the Midtown Greenway. The conceptual engineering developed for this Draft EIS indicates that there is sufficient space within the HCRRA's ROW for the Build Alternatives and the interim-use trails to coexist; therefore, with the exception of the Midtown Greenway in Segments C-1 and C-2, long-term impacts on the capacity and operations of the interim-use trails is not anticipated. For safety reasons, it is likely that fencing or other measures to separate the bicycles and pedestrians from the LRVs would be necessary, with crossing of the tracks allowed at roadway intersections and station locations.

According to LRT design standards developed by Metro Transit, traffic signals with pedestrian indicators would be required at all locations where trails cross the Build Alternatives. The grade crossings are not anticipated to result in significant delays for trail users. The trail users, however, may be obliged to travel longer distances than today because of fencing and the consolidation of access points at, primarily, station locations.

<u>Segment 1 (Build Alternative LRT 1A)</u>

In Segment 1 the Minnesota River Bluffs LRT Regional Trail and Cedar Lake LRT Regional Trail are proposed to cross the Build Alternative at West 62nd Street, Rowland Road, and Dominick Drive. In Segment 1, the existing grade crossing at Venture Lane would be relocated approximately 300 feet south of the existing crossing.

<u>Segment 1 (Build Alternative LRT 1A)</u>

In Segment 1 the Minnesota River Bluffs LRT Regional Trail and Cedar Lake LRT Regional Trail are proposed to cross the Build Alternative at West 62nd Street, Rowland Road, and Dominick Drive. In Segment 1, the existing grade crossing at Venture Lane would be relocated approximately 300 feet south of the existing crossing.

<u>Segment 3 [Build Alternatives LRT 3A (LPA), LRT 3A-1 (Co-location alternative), LRT 3C-1(Nicollet Mall) and LRT 3C-2 (11th/12th Street)]</u>

In Segment 3, several sidewalks or local trails would be relocated to accommodate the Build Alternative, particularly in the Golden Triangle area of Eden Prairie and Opus area of Minnetonka. Approximately 800 feet of local trail on private property would be removed near the Golden Triangle Station Park-and-Ride.

With LRT 3A-1 (co-location alternative) Cedar Lake LRT Regional Trail would have at-grade crossings with freight rail traffic at the Penn Station and just west of the Wooddale Station.

Segment 4 [Build Alternatives LRT 1A, LRT 3A (LPA), LRT 3A-1 (Co-location alternative), LRT 3C-1 (Nicollet Mall) and LRT 3C-2 (11th/12th Street)]

In Segment 4, the Minnesota River Bluffs LRT Regional Trail is proposed to cross the Build Alternative at Wooddale Avenue.

Segment A [Build Alternatives LRT 1A, LRT 3A (LPA), and LRT 3A-1 (Co-location alternative)]

In Segment A, the Cedar Lake LRT Regional Trail is proposed to cross the Build Alternatives in one location, 1,200 feet southwest of the I-394 bridge. With LRT 3A-1 (co-location alternative) Cedar Lake LRT Regional Trail is proposed to cross the freight rail tracks just west of Wooddale Station and again at Penn Station.

Segments C-1 and, C-2 [Build Alternatives LRT 3C-1 (Nicollet Mall) and LRT 3C-2 (11th/12th Street)]

In Segment C-1, the Cedar Lake LRT Regional Trail is proposed to cross the Build Alternative northeast of the Lake Street bridge.

In Segment C-1, construction of the Build Alternative would necessitate substantial modifications to the Midtown Greenway. With the current placement of the bridge piers, the Build Alternative would entail the narrowing of the existing Midtown Greenway. Narrowing of the Midtown Greenway would have a long-term effect by reducing the capacity of the trail.

In addition, the Midtown Greenway would be relocated from the HCRRA owned Midtown Corridor just west of Nicollet Avenue in order to accommodate the Build Alternative's entry to a tunnel under Nicollet Avenue. To accommodate the tunnel the Midtown Greenway users would be directed to exit the Midtown Corridor at Nicollet Avenue using the trail access ramp, then to cross Nicollet Avenue at grade, and then to reenter the Midtown Corridor west of Nicollet Avenue. The forced exit and reentry into the Midtown Corridor may reduce its current function as a commuter bicycle facility. In addition, cyclists and pedestrians crossing Nicollet Avenue would introduce a conflict among cars, pedestrians, and cyclists, especially if Nicollet Avenue is reopened at a future date.

In the section of Segment C-1 between Franklin Avenue and Grant Avenue, the Build Alternative would be at-grade, center-running. Current design standards would only permit cyclists and pedestrians to cross the Build Alternative at signalized locations. Because several intersecting roadways would become right-in right-out controlled, pedestrians and cyclists would not be permitted to cross Nicollet Avenue at these locations.

The construction of LRT on Nicollet Mall is assumed to entirely remove bicyclists from Nicollet Mall.

In Segment C-2, the Build Alternatives are assumed to be at-grade, side-running, which would likely impact the existing bicycle lanes on 11th and 12th streets.

Implementation of the Build Alternatives is likely to result in an improvement for pedestrians and cyclists immediately surrounding the proposed station areas. Station areas would be designed to provide access to and from stations by walking and biking. Station areas would include amenities such as bicycle lockers, bicycle racks, and covered seating areas. In most station areas, it is likely that new sidewalks and trails would be constructed to accommodate and encourage pedestrian activity. Stations would employ ADA compliant design standards and would place special emphasis on creating neighborhood interconnectivity.

6.3.3 Short-Term Construction Effects

The No Build and Enhanced Bus Alternatives would have no short-term construction effects on parking, freight rail, trucking, or bicycle and pedestrian movements.

6.3.3.1 Build Alternatives

Short-term construction effects to parking are anticipated in all Build Alternatives. Perhaps the most substantial impact to parking would be the temporary loss of on-street parking along Nicollet Avenue between 29th Street and Franklin Avenue. While construction of the shallow tunnel would occur only on one side of the street at a time, it is likely that no parking would be allowed on either side of Franklin Avenue during construction. The loss of on-street parking and construction disruptions could have a substantial impact on small businesses along the corridor. Construction activities may also result in a temporary loss of access to privately-owned off-street parking lots along Nicollet Avenue. The full extent of the impacts on parking will be determined during Preliminary Engineering and outlined as part of the Final EIS.

It is anticipated that there would be short-term construction effects to both trucking facilities and freight railroads.

Short-term construction effects to bicyclists and pedestrians are also anticipated in all Build Alternatives. In Segments 1, 4, A, and C, some disruptions to the existing regional trails are anticipated during construction. The extent to which the trails would be available for use throughout the process of relocation will be determined during Preliminary Engineering. Disruptions to the existing sidewalk network are anticipated in all Build Alternatives. Some of the most substantial disruptions are anticipated to occur in Segment C along all portions of Nicollet Avenue north of 29th Street. Between 29th Street and Franklin Avenue, the extensive nature of the construction of the shallow tunnel and the planned full replacement of all sidewalks would result in substantial temporary disruptions to the corridor. Construction on Nicollet Mall is also anticipated to disrupt pedestrians.

For LRT 3A-1 (co-location alternative) TC&W freight rail service may be obliged to use temporary trackage during LRT construction.

Closure of Louisiana Avenue during construction would be coordinated with the City of St. Louis Park and Hennepin County. Nighttime lane closure on TH 7 would be coordinated and scheduled with MnDOT. Detours and adherence to local construction times would occur during construction and be coordinated with the facilities.

6.3.3.2 Freight Rail Relocation

Timing and Duration

It is anticipated that implementation of the freight rail relocation would occur over two construction seasons. Bridge and retaining wall piling and foundation work, as well as clearing and grubbing work, can occur during the winter months. Other activities such as placement of subballast and ballast, track welding, and intersection grading and paving would be done during the traditional construction season when ambient temperatures remain above freezing. It is anticipated that construction would occur within the available ROW for most of the alignment. The exception would be the work to be done along the CP Bass Lake Spur between Minnehaha Creek and the MN&S Spur. Temporary and permanent easements would be required in this area to accommodate construction outside of the in-place railroad ROW. This includes the area on the north and south sides of the CP Bass Lake Spur.

Disruption to Rail Operations

Track reconstruction and line/surfacing work along MN&S would likely be done during 8-hour track outages. Grade crossing and Quiet Zone improvements would likely be constructed during 48-hour weekend closures (for road and civil work), with 2- to 8-hour track outages. It is expected that accelerated construction methods would be utilized to minimize track outages. Precast substructure components may be used to eliminate concrete curing time. It is assumed that a 1-week to 4-week outage would be needed to remove and reconstruct the MN&S bridge over TH 7 and the TH 7 South Frontage Road. A 1-week to 4-week track outage may necessitate temporary re-routing of TC&W freight rail traffic elsewhere within the Twin Cities. If railroads find the duration of the track outage to be unacceptable, it may be necessary to construct a temporary alignment and bridge structure. It is assumed that TC&W would continue operations on the CP Bass Lake Spur during construction of other elements of the freight rail relocation.

Disruption to Roadway and Pedestrian Traffic

It is expected that grade crossing and Quiet Zone improvements will likely be constructed during 48-hour weekend closures (for road and civil work), with 8-hour track outages. Construction signage and traffic control devices will be provided and vehicular/pedestrian traffic will be detoured around the grade crossing construction zone. It is assumed that lane closures will be needed on Louisiana Avenue to facilitate construction of the proposed MN&S connecting track bridge over Louisiana Avenue. This work will be closely coordinated with the city and county. Nighttime lane closures would be needed on Highway 7 to facilitate construction of the proposed MN&S bridge over TH 7. This work will be closely coordinated and scheduled with MnDOT. All closures would also be coordinated with Methodist Hospital to ensure continued availability of emergency vehicle routes and/or suitable detours.

Temporary trail closure would be anticipated for portions of the Cedar Lake LRT Regional Trail along the CP Bass Lake Spur, due to bridge demolition and construction. Duration would be eight to 12 hours. The proposed overpass of the

Cedar Lake LRT Regional Trail along the BNSF alignment would necessitate temporary re-routing and potential 48-hour trail closures.

6.3.3.3 LRT 3A-1 (Co-location alternative)

In order for freight rail operation to continue uninterrupted during construction of LRT 3A-1 (co-location alternative), multiple **shoofly operations** are proposed. The co-location alternative would install 115RE track for both LRT and freight rails, which will allow for the tracks to be used by either vehicle. As proposed track is constructed the multi-use trail in adjacent locations will also be constructed.

> "Shoofly operations" refers to freight rail operations on temporary trackage used to detour around a construction site.

Phase1: The proposed LRT tracks would be constructed from station 910+00 to the east end of the co-location alignment and from station 725+00 to station 833+00. At the same time, the freight tracks would be reconstructed from station 840+00 to 903+00 and include the proposed freight turnouts under the proposed LRT bridge over the freight rail track. To connect the freight and LRT tracks, temporary tracks would be installed. At station 725+00, a temporary turnout would be installed from the existing freight line to the proposed LRT tracks. A temporary turnout would be installed at station 910+00 of the proposed LRT tracks, but would not tie in or cross the existing freight tracks. At station 910+00 there would be a temporary tie in between the existing freight track and the new proposed LRT tracks. When this phase of construction is complete freight traffic could be shifted to the proposed LRT tracks at station 910+00.

Phase2: The existing freight tracks from station 910+00 to the east end of the co-location alignment would be demolished. Then at station 910+00 the temporary turnout from the proposed LRT tracks to the newly constructed freight tracks could be connected. Freight traffic could then be shifted from its existing alignment to the newly constructed LRT/freight tracks.

Phase3: Proposed new freight tracks and tie-ins would be constructed from the proposed LRT overpass west. Then the proposed LRT bridge over the freight rail track could be constructed with construction not impacting freight rail operations. New freight tracks would be constructed from station 910+00 east and tie into its adjacent, previously constructed freight tracks. Freight traffic could now shift to proposed freight alignment.

Phase4: Remaining pieces of proposed LRT tracks would then be constructed, and all temporary tracks would be demolished. LRT would then run on its proposed alignment.

For LRT 3A-1 (co-location alternative) continued TC&W freight rail operations would require temporary track construction and use of shoofly operations. An agreement with TC&W would need to be developed during the design process.

6.3.4 Mitigation

Private parking associated with businesses or residences may be reduced in some cases. Property owners would be compensated for loss of parking in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act.

Where the eliminated parking spaces are associated with the displacement of a business or residence, no mitigation would be required. Where eliminated spaces are associated with partial property acquisitions, mitigation could include replacing lost spaces on nearby property or could be determined in the final agreement with the property owner consistent with the requirements of the Uniform Relocations and Real Property Assistance Act of 1970, as amended.

The impacts to freight railways, trucking facilities, pedestrians, and cyclists would be minimized through a traffic management plan that would be developed to minimize the short-term construction effects. Construction documents would require the contractor to comply with all traffic management best practices and local regulations. A traffic management plan would be developed to minimize the impacts to truck and freight rail movement. A traffic management plan would be developed to document how pedestrians and bicyclists would be accommodated during construction.

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