6.0 TRANSPORTATION

This chapter provides an analysis of the transportation impacts of the Central Corridor Light Rail Transit (LRT) Project alternatives described in Chapter 2 of this document. The chapter describes the Key Project Elements and their associated changes to the adopted Locally Preferred Alternative (LPA). Evaluation of these alternatives is based on the projected ridership, transportation network capacity, transportation system performance measures, traffic impacts to the roadway network, and anticipated construction impacts on these facilities. The data for the transit and roadway analyses were generated from the regional travel demand forecasting model used by the Metropolitan Council for the Twin Cities area. The methodology used to assess these impacts is consistent with those discussed in Chapter 6 of the Central Corridor Alternatives Analysis and Draft Environmental Impact Statement (AA/DEIS).

Section 6.1 provides an overview of the methodology and anticipated effects on the existing and future transit operations based on the proposed changes to the AA/DEIS LPA.

Section 6.2 provides an overview of the methodology and anticipated effects on the existing and future roadway traffic operations and on the 2030 transportation network based on the proposed changes to the AA/DEIS LPA.

Section 6.3 discusses the long-term impacts of the proposed changes to the AA/DEIS LPA on parking, pedestrians, bicycles, and other transportation facilities.

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 set. The model set and its components are of the same type as those used in most large urban areas in North America. The model uses what is known as the standard four-step planning process of trip generation, trip distribution, mode choice, and traffic/transit assignment. The structure of the model and the process of applying it to transportation studies are consistent with the method endorsed by the Federal Transit Administration (FTA) and the Federal Highway Administration (FHWA). The forecast year for the model is 2030.

The primary inputs used in the model are the Central Corridor LRT Study Area population, employment, household and socioeconomic characteristics, parking costs, transit fares, automobile operating costs, and highway and transit levels of service (LOS). The model set simulates travel on the entire transit and highway system within the Twin Cities metropolitan area. As such, it contains all the existing and planned rail and bus lines. The model contains service frequency (i.e. how often trains and buses arrive at any given transit stop), routing, travel time, and fares for all 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 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 SDEIS, the evaluation of the No-Build Alternative, Baseline Alternatives and proposed modifications to the AA/DEIS LPA are 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 the LRT, and transportation system user benefits (TSUB).

6.1.2 Major Changes in Technical Assumptions

Since the AA/DEIS was completed, several changes have occurred in the existing and planned transit system in the following areas: LRT alignment, station size and locations, supporting bus system, LRT end-to-end travel times, and a Vehicle Maintenance and Storage Facility in downtown St. Paul. Another significant change was the horizon year used in the travel forecasting model—in the AA/DEIS, the horizon year was 2020, but in the SDEIS it is 2030. Collectively, all these changes resulted in significantly higher ridership forecasts for all the SDEIS alternatives than for the AA/DEIS alternatives. The revised preliminary ridership forecasts are presented in this chapter. Final travel demand output based on revisions during preliminary engineering will be presented in the FEIS.

6.1.3 Description of Transit Service Plan

The transit service plan associated with the No-Build Alternative, AA/DEIS LPA and the proposed changes to the LPA are restated briefly in this chapter to facilitate interpretation of ridership impacts.

6.1.3.1 No-Build Alternative

The No-Build Alternative includes roadway and bus system improvements along the University Avenue and I-94 corridors as specified in the appropriate agency Transportation Improvement Programs (TIP) and 2030 Transportation Policy Plan for which funding has been committed. The current transportation and transit facilities and services, with minimal modifications or expansions, form the basis for this alternative. Further details describing the No-Build Alternative, and all regionally constrained projects included in it are documented in Section 2.3.1 of the AA/DEIS. Under the No-Build Alternative, transit service in the Central Corridor would be provided using four primary bus routes: 16, 21, 50, and variations of 94 as shown in Table 6-1.

6.1.3.2 Baseline Alternative

The Baseline Alternative consists of improvements to the transit system that are relatively low in cost and the “best that can be done” to improve transit without major capital investment for new infrastructure. For the Central Corridor LRT project, the Baseline Alternative would use an enhanced Route 50 limited stop service along University Avenue to provide improved future transit service. This route would stop at the same locations as the proposed Central Corridor LRT station locations (including the revised downtown St. Paul alignment). Due to the lower loading capacity of buses versus light rail vehicles, the Baseline Alternative assumes shorter service headways of 6 minutes (7.5 was assumed for the AA/DEIS LPA) during peak hours to manage forecast loads. The Baseline Alternative would require 23 additional vehicles over existing service. Feeder bus service to the enhanced Route 50 would be required under the Baseline Alternative and would be identical to the service assumed for the Central Corridor LRT Alternative as described in this document and as illustrated in Figure 6-1.

Table 6-1 Transit Service Plan Headways (Minutes)

	Year 2000	Year 2030		
		No Build	Baseline	Proposed Changes to the AA/DEIS LPA
16 Peak 16 Off-peak	10 10	10 10	20 30	20 30
21 Peak 21 Off-peak	10 15	10 15	10 15	10 15
50 Peak 50 Off-peak	30 60	30 60	6 10	n/a n/a
94 B Peak 94 B Off-peak	20 30	30 n/a	30 n/a	30 n/a
94C Peak 94 C Off-peak	n/a 30	30 n/a	30 n/a	30 n/a
94 D Peak 94 D Off-peak	20 n/a	20 30	20 30	20 30
LRT Peak LRT Off-peak	n/a n/a	n/a n/a	n/a n/a	7.5 10

Source: Metropolitan Council Engineering Services Consultant, March 2008

The current Baseline Alternative is slightly different from the one assumed in the AA/DEIS. Changes are summarized as follows:

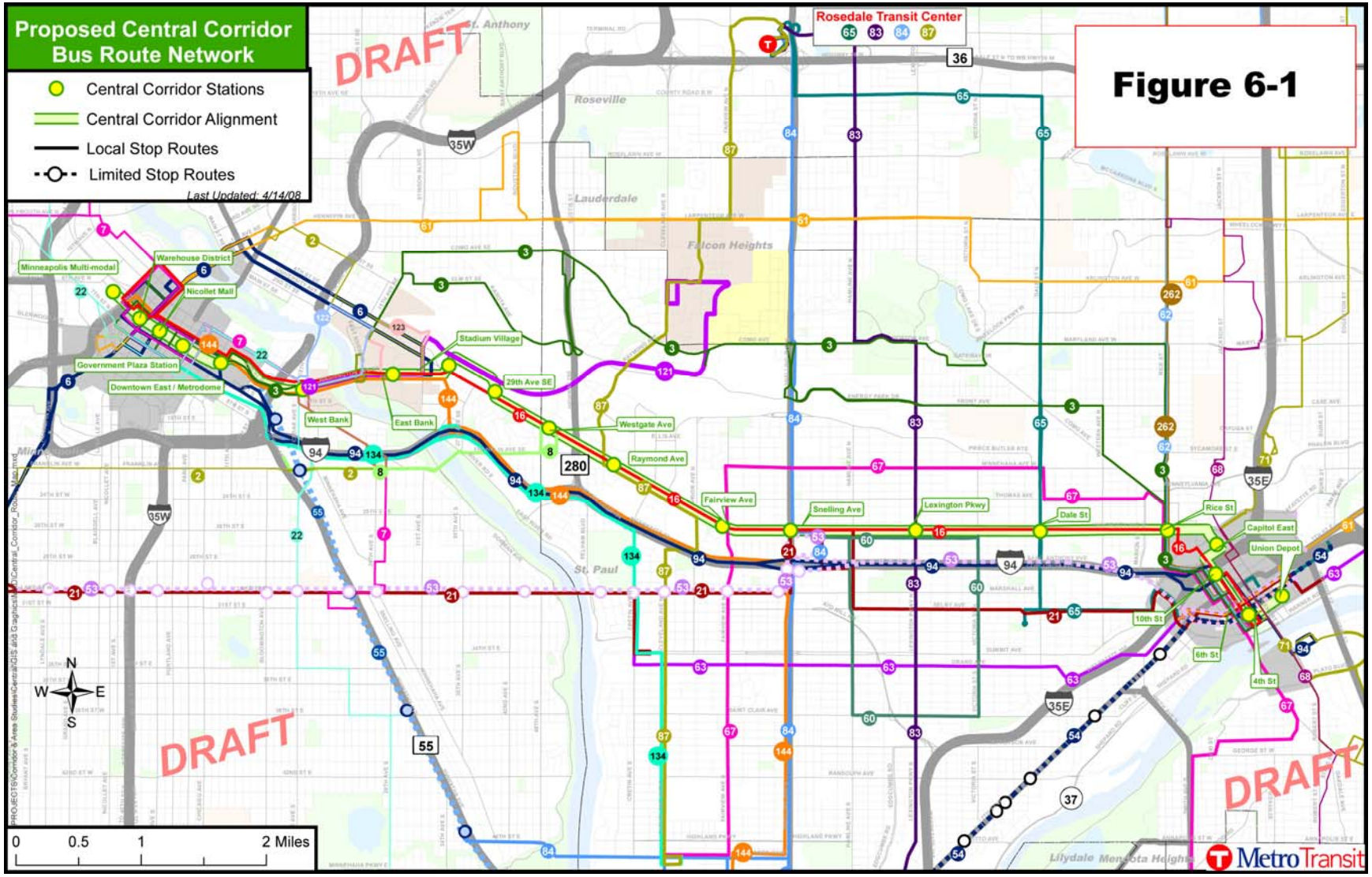
- Route 16 – AA/DEIS assumption of 10-minute all-day service frequency is modified to 20-minute peak period, 30-minute midday, evening, and weekend (same as AA/DEIS LPA service);
- Route 50 (new Baseline Service) – AA/DEIS assumption of 15-minute peak/30-minute midday (no evening or weekend service) is modified to 6-minute peak/10-minute midday, evening and weekends;
- Route 94B – Eliminated midday and weekend service; and
- Route 94C – Eliminated weekday midday and evening service.

6.1.3.3 Proposed Changes to the AA/DEIS LPA

From the standpoint of the overall transportation network, the most significant proposed change to the AA/DEIS LPA will occur on Washington Avenue on the University of Minnesota's (U of M) East Bank campus. Proposed changes to the AA/DEIS LPA assume the LRT would operate at-grade on Washington Avenue—the AA/DEIS assumed the LRT would operate below-grade in a tunnel. Other proposed changes to the AA/DEIS LPA include changes to the location of LRT stations on the East Bank Campus. The Stadium Village Station would be located at the proposed U of M multi-modal center and the East Bank Station would be located on Washington Avenue at Union Street.

.

FIGURE 6-1 PROPOSED CENTRAL CORRIDOR BUS ROUTE NETWORK



The service frequencies of the LRT service would continue to be the same as in AA/DEIS i.e. 7.5 minute in peak periods and 10 minute during midday period. The average operating speed of the LRT would be about 16 MPH. The total end-to-end travel time is projected to be about 40 minutes. There would be 20 stations along the alignment. The first five stations on the western portion of the alignment would be common to both the Central Corridor LRT and the Hiawatha LRT line. Intermodal connections with the underlying bus network would be provided at key stations. Bus routes 2, 3, 6, 8, 21, 53, 60, 62, 262, 63, 65, 67, 83, 84, 87, 134, 144 and all of the U of M bus routes would have intermodal connectivity with the Central Corridor LRT. Figure 6-1 shows the entire proposed Central Corridor LRT alignment, station locations, and the connecting bus network.

6.1.4 Long-Term Effects

6.1.4.1 System-Wide Impacts

The transit trips projected for the alternatives were estimated using linked and unlinked passenger trips. A linked passenger trip includes segments of travel from point of origin to point of final destination as a single trip, regardless of transfers or intermediate stops. As such, the number of linked passenger trips provides an estimate of the number of people using the transit system. An unlinked passenger trip counts each segment of an overall trip as a separate unlinked trip. Unlinked passengers trips represent the activity experienced by each route segment and travel mode. In presenting the analysis of transit patronage, both linked and unlinked passenger trips are reported to provide a comprehensive assessment of each alternative.

Table 6-2 provides a summary of projected daily performance measures for the 2030 No-Build Alternative, Baseline Alternative, and for proposed changes to the AA/DEIS LPA. As seen from the table, under the No-Build Alternative, it is projected there would be 338,550 linked trips on the transit system. When service improvements are added to Route 50 (in addition to feeder bus system improvements) as part of the Baseline Alternative, the number of linked transit trips increases to 340,250 or by about 1,700 trips a day. The increase in transit trips would be as a result of people switching from auto to transit mode. This means, in the Baseline alternative, there would be 1,700 fewer auto person trips. When expressed in terms of auto vehicles, this reduction would translate to 1,400 fewer auto vehicles per day on the region's roadway system. For the purpose of converting auto person trips to auto vehicle trips, an average auto occupancy of 1.2 was used (i.e. 1.2 people per auto). Under changes to the AA/DEIS LPA, the system wide linked transit trips are projected to go up by another 6,400 trips a day, compared to the Baseline alternative. Stated differently, there would be 6,400 fewer auto person trips under the build alternative (i.e. under changes to the AA/DEIS LPA). In terms of auto vehicle trips, there would be 5,350 fewer autos on the region's roadway system. When compared to the No-Build alternative, the build alternative would contribute to a reduction of 6,750 (i.e. 1,400 + 5,350) auto trips in the region per day

Table 6-2 Summary of Transit Ridership Forecasts for 2030

	No-Build Alternative	Baseline Alternative	Proposed Changes to AA/DEIS LPA
System-wide linked transit trips	338,550	340,250	346,650
New transit trips	N/A	1,700 (relative to No-Build Alternative)	6,400 (relative to Baseline Alternative)
Approximate number of auto trips reduced regionally		1,400	5,350
System-wide Unlinked Trips			
Local Bus	350,200	354,000	327,250
Express Bus	102,400	102,150	97,950
LRT	35,250	35,400	78,150
Commuter rail	1,300	1,350	1,350
Total	**489,150**	**492,900**	**504,700**
Increase in unlinked trips	N/A	3,750 (relative to No-Build Alternative)	11,800 (relative to Baseline Alternative)
Corridor Trips			
Bus Boardings	53,800	59,900	23,300
Light Rail Boardings	n/a	n/a	41,800
Total Boardings	53,800	59,900	65,100
Increase in corridor boardings	n/a	6,100 (relative to No-Build Alternative)	5,200 (relative to Baseline Alternative)
Daily Passenger Miles	2,531,400	2,553,620	2,603,390
Daily Passenger Hours	134,180	134,110	135,940
System-wide daily vehicle miles of travel (VMT)	109,181,600	109,159,300	109,106,100
Decrease in VMT	n/a	22,300 (relative to No-Build Alternative)	53,200 (relative to Baseline Alternative)

Source: Model results generated by Metropolitan Council Engineering Services Consultant, March 2008

Note: Results presented in this table represent preliminary Transit Ridership Forecasts for 2030. Final travel demand output and ridership results based on refinements to model inputs and to the project will be presented in the FEIS.

In terms of unlinked trips, the No-Build Alternative would carry 489,150 trips (see Table 6-2). Under the Baseline Alternative, the unlinked transit trips would increase by 3,750 a day to total 492,900. Most of the increase is due to the service improvements on Route 50. Under proposed changes to the AA/DEIS LPA, the Central Corridor LRT is projected to carry an additional 11,800 unlinked trips system-wide (total of 504,700). The Central Corridor LRT is projected to carry 41,800 trips a day in the year 2030. Approximately 50 percent of the trips on the line would be work-related trips resulting from linking the two central business districts and significant employment centers at the U of M and Capitol Area.

6.1.4.2 Corridor Trips

Within the study area, the No-Build Alternative is projected to carry 53,800 boardings a day on the bus system. With the improved service on Route 50 in the Baseline Alternative, the corridor ridership is projected to increase by 6,100 a day, or 59,900 total trips. Implementation of the Central Corridor LRT line would add another 5,200 trips a day in the corridor for a total of 65,100.

System Productivity

The Metropolitan Council model projects the Central Corridor LRT will provide 2.8 percent more passenger miles of service and 1.3 percent more passenger hours of service per day than the No-Build Alternative. This represents a moderate increase in system productivity.

6.1.4.3 Vehicle Miles of Travel on the Highway System

As discussed earlier, the Central Corridor LRT would contribute to about 6,750 fewer auto trips in the region as more patrons switch from auto to transit modes. The reduction in automobile trips would result in a decrease in regional vehicle miles traveled (VMT). The model results indicate there would be about 75,500 fewer VMT under the proposed changes to the AA/DEIS LPA than the No Build Alternative. The reduction in VMT would contribute to reductions in air pollutants from vehicles and ease congestion.

6.1.4.4 LRT Station Volumes

Table 6-3 presents the estimated 2030 LRT boardings at each station along the proposed alignment. The first five stations starting from the Downtown Minneapolis Ballpark Station would be common to both the Hiawatha LRT and Central Corridor LRT. The daily boardings shown for these stations are for the Central Corridor LRT only and do not include boardings for the Hiawatha LRT line. As shown in Table 6-3, 2030 Central Corridor Daily Volumes by Station, the East Bank and Nicollet Mall stations are among the top stations and are projected to have daily boardings of about 6,840 and 6,650 respectively. Downtown East/Metrodome and Warehouse District/Hennepin Avenue stations would have the next highest boardings—about 4,190 and 3,420 a day. With the exception of three stations, all the other stations on the Central Corridor LRT line would carry 1,000 or more boardings per day. Model results indicate 65 percent of the daily LRT boardings would occur during the peak periods.

Table 6-6-3 2030 Central Corridor LRT Daily Volumes by Station

Weekday Boardings			
Station	Peak hours	Off-Peak hours	Total Daily
Downtown Minneapolis Ballpark Station	600	280	880
Warehouse District/Hennepin Avenue	2,210	1,210	3,420
Nicollet Mall	4,540	2,110	6,650
Government Plaza	520	260	780
Downtown East / Metrodome	2,740	1,450	4,190
West Bank Station	950	310	1,260
East Bank Station	4,230	2,610	6,840
Stadium Village Station	720	280	1,000
29th Avenue Station	670	290	960
Westgate Station	740	390	1,130
Raymond Avenue Station	840	420	1,260
Fairview Avenue Station	1,370	620	1,990
Snelling Avenue Station	1,240	1,410	2,650
Lexington Parkway Station	640	480	1,120
Dale Street Station	410	290	700
Rice Street Station	870	440	1,310
Capitol East Station	310	140	450
10th Street Station	1,460	920	2,380
4th and Cedar Streets Station	880	390	1,270
Union Depot Station	960	590	1,550
Total Daily Boardings	**26,900**	**14,890**	**41,790**

Source: Model results generated by Metropolitan Council Engineering Services Consultant, March 2008

Note: Results presented in this table represent preliminary 2030 Daily Volumes by Station. Final ridership results based on refinements to model inputs and to the project will be presented in the FEIS.

6.1.4.5 Beneficiaries of the Central Corridor Light Rail Project

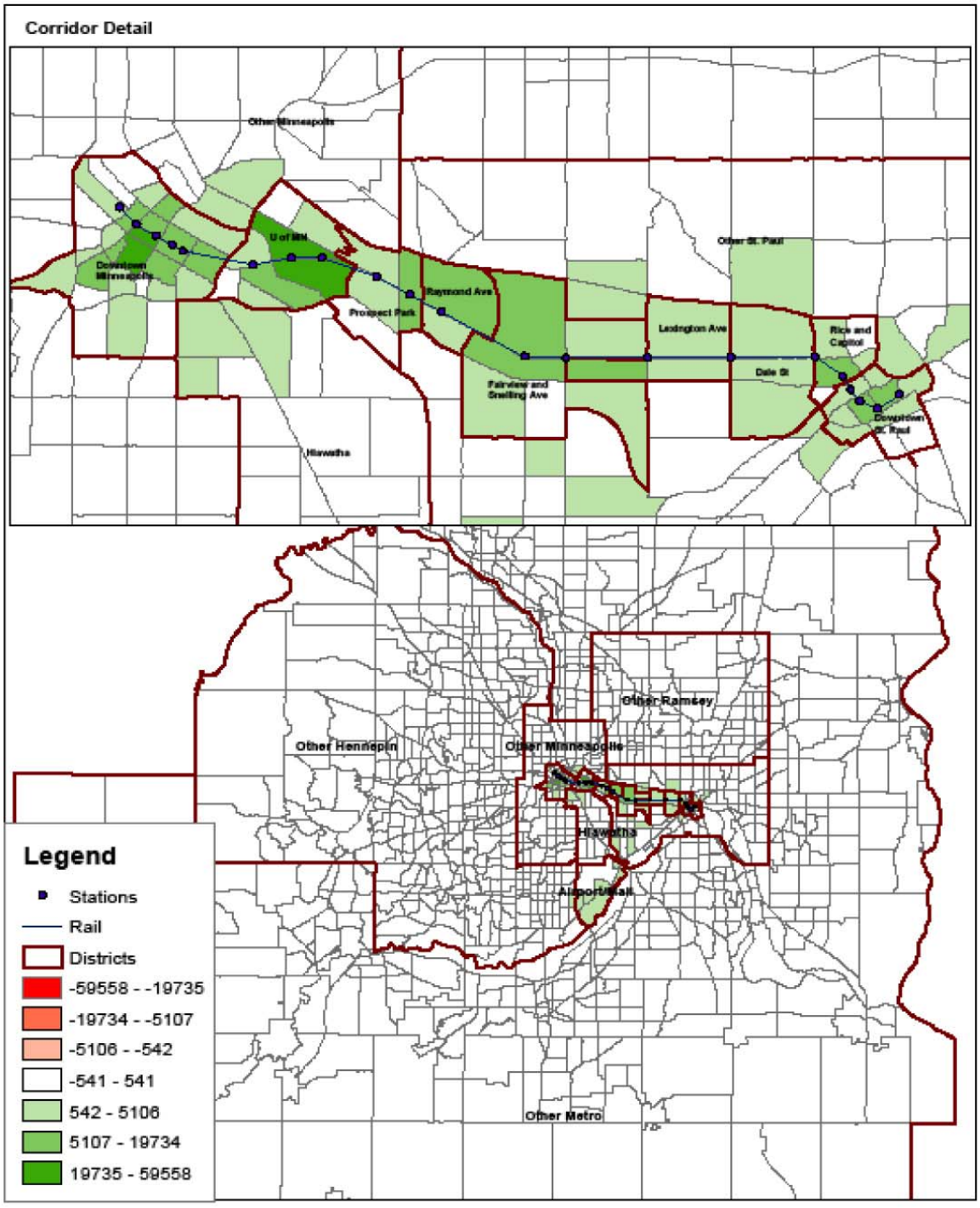
The results of the travel demand model are used to illustrate the extent to which different geographic areas in the region would potentially benefit from the Central Corridor project. These benefits are usually projected as the overall travel time savings (also called User Benefits) and are estimated using a software program called SUMMIT. Using the travel model results, the SUMMIT program compares the performance of the Baseline and AA/DEIS LPA alternatives and estimates the overall time and cost savings. To make the comparison easier, all cost savings are converted to equivalent time savings.

The SUMMIT model results indicate about 45 percent of all the user benefits (incremental estimated mobility impacts, in terms of weighted travel time) would be attributable to trips that occur in the peak periods and the remaining 55 percent would occur in the off-peak periods. During the peak period, about 46 percent of the benefits would be attributable to trips that are attracted to downtown Minneapolis and downtown St. Paul. About 11 percent of the benefits would go to trips attracted by the U of M. The trips attracted to the airport would enjoy about 5 percent travel time savings. The distribution of user benefits are shown using what is known as thematic maps. Figure 6-2 shows the magnitude of benefits enjoyed by different areas. Those areas receiving high level of benefits are shown in dark green color, medium benefits in a slightly lighter shade of green and so on. Sometimes, a transportation project can generate negative benefits to some areas and positive benefits to other areas at the same time. Areas receiving negative benefits (meaning their travel times have increased in the Build alternative) are shown in shades of red color.

The SUMMIT model results indicate about 78 percent of all the benefits during the off-peak period would go to trips attracted to downtown Minneapolis, downtown St. Paul and the U of M. The U of M alone is projected to receive 29 percent of all the off-peak period benefits. Because a major portion of the U of M trips occur during off-peak periods, it follows that most benefits enjoyed by U of M related trips would also occur during the off-peak period.

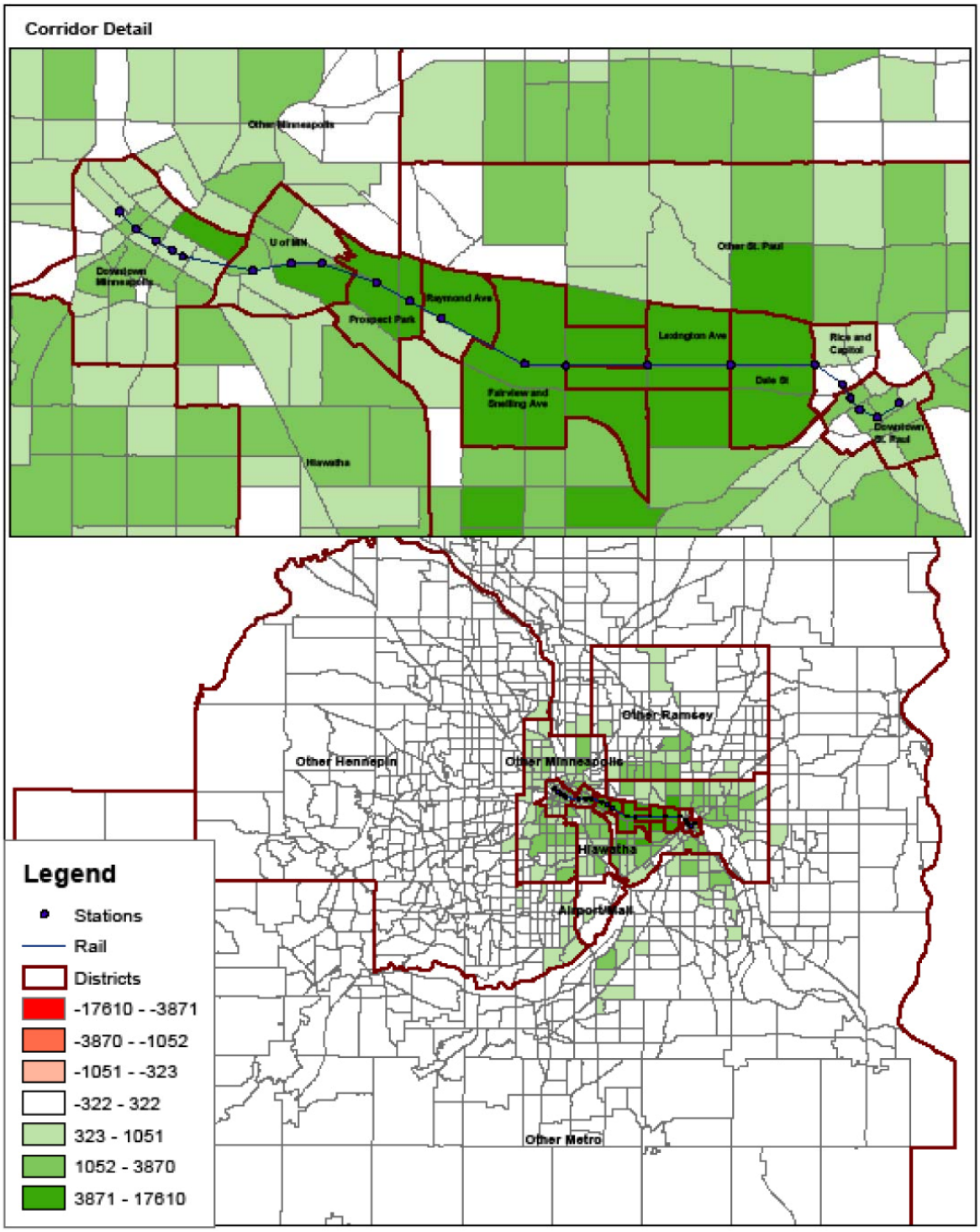
Figure 6-3 shows the distribution of user benefits at the trip production end (i.e. where the home end of the trip is located).

FIGURE 6-2 DISTRIBUTION OF USER BENEFITS (FOR TRIPS ATTRACTIONS)



Source: Metropolitan Council SUMMIT Model Results, 2006

FIGURE 6-3 DISTRIBUTION OF DAILY USER BENEFITS (FOR TRIPS PRODUCTIONS)



Source: Metropolitan Council SUMMIT Model Results, 2006

6.1.4.6 Short-term Effects

Some disruption of Route 16 and Route 50 service on University Avenue would occur during construction. For short-term changes to bus routes during construction, information would be posted at bus-stops indicating the distance of the detour and number of stops removed from service. Detour information would also be placed on Metro Transit's web site and updated daily.

6.1.5 Mitigation

Metro Transit would follow standard procedures for route changes and deletions. Metro Transit would communicate service changes along the corridor as part of its community outreach program described in Chapter 11.

6.2 Effects on Roadways

This section details the existing and forecasted roadway operation conditions that are expected in the Central Corridor as a result of changes in the transportation system and proposed changes to the AA/DEIS LPA. The potential effects on roadway operations include changes in traffic delays and intersection levels of service (LOS).

6.2.1 Methodology

2030 Traffic Forecasts

The roadway operations analysis in the AA/DEIS was based on 2020 traffic forecasts which were developed using the Metropolitan Council 2020 Regional Travel Demand Model. The roadway operations analysis included in this SDEIS are based on 2030 traffic forecasts developed using the Metropolitan Council's 2030 Regional Travel Model. There are no major differences in the regional roadway system assumed in the 2020 regional travel model when compared to the regional roadway system assumed in the 2030 regional travel model.

The 2030 average daily traffic (ADT) forecasts presented in this section have been developed based on adjusted model assignments from the Metropolitan Council's 2030 Travel Demand Model. 2030 PM-peak hour volume and turning movement forecasts have been developed for key roadways and intersections affected by the changes proposed as part of the Key Project Elements. These PM peak-hour forecasts were developed using the 2030 ADT forecasts and 2007 peak-hour volume and turning movement counts at selected roadways and intersections. The PM peak hour is typically the highest volume hour of the day, and is commonly used in traffic analyses. The analysis uses LOS designations as defined by the 2000 Highway Capacity Manual. The intersection LOS definition includes designation and associated traffic below as indicated below:

- LOS A – up to 10 seconds per vehicle
- LOS B – greater than 10 and up to 20 seconds per vehicle
- LOS C – greater than 20 and up to 35 seconds per vehicle
- LOS D – greater than 35 and up to 55 seconds per vehicle
- LOS E – greater than 55 and up to 80 seconds per vehicle
- LOS F – greater than 80 seconds per vehicle

6.2.2 Existing Conditions

There have been two major changes since publication of the AA/DEIS that affect the existing roadway system in the corridor. Neither of these issues is expected to have any significant impact on the 2030 Traffic Forecasts for the corridor.

I-35W Bridge Collapse

In August 2007, the I-35W bridge over the Mississippi River just northeast of downtown Minneapolis collapsed into the river. This dramatic event changed travel patterns to and around downtown Minneapolis and the U of M, as well as in the City of St. Paul from Snelling Avenue to TH 280. A new bridge is currently being constructed that will increase the capacity of this crossing and accommodate LRT or other transit technologies in the future. The new bridge is expected to open by the end of 2008.

In response to the collapse of the I-35W Bridge, MnDOT increased the capacity on I-94 between I-35W and the TH 280 junction, adding an additional traffic lane in each direction through an overlay and restriping project. The project eliminated or narrowed shoulders and modified the ramp entrances and exits from the highway. In conjunction with the I-94 work, MnDOT also modified TH 280. The work included eliminating signalized intersections at Broadway Street NE and County Road B West, along with other ramp modifications that increased capacity in the corridor.

The I-35W bridge collapse changed traffic access and circulation for both downtown Minneapolis and the U of M. These patterns are expected to change again after the new bridge is opened. A final determination has not been made on whether the roadway changes on I-94 and TH 280 made in response to the I-35W collapse will be permanent or whether future changes will be made to I-94 and TH 280 after the new I-35W bridge is open.

The City of Minneapolis, MnDOT, and Hennepin County are currently studying an additional access to I-35W on 4th Street. Any proposed changes in the access to I-35W could affect future demand on the I-35W access ramps and at ramp intersections. This was a consideration in the evaluation of design alternatives for the Hiawatha/Central Corridor Connection, which is one of the Key Project Elements.

Changes at the University of Minnesota

The U of M studied improvements and modifications to the roadway network within and adjacent to the U of M since the release of the AA/DEIS. A new stadium is currently under construction for the U of M Gopher football games. To accommodate the proposed TCF Bank Stadium, existing parking lots and roadways were reconfigured (see Figure 6-4). The stadium project affected the alignment of planned future projects, such as the Central Corridor LRT and Granary Road. The Central Corridor LRT is the subject of this SDEIS and refinements to the alignment are reflected as part of the proposed changes to the AA/DEIS LPA. Granary Road, which has been identified as a regional roadway by the Metropolitan Council and included in the Minneapolis Capital Improvement Program (CIP), will extend from the eastern city limits to I-35W. The project is intended to augment the overall transportation system as well as provide access to the Southeast Minneapolis Industrial Area/University Research Park.

The traffic analysis completed for the stadium project showed that the proposed roadway system would be able to accommodate the forecast 2009 weekday traffic volumes at an acceptable LOS. The projected 2009 weekday LOS at key intersections are shown in Table 6-4. The U of M Football Stadium Final Environmental Impact Statement (FEIS) indicated a deficiency at the intersection of University Avenue, Huron Street, and 23rd

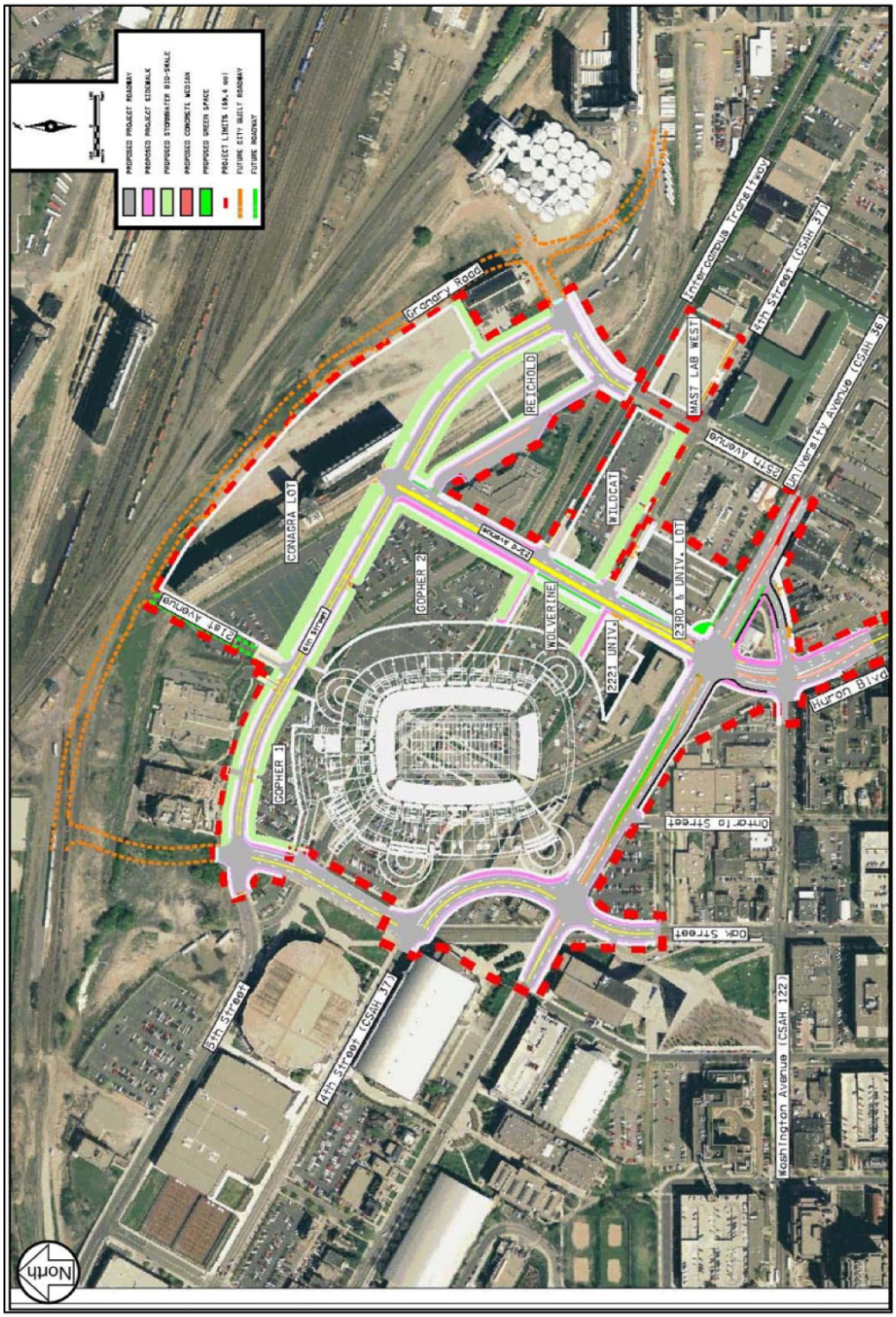
Avenue in 2030. This intersection was reconfigured to add a turn lane in order to bring the deficient LOS from E to D. The 2030 analysis assumed implementation of the Central Corridor LRT based on the AA/DEIS LPA. Since publication of the stadium FEIS, proposed changes to the LRT alignment through the U of M have been evaluated and are addressed in Section 6.2.3.

Table 6-4 U of M PM-Peak Hour Intersection LOS with New Roadway Configuration

Intersections	2009 PM-Peak LOS	2030 PM-Peak LOS
Oak St/4th St.	C	C
University Ave./Oak St.	C	C
University Ave./Huron St./23rd Ave.	C	D
University Ave./25th Ave.	B	D
Washington Ave./Huron St.	C	D
Washington Ave./Oak St.	C	C

Source: University of Minnesota On-Campus Football Stadium FEIS (NOA – February 13, 2006)

FIGURE 6-4 U OF M STADIUM ROADWAY CHANGES



Source: University of Minnesota On-Campus Football Stadium FEIS, February 13, 2006

Changes in Existing Travel Demand

The ADT volumes presented in the AA/DEIS were from the year 2001, the most recent counts available when the AA/DEIS traffic analysis was completed. Table 6-5 shows a comparison of the 2001 average daily traffic (ADT) presented in the AA/DEIS and 2006 ADT from the MnDOT Trunk Highway Volume Maps, which is the most recent year of traffic count data presently available. As can be seen from Table 6-5, traffic volumes on the roadway segments along the Central Corridor LRT alignment have not changed significantly since 2001. The 2001 segment LOS as reported in the AA/DEIS is also summarized below in Table 6-5.

Table 6-5 Existing Roadway ADT and LOS

Street	Segment	ADT Reported in AA/DEIS (2001)[1]	2006 ADT[2]	2001 Segment LOS reported in AA/DEIS
Fifth Street	Third Avenue N to Park Ave	8,800	Access Only	C
Fourth Street	Chicago Ave and Washington Ave Bridge	7,200	4,800	C
Washington Avenue Bridge	Fourth St. and Pleasant St Ramps	22,500	18,800	D
Washington Avenue	Pleasant St. Ramps and University Ave	18,000	17,700	D
University Avenue	Washington Ave and Highway 280	25,000	23,700	D
University Avenue	Highway 280 and Snelling Ave	25,000	23,500	D
University Avenue	Snelling Ave and Lexington Ave	25,000	26,200	D
University Avenue	Lexington Ave and Dale St.	25,000	24,100	D
University Avenue	Dale St. and Rice St.	27,500	23,700	D
University Avenue	Rice St. and Robert St.	20,000	17,000	D
Robert St.	University Ave and Columbus Ave	8,000	5,000	C
Columbus Avenue	Robert St. and Cedar St.	1,200	NA	C
Cedar Street	11th Stand 4th St	6,800	5,700	C
4th Street	Cedar St. and Sibley	5,600	5,500	C

1 ADT was calculated using turning movement data collected in September 2001 and December 2001, assuming the PM peak period
represented 9 percent of the daily volumes

2 ADT from MnDOT 2006 Trunk Highway Volumes

2030 ADT Forecasts

Table 6-6 shows the 2030 average annual daily traffic (AADT) forecasts for the corridor in comparison to the 2020 ADT forecasts presented in the AA/DEIS. The roadway segments for which 2030 AADT forecasts were developed are not identical to ADT forecasts for the AA/DEIS segments, but are at similar locations on Washington Avenue and University Avenue. The segment designations in this table are based on the segments identified in the AA/DEIS. In general, the 2030 AADT forecasts are slightly lower than the 2020 ADT forecasts in the AA/DEIS. This is consistent with a comparison of the 2001 and 2006 ADT in the corridor, which show very little growth in traffic.

Table 6-6 Comparison of 2020 and 2030 Forecast Average Annual Daily Traffic (AADT) in the Central Corridor

Street	Segment	2020 No-Build ADT in AA/DEIS[1]	2020 Build LRT ADT in AA/DEIS	2030 No-Build AADT[2]	2030 Proposed Changes to AA/DEIS LPA[2]
Washington Avenue Bridge	Fourth St. and Pleasant St Ramps	26,700	26,700	26,100	15,100
Washington Avenue	Pleasant St. Ramps and University Ave	21,400	21,400	Not Available	Not Available
University Avenue	Washington Ave and Highway 280	29,700	29,700	28,800	28,000
University Avenue	Highway 280 and Snelling Ave	29,700	29,700	28,700	28,300
University Avenue	Snelling Ave and Lexington Ave	29,700	29,700	27,000	27,100
University Avenue	Lexington Ave and Dale St.	29,700	29,700	28,400	28,100
University Avenue	Dale St. and Rice St.	32,700	32,700	26,500	26,100
University Avenue	Rice St. and Robert St.	23,800	23,800	20,200	19,800

[1] ADT from AA/DEIS

[2] 2030 Transportation Policy Plan, AADT derived from Metropolitan Council Regional Model

6.2.3 Long-term Effects

This section addresses the long-term effects on roadway traffic operations in the corridor relative to the Key Project Elements.

6.2.3.1 No-Build Alternative

The No-Build Alternative is not anticipated to have impacts on roadway traffic operations because it does not change existing traffic operating plans. The No-Build Alternative is not consistent with the Metropolitan Council 2030 Transportation Policy Plan goals of reducing congestion and providing increased transportation choices and mobility within the Central Corridor. The No-Build Alternative is defined in Chapter 2.

6.2.3.2 Key Project Elements

Hiawatha/Central Corridor Connection

The primary transportation impact of the Hiawatha/Central Connection is related to the alignment of the Central Corridor LRT and how it enters the median of Washington Avenue/4th Street. The AA/DEIS LPA connection to the Hiawatha LRT alignment started east of Chicago Avenue and entered into the median of Washington Avenue/4th Street between 3rd and 4th Street without crossing either 3rd or 4th Street. This option also removed one through lane in each direction from Washington Avenue/4th Street. In the proposed connection, the LRT tracks cross eastbound Washington Avenue/4th Street at-grade just west of the Cedar Avenue Bridge to enter the median of Washington Avenue/4th Street (see Figure 2-4). Washington Avenue/4th Street would be reduced to one through lane in each direction, the same as documented in the AA/DEIS. The at-grade crossing would be controlled by a signalized gate, requiring traffic on eastbound Washington Avenue/4th Street to stop when the LRT vehicles are crossing. This would create some additional delay for traffic on eastbound Washington Avenue/4th Street because this traffic is not presently required to stop. The design would also require the relocation of the northbound I-35W exit

ramp to 4th Street, which would result in a stop condition for ramp traffic where it enters 4th Street. Presently this ramp has a free flow merge condition onto 4th Street. The City of Minneapolis, MnDOT, and Hennepin County are currently studying an additional access to I-35W on 4th Street. Any proposed changes in the access to I-35W could affect future demand on the I-35W access ramps and at ramp intersections.

The traffic analysis in the AA/DEIS indicated that the roadway segment of Washington Avenue between Cedar Avenue and Pleasant Street would operate at LOS "D" with the No-Build Alternative, and LOS "F" with the AA/DEIS LPA. With the proposed At-Grade Transit/Pedestrian Mall on Washington Avenue, the 2030 AADT on this segment is expected to drop by 11,000 vehicles per day—from 26,100 vehicles per day to 15,100 vehicles per day. It is anticipated that the decrease in traffic volume would improve the LOS along these segments.

The LRT at-grade crossing on Washington Avenue/4th Street would introduce delay to eastbound traffic on Washington Avenue/4th Street, but the average delay per vehicle would be very low. The estimated 2030 eastbound ADT volume on Washington Avenue/4th Street at the crossing location is approximately 3,700 vehicles per day and approximately 400 vehicles in the PM-peak hour. Based on the proposed LRT headways, the crossing gate would be closed on average every 7.5 minutes for approximately 30 seconds, or 4 minutes of every hour. Given the projected traffic volumes, the gate closures would impact about 50 vehicles during the PM-peak hour. The peak vehicle queue during the peak hour at this gate would be approximately 6 vehicles and the average delay per vehicle on this approach would be approximately 4 seconds per vehicle. Some vehicles would experience no delay while others may experience up to 30 seconds of delay.

University of Minnesota Alignment

The AA/DEIS LPA included a tunnel running from Church Street to Oak Street through the U of M's East Bank campus. The AA/DEIS indicated that intersections on Washington Avenue through the U of M were anticipated to operate at LOS B in 2020 for both the No-Build Alternative and the AA/DEIS LPA. The proposed changes to the AA/DEIS LPA evaluated through the U of M's East Bank include an At-Grade Transit/Pedestrian Mall along Washington Avenue between approximately Pleasant Street and Oak Street. Travel along this section would be limited to the Central Corridor LRT, Metro Transit and U of M buses, and emergency vehicles.

A specific traffic analysis was conducted for the U of M area to understand the potential impacts at major intersections for the Transit/Pedestrian Mall on Washington Avenue. The U of M and surrounding neighborhoods were concerned that altered traffic patterns associated with the implementation of the Transit/Pedestrian Mall would generate additional traffic impacts. To make sure all potential impacts were captured, geographic limits for this special traffic analysis and the intersections that were analyzed were defined in cooperation with the City of Minneapolis, the U of M, MnDOT, and Hennepin County. A total of 48 intersections were identified for evaluation within the U of M study area. Data from previous East Bank traffic studies were used as the basis of this study along with data from other studies conducted in nearby City of Minneapolis neighborhoods. The data analyzed included historic ADT from the City of Minneapolis, PM-peak hour counts from the City of Minneapolis, and PM-peak hour traffic counts taken for the traffic studies for the TCF Bank Stadium. 2030 forecasts at the 48-key intersections with and without the proposed Transit/Pedestrian Mall on Washington Avenue were based on the existing traffic count data and peak period data from the Metropolitan Council 2030 Regional Travel model. For roadways not represented in the regional model a 0.25 percent annual growth rate was assumed. All peak hour

intersection operations analyses of existing and 2030 traffic forecasts documented in this section were conducted using Synchro traffic analysis software. The traffic impacts were determined based on intersection LOS using the same criteria identified in the AA/DEIS.

The proposed Transit/Pedestrian Mall would result in a redistribution of traffic currently using Washington Avenue onto a number of different streets. Of the 48 intersections analyzed, four intersections were identified to operate at a deficient level of service due to the redistribution of traffic. These intersections would operate at LOS of "E" or "F" in 2030 with Washington Avenue as a Transit/Pedestrian Mall and they would operate at LOS "C" or "D" in 2030 without the closure of Washington Avenue to automobile traffic. The intersections of concern include: Franklin Avenue/Cromwell Avenue, Riverside Avenue/20th Avenue South, Riverside Avenue/19th Avenue South, and Riverside Avenue/Cedar Avenue (see Table 6-7).

Table 6-7 PM Peak Hour Levels of Service at Intersections of Concern with Washington Avenue Transit/Pedestrian Mall

Intersection		2030 Base Analysis		2030 At-Grade Transit/ Pedestrian Mall	
		LOS	Delay	LOS	Delay
Franklin Avenue	Cromwell Avenue	C	34.5	F	93.7
Riverside Avenue	20th Avenue South	D	54.8	F	97.1
Riverside Avenue	19th Avenue South	D	38.5	E	75.7
Riverside Avenue	Cedar Avenue	D	36.4	F	89.8

Source: Metropolitan Council Engineering Services Consultant, February 2008

Six of the 48 intersections analyzed were anticipated to have a LOS "E" or "F" for both the No-Build Alternative and proposed changes to the AA/DEIS LPA; in other words, regardless of whether Washington Avenue became a Transit/Pedestrian Mall they would experience unacceptable levels of service under 2030 conditions. These intersections include:

- Franklin Avenue/East River Road
- Cedar Avenue/Washington Avenue
- Washington Avenue/I-35W Northbound Ramp
- Washington Avenue/I-35W Southbound Ramp
- University Avenue/10th Avenue SE
- Riverside Avenue/10th Avenue SE

The Metropolitan Council, in partnership with the jurisdictions that have oversight of the affected intersections, is evaluating a number of potential strategies to improve operations at these intersections.

The conversion of Washington Avenue to a Transit/Pedestrian Mall would improve traffic operations on Washington Avenue between Harvard Street and Huron Boulevard. With the removal of through traffic on Washington Avenue, there would be more green time available at traffic signals for pedestrians, transit vehicles and cross street traffic (see Table 6-8).

Table 6-8 Washington Avenue 2030 PM Peak Hour LOS

Intersection		2030 No-Build		2030 Proposed Changes to the AA/DEIS LPA	
		LOS	Delay	LOS	Delay
University Avenue	Huron Blvd	D	40.2	C	27.3
University Avenue	Washington Avenue	B	13.2	A	4.8
Washington Avenue	Huron Blvd	B	15.2	B	18.4
Washington Avenue	Ontario Street	B	16.8	B	10.7
Washington Avenue	Oak Street	C	22.6	B	16.6
Washington Avenue	Walnut Street	B	11.4	A	1.1
Washington Avenue	Harvard Street	C	22.8	A	1.5
Washington Avenue	Union Street	B	10.7	NA	NA
Washington Avenue	Church Street	B	11.8	A	1.5

Source: Metropolitan Council Engineering Services Consultant, February 2008

A substantial portion of traffic presently using Washington Avenue would be diverted onto East River Parkway with the closure of Washington Avenue to automobile traffic. All eastbound traffic coming from the Washington Avenue Bridge would be diverted to an off-ramp, where drivers would have access to Delaware Street SE and East River Parkway. The thru/stop controlled intersection between East River Parkway and the eastbound Washington Avenue off-ramp would be signalized. The traffic analysis determined that traffic on East River Parkway south of Washington Avenue may increase from a 2030 ADT of 4,280 under the No-Build Alternative to 9,320 with the Transit/Pedestrian Mall. The existing two-lane roadway configuration of East River Parkway could accommodate this level of traffic at an acceptable LOS with minor signal and operational improvements such as left-turn lanes at intersections where higher volumes are present. All vehicular traffic desiring to travel west across the Washington Avenue Bridge would have the ability to do so from the Pleasant Street access via East River Parkway or 4th Street SE (see Section 3.6 for graphic depictions of the At-Grade Transit/Pedestrian Mall).

Future Infill Stations

Future Infill stations at Hamline Avenue, Victoria Street, or Western Avenue are not expected to affect traffic operations on University Avenue beyond impacts identified in the AA/DEIS. Anticipated impacts at intersections near the station locations would be due to the LRT alignment, not the introduction of stations. The area required for the station platforms at these infill stations would be developed by eliminating on-street parking spaces rather than reducing the number or length of traffic lanes and turn lanes on University Avenue. Therefore, traffic operations at Hamline Avenue, Victoria Street, and Western Avenue would be the same with or without the LRT stations. The AA/DEIS identified nine intersections on University Avenue between Huron Boulevard and Marion Street that were expected to operate at LOS “E” or “F” in 2020 with the LPA. Hamline Avenue was one of the nine intersections identified in the AA/DEIS as having an unacceptable LOS with implementation of the LPA. Hamline Avenue was forecast to operate at LOS “C” in the 2020 No-Build and at LOS “E” in 2020 under the AA/DEIS LPA. Victoria Street was projected to operate at LOS “C” for both the No-Build alternative and AA/DEIS LPA. The AA/DEIS did not analyze the

Western Avenue intersection because it had lower traffic volumes than the other two locations.

Capitol Area Alignment/Stations

The new alignment through the Capitol Area is expected to have some impact on traffic operations on University Avenue, Robert Street, and Cedar Street. These impacts represent changes to the proposed AA/DEIS LPA. The alignment on University Avenue shifts from center-running on University Avenue to side-running on the south side of University Avenue just east of Marion Street. This shift would change existing traffic operations at both Marion Street and Rice Street from what was disclosed in the AA/DEIS. The proposed changes to the AA/DEIS LPA would shift the alignment from Columbus Avenue to 12th Street (north I-94 frontage road) between Robert Street and Cedar Street. Volumes along 12th Street carry a higher volume of traffic compared to Columbus Avenue. Traffic operations at both the 12th Street/Robert Street intersection and the 12th Street/Cedar Street intersections were analyzed. Table 6-9 shows results of the AA/DEIS 2020 findings and 2030 traffic operations for several Capitol Area intersections. It also shows the 2020 and 2030 forecast intersection LOS for the No-Build Alternative and proposed changes to the AA/DEIS LPA.

Table 6-9 Comparison of 2020 and 2030 PM Peak Hour Forecast Intersection LOS with Capitol Area Alignment and Station Changes

Intersection	2020 No-Build	2020 AA/DEIS LPA	2030 No-Build	2030 Proposed Changes to AA/DEIS LPA
Marion/University	E	F	D	D
Rice/University	F	F	F	F
Robert Street/12th Street	B	C	F	F
Cedar Street/12th Street	Not Analyzed	Not Analyzed	C	D

Source: Metropolitan Council Engineering Services Consultant, February 2008

The AA/DEIS indicated that the Marion Street and Rice Street intersections on University Avenue would operate at LOS "E" or "F" for both the 2020 No-Build Alternative and AA/DEIS LPA. In the AA/DEIS, no traffic operations problems were expected at the Robert Street/12th Street intersection or the Cedar Street/12th Street intersection. With the 2030 forecasts, the Marion Street and University Avenue intersection is projected to operate at an acceptable LOS under both No-Build conditions as well as proposed changes to the AA/DEIS LPA. Rice Street is projected to operate at LOS "F" in both the No-Build Alternative and proposed changes to the AA/DEIS LPA in 2030; similar to what was projected in 2020 in the AA/DEIS.

The Robert Street and 12th Street intersection is now projected to operate at LOS "F" in 2030 under the No-Build Alternative and proposed changes to the AA/DEIS LPA. The Cedar Street and 12th Street intersection is forecast to have acceptable traffic operations in 2030. The AA/DEIS also indicated that the intersection of Robert Street and University Avenue would operate at LOS "F" because of turning movements across the LRT tracks. Proposed changes to the AA/DEIS LPA would eliminate the turns across the LRT tracks and this intersection is now expected to operate at an acceptable LOS.

Downtown St. Paul Alignment/Station Modifications

Proposed changes to the AA/DEIS LPA in downtown St. Paul could potentially impact traffic operations on Cedar Street at 5th Street, Cedar Street at 4th Street, and on 4th Street at Minnesota Street. The AA/DEIS indicated that the intersections of Cedar Avenue and 5th Street and Cedar Avenue and 7th Street would operate at LOS "F" with the AA/DEIS LPA

because of turning movements across the LRT tracks. The change in alignment would not affect the traffic operations at these two intersections and they are projected to operate at LOS "F" with the 2030 Build LRT alternative. The AA/DEIS indicated that other intersections on 4th Street, including 4th and Cedar, were forecasted to operate at LOS "A" or "B." The proposed change in the alignment would have minor improvements on the traffic operations at 4th Street and Minnesota Street. The intersection would have the same number of traffic lanes but the alignment would cut diagonally through the intersection requiring a separate LRT signal phase. An acceptable LOS is anticipated to be maintained on Kellogg Boulevard with the Wacouta Mid-Block Alternative, since the LRT tracks would cross Kellogg Boulevard over a structure. The analysis of the Kellogg Boulevard and Broadway Avenue intersection indicates that this intersection would operate at LOS "A" in 2030 for both the No-Build condition and Wacouta Mid-Block Alternative. With the Broadway Alternative, the LRT tracks would cross of Kellogg Boulevard at-grade between Wall Street and Broadway Street. Kellogg Boulevard carries about 13,900 vehicles per day and the trains would cause delay for this traffic. The impacts on traffic operations in this area with the Broadway Alternative will be disclosed in the FEIS.

Traction Power Substations

Siting of traction power substations (TPSS) is not anticipated to impact traffic operations.

Three-car Train Operations

Future three-car train operations are expected to have a minor impact on traffic operations. The additional clearance interval for the three-car train versus a two-car train would be minimal. The extra platform length needed to accommodate the three-car trains would typically require eliminating three or four additional parking spaces per platform, but it would not reduce the number of traffic lanes or reduce turn-lane lengths.

Vehicle Maintenance and Storage Facility

Traffic impacts from the Vehicle Maintenance and Storage Facility in downtown St. Paul are dependent upon the connection to the facility. The Broadway Alternative would require LRT trains to cross Wall Street, Kellogg Boulevard and Broadway Street at-grade. Wall Street carries 3,250 vehicles per day, and Broadway Street carries 2,950 vehicles per day. As mentioned previously, Kellogg Boulevard carries 13,900 vehicles per day. Trains crossing these roadways to and from the maintenance facility would cause delay for this traffic. The Wacouta Mid-Block Alternative crosses Kellogg Boulevard on a grade separated structure, and does not cross Wall Street or Broadway Street. Relative to traffic operations, the Wacouta Mid-Block Alternative is anticipated to have fewer impacts. These alternatives are being evaluated for their impacts on traffic and operations. Results of this analysis and a final alignment for this section will be disclosed in the FEIS.

Washington Avenue Bridge

Structural modifications to the Washington Avenue Bridge to accommodate Central Corridor LRT operations are not anticipated to impact traffic operations beyond what was documented in the AA/DEIS. With implementation of a transit/pedestrian mall, 2030 traffic volumes using this facility are expected to decrease from ADT of 26,100 to 15,100. Improvements to traffic operations are expected with this change.

6.2.4 Short-term Effects

The construction of the LRT alternative would result in lane closures, traffic detours, and additional congestion on the streets where the LRT line would be constructed. The construction would also affect the access to parking and businesses along the LRT

alignment during the construction period. A traffic management plan will be developed and agreed upon between the agency stakeholders. The plan will include ways to maintain traffic flow, bus service, bicycle, and pedestrian activities while allowing for the delineation of the construction areas. The magnitude of traffic disruption will depend on the nature of the street and any local constraints.

Short-term transportation and circulation impacts are expected because of project construction along 4th Street, Washington Avenue, 29th Avenue, and University Avenue in Minneapolis, and University Avenue, Robert Street, 12th Street, Cedar Avenue, and 4th Street in St. Paul. Traffic impacts could also occur around construction staging areas. During final design, a construction sequencing plan will be developed to schedule lane closures and use temporary traffic control. Temporary lanes, sidewalks, driveways, and bus stops could be used. These impacts would be temporary in nature.

6.2.5 Mitigation

Potential mitigation strategies include signal timing and operational improvements, addition of turn lanes and the extension of existing turning lane lengths. A preliminary investigation of mitigation measures indicated that these strategies could be implemented without the need for additional right-of-way. The Metropolitan Council is evaluating a number of potential strategies to improve operations at intersections operating at a deficient LOS. Further analysis and mitigation commitments will be documented in the FEIS.

6.3 Other Transportation Impacts

This section describes the potential impacts on parking, pedestrians, bicycles, and freight movements as result of changes in the transportation system and proposed changes to the AA/DEIS LPA. The discussion focuses on the impact of changes that have been made since the AA/DEIS was completed. These changes consist of changes to the existing transportation system and proposed changes to the AA/DEIS LPA.

6.3.1 Methodology

6.3.1.1 Parking Methodology

An updated inventory of on-street parking at the U of M between Church Street and Huron Boulevard and on University Avenue between 29th Avenue and Rice Street was conducted between October and November 2007. The following criteria were used in updating the on-street parking spaces:

- Spaces were calculated at 22 feet in length
- No space is counted closer than 5 feet to a curb cut or driveway
- No space is counted closer than 30 feet from the corner of a signalized intersection
- No space is counted closer than 20 feet from the corner of a non-signalized intersection
- No space is counted within bus stop areas, adjacent to fire hydrants, or where posted “no parking”

The updated on-street parking inventory was used to determine the parking impacts of the proposed changes to the AA/DEIS LPA.

6.3.1.2 Bicycle/Pedestrian Methodology

Impacts to pedestrian and bicycle facilities were evaluated through an analysis of preliminary project plans, along with an analysis of existing bicycle and pedestrian plans and policies established by the Cities of Minneapolis and St. Paul. Furthermore, the analysis considered sidewalk and bicycle facility inventories and data available from the cities, counties, and Metropolitan Council.

The evaluation addresses the potential for Key Project Elements to affect these facilities during construction and operation. The following criteria were used to determine potential impacts of each alternative on community facilities:

- Construction or operation of the alternative would displace bicycle or pedestrian facilities or alter the facility's property
- Construction or operation of the alternative would restrict access or use of the facility

The evaluation considers impacts of the No-Build Alternative and proposed changes to the AA/DEIS LPA on bicycle and pedestrian facilities adjacent to the preferred alignment.

6.3.2 Existing Conditions and Planned Facilities

The following changes to existing conditions or existing plans could affect the potential impacts of the proposed changes to the AA/DEIS LPA.

Twins Baseball Stadium

Construction is in progress on the new stadium for the Minnesota Twins. The stadium is located adjacent to the multi-modal station being constructed at the Hiawatha LRT Transit connection with the Northstar Commuter Rail Line. The multi-modal station will have special accommodations for pedestrians and bicycles. The Twins Stadium is expected to open in 2010.

Access Minneapolis

In June 2007, the City of Minneapolis adopted a Downtown Action Plan that is part of Access Minneapolis, the City's Ten-Year Transportation Action Plan. The Downtown Action Plan identifies the actions that the City of Minneapolis and its partner agencies (Metro Transit, Metropolitan Council, Hennepin County, and Minnesota Department of Transportation) need to take within the next ten years to implement the transportation policies articulated in the Minneapolis Plan. The plan identifies the infrastructure needs and actions relative to pedestrians, bicycles, transit, automobiles, and parking.

6.3.2.1 Existing Parking

A parking inventory and utilization study was completed for the AA/DEIS and concluded that sufficient on-street parking would remain with the AA/DEIS LPA in place, but that on individual blocks there may be a deficit of on-street spaces that could be mitigated by the creation of small off-street parking facilities close to retail businesses. The Baseline Alternative was not expected to impact parking.

The parking inventory on University Avenue was updated between October and November 2007. The updated parking inventory limits were between 29th Avenue and Rice Street. The western limit of this inventory is approximately 5 blocks less than the inventory documented in the AA/DEIS. The updated inventory on University Avenue determined that there are currently 1,150 on-street parking spaces between 29th Avenue and Rice Street. Along

Washington Avenue between Church Street and Huron Boulevard, 79 on-street parking spaces are available.

6.3.2.2 Existing Bicycle Environment

The Twin Cities metropolitan region, particularly the City of Minneapolis, has one of the highest rates of bicycle commuting nationally as compared with other major metropolitan areas. Furthermore, the Twin Cities metropolitan region has one of the most extensive on-street and off-road bicycle networks nationally. According to the Metropolitan Council's Year 2000 Travel Behavior Inventory survey results, 1.5 percent of all trips made in the seven county metropolitan area were by bicycle. Existing on- and off-road bicycle facilities are present throughout the Central Corridor study area; however, certain portions of the study area contain more bicycle facilities and services than other areas. Striped bicycle lanes are provided on many downtown streets in Minneapolis and some streets in downtown St. Paul. The downtown central business districts of both cities are equipped with bicycle racks or storage lockers. These facilities are especially important to commuting cyclists. The foundation of the bicycle networks in both downtowns are the designated bicycle lanes provided on many one-way street pairs. These lanes, which operate within the flow of traffic, are relatively safe due to the slower speeds of vehicles in the downtown area and the increased visibility of bicyclists on the street.

Networks of off-road bicycle trails connect with or cross the proposed alignment and study area. The Grand Rounds National Scenic Byway is an expanding network of on- and off-road trails connecting public parks and lakes in the Minneapolis area, as well as paralleling the Mississippi River. Connections with off-road trail systems in St. Paul have also been established, and plans support the connection of bicycle facilities between the two cities. Plans to extend this network would include an at-grade crossing of the Central Corridor LRT tracks at 27th Avenue and U of M's Transitway.

In support of the street infrastructure and bicycle facilities, Metro Transit buses serving the study area are equipped with bicycle racks so that bicyclists can travel to their destinations by bus with their bicycles. LRT vehicles for the Hiawatha LRT line are equipped to handle bicycles onboard trains. At Hiawatha LRT stations, bicycle racks and lockers have been provided by Metro Transit and are frequently used by travelers. These facilities help to encourage alternative modes of travel and intermodal connections and have been shown to help support transit ridership.

The following are detailed descriptions of bicycle environments for specific points along the corridor.

Downtown St. Paul and Capitol Area

In downtown St. Paul, only portions of Jackson and Broadway Streets have striped bicycle lanes. On Jackson Street, a bicycle lane is provided from Kellogg Boulevard to 7th Street, and on Broadway Street, a dedicated bicycle lane is provided from Kellogg Boulevard to 5th Street. Following the Mississippi River, a paved bicycle trail follows Warner Road between the river and roadway.

The City of St. Paul is in the final planning phases for adopting a citywide bicycle transportation plan. The plan promotes bicycling as a part of daily life and an important component of transportation for many residents of St. Paul, and notes that several accommodations for bicyclists must be made to further enhance the bicycle network of St. Paul (St. Paul Planning, 2007). The ten-year goal of the plan is to increase bicycle use in St. Paul increasing bicycle mode share for all trips from 2 percent to 5 percent. The plan is

intended to be fully compatible with the City's strategic plan. Among the chief priorities of the plan are the establishment of north-south connections with the Central Corridor LRT, and integrating one east-west bicycle route parallel to University Avenue to accommodate bicyclists making connections along the Central Corridor LRT alignment route

Midway East/Midway West

While neither University nor Washington avenues have striped bicycle lanes, bicyclists frequently travel along segments of these roads as part of their commute. Streets in residential areas off of University Avenue may or may not have dedicated bicycle lanes striped on the roadway; however, cyclists use these streets for mobility and access from their homes to destinations or other bicycle facilities. Bicycle storage is available on University Avenue; however, these facilities are intended to primarily serve residents living along the street. Publicly available storage racks are limited. The corridor serves a high volume of automobile traffic, which creates an environment generally perceived to be unsafe for many cyclists. Curb cuts for access to both public and private driveways, along with the intersections along University Avenue, create a high number of potential conflict points between vehicles and bicycles. The presence of on-street parking also creates additional safety concerns for bicyclists.

University of Minnesota

Many of the 60,000 students at the U of M are dependent on alternative means of transportation, with bicycles being a popular choice. Students, faculty and staff, as well as the general public regularly utilize the bicycle facilities and services provided by the U of M throughout the calendar year. Above the Washington Avenue Bridge, a bikeway and pedestrian walkway is provided for students to cross from one side of campus to the other. The campus has an extensive network of dedicated bikeways and off-road pathways for cyclists to use. The U of M also has bicycle storage facilities, and provides free compressed air stations for the public to inflate bicycle tires.

Downtown Minneapolis

In downtown Minneapolis, streets with dedicated bicycle lanes that would cross or connect with the alignment include the north-south streets of Portland and Park Avenues, Marquette Avenue and 2nd Avenue South, and the east-west streets of 5th Street South, and 4th Street South. Hennepin Avenue, which bisects the Hiawatha LRT alignment, has a two-way bicycle lane running parallel to northbound vehicular traffic and southbound bus and taxi traffic. In 2003, a bicycle/pedestrian trail that runs parallel to the HLRT tracks was completed on the north side, between 15th Avenue and 11th Avenue. This facility shares right-of-way (ROW) with Hiawatha LRT and was planned during the planning and design phase of the Hiawatha LRT. The trail is maintained on Metro Transit inventory and is used primarily as a transportation facility. Current surveys show extensive use by bike commuters into downtown Minneapolis. The City of Minneapolis is planning to extend the facility further west into downtown.

Beyond these facilities, dedicated bicycle lanes are provided on many other streets in the downtown area. In support of the Downtown Action Plan, *Access Minneapolis*, the City is developing a bicycle master plan, the Bikeways Master Plan, scheduled for release in December 2008.

6.3.2.3 Existing Pedestrian Environment

The current pedestrian environment extends from one end of the study area to the other, with a mix of old and new sidewalks running parallel to the proposed alignment. Pedestrian

facilities are restricted to sidewalks along streets in the corridor. Side streets connected with University and Washington avenues along with streets in the commercial downtown central business districts are lined with sidewalks allowing for pedestrian circulation to destinations within the study area and movement through the corridor. Pedestrian movements are accommodated at all signalized intersections with "Walk/Don't Walk" indications and marked crosswalks.

Although sidewalks are present throughout the corridor, the character of existing development sometimes may discourage or limit walking in certain areas. Sidewalk widths vary throughout the corridor, with wider sidewalks in the downtown commercial districts and around the U of M, where pedestrian circulation is greater, especially during daytime hours. Conversely, sidewalk widths are narrow in other areas where industrial or warehousing activities take place, particularly along stretches of roadway in the Midway West planning segment, or in residential areas. Finally, sidewalk widths also differ from one side of the street to the other. Both Minneapolis and St. Paul have established minimum design guidelines for sidewalk construction. In each case, the type of road, carrying capacity, and location of the roadway facility dictate the appropriate type of pedestrian facilities along the road.

In select areas, intermittent landscape buffers (belonging to adjacent developments) have been developed along the sidewalk. Where permitted, commercial establishments may use the sidewalks for outdoor commercial activities, particularly during the summer months. However, the majority of sidewalks in the study area run directly between buildings and the streets and are without any landscaped features.

The following are detailed descriptions of pedestrian environments for specific areas along the corridor.

Downtown St. Paul and Capitol Area

The downtown district of St. Paul is also home to high-density office buildings and major activity centers. The city center is a major destination for vehicle, transit, bicycle, and pedestrian trips. In addition to large office towers, major regional, county, and state government office buildings are located in downtown St. Paul. The area includes a network of sidewalks and pedestrian amenities and connections with existing transit services that promote transit ridership. Transit facilities that encourage ridership and walking include sheltered bus stations and minimal curb cuts or private access points, both of which improve pedestrian safety by reducing the conflict points between vehicles and pedestrians.

An important component of downtown St. Paul and the Capitol district are the historical landmarks of both the City and the State of Minnesota. Significant efforts have been made by the City and the Capitol Area Architectural and Planning Board (CAAPB) to ensure that pedestrian access to these landmarks is maintained.

Midway East/Midway West

University Avenue supplies a relatively low amount of pedestrian traffic compared to other parts of the study area. The auto-centric nature of the corridor, with extensive side street connections, private driveway entrances, and parking contribute to pedestrian conditions being less desirable as compared to the downtown and U of M areas. Although an extensive sidewalk network is in place, pedestrian amenities such as landscaping or wayfinding systems are minimal or non-existent. The intersection of Snelling and University Avenue, the most significant area for pedestrian activity, is also one of the highest volume intersections in the Twin Cities metropolitan area. Further compounding pedestrian activity are the large

swaths of parking lot areas for major retail centers. As a result of development patterns and traffic conditions in the area, pedestrian activities are minimal.

University of Minnesota

The pedestrian environment at the U of M is extensive. Similar to many other large campuses around the country, the campus core functions as a pedestrian mall, with the U of M only permitting authorized or emergency vehicles to travel on campus walkways. The minimal amount of traffic reduces the number of potential conflicts between automobiles and pedestrians. Painted crosswalks, walk signals, and pedestrian bridges exist. Illegal, mid-block pedestrian crossings often occur, inhibiting the safe flow of traffic and pedestrians in the area. In addition to on street networks, an extensive network of underground tunnels connecting buildings throughout the campus is provided. The "Gopher Way" network of underground tunnels is especially important to pedestrian mobility during inclement weather.

Downtown Minneapolis

Approximately 140,000 jobs are located in the Minneapolis central business district, resulting in a substantial amount of pedestrian-oriented traffic and amenities to promote walking. The downtown core district has established wide sidewalks and high quality streetscapes making conditions favorable for pedestrians. Sidewalks in the downtown area allow for connections to major office buildings, sports and convention centers, retail centers and public parks. Anchoring the downtown sidewalk network is the Nicollet Mall, the core retail and office activity center of downtown Minneapolis. Nicollet Mall functions as a pedestrian and transit mall; motorized traffic is restricted to buses and taxis. The city's long-term transportation plan, The Downtown Action Plan *Access Minneapolis*, calls for further enhancement of pedestrian facilities (by location and opportunity), including improvements to street facades by public and private property owners, lower cost "greening" activities, safety improvements to crosswalk areas, and installation of wayfinding systems. The city also hopes to improve or add new transit waiting area facilities to encourage transit ridership.

In addition to exterior sidewalks, Minneapolis has maintained an extensive skyway walking network between buildings to enhance pedestrian movement throughout much of downtown. Skyway facilities are primarily privately owned and operated, yet allow the public to access major office buildings, hotels, retail establishments, and parking facilities. Presently, the city is in the preliminary planning phases for a pedestrian master plan.

6.3.3 Long-Term Effects

6.3.3.1 No-Build Alternative

The No-Build Alternative is not expected to have any negative impacts on the parking, bicycle, or pedestrian environment currently in place within the study area. The No-Build Alternative would result in maintaining the existing parking, bicycle and pedestrian facilities, travel patterns, and access within the study area, with the exception of those facilities or improvements currently being constructed or planned for future construction. Under the No-Build Alternative, frequency enhancements to the existing transit service within the corridor would be made that would provide pedestrians and bicyclists with greater schedule flexibility and may improve general mobility. However, enhanced flexibility and general mobility for bicyclists or pedestrians beyond the currently operating transit network does not improve non-motorized transportation networks, nor improve peripheral concerns of non-motorized travelers, such as safety. No displacement or disruption of facility operations or services would occur as a result of the No-Build Alternative. No construction effects are

anticipated for parking, bicycle and pedestrian facilities associated with the No-Build Alternative. Minor impacts might occur with planned expansion of existing transit service in the corridor. These impacts would be short in duration.

6.3.3.2 Key Project Elements

This section provides an analysis of the long-term impacts to parking, bicycle, pedestrian, and other transportation facilities resulting from implementation of proposed revisions to the AA/DEIS LPA as described under the Key Project Elements.

Impacts to pedestrian and bicycle facilities as a result of the proposed revisions to the AA/DEIS LPA are summarized below:

6.3.3.3 Parking Impacts

The Metropolitan Council's Engineering Services Consultant (ESC) determined that all 79 spaces along Washington Avenue, and 625 of the 1,150 parking spaces on University Avenue between 29th Avenue and Rice Street, would be eliminated to accommodate mandatory design features. An element was considered mandatory if it was required as part of maintaining optimal rail operations and traffic flow. Mandatory design features include: retention of two driving lanes in each direction along University Avenue, additional traffic signals, longer left-turn lanes, station platform lengths, and station locations. This would result in a total of 525 parking spaces remaining after mandatory design features were in place as part of Central Corridor LRT.

Desirable design elements were also incorporated into the overall Central Corridor LRT design. Desirable elements were those that were developed in response to concerns expressed by the community and included non-signalized pedestrian crossings to maintain community cohesion. If all of the desirable Central Corridor LRT design elements are incorporated, an additional 360 parking spaces would be lost. Implementing desirable design elements, in addition to the mandatory design elements would result in a total of 165 parking spaces remaining on University Avenue between 29th Avenue and Rice Street.

In addition to on-street parking on University Avenue, the inventory identified 629 on-street parking spaces within the first block of University Avenue cross-streets. These parking spaces could be utilized to offset the loss of on-street parking on University Avenue.

The AA/DEIS concluded that parking loss on University Avenue would total approximately 660 spaces out of an inventoried supply of 1,500 spaces. There are several reasons for the discrepancy between what was disclosed in the AA/DEIS and what has been summarized in this SDEIS. As discussed above, a very detailed parking inventory, including a block-by-block survey of the entirety of the Avenue was undertaken as part of PE efforts. This compares to a more generalized inventory done during the AA/DEIS that did not include an on-the-ground survey. In addition to a more detailed inventory of on-the-ground conditions, there are impacts to parking associated with the refinement of the LRT design during PE as well as with some Key Project Elements. These impacts are summarized in Table 6-10.

Table 6-10 Parking Impacts of Various Design Elements

Design Element	Type of Element	Parking Loss (Spaces)
Two driving lanes in each direction along University Ave	Mandatory Element	625
Additional traffic signals	Mandatory Element	
Longer left-turn lanes	Mandatory Element	
Station platform lengths	Mandatory Element	
Station locations	Mandatory Element	
Three-car platforms	Key Project Element	15 - 20
Future Infill Stations	Key Project Element	30 - 40
U of M Transit/Pedestrian Mall	Key Project Element	80
Non-signalized pedestrian crossings	Desirable Design Element	230 - 260
Secondary platform access at non-signalized crossings	Desirable Design Element	30 - 40
Eliminating closely spaced travel lane transitions	Desirable Design Element	40 - 50

Most of the additional spaces that are being eliminated are the result of design changes not associated with the changes in the Key Project Elements.

6.3.3.4 Bicycle Impacts

Bicycle lanes that cross the alignment would not be adversely affected with the proposed changes to the AA/DEIS LPA with the exception of the bike trail at the Hiawatha LRT connection. A segment of the trail between 11th Avenue and 15th Avenue would need to be relocated with a comparable route providing users with a direct connection to the planned expansion of this trail.

Track designs on the streets for the LRT are paved with only the top of the embedded rail exposed. At-grade crossings would also be paved. Access to all existing bicycle lanes in the study area would not be adversely affected. Current design standards require traffic signals with pedestrian indicators at all locations, which also serve bicyclists. Potential impacts to bicycle facilities may occur on side streets where new parking facilities may be located as a result of parking spaces lost along University Avenue under proposed changes to the AA/DEIS LPA. The design of the facilities includes prescribed mitigation that would likely enhance bicycle access in the vicinity they are located.

6.3.3.5 Pedestrian Impacts

The Central Corridor LRT uses a fixed-guideway with semi-exclusive rights-of-way allowing vehicular cross street traffic at signalized intersections only. The current configuration of University Avenue poses a barrier to pedestrian movements. Adding LRT would not degrade conditions further. Incorporating desired system elements such as non-signalized pedestrian crossings and secondary station platform access would provide clearly defined crossing

areas and connections along the corridor, enhancing the overall pedestrian environment and promoting community cohesion. Additionally, various safety treatments and/or landscaping may be installed to hinder pedestrian movement outside of legal crossing areas. Each of these design elements would improve pedestrian safety.

6.3.3.6 Other Transportation Impacts

Access to Properties and Businesses

The implementation of the Central Corridor LRT would impact access to adjacent properties and businesses in the corridor. In most cases, access would remain, but would be restricted to right-in and right-out. For many areas on University Avenue, this is the existing condition. In downtown St. Paul, the AA/DEIS noted that the construction of Central Corridor LRT on Cedar Street would restrict access to 10 driveways to and from parking structures or parking lots. Additional study is being conducted to develop a circulation and access plan for the U of M that will define how access will be provided to those properties that had their primary access on Washington Avenue. This study will also consider the appropriate eastern terminus of the Transit/Pedestrian Mall taking into consideration the access and circulation needs in the area. It will also evaluate the potential impact on traffic operations of reorienting access to these properties. This information will be documented in the FEIS.

Railroad Facilities and Services

The AA/DEIS mentioned the interface that is being planned between commuter rail and LRT in downtown Minneapolis and the interface between buses, taxis, inter-city buses, commuter rail, passenger rail, and potentially high speed rail at the Union Depot in St. Paul. The proposed changes to the AA/DEIS LPA would not change the interface between these other transportation modes.

6.3.4 Short-term Construction Impacts

There would be short-term impacts on parking, business access, bikeways, and sidewalks during construction. Various on-street parking locations along the corridor alignment would not be available during certain stages of project construction. Safe access for non-vehicular movements as a result of detours, closures and other inconveniences during the construction phases would be minimized for bicyclists and pedestrians. Access to businesses would continue to be maintained throughout the construction process.

Depending on whether construction activities impact sidewalk areas, special facilities, such as temporary handrails, fences, ramps, barriers, walkways and bridges may be provided for the safety of pedestrians. If crosswalks are temporarily closed, pedestrians would be directed to use alternative crossings that are in close proximity to the crosswalk being temporarily closed. Every effort would be made not to close adjacent crosswalks at the same time to allow for pedestrian movement across streets, or to close the adjacent crosswalks during non-peak times. All sidewalk and crosswalk surfaces will be required to meet minimum standards for accessibility and free of slipping and tripping hazards. Sidewalk closures are discouraged but, if necessary, only one side of the street may be closed at the same time. The bike path at the Hiawatha connection will be re-routed during construction and permanently relocated. The extent of relocation will be disclosed in the FEIS. Bicyclists would be notified through signage that bike lanes are detoured. Other temporary disruption to bike facilities will be managed according to the traffic management plan developed during final design. Some bus stops may need to be closed temporarily; however, Americans with Disabilities Act (ADA) access and signage for bus stops would be maintained throughout

construction. All temporary maintenance of pedestrian and bicycle traffic is governed by the Manual on Uniform Traffic Control Devices (MUTCD).

6.3.5 Mitigation

Many of the mitigation efforts will be determined in the later stages of preliminary engineering (PE) and will be disclosed in the FEIS. Although the Central Corridor LRT may reduce the need for on-street parking, additional mitigation to offset the loss of on-street parking spaces may be required. The Metropolitan Council, working closely with the local business and neighborhoods groups, is identifying priority areas to maintain parking and to identify other parking opportunities. Impacts to bicycle and pedestrian facilities would be minor and generally limited to perpendicular crossings at existing roadway intersections, with the exception of the HLRT trail between 15th Avenue and 11th Avenue, which will need to be relocated. As stated in the previous section, a segment of the bike path at the Hiawatha connection will be re-routed during construction and permanent relocation of the facility will be required. Notifications would be managed according to the traffic management plan developed during final design. Current planning for the Central Corridor LRT supports the enhancement of pedestrian facilities and sidewalk landscaping to serve as a safety barrier between pedestrians and automobile traffic. These enhancements are intended to act as both a beautification effort and as a natural barrier for safety purposes. Measures to mitigate impacts to bicyclists and pedestrians will be documented and disclosed in the FEIS.

Measures would be taken to discourage pedestrians from illegally crossing the tracks and to enhance safety at permitted crossing locations. Pedestrian signals and well-marked crosswalks would be provided at crossing locations. Directional signage or signalized access would be provided where the Central Corridor LRT alignment crosses community facilities such as the proposed U of M At-Grade Transit/Pedestrian Mall to alleviate impacts associated with the altered traffic patterns along the alignment.

Central Corridor LRT stations would be designed with pedestrian and bicycle friendly-linkages to community facilities located adjacent to the stations to alleviate impacts associated with the altered traffic patterns along the alignment.