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Travel Demand Methodology & Forecast

February 2016

Revision 4

Southwest LRT Project Technical Report

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1. Introduction

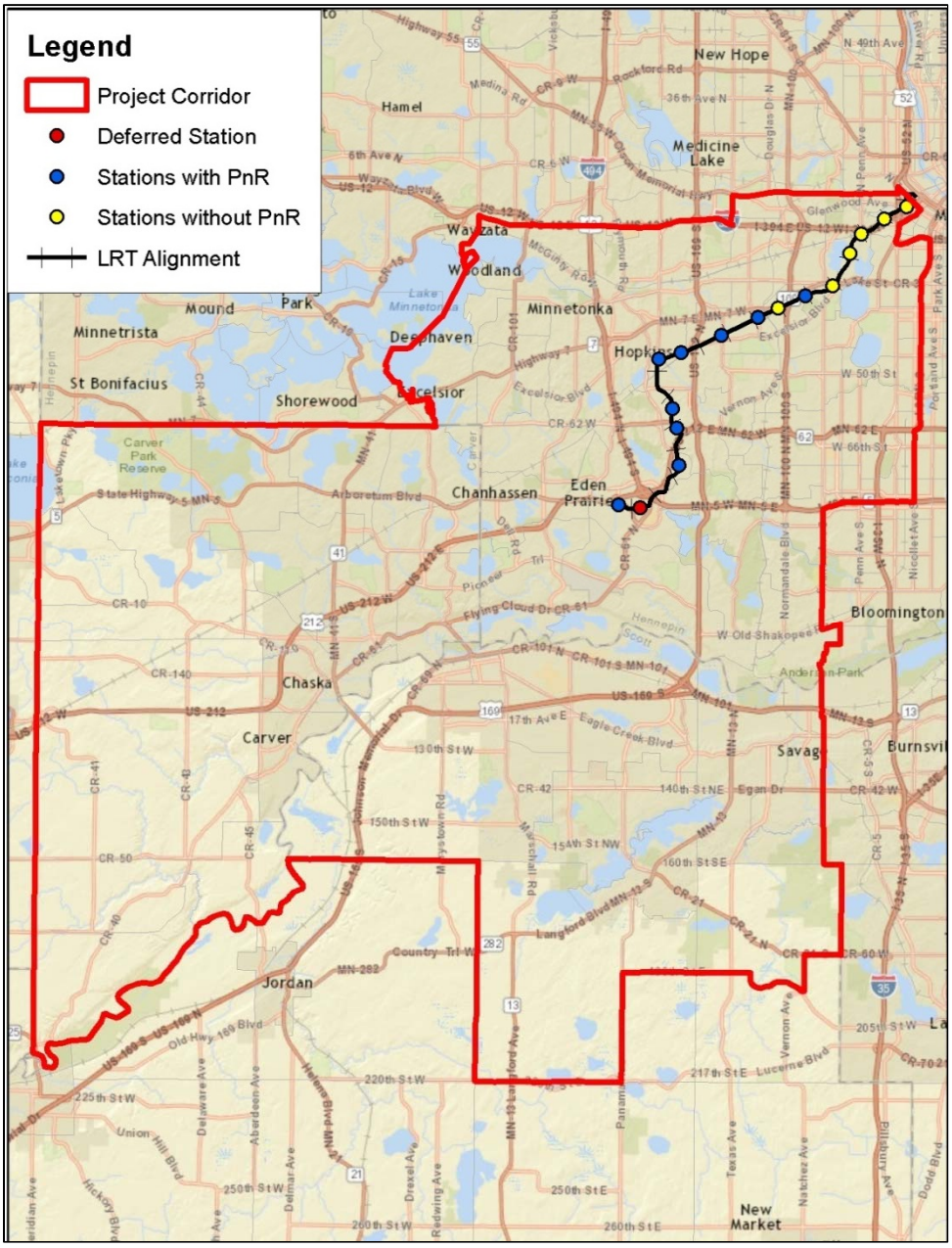
This document summarizes the results of the forecasting effort for the Southwest Light Rail Transit (SWLRT) Project. These forecasts have been prepared to support the Project's Final Environmental Impact Statement (FEIS), and use the Metropolitan Council (Met Council) Regional Travel Demand Model. This report includes details of the following tasks:

- Travel demand model methodology
- Travel demand model validation
- SWLRT alternatives and ridership estimates

The SWLRT Project is a southwestern extension of the METRO Green Line (formerly Central Corridor LRT or CCLRT). The METRO Green Line is an 11-mile LRT line between downtown Minneapolis and Downtown Saint Paul. It has 23 stations, including five shared stations in downtown Minneapolis with the METRO Blue Line (formerly Hiawatha LRT). It began revenue service in June 2014.

The SWLRT Project is 14.5 miles in length and runs from Target Field in Downtown Minneapolis to SouthWest Station in Eden Prairie. The estimated one-way travel time is 31.9 minutes. The Project consists of 16 new stations between Downtown Minneapolis and Eden Prairie: Royalston, Van White, Penn, 21st Street, West Lake, Beltline, Wooddale, Louisiana, Blake, Hopkins, Shady Oak, Opus, City West, Golden Triangle, Eden Prairie Town Center, and SouthWest Station. Figure 1-1 shows the project corridor along with the final project station locations and alignment.

Figure 1-1: SWLRT Corridor Study Area



2. Methodology

The ridership forecasts for the SWLRT Line are based on the Met Council Regional Travel Demand Model. This version is generally consistent with current Federal Transit Administration (FTA) guidance related to transit New Starts forecasting.

The model has been used to forecast ridership for the SWLRT Project as well as the Bottineau and Central Corridor Projects.

2.1. Model Overview

The Met Council Regional Travel Demand Model uses regional socioeconomic and transportation network characteristics to generate estimates for trips between different locations in the study area, the mode share of these trips, and the route that these trips take between the locations on the highway and transit networks. The results of the model include trips by mode and facility including detailed transit route information for individual routes or stations to obtain ridership.

The process is done for all origin and destination locations in the region to generate regional trip estimates. In order to manage this process, locations are aggregated into Traffic Analysis Zones (TAZs) which are the fundamental geographic unit of analysis for the process.

The model is a form of the conventional four-step model used for transportation analysis throughout the United States. The four steps of the model include:

- **Trip generation.** This step estimates the number of trips produced in and attracted to each TAZ based on zonal socioeconomic variables such as population, households, and employment. The trip generation step estimates the amount of travel beginning and ending in each production (home) and attraction (non-home) TAZ for Home-Based Work, Home-Based University, Home-Based Shopping, Home-Based School, Home-Based WR, Home-Based Other, Non-Home Based Work, and Non-Home Based Other trips. Trip generation rates are based on procedures developed by the Met Council.
- **Trip distribution.** A computerized network representation of the highway system is used to estimate the time and cost associated with travel between each pair of zones and these estimates are combined with trip generation results to develop a matrix (known as a "trip table") of travel between each production and each attraction zone in the region. Both the zone-to-zone travel times (known as "skims") and the trip tables are organized as very large matrices that have one row for each production zone and one column for each attraction zone. Each cell in these matrices contains an estimate of the time or number of trips beginning at a given production zone and ending at a given attraction zone. Each skim table or trip table contains over 1 million values representing each combination of production and attraction zone.

- **Mode Choice.** Following trip distribution, the skim matrices for each mode of travel (drive alone, HOV, and various transit options) are used to characterize the quality of each transportation option and to estimate the market share that each mode would attract. This step is known as "Mode Choice." In addition to generating trip tables for each mode of travel, this step generates estimates of the number of linked trips (i.e., from origin to destination, independent of transfers) attracted to each mode.
- **Assignment.** Finally, network processing software is used to determine the best path or routing that each highway and transit trip will use to travel between the trip origin and destination. This step is known as "Assignment" and ridership results such as boardings by station or route are determined from the results of this element of the model.

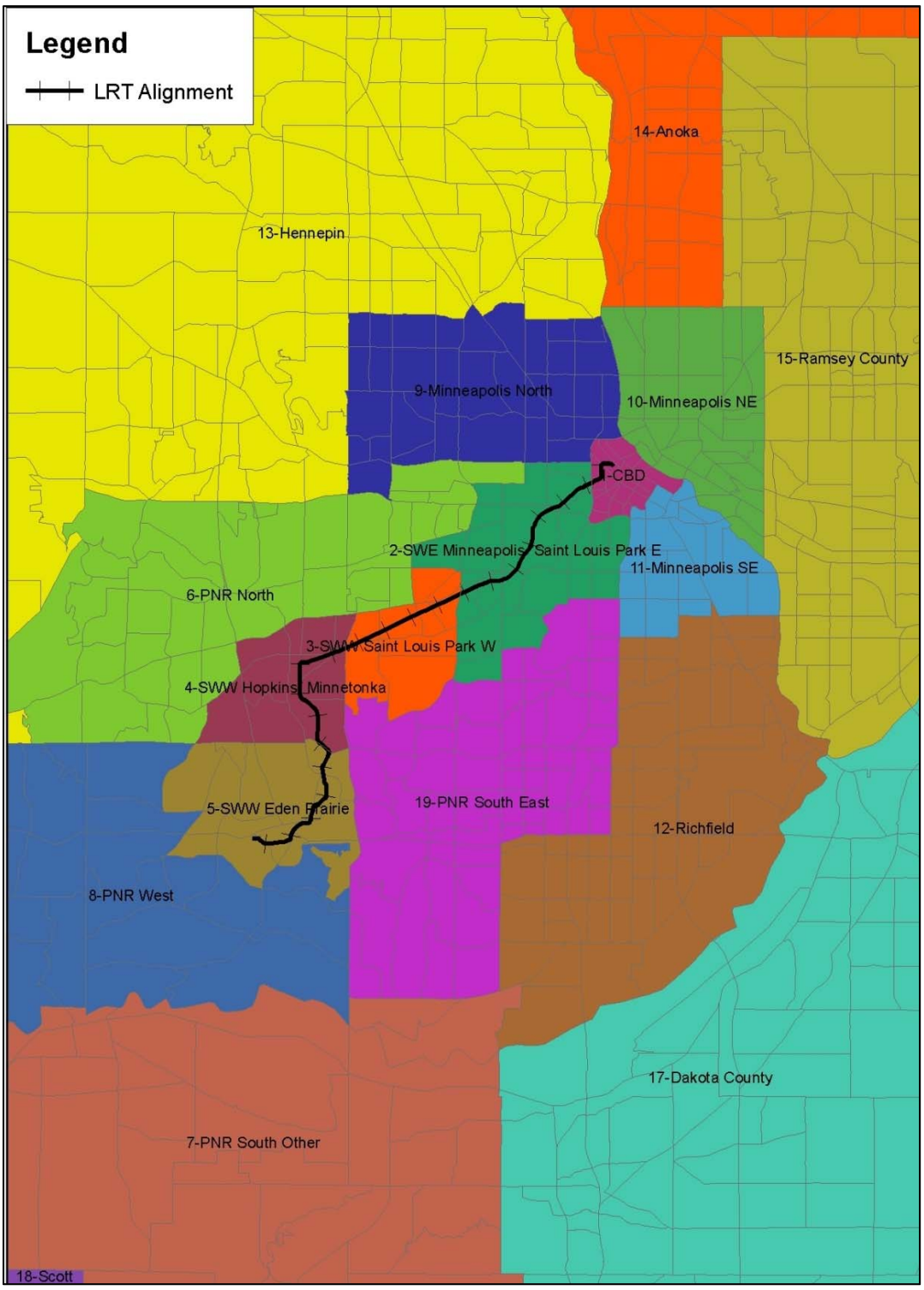
The remainder of this section describes each aspect of the modeling approach in more detail.

2.2. Traffic Analysis Zones

The system of zones utilized in the Met Council Regional Travel Demand Model is designed to characterize the travel patterns occurring to, from, and within the seven-county region that makes up the Metropolitan Council's jurisdiction. Within the model, all travel is represented beginning at the trip production end (e.g., home) and ending at the trip attraction end (e.g., workplace). This requires a large geographic system that includes the key travel markets to, from, and within Hennepin, Ramsey, Anoka, Washington, Dakota, Scott, and Carver counties. The zone system has 1,742 zones in 2010 and 1,632 zones in 2040. A depiction of the zone system is shown in Figure 2-1 as grey boundary lines. The SWLRT district system is shown by the different colored zones.

The region is divided into 19 districts for analysis. Four districts enclose the rail line itself, four districts compose the main park and ride capture area for the line, four districts contain the CBD and surrounding areas where transfers are likely to be high, and the rest of the region is divided into seven districts, primarily along county lines.

Figure 2-1: Year 2040 Traffic Analysis Zones with SWLRT Districts



2.3. Socioeconomic Data

Data on existing and projected socioeconomic characteristics are major inputs to the travel demand model for trip generation. The socioeconomic data include population, employment, and household information that are aggregated by TAZ. Base year (2010) data and preliminary forecast year (2040) projections were obtained from the Met Council using the December 2014 series of forecasts that cover the period ending in the Year 2040. The specific data used include population, number of households, retail employment, and total employment.

Table 2-1 and Table 2-2 show 2010 and 2040 population, households, and employment summarized to the district level of detail. Table 2-3 shows the percent change from 2010 to 2040 for each demographic data set.

The Minneapolis CBD is expected to lead the region in growth in population (162) while PNR South Other and SWW Saint Louis Park West are expected to lead the region in retail and non-retail employment growth (129 percent and 66 percent, respectively). The rest of the districts all see some level of growth with PNR South East and Minneapolis North seeing the least growth.

Table 2-1: Year 2010 Socioeconomic Data by District[1]

Districts	Population	Households	Retail Employment	Non-Retail Employment
CBD	21,035	13,009	10,369	115,680
SWE Minneapolis/Saint Louis Park East	84,405	42,703	8,273	25,025
SWW Saint Louis Park West	21,045	9,593	2,614	10,831
SWW Hopkins/Minnetonka	17,945	8,795	1,716	26,178
SWW Eden Prairie	15,919	7,161	7,500	35,001
PNR North	70,453	30,401	10,983	36,916
PNR South East	127,677	56,721	16,298	63,226
PNR South Other	102,754	36,668	6,444	31,863
PNR West	136,016	49,695	5,376	35,235
Minneapolis North	88,435	33,375	3,862	40,680
Minneapolis NE	72,071	29,180	5,859	58,134
Minneapolis SE	82,322	31,238	4,836	39,392
Richfield	113,626	47,680	18,635	80,390
Hennepin	384,616	145,693	32,934	134,631
Anoka County	330,844	121,227	25,057	81,538
Ramsey County	508,640	202,691	47,181	268,299
Washington County	238,126	87,855	18,695	53,149
Dakota County	398,552	152,060	35,284	134,806
Scott	35,065	11,996	1,709	6,200
Total	**2,849,546**	**1,117,741**	**263,625**	**1,277,174**

[1] Source: Metropolitan Council, 2040 population and employment forecasts, December 2014.

Table 2-2: Year 2040 Socioeconomic Data by District[1]

Districts	Population	Households	Retail Employment	Non-Retail Employment
CBD	55,170	24,280	18,860	151,400
SWE Minneapolis/Saint Louis Park East	105,890	53,910	10,670	28,980
SWW Saint Louis Park West	25,870	11,550	2,500	17,960
SWW Hopkins/Minnetonka	23,430	10,980	2,070	34,040
SWW Eden Prairie	36,030	14,910	10,270	51,840
PNR North	82,510	35,970	15,160	46,530
PNR South East	136,950	62,770	17,320	84,680
PNR South Other	154,090	59,310	14,750	45,140
PNR West	205,430	81,620	9,850	54,430
Minneapolis North	90,190	36,490	4,410	49,940
Minneapolis NE	94,680	35,770	6,250	70,630
Minneapolis SE	91,200	38,520	8,290	46,710
Richfield	130,310	56,450	26,540	92,240
Hennepin	499,870	198,990	47,350	206,650
Anoka County	426,130	171,180	36,750	115,910
Ramsey County	597,670	248,630	63,820	344,890
Washington County	337,590	135,010	27,990	79,240
Dakota County	524,810	210,660	57,270	188,630
Scott	58,440	23,010	3,370	8,850
Total	**3,676,260**	**1,510,010**	**383,490**	**1,718,690**

Table 2-3: Socioeconomic Data Growth from 2010 to 2040[1]

Districts	Population	Households	Retail Employment	Non-Retail Employment
CBD	162%	87%	82%	31%
SWE Minneapolis/Saint Louis Park East	25%	26%	29%	16%
SWW Saint Louis Park West	23%	20%	-4%	66%
SWW Hopkins/Minnetonka	31%	25%	21%	30%
SWW Eden Prairie	126%	108%	37%	48%
PNR North	17%	18%	38%	26%
PNR South East	7%	11%	6%	34%
PNR South Other	50%	62%	129%	42%
PNR West	51%	64%	83%	54%
Minneapolis North	2%	9%	14%	23%
Minneapolis NE	31%	23%	7%	21%
Minneapolis SE	11%	23%	71%	19%
Richfield	15%	18%	42%	15%
Hennepin	30%	37%	44%	53%
Anoka County	29%	41%	47%	42%
Ramsey County	18%	23%	35%	29%
Washington County	42%	54%	50%	49%
Dakota County	32%	39%	62%	40%
Scott	67%	92%	97%	43%
Total	**29%**	**35%**	**45%**	**35%**

2.4. Trip Generation and Distribution

In the trip generation step, the model processes the socioeconomic data and creates trips that are produced and attracted by each TAZ. The Met Council Travel Demand Model stratifies trips by trip purpose, time of day, and auto ownership of the household of the trip being generated. These stratifications include:

- Home-Based Work: (Peak and Off-Peak for 0, 1, 2, 3+ Car Households)
- Home-Based Work Related: (Peak and Off-Peak for 0, 1, 2, 3+ Car Households)
- Home-Based School: (Peak and Off-Peak for 0, 1, 2, 3+ Car Households)
- Home-Based Shopping: (Peak and Off-Peak for 0, 1, 2, 3+ Car Households)
- Home-Based Other: (Peak and Off-Peak for 0, 1, 2, 3+ Car Households)
- Home-Based University: (Peak and Off-Peak with no auto ownership stratification)
- Non-Home Based Work: (Peak and Off-Peak with no auto ownership stratification)
- Non-Home Based Other: (Peak and Off-Peak with no auto ownership stratification)

Tables 2-4 and 2-5 show the total person trips generated in each stratification for 2010 and 2040, respectively.

Trip tables contain information on the number of trips that are attracted to and produced in each zone-to-zone interchange in the modeling area. These tables take the form of large matrices where each row contains the total trips produced in the TAZ and each column contains the total trips attracted to the TAZ. Each individual cell contains the number of trips traveling from the production TAZ to the attraction TAZ.

Detailed trip tables showing travel in district-to-district format are presented in the appendix.

2.5. Highway Networks

Highway networks for 2010 and 2040 are based on the Met Council highway networks. Minor coding was performed to box code around highway nodes near rail stations in order to estimate walk, drive, and transfer access to stations.

The highway network contains details including distance, area type, assignment group, and number of lanes. The network contains major highways, arterials, and collectors in the region. Figure 2-2 is a view of the highway network from the Cube GIS view.

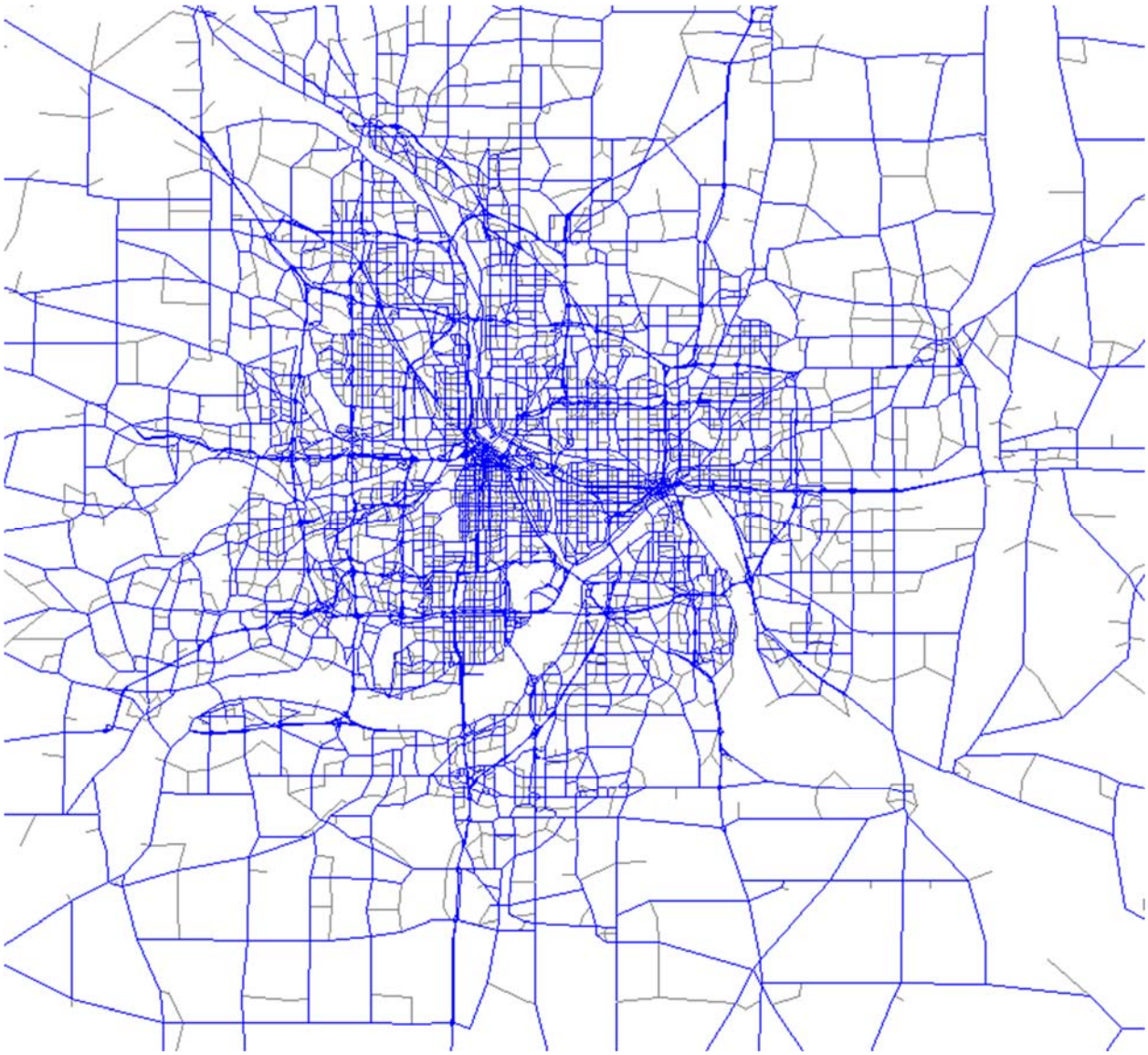
Table 2-4: Year 2010 Person Trips by Time Period

Purpose	2010 Build - Peak Person Trips					2010 Build – Off-Peak Person Trips				
	0 car	*1 car*	*2 car*	*3+ car*	*Total*	*0 car*	*1 car*	*2 car*	*3+ car*	*Total*
HBW	43,319	273,500	655,219	299,388	1,271,426	15,711	95,871	242,634	135,492	489,708
HBO	51,691	316,893	731,644	321,642	1,421,870	76,189	410,685	933,185	431,804	1,851,863
HBSCH	40,963	247,326	784,346	470,560	1,543,195	34,628	41,741	141,573	54,912	272,854
HBSHOP	32,519	195,586	358,523	166,143	752,771	42,721	334,457	691,632	301,866	1,370,676
HBWR	5,268	28,426	79,192	57,369	170,255	2,645	22,253	45,304	33,621	103,823
HBU	-	-	-	-	154,506	-	-	-	-	103,305
NHBW	-	-	-	-	659,779	-	-	-	-	729,792
NHBO	-	-	-	-	720,181	-	-	-	-	1,197,688
Total	173,760	1,061,731	2,608,924	1,315,102	6,693,983	171,894	905,007	2,054,328	957,695	6,119,709

Table 2-5: Year 2040 Person Trips by Time Period[1]

Purpose	2040 Build - Peak Person Trips					2040 Build – Off-Peak Person Trips				
	0 car	*1 car*	*2 car*	*3+ car*	*Total*	*0 car*	*1 car*	*2 car*	*3+ car*	*Total*
HBW	86,726	413,504	886,543	357,703	1,744,476	31,186	143,568	324,531	159,024	658,309
HBO	92,423	439,432	912,132	351,188	1,795,175	136,154	569,733	1,163,911	471,712	2,341,510
HBSCH	74,301	330,998	926,117	492,520	1,823,936	62,811	55,863	167,162	57,474	343,310
HBSHOP	57,676	274,701	456,866	187,790	977,033	75,772	469,746	881,348	341,197	1,768,063
HBWR	9,654	39,582	101,815	65,030	216,081	4,848	30,986	58,246	38,110	132,190
HBU	-	-	-	-	154,546	-	-	-	-	103,331
NHBW	-	-	-	-	865,377	-	-	-	-	957,543
NHBO	-	-	-	-	934,059	-	-	-	-	1,553,367
Total	**320,780**	**1,498,217**	**3,283,473**	**1,454,231**	**8,510,683**	**310,771**	**1,269,896**	**2,595,198**	**1,067,517**	**7,857,623**

Figure 2-2: Year 2040 Model Highway Network



2.6. Transit Networks

The 2010 and 2040 transit networks were provided by the Met Council. The data for the transit network includes paths along the highway network, peak and off-peak frequencies, route names, stops, and owner. The transit network contains all routes in the twin cities region. Metro Transit is the primary transit provider for the region, with other bus operators ('opt-outs') also providing service. This includes SouthWest Transit, an opt-out provider within portions of the SWLRT corridor. The coded transit modes include Local Bus, Local Limited Bus, Express Bus, LRT, and CRT. Table 2-6 shows the mode numbers, companies that operate them, and the service types of those modes.

Table 2-6: Model Transit Network Modes, Companies, and Service Types

Mode	Companies	Service Type
5	University of Minnesota, Metro Transit	Local Bus
6	SouthWest Transit, Minnesota Valley, Plymouth, Scott County Transit, Prior Lake, Maple Grove, Metro Transit	Local Limited Bus
7	SouthWest Transit, Minnesota Valley, Plymouth, Prior Lake, Maple Grove, Metro Transit	Express Bus
8	Metro Transit	LRT
9	Metro Transit	CRT

Initial transit access was provided by the Met Council and includes walk and drive links from zone centroids to highway nodes that have corresponding transit stops. Park-and-Ride access to transit use drive links (Mode 2) while Walk and Kiss-and-Ride access to transit use walk links (Mode 1). Access links can be added or removed manually to adjust coverage areas for specific stops. Access link details include TAZ where trips are produced or attracted, node in highway network where a transit route stops, access mode type, and distance, speed, and travel time between zone and stop.

2.7. Travel Times

There are four key travel time-generated by the model in order to perform mode choice and run network assignments: Peak Highway, Off-Peak Highway, Peak Transit and Off-Peak Transit.

Peak and Off-Peak Highway Travel Times

Highway travel times are found during the feedback process of the model. Based on iterative highway assignments, highway times in the peak and off-peak are adjusted to help the model converge. (See Table 2-7.)

Peak and Off-Peak Transit Travel Times

The model uses a lookup table based on area type and assignment group of links in the highway network for transit speeds. The speeds on the links are applied to the routes that use them to find travel times on these links. The initial model used a single lookup table for both peak and off-peak periods. As an update, a peak table and an off-peak table were added to match 2010 schedule times for bus routes. Transit times in the peak period were decreased on freeways and arterials to reflect congestion while times were increased in the off-peak period on some arterials. (See Table 2-8.)

Table 2-7: Peak Transit Speeds by Area Type and Assignment Group

Area Type	Assignment Group														
	1	2	3	4	5	6	7	8	9	10	11	13	14	15	100
1,10	50	50	27	19	15.5	21.5	14.5	58	12	50	45	37	37	47	50
2	50	50	27	23	20.5	22.5	15.5	58	12	50	45	37	37	39	40
3	50	50	26	27	17.5	15.5	13.5	55	12	50	45	36	36	32	40
4	50	50	25	26	12.5	12.5	11.5	54	12	50	45	35	35	28	30
5	50	50	24	25	10.5	9.5	9.5	55	12	50	45	35	35	23	20
6	50	50	26	28	13.5	16.5	12.5	55	12	50	45	39	39	32	20

Table 2-8: Off-Peak Transit Speeds by Area Type and Assignment Group

Area Type	Assignment Group														
	1	2	3	4	5	6	7	8	9	10	11	13	14	15	100
1,10	56	58	27	20	17	21	14	58	12	50	45	37	37	47	50
2	56	58	27	27	20	22	15	58	12	50	45	37	37	39	40
3	55	55	26	27	18	19	13	55	12	50	45	36	36	32	40
4	54	54	25	26	13	13	11	54	12	50	45	35	35	28	30
5	55	55	24	25	11	11	11	55	12	50	45	35	35	23	20
6	55	55	26	28	13	16	13	55	12	50	45	39	39	32	20

2.8. Mode Choice

The heart of the ridership forecasting process is the mode choice model. This process is designed to subdivide the person trip tables from the trip distribution model into separate trip tables for each travel mode. The share attracted to each mode is based on the travel characteristics of competing highway and transit services, socio-economic characteristics of the production and attraction TAZs, and parameters that define the relative importance of each factor.

The proportion of trips selecting each mode is estimated using a logit function that relates the probability of selecting a mode to the relative utility of that mode compared to that of all other modes. The form of this function is as follows:

$$P_{g,i} = \frac{e^{[U_{g,i}(x_{g,i})]}}{\sum e^{[U_{g,m}(x_{g,m})]}}$$

Where:

$P_{g,i}$ is the probability of a traveler from group g choosing mode i;

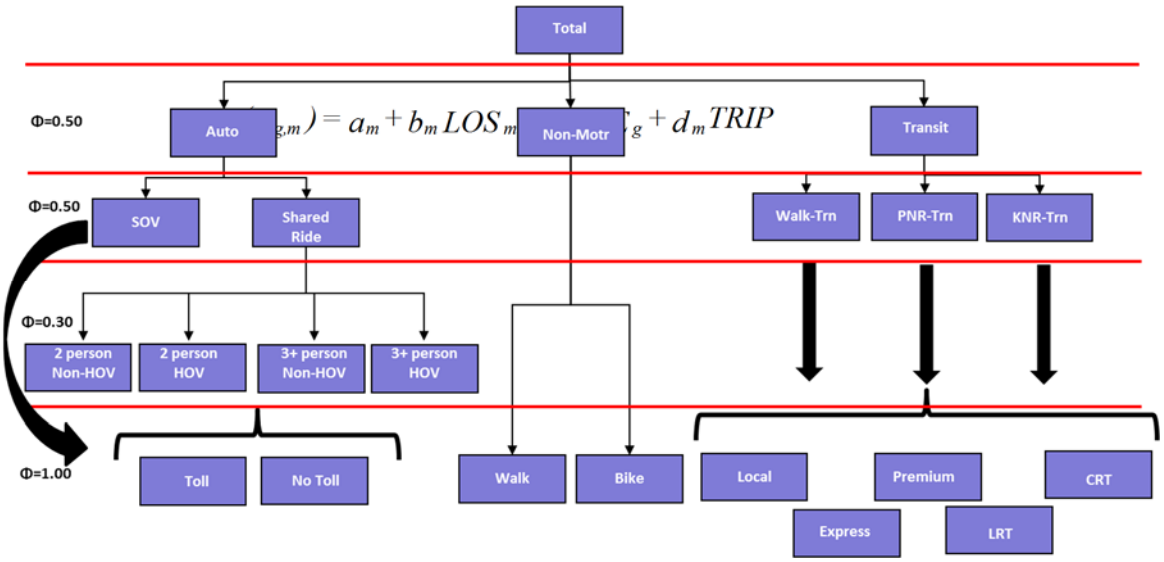
$x_{g,i}$ are the attributes of mode i that describe its attractiveness to group g; and

$U_{g,m}(x_{g,m})$ is the utility (or attractiveness) of mode m for travelers in group g.

The Met Council model is based on the nested logit form of this function, which allows for sub-modal trade-offs to be more sensitive to service measures than higher-level choices of the "main"

modes. Separate models have been developed for each time period (peak and off-peak) and for each modeled purpose. Figure 2-3 depicts the choice set for this model, showing a top tier of auto vs. non-motorized, or transit. The second tier subdivided auto into single occupancy vehicle and shared ride trips and transit into walk access, park-and-ride access, and kiss-and-ride access. The third tier subdivides shared ride into 2-person shared ride or 3-person shared ride trips along with if HOV lanes or non-HOV lanes are to be used. The fourth tier subdivides all auto modes into toll vs. non-toll users, non-motorized trips into walk or bike access, and the transit access trips into the transit modes.

Figure 2-3: Model Mode Choice Structure



The relative attractiveness (or "utility") of each travel mode takes the following form:

Where:

LOS_m is a variable set describing levels-of-service by mode m;

SE_g is a variable set describing the socioeconomic characteristics of group g;

TRIP is a variable set describing the characteristics of the trip;

b_m is vector of coefficients describing the importance of each LOS_m variable;

$c_{g,m}$ is vector of coefficients describing the importance of each SE_g characteristic of group g with respect to mode m

d_m is vector of coefficients describing the importance of each TRIP characteristic of with respect to mode m, and

a_m is a constant specific to mode m.

Tables 2-9 and 2-10 show the alternative-specific constants in terms of equivalent minutes saved as compared to local bus by the same access mode for peak and off-peak periods.

Table 2-9: Peak Transit Alternative-Specific Constants Relative to Local Bus

Equivalent Minutes								
	HBW_PK	HBU_PK	HBWR_PK	HBSH_PK	HBO_PK	HBSCH_PK	NHBW_PK	NHBO_PK
Walk to Express Alternative Specific Constant	(7.50)	(20.00)	(40.00)	0.00	(40.00)	0.00	(40.26)	(20.00)
PNR to Express Alternative Specific Constant	20.00	(10.00)	(10.00)	0.00	(10.00)	32.77	22.69	0.00
KNR to Express Alternative Specific Constant	(2.50)	0.00	5.00	0.00	5.00	0.00	0.00	0.00
Walk to LRT Alternative Specific Constant	25.00	5.00	25.00	25.00	25.00	12.50	25.00	22.50
PNR to LRT Alternative Specific Constant	20.00	0.00	10.00	10.00	10.00	0.00	20.00	22.50
KNR to LRT Alternative Specific Constant	20.00	0.00	10.00	10.00	10.00	0.00	20.00	22.50
Walk to CRT Alternative Specific Constant	27.50	0.00	20.00	0.00	20.00	0.00	(10.00)	6.00
PNR to CRT Alternative Specific Constant	52.50	10.00	5.00	0.00	5.00	32.77	0.00	36.00
KNR to CRT Alternative Specific Constant	32.50	0.00	5.00	0.00	5.00	0.00	0.00	16.00

Table 2-10- Off-Peak Transit Alternative Specific Constants Relative to Local Bus

Equivalent Minutes								
	HBW_OP	HBU_OP	HBWR_OP	HBSH_OP	HBO_OP	HBSCH_OP	NHBW_OP	NHBO_OP
Walk to Express Alternative Specific Constant	(25.00)	(7.50)	(10.00)	15.00	(10.00)	20.00	(7.56)	(20.00)
PNR to Express Alternative Specific Constant	20.00	(12.50)	0.00	0.00	0.00	0.00	0.00	0.00
KNR to Express Alternative Specific Constant	(20.00)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Walk to LRT Alternative Specific Constant	15.00	5.00	30.00	20.00	40.00	20.00	22.50	22.50
PNR to LRT Alternative Specific Constant	27.50	0.00	10.00	10.00	30.00	0.00	22.50	22.50
KNR to LRT Alternative Specific Constant	15.00	0.00	10.00	10.00	10.00	0.00	22.50	22.50
Walk to CRT Alternative Specific Constant	(10.00)	22.40	31.80	26.80	31.80	20.00	12.10	6.00
PNR to CRT Alternative Specific Constant	20.00	(7.53)	11.80	11.80	11.80	0.00	27.23	36.00
KNR to CRT Alternative Specific Constant	(15.00)	4.97	11.80	11.80	11.80	0.00	12.10	16.0

2.9. Highway Assignment

After the mode choice portion of the model is completed and all trips are segmented by mode, highway and transit assignments are run in order to route trips on specific paths between zone pairs. For highway assignment, Drive Alone, Shared Ride, and Trucks modes have their trips factored by hour in the peak and off-peak periods. The highway networks are then loaded with trip volumes. Based on the ratio of trip volumes to roadway capacity for each time period along with the free flow speed on each highway link, a congested speed is calculated for them. As part of the iterative process of the model, these congested speeds are input back into the model in order to generate new times between zone pairs and all of the steps repeat.

Once the model has run through several iterations (approximately 4), trip tables are fairly convergent in not changing due to the congestion on the highway network. At this point, the trip tables are set and additional model runs that change the transit network but not the highway network are performed for alternative analysis for the project.

2.10. Transit Assignment

Mode Choice and Transit Assignment are run in tandem for most alternatives to be analyzed using the model. Using consistent trip tables from a full iteration run of the model allows for analysis of what any specific transit change be it a headway change, stop change, or different routes being included or excluded. While mode choice generates skims for the transit network by finding the fastest weighted path between zonal pairs, transit assignment separates those paths into individual routes and transfers between them and finds the total volume of trips on each route. Mode choice separates the various highway and transit modes out, with each transit mode being able to use one or more transit type in their paths, for example, light rail trips can use any routes in the transit network as long as a portion of the trip uses light rail while local bus trips can only use local bus routes.

Transit assignment creates database files that segment each zone-to-zone trip by the network link they use and which route on that link they use by time period and mode choice (i.e. walk to local bus trips or park and ride to commuter rail trips.) After each transit mode choice is assigned, the total number trips on each segment of each route is accessible and the total route volumes are calculated.

3. Model Validation

In order to validate the model, three main aspects were checked: Travel times, park-and-ride ridership, and regional transit ridership. Observed 2010 data were compared to modeled 2010 data based on 2010 socioeconomic inputs and transit network for the region.

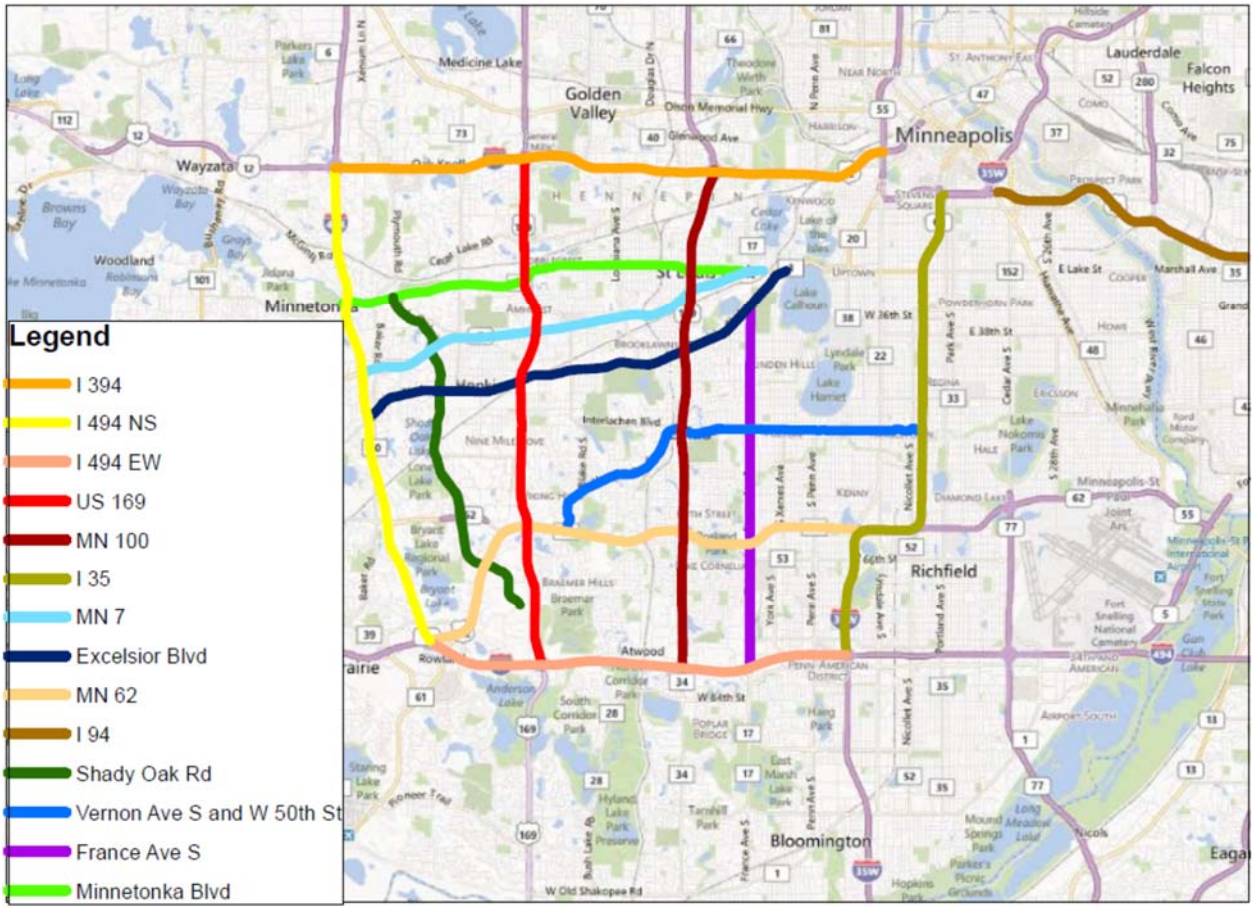
3.1. Travel Times

Both highway and transit travel times were checked in the validation process to ensure that skimming data reflected actual travel times. Observed peak and off-peak highway measurements were obtained from TomTom travel time data provided by the Met Council and compared to model highway travel times for selected segments. Transit travel times were taken from 2010 route schedules for end-to-end run times.

Highway Travel Times

In order to validate the highway skims in the study area, TomTom GPS data were used to validate the modeled travel times along several highways and major arterials. Figure 3-1 shows the selected highways and arterials.

Figure 3-1 : Highways and Arterials Checked for Highway Travel Time Validation

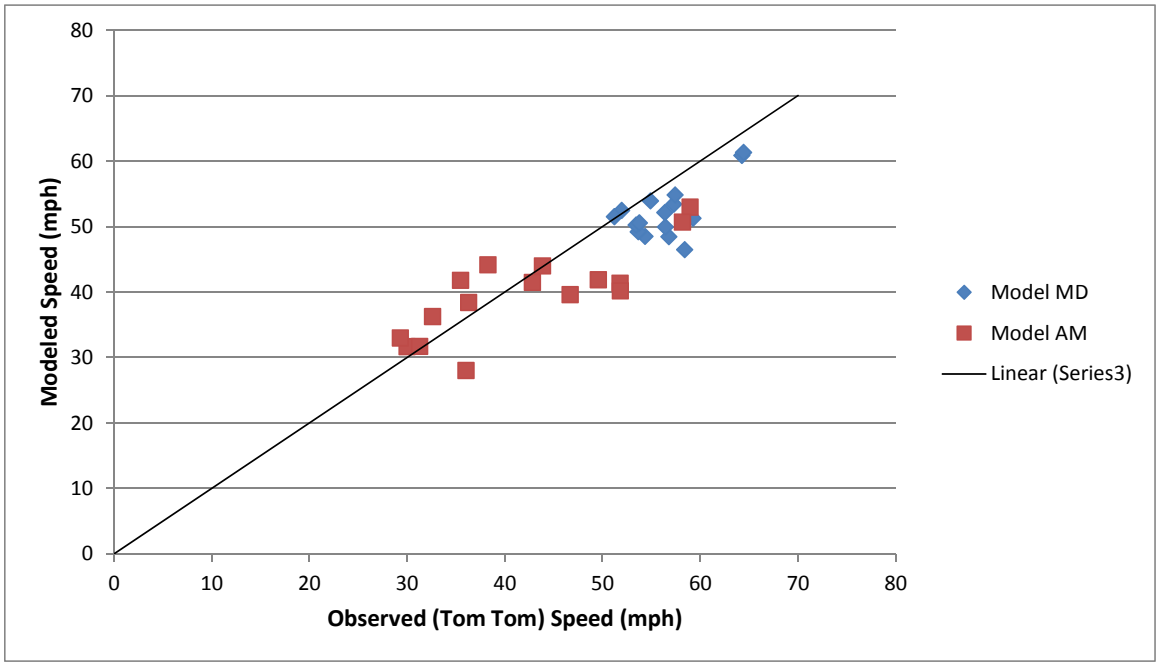


For highway segments, average speed travel times were taken for the midday period, while 85th percentile speeds were taken for the AM peak period to reflect congested conditions from TomTom data. As Table 3-1 and Figure 3-2 show, the model matches observed data reasonable well for both the peak and off-peak periods (peak represented by AM peak times and off-peak represented by midday times.)

Table 3-1: Year 2010 Observed vs. Modeled Highway Travel Times

Freeway	Direction	From Street	To Street	Observed AM	Model AM	Diff. AM	Observed MD	Model MD	Diff. MD
I 494	NB	US 212	I 394	7.7	8.7	0.9	7.1	7.5	0.4
	SB	I 394	US 212	7.8	9.0	1.2	7.1	7.5	0.4
I 35 W	NB	I 494	I 94	13.5	14.1	0.6	9.0	9.7	0.7
	SB	I 94	I 494	13.4	12.8	-0.6	9.1	10.0	0.9
I 494	EB	US 212	I 35 W	13.2	12.5	-0.7	7.6	7.5	-0.1
	WB	I 35 W	US 212	8.5	9.9	1.4	6.7	7.7	1.0
I 394	EB	I 494	I 94	17.8	16.2	-1.6	9.7	10.6	0.9
	WB	I 94	I 494	10.1	11.4	1.3	8.9	10.6	1.7
I 94	EB	I 35 W	I 35 E	8.9	10.8	1.9	8.1	8.8	0.6
	WB	I 35 E	I 35 W	14.9	14.4	-0.5	8.6	9.0	0.4
US 169	NB	I 494	I 394	9.7	11.5	1.8	8.4	8.9	0.5
	SB	I 394	I 494	11.0	11.2	0.2	8.8	9.1	0.4
MN 62	EB	I 494	I 35 W	15.3	13.3	-2.0	9.7	9.4	-0.4
	WB	I 35 W	I 494	14.1	11.5	-2.6	8.9	9.2	0.3
MN 100	NB	I 494	I 394	12.2	10.7	-1.5	8.1	8.6	0.5
	SB	I 394	I 494	11.0	11.3	0.3	8.3	9.3	1.0

Figure 3-2: Year 2010 Observed vs Modeled Highway Travel Times

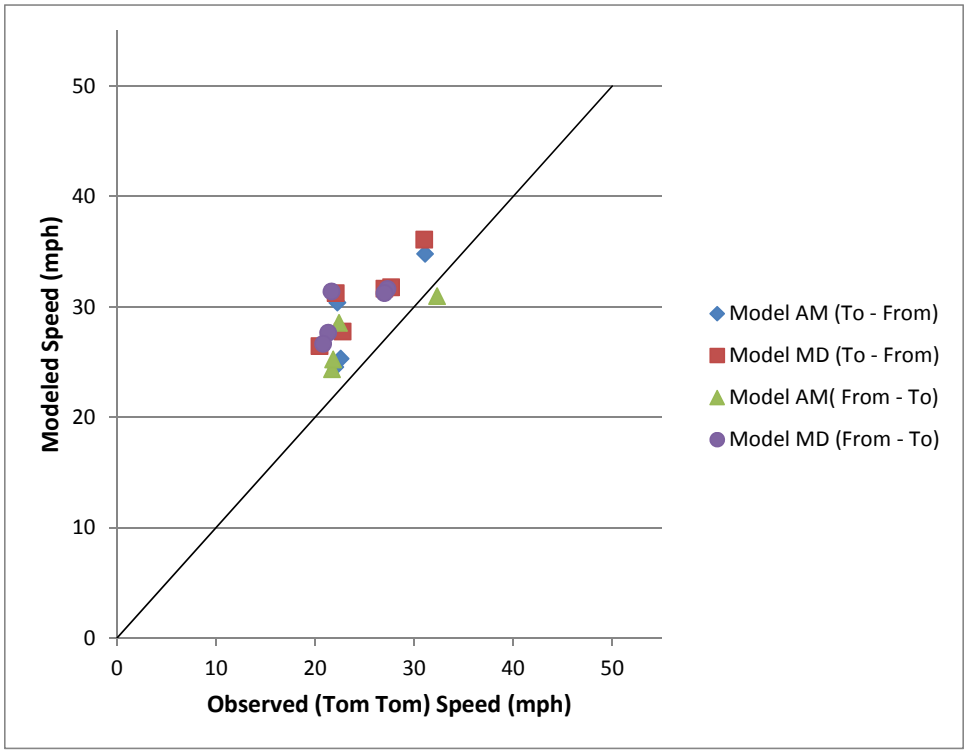


For arterials, the average speeds were used for both peak and off-peak observed data for segment travel times. Table 3-2 and Figure 3-3 show travel time comparisons between observed and model. The model has slightly faster speeds than the observed data; however, these values appeared reasonable and did not require recalibration of the model.

Table 3-2: Year 2010 Observed vs. Modeled Arterial Travel Times

			Observed		Modeled		Difference		Observed		Modeled		Difference	
Arterial	From Street	To Street	From --> To		From --> To		From --> To		To --> From		To --> From		To --> From	
			AM	MD	AM	MD	AM	MD	AM	MD	AM	MD	AM	MD
MN 7	I 494	Minnetonka Blvd	12.1	12.2	13.4	11.5	1.3	-0.6	12.7	12.7	11.9	11.5	-0.7	-1.2
Excelsior Blvd	I 494	W Lake St	19.3	20.0	16.2	14.8	-3.0	-5.2	19.4	19.5	15.3	14.8	-4.1	-4.7
Minnetonka Blvd	I 494	MN 7	14.8	14.1	13.6	12.3	-1.1	-1.8	14.3	14.0	12.6	12.3	-1.7	-1.7
Vernon Ave & W 50th St	MN 62	I 35 W	17.9	18.2	16.2	14.2	-1.7	-4.0	17.2	17.1	15.6	14.2	-1.7	-2.9
Shady Oak Dr	MN 62	Minnetonka Blvd	10.5	10.5	9.4	9.1	-1.1	-1.5	10.5	10.5	9.7	8.9	-0.8	-1.5
France Ave S	I 494	MN 7	15.5	16.2	13.5	12.8	-2.0	-3.4	15.3	16.5	13.9	12.9	-1.4	-3.6

Figure 3-3: Year 2010 Observed vs Modeled Arterial Travel Times

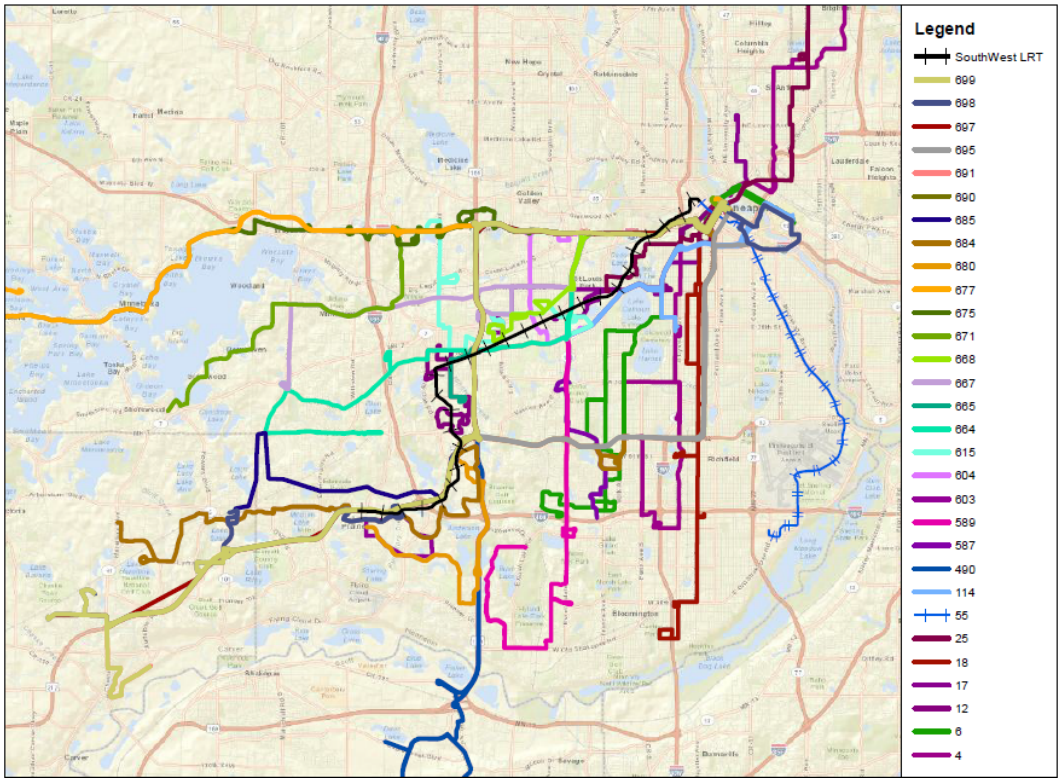


Overall, the model highway times seemed accurate in representing observed data collected from Tom Tom, and no further adjustments were made to highway travel times.

Transit Travel Times

Transit travel times were checked to aid in validating transit ridership for the base year. Routes in the SWLRT corridor were selected to compare modeled and observed travel times for peak and off-peak periods. Observed travel times were taken from the 2010 transit schedules provided by Metro Transit and SouthWest Transit. Modeled travel times were taken from model output files that provide peak and off-peak runtimes for each transit route. Figure 3-4 shows the selected routes used to validate transit travel times.

Figure 3-4: Corridor Transit Routes Checked for Transit Travel Time Validation



Before making any calibrations to transit travel times, transit schedules were compared to the modeled times for each transit route which used a single speed lookup for both the peak and off-peak periods. Figure 3-5 shows route times plotted based on time period; it demonstrates that travel times match moderately well with R2 values of 0.68 in the peak period and 0.81 in the off-peak period.

In order to calibrate the model transit times to more accurately match the schedule times, the peak and off-peak periods were split such that they used different speed lookup tables. (See Section 2.7.) Figure 3-6 shows the revised modeled vs. scheduled runtimes for the selected routes by time period, and demonstrates that these are more accurately reflected by the R2 values of 0.92 for the peak and 0.97 for the off-peak period.

Figure 3-5: Initial Year 2010 Peak and Off-Peak Observed vs Modeled Transit Travel Times

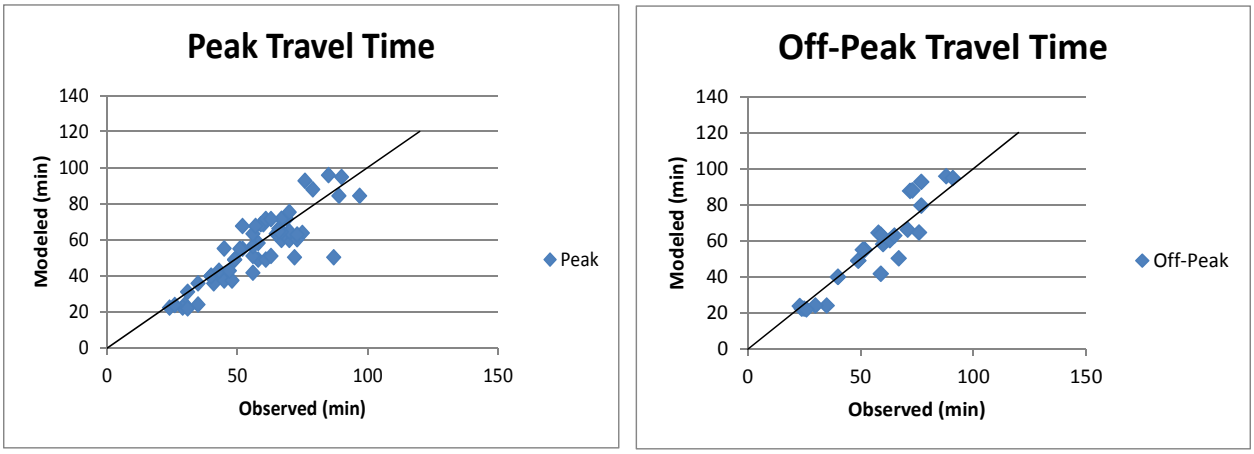
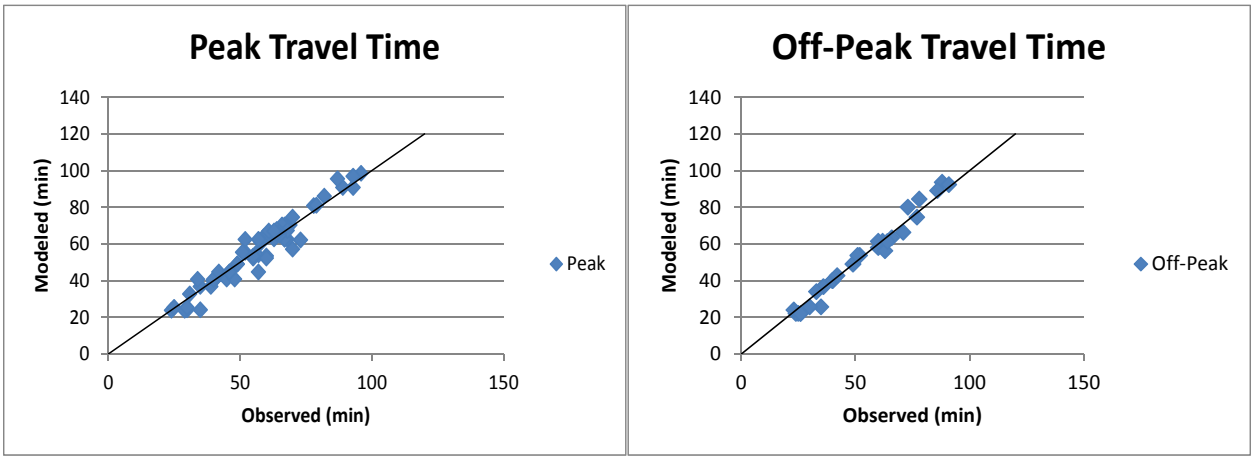


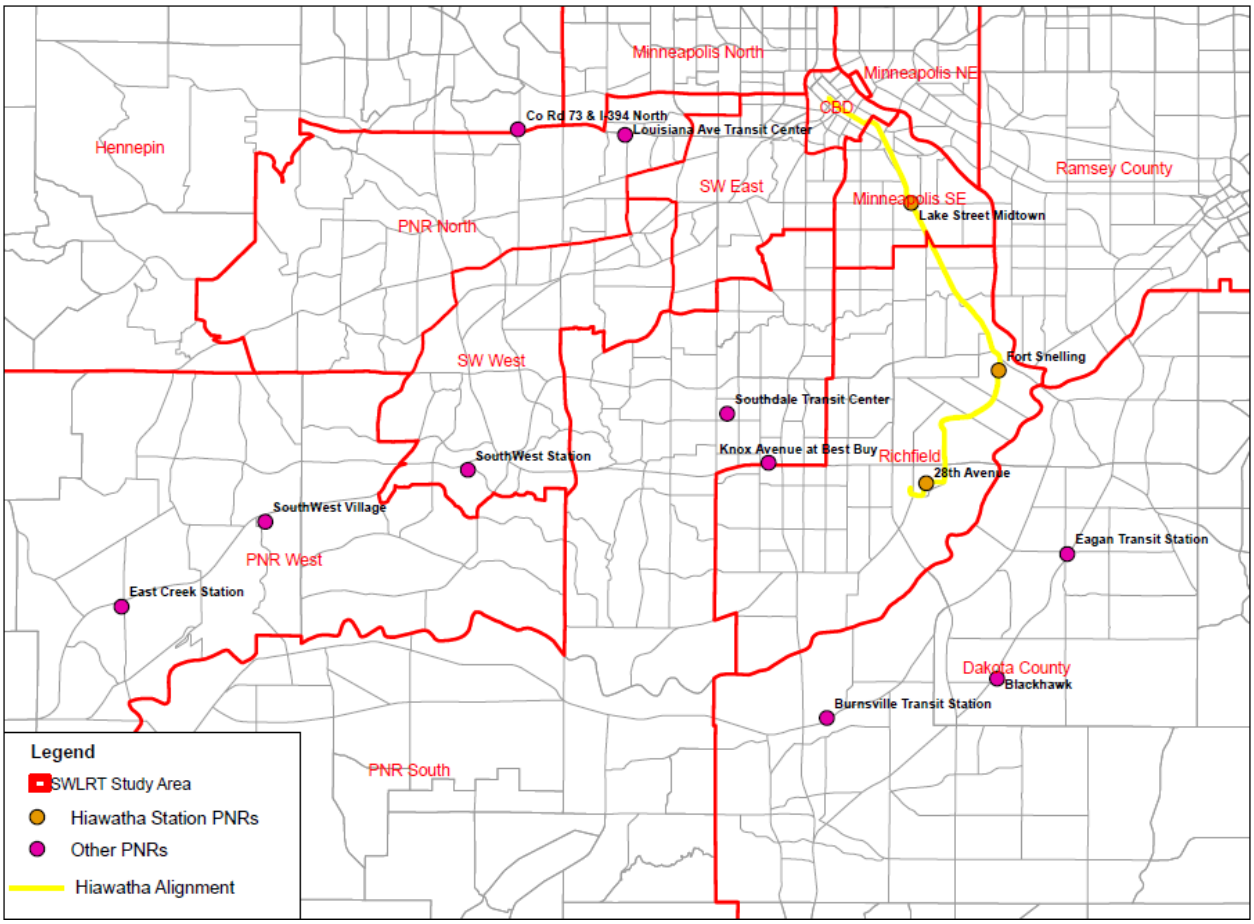
Figure 3-6: Revised Year 2010 Peak and Off-Peak Observed vs Modeled Transit Travel Times



3.2. Park-and-Ride Validation

Another important aspect of the validation effort is to represent the model's prediction of drive access to park-and-rides accurately. Park-and-rides in the SouthWest Transit service area that lies within the SWLRT corridor as well as around the Hiawatha LRT were selected to verify the accuracy of the model compared to observed data. Observed park-and-ride usage was provided by the Met Council for regional park-and-rides along with origins of those vehicles parked at the park-and-rides in 2011. Figure 3-7 shows the selected park–and-rides used for validation.

Figure 3-7: Regional Park-and-Rides Checked for Validation



From the Met Council model, park-and-ride space utilization was taken to be one-half of park-and-ride trips multiplied by 0.9. The one-half accounts for both an outbound and inbound trip as trip tables are in Production/Attraction format; the 0.9 accounts for a rule-of-thumb 10 percent daily turnover of parking spaces. In order to validate the accuracy of the bus park-and-rides in the region, the weighted travel time for drive access was lowered from 2.2 times the drive access time to 1.5 times the drive access time. Table 3-3 presents the results of the park-and-ride model validation.

Table 3-3: Year 2010 Observed vs. Modeled Volumes for Regional Park-and-Rides

Park-and-Ride	Survey Counts[2]	Model Volume (Before)	% Difference (Before)	Model Volume	% Difference
Near Study Area					
Knox Ave at Best Buy	123	72	-41%	137	11%
Southwest Transit Station	915	457	-50%	915	0%
East Creek Station	187	124	-34%	165	-12%
Louisiana Ave Transit Center	317	204	-36%	365	15%
CR 73 & I-394 South	480	376	-22%	498	4%
Southwest Village	294	91	-69%	189	-36%
Southdale Transit Center	59	76	29%	68	14%
Total	2,375	1,399	-41%	2,336	-2%
Outside Study Area					
Eagan Transit Station	311	41	-87%	300	-4%
Blackhawk	261	151	-42%	238	-9%
Burnsville Transit Station	1,178	596	-49%	1,141	-3%
Total	1,750	787	-55%	1,678	-4%
METRO Blue Line					
Lake Street/ Midtown Station	168	365	117%	175	4%
Fort Snelling Station	987	1,097	11%	981	-1%
28th Avenue Station	677	1,164	72%	650	-4%
Total	1,832	2,625	43%	1,805	-1%
TOTAL	**5,957**	**4,215**	**-29%**	**5,819**	**-2%**

3.3. Transit Route Validation

The Project would affect a number of existing transit routes in the study area. To track the current ridership on these routes in order to forecast potential growth, 2010 Metro Transit surveyed route data were compared with the model route level ridership. An initial list of routes in the corridor was compiled along with the other rail service in the region. Both the Metro Transit and SouthWest Transit services were validated by checking route headways and runtimes in the peak and off-peak periods. Headway adjustments so that modeled values tracked scheduled headways improved the accuracy of the model, along with validated transit travel times. Table 3-4 shows observed vs. original and validated ridership for regional transit routes.

[2] Source: 2010 expanded license plate survey.

Table 3-4: Year 2010 Observed vs. Modeled Ridership for Regional Transit Routes[3]

Route	On-Board Survey 2010			Model 2010 (Before)			%Diff (Before)			Model 2010			%Diff		
	Peak	Off-Peak	Total	Peak	Off-Peak	Total	Peak	Off-Peak	Total	Peak	Off-Peak	Total	Peak	Off-Peak	Total
METRO Blue Line	15,455	13,872	29,327	13,148	12,716	25,864	-15%	-8%	-12%	12,436	13,079	25,515	-20%	-6%	-13%
Northstar Rail	1,967	0	1,967	393	0	393	-80%	-	-80%	419	0	419	-79%	-	-79%
680	55	0	55	30	0	30	-	-	-	26	0	26	-	-	-
681	-	-	-	0	0	0	-	-	-	0	0	0	-	-	-
684	68	2	70	392	0	392	-	-	-	332	0	332	-	-	-
685	83	14	97	89	0	89	-	-	-	97	0	97	-	-	-
690	1,244	18	1,262	722	40	762	-42%	-	-40%	1,313	81	1,394	6%	-	10%
691	23	31	53	0	0	0	-	-	-	0	0	0	-	-	-
695	321	0	321	212	0	212	-34%	-	-34%	284	0	284	-11%	-	-11%
697	90	0	90	81	0	81	-	-	-	88	0	88	-	-	-
698	103	695	799	562	471	1,033	445%	-32%	29%	933	715	1,648	805%	3%	106%
699	552	29	581	230	0	230	-58%	-	-60%	247	0	247	-55%	-	-57%
603	30	0	30	116	179	295	-	-	-	122	184	306	-	-	-
664	142	11	153	158	0	158	11%	-	3%	207	0	207	46%	-	35%
665	111	0	111	51	0	51	-54%	-	-54%	45	0	45	-60%	-	-60%
667	380	122	502	384	0	384	1%	-100%	-24%	487	0	487	28%	-100%	-3%
668	211	33	244	77	0	77	-63%	-	-68%	132	0	132	-37%	-	-46%
604	23	48	72	134	110	244	-	-	-	130	110	240	-	-	-
4	3,070	3,260	6,330	4,363	3,574	7,937	42%	10%	25%	4,404	3,612	8,016	43%	11%	27%
6	4,499	4,264	8,763	3,864	4,410	8,274	-14%	3%	-6%	4,094	4,497	8,591	-9%	5%	-2%
12	1,416	744	2,160	2,697	1,618	4,315	90%	117%	100%	2,818	1,697	4,515	99%	128%	109%
17	3,131	2,750	5,881	2,224	2,979	5,203	-29%	8%	-12%	2,356	3,004	5,360	-25%	9%	-9%
18	4,059	6,332	10,391	3,234	4,509	7,743	-20%	-29%	-25%	3,420	4,718	8,138	-16%	-25%	-22%
114	709	400	1,109	332	377	709	-53%	-6%	-36%	328	364	692	-54%	-9%	-38%
615	19	95	114	486	560	1,046	-	-	817%	498	571	1,069	-	-	837%
490	588	0	588	178	0	178	-70%	-	-70%	138	0	138	-77%	-	-77%
587	243	0	243	83	0	83	-66%	-	-66%	174	0	174	-29%	-	-29%
589	180	0	180	196	0	196	9%	-	9%	324	0	324	80%	-	80%
25	0	1,050	1,050	763	1,601	2,364	-	53%	125%	809	1,652	2,461	-	57%	134%
675	772	641	1,413	1,026	796	1,822	33%	24%	29%	1,105	869	1,974	43%	36%	40%
677	208	0	208	148	0	148	-29%	-	-29%	62	0	62	-70%	-	-70%
671	131	0	131	117	0	117	-11%	-	-11%	116	0	116	-12%	-	-12%
Total	**39,884**	**34,413**	**74,297**	**36,490**	**33,940**	**70,430**	**-9%**	**-1%**	**-5%**	**37,944**	**35,153**	**73,097**	**-5%**	**2%**	**-2%**

[3] SouthWest Transit routes in grey, Metro Transit routes in white.

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In addition to examining individual transit routes, the entire transit network was also compared with the 2010 on-board survey. The changes to the transit run times and headways had a minor impact on region-wide boardings. Table 3-5 displays the 2010 observed vs modeled transit ridership by mode.

Table 3-5: Year 2010 Observed vs. Modeled Transit Ridership by Mode

Mode	Type	2010 Transit On-Board Survey			2010 Model (Before)			2010 Model		
		Peak	Off-Peak	Total	Peak	Off-Peak	Total	Peak	Off-Peak	Total
5	Local	81,189	95,061	176,249	82,213	95,199	177,412	83,282	98,022	181,304
6	Local Limited	7,591	7,208	14,799	20,846	16,247	37,093	20,881	16,763	37,644
7	Express	40,125	6,697	46,823	28,575	5,500	34,075	30,230	6,442	36,672
	Subtotal (6,7)	47,716	13,905	61,622	49,421	21,747	71,168	51,111	23,205	74,316
8	LRT	12,286	14,519	26,805	13,148	12,716	25,864	12,436	13,079	25,515
9	CRT	1,967	0	1,967	393	0	393	419	0	419
Total		143,158	123,485	266,643	145,175	129,662	274,837	147,248	134,306	281,554

4. 2040 No-Build Alternative

The 2040 No-Build alternative as defined in support of the FEIS is summarised herein, and developed with the Metropolitan Council, Metro Transit Service Development, and SouthWest Transit. Detailed service plan assumptions are provided under separate cover. In summary, the 2040 service plan for the No-Build Alternative includes the following features:[4]

- Existing Transitways: METRO Blue (Hiawatha LRT), Green (Central Corridor LRT), Red (Cedar BRT) Lines; and North Star Commuter Rail
- Future Major Transit Projects: METRO Blue Extension (Bottineau LRT), Orange (I-35W BRT), Gold (Gateway BRT), and Red (extension to 181st Street) Lines
- Arterial BRT Lines: A (Snelling Avenue), C (Penn Avenue, and Chicago-Emerson/Fremont.

Figure 4-1 illustrates the major transit infrastructure and services included in the 2040 No-Build service plan. Table 4-1 summarizes the operational features of the 2040 No-Build and Build service plan for Metro Transit. Table 4-2 summarizes the operational features of the 2040 No-Build and Build service plan for SouthWest Transit.

[4] Reference: *2040 Transportation Policy Plan*, Metropolitan Council, January 2015.

Figure 4-1: Major Transit Projects in the 2040 No-Build Alternative

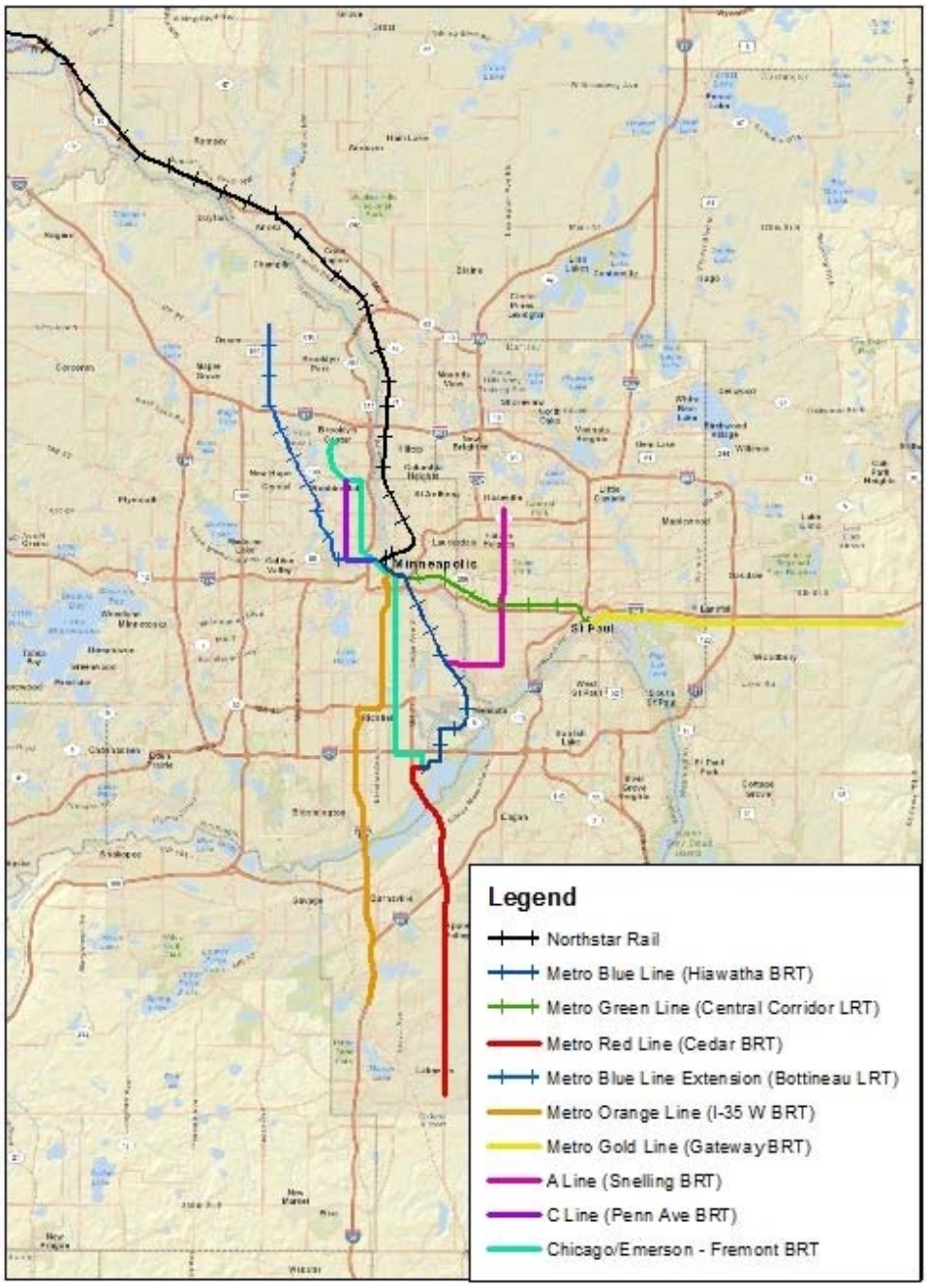

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Table 4-1: Summary of 2040 No-Build and SWLRT Concept Bus Plans – Metro Transit

Route	2040 No-Build Alternative							2040 Build Alternative							
	Route Description	Weekday			Saturday		Sunday		Route Description	Weekday			Saturday		Sunday		SW LRT Stations Served
		Span	Peak	Off Peak	Span	Day	Span	Day		Span	Peak	Off Peak	Span	Day	Span	Day	
5	Reduced Frequency to 30 minutes with implementation of Fremont/Chicago ABRT. Eliminate Route 5F with introduction of route 26	All Day	30	30	All Day	30	All Day	30	No change from No-Build	All Day	30	30	All Day	30	All Day	30	Royalston
6	No change from Existing	4:30 a.m. - 1:00 a.m.	10	10	4:30 a.m. - 1:00 a.m.	15	6:00 a.m. - 12:00 a.m.	15	Increase in weekday peak service form Uptown Transit Station to downtown to cover changes in Route 12 (freq. not specified)	4:30 a.m. - 1:00 a.m.	5	10	4:30 a.m. - 1:00 a.m.	15	6:00 a.m. - 12:00 a.m.	15	n/a
9	No change from Existing	5:30 a.m. - 12:30 a.m.	15-20	30	5:30 a.m. - 12:30 a.m.	30	7:00 a.m. - 11: 00 p.m.	30	Service to 9h Branch discontinued, with various segments picked up by proposed Route 601	5:30 a.m. - 12:30 a.m.	15-20	30	5:30 a.m. - 12:30 a.m.	30	7:00 a.m. - 11: 00 p.m.	30	Royalston
12	All trips operate to downtown Mpls. Increase frequency to 15 peak, 20 off-peak. Extend a uniform service span to 5:00 a.m. to 1:00 a.m.	5:00 a.m. - 1:00 a.m.	15	20	5:00 a.m. - 1:00 a.m.	20	5:00 a.m. - 1:00 a.m.	20	Eliminated and replaced by new Route 612	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
17	Service west of West Lake station will be on par with the rest of the route. Reduced service to Beltline Boulevard but Weekday and Saturday service is extended south slightly to Excelsior Boulevard for connections with Route 12	5:00 a.m. - 2:00 a.m.	10	15	5:30 a.m. - 2:00 a.m.	15	5:30 a.m. - 2:00 a.m.	15-30	No change from No-Build	5:00 a.m. - 2:00 a.m.	10	15	5:30 a.m. - 2:00 a.m.	15	5:30 a.m. - 2:00 a.m.	15-30	West Lake Street, Blake
19	Reduce frequency to 30 minutes all day with implementation of Penn Avenue ABRT	All Day	30	30	All Day	30	All Day	30	No change from No-Build	All Day	30	30	All Day	30	All Day	30	Royalston
21	No change from Existing	4:00 a.m. - 2:00 a.m.	15-Jun	15-Jun	4:00 a.m. - 2:00 a.m.	15-Jun	4:00 a.m. - 2:00 a.m.	20-Aug	Extension to West Lake Street Station with 20 min. freq. Mon-Sun. Service span 7:00 a.m.-12:00 a.m.	4:00 a.m. - 2:00 a.m.	15-Jun	15-Jun	4:00 a.m. - 2:00 a.m.	15-Jun	4:00 a.m. - 2:00 a.m.	20-Aug	West Lake Street

Route	2040 No-Build Alternative							2040 Build Alternative							
	Route Description	Weekday			Saturday		Sunday		Route Description	Weekday			Saturday		Sunday		SW LRT Stations Served
		Span	Peak	Off Peak	Span	Day	Span	Day		Span	Peak	Off Peak	Span	Day	Span	Day	
22	No change from Existing	4:30 a.m. - 12:30 a.m.	15	20	4:30 a.m. - 12:30 a.m.	20	5:00 a.m. - 12:30 a.m.	30	No change from No-Build	4:30 a.m. - 12:30 a.m.	15	20	4:30 a.m. - 12:30 a.m.	20	5:00 a.m. - 12:30 a.m.	30	Royalston
25	No change from Existing	5:00 a.m. - 7:00 p.m.	20-30	60	8:00 a.m. - 6:00 p.m.	90	n/a	n/a	No change from No-Build	5:00 a.m. - 7:00 p.m.	20-30	60	8:00 a.m. - 6:00 p.m.	90	n/a	n/a	n/a
26	New North Minneapolis circulator; operates one-direction (clockwise) with 30 min frequency during all time periods	6:00 a.m. - 11:00 p.m.	30	30	6:00 a.m. - 11:00 p.m.	30	6:00 a.m. - 11:00 p.m.	30	No change from No-Build	6:00 a.m. - 11:00 p.m.	30	30	6:00 a.m. - 11:00 p.m.	30	6:00 a.m. - 11:00 p.m.	30	Penn, Van White
601	Not in No-Build Network	n/a	n/a	n/a	n/a	n/a	n/a	n/a	New - Replaces the 9H branch as a crosstown servicing West Lake Station to the Louisiana Transit Center	4:30 a.m. - 1:00 a.m.	30	30	5:00 a.m. - 1:00 a.m.	30	6:00 a.m. - 1:00 a.m.	30	West Lake Street
602	Not in No-Build Network	n/a	n/a	n/a	n/a	n/a	n/a	n/a	New crosstown between West Lake Station and the Southdale Transit Center	4:30 a.m. - 1:00 a.m.	30	30	5:00 a.m. - 1:00 a.m.	30	6:00 a.m. - 1:00 a.m.	30	West Lake Street
604	Add weekend service with 30 min. daily frequency. Extend service span from 6:00 a.m. - 12:00 a.m.	6:00 a.m. - 12:00 a.m.	30	30	6:00 a.m. - 12:00 a.m.	30	6:00 a.m. - 12:00 a.m.	30	Extend service to Belt Line Station and end service at Louisiana Transit Center	6:00 a.m. - 12:00 a.m.	30	30	6:00 a.m. - 12:00 a.m.	30	6:00 a.m. - 12:00 a.m.	30	Belt Line, Louisiana
605	Not in No-Build Network	n/a	n/a	n/a	n/a	n/a	n/a	n/a	New route picking up parts of 615 and servicing Hopkins station to Beltline Station. 30 min. freq. Mon-Sun. 6:00 a.m. - 12:00 a.m.	6:00 a.m. - 12:00 a.m.	30	30	6:00 a.m. - 12:00 a.m.	30	6:00 a.m. - 12:00 a.m.	30	Louisiana, Blake, Hopkins.
612	Not in No-Build Network	n/a	n/a	n/a	n/a	n/a	n/a	n/a	New - Replaces Route 12, from Hopkins to West Lake Station. Mon-Sat - 15-min. freq. Sun - 30-min. freq. 5:00 a.m. - 1:00 a.m. daily	5:00 a.m. - 1:00 a.m.	15	15	5:00 a.m. - 1:00 a.m.	15	5:00 a.m. - 1:00 a.m.	30	Hopkins, Blake, West Lake
614	No change from Existing	6:00 a.m. - 12:00 a.m.	30	60	9:00 a.m. - 4:00 p.m.	60	n/a	n/a	Operate the east segment of Route 670 from Vine Hill Road to Hopkins Station. 30-min. peak/60-min. off-peak. Mon-Sun. 6:00 a.m. - 12:00 a.m.	6:00 a.m. - 12:00 a.m.	30	60	6:00 a.m. - 12:00 a.m.	60	6:00 a.m. - 12:00 a.m.	60	Hopkins

Route	2040 No-Build Alternative								2040 Build Alternative								
	Route Description	Weekday			Saturday		Sunday		Route Description	Weekday			Saturday		Sunday		SW LRT Stations Served
		Span	Peak	Off Peak	Span	Day	Span	Day		Span	Peak	Off Peak	Span	Day	Span	Day	
615	No change from Existing	6:00 a.m. - 12:00 a.m.	30	30	6:00 a.m. - 12:00 a.m.	30	6:00 a.m. - 12:00 a.m.	30	Takes over part of Route 12 south of Downtown Hopkins to Opus Station. Route is extended to Carlson Parkway on north end. Add weekend service from Ridgedale to Opus. 30-min. freq. Mon-Sun. 6:00 a.m.-12:00 a.m.	6:00 a.m. - 12:00 a.m.	30	30	6:00 a.m. - 12:00 a.m.	30	6:00 a.m. - 12:00 a.m.	30	Hopkins, Opus
616	Not in No-Build Network	n/a	n/a	n/a	n/a	n/a	n/a	n/a	New route operating between Opus Station and Minnetonka Corporate Center. Peak only at 30-min. freq.	Peak Periods Only	30	n/a	n/a	n/a	n/a	n/a	Opus
620	New crosstown route operates between Southwest and Hopkins. Mon-Sat freq at 30 min. with 60 min. eve freq. Service span from 6:00 a.m.-12:00 a.m. No Sunday service	6:00 a.m. - 12:00 a.m.	30	30	6:00 a.m. - 12:00 a.m.	30	n/a	n/a	Route eliminated in Build network.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
664	No change from Existing	Peak	15 trips	n/a	n/a	n/a	n/a	n/a	No change from No-Build	Peak	15 trips	n/a	n/a	n/a	n/a	n/a	Opus
667	No change from Existing	Peak	20 trips	n/a	n/a	n/a	n/a	n/a	No change from No-Build	Peak	20 trips	n/a	n/a	n/a	n/a	n/a	n/a
668	No change from Existing	Peak	9 trips	n/a	n/a	n/a	n/a	n/a	Route eliminated in Build network.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
670	No change from Existing	Peak	6 trips	n/a	n/a	n/a	n/a	n/a	Route eliminated in Build network.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
671	No change from Existing	Peak	6 trips	n/a	n/a	n/a	n/a	n/a	No change from No-Build	Peak	6 trips	n/a	n/a	n/a	n/a	n/a	n/a
755	No change from Existing	Peak	25 trips	n/a	n/a	n/a	n/a	n/a	No change from No-Build	Peak	25 trips	n/a	n/a	n/a	n/a	n/a	n/a
A Line - Snelling	New ABRT Route in Regional Network	All-Day	10	10	All-Day	10	All-Day	10	No change from No-Build	All-Day	10	10	All-Day	10	All-Day	10	n/a
C Line - Penn	New ABRT Route in Regional Network	All-Day	10	10	All-Day	10	All-Day	10	No change from No-Build	All-Day	10	10	All-Day	10	All-Day	10	n/a
Chicago/ Fremont ABRT	New ABRT Route in Regional Network	All-Day	10	10	All-Day	10	All-Day	10	No change from No-Build	All-Day	10	10	All-Day	10	All-Day	10	n/a

Table 4-2: Summary of 2040 No-Build and SWLRT Concept Bus Plans – SouthWest Transit

Route	2040 No-Build Alternative								2040 Build Alternative								
	Route Description	Weekday			Saturday		Sunday		Route Description	Weekday			Saturday		Sunday		SW LRT Stations Served
		Span	Peak	Off Peak	Span	Day	Span	Day		Span	Peak	Off Peak	Span	Day	Span	Day	
630N	Not in No-Build Network	n/a	n/a	n/a	n/a	n/a	n/a	n/a	New Local route	6:00 a.m. - 7:00 p.m.	10	20	n/a	n/a	n/a	n/a	Golden Triangle
630S	Not in No-Build Network	n/a	n/a	n/a	n/a	n/a	n/a	n/a	New Local route	6:00 a.m. - 7:00 p.m.	10	20	n/a	n/a	n/a	n/a	Golden Triangle
631	Not in No-Build Network	n/a	n/a	n/a	n/a	n/a	n/a	n/a	New Local route	6:00 a.m. - 10:00 p.m.	20	40	8:30 a.m. - 10:10 p.m.	30	n/a	n/a	Southwest Station
632	Not in No-Build Network	n/a	n/a	n/a	n/a	n/a	n/a	n/a	New Local route	6:00 a.m. - 10:00 p.m.	10	20	8:30 a.m. - 10:10 p.m.	30	n/a	n/a	Southwest Station
633	Not in No-Build Network	n/a	n/a	n/a	n/a	n/a	n/a	n/a	New Local route	Peak	15	30	8:30 a.m. - 10:10 p.m.	30	n/a	n/a	Southwest Station
634	Not in No-Build Network	n/a	n/a	n/a	n/a	n/a	n/a	n/a	New Local route	Peak	15	30	8:30 a.m. - 10:10 p.m.	30	n/a	n/a	Southwest Station
635A	Not in No-Build Network	n/a	n/a	n/a	n/a	n/a	n/a	n/a	New Local route	Peak	15	30	8:30 a.m. - 10:10 p.m.	30	n/a	n/a	Southwest Station
635B	Not in No-Build Network	n/a	n/a	n/a	n/a	n/a	n/a	n/a	New Local route	Peak	15	30	8:30 a.m. - 10:10 p.m.	30	n/a	n/a	Southwest Station
684	Add service - 12 trips EB AM / 15 trips WB PM	Peak	Varies	n/a	n/a	n/a	n/a	n/a	Same as No-Build - 12 trips EB AM / 15 trips WB PM	Peak	Varies	n/a	n/a	n/a	n/a	n/a	n/a
687	Add service - 4 trips EB AM / 4 trips WB PM	Peak	Varies	n/a	n/a	n/a	n/a	n/a	Same as No-Build - 4 trips EB AM / 4 trips WB PM	Peak	Varies	n/a	n/a	n/a	n/a	n/a	n/a
690	Add service - 5 min. in peak	Peak	Varies	n/a	n/a	n/a	n/a	n/a	Same as No-Build - 5 min. in peak	Peak	Varies	n/a	n/a	n/a	n/a	n/a	Southwest Station
691	Add service - 3 trip EB AM; 3 trip WB PM	Peak	Varies	n/a	n/a	n/a	n/a	n/a	Same as No-Build - 3 trip EB AM; 3 trip WB PM	Peak	Varies	n/a	n/a	n/a	n/a	n/a	Southwest Station
692	No change from existing - 4 trips EB AM / 4 trips WB PM	Peak	Varies	n/a	n/a	n/a	n/a	n/a	Same as No-Build - 4 trips EB AM / 4 trips WB PM	Peak	Varies	n/a	n/a	n/a	n/a	n/a	n/a
694	Add service - 15 min - Peak; 30 min - Midday	7:00 a.m. - 6:00 p.m.	Varies	n/a	n/a	n/a	n/a	n/a	Same as No-Build - 15 min - Peak; 30 min - Midday	7:00 a.m. - 6:00 p.m.	Varies	n/a	n/a	n/a	n/a	n/a	Southwest Station
695	Add service - 10 min - AM & PM Peak	6:00 am - 9:00 pm	Varies	n/a	n/a	n/a	n/a	n/a	Same as No-Build - 10 min - AM & PM Peak	6:00 am - 9:00 pm	Varies	n/a	n/a	n/a	n/a	n/a	Southwest Station
697	No change from existing - 6 trips EB AM / 5 trips WB PM	Peak	Varies	n/a	n/a	n/a	n/a	n/a	Same as No-Build - 6 trips EB AM / 5 trips WB PM	Peak	Varies	n/a	n/a	n/a	n/a	n/a	n/a
698	Add service - 30 Peak; 15 Off Peak	6:00 am - 10:30 pm	Varies	n/a	n/a	n/a	n/a	n/a	Same as No-Build - 30 Peak; 15 Off Peak	6:00 am - 10:30 pm	Varies	n/a	n/a	n/a	n/a	n/a	Southwest Station
699	No change from existing - 11 trips EB AM / 11 trips WB PM	Peak	Varies	n/a	n/a	n/a	n/a	n/a	Same as No-Build - 11 trips EB AM / 11 trips WB PM	Peak	Varies	n/a	n/a	n/a	n/a	n/a	n/a

5. 2040 Build Alternative (SWLRT Project)

This section summarizes the assumptions for the SWLRT Project that are included in the 2040 Build Alternative.

5.1. Concept Bus Plan

A number of changes to the No-Build bus network in order to incorporate the Green Line LRT Extension. Similar to the 2040 No-Build service plan, the 2040 concept bus plan has been developed in collaboration with the Metropolitan Council, Metro Transit and SouthWest Transit. (Details are provided under separate cover.) See Figure 5-1 and Table 4-1 for a summary of the 2040 SWLRT service plan assumptions.

5.2. SWLRT Service Plan and Run Times

Tables 5-1 and 5-2 summarize the SWLRT frequencies and station-to-station run times.

Table 5-1: SWLRT Service Plan

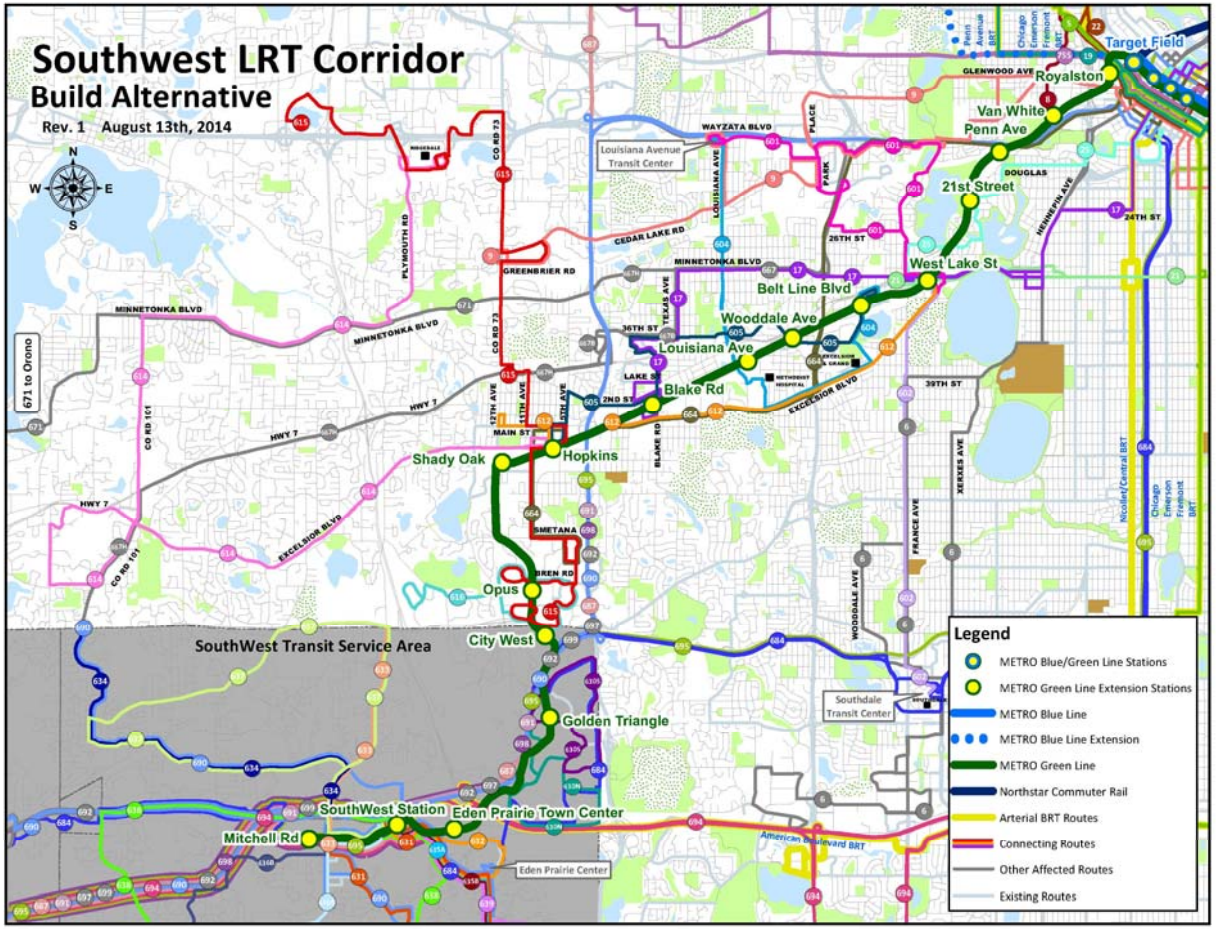
From	To	Time (min.)	Distance (mi.)	Day	Headway Early	AM	Mid	PM	Eve	Late	Owl
Blue Line		40.00	12.45	M-Th	15	10	10	10	10	15	30
Mall of America	The Interchange			Fri	15	10	10	10	10	15	30
				Sat	20	15	10	10	15	15	30
				Sun	20	15	10	10	15	15	30
TOTALS											
Green Line		77.40	25.40	M-Th	20	10	10	10	10	15	n/a
Union Depot	SouthWest			Fri	20	10	10	10	10	15	n/a
				Sat	20	15	10	10	15	15	n/a
				Sun	20	15	10	10	15	15	n/a
TOTALS											
Green Line		45.50	10.90	M-Th	n/a	n/a	n/a	n/a	n/a	n/a	60
Union Depot	The Interchange			Fri	n/a	n/a	n/a	n/a	n/a	n/a	60
				Sat	n/a	n/a	n/a	n/a	n/a	n/a	60
				Sun	n/a	n/a	n/a	n/a	n/a	n/a	60
TOTALS											
SYSTEM TOTALS CHANGE FROM NO BUILD											

Table 5-2: SWLRT Station-to-Station Run Times

From Station	To Station	Runtime (minutes)
SouthWest	Eden Prairie Town Center	2.08
Eden Prairie Town Center	Golden Triangle	3.65
Golden Triangle	City West	2.27
City West	Opus	1.37
Opus	Shady Oak	2.98
Shady Oak	Hopkins	1.4
Hopkins	Blake	2.08
Blake	Louisiana	2.1
Louisiana	Wooddale	1.47
Wooddale	Beltline	1.67
Beltline	West Lake	1.58
West Lake	21st Street	2.05
21st Street	Penn	1.5
Penn	Van White	1.62
Van White	Royalston	2.33
Royalston	Interchange	1.73
SouthWest	**Interchange**	**31.9**

The SWLRT service plan modeled herein has an estimated 31.9 minutes runtime between the Interchange Station and SouthWest Station.

Figure 5-1: SWLRT 2040 Service Plan



Note: Graphic is not up to date, Mitchell Station and Routes 8, 636-639 should be removed, Route 26 should be added.

5.3. LRT Stations and Park-and-Ride Facilities

Figure 5-2 presents the locations of the LRT station and park-and-ride facilities associated with the SWLRT Project. The Project includes 16 stations, 9 of which have park-and-ride facilities. Table 5-3 lists the stations with park-and-ride facilities and number of spaces at each location.

Figure 5-2: SWLRT Alignment and Station Locations

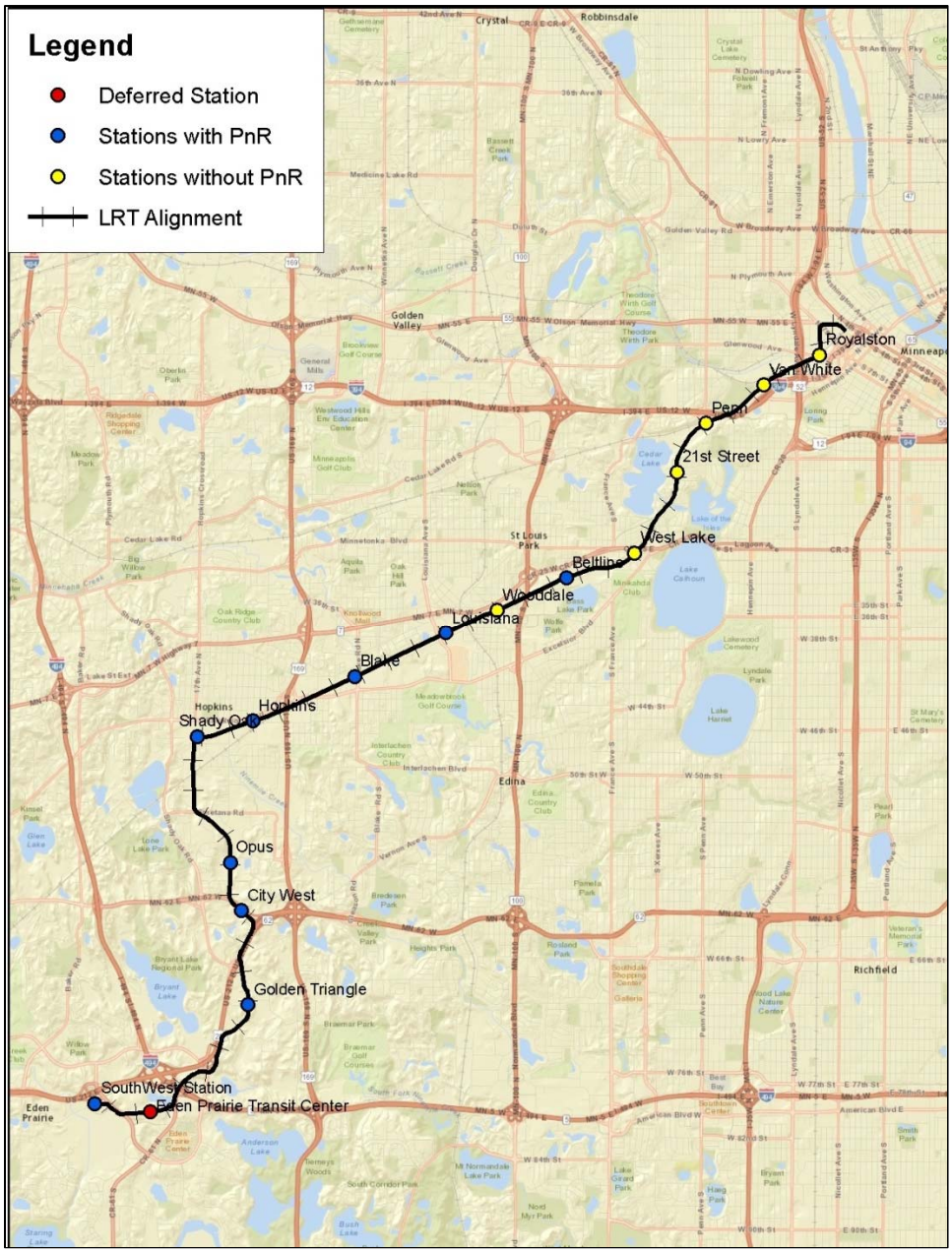


Table 5-3: SWLRT Park-and-Ride Facilities

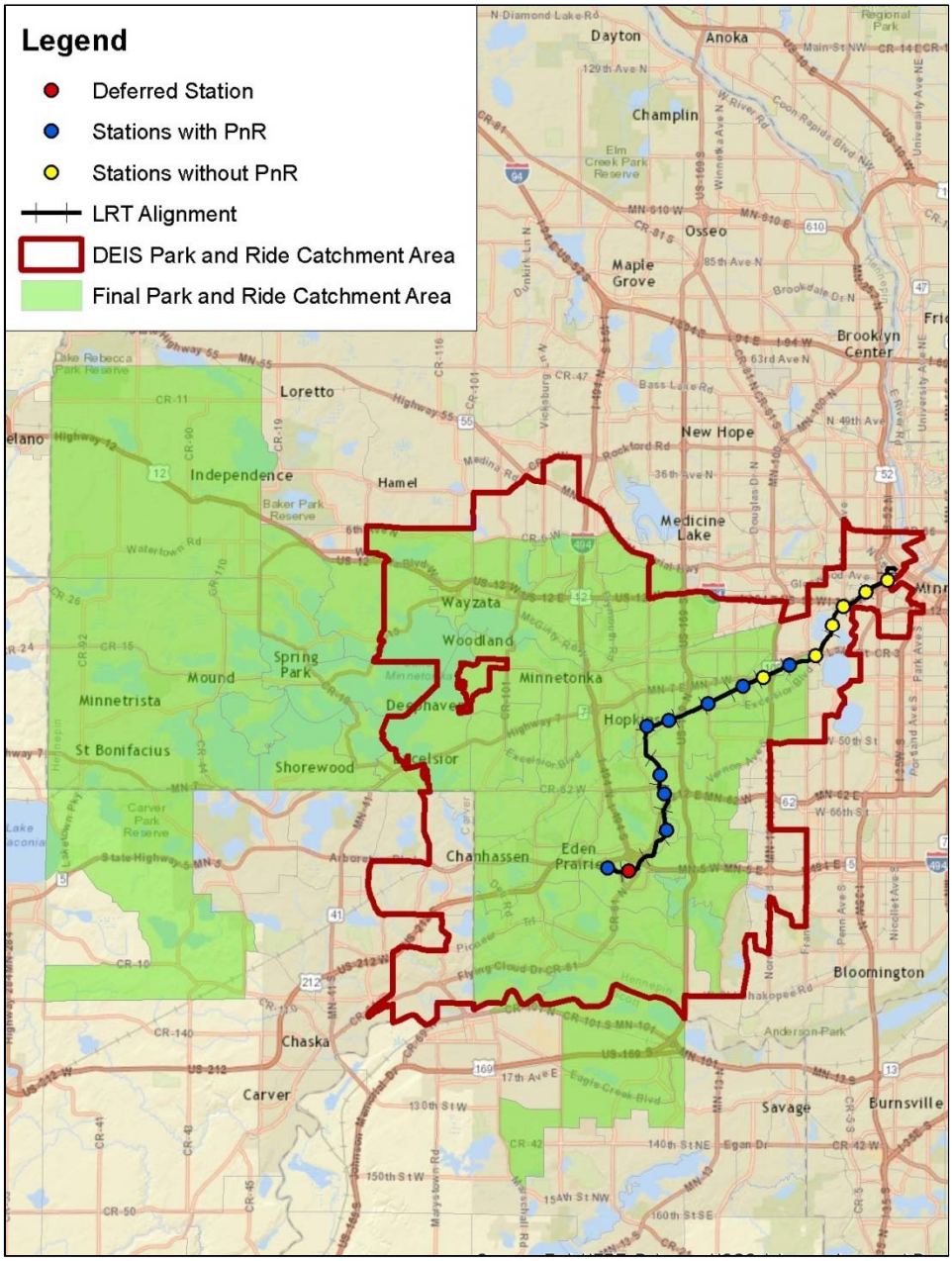
Location	Number of Spaces[5]
SouthWest Station	450
Golden Triangle	200
City West	160
Opus	80
Shady Oak	700
Hopkins	190
Blake	89
Louisiana	350
Beltline	268
Total	**2,487**

5.4. Park-and-Ride Catchment Areas

Initial park-and-ride catchment areas came from the previous model used for the DEIS. In order to reflect real world catchment areas, a park–and-ride model was used to generate parking space estimates for stations with park-and-rides based on the park-and-ride survey. This model's generated catchment areas were reconciled with the DEIS park-and-ride catchment areas in order to limit the park-and-ride demands to the parking space capacities at each station. Figure 5-3 shows the original DEIS park-and-ride catchment areas along with the final catchment area used for all stations in the Project.

5 Number of parking spaces in 2040.

Figure 5-3: DEIS and Final Park-and-Ride Catchment Areas



6. Model Results Specific to the FEIS

The tables herein present the travel demand modeling results specific to the FEIS. Table 6-1 shows the Existing (2010), No-Build (2040), and LPA (2040) PM peak hour travel times for transit and auto trips between select locations in terms of in-vehicle travel time, total travel time, and weighted travel time. Table 6-2 shows measures of transit reliability in the corridor for 2040 in terms of corridor transit passenger miles and LRT passenger miles. Table 6-3 displays the corridor transit service characteristics for Existing, No-Build, and LPA scenarios in terms of VMT, VHT, and place miles for bus and LRT. Table 6-4 shows the light rail and bus network operating characteristics systemwide for the No-Build and LPA scenarios in terms of weekday miles traveled and weekday revenue hours. Table 6-5 displays the average weekday light rail and commuter rail boardings for the No-Build and LPA scenarios in terms of average weekday boardings and peak-hour, peak-direction load point. Table 6-6 shows the average weekday total systemwide corridor transit trips for the Existing, No-Build, and LPA scenarios. Table 6-7 displays the average weekday work and nonwork corridor transit trips and transit shares to Downtown Minneapolis for the Existing, No-Build, and LPA scenarios. Table 6-8 shows the average weekday station usage by mode of access and egress for the LPA scenario.

Table 6-1: Transit and Auto Average Weekday PM Peak Hour Travel Times to and from Select Locations

From/To	Existing (2010)		No-Build (2040)		LPA (2040)	
	Automobile	Transit	Automobile	Transit	Automobile	Transit
In-Vehicle Travel Time[1]						
To downtown St Paul (815) from:						
Louisiana Ave (580)	32.76	41.82	34.68	41.09	34.68	58.03
Opus (594)	34.95	52.1	38.95	68.33	38.95	53.11
Eden Prairie TC (551)	39.11	51.95	44.77	49.36	44.77	46.67
To downtown Minneapolis (408) from:						
Louisiana Ave (580)	16.88	25.02	19.09	23.15	19.09	19.91
Opus (594)	23.35	35.3	26.46	50.39	26.46	35.17
Eden Prairie TC (551)	30.73	35.15	35.78	31.42	35.78	30.33
To North Minneapolis (433) from:						
Louisiana Ave (580)	18.28	40.81	20.92	37.91	20.92	20.39
Opus (594)	25.72	46.92	29.69	58.78	29.69	43.56
Eden Prairie TC (551)	32.26	46.77	38.26	39.81	38.26	38.72
To West Lake Calhoun (332) from:						
Louisiana Ave (580)	5.66	9.48	5.86	9.48	5.86	11.26
Opus (594)	13.18	34.2	14.63	36.72	14.63	29.46
Eden Prairie TC (551)	20.01	42.45	23.57	40.45	23.57	28.2

From/To	Existing (2010)		No-Build (2040)		LPA (2040)	
	Automobile	Transit	Automobile	Transit	Automobile	Transit
In-Vehicle Travel Time[1]						
To Eden Prairie (551) from*:*						
Opus (594)	9.69	56.41	10.4	21.09	10.4	20.21
Louisiana Ave (580)	16.31	46.13	17.4	55.21	17.4	23.08
Downtown Minneapolis (408)	26.96	43.17	29.5	32.55	29.5	32.55
North Minneapolis (433)	30.79	49.46	33.83	76.87	33.83	41.03
U of MN (359)	29.54	51.87	33	47.41	33	48.92
Downtown St Paul (815)	35.32	60.08	40.68	88.39	40.68	78.4
To downtown Hopkins (567) from*:*						
Louisiana Ave (580)	6.84	12.04	7.22	12.04	7.22	11.73
Downtown Minneapolis (408)	18	44.14	19.92	29.41	19.92	27.38
North Minneapolis (433)	22.95	53.87	25.09	38.96	25.09	28.18
U of MN (359)	23.16	53.1	25.25	38.73	25.25	36.07
Downtown St Paul (815)	36.8	67.02	42.62	49.26	42.62	65.55
To West Lake Calhoun (332) from*:*						
Downtown Minneapolis (408)	10.89	23.39	12.1	23.42	12.1	23.42
North Minneapolis (433)	15.56	31.34	17.15	30.52	17.15	16.39
U of MN (359)	15.52	30.57	17.03	32.14	17.03	24.28
Downtown St Paul (815)	28.23	44.49	32.51	47.39	32.51	47.39
Total Travel Time[2]						
To downtown St Paul (815) from:						
Louisiana Ave (580)	32.76	83.19	34.68	79.69	34.68	85.98
Opus (594)	34.95	96.83	38.95	108.85	38.95	97.25
Eden Prairie TC (551)	39.11	80.01	44.77	92.53	44.77	80.76
To downtown Minneapolis (408) from:						
Louisiana Ave (580)	16.88	51.78	19.09	47.59	19.09	46.87
Opus (594)	23.35	65.42	26.46	76.75	26.46	65.15
Eden Prairie TC (551)	30.73	48.6	35.78	60.43	35.78	48.66

From/To	Existing (2010)		No-Build (2040)		LPA (2040)	
	Automobile	Transit	Automobile	Transit	Automobile	Transit
Total Travel Time[2]						
To North Minneapolis (433) from:						
Louisiana Ave (580)	18.28	76.99	20.92	71	20.92	60.3
Opus (594)	25.72	91.02	29.69	97.29	29.69	85.69
Eden Prairie TC (551)	32.26	74.2	38.26	80.97	38.26	69.2
To West Lake Calhoun (332) from:						
Louisiana Ave (580)	5.66	35.18	5.86	34.5	5.86	34.36
Opus (594)	13.18	56.88	14.63	74.66	14.63	69.1
Eden Prairie TC (551)	20.01	73.08	23.57	83.84	23.57	62.76
To Eden Prairie (551) from*:*						
Opus (594)	9.69	121.81	10.4	65.85	10.4	69.6
Louisiana Ave (580)	16.31	108.17	17.4	102.43	17.4	62.02
Downtown Minneapolis (408)	26.96	64.89	29.5	58.83	29.5	58.83
North Minneapolis (433)	30.79	98.25	33.83	107.86	33.83	76
U of MN (359)	29.54	76.71	33	76.33	33	76.22
Downtown St Paul (815)	35.32	106.61	40.68	122.95	40.68	103.38
To downtown Hopkins (567) from*:*						
Louisiana Ave (580)	6.84	44.36	7.22	41.86	7.22	41.55
Downtown Minneapolis (408)	18	70.2	19.92	59.37	19.92	54.52
North Minneapolis (433)	22.95	91.04	25.09	78.91	25.09	66.11
U of MN (359)	23.16	84.66	25.25	71.1	25.25	66.33
Downtown St Paul (815)	36.8	102.63	42.62	92.78	42.62	93.49
To West Lake Calhoun (332) from*:*						
Downtown Minneapolis (408)	10.89	37.85	12.1	36.62	12.1	36.62
North Minneapolis (433)	15.56	63.95	17.15	59.69	17.15	49.76
U of MN (359)	15.52	57.57	17.03	53.73	17.03	49.98
Downtown St Paul (815)	28.23	75.55	32.51	67.91	32.51	67.91

From/To	Existing (2010)		No-Build (2040)		LPA (2040)	
	Automobile	Transit	Automobile	Transit	Automobile	Transit
Weighted Travel Time[3]						
To downtown St Paul (815) from:						
Louisiana Ave (580)	32.76	132.83	34.68	130.51	34.68	120.12
Opus (594)	34.95	150.5	38.95	167.42	38.95	152.82
Eden Prairie TC (551)	39.11	113.69	44.77	144.65	44.77	120.06
To downtown Minneapolis (408) from:						
Louisiana Ave (580)	16.88	83.89	19.09	81.55	19.09	79.5
Opus (594)	23.35	101.56	26.46	118.46	26.46	103.41
Eden Prairie TC (551)	30.73	64.75	35.78	95.24	35.78	70.65
To North Minneapolis (433) from:						
Louisiana Ave (580)	18.28	128.58	20.92	118.3	20.92	109.83
Opus (594)	25.72	146.83	29.69	155.26	29.69	140.81
Eden Prairie TC (551)	32.26	110.02	38.26	132.64	38.26	108.05
To West Lake Calhoun (332) from:						
Louisiana Ave (580)	5.66	67.93	5.86	66.43	5.86	64.33
Opus (594)	13.18	90.94	14.63	127.53	14.63	122.56
Eden Prairie TC (551)	20.01	113.12	23.57	138.41	23.57	105.36
To Eden Prairie (551) from*:*						
Opus (594)	9.69	200.28	10.4	123.78	10.4	132.9
Louisiana Ave (580)	16.31	182.61	17.4	170.14	17.4	109.79
Downtown Minneapolis (408)	26.96	90.95	29.5	90.37	29.5	90.37
North Minneapolis (433)	30.79	159.87	33.83	147.36	33.83	120.15
U of MN (359)	29.54	106.51	33	111.03	33	109.74
Downtown St Paul (815)	35.32	162.44	40.68	164.42	40.68	134.44
To downtown Hopkins (567) from*:*						
Louisiana Ave (580)	6.84	85.56	7.22	80.06	7.22	79.69
Downtown Minneapolis (408)	18	110.29	19.92	101.2	19.92	88.02
North Minneapolis (433)	22.95	146.41	25.09	134.64	25.09	113.98
U of MN (359)	23.16	133.14	25.25	117.68	25.25	103.57
Downtown St Paul (815)	36.8	153.82	42.62	150.49	42.62	128.27

From/To	Existing (2010)		No-Build (2040)		LPA (2040)	
	Automobile	Transit	Automobile	Transit	Automobile	Transit
Weighted Travel Time[3]						
To West Lake Calhoun (332) from*:*						
Downtown Minneapolis (408)	10.89	59.88	12.1	57.15	12.1	57.15
North Minneapolis (433)	15.56	109.35	17.15	99.51	17.15	91.59
U of MN (359)	15.52	96.08	17.03	84.2	17.03	81.18
Downtown St Paul (815)	28.23	116.76	32.51	102.01	32.51	102.01

Note: (nnn) = transportation analysis zone number.

1. In minutes; in-vehicle time is only the time that a passenger would spend within a public transit vehicle or an automobile.

2. In minutes; total time is the sum of in-vehicle time and all other time related to completing the trip, including walking and waiting time.

3. In minutes; total time is the sum of in-vehicle time, a weighted wait time for transit and all other time related to completing the trip including walking.

Table 6-2: Measures of Transit Reliability in the Southwest SWLRT Corridor (2040)

Light Rail Right-of-Way Measure	No Build	LPA
Miles of Light Rail	0	14.5
Average Weekday Passenger Miles (2040)	0	234,504
% of Total Corridor Passenger Miles	0%	33%
Corridor Passenger-Miles	594,575	700,471

Table 6-3: Average Weekday Corridor Transit Service Characteristics

	Existing (2010)	No Build (2040)	LPA (2040)
Transit VMT (Adjusted Daily Miles)			
Bus	36,171	53,681	60,697
LRT[1]	0	0	3,327
Total	36,171	53,681	64,024
% Change[2]	N/A	48%	19%
Transit VHT (Adjusted Revenue Hours)			
Bus	1,869	2,488	2,716
LRT[1]	0	0	128
Total	1,869	2,488	2,844
% Change[2]	N/A	33%	14%
Place-Miles[3]			
Bus	1,519,182	2,254,602	2,549,274
LRT	0	0	618,822
Total	1,519,182	2,254,602	3,168,096
% Change[2]	N/A	48%	41%

1. For LRT, transit VMT is measured in train miles, rather than in car miles.

2. For the No-Build Alternative, the % change is from existing; for the LPA, the % change is from the No-Build Alternative

3. Place miles = transit vehible capacity (seated and standing) for each vehicle type multiplied by VMT for each vehicle type.

Table 6-4: Light Rail and Bus Network Operating Characteristics of the No-Build and LPA (2040)

Operating Characteristics by Vehicle Mode	No Build (2040)	LPA (2040)
Bus Network Operating Characteristics Weekday Miles Traveled (Adjusted Daily Miles)		
Systemwide	192,577	196,864
Difference from No-Build Alternative	N/A	4,287
Weekday Bus Revenue Hours		
Systemwide	8,479	8,714
Difference from No-Build Alternative	N/A	235
Corridor Weekday Bus Place Miles[1]	8,088,234	8,268,288
LRT Network Operating Characteristics Weekday Miles Traveled (Adjusted Daily Miles)		
Systemwide	8,855	12,182
Difference from No-Build Alternative	N/A	3,327
Weekday Revenue Hours		
Systemwide	437	565
Difference from No-Build Alternative	N/A	128
Corridor Weekday LRT Place Miles[1]	1,647,030	2,265,887

*No change in commuter rail operating characteristics in the LPA compared to the No Build

1. Place miles are a measure of the passenger carrying capacities of the alternatives, similar to airline seat miles. Place miles equal transit vehicle capacity (seated and standing) of a vehicle type, multiplied by the number of vehicle miles traveled for that vehicle type, summed across all vehicle types. The estimate of bus place miles under the No-Build Alternative is based on 42 seats per vehicle for bus, 186 seats per vehicle for LRT.

Table 6-5: Average Weekday Light Rail and Commuter Rail Boardings (2040)

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

1. Boardings are rides per line. Linked trips are counted twice if the passenger transfers from one LRT line to another LRT line.

2. SW LRT is an extension of the Green Line (segment between St. Paul and Minneapolis opening June 2014). For the LPA, 36,162 number of these boardings are from new riders at the LPA stations

3. Northstar Rail has low ridership as the model does not cover the entire length of the rail line.

4. The peak-load for each line would be in the following locations: Green Line - Stadium Village - Prospect Park / 21st Street - Penn; Blue Line - Downtown East - Cedar-Riverside; Northstar - Interchange Station - Fridley Station.

Table 6-6: Average Weekday Total Systemwide and LPA Corridor Transit Trips (2040)

	Existing (2010)	No Build (2040)	LPA (2040)
Total Corridor Transit Trips[1] (originating rides)	56,914	94,339	107,354
Change from Existing	NA	37,425	50,440
% Change from Existing	NA	66%	89%
Change from No Build	NA	NA	13,015
% Change from No Build	NA	NA	14%
Total Systemwide Transit Trips	204,483	330,899	344,139

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

Table 6-7: Average Weekday Work and Nonwork Corridor Transit Trips and Transit Mode Share to Downtown (2040)

	Existing (2010)	No Build (2040)	LPA (2040)
Home-Based Work[1]			
Transit	15,349	28,849	31,287
Transit Mode Share %	32%	44%	48%
Nonwork[2]			
Transit	4,703	7,335	8,438
Transit Mode Share %	8%	9%	11%
Total			
Transit	20,052	36,184	39,725
Transit Mode Share %	18%	25%	27%

1. Home-based work trips are defined as trips taken directly between one's home and one's place of work.
2. Nonwork trips are defined as all trips that are not home-based work trips.

Table 6-8: Average Weekday Station Usage (Ons and Offs) by Mode of Access and Egress (2040)

Station	Station Ons(Offs)	% of Total Ons(Offs)	% by Mode of Access	
Mitchell Station				Walk
				Transfer
				Park-and-Ride
Southwest Station	3,104 (1,579)	10% (8%)	33% (48%)	Walk
			35% (52%)	Transfer
			33% (0%)	Park-and-Ride
Eden Prairie Town Center Station	1,502 (916)	5% (5%)	89% (79%)	Walk
			11% (21%)	Transfer
			0% (0%)	Park-and-Ride
Golden Triangle Station	1,263 (1,844)	4% (10%)	56% (69%)	Walk
			8% (31%)	Transfer
			36% (0%)	Park-and-Ride
City West Station	790 (565)	3% (3%)	52% (100%)	Walk
			0% (0%)	Transfer
			48% (0%)	Park-and-Ride
Opus Station	1,032 (1,717)	3% (9%)	83% (100%)	Walk
			1% (0%)	Transfer
			16% (0%)	Park-and-Ride
Shady Oak Station	2,087 (485)	7% (3%)	25% (100%)	Walk
			0% (0%)	Transfer
			75% (0%)	Park-and-Ride
Downtown Hopkins Station	2,890 (1,227)	9% (7%)	6% (31%)	Walk
			79% (69%)	Transfer
			15% (0%)	Park-and-Ride
Blake Station	1,316 (576)	4% (3%)	71% (95%)	Walk
			14% (5%)	Transfer
			16% (0%)	Park-and-Ride
Louisiana Station	2,232 (1,155)	7% (6%)	56% (88%)	Walk
			8% (12%)	Transfer
			36% (0%)	Park-and-Ride
Wooddale Station	1,817 (546)	6% (3%)	100% (100%)	Walk
			0% (0%)	Transfer
			0% (0%)	Park-and-Ride
Beltline Station	2,653 (1,333)	8% (7%)	77% (100%)	Walk
			0% (0%)	Transfer
			23% (0%)	Park-and-Ride

Station	Station Ons(Offs)	% of Total Ons(Offs)	% by Mode of Access	
West Lake Station	4,028 (1,453)	13% (8%)	36% (30%)	Walk
			64% (70%)	Transfer
			0% (0%)	Park-and-Ride
21st Street Station	1,641 (361)	5% (2%)	100% (100%)	Walk
			0% (0%)	Transfer
			0% (0%)	Park-and-Ride
Penn Station	1,024 (263)	3% (1%)	100% (100%)	Walk
			0% (0%)	Transfer
			0% (0%)	Park-and-Ride
Van White Station	332 (246)	1% (1%)	100% (100%)	Walk
			0% (0%)	Transfer
			0% (0%)	Park-and-Ride
Royalston Station	1,430 (1,819)	5% (10%)	6% (17%)	Walk
			94% (83%)	Transfer
			0% (0%)	Park-and-Ride
Interchange Station	2,308 (2,670)	7% (14%)	53% (67%)	Walk
			27% (33%)	Transfer
			20% (0%)	Park-and-Ride

	Total Station Ons/Offs by Mode of Access	% of Total Ons/Offs
Walk	16,830 (12,759)	54% (68%)
Transfer	8,561 (5,996)	27% (32%)
Park-and-Ride	6,058 (0)	19% (0%)
Total Station Ons/Offs	31,449 (18,755)	100% (100%)

Table 6-9: Average Weekday Station Ridership by Station, including YR 2020 Opening Day, YR 2040, and YR 2040 Reverse Commute, New Transit Trips, and Transit Dependent

Station Name	Opening Day (YR 2020) Ridership Projections	YR 2040 Projected Ridership	Reverse Commute Ridership (YR 2040)	New Transit Trips (YR 2040)	Transit Dependent Ridership (0 Car Households) (YR 2040)
SouthWest Station	1,629	2,342	600	925	603
Eden Prairie Town Center Station (deferred)	0	1,209	330	594	394
Golden Triangle Station	934	1,554	584	591	526
City West Station	415	678	240	226	199
Opus Station	840	1,375	615	718	507
Shady Oak Station	1,132	1,286	282	455	206
Downtown Hopkins Station	1,325	2,059	547	830	590
Blake Station	664	946	251	307	262
Louisiana Station	1,176	1,694	446	568	420
Wooddale Station	766	1,182	243	461	313
Beltline Station	1,272	1,993	529	677	518
West Lake Station	1,941	2,741	915	859	944
21st Street Station	670	1,001	137	514	218
Penn Station	404	644	229	190	308
Van White Station	683	289	69	105	108
Royalston Station	992	1,625	435	455	574
Downtown ridership & transfers from Green & Blue Lines	8,101	11,814	1931	3661	2190
Ridership	**22,944**	**34,427**	**8,379**	**12,132**	**8,876**