

Highway Transitway Corridor Study

Technical Memorandum 2: Transit Market Analysis

Prepared for: Metropolitan Council



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Purpose of Highway Transitways

The Metropolitan Council's *2030 Transportation Policy Plan (TPP)* states that mobility in the Twin Cities metropolitan region is fundamental to its economic vitality and quality of life. However, as the region grows and prospers the expected growth in population and employment will put greater and greater pressure on an already taxed transportation system. The *TPP* acknowledges that it is unrealistic, both in terms of funding and logistics, to expect to “fix” current and future traffic congestion by building additional highway capacity. Instead, the plan emphasizes the need to invest in strategies that provide increased regional mobility by optimizing and enhancing existing transportation infrastructure.

Highway bus rapid transit (BRT) is well suited to meet the needs expressed in the *TPP*. First, highway BRT is designed to operate on existing highways. Second, the purpose of highway BRT is to provide fast, frequent, all-day service that is cost-effective in serving high-demand regional population, employment, and transit nodes in highway corridors. The high level of service offered by highway BRT is designed to make transit a convenient, attractive option for regional residents. Therefore, implementing highway BRT would address the following regional transportation needs highlighted in the *TPP*:

- Highway BRT would effectively contribute to congestion management as well as optimize the performance of the existing highway system
- Highway BRT would increase the people-moving throughput of existing highways
- Highway BRT would provide greater trip speed and trip reliability to transit riders and automobile drivers
- Highway BRT would provide increased access to fast, frequent, and reliable services to residents in the outer suburbs thereby moving the region toward its goal of doubling transit ridership by 2030.

The Highway Transitway Corridor Study is an essential first step towards realizing these benefits.

Transit Market Analysis

The purpose of the Transit Market Analysis is to determine which segments of the study corridors have the characteristics that may support all-day frequent highway BRT service. The Transit Market Analysis also identifies preliminary station locations. The eight corridors being considered in this study include:

- TH 36 (Minneapolis to Stillwater)
- I-94 (Minneapolis to Maple Grove)
- Trunk Highway (TH) 65 (Minneapolis to Blaine)
- I-35E North (St. Paul to Forest Lake)
- I-35E South (St. Paul to Burnsville)
- I-394 (Minneapolis to Plymouth)

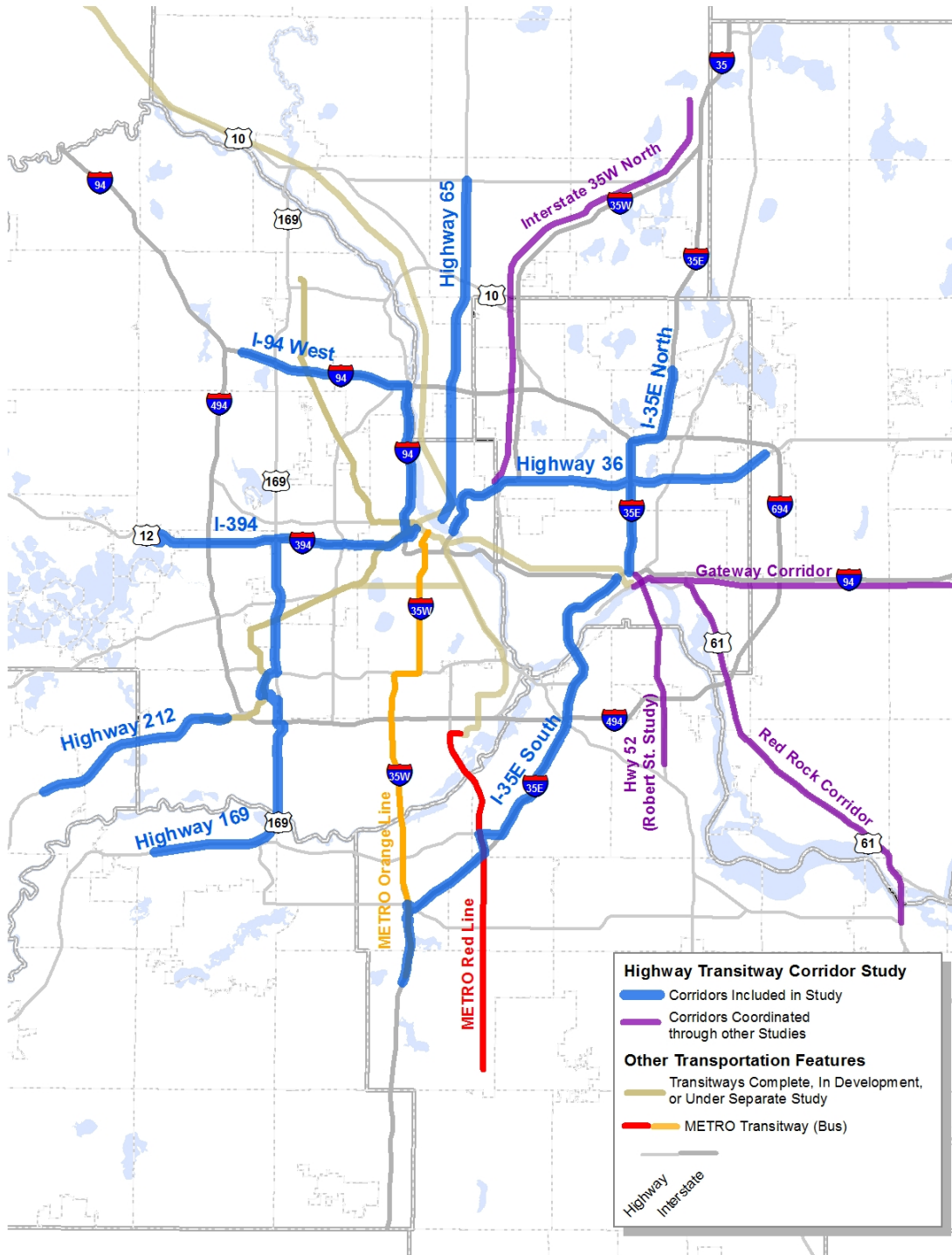
- TH 169 (Minneapolis to Shakopee)
- TH 212 (Southwest LRT to Chaska)

The eight corridors are shown in Figure 1.

Transit Market Analysis Approach

The Transit Market Analysis used a two part approach to identify the corridor segments with the strongest potential for all-day frequent BRT service and preliminary station locations. First, a quantitative screening analysis of existing and future demographics and transit infrastructure was conducted for all eight study corridors. The results of this analysis determined the appropriate length of the study corridors as well as identified potential station locations. Second, a qualitative review of each corridor's characteristics was performed to fine tune the results of the screening analysis. The topics reviewed included existing physical conditions, employment centers, planned transit and infrastructure improvements, and concentrations of low income and transit-reliant populations in each corridor. Guided by the station spacing guidelines from the Metropolitan Council's Regional Transitway Guidelines, the information gathered from the screening analysis and the high-level corridor review were used in tandem to recommend preliminary highway BRT station locations for this study. The specific methodologies and data used for both the quantitative screening analysis and the qualitative review are described in this report.

Figure 1: HTCS Study Corridors



Screening Analysis Methodology

The screening analysis was used to determine the appropriate length of the study corridors and to identify interchanges with high potential for highway BRT stations. Feasible station locations were defined as all local interchanges that have both on- and off-ramps in both directions (full-access interchanges). The study used the area within a two-mile radius of each feasible station location as the unit of measure for the screening analysis. A two-mile radius was used to ensure that all residences or employment centers that could be accessed via walking, biking or a short connecting bus route were included in the analysis.

Four screens were used to determine the potential of all-day, frequent BRT service along each corridor:

- Screen 1: Existing population and employment density (2010)
- Screen 2: Existing park-and-ride facilities
- Screen 3: Future population and employment (2030)
- Screen 4: Future park-and-ride facilities

The following sections describe the screening process in more detail.

Screen 1: Existing Population and Employment Density

Screen 1 used a combination of existing population and employment density to determine if a potential station location should be considered for a Highway BRT station. First, the existing population density for each potential station location was calculated using Year 2010 US Census data. Figure 2 shows the existing population density for each potential station location. In order to compare results across all of the study corridors, each location was assigned a number of points based on its existing population density.¹ As seen in Table 1, potential station locations with greater population densities were assigned more points. Next, the existing employment density for each potential station location was calculated using Year 2010 Quarterly Census Employment and Wages (QCEW) data, as shown in Figure 3. Similar to the population density analysis, each location was assigned a point value corresponding to its density level, as shown in Table 2.² Following these initial steps, the existing population and employment density point values were averaged together for each potential station location. Locations that had an average score of 3 or greater were considered initial candidates as Highway BRT station locations out of this first screening process. Locations that passed screen 1 are shown in purple in Figure 6, on page 9.

Not all locations that scored highly were ultimately recommended. Screen 1 was only the starting point for identifying potential station locations. Additional screens as well as station spacing guidelines were used in making final station recommendations.

¹ For a full description of the datasets and spatial analysis methods used to estimate population density please see Appendix A

² For a full description of the datasets and spatial analysis methods used to estimate employment density please see Appendix A

Analysis

Figure 2: 2010 Potential Station Area Population Densities

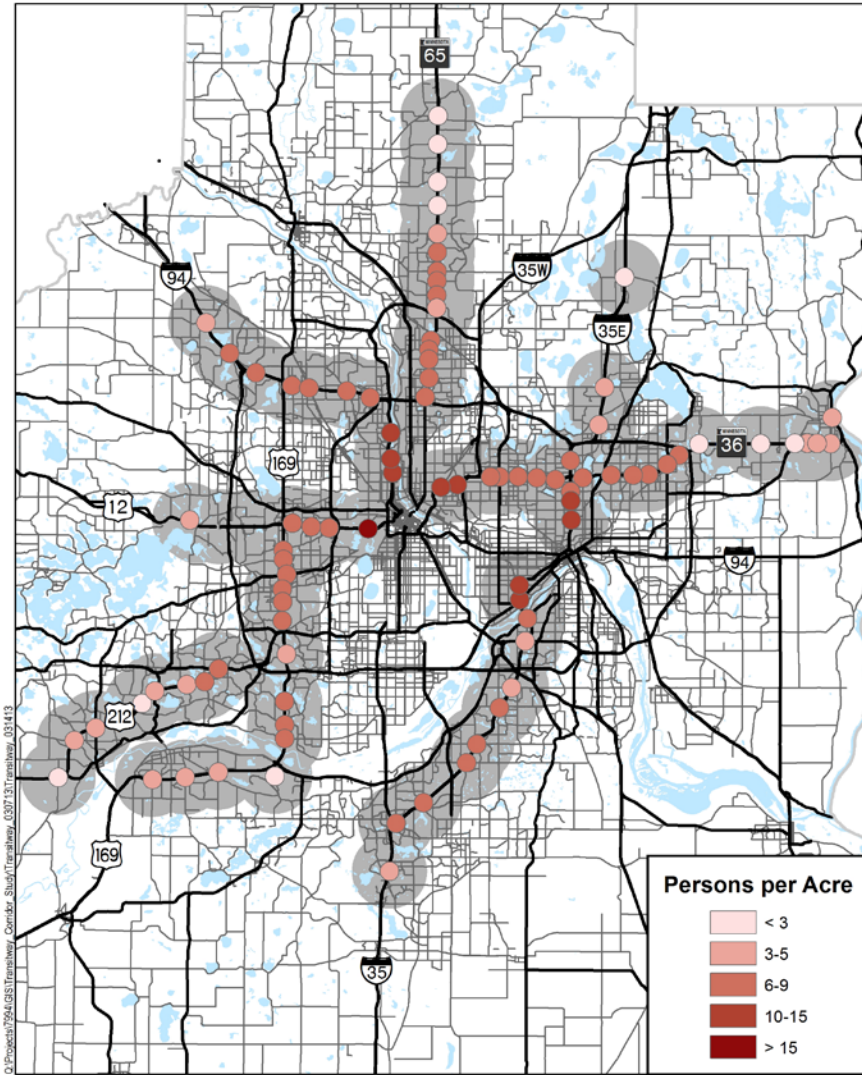


Figure 3: 2010 Potential Station Location Area Employment Densities

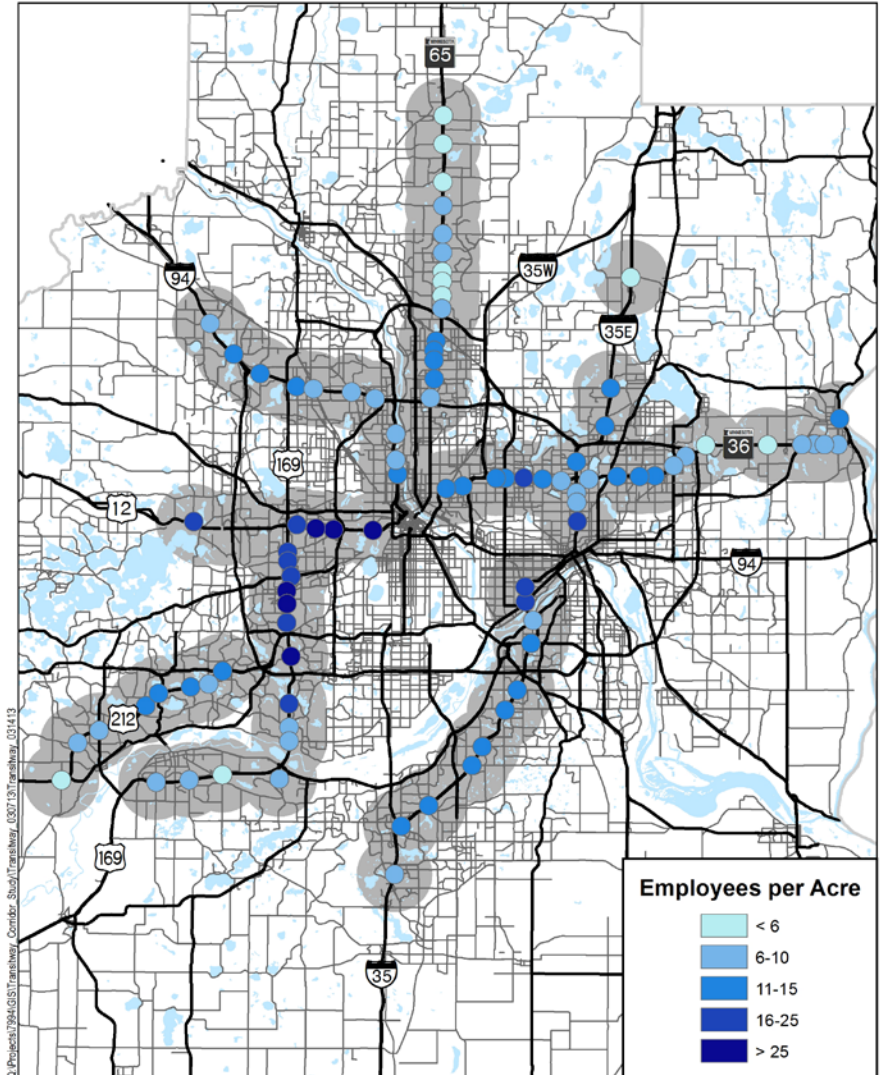


Table 1: Existing Population Density Thresholds

Persons per acre ³	Screen 1 Points
Less than 3	1
3 to 5	2
6 to 9	3
10 to 15	4
Greater than 15	5

Table 2: Existing Employment Density Thresholds

Jobs per acre ⁴	Screen 1 Points
Less than 6	1
6 to 10	2
11 to 15	3
16 to 25	4
Greater than 25	5

Screen 2: Existing Park-and-Ride Facilities

Screen 2 added potential station locations not included through Screen 1 if they were located nearby an existing park-and-ride. This screen added 11 locations as shown in pink on Figure 6, on page 9.

Screen 3: Future Population and Employment

Screen 3 used a combination of future population and employment data to determine if any of the potential station locations not included through Screen 1 and 2 should be considered for Highway BRT service. Screen 3 used magnitude instead of future population and employment density, because 2030 future development and density patterns are too unpredictable to estimate with any certainty. Future population and employment data was based on Year 2030 population and employment forecasts provided by the Metropolitan Council. Figure 4 and Figure 5 show the magnitude of each location’s future population and employment. Similar to the analysis of existing population and employment, each location was assigned a number of points based these magnitudes, as shown in Table 3 and Table 4. Potential station locations that had an average score of 3 or greater were included for consideration of Highway BRT service. These locations are shown in green in Figure 6, on page 9.

³ Population thresholds based on transit recommendations from *Transit Redesign*, a 1996 Metropolitan Council report

⁴ Employment thresholds based on transit recommendations from *Transit Redesign*, a 1996 Metropolitan Council report

Figure 4: Potential Station Location Future Population Magnitudes

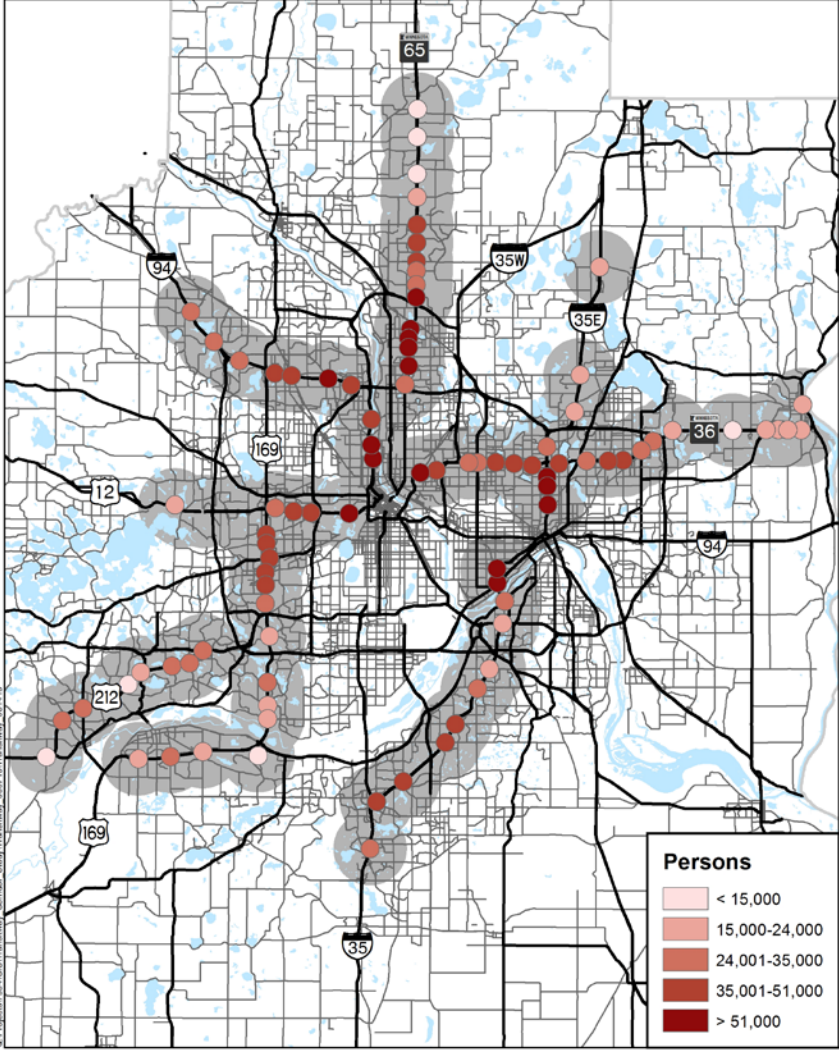


Figure 5: Potential Station Location Future Employment Magnitudes

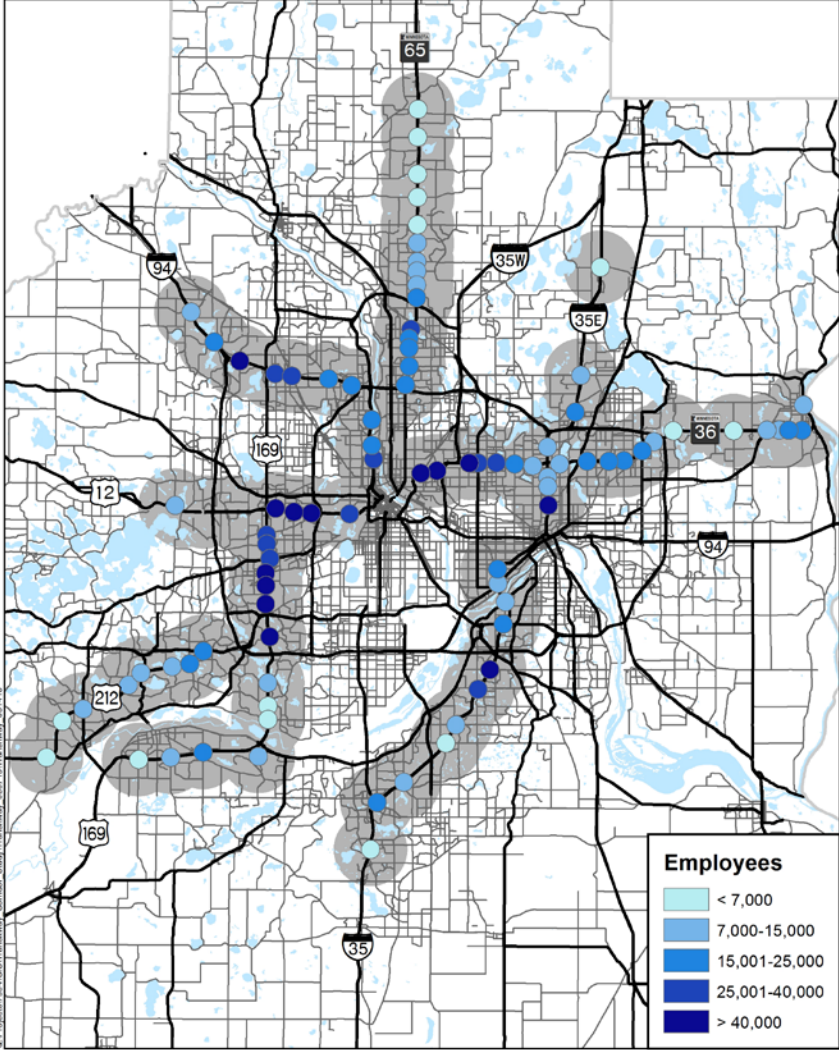


Table 3: Future Population Thresholds

Number of Persons ⁵	Screen 2 Points
Less than 15,000	1
15,000 to 24,000	2
24,001 to 35,000	3
35,001 – 51,000	4
Greater than 51,000	5

Table 4: Future Employment Thresholds

Number of Jobs ⁶	Screen 2 Points
Less than 7,000	1
7,001 to 15,000	2
15,001 to 25,000	3
25,001 – 40,000	4
Greater than 40,000	5

Screen 4: Future Park-and-Ride Facilities

Screen 4 added potential station locations not included through Screen 1, 2, or 3 if they were located near a planned park-and-ride facility. These stations are shown in blue in shown in Figure 6.

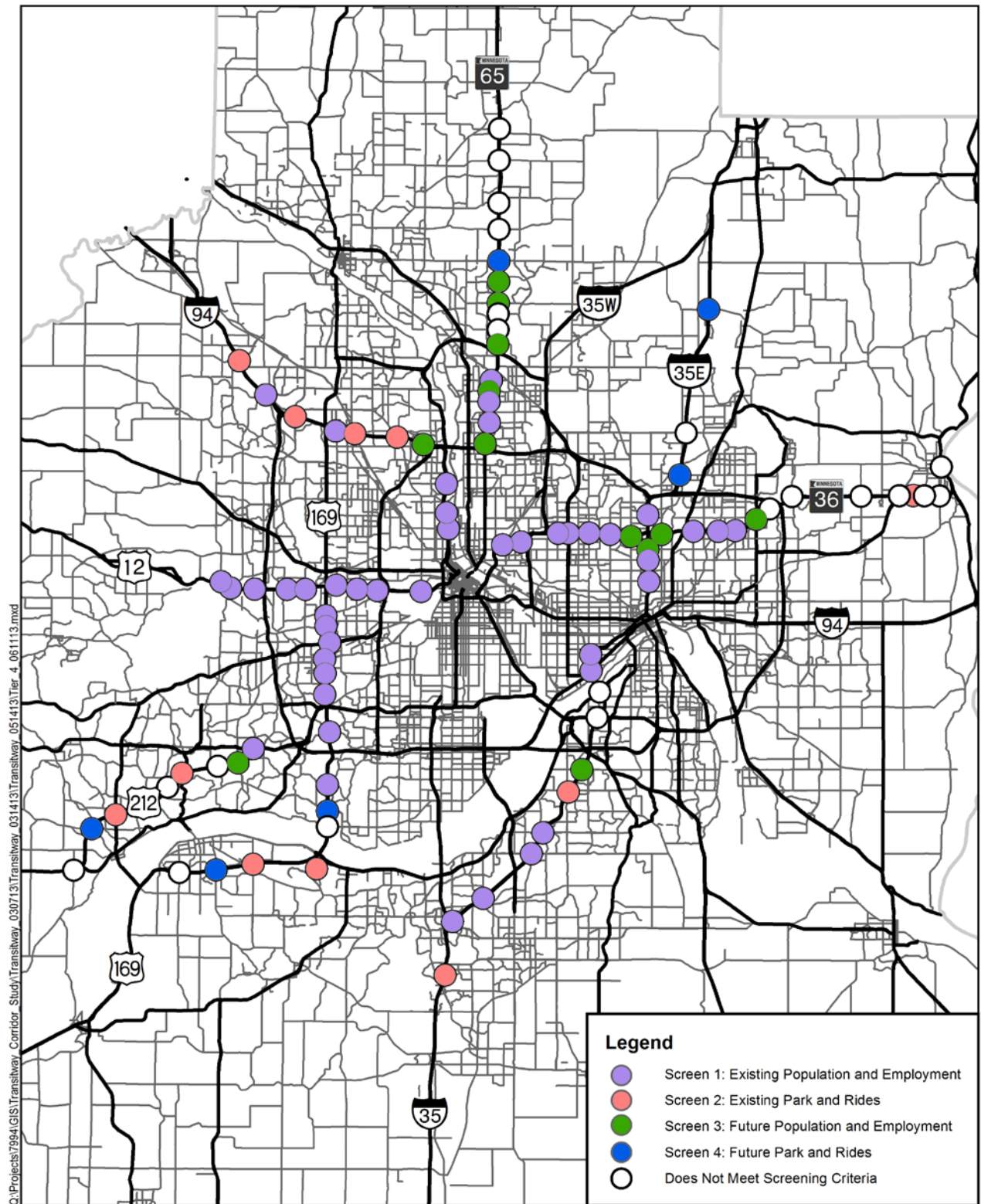
Screening Exercise Results Summary

All potential station locations that met at least one of the four screens are shown in Figure 6. The screening analysis helped identify the locations to consider for a BRT station. It is important to note that while Figure 6 identifies many interchanges that passed the screen, not all interchanges are recommended as a BRT station. This analysis provided the first level of information that was used to ultimately determine station locations. Other qualitative factors were used in addition to the screening to determine final candidates for BRT stations to be used in subsequent study analysis activities. These other qualitative factors are explained in more detail in the following section.

⁵ Future population thresholds based on transit recommendations from *Transit Redesign*, a 1996 Metropolitan Council report

⁶ Future employment thresholds based on transit recommendations from *Transit Redesign*, a 1996 Metropolitan Council report

Figure 6: Station Locations with the Greatest Highway BRT Potential



Qualitative Corridor Review

A qualitative corridor review was completed to help fine tune the results of the screening analysis and make candidate station location recommendations. This qualitative review considered existing physical conditions, employment center locations, existing and planned transitways, planned road infrastructure improvements, and low income and transit-reliant population concentrations. These characteristics, in conjunction with the highway BRT station spacing guidelines stated in the Metropolitan Council's *Regional Transitway Guidelines*, shaped the candidate station location recommendations. Appendix B includes a listing of each interchange analyzed and whether or not it was recommended as a candidate BRT station as well as the reason(s) for the recommendation.

The following sections describe the qualitative factors considered as part of the analysis.

Existing Physical Conditions and Physical Barriers

Existing physical conditions at each potential station location that passed the screening process were examined. Potential barriers and site constraints that would make highway BRT implementation difficult were documented at locations with those conditions. The review documented the following issues:

- Existing exit ramp infrastructure
- Potential utility impacts
- Existing transit facilities
- Existing pedestrian infrastructure
- Existing slope and grade change issues
- Site space constraints

The details of the review for each corridor are included in Appendix B.

Employment Centers and Commuting Patterns

Candidate station location recommendations incorporate corridor employment centers, areas defined as locations with 7,000 or more jobs and a job density of ten or more jobs per acre. For more information on corridor employment centers please see the Highway Transitway Corridor Study's *Technical Memorandum 1: Existing Conditions*.

Candidate station location recommendations also consider commuting patterns within the study corridors. The study examined commuting patterns using Longitudinal Employer-Household Dynamics (LEHD) data and identified the top five destinations for work trips in each corridor. Overall, downtown Minneapolis and St. Paul were the top destinations for all eight corridors, reinforcing the downtown focus of each alignment. The analysis also guided routing decisions in some corridors. For example, in the Trunk Highway 65 corridor, the southern end of the alignment could have terminated near the intersection with the planned Central Avenue Arterial BRT line; however, because the top commuting destination in this corridor was downtown Minneapolis the

alignment instead continued down I-94 into downtown Minneapolis. For a full list of the top five commuting destinations for each corridor please see Appendix C.

Existing and Planned Regional Transitway Connections

Candidate station recommendations also take advantage of existing and potential regional transitways. The transitways listed in Table 5 were considered in the review. As multiple corridors in the region are currently under study, the table also distinguishes between transitways currently assumed as programmed in the Metropolitan Council’s *TPP* Year 2030 No-Build scenario (see *TPP* Appendix F) and those corridors that are currently or have been recently studied.

Table 5: Existing and Planned Regional Transitways

Transitway	Status	Year 2030 No-Build Transitway Assumptions (programmed)
Northstar Commuter Rail	Existing	X
METRO Blue Line (Hiawatha LRT)	Existing	X
METRO Red Line (Cedar Avenue BRT)	Existing	X
METRO Green Line (Central Corridor LRT)	Planned	X
METRO Blue Line Extension (Bottineau LRT)	Planned	X
METRO Green Line Extension (Southwest LRT)	Planned	X
METRO Orange Line (I-35W BRT)	Planned	X
Nicollet-Central Corridor	Under Current Study	
Midtown Corridor	Under Current Study	
Robert Street Corridor	Under Current Study	
Arterial BRT Routes:		
• Snelling Avenue	Under Current Study	X
• Lake Street	Under Current Study	
• Central Ave	Under Current Study	X
• Nicollet Ave	Under Current Study	X
• Robert Street	Under Current Study	X
• American Boulevard	Planned	X
• West Broadway Avenue	Planned	X
• Chicago-Emerson/Fremont Avenue	Planned	X
• East 7th Street	Planned	X
• West 7th Street	Planned	X
• Penn Avenue	Potential	
• Hennepin Avenue	Potential	

X = Transitway is listed as programmed in the Metropolitan Council’s *TPP* (See *TPP* Appendix F)

Planned Corridor Infrastructure Improvements

Large scale corridor roadway infrastructure improvement projects planned in the eight study corridors were also reviewed and documented. These projects were highlighted as opportunities for potential coordination between planned projects and future highway BRT infrastructure. The review focused on all projects planned through 2022 with budgets over \$2 million. These projects are listed in Table 6. Projects from years 2014 – 2017 are listed in the State Transportation Improvement Program (STIP) and are considered to have funding commitments. Projects from years 2018 – 2022 projects are in the current state budget; however they are not official commitments. Some changes in the scope and timing of these projects should be anticipated.

Table 6: Planned Infrastructure Improvements in the Study Corridors

Corridor	Project Location	Project Details	Year	Total Project Cost
I-35E North	From I-94 in St. Paul to just north of Little Canada Rd in Little Canada	Construct MNPASS Lane	2014	\$104.8 M
I-35E North	From Ramsey County Rd E in Vadnais Heights to just S of Ramsey CSAH 96 in White Bear Lake	Mill & overlay, drainage, loop detectors, guardrail, etc.	2015	\$4.9 M
I-35E North	Over Goose Lake Rd. and BNSF RR in Vadnais Heights	Replace Bridges 9567 (new 62729) and 9568 (New 62730) including replacement and profile adjustments of pavement on both sides of bridge	2015	\$9.5 M
I-35E North	South of I-35E/W split to US 8	Unbonded concrete overlay	2017	\$27.0 M
I-394	Just east of MN 100 in Golden Valley to west end of bridge 27770D in Minneapolis	Mill and overlay, minor CPR, diamond grinding, shoulders, drainage, ADA ramps, guardrail and signal loops	2015	\$4.5 M
I-394	From MN 100 to I-94	Corridor bridge painting	2017	\$7.0 M
I-94	At Hennepin/Lyndale tunnel (Bridge 27832) and eastbound I-94 under I-35W tunnel (Bridge 27834) in Minneapolis	Tile repair	2017	\$4.7 M
I-94	From Nicollet Ave. in Minneapolis to W Shingle Creek Bridges 27909 in Brooklyn Center	Major CPR and diamond grinding drainage	2017	\$23.4 M
MN 169	Between MN 282 and MN 21 in Jordan	Reconstruct mainline including median J-barrier and replace median drainage structures and pipes		
MN 36	Over Lexington Ave. in Roseville	Replace bridge 5723 and approaches, signals, TMS, ADA guardrail, storm sewer and ponds	2015	\$13.6 M
MN 36	Bridges 62853, 6277, over Cleveland Ave. and on-ramp from I-35W	Bridge repair and replacement	2017	\$5.2 M

MN 65	From S of intersection of 53rd Ave NE in Fridley to bridge under Anoka CSAH 10 in Spring Lake Park.	Mill and overlay, drainage, guardrail, ADA pedestrian ramps & walk signal striping and bus stop improvements	2014	\$9.33 M
MN 65	North of 14th Ave in Minneapolis	Replace railroad bridge 80446 (New 27236) and raise clearance, drainage	2014	\$11.5 M
MN 65	CSAH 10 to 153rd Ave	Medium mill and overlay	2019	\$12.0 M
MN 65	Bridges 6817, 9417, over Coon Creek	Repair and replace bridges	2019	\$1.6 M
MN 65	Bridge 2440 over Mississippi River in Minneapolis	Rehabilitate bridge	2019	\$33.0 M
MN 65	Bridges 9263, 9264, CSAH 10 over MN 65,	Repair and replace bridges	2020	\$5.0 M
US 169	From just N of JCT I-494 in Bloomington to just N of JCT MN 62 in Edina	Mill and overlay, guardrail, drainage, pedestrian ramps, curb and gutter, signal and signing	2014	\$8.8 M
US 169	At Scott County Rd 69	Interchange construction (SAM Interchange bonds)	2014	\$15.5 M
US 169	Over US 212/MN 62 in Eden Prairie/Edina	Re-deck bridges 27079 and 27080, new approach panels	2016	\$ 2.2 M
US 169	Just north of MN 62 in Edina to MN 55 in Golden Valley	CPR with diamond grinding and mill and overlay, drainage	2017	\$16.5 M
US 169	CSAH 69 to Bloomington Ferry Bridge	Medium mill and overlay, minor CPR and diamond grind	2020	\$11.5 M
US 212	At Shady Oak Rd. in Eden Prairie	Interchange reconstruction (TED)	2015	\$7.0 M

Low-Income and Zero-Car Households

Concentrations of low-income and zero-car households were evaluated in each corridor as part of the high-level review. These populations were a focus of the analysis because they are strong markets for public transit service. The review calculated the percentage of low income and zero car households within each potential station location, using data from the 2010 US Census and the 2011 American Community Survey. The percentages were classified as low, medium or high, in comparison to the regional average percentage of these populations. The details of this analysis are included in Appendix D.

Station Spacing Guidelines

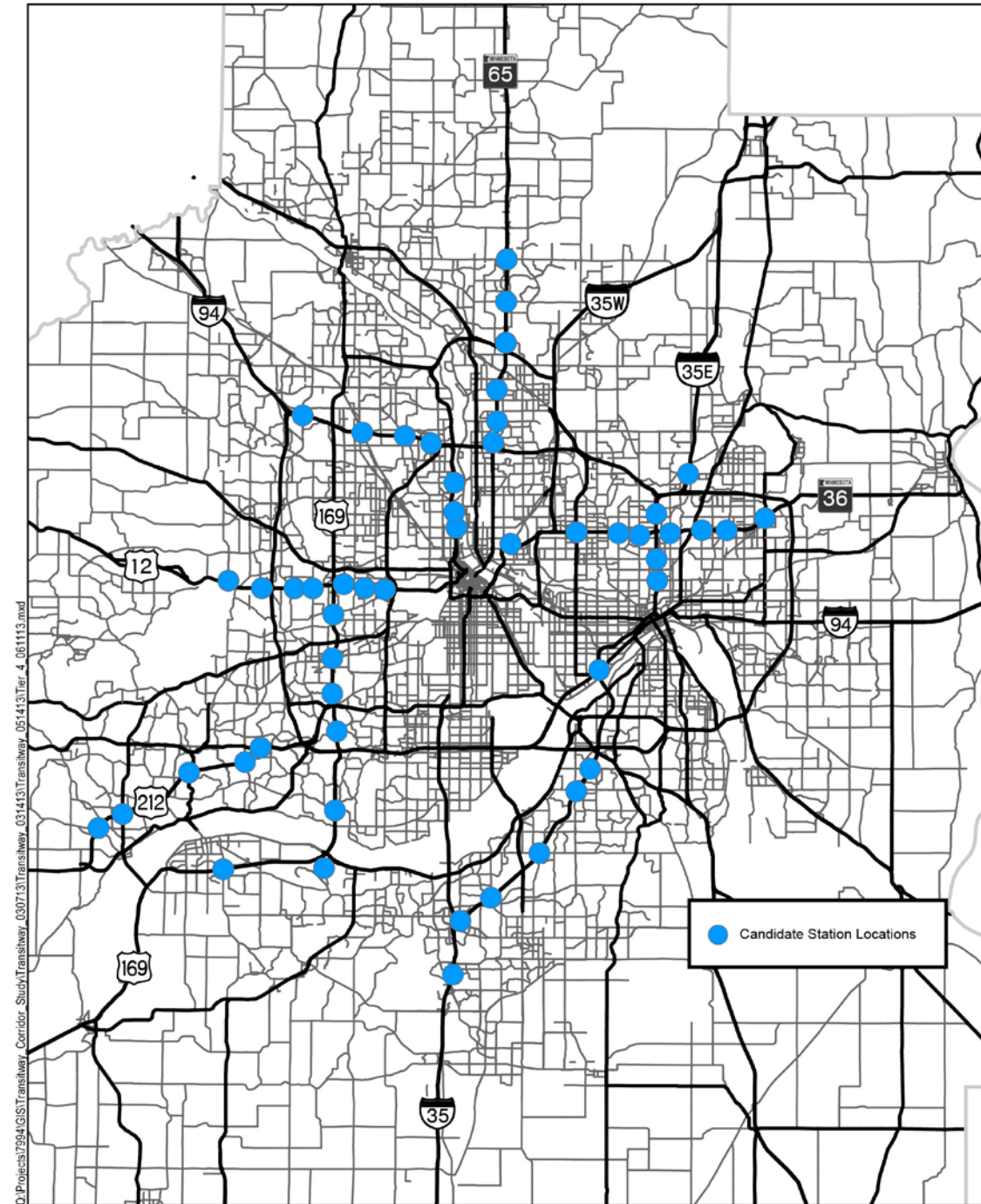
The Metropolitan Council’s *Regional Transitway Guidelines* detail the recommended station spacing for highway BRT. The *Guidelines* provide technical guidance, based in best practices, for transitway implementation throughout the Twin Cities. For highway BRT, the *Guidelines* recommend an average spacing for the entire corridor of two miles between stations and a minimum distance of ½ mile between stations.⁷

⁷ Source: *Regional Transitway Guidelines*, 2012, pg 23

Qualitative Review Summary

The locations identified as candidate station locations after the completion of the qualitative review are shown in Figure 7.

Figure 7: Candidate Locations as a Result of the Qualitative Review



Candidate Station Locations Adjusted Through Stakeholder Input

The culmination of the transit market analysis was a set of candidate station locations based on both quantitative and qualitative factors. These station locations were presented at a stakeholder workshop to regional policymakers, elected officials, transit officials, and their associated staff members. The feedback given by attendees during the workshop was recorded and adjustments were made to the candidate station locations based on workshop discussions. Changes to the alignments and station locations incorporated into the study based on stakeholder feedback are listed below. For a full record of the workshop and action items proposed by stakeholders please see Appendix E.

Stakeholder Requested Adjustments to Alignments and Station Locations

- The I-35E North corridor was extended north to include an end-of-line station at Highway 96.
- The I-35E South corridor alignment was rerouted to provide direct connections to planned stations on the METRO Red Line and the METRO Orange Line.
- The I-35E South corridor local bus service plan will include a new feeder bus route that connects Apple Valley Transit Station to Glendale Road, via County Road 42.
- The Highway 65 corridor was extended south to include an end-of-line station at 53rd Avenue, providing a direct connection the planned Central Avenue Arterial BRT.
- The I-394 corridor will connect to the existing park-and-ride facility at Wayzata Boulevard and Barry Avenue.
- The Highway 169/I-394 corridor will include a station a County Road 83.
- The Highway 169/I-394 Pioneer Road Station will be coded as a future park-and-ride facility as it is currently listed as a planned park-and-ride location in SouthWest Transit's latest comprehensive plan.

Transit Market Analysis Results Summary

The final station locations to be used in subsequent study analysis activities are shown in Figure 8. Detailed maps of each corridor are located in Appendix F. Table 7 through Table 14 summarize the results of the transit market analysis.

Figure 8: Final Station Location for Analysis in the Highway Transitway Corridor Study

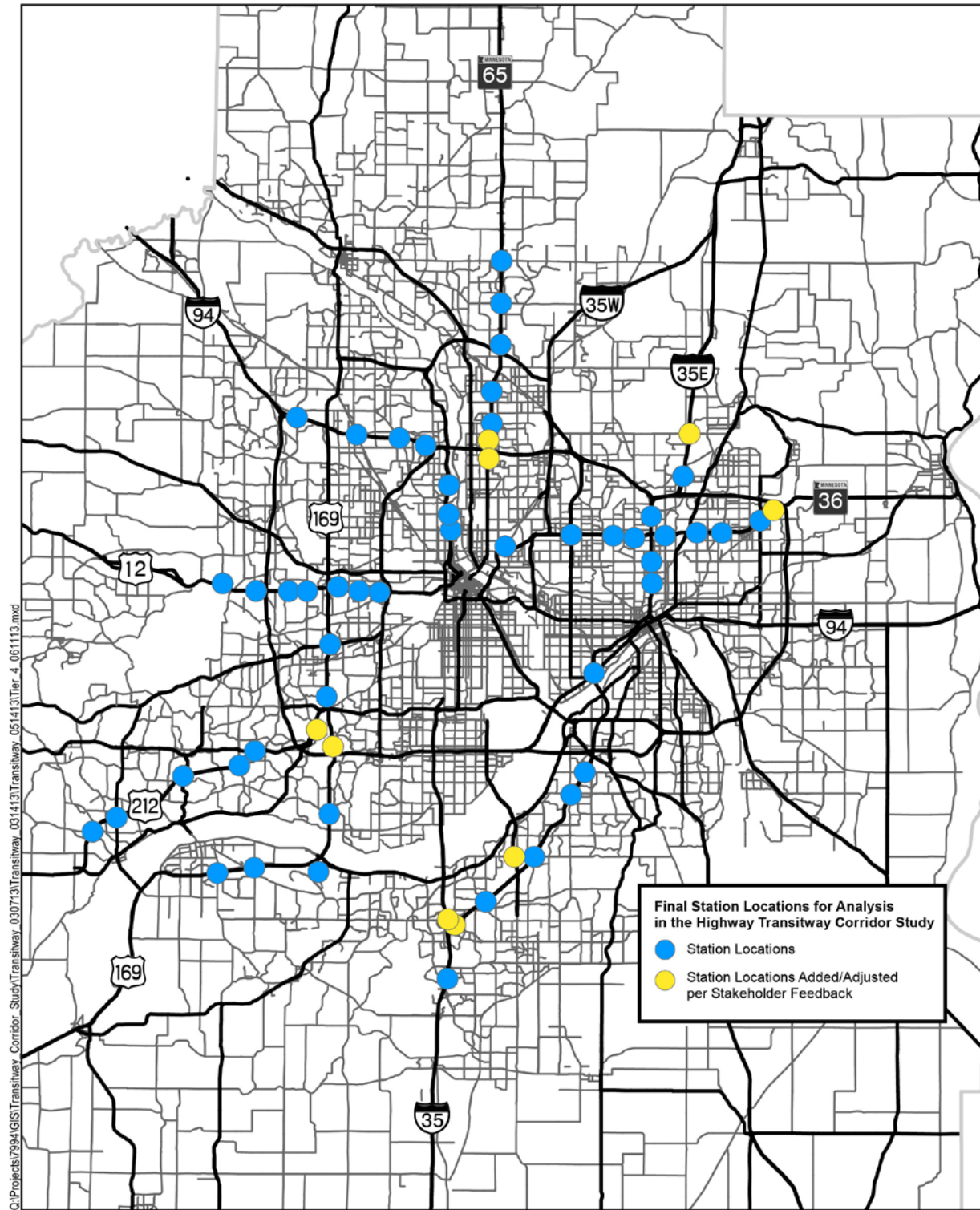


Table 7: I-394 Study Station Location Selection Process Summary

Station Location	Passed Quantitative Screening	Passed Qualitative Review	Added/Deleted Per Stakeholder Recommendation	Final Recommendation
Central Ave/CSAH 101	✓	✓		✓
Gleason Lake Rd	✓			
Carlson Pkwy	✓	✓		✓
Plymouth Rd	✓	✓		✓
Hopkins Rd	✓	✓		✓
General Mills Blvd	✓	✓		✓
Louisiana Ave S	✓	✓		✓
Xenia Ave/Park Place Blvd	✓	✓		✓
Penn Ave S	✓			

Table 8: I-94 Study Station Location Selection Process Summary

Station Location	Passed Quantitative Screening	Passed Qualitative Review	Added/Deleted Per Stakeholder Recommendation	Final Recommendation
Maple Grove Pkwy	✓			
Weaver Lake Rd	✓			
Hemlock La	✓	✓		✓
Boone Ave	✓			
CSAH 81/Bottineau Blvd	✓	✓		✓
Brooklyn Blvd	✓	✓		✓
Shingle Creek Pkwy	✓	✓		✓
49th Ave N	✓	✓		✓
Dowling Ave N	✓	✓		✓
Lowry Ave N	✓	✓		✓

Table 9: Highway 65 Study Station Location Selection Process Summary

Station Location	Passed Quantitative Screening	Passed Qualitative Review	Added/Deleted Per Stakeholder Recommendation	Final Recommendation
Crosstown Blvd NE				
Constance Blvd NE				
Andover Blvd NE				
Bunker Lake Blvd NE				
125th Ave NE	✓	✓		✓
117th Ave NE	✓			
109th Ave NE	✓	✓		✓
105th Ave NE				
99th Ave NE				
93rd La NE	✓	✓		✓
81st Ave NE	✓			
Osborne Rd NE	✓	✓		✓
73rd Ave NE	✓			
Mississippi St NE	✓	✓		✓
Moore Lake Dr			+	✓
Medtronic Parkway	✓	✓	-	
53rd Ave			+	✓

Table 10: I-35E North Study Station Location Selection Process Summary

Station Location	Passed Quantitative Screening	Passed Qualitative Review	Added/Deleted Per Stakeholder Recommendation	Final Recommendation
Main St/Co. Rd 14	✓			
Hwy 96			+	✓
County Rd E	✓	✓		✓
Little Canada Rd	✓	✓		✓
Roselawn Ave E	✓			
E Larpenteur Ave	✓	✓		✓
E Maryland Ave	✓	✓		✓

Table 11: Highway 36 Study Station Location Selection Process Summary

Station Location	Passed Quantitative Screening	Passed Qualitative Review	Added/Deleted Per Stakeholder Recommendation	Final Recommendation
E. Chestnut Street				
Osgood Ave N				
S Greely St				
Washington Ave	✓			
Stillwater Blvd N				
Lake Elmo Ave N				
Hilton Trail				
Hadley Ave N			+	✓
Century Ave	✓	✓		✓
McKnight Rd N	✓			
White Bear Ave N	✓	✓		✓
English St	✓	✓		✓
Edgerton St	✓	✓		✓
Rice St	✓	✓		✓
Dale St N	✓	✓		✓
Lexington Ave N	✓			
Snelling Ave N	✓			
Rosedale Mall		✓		✓
Fairview Ave N	✓			
Industrial Blvd	✓			
N Brighton Rd	✓	✓		✓

Table 12: I-35E South Study Station Location Selection Process Summary

Station Location	Passed Quantitative Screening	Passed Qualitative Review	Added/Deleted Per Stakeholder Recommendation	Final Recommendation
W Randolph Ave	✓			
W 7th St	✓	✓		✓
MN TH 13				
MN TH 110				
Lone Oak Rd	✓	✓		✓
Yankee Doodle	✓	✓		✓
Diffley Rd	✓			
Cliff Rd	✓	✓		✓
Cliff Rd/Cedar Ave			+	✓
CSAH 11	✓	✓		✓
CSAH 42/Nicollet Ave	✓	✓		✓
Burnsville Center			+	✓
167th W	✓	✓		✓

Table 13: 169/I-394 Study Station Location Selection Process Summary

Station Location	Passed Quantitative Screening	Passed Qualitative Review	Added/Deleted Per Stakeholder Recommendation	Final Recommendation
Cedar Lake Rd S	✓	✓	—	
Minnetonka Blvd	✓			
TH 7	✓		+	✓
Excelsior Blvd	✓	✓	—	
7th St	✓			
Bren Rd W	✓	✓		✓
70th Ave (Golden Triangle)	✓	✓		✓
Valley View Rd	✓			
Viking Dr/Washington Ave			+	✓
Anderson Lakes Pkwy/Bloomington Ferry Rd	✓			
Pioneer Trail	✓	✓		✓
Riverview Rd/Old Shakopee Rd				
Stagecoach Rd	✓	✓		✓
Canterbury Rd	✓		+	✓
Marschall Rd	✓	✓		✓
CSAH 15				

Table 14: Highway 212 Study Station Location Selection Process Summary

Station Location	Passed Quantitative Screening	Passed Qualitative Review	Added/Deleted Per Stakeholder Recommendation	Final Recommendation
CSAH 11				
CSAH 10	✓			
MN TH 41	✓	✓		✓
Powers Blvd				
Great Plains Blvd	✓	✓		✓
Dell Rd				
Eden Prairie Rd	✓	✓		✓
SouthWest Transit Station	✓	✓		✓

APPENDIX A

POPULATION AND EMPLOYMENT METHODOLOGY

Population and Employment Methodology

2010 Population:

1. Removed lakes, ponds, parks and major roadways from block shape file and computed remaining land area for each block.
2. Revised blocks were intersected with 2 mile stop buffers and block area was computed for portion of block within buffer.
3. Calculated the portion of each block within each station 2 mile buffer area.
4. Estimated the population for each block that is in the station area by multiplying the area portion from step 3 by the block population total.
5. Aggregated population by corridor stop number. The buffer areas for each stop typically overlap and therefore population totals are not unique to a specific stop.
6. Calculated population density by dividing station population by the portion of land area within 2 mile buffer as calculated in step 2. Only blocks with greater than 1 person were included in area component of the density calculation.

2010 Employment:

1. Removed lakes, ponds, parks and major roadways from Met Council 2000 TAZ shape file. Calculated land area by TAZ.
2. Intersected Met Council's 2010 employed Land Use File with revised TAZ file.
3. TAZ level QCEW total employment was proportioned to employed land use boundaries only. The employment was proportioned by area to each employment boundary. Area was calculated for each employment boundary part.
4. Revised employment boundaries were intersected with 2 mile stop buffers and area was computed for portion within buffer.
5. Calculated the portion of each employment boundary within each station 2 mile buffer area.
6. Estimated the employment for each employment boundary part that is in the station area by multiplying the area portion from step 5 by the employment boundary part employment estimate from step 3.
7. Aggregated employment by corridor stop number. The buffer areas for each stop typically overlap and therefore employment totals are not unique to a specific stop.
8. Calculated employment density by dividing station employment estimate by the portion of employed land area within 2 mile buffer as calculated in step 4.

2030 Population and Employment

- Used TAZ level boundaries to determine the total and portion area for the buffer

- Applied this portion to the population forecast provided by the Met Council for 2030 to calculate the population growth completely within the 2 mile buffer
 - The population growth was added to the 2010 population to calculate the 2030 population for each stop
1. Removed lakes, ponds, parks and major roadways from Met Council 2000 TAZ shape file. Calculated land area by TAZ.
 2. Intersected TAZ shape file with 2 mile stop buffers and calculated portion of area within each station buffer.
 3. Estimated the population and employment growth for each TAZ part that is in the station area by multiplying the area portion from step 2 by the total population and employment growth for each TAZ.
 4. Aggregated population and employment growth by corridor stop number. The buffer areas for each stop typically overlap and therefore population and employment growth totals are not unique to a specific stop.
 5. The population and employment growth was added to the 2010 population and employment respectively to calculate the 2030 population and employment for each stop.

APPENDIX B

INTERCHANGE EVALUATION FOR STATION SITING

Seq	CORRIDOR	site_at	DIR	EXISTING TRANSIT FACILITIES	POTENTIAL UTILITY IMPACTS	SIDEWALK ACCESS PROVIDED (Y/N)	ADDITIONAL SITE CONSTRAINTS	STATION RECOMMENDED (Y/N)
1	35 NORTH	Main St/Cnty Rd 14	NB	Planned location for future park and ride	N/A	Y - on south side of Main Street only	Location is a highly rural area with a folded diamond interchange. Northbound off-ramp is a forced right turn onto Main Street eastbound. I-35 has a substantial median that would accommodate an online station with vertical circulation.	N - Interchange is 6 miles north of Highway 96. Staff recommended that end of line station should be farther south.
			SB	Planned location for future park and ride	N/A	N/A	Location is a highly rural area with a folded diamond interchange. Southbound on-ramp has an HOV bypass lane. I-35 has a substantial median that would accommodate an online station with vertical circulation. There appears to be room to accommodate an inline station on the on-ramp, but it would require additional grading as the road has fairly steep banks.	
2	35 NORTH	Hwy 96	NB	Existing Cub Foods park and ride near intersection of Hwy 96 and Centerville Rd.	Traffic signal at intersection of Hwy 96. Power boxes in southeast corner of intersection. Overhead power lines run on north and south side of Hwy 96.	N	Existing Cub Foods park and ride is slated to be closed.	Y- While interchange did not meet screening criteria, station was included due to stakeholder input.
			SB	Existing Cub Foods park and ride near intersection of Hwy 96 and Centerville Rd.	Traffic signal at intersection of Hwy 96. Power boxes in southeast corner of intersection. Overhead power lines run on north and south side of Hwy 96.	N	Existing Cub Foods park and ride is slated to be closed.	
3	35 NORTH	County Rd E	NB	Planned location for future park and ride	N/A	N/A	would make the farside location better suited for a station. There is plenty of room to widen the pavement to add the station on the NB on-ramp, although there is a fairly steep bank that would require grading. No sidewalk is provided on the north side of County Rd E to connect to a farside station location.	Y
			SB	Planned location for future park and ride	N/A	N/A	Southbound on-ramp has an HOV meter bypass lane. The SB off-ramp has a pond to the east. There is not a lot of room to the west of the off and on-ramps to widen the roads for a station, and they have steep banks down to the commercial properties.	
4	35 NORTH	Little Canada Rd	NB	Existing bus stop on Little Canada Road about 200' east of I-35E off-ramp. Bus only shoulders south of Little Canada on I-35E.	Existing light pole would require relocation. Power box in SE corner of intersection. Traffic signal modifications on south side of road.	Y	Slight slopes down to heavy vegetation on both sides of the off-ramp would require grading and/or retaining walls for a platform. The road could be expanded on both sides to more easily accommodate a median type station platform. The right turn lane would shift, and the traffic signal would require relocation.	Y

Seq	CORRIDOR	site_at	DIR	EXISTING TRANSIT FACILITIES	POTENTIAL UTILITY IMPACTS	SIDEWALK ACCESS PROVIDED (Y/N)	ADDITIONAL SITE CONSTRAINTS	STATION RECOMMENDED (Y/N)
			SB	Existing bus stop on Little Canada Road about 600' west of I-35E off-ramp. Bus only shoulders south of Little Canada on I-35E.	Power box in southeast corner of intersection. Existing light pole would require relocation.	Y	Heavily wooded area immediately adjacent to SB on-ramp at intersection. There should be room to expand on-ramp for station platform.	

Seq	CORRIDOR	site_at	DIR	EXISTING TRANSIT FACILITIES	POTENTIAL UTILITY IMPACTS	SIDEWALK ACCESS PROVIDED (Y/N)	ADDITIONAL SITE CONSTRAINTS	STATION RECOMMENDED (Y/N)
5	35 NORTH	Roselawn Ave E	NB	Bus only shoulders on I-35E. Bus routes on McMenemy St with a stop about 600' east of I-35 off-ramp.	None	N	I-35E is two bridges over Roselawn Avenue with about 12' between the bridges. There are no sidewalks in the vicinity of the intersection. The east bank of the on and off-ramps slope drastically up, but a platform should fit with some grading work. I-35E bridges would require widening for Online Station.	N - Interchange is 0.5 miles north of Larpenteur Ave; does not meet station spacing guidelines
			SB	Bus only shoulders on I-35E. Bus routes on McMenemy St with a stop about 1,000' east of I-35 off-ramp.	None	N	I-35E is two bridges over Roselawn Avenue with about 12' between the bridges. There are no sidewalks in the vicinity of the intersection. The east bank of the on and off-ramps slope drastically up, but a platform should fit with some grading work. I-35E bridges would require widening for Online Station.	
6	35 NORTH	E Larpenteur Ave	NB	Bus only shoulders on I-35E. Bus routes on Larpenteur Ave. with stops about 500' west of NB off-ramp.	Existing light pole would require relocation. Two manholes in southeast corner of intersection adjacent to off-ramp.	N	Off-ramp for I-35E NB does not exit directly to Larpenteur Avenue, but instead to non-signalized intersection with Wheelock Parkway one block south. There are sidewalks across the bridge on Larpenteur Ave. that don't connect to any other sidewalks, and there are no other sidewalks in the area. Small strip mall is on nearside, with large grass area to fit station platform.	Y
			SB	Bus only shoulders on I-35E. Bus routes on Larpenteur Ave. with stops about 200' west of SB off-ramp.	Existing light pole would require relocation.	N	On-ramp for I-35E SB is not directly from Larpenteur Avenue, but instead at a non-signalized intersection with Wheelock Parkway one block south. There is adequate room to expand the roadway for an Inline Station on the nearside of Larpenteur, but the road is elevated with a steep bank and would require grading and/or retaining walls. There are sidewalks across the bridge on Larpenteur Ave. that don't connect to any other sidewalks, and there are no other sidewalks in the area.	
7	35 NORTH	E Maryland Ave	NB	Bus only shoulders on I-35E. Bus routes on Maryland Ave. with a stop about 1,000' east of NB off-ramp near Arkwright St. and a stop about 1,000' west near L'Orient St.	Existing light pole would require relocation.	Y	This intersection was recently reconstructed. Off-ramp has steep banks that would require grading and/or retaining walls to accommodate a station platform. One or more traffic signal poles would potentially require relocation. Median station with queue jump signal for buses could avoid modifications to the on-ramp.	Y
			SB	Bus only shoulders on I-35E. Bus routes on Maryland Ave. with a stop about 200' west of I-35E off-ramp SB near L'Orient St.	Traffic signal at intersection of Maryland Ave.	Y	This intersection was recently reconstructed. Off-ramp has steep banks on the west that would require grading and/or retaining walls. The roadway could be expanded to the east to accommodate the median platform without excessive grading. One or more traffic signal poles would potentially require relocation. Median station with queue jump signal for buses could avoid modifications to the on-ramp.	

Seq	CORRIDOR	site_at	DIR	EXISTING TRANSIT FACILITIES	POTENTIAL UTILITY IMPACTS	SIDEWALK ACCESS PROVIDED (Y/N)	ADDITIONAL SITE CONSTRAINTS	STATION RECOMMENDED (Y/N)
1	35 SOUTH	W Randolph Ave	NB	Bus only shoulders on I-35E north of Randolph Ave. Bus routes on Randolph Ave with a stop at the intersection of Randolph Ave. and the NB off-ramp.	Traffic signal at intersection of Randolph Ave. Power boxes in northeast corner of intersection.	Y	Residential area immediately adjacent to off-ramp and on-ramp with barrier wall very close to pavement. Complex interchange with connections to Ayd Mill Rd. would make online station infeasible.	N - Interchange is 0.8 miles north of W 7th Street where a station is recommended. Station not recommended at Randolph due to station spacing guidelines.
			SB	Bus only shoulders on I-35E north of Randolph Ave. Bus routes on Randolph Ave with a stop at the intersection of Randolph Ave. and the NB off-ramp about 400' east.	Traffic signal at intersection of Randolph Ave. Power boxes in southwest corner of intersection.	Y	Residential area immediately adjacent to off-ramp. Trader Joe's very close to SB on-ramp in southwest corner of intersection with steep embankment on the east side of the SB on-ramp. Complex interchange with connections to Ayd Mill Rd. would make online station infeasible.	
2	35 SOUTH	W 7th St	NB	Bus routes on 7th St. with a stop about 600' west of I-35E.	Existing light pole would require relocation.	Y	The nearside appears to have room for the station platform. There is a small slope, which would likely require a retaining wall behind the platform. A tree would also need to be removed. This is a folded diamond interchange, so NB buses would not have a direct route to get back on I-35E. Buses could travel about 0.5 miles on existing streets to turn around for NB re-entry on I-35E.	Y
			SB	Bus routes on 7th St. with a stop about 600' west of I-35E.	None	y	The intersection is currently skewed, making it difficult for buses to make the movement straight through the intersection. The farside location has a guardrail on the east side and a slope with heavy vegetation down to a natural rock wall. Significant grading and retaining walls would likely be required. There is also room to expand the on-ramp to the west near the intersection to make the re-alignment easier. The nearside location does not have room to expand for a station.	
3	35 SOUTH	MN TH 13	NB					N - Does not meet screening criteria
4	35 SOUTH	MN TH 110	NB					N - Does not meet screening criteria
5	35 SOUTH	Lone Oak Rd	NB	Bus routes on Lone Oak Rd. with a stop at the intersection of Lone Oak Rd. and NB off-ramp.	Traffic signal at intersection of Lone Oak Rd. Power boxes in southeast corner of intersection.	Y	Nearside off-ramp has plenty of room to expand roadway for inline median station. Part of the expansion will require grading and/or retaining walls for a short length. Traffic signal would require modifications. NB on-ramp has HOV bypass lane.	Y

Seq	CORRIDOR	site_at	DIR	EXISTING TRANSIT FACILITIES	POTENTIAL UTILITY IMPACTS	SIDEWALK ACCESS PROVIDED (Y/N)	ADDITIONAL SITE CONSTRAINTS	STATION RECOMMENDED (Y/N)
			SB	Bus routes on Lone Oak Rd. with a stop at the intersection of Lone Oak Rd. and NB off-ramp.	Traffic signal at intersection of Lone Oak Rd. Power boxes in northwest corner of intersection.	Y	Nearside off-ramp has plenty of room to expand roadway for inline median station. Shoulders have steep grades, so roadway expansion will require grading and/or retaining walls to accommodate the station platform. Traffic signal would require modifications.	
6	35 SOUTH	Yankee Doodle	NB	Eagan Transit Center	N/A	N/A	Existing Eagan Transit Center utilizes the configuration of the interchange for operations. Due to the complex interchange configuration any other station types at this location would be extremely difficult.	Y
			SB	Eagan Transit Center	N/A	N/A	Existing Eagan Transit Center utilizes the configuration of the interchange for operations. Due to the complex interchange configuration any other station types at this location would be extremely difficult.	
7	35 SOUTH	Diffley Rd	NB	Bus routes on Diffley Rd. and Blackhawk Rd. west of I-35E with stops about 1,500' west of I-35E.	Traffic signal at intersection of Diffley Rd. Power boxes in northwest corner of intersection.	Y	I-35E has a large grass median at the intersection with Diffley Rd. with potential room for an online station without major modifications to the bridge other than providing vertical pedestrian circulation. There is plenty of room at off-ramp and on-ramp for inline station. The NB on-ramp has a median at the intersection separating the westbound right turn lane for access to I-35E which would require modifications for a farside station.	N- Interchange is 1 mile north of Cliff Road where a station is being recommended. Station not recommended at Diffley due to station spacing guidelines.
			SB	Bus routes on Diffley Rd. and Blackhawk Rd. west of I-35E with stops about 1,500' west of I-35E.	Traffic signal at intersection of Diffley Rd. Power boxes in northwest corner of intersection.	Y	I-35E has a large grass median at the intersection with Diffley Rd. with potential room for an online station without major modifications to the bridge other than providing vertical pedestrian circulation. There is plenty of room at off-ramp and on-ramp for inline station.	
8	35 SOUTH	Cliff Rd	NB	Bus routes on Cliff Rd. and Blackhawk Rd. with stops about 600' east of NB off-ramp near Blackhawk Rd. Blackhawk park-and-ride is located at intersection farside with direct NB access to I-35E.	N/A	Y	The existing station at the Blackhawk Park and Ride would be about 0.4 miles from the intersection of the NB off-ramp and Cliff Rd with a signalized left turn on Cliff Rd and a unsignalized left turn into the park and ride lot. Direct access from the station to NB I-35E is provided from the station.	Y
			SB	Bus routes on Cliff Rd. and Cliff Lake Rd. with stops about 1,400' west of SB off-ramp near Cliff Lake Rd. Blackhawk park-and-ride is located near NB intersection of Cliff Rd.	N/A	Y	The existing station at the Blackhawk Park and Ride would be about 0.6 miles from the intersection of the SB off-ramp and Cliff Rd with two signalized left turns on Cliff Rd and a unsignalized left turn into the park and ride lot. Access back to the SB on-ramp would require traveling the same path in reverse, but would only be about 0.4 miles.	

Seq	CORRIDOR	site_at	DIR	EXISTING TRANSIT FACILITIES	POTENTIAL UTILITY IMPACTS	SIDEWALK ACCESS PROVIDED (Y/N)	ADDITIONAL SITE CONSTRAINTS	STATION RECOMMENDED (Y/N)
9	35 SOUTH	Cliff Rd/Cedar Ave	NB	Planned future Red Line station	None	Y	If the planned Red Line station at Cliff Rd is an Online station with access from the bridge, a separate platform will be necessary to accommodate the transfer with NB 35E BRT. There is plenty of room on the NB off-ramp for the nearside station platform. There is a small drainage swale and hill that could require some additional grading.	Y
			SB	Planned future Red Line station	None	Y	If the planned Red Line station at Cliff Rd is an Online station with access from the bridge, the SB 35E BRT platform could be incorporated into the bridge modifications for a simple transfer with the Red Line. Otherwise, the SB 35E BRT platform would have to be on the on-ramp to Cedar Ave. There is plenty of room on the SB on-ramp for the farside station platform. The roadway has a steep slope on the west side with trees. The east side of the on-ramp is flatter, and would provide room to widen the roadway to accommodate a station platform.	
10	35 SOUTH	CSAH 11	NB	Bus routes on CSAH 11 with stops about 1,300' south of NB off-ramp near McAndrews Rd.	Traffic signal at intersection of CSAH 11. Power boxes in northwest corner of intersection. Manhole in median near crosswalks indicates some type of underground utility.	Y	This is a very spread out rural type of intersection with large walking distances from the NB and SB off-ramps. There is plenty of room for a nearside platform with no major constraints. The intersection has medians with traffic signals which would need to be relocated and reconstructed with the nearside median station.	Y
			SB	Bus routes on CSAH 11 with stops about 1,900' south of SB off-ramp near McAndrews St.	Traffic signal at intersection of CSAH 11. Power boxes in southwest corner of intersection. Manhole in median near crosswalks indicates some type of underground utility.	Y	This is a very spread out rural type of intersection with large walking distances from the NB and SB off-ramps. There is a pond adjacent to the off-ramp. The intersection has medians with traffic signals which would need to be relocated and reconstructed with the farside station.	
11	35 SOUTH	CSAH 42/Nicollet Ave	NB	Bus stops on Nicollet Ave at Grand Ave	None	Y	Station platform is located on County Rd 42 just east of Nicollet Ave. There is plenty of room to expand the roadway to accommodate a platform, but there is a steep slope that would require grading and/or retaining walls.	Y
			SB	Bus stops on Nicollet Ave at Grand Ave	None	Y	Station platform is located on County Rd 42 just east of Nicollet Ave. The farside location is located on a steep grade that would not work for a station. There is plenty of room to expand the roadway to accommodate a median platform, but this would require extensive intersection improvements.	

Seq	CORRIDOR	site_at	DIR	EXISTING TRANSIT FACILITIES	POTENTIAL UTILITY IMPACTS	SIDEWALK ACCESS PROVIDED (Y/N)	ADDITIONAL SITE CONSTRAINTS	STATION RECOMMENDED (Y/N)
12	35 SOUTH	Burnsville Center	NB	Bus stops in mall parking lot.	None	Y	Buses would exit 35E NB at Crystal Lake Rd and continue north on Grand Ave, turn left at Southcross Dr, right at Buck Hill Rd, and loop through the Burnsville Center parking lot where the station platform would be located. They would then exit the parking lot, turn left at Buck Hill Rd, and right at County Rd 42.	Y
			SB	Bus stops in mall parking lot.	None	Y	Buses would exit 35E SB at County Rd 42 and turn right, stop at the CSAH 42/Nicollet stop, continue west on CSAH 42 and turn left at Buck Hill Rd. They would then loop through the Burnsville Center parking lot where the station platform would be located. They would then exit the parking lot and turn right at Buck Hill Rd, continue south and turn left at Crystal Lake Rd, and turn right onto the SB 35E on-ramp.	
13	35 SOUTH	167th W	NB	Kenrick Transit Station with transit only access to and from I-35E NB.	N/A	N/A	Existing Kenrick Transit Station provides direct access to I-35E NB.	Y
			SB	Kenrick Transit Station with transit only access to and from I-35E NB.	N/A	N/A	Existing Kenrick Transit Station provides direct access to I-35E NB but has no direct access from SB direction. For buses to reach the transit station from SB I-35 they would have to exit at Kenwood Trail and turn around back onto I-35E NB. As this stop would be the terminus of the SB route, the current configuration does not affect operations south of this station. If the route is extended further south in the future, an alternative could be to make a pull-out station on I-35E for SB buses and provide a pedestrian bridge over I-35E.	
1	HWY 36	E. Chestnut Street	WB					N- Does not meet screening criteria
			EB					
2	HWY 36	Osgood Ave N	WB					N- Does not meet screening criteria
			EB					
3	HWY 36	S Greely St	WB					N- Does not meet screening criteria
			EB					
4	HWY 36	Washington Ave	WB	Existing pak and ride located at St. Croix Valley Rec Center				N- While there is an existing park and ride at this interchange, staff recommended that
		Washington Ave	EB	Existing pak and ride located at St. Croix Valley Rec Center				
5	HWY 36	Stillwater Blvd N	WB					N- Does not meet screening criteria
			EB					
6	HWY 36	Lake Elmo Ave N	WB					N- Does not meet screening criteria
			EB					

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7	HWY 36	Hilton Trail	WB					N- Does not meet screening criteria
			EB					
8	HWY 36	Hadley Ave N	WB	Planned location for future park and ride	N/A	N/A	End of line station would be at future park and ride location west of Hadley Ave, north of Hwy 36 in vacant grass field.	While interchange does not meet screening criteria, station was added due to
			EB	Planned location for future park and ride	N/A	N/A	End of line station would be at future park and ride location west of Hadley Ave, north of Hwy 36 in vacant grass field.	
9	HWY 36	Century Ave	WB	No	Traffic Signal in NW corner	N	Minimal constraints and adequate room for a station.	Y
			EB	No	None	N	Vegetation is thick in this area	
10	HWY 36	McKnight Rd N	WB	No	Electrical Boxes	Far side - Y, Nearside - N	Fairly steep grade changes on South side of off/on ramp. Retention ponds North of on/off ramp both near/far side.	N - Interchange is 1 mile from Century Ave and less than 1 mile from White Bear Avenue where stations are being
			EB	No	Electrical Boxes	Nearside - Y, Far side - N	Fairly steep grade changes on North side of on/off ramp. Limited space due to large retention pond on far side of on-ramp.	
11	HWY 36	White Bear Ave N	WB	No	None	Y	Minor vegetation and inconsistent grading	Y
			EB	No	None	Y	Severely sloped adjacent ground	
12	HWY 36	English St	WB	No	None	N	Planned reconstruction of interchange incorporates a detention pond in the NW corner between the WB on-ramp and Maplewood Drive. Roadway expansion and station platform construction is possible South of the planned on-ramp, but requires roadway and grading modifications. Nearside has planned retaining walls directly adjacent to the off-ramp on both sides.	Y
			EB	No	None	N	Planned construction leaves room in the SW quadrant of the interchange for a platform and bus pull out, but there would be major re-grading necessary to accommodate a widened roadway/station platform.	
13	HWY 36	Edgerton St	WB	No	None	N	There is limited space for a bus pull out on either the far or nearside of the intersection as Vikings Dr. runs directly adjacent to the on and off ramps. If a median station is used on the near side then roadway expansion is possible South of the off-ramp with some minor re-grading of the slope.	Y
			EB	No	None	N	Chain link fence approximately 20 ft. from on-ramp with adjacent vegetation. Adequate room to expand on either side of roadway.	

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14	HWY 36	Rice St	WB	No	Electrical boxes in NE corner of intersection	Y	Relatively flat portion of land North of the off-ramp with minor vegetation and grading issues. The addition of a median station on the nearside would work if all expansion occurs on the Northside of the off-ramp as the EB on-ramp runs directly adjacent to the off-ramp on the Southside.	Y
			EB	No	None	Y	On/off ramp recently constructed - space for a bus stop and platform were not incorporated into the design. Difficult to incorporate a station within the interchange, without significant changes due to the configuration - guardrail, steep grading, and adjacent right turn lane located on S side of the roadway. Significant structural work and re-grading would be necessary to accommodate a station. Inline station would require the construction of bus-only slip ramps in the EB direction to get on/off Th36.	
15	HWY 36	Dale St N	WB	No	Light pole just East of intersection	Y	Land adjacent to the off-ramp slopes down toward the roadway at a steep grade all the way along the ramp.	Y
			EB	No	None	Y	There is an existing HOV lane on the farside, but adjacent grassy area is severely sloped. A station platform could fit directly adjacent to the intersection and allow buses access to the existing HOV lane.	
16	HWY 36	Lexington Ave N	WB	Bus route 1 block N A W County RD B2 & Lexington Ave.	Electrical Boxes in NE and NW corners of intersections.	Far side Y, Nearside N	Electrical boxes on near side, probably not an issue, electrical box on far side could get in way of additional sidewalk area from potential new bus stop location. West side of intersection (on-ramp) grade is at an incline.	N -Interchange is 1 mile from Dale Street and 1.8 miles from Rosedale where stations are recommended; does not meet station spacing guidelines
			EB	No	None	Nearside Y, Far side N	Far side of intersection has a right turn lane movement merges into the thru movement, which leaves a possible drop off point in small triangle median, or after merge, where there is no sidewalk.	
17	HWY 36	Snelling Ave N	WB	Bus route along County Rd B2, and through Roseville Mall loop. Future connection with Snelling BRT	None	Depends where bus stop would be located, most likely yes.	The intersection of 36 and Snelling is a clover leaf/diamond interchange, with no simple drop off spot available. One possible option could be to take the Snelling exit, then take County Rd B2 exit, bus stop at County Rd B2 off ramp, Turn right onto W Country Rd B2, take Snelling ramp, merge onto Snelling, and then merge back onto 36.	

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			EB	Bus routes along Snelling and Country Rd B W. Future connection with Snelling BRT	None	Depends where bus stop would be located, most likely yes.	The intersection of 36 and Snelling is a clover leaf/diamond interchange, with no simple drop off spot available. There are several possible options that could be used, but each would require an off line route, to get back onto 36. One possible option could be to take the Snelling exit, take a left onto Country Rd B W, with a possible bus stop either directly after the left turn movement onto County Rd B W, or at Country Rd B W and State Farm Rd., then take a left at Albert St., then take ramp to merge onto back onto 36. Total of 1 mile off line. Another option is to take the Snelling exit, take a left at Country Rd B W, turn right into the HarMar Mall, bus stop in front of the mall, use east mall exit, take left back onto County Rd B W, take right onto Snelling Ave, then take ramp to merge back onto 36. Total of 1.1 miles off line.	N - Large clover interchange difficult for station, use existing transit center at Rosedale Mall
18	HWY 36	Rosedale Mall	WB	Bus route along County Rd B2, and through Roseville Mall loop.	N/A	Y	Utilize existing Rosedale Transit Center	Y
			EB	Bus routes along Snelling and Country Rd B W	N/A	Y	Utilize existing Rosedale Transit Center	
19	HWY 36	Fairview Ave N	WB	Bus route along Fairview Ave, and through Roseville Mall loop. Park and Ride	None	Depends where bus stop would be located, most likely yes.	Folded diamond interchange. There is no easy way for a bus to get back onto 36 WB, because the on ramp and off-ramp are both at the NE corner of the intersection. One possible option would be to take the Fairview Ave exit, go straight onto 36th Service Dr, bus stop on 36th Service Dr, Take right onto Perimeter Drive, take left at Prior Ave, take left at 36th Service Dr, straight onto Fairview cloverleaf on ramp to 36.	N - Interchange is less than 1 mile from Rosedale; does not meet station spacing guidelines
			EB	Bus route along Fairview Ave N. Park and Ride	None	Depends where bus stop would be located, most likely yes.	There is no easy way for a bus to get back onto 36 EB, because both on and off ramps are located in the SE corner of the intersection. Possible route could be to take a left onto Fairview Ave, bus stop after Frontage Rd/Gluek Ln intersection, left onto County Rd B W, left onto Snelling, right onto 36 on-ramp.	
20	HWY 36	Industrial Blvd	WB	No	Electrical Box in NE corner of intersection.	No sidewalk, but there is a cross walk on the nearside.	Near side off-ramp has 3 lanes, left/right/thru. Far side on-ramp has a dedicated right hand turn movement merge onto ramp, possible drop-off at triangle median. Lane configuration makes bus pull out difficult.	N - Station not recommended in I-35W North Managed Lane Study
			EB	Bus route starts along Industrial one block S of intersection.	None	No	No ideal bus drop off location, off-ramp has dedicated right turn movement, and thru and left. On-ramp on the far side has a dedicated right turn lane merge into it. Lane configuration makes bus pull out lane difficult.	

Seq	CORRIDOR	site_at	DIR	EXISTING TRANSIT FACILITIES	POTENTIAL UTILITY IMPACTS	SIDEWALK ACCESS PROVIDED (Y/N)	ADDITIONAL SITE CONSTRAINTS	STATION RECOMMENDED (Y/N)
21	HWY 36	N Brighton Rd	WB	Bus route along, Stinson Blvd, and New Brighton Rd.	Light pole, power pole, and electric box all in NE corner	Trail on near side (East) side of intersection, cross walks connect intersection.	Nearside of New Brighton road has adequate room for a station, but dips down with potential grading issues. Farside location would eliminate space for vehicles to exit onto Quarry Center Dr.	Y
			EB	Bus route 1 block S of intersection.	None	N	Nearside location would require roadway expansion to accommodate vehicles turning right from off ramp.	
1	I-94	Maple Grove Pkwy	WB	Existing Parkway Station park and ride about 0.6 miles from I-94	N/A	N/A	Existing transit center park and ride with easy access to I-94.	N - Interchange is 5 miles north of Maple Grove P&R. Staff recommended that end of line station should be further south.
			EB	Existing Parkway Station park and ride about 0.6 miles from I-94	N/A	N/A	Existing transit center park and ride with easy access to I-94.	
2	I-94	Weaver Lake Rd	WB	Crosswinds Park & Ride Located a half mile west of 94/Weaver Lake Rd Intersection. Buses currently run E/W on Weaver Lake Rd	Minimal - E/W running power lines	Y	On-ramp to WB 94 is only one lane, so adding a bus-pullout or additional lane would be necessary to minimize existing traffic impacts. On and off-ramps have mild slopes and may require structural work to provide a flat landing for passengers.	N - Due to close proximity to Maple Grove P&R (Hemlock), interchange was not included
			EB	Crosswinds Park & Ride Located a half mile west of 94/Weaver Lake Rd intersection. Buses currently run E/W on Weaver Lake Rd	Electric box located in NW and SE Corners of intersection. E/W running power lines	Y	Off-ramp is surrounded by wetlands and detention ponds so there is minimal space for a station. On-ramp has minimal ROW due to running directly between Fish Lake Rd, and 94	
3	I-94	Hemlock La	WB	Maple Grove Transit Station	N/A	N	Utilize existing Maple Grove Transit Station	Y
			EB	Bus stop at 73rd Ave and Hemlock Ln about one block South of interchange. Buses run N/S on Hemlock Ln.	N/A	N	Utilize existing Maple Grove Transit Station	
4	I-94	Boone Ave	WB	Buses run N/S along Boone Ave N	Minimal - Light poles and traffic signals at each intersection. Also, power lines run N/S on West side of Boone Ave across 94	Farside - Y, Nearside - N	This is a Folded-Diamond interchange so station would likely need to be off-line. Station could not be on-line without major modifications to the Boone Ave Overpass and road widening on 94. If an off-line station is used, buses would need to exit on the WB off-ramp and find a turn-around point or make a tight U-turn back on WB 94. An additional alternative would be add a bus-only lane between on and off ramps and provide pedestrians access to the station location. There is a wetland/pond located on the North side of the WB off-ramp directly adjacent to the roadway.	N - Interchange is 1 mile from Bottineau Blvd where a station is recommended. Boone

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			EB	Buses run N/S along Boone Ave N	Minimal - Light poles and traffic signals at each intersection. Also, power lines run N/S on West side of Boone Ave across 94	N	This is a Folded-Diamond interchange so station would likely need to be off-line. Station could not be on-line without major modifications to both Boone Ave Overpass and road widening on 94. If an off-line station is used, buses would need to exit on the EB off-ramp and find a turn-around point or make a tight U-turn back on EB 94. An additional alternative would be add a bus-only lane between on and off-ramps and provide pedestrians access to the station location. A noise retaining wall is located adjacent to the EB on-ramp more that 20 ft. from the roadway	Recommended, Boone Ave interchange does not meet station spacing criteria
5	I-94	CSAH 81/Bottineau Blvd	WB	63rd Ave & Bottineau Blvd Park & Ride; existing railroad runs underneath interchange parallel with Bottineau Blvd. Future connection to Blue Line LRT	N/A	N	Utilize existing 63rd Ave & Bottineau Blvd Park & Ride	Y
			EB	63rd Ave & Bottineau Blvd Park & Ride; existing railroad runs underneath interchange parallel with Bottineau Blvd. Future connection to Blue Line LRT	N/A	N	Utilize existing 63rd Ave & Bottineau Blvd Park & Ride	
6	I-94	Brooklyn Blvd	WB	Buses run N/S along Brooklyn Blvd, and Brooklyn Blvd P&R is located one block S of 94 interchange	N/A	Y	Utilize existing Brooklyn Blvd Park & Ride	Y
			EB	Buses run N/S along Brooklyn Blvd, and Brooklyn Blvd P&R is located one block S of 94 interchange	N/A	Y	Utilize existing Brooklyn Blvd Park & Ride	
7	I-94	Shingle Creek Pkwy	WB	Buses run N/S along Shingle Creek Pkwy	Electric box and light pole located in NW corner of intersection	Y	Physical constraints are limited in Nearside location as there is plenty of room at a level grade for roadway expansion and a station to the South of the off-ramp. Buses would need to go offline and take the following route before returning to the WB 94 on-ramp; left on Shingle Creek Pkwy, right on Freeway Blvd, right on James Cir N, left on Freeway Blvd, then left on Shingle Creek Pkwy.	Y

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			EB	Buses run N/S along Shingle Creek Pkwy	Electric box and Light pole in SE corner of intersection	Y	The EB on-ramp has a large area for a station including an existing section with just gravel that could accommodate a bus pullout. Buses would need to go offline and take the following route before returning to the EB 94 on-ramp; right on Shingle Creek Pkwy, right on Freeway Blvd, right on James Cir N, left on Freeway Blvd, then left on Shingle Creek Pkwy.	
8	I-94	49th Ave N	WB	Buses currently run E/W along 49th Ave N.	None - no traffic signals	Y	There are no traffic signals for vehicles or pedestrians at this interchange. WB buses cannot re-enter 94 until traveling 0.8 miles North on a frontage road to the 53rd Ave interchange. The frontage road has a noise barrier wall and chain link fence directly adjacent to the road about 10 ft. on either side, so nearside of the 49th Ave intersection is preferred as there are minimal physical constraints.	Y
			EB	Buses currently run E/W along 49th Ave N.	N/A	Y	EB buses must exit I-94 at 53rd Ave N and follow 3rd Ave S until the EB on-ramp at 49th Ave. This on-ramp has an existing bus-only lane with an area for pedestrians to board along with vertical circulation provided.	
9	I-94	Dowling Ave N	WB	Buses run E/W along Dowling Ave	Minimal - light poles directly adjacent to roadway along on/off ramps	Y	WB on-ramp has a steep bank further down the ramp, but should not affect the station located near the intersection. Farside of intersection already includes a gravel area adjacent to the road at a level grade and has more available ROW than a nearside location.	Y
			EB	Buses run E/W along Dowling Ave	Minimal - light poles directly adjacent to roadway along on/off ramps	Y	Buses should utilize the existing HOV/Carpool lane. Trees and a slight bank are located directly on the SW corner of the intersection.	
10	I-94	Lowry Ave N	WB	Buses currently run E/W along Lowry Ave N.	N/A	Y	There are no WB off-ramps within 1.5 miles of the proposed station location. This means an online station would be necessary in order for buses to access a station at this location. There are currently wide median shoulders on I-94 at this location but roadway widening and bridge modifications would be necessary to incorporate an online station. There would also need to be vertical circulation provided for pedestrians.	Y
			EB	Buses currently run E/W along Lowry Ave N.	N/A	Y	There are no EB off-ramps near the proposed station location. This means an online station would be necessary in order for buses to access a station at this location. There are currently wide median shoulders on I-94 at this location, but roadway widening and bridge modifications would be necessary to incorporate an online station. There would also need to be vertical circulation provided for pedestrians.	
1	HWY 169	Cedar Lake Rd S	NB	Bus route along Cedar Lake Rd.	None	N	Potential turn around location and drop off point need to be determined.	N - Difficult interchange for bus and pedestrians

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			SB	Bus route along Cedar Lake Rd.	None	N	Potential turn around location and drop off point need to be determined.	for bus and pedestrian access
2	HWY 169	Minnetonka Blvd	NB	Bus route along Minnetonka Blvd.	None	Nearside - Y, Far side - N		N - Minimal pedestrian access; interchange is 1 mile north of TH 7 where station is
			SB	Bus route along Minnetonka Blvd.	None	N		
3	HWY 169	TH 7	NB	None	None	N	This interchange has no existing sidewalks. This is not a typical diamond interchange, so the SB route does not have direct access off and back onto Hwy 169 - planned to construct a bus only slip ramp to go SB on 169. There is a median between the NB and SB lanes, but the bridge would most likely require reconstruction to accommodate an Online station.	Y
			SB	None	None	N	This interchange has no existing sidewalks. This is not a typical diamond interchange, so the SB route does not have direct access off and back onto Hwy 169. There is a median between the NB and SB lanes, but the bridge would most likely require reconstruction to accommodate an Online	
4	HWY 169	Excelsior Blvd	NB	No	N/A	N/A	Folded diamond interchange. Potential turn around location and drop off point need to be determined. Lane configurations difficult for Inline bus stop. Limited ROW East of on-ramp	N - Difficult interchange for bus access
			SB	No	N/A	N/A	Folded diamond interchange. Potential turn around location and drop off point need to be determined. Lane configurations difficult for Inline bus stop. Limited ROW West of off-ramp	
5	HWY 169	7th St	NB	No	None	N	Diamond interchange. 7th St/Interlachen Rd Bridge over 169 does not have a sidewalk.	N - Interchange is 1 mile north of Bren Road where station is recommended.
			SB	No	None	N	Diamond interchange. 7th St/Interlachen Rd Bridge over 169 does not have a sidewalk.	
6	HWY 169	Bren Rd W	NB	Bus routes along Bren Rd and Lincoln Dr.	None	Y	This interchange was recently reconstructed and Street View images are not current with the recent construction, so impacts are hard to estimate. The off-ramp has four lanes, with two dedicated left turns and one left turn/through lane which with the added bus-only lane could reduce the interchange to only the two dedicated left lanes. The NB on-ramp has an HOV bypass lane on the left, which the lane configuration or TSP would allow the bus to access this.	Y

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			SB	Bus routes along Bren Rd and Lincoln Dr.	None	Y	This interchange was recently reconstructed and Street View images are not current with the recent construction, so impacts are hard to estimate. The off-ramp has three lanes, but it appears there is room to expand the roadway to accommodate a station platform.	
7	HWY 169	70th Ave	NB	None	None	N/A	Station would connect to SWLRT, as this is a planned SWLRT stop location that would provide transfer access. The location and configuration of the station has not been determined yet.	Y
			SB	None	None	N/A	Station would connect to SWLRT, as this is a planned SWLRT stop location that would provide transfer access. The location and configuration of the station has not been determined yet.	
8	HWY 169	Valley View Rd	NB	No	None	Y		N - 70th Ave stop to provide direct
			SB	No	None	Y		
9	HWY 169	Viking Dr/Washington Ave	NB	None	None	N	This stop would be on Washington Ave S just north of I-494 at Viking Dr. and would connect with the future American Blvd ABRT corridor. There was recent construction of a round-a-bout that is not reflected in the aerial image in maps. The exact location of the stop would need to be determined.	Y
			SB	None	None	N	This stop would be on Washington Ave S just north of I-494 at Viking Dr. and would connect with the future American Blvd ABRT corridor. There was recent construction of a round-a-bout that is not reflected in the aerial image in maps. The exact location of the stop would need to be determined.	
10	HWY 169	Anderson Lakes Pkwy/Bloomington Ferry Rd	NB	No	None	Y	Far side on-ramp East side first ~100 ft. has fence 5-10ft from on-ramp. East side of fence begins to slope down to pond area. Past the ~100 ft. of fence, there is a 10 ft. wide concrete pad and barrier on East side that goes ~400 ft. Ramp meter is placed on this concrete pad.	N - Challenging interchange configuration
			SB	No	None	Y	SB has a diamond off-ramp and a cloverleaf on-ramp both located on the North side of the intersection. This will require a turnaround route to be determined. Most likely to head South on Hennepin Town Rd, and loop through mini-mall parking lot back to the SB 169 on-ramp.	
11	HWY 169	Pioneer Trail	NB	Planned location for future park and ride	N/A	N/A	Planned future park and ride location.	Y
			SB	Planned location for future park and ride	N/A	N/A	Planned future park and ride location.	

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12	HWY 169	Riverview Rd/Old Shakopee Rd	NB SB					N - Does not meet screening criteria
13	HWY 169	Stagecoach Rd	NB SB	Southbridge Crossing Park and Ride Southbridge Crossing Park and Ride	None	Y	Park and ride on Stagecoach Rd. between 13th Ave and Hansen Ave. south of 169. To get to park and ride would require bus to go offline for about 2.3 miles, by exiting at Cnty Rd 21. To merge back onto 169 NB from park and ride, bus would travel about 1.0 mile offline. Park and ride on Stagecoach Rd. between 13th Ave and Hansen Ave. south of 169. To get to park and ride bus would have to exit at Cnty Rd 21 and travel off line for about 2 miles. To merge back onto 169 SB, bus would have to travel about 1.5 miles offline.	Y
14	HWY 169	Canterbury Rd	NB SB	Existing Shakopee Park and Ride at Seagate Existing Shakopee Park and Ride at Seagate	N/A N/A	N/A N/A	Existing park and ride location. Existing park and ride location.	Y
15	HWY 169	Marschall Rd	NB SB	Planned location for future park and ride Planned location for future park and ride	N/A N/A	N/A N/A	Planned future park and ride location. Planned future park and ride location.	Y
16	HWY 169	CSAH 15	NB SB					N - Does not meet screening criteria
1	HWY 212	CSAH 11	WB EB					N - Does not meet screening criteria
2	HWY 212	CSAH 10	WB EB	Planned location for future park and ride Planned location for future park and ride	N/A N/A	N/A N/A	Planned future park and ride location. Planned future park and ride location.	N - Interchange located close to TH 41 where station is recommended.
3	HWY 212	MN TH 41	WB EB	Park and Ride located at SW corner of interchange. Park and Ride located at SW corner of interchange.	N/A N/A	N/A N/A	Station to utilize existing park and ride station location. Station to utilize existing park and ride station location.	Y
4	HWY 212	Powers Blvd	WB EB					N - Does not meet screening criteria

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5	HWY 212	Great Plains Blvd	WB	Park and Ride located at SW corner of interchange.	N/A	N/A	Folded diamond interchange. Park and Ride location allows for drop off/pick up location by using EB on-ramp bus pull out and loops around the park and ride facility to allow the bus to turn back onto Great Plains Blvd and merge back onto 212 WB.	Y
			EB	Park and Ride located at SW corner of interchange.	N/A	N/A	On and off-ramps both located at the SE corner of the intersection, making bus turn around difficult. A bus-only left turn lane could potentially be added at the off-ramp for direct entrance into the transit center platform, otherwise buses would have to use a longer route to turn around.	
6	HWY 212	Dell Rd	WB					N - Does not meet screening criteria
			EB					
7	HWY 212	Eden Prairie Rd	WB	None	None	Y	On-ramp and off-ramp are both located on the north side of the intersection, making it necessary for a bus to travel off line to make a turn around. Cloverleaf off-ramp shares a median with the WB on-ramp. There is not a good route for a turn around. An alternate route could be to exit 78th St W and make a left turn onto Eden Prairie Rd which would provide direct access to the WB on-ramp. The platform could be located on the on-ramp, near the intersection with Eden Prairie Rd. An existing paved regional bike trail may need a small alignment adjustment to accommodate the platform.	Y
			EB	None	None	Y	On-ramp has HOV bypass lane on the right. The station platform would be prior to the HOV bypass lane, with possibly some adjustments to the entrance of the HOV lane. A steep slope down to a drainage basin would require grading for the platform. An existing chain link fence would require relocation.	
8	HWY 212	Wallace Rd	WB	No	N	Depends where bus stop is located.	No dedicated WB off-ramp. To get to Martin Dr./Wallace Rd., it would be necessary to exit on Arboretum Blvd., take a right along Mitchell Rd., take a left at Martin Dr. and connect up to Wallace Rd. The bus stop location would need to be determined.	N - No WB off ramp. Very difficult for buses to get to this intersection.
			EB	Bus route along Wallace Rd heading South	N	Y	No on-ramp to 212 from Wallace Rd., necessary to take Technology Dr. to Mitchell Rd., then merge back onto 212 ramp.	
9	HWY 212	SW Transit Center	WB	SW Transit Center	N/A	N/A	Existing transit facility is located at the proposed station location, potential to connect to SWLRT	Y
			EB	SW Transit Center	N/A	N/A	Existing transit facility is located at the proposed station location, potential to connect to SWLRT	

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1	I-394	Central Ave/CSAH 101	WB	Existing Wayzata Blvd & Barry Ave Park and Ride	N/A	Y	Stop to be at existing Wayzata Blvd & Barry Ave Park and Ride, located 1 mile from 394.	Y
			EB	Existing Wayzata Blvd & Barry Ave Park and Ride	N/A	Y	Stop to be at existing Wayzata Blvd & Barry Ave Park and Ride, located 1 mile from 394.	
2	I-394	Gleason Lake Rd	WB	Bus route along Wayzata Blvd/101	N/A	Depends on bus stop location	There is no on ramp to head WB at Gleason. One option would be to use Wayzata Blvd to connect to Central Ave N, and use on ramp at Central. Gleason WB has two off ramps. One is a diamond off ramp that only allows traffic to go North, and the other off ramp is a cloverleaf that only allows traffic to go South.	N - No on-ramp going WB and no off-ramp going EB
			EB	Bus route along Wayzata Blvd/101	N/A	Depends on bus stop location	No off ramp from EB 12. On ramp uses bus/car pool lane around meter. The Wayzata/Gleason/on ramp intersection provides sidewalks at NW, SW, and SE corners of intersection.	
3	I-394	Carlson Pkwy	WB	Bus route along Carlson Pkwy, with bus stop at 12 Oaks Center Dr. roundabout NE of intersection. Bus route South of intersection EW along Oakland Rd.	Electric box and light pole in NW corner of intersection.	N	Nearside location has grading issues and existing vegetation. Expansion of roadway to include a median station could only happen South of the off-ramp as the on-ramp is directly adjacent to the North. Bus would need to turn onto Carlson Pkwy and use Lakeshore Pkwy roundabout as a turnaround location.	Y
			EB	Bus route North along Carlson Pkwy, with bus stop at 12 Oaks Center Dr. roundabout NE of intersection. Bus route South of intersection EW along Oakland Rd.	Light Pole	N	Minimal constraints with adequate room to expand roadway on nearside of intersection. Bus would need to turn onto Carlson Pkwy and use Lakeshore Pkwy roundabout as a turnaround location.	
4	I-394	Plymouth Rd	WB	Plymouth Rd Transit Center	None	Y	Utilize existing Plymouth Rd Transit Center	Y
			EB	Plymouth Rd Transit Center	None	Y	Utilize existing Plymouth Rd Transit Center	
5	I-394	Hopkins Rd	WB	Park and Ride ramp and drop off at SW corner of interchange. Surface lot park and ride at NW corner of interchange. Managed lanes EB/WB. Bus route along both North and South Frontage Rd.	N/A	Y	Utilize existing Hopkins Crossroad Park & Ride (Surface Lot)	Y

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			EB	Park and Ride ramp and drop off at SW corner of interchange. Surface lot park and ride at NW corner of interchange. Managed lanes EB/WB. Bus route along both North and South Frontage Rd.	None	Y	Utilize existing Hopkins Crossroad Park & Ride (Facility)	
6	I-394	General Mills Blvd	WB	Bus route N/S along General Mills Blvd, and EW along S Frontage Rd.	N/A	Y	Utilize existing General Mills Blvd Park & Ride surface lot as turnaround/station location on Southside of interchange. There would likely need to be some modifications to existing blvd/curb adjacent to Park & Ride lot to allow adequate turning movements for an articulated bus. Inline station options have detention ponds adjacent to the on/off ramps.	Y
			EB	Small Park and Ride at SE corner of intersection with existing bus stop and shelter. Bus stop connects with S Frontage Rd and on ramp bus/car pool lane.	N/A	Y	Utilize existing General Mills Blvd bus stop connected to on-ramp bus/car pool lane and S frontage road. A small park and ride surface lot is also directly South of the cloverleaf and on-ramp.	
7	I-394	Louisiana Ave S	WB	Surface lot Park and Ride at South side of Interchange. Offers turn around loop for WB buses.	N/A	Y	Utilize existing Louisiana Ave Transit Center. Louisiana Ave S is a raised overpass diamond interchange. The entire North side of the interchange is raised above the surrounding area via large retaining walls. Louisiana Ave gradually slopes to grade level by the time it reaches Market St. There are sidewalks along the East and West sides of the bridge. On-ramp includes bus/car pool lane, but inadequate room for a station platform. Bus must go offline to transit center on South side of interchange.	Y
			EB	Surface lot Park and Ride at South side of Interchange. Off ramp has bus pull out lane, that connects with park and ride surface lot bus stop.	N/A	Y	Utilize existing off-ramp station at Louisiana Ave Transit Center. Existing bus pull out lane on off ramp connects to park and ride surface lot. On-ramp includes bus/car pool lane around meter. 394 has managed lanes EB/WB.	
8	I-394	Xenia Ave/Park Place Blvd	WB	Surface lot Park and Ride at SE corner of interchange. Managed lanes.	None	Y	Utilize existing Park Place Park & Ride station on South side of Wayzata Blvd to pick up passengers. Buses would then need to follow Wayzata Blvd EB, take a right on Utica Ave S, right on Zarthan Ave, right on Park Place Blvd and then re-enter I-394.	

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			EB	Surface lot Park and Ride at SE corner of interchange. Managed lanes.	N/A	Y	Utilize existing Park Place Park & Ride Station on South side of Wayzata Blvd to pick up passengers. Buses would then need to follow Wayzata Blvd EB, take a right on Utica Ave S, right on Zarthan Ave, right on Park Place Blvd and then re-enter I-394. On and off-ramps have steep slopes or retaining walls 10 ft. from roadway surface which prevents the implementation of an inline station.	Y
9	I-394	Penn Ave S	WB	None	Electric box on North side of on ramp, 10 ft. from roadway.	Y	Noise wall 10 ft. from off/on ramp. Retaining wall on North side of noise wall by off ramp. Majority of off ramp is an additional bridge structure, with no sidewalks. On and off ramp both have steep grade changes both E/W and N/S, since the intersection is on a hill. 394 center lanes are managed, and offer Online option. Off line option could be selected, with a selected bus stop and turn around point.	N - Interchange is less than 2 miles from Downtown Minneapolis. Difficult place for bus stop.
			EB	None	Fire hydrant at SW corner of intersection. Traffic camera at NW corner and SE corner of intersection.	Depends on bus stop location	Off ramp transitions into a bridge directly after the intersection, which goes over railroad tracks. Guardrail and barriers along the North side of on-ramp. Triangle median between off ramp thru/left lane and dedicated right lane. North of off ramp slopes steeply down to 394.	
1	HWY 65	Crosstown Blvd NE	NB					N - Does not meet screening criteria
			SB					
2	HWY 65	Constance Blvd NE	NB					N - Does not meet screening criteria
			SB					
3	HWY 65	Andover Blvd NE	NB					N - Does not meet screening criteria
			SB					
4	HWY 65	Bunker Lake Blvd NE	NB					N - Does not meet screening criteria
			SB					
5	HWY 65	125th Ave NE	NB	Planned location for future park and ride	N/A	N/A	Interchange is a newly constructed bridge over Highway 65, with a large deck to accommodate large radius turning lanes. Off and on-ramps are elevated on retaining walls that have no room for station platforms. Ponds are adjacent to both off and on-ramps.	Y
			SB	Planned location for future park and ride lot	N/A	N/A	Interchange is a newly constructed bridge over Highway 65, with a large deck to accommodate large radius turning lanes. Off and on-ramps are elevated on retaining walls that have no room for station platforms. A pond is adjacent to the off-ramp. The on-ramp is elevated adjacent to several businesses.	

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6	HWY 65	117th Ave NE	NB	No	Power lines run along NB HW 65 across intersection. Power lines look to be at least 20-30 ft from roadway	Farside - yes, Nearside - no	Wetlands and Ponds located in the NW, SE, & SW corners of intersection but look to be far enough away to affect a potential station. There is sufficient grass median for a center station platform.	N - Intersection is 1 mile from proposed station to the north (125th) and south (109th); does not meet station spacing guidelines
			SB	No	Electric Boxes near traffic signal pole in SW corner of intersection	Farside - yes, Nearside - No	Wetlands and Ponds located in the NW, SE, & SW corners of intersection. There is sufficient grass median for a center station platform.	
7	HWY 65	109th Ave NE	NB	No	Overhead power lines run parallel to HW 65, set back to the east.	Y	This location contains good pedestrian accommodations from 109th Avenue (crosswalks, walkways, signals, etc.) along with non-used green space. Drainage swale runs adjacent to highway, and would require piping and earthwork. Overhead power lines are set back from the road, but could be impacted. Highway sign would require relocation.	Y
			SB	No	Overhead power lines run parallel to HW 65, set back to the west.	Y	This location contains good pedestrian accommodations from 109th Avenue (crosswalks, walkways, signals, etc.) along with non-used green space. Drainage swale runs adjacent to highway, and would require piping and earthwork. Overhead power lines are set back from the road, but could be impacted. Highway sign would require relocation. Driveway of abandoned gas station to the south could be impacted.	
8	HWY 65	105th Ave NE	NB					N - Does not meet screening criteria
			SB					
9	HWY 65	99th Ave NE	NB					N - Does not meet screening criteria
			SB					
10	HWY 65	93rd La NE	NB	No	Power lines run along Eastern side of 65. Possible utility marker just east of pavement.	N	There are no sidewalks on 93rd Lane NE except at SW corner, and there is no crosswalk for pedestrians to cross HW 65 on the Northern half of intersection. Fairly significant sign for Marathon Gas Station located in NE corner. The traffic signal and crosswalks on the east are located on triangle medians, with right-turn lanes and a lane for traffic to merge onto HW 65 NB. Traffic signals and turn lanes may need reconstructed to allow for a bus pullout.	Y
			SB	No	Power lines run along Western side of 65, but are set back.	Farside - Y, Nearside - N	There are no sidewalks on 93rd Lane NE except at SW corner, and there is no crosswalk for pedestrians to cross HW 65 on the Northern half of intersection.	

Seq	CORRIDOR	site_at	DIR	EXISTING TRANSIT FACILITIES	POTENTIAL UTILITY IMPACTS	SIDEWALK ACCESS PROVIDED (Y/N)	ADDITIONAL SITE CONSTRAINTS	STATION RECOMMENDED (Y/N)
11	HWY 65	81st Ave NE	NB	Existing limited stop North 59B line stops in NE corner of intersection. No pedestrian accommodations.	None	Farside - no, Nearside - yes	Fairly severe slope in grassy area along Eastern portion of 65. This could require structural (retaining wall), or excavation work to provide a flat station surface.	N - Intersection is 0.5 mile from proposed Osborne Rd. station to the south; does not meet station spacing guidelines
			SB	Existing limited stop South 59 line stops in SW corner of intersection. No pedestrian accommodations.	None	Farside - no, Nearside - yes		
12	HWY 65	Osborne Rd NE	NB	Existing bus stops for HW 65 routes at farside location.	Electric box in NE corner of intersection.	Y	This location contains good pedestrian accommodations from Osborne Road NE (crosswalks, walkways, signals, etc.). Drainage swale runs adjacent to highway, and would require piping and earthwork. Several highway signs would require relocation.	Y
			SB	Existing bus stops for HW 65 routes at farside location.	Overhead power lines run parallel to HW 65, set back to the west.	Y		
13	HWY 65	73rd Ave NE	NB	Existing bus stops in NE and SW Corners - no station amenities	None	Farside - no, Nearside - yes	Potential relocation of speed limit sign in NE corner	N - Intersection is 0.5 mile from proposed Osborned Rd. station to the north; does not meet station spacing guidelines
			SB	Existing bus stops in NE and SW Corners - no station amenities	Power lines run along Eastern portion of 65, and SW corner has a pole directly adjacent to 73rd Ave. Electric box in NW corner.	Farside - yes, Nearside - no		
14	HWY 65	Mississippi St NE	NB	Existing bus stops for HW 65 routes at farside location.	Electric box in NE corner of intersection.	Y	This station location is in a heavily residential area and vegetation/trees surround the intersection. Drainage swale runs adjacent to highway, and would require piping and earthwork.	Y
			SB	Existing bus stops for HW 65 routes at farside location.	None	Y		
15	HWY 65	Moore Lake Dr	NB	Existing bus stops for HW 65 routes at farside location.	None	N	There is no sidewalk on the northeast corner of the intersection where the station is located. Drainage swale runs adjacent to highway, and would require piping and earthwork.	Y
			SB	Existing bus stops for HW 65 routes at farside location.	None	Y		

Seq	CORRIDOR	site_at	DIR	EXISTING TRANSIT FACILITIES	POTENTIAL UTILITY IMPACTS	SIDEWALK ACCESS PROVIDED (Y/N)	ADDITIONAL SITE CONSTRAINTS	STATION RECOMMENDED (Y/N)
16	HWY 65	Medtronic Pkwy/Central Ave NE	NB SB	Existing Routes 10 and 59 stop at intersection				N- intersection configuration makes it challenging for station.
17	HWY 65	53rd Ave	NB SB	Existing bus stop in SW corner of intersection	Electric box in NE corner of intersection.	Y	There is a large grass median with room to expand for a bus pullout station on the farside.	Y
				Existing bus stop in SW corner of intersection	Electric box in SW corner of intersection.	Y	There is a large grass median fronting a commercial property where the existing station shelter is located.	

APPENDIX C

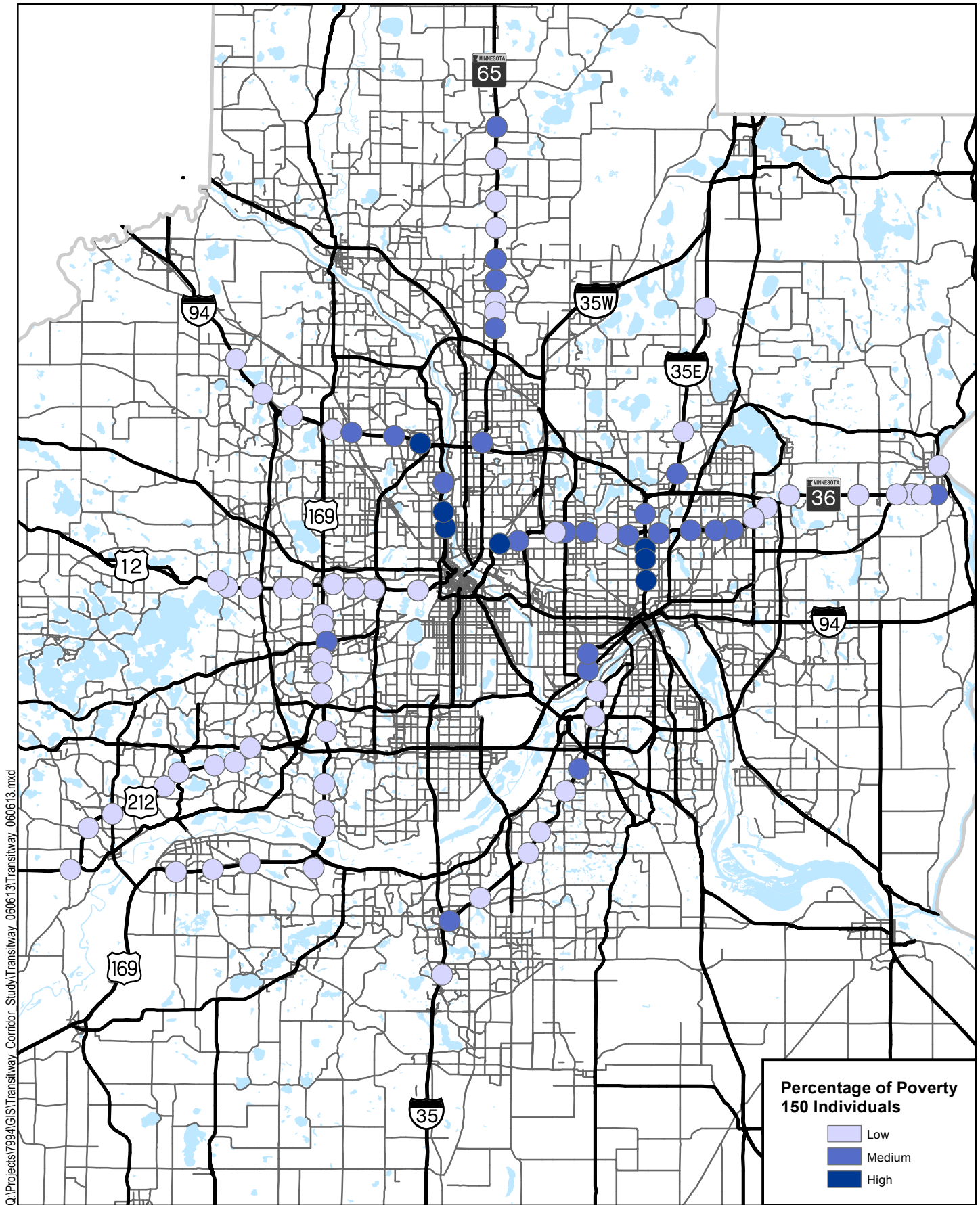
JOB AND ACTIVITY CENTER ANALYSIS

Corridor	Work Trips	Percent	Rank	Major Job / Activity Centers	Work Trips	Percent	Rank	City
TH 36	8,830	17%	1	Downtown Minneapolis	21,968	21%	1	St. Paul
TH 36	8,309	16%	2	Downtown St. Paul/Capital	21,238	20%	2	Minneapolis
TH 36	4,630	9%	3	University of Minnesota Minneapolis Campus Area	5,358	5%	3	Maplewood
TH 36	2,686	5%	4	Hwy 280/University Avenue	5,058	5%	4	Roseville
TH 36	2,043	4%	5	I-94 East St Paul/Maplewood	3,136	3%	5	Bloomington
Total	52,441				105,108			
TH 65	5,474	19%	1	Downtown Minneapolis	12,104	20%	1	Minneapolis
TH 65	1,809	6%	2	Hwy 47/Osborne Road	5,103	9%	2	St. Paul
TH 65	1,806	6%	3	Downtown St. Paul/Capital	4,211	7%	3	Fridley
TH 65	1,507	5%	4	University of Minnesota Minneapolis Campus Area	3,708	6%	4	Blaine
TH 65	1,390	5%	5	Northtown/CR 10	2,718	5%	5	Coon Rapids
Total	28,278				59,653			
I-94	13,561	23%	1	Downtown Minneapolis	29,858	27%	1	Minneapolis
I-94	3,529	6%	2	Hwy 55/I-494 Plymouth	7,584	7%	2	St. Paul
I-94	2,773	5%	3	University of Minnesota Minneapolis Campus Area	6,190	6%	3	Maple Grove
I-94	2,217	4%	4	I-394/Park Place Blvd-Xenia	5,993	5%	4	Plymouth
I-94	2,173	4%	5	France Avenue South & I-494/Hwy 100*	5,009	5%	5	Brooklyn Park
Total	59,517				110,158			
TH 169	16,259	22%	1	Downtown Minneapolis	31,204	25%	1	Minneapolis
TH 169	4,818	7%	2	France Avenue South & I-494/Hwy 100*	9,402	8%	2	Eden Prairie
TH 169	3,545	5%	3	University of Minnesota Minneapolis Campus Area	9,219	8%	3	Edina
TH 169	3,355	5%	4	Hwy 169/Bren Road	8,924	7%	4	Bloomington
TH 169	3,143	4%	5	Golden Triangle	7,748	6%	5	St. Louis Park
Total	73,798				122,510			
TH 212	2,829	13%	1	Downtown Minneapolis	7,381	19%	1	Eden Prairie
TH 212	2,022	10%	2	Hwy 212 Eden Prairie	4,724	12%	2	Minneapolis
TH 212	1,960	9%	3	Golden Triangle	3,060	8%	3	Edina
TH 212	1,661	8%	4	Eden Prairie Center/I-494	2,926	7%	4	Minnetonka
TH 212	1,535	7%	5	France Avenue South & I-494/Hwy 100*	2,672	7%	5	Chaska
Total	21,164				39,772			
35E North	5,225	18%	1	Downtown St. Paul/Capital	15,274	25%	1	St. Paul
35E North	3,782	13%	2	Downtown Minneapolis	9,021	15%	2	Minneapolis
35E North	1,848	6%	3	Hwy 280/University Avenue	2,863	5%	3	Maplewood
35E North	1,561	5%	4	University of Minnesota Minneapolis Campus Area	2,798	5%	4	Roseville
35E North	1,390	5%	5	I-694/Lexington Ave	1,827	3%	5	White Bear Lake
Total	28,603				60,825			
35E South	10,093	16%	1	Downtown Minneapolis	21,549	18%	1	St. Paul
35E South	8,040	12%	2	Downtown St. Paul/Capital	20,147	17%	2	Minneapolis
35E South	4,239	7%	3	I-494/I-35E	10,667	9%	3	Eagan
35E South	3,480	5%	4	South Loop/Bloomington	8,955	7%	4	Bloomington
35E South	3,318	5%	5	France Avenue South & I-494/Hwy 100*	8,100	7%	5	Burnsville
Total	64,932				120,887			
I-394	12,127	27%	1	Downtown Minneapolis	23,645	33%	1	Minneapolis
I-394	2,781	6%	2	University of Minnesota Minneapolis Campus Area	4,986	7%	2	St. Louis Park
I-394	2,431	5%	3	Hwy 55/I-494 Plymouth	4,876	7%	3	Minnetonka
I-394	1,931	4%	4	I-394/Park Place Blvd-Xenia	4,375	6%	4	St. Paul
I-394	1,913	4%	5	France Avenue South & I-494/Hwy 100*	4,151	6%	5	Plymouth
Total	45,462				72,365			

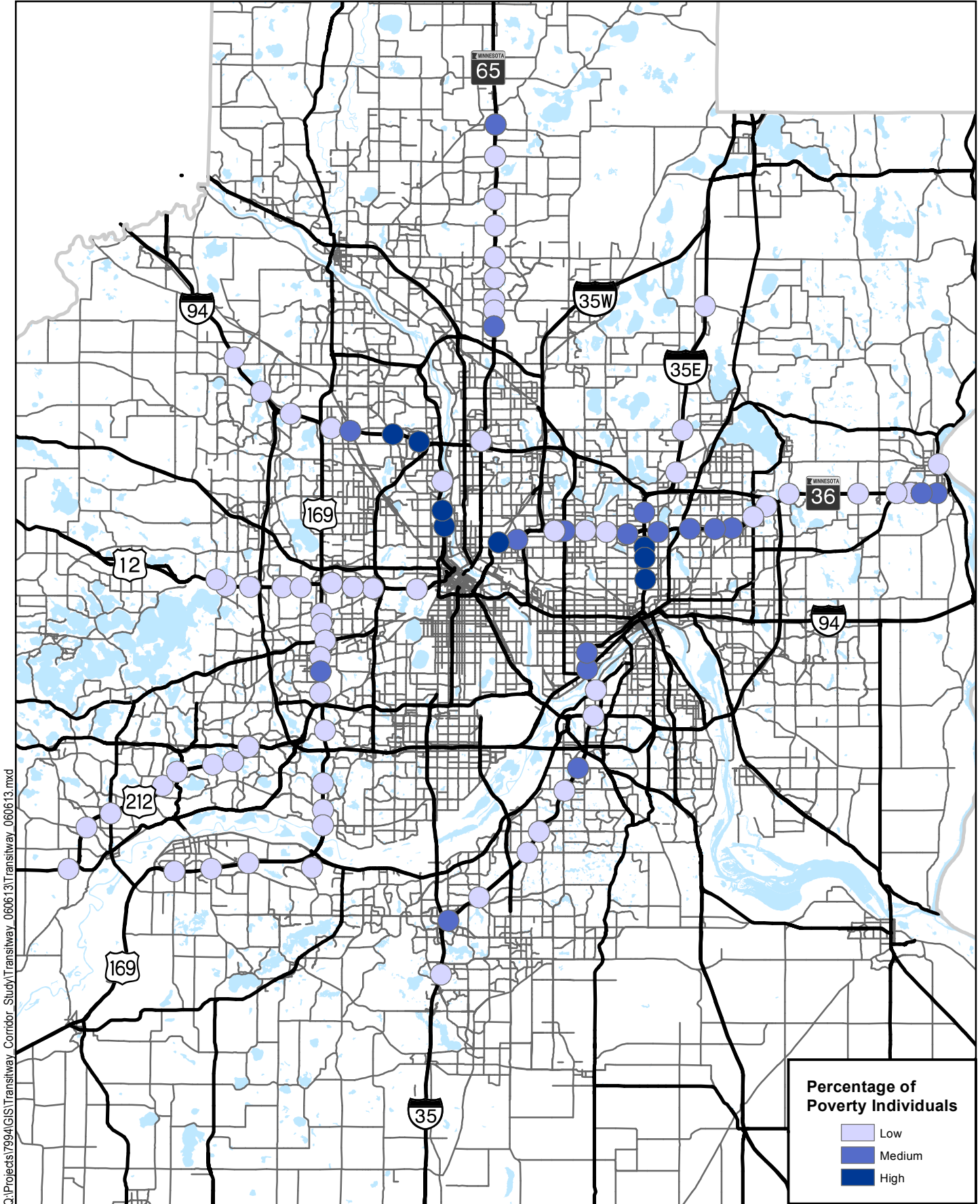
* France Avenue South & I-494/Hwy 100 is combination of two activity centers.

APPENDIX D

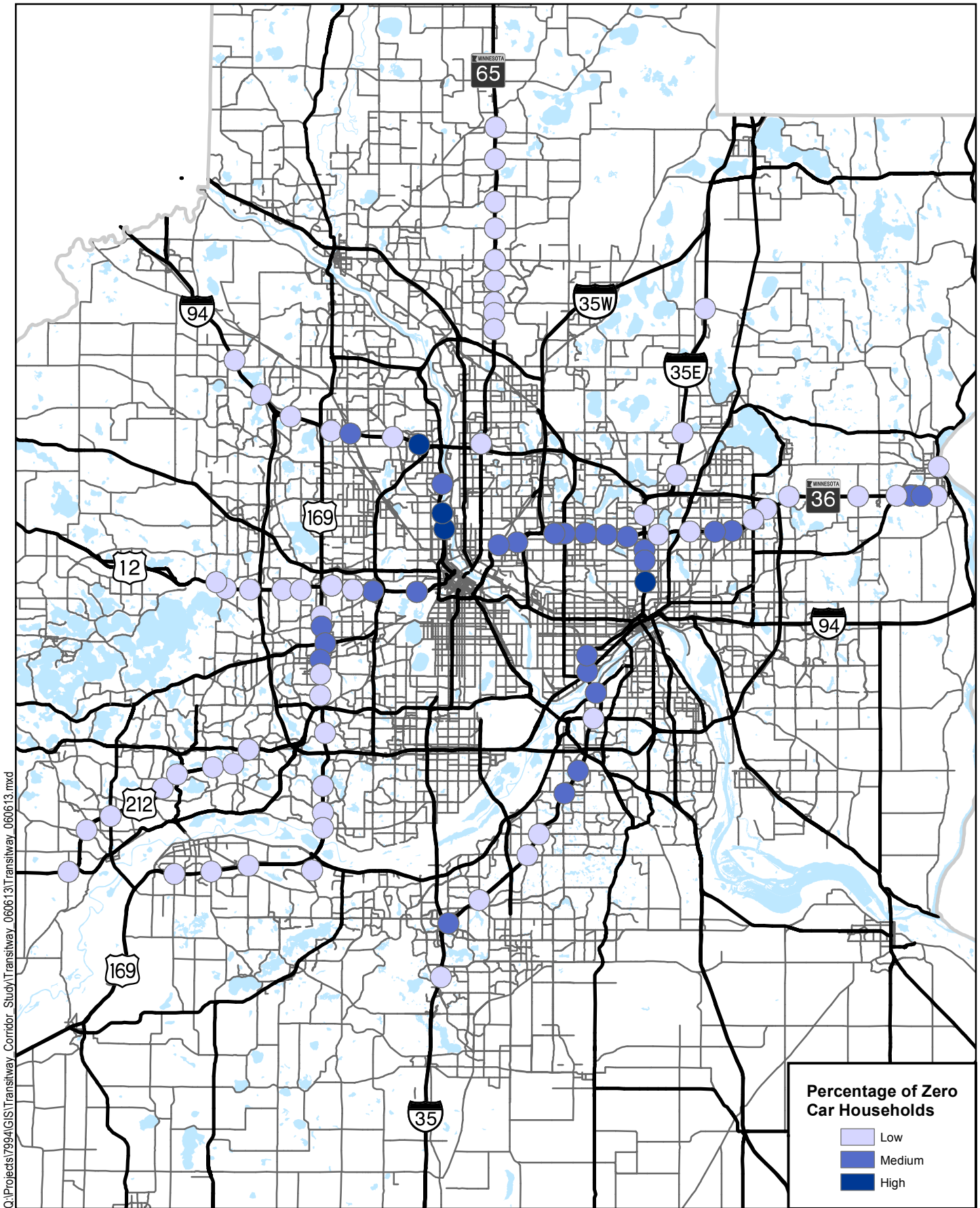
LOW-INCOME AND ZERO-CAR HOUSEHOLD ANALYSIS



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APPENDIX E

STAKEHOLDER WORKSHOP SUMMARY

June 28 2013 Stakeholder Workshop Summary

Approximately 30 transportation leaders from the region participated in a workshop hosted by the Metropolitan Council on June 28, 2013 and offered feedback on the corridors and transit service levels that will be studied in the Highway Transitway Corridor Study. The workshop consisted of an introduction to the concept of highway bus rapid transit (BRT) and then two small group breakout sessions. The first session generated discussion around higher level questions regarding highway BRT transit services and facilities. The second session focused on stakeholder feedback specific to each of the eight study. Both sessions generated valuable feedback; however the second breakout session generated a list of specific action items for some of the proposed corridor alignments and potential station locations. Table 1 summarizes the action items proposed by stakeholders and how they will be addressed as the Highway Transitway Corridor Study moves forward. A full list of feedback from each breakout section is included in the following sections.

Table 1: Proposed Action Items from Stakeholders

Corridor	Proposed Stakeholder Action Item	Action taken for the Highway Transitway Corridor Study
35E North	Connect to the airport	The existing Route 54 (a limited stop bus route) and the planned West 7th Arterial Bus Rapid Transit (BRT) line provide a connection from downtown St. Paul to the airport. Extending the I-35E highway BRT line to the airport would be redundant.
	Add a station at Highway 96	The study will add a station at Highway 96 for further analysis.
	Swap the station at County Rd E for a station at Highway 96	This study will analyze an added station at Highway 96 instead of swapping out the County Rd E station. County Rd. E has good existing transit connections.
I-35E South	Add a station at Highway 77.	A station will not be added at Highway 77, because freeway-to-freeway connections create extremely difficult pedestrian access issues.
	Coordinate CSAH 42 station with Orange Line	The study will change the I-35E South alignment to connect with an Orange Line station at CSAH 42/Burnsville Center.
	Add a connection to the new outlet mall in Eagan (northeast of Highway 77 at Hwy 13 and Silverbell Rd)	This location is too far away from the corridor and therefore serving this location would detract from highway BRT's purpose of providing fast and frequent service. Also, this location is already served by the METRO Red Line station at Cedar Grove Station
	Add a station between W. 7th St. and Lone Oak Rd.	The potential station locations between W. 7th St. and Lone Oak Rd. did not meet the requirements of any of the four screens.
	Yankee Doodle and Lone Oak Rd. are too close together. Find alternate station locations?	Both of these two stations serve relatively high concentrations of population and employment in this area. Also, the Yankee Doodle location serves the Eagan Transit

Corridor	Proposed Stakeholder Action Item	Action taken for the Highway Transitway Corridor Study
		Station.
	Run service off I-35E to CSAH 42 west	This need will be filled by a local bus connection on CSAH 42.
	Provide a station in vicinity of I-35W to provide direct connection of lines and better access to multiple origin/destinations. Avoids redundant service on I-35W.	Service to Kenrick will provide an important end-of-line park-and-ride station for I-35E travel market and downtown St. Paul (currently unserved).
	Provides another primary connection/basis for future E-W service on CSAH 42. At a minimum from Cedar to Burnsville Center tying 3 lines together.	The study will model a local bus connection on CR 42 between Apple Valley Transit Station and west to Glendale Rd.
	Leave highway at Cliff Rd. to connect with Red Line	The study will change the I-35E South alignment to connect with a Red Line station at Cliff Road.
Highway 36	Add a direct connection to Century College at Division Street	This location is too far away from the corridor and therefore serving this location would detract from highway BRT's purpose of providing fast and frequent service. This location will be served by a local bus connection.
	Model demand from Stillwater park and ride	The study will model an end-of-line park and ride at Hadley Avenue.
	As signals are slated to be removed, model with no signals	The project team consulted with MnDOT staff on this proposed action item, and the team was instructed to assume existing conditions (i.e. model with existing signals).
	Add a station at 35E/36 interchange	A station will not be added at I-35E, because freeway-to-freeway connections create extremely difficult pedestrian access issues.
I-94	<i>No proposed action items from stakeholders</i>	
Highway 65	Make a direct connection to Central ABRT	The Highway 65 alignment will terminate at 53rd Ave NE to provide a direct connection to Central ABRT.
	Make a direct connection to Fridley NorthStar Station	The Northstar line does not provide frequent, all day service; therefore providing a frequent highway BRT connection to this line would not improve mobility in these corridors. This location should be served by a local bus connection.
I-394	Model a park and ride at the terminal station (Central Ave)	The existing Wayzata Blvd. & Barry Ave. park and ride will be added to the analysis. The Central Ave./101 station will be modeled as an existing park and ride.
	Extend the alignment to Medina/Mound	This location is too far away from the corridor and therefore serving this location would detract from highway BRT's purpose of providing fast and frequent service. This location is more of an express service market.

Corridor	Proposed Stakeholder Action Item	Action taken for the Highway Transitway Corridor Study
	Delete Louisiana Station, because it is too close to Xenia/Park Place	The Louisiana station provides important local bus connections.
Highway 212	Extend the alignment to City of Carver's new park and ride at County Road 11 (Ironwood Drive in the City of Carver)	This location is not yet a proven market for all-day service. Also, there are multiple other park-and-ride stations in the 212 corridor, so serving this station would be duplicative.
	Connect to Eden Prairie Town Center	This location is too far away from the corridor and therefore serving this location would detract from highway BRT's purpose of providing fast and frequent service. This location could be served by a local bus connection.
	Connect to the Arboretum	This location is too far away from the corridor and therefore serving this location would detract from highway BRT's purpose of providing fast and frequent service. This location could be served by a local bus connection.
	Connect to the Chanhassen Dinner Theater	This location is too far away from the corridor and therefore serving this location would detract from highway BRT's purpose of providing fast and frequent service. This location could be served by a local bus connection.
Highway 169	Add a station at County Rd 83	The study will add a station at County Rd 83
	Extend the alignment north of 394 to 610	The employment center and commuting patterns analysis demonstrated that the largest percentage of commuters traveling in the Highway 169 corridor south of I-394 are traveling to downtown Minneapolis; therefore the corridor was not extended north of I-394. This section of Highway 169 could analyzed in a future study.
	Code Pioneer Trail as a future park and ride	The Pioneer Trail station will be coded as a future park and ride. It is currently listed as a future park and ride by Southwest Transit's latest comprehensive plan.

Small Group Questions – Part 1

During the first half, participants broke into four small groups and discussed four questions regarding the transit services and facilities that should be assumed for evaluation in the Highway Transitway Corridor Study.

Question 1: Service Frequency

The regional transitway guidelines and FTA criteria establish a 15-minute, all-day service frequency for Highway BRT station-to-station service. The purpose of this study is to determine the feasibility of 15-minute, all-day BRT service in these corridors but, in some corridors, the demand for such a frequent service may not warrant that level of investment. What are some alternative considerations that we should make in some corridors for a service-level matched more to demand? How important do you think service frequency is for attracting riders? How important do you think service frequency is for meeting people's needs? How much do you think this would affect cost?

Responses/Comments

- Regarding recommended frequency of 15 minute, all day service:
 - Adjust frequency based on demand
 - Commuter
 - Shift workers (important to understand work schedules)
 - Need to be flexible, consider setting
 - More frequent in the am
 - Maybe less in the afternoon
 - Seasonal variations
 - Know the locations and frequency of connections
 - Higher frequency in-bound (am), more tailored service other times
 - Need 15 minute during peak
 - Different expectations for
 - Commuter service (Peak am and pm)
 - All-day service
 - Need frequency that users can rely on without a schedule
 - Rush hour should be every 15 minutes or more, but don't need that frequency all day
 - May not be worth having the service at 30 minute frequency
 - Hour frequency makes people not take transit
 - Look at other existing service for guidance
 - Need service frequency that will generate riders to get development
 - Adjust frequency during peak
 - As frequency increases, ridership increases (More frequent, more dependable)
 - As long as there are seats, longer trip/wait times are ok
- Other comments about service
 - In addition to frequency, transit also needs to be competitive with car travel times
 - Travel time advantage important - Trip times need to be competitive with car, bike
 - People consider the trade-off between time and cost of gas
 - People take transit because of parking issues
 - Is the purpose of BRT congestion mitigation? Moving people? Both?
 - Frequency + Convenience = Choice Riders
 - Transitway access should occur before congestion points
 - Connections are even more important
 - New service needs to be something simple and reliable

General direction regarding service frequency:

- Should be 15 minute frequencies during peak periods, especially a.m.
- Should be based on demand
- Lower frequencies during non-peak periods are acceptable
- All-day service may not be justified if service frequencies have to be more than 30-60 minutes
- Important to consider shift workers/schedules when determining a.m. and p.m. peak periods

Question 2: Service Span

Transitway guidelines and FTA criteria for BRT suggest service for 16 hours or more a day, including weekends. For comparison, the Hiawatha LRT Line runs every 10-15 minutes, 22 hours per day, 7 days a week. The approximately 12 mile corridor's schedule is geared toward the activities at the Mall of America, the Airport, and commuters. How late in the evening should service be provided? How frequent should evening service be? Should service be provided on weekends? How frequent? How important is late night and/or weekend service?

Responses/Comments:

- Regarding span of service:
 - Should be tied to demand
 - Should avoid the fear of being stranded, “Last Trip Factor” Service
 - Span should be different on week days/ weekends
 - Service span should be different based on the uniqueness of the corridor
 - Extend span for special events like the State Fair and Sports Games – people would use service for entertainment and special events - occasional high ridership
 - 6 am?
 - Span should provide for connections with circulators/connecting bus routes
 - Connecting with circulators frequently is important
 - SW has event service, but not very flexible trip times, people can figure out how to use event service
 - Evening and weekend attractions - bars, restaurants, working hours
 - Consider reverse commuters and identify the workforce
 - Concern about getting commuters where they need to be *on time* - 24 hr companies and local destinations
 - Needs to be flexible (*tailor* frequency and span as appropriate) for seasonal use and/or special events
 - Need to understand local attractions and destinations
 - Tourism/Recreation like Canterbury, Casino, Etc.
 - Sporting Events
 - Mystic Lake and Canterbury already providing sufficient bus service
- Other comments
 - Suggestion to use short lines to provide more frequent service to limited segments of the corridor but this may lead to user confusion
 - BRT needs to serve the masses, and be coordinated with commuter buses
 - BRT serves primarily commuters – regular weekday riders
 - Aging and minority populations – less frequent service and with a varied schedule - Important to provide connections
 - Precrash, manufacturers were asking for reverse commutes – had trouble attracting employees

Ensure transit connections exist including connections for bikes and peds and coordination with local service

General direction regarding service span:

- No clear direction on service span
 - Should be based on demand
 - Value of longer span is better service for reverse commute, entertainment/recreation trips, special events
 - Recognition that should be flexible to expand span of service to accommodate special events
 - Should consider schedule of connecting routes when determining span of service
 - Recognition that span/service frequency would be different on weekends than on weekdays
-

Question 3: Corridor Length

Our technical analysis has looked at various factors to determine recommended stations, including population, employment, planned growth, transit connections. There is a trade-off between going further and serving more areas (more cost) and serving the most efficient markets but missing key connections (less ridership). How do we analyze what is ready and cost-effective today against future needs? Should we serve the strongest markets today and plan to serve stronger markets when they are ready? How do we determine the end of the line station? What other factors are important when determining the length of a corridor or potential stations?

Responses/Comments:

- Regarding corridor configuration/length:
 - Use a combination of *existing* population and employment data as well as *future* data projections
 - Corridors can be built incrementally
 - Make sure the terminus station is in a good location for rural access - consider the local street network and travel conditions
 - Reduce frequency as you go out further
 - Plan for future stations before implementation
 - Reserve land for stations
 - “Densify” at key locations
 - Balance between existing and future demands
 - 5 miles minimum
 - Identify best opportunities for anchor, then develop feeder express to anchor
 - Consider development opportunities - ask/Know if the local government is willing/planning to zone supportively
 - End of line should be tied to employment
 - Phasing based on existing and forecasted population
 -
- Other Comments:
 - Have the flexibility to respond to future changes
 - BRT can encourage development and redevelopment

- Consider overall travel patterns, not just travel in and out of downtowns
 - Ridership is tied to the economy
 - Carver County's #1 issue is an aging population and how to provide transportation – need access to medical services; may need stops closer together
 - Reverse commutes have scattered destinations and are hard to serve; they have cheap parking and don't have to fight congestion
 - BRT is flexible, ability to test market support
-
- Important to keep/attract young professionals, they are moving to other regional centers
 - Phasing based on existing and forecasted population

General direction regarding line length:

- Use a combination of existing and future population and employment
 - Phasing over time is acceptable
 - Terminus station should be at an anchor – development or employment center or activity center
 - Terminus station should have good access and good transit connections
-

Question 4: Station Types

On-line and in-line stations provide for faster regional connections but generally do not get riders directly where they want to go. They will either need connecting bus services or a walkable urban form and design to get there, which can be lacking in freeway environments. Off-line stations can significantly slow down a service, making them unattractive from a travel time perspective. For reference, there is an On-line station at 46th St. On-line/In-line costs about 50-100 million and Off-line costs about 5 million. What is more important? What should we consider when determining the type of station in corridors and with service like this? Should there be ridership or cost thresholds for when certain types of stations are used? Should there be other criteria? If so, what should they be?

Responses/Comments:

- Regarding on-line stations:
 - Higher cost for on-line, but it operates like rail
 - On-line user waiting experience can be uncomfortable
 - Haven't planned for online stations – need to plan in advance and anticipate growth and change
- Regarding in-line stations:
 - In-line might be a good middle ground
 - In-line makes sense for bus to bus transfers
- Regarding off-line stations:

- It's about providing connections – if speed were a concern, then they would be on the express service
 - Off-line has a travel time disadvantage
 - Minimize the number of off-line stops
- Regarding criteria for selecting station type:
 - Speed vs. access
 - Types of riders being served - they have different needs
 - Auto connections vs. bike/ped transfers and connections (car drivers won't want to walk)
 - Adjacent land uses
 - Transit connections
 - Local by-in
 - Setting (urban vs suburban)
 - How are users going to get there? If they are from a high-density area, less likely to have a vehicle
 - Speed of boarding
 - Speed of transit (faster the better)
 - Need to justify cost and ridership
 - Need room for parking in more suburban areas
 - Need to consider the load on each route
 - Make the in-bound (start of the line) the most convenient
 - Other comments:
 - Consider shuttles between parking and the highway; between stations and other destinations
 - Premium investments considered development drivers, Local buy-in is key
 - Some stops on the Red line that don't have P&R don't make sense to communities
 - Some customers are more interested in express service to downtown areas
 - Need to look at family of services for each community
 - Consider if an area can be changed? Redeveloped? Grow?
 - Uniqueness of the Twin Cities needs to be considered in the guidelines

General direction regarding station types:

- No clear direction but general recognition that in-line stations are expensive and have challenges for pedestrians while having advantages for transit speeds
- Recognition that there is a need for park and ride at many station locations
- Recognition that in-line stations may be a good compromise in some locations
- Need to consider land use setting, types of users, transit connections and mode of access to the station when making these decisions
- Trade-offs in speed, access, ridership and cost need to be weighed when making this decision

Small Group Session 2 – Corridor Analysis

During the second half of the workshop, participants broke up into four groups and discussed the following corridors:

- 1) I-35E North & Hwy 36
- 2) I-35E South
- 3) I-94 & Hwy 65
- 4) Hwy 169/I-394, Hwy 212, & I-394

I-35E North:

- Enhance existing service
- Serve northern stations – commuters
- Serve areas of transit dependence
- Intensify existing land use
- Connect to airport
- Hub at County Road E
- Local bus connections the White Bear Lake and other Communities
- 96th better than County Road E for “funnel”
- Consider existing road network
 - Not as many connections to Co. Rd. E as 96th
- Bike & Ped connections at 96th
- 96th = Focal Point
- County Road E Park & Ride 2013/2014
- 96th existing Park & Ride slated for closing
- Nothing East/West on Maryland – opportunity
- Larpenteur/Maryland = Good
- Corridor has important environmental features
- Recreational opportunities are key for the corridor
 - Important to consider trail connections (add to map)
- Movement/use of corridor – telecommute and recreate
- Barriers and Constraints
 - Little Canada Road – gas stations, fire station

Hwy 36:

- Division Street and Century Ave/120 – connect to Century College

- Hadley and Century Ave/120 – Interchange study
- New bridge move traffic off 94 to 36
- Connection opportunity at Rice
- Freeway to freeway connection not worthy of direct connection
- Model demand from Stillwater Park & Ride
- Signals to be removed
- Maplewood Mall – critical attraction drives usership
- English has a trail connection
- Edgerton/Rice are diverse/different
- Lexington *or* Dale – Lexington makes sense due to Zoo, Park, Further North
- 36-35W should be considered
- Get MnDOT figures

I-35E South:

- Want/need mid-day service
- Yankee & Lone Oak are not near residential areas
- People feel left out in this corridor
- 2 Markets
 - To St. Paul (20 min)
 - To Minneapolis (7-10 min)
- Full or standing room only on buses
- Strong magnet school in St. Paul has seasonal demand (north end of corridor)
- Warrants enhanced service if not BRT
- Minimum transit advantage on 35E now
- West of Cliff Road there is
 - Development potential
 - Potential future red line station
- MVTA is looking into a Park and Ride near 35E / Cedar junction
- Do not have ridership for all-day service
- Enhanced service for some
- Connections to
 - new outlet mall in Eagan
 - Burnsville Center
- Peak and event service to begin with,
- Future service depends on what develops to the south and future demand for St. Paul
- Current draw is for Minneapolis (red line)
- Yankee Doodle is not built up yet
- Not a top priority for BRT corridor
- Better to expand service during peak and midday service
- CSAH 11 station is questionable
- CSAH 42 needs to be coordinated with the orange line station
- Lone Oak and Yankee Doodle may be too close together

- Makes sense that there is no station between 7th and Lone Oak
- Existing Park and Ride at
 - Cliff Road needs improvement
 - Kendrick is a garage
- W 7th does not have enough service
 - Meets lots of needs now
- Congestion and back up on SB 35E, just south of river as road goes up hill
 - Difficult topography,
 - Lots of weaving north of W 7th
 - Slower speed limits
- 494 junction is better with the new ramps
- Back up at 35E and 35W junction especially during Holidays
- Problem back-ups at 35E and Cedar junction
- 35E just north of Diffley: backup on SB during afternoon due to blinding sun
- No 35E junction with Hwy 55
 - Eagan would still like a connection there
 - Have to go to 149

Sticky Note Comments

- *Lone Oak Road transit connection is questionable*
- *Golf course south of Yankee Doodle Rd, west of Erlene Rd, will become residential*
- *Golf course south of 32, east of 31, will become residential*
- *NW corner of Yankee Doodle and Pilot Knob Rd is redeveloping into retail/office*
- *Eagan has identified the northern delta between 35E and 77(along Cliff Rd) as a Special Planning Area*
- *Existing Park and Ride Blackhawk @ Cliff Road*
- *Existing Park & Ride Palomino @77*

I-94:

- Originates on N Southern segment
- Reverse commute route to the suburbs
- Good service to the EJ population
- Competition with Bottineau? Arterial BRT?
- Not a lot of choice riders
- Not a lot of congestion on I-94
- Broadway bus line
- Do you need Dowling if you have invest in Lowry?
- Reverse commute very important with growing Downtown population

Sticky Note Comments

- *Does this compete with the Blue Line?*
- *Do you need Dowling if you have Lowry?*
- *Potential connection to northern suburbs via 65?*

- *Consider connections with arterial BRT @ 65 and 694*

TH 65:

- Going to I-94 makes investment in Lowry more viable – 94 corridor is faster route than Central
- Need a connection to Arterial BRT
- Maybe connect with Fridley NorthStar station
- More like a higher speed ABRT – not a lot of opportunities for On-line, they'd have to be In-line
- 65 is heavily congested
 - BRT would be attractive here
 - Queue jump, not a lot of transportation benefit
- 35W will compete with 65
- Southbound right on 53rd connect with ABRT, continue on 53

Sticky Note Comments

- *65 is not a freeway, more like high-speed arterial BRT*
- *95th St P&R on 35W creates competition between 35W BRT and 65 BRT*
- *Connect TH 65 with 94 via 53rd Arterial BRT station*

I-394:

- Consider destinations/connections to
 - General Mills
 - Carlson Parkway (Difficult to get to)
 - 101/Central (Better access)
 - Ridgedale (currently expanding)
 - West End/Xenia-Park Place
- Access challenges at all/most stations
- Northwest Plymouth is experiencing huge growth – rerouting road (100 to 47)
- Demand for a Park & Ride at a terminus in Medina/Mound – tie into existing Park & Rides
- We should model a park & ride at the end of the line station to gauge impact
- Land use around the Carlson Pkwy interchange makes it difficult to access
- Plymouth Road/Ridgedale area is very difficult to serve in a direct manner
- General Mills Blvd area is a key area to serve due to employment levels

Sticky Note Comments

- *Need Park and Ride at end of line*
- *Carlson Parkway is an employment destination, but not high need for Park & Ride*
- *Carlson Parkway has difficult ingress/egress*
- *Older residential population at Hopkins Crossroad*
- *Is Louisiana needed so close to Xenia/Park Place? It does have 2 Park and Ride lots*
- *High density population and employment at Xenia/Park Place*
 - *No space for Park & Ride*

- *All day/evening entertainment/hotels/shopping area*

Hwy 212:

- Just off the map at the end of 212, City of Carver station being built (400 space lot)
- Important to look to the future in this corridor
- Important connections:
 - Dial-a-ride
 - SW Transit
- Important destinations:
 - Eden Prairie Town Center
 - Arboretum
 - Chanhassen Dinner Theater
- Need for increased local service to support the existing SW Transit service in the corridor
- The threshold/target for population and density is 5 persons per acre or 10 jobs per acre
 - Important to consider supporting transit and higher densities along this corridor
- Raw data is important feedback to share with Cities so they can plan development
- Might not be a great corridor for BRT
- Should there be an additional station west of TH 41 and County Road 11?

Sticky Note Comments

- *Station being built in City of Carver, south of 212 on CR11*
- *Density and population issues (not dense enough) south of 212 along TH 41 (end of the line)*
- *Paisley Park*
- *Arboretum*
- *Chanhassen Dinner Theater*

Hwy 169/394:

- Pioneer Trail could be a potential Park & Ride location
- Many people currently using Pioneer Trail Park & Ride would prefer one at Marschall Rd S
- There is also a Park & Ride at 83rd
- There are major changes taking place between Stagecoach Rd and Marschall Rd S
 - 50-100 additional jobs
 - Interchange at 83rd
- Add a station at 83rd (stations would still be 2 miles apart)
- The 169 corridor should go to 610, why does it terminate at 394? (It's considered a separate corridor north of 394)
 - This ignores City of Plymouth
- Pioneer Trail station should be coded as a future park & ride
- An additional station should be included at Highway 83 between Marschall Road and Stagecoach Road to serve significant employment areas

Sticky Note Comments

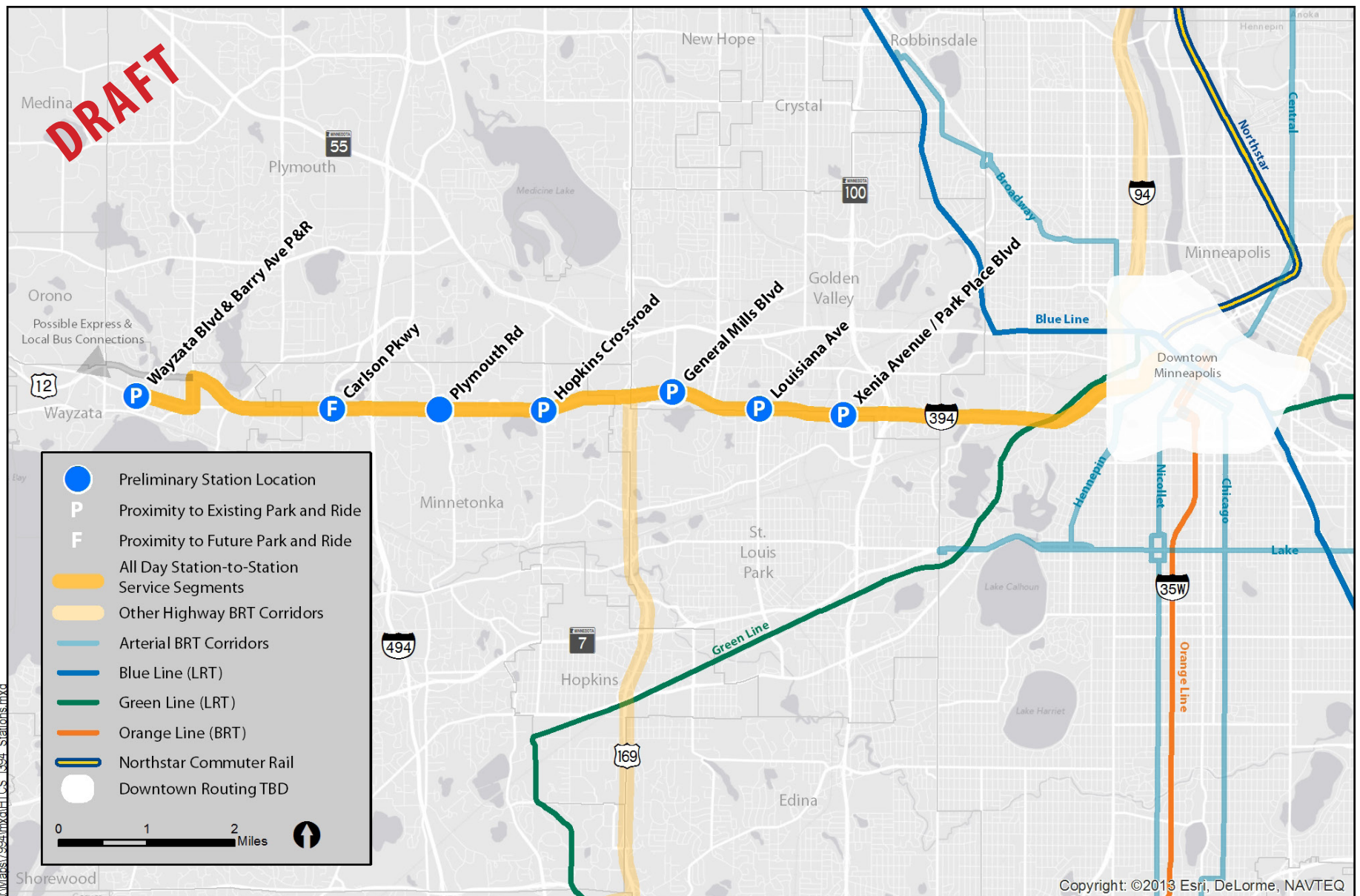
- *169 to 610 at Target headquarters should be included*
- *Why stop the 169 BRT at 394? Why not continue up 169 so people north can reach downtown*
- *Is this Park and Ride needed at Bren Road with one so close at golden triangle?*
- *(Referring to W Old Shakopee Rd) Alternative to Pioneer Trail due to job corridor along Old Shakopee Road (Also goes to Mall of America and Airport)*
- *County Rd 83 will see significant land use and density changes in the next 5 years*
- *Need a station at 83 to serve Canterbury, Mystic Lake, and 1500 new jobs in the next 18 months, 1200 new jobs (Emerson) in 10 years*
- *Marschall Rd needs to show up as Park & Ride*

DRAFT

APPENDIX F

ADJUSTED CORRIDOR CONCEPTS FOR EVALUATION

I-394 Corridor - DRAFT Station Locations

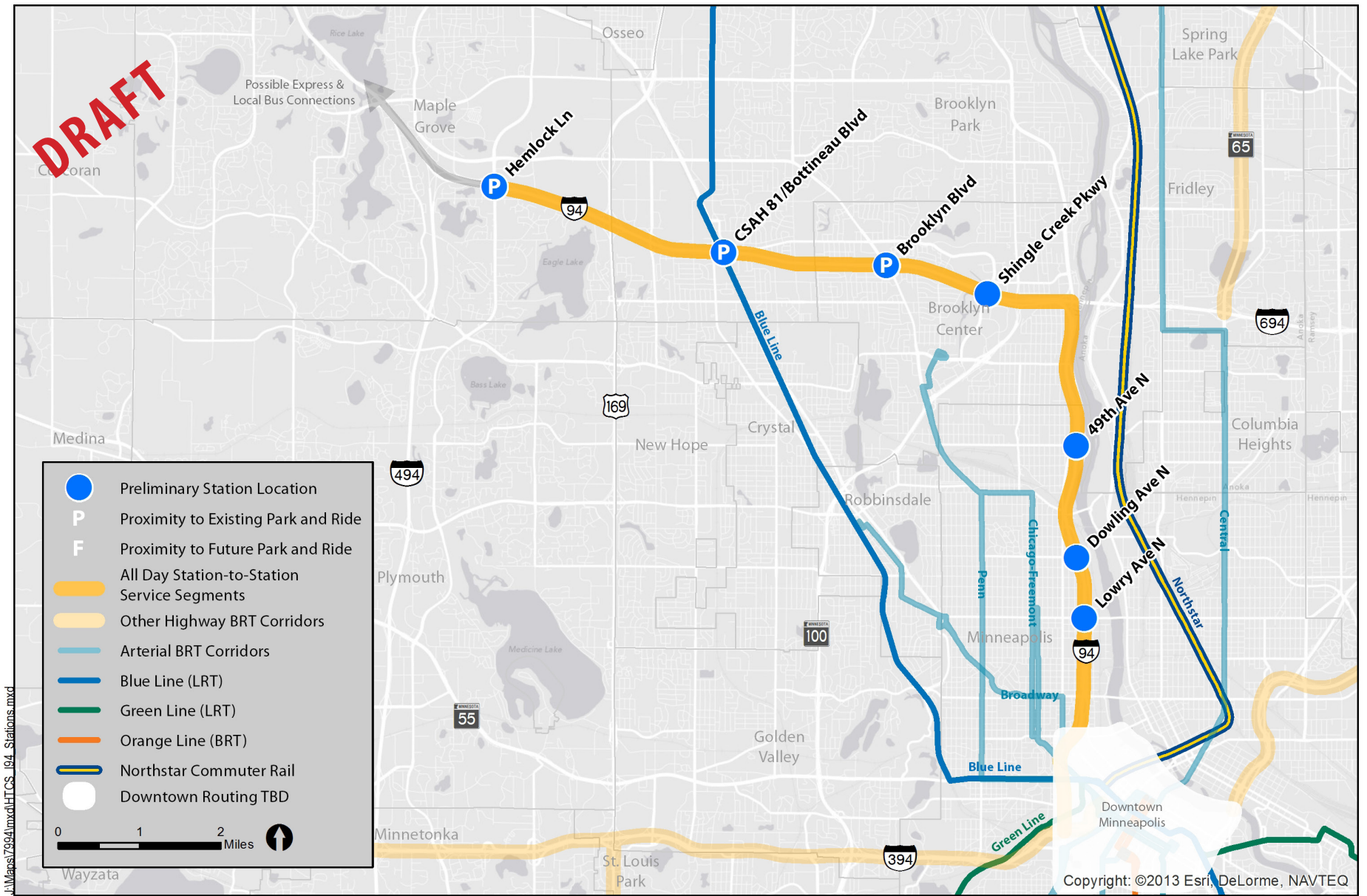


STATION LOCATION	DISTANCE BETWEEN STATIONS	MEETS POPULATION AND EMPLOYMENT THRESHOLDS	GOOD TRANSIT CONNECTIONS	MINIMAL PHYSICAL CONSTRAINTS	MEETS STATION SPACING REQUIREMENTS	NEAR MAJOR EMPLOYMENT CENTER	ADDITIONAL FACTORS CONSIDERED
Central Ave/ CSAH 101	1.7	<input checked="" type="checkbox"/>		✓	✓		End of line station, high existing and future employment density near station location. Existing park and ride
Carlson Pkwy	1.2	<input checked="" type="checkbox"/>	✓	✓	✓		
Plymouth Rd	1.2	<input checked="" type="checkbox"/>		✓	✓	✓	
Hopkins Crossroad	1.5	<input checked="" type="checkbox"/>	✓	✓	✓		Existing transit facility is located at the proposed station location (EB)
General Mills Blvd	1	<input checked="" type="checkbox"/>	✓	✓	✓	✓	Existing transit facility is located at the proposed station location (EB)
Louisiana Ave S	1	<input checked="" type="checkbox"/>	✓	✓	✓		Existing transit facility is located at the proposed station location (EB)
Park Place Blvd	-	<input checked="" type="checkbox"/>	✓	✓	✓	✓	Existing transit facility is located at the proposed station location

Meets Existing Population and Employment Thresholds

Meets Future Population and Employment Thresholds

I-94 Corridor - DRAFT Station Locations

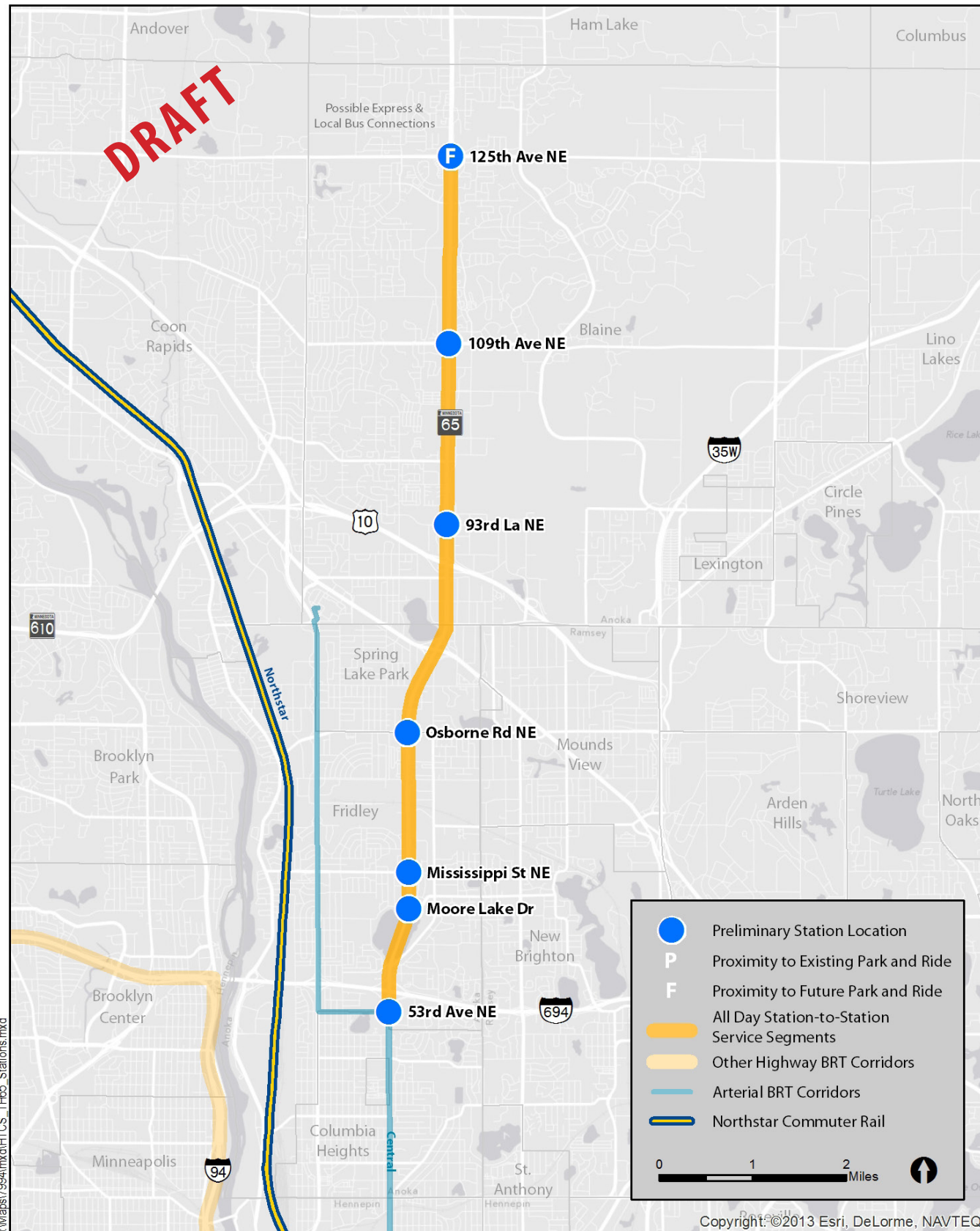


STATION LOCATION	DISTANCE BETWEEN STATIONS	MEETS POPULATION AND EMPLOYMENT THRESHOLDS	GOOD TRANSIT CONNECTIONS	MINIMAL PHYSICAL CONSTRAINTS	MEETS STATION SPACING REQUIREMENTS	NEAR MAJOR EMPLOYMENT CENTER	ADDITIONAL FACTORS CONSIDERED
Hemlock Lane	2.9	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	End of line station at Maple Grove Transit Center Existing park and ride at Maple Grove Transit Center
CSAH 81/ Bottineau Blvd	2.1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		Potential connection to LRT (Bottineau Corridor) Existing park and ride at 63rd Ave. and Bottineau Boulevard
Brooklyn Blvd	1.3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Existing park and ride located at 65th Ave. and Brooklyn Blvd. Serves transit reliant and low income populations
Shingle Creek Pkwy	2.7	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Serves transit reliant and low income populations
49th Ave N	1.4	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Metro Transit has future plans to reroute existing service to this location Serves transit reliant and low income populations
Dowling Ave N	0.8	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Serves transit reliant and low income populations
Lowry Ave N	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		Strong existing transit connections Serves transit reliant and low income populations

Meets *Existing* Population and Employment Thresholds

Meets *Future* Population and Employment Thresholds

TH 65 Corridor - DRAFT Station Locations



STATION LOCATION	DISTANCE BETWEEN STATIONS	MEETS POPULATION AND EMPLOYMENT THRESHOLDS	GOOD TRANSIT CONNECTIONS	MINIMAL PHYSICAL CONSTRAINTS	MEETS STATION SPACING REQUIREMENTS	NEAR MAJOR EMPLOYMENT CENTER	ADDITIONAL FACTORS CONSIDERED
125th Ave NE	2			✓	✓		End of line station Future park and ride
109th Ave NE	2	✓		✓	✓	✓	
93rd La NE	2.3	✓		✓	✓	✓	
Osborne Rd NE	1.5	✓	✓	✓	✓		Station located near TH 47 / Osborne Road employment center, future transit connections planned
Mississippi St NE	0.4	✓	✓	✓	✓		
Moore Lake Dr	1.1	✘	✓	✓			
53rd Ave NE	-	✘	✓	✓	✓		Included per stakeholder input Connection to Central Ave. Arterial BRT



Meets *Existing* Population and Employment Thresholds



Meets *Future* Population and Employment Thresholds



Station added based on stakeholder input, but not included in screening analysis. Therefore there is no population and employment data calculated for this station.

I-35 E North Corridor - DRAFT Station Locations



STATION LOCATION	DISTANCE BETWEEN STATIONS	MEETS POPULATION AND EMPLOYMENT THRESHOLDS	GOOD TRANSIT CONNECTIONS	MINIMAL PHYSICAL CONSTRAINTS	MEETS STATION SPACING REQUIREMENTS	NEAR MAJOR EMPLOYMENT CENTER	ADDITIONAL FACTORS CONSIDERED
Highway 96	2			✓	✓		Included per stakeholder input
County Rd E	2.9		✓	✓	✓		Strong existing transit connections Park and ride currently under construction
Little Canada Rd	2.1	✓	✓	✓	✓		
E Larpenteur Ave	1	✓	✓		✓		Potential coordination with 35E MnPass project
E Maryland Ave	-	✓	✓		✓		Potential coordination with 35E MnPass project Serves transit reliant and low income populations

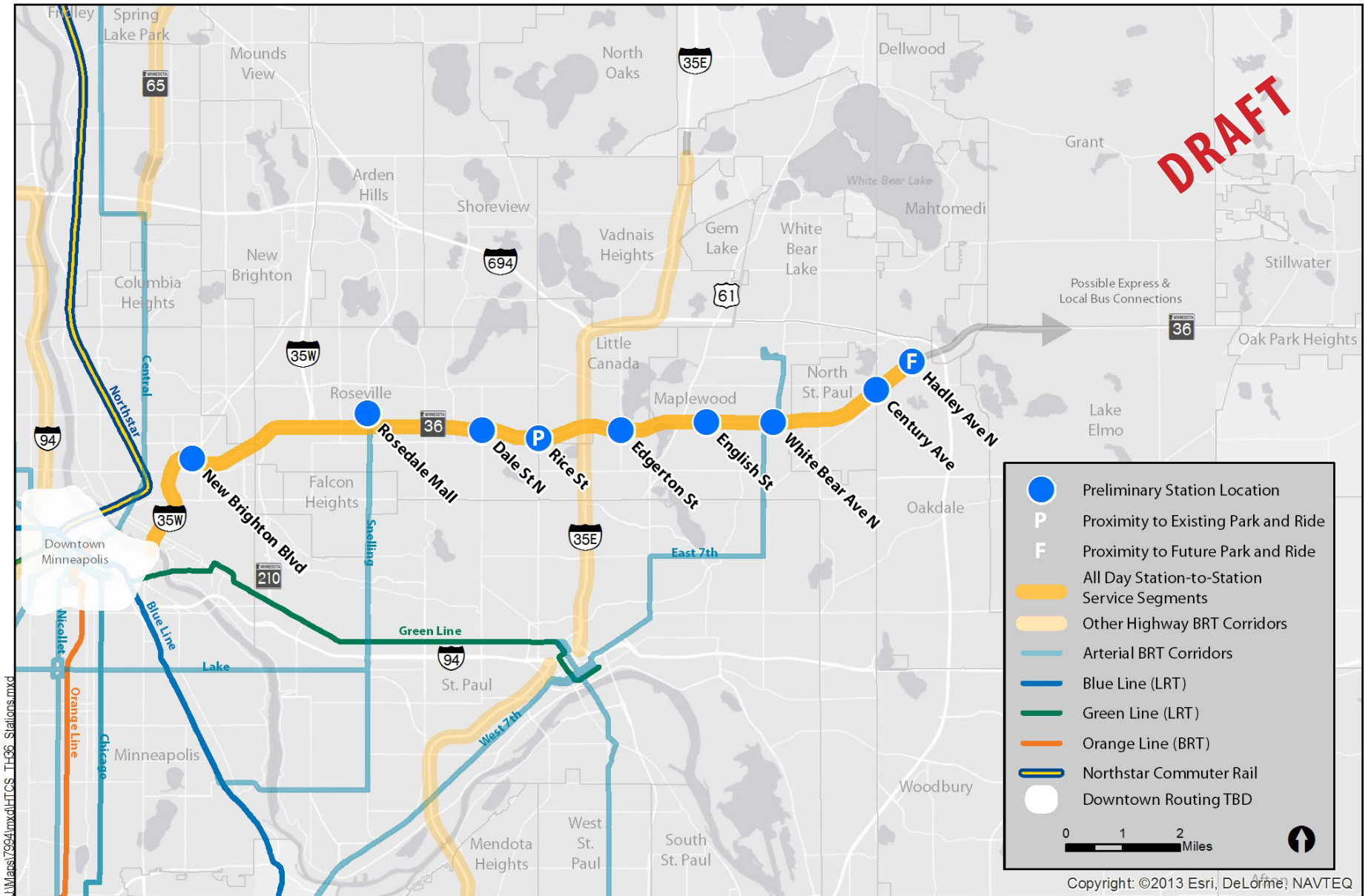


Meets *Existing* Population and Employment Thresholds



Meets *Future* Population and Employment Thresholds

MN 36 Corridor - DRAFT Station Locations



STATION LOCATION	DISTANCE BETWEEN STATIONS	MEETS POPULATION AND EMPLOYMENT THRESHOLDS	GOOD TRANSIT CONNECTIONS	MINIMAL PHYSICAL CONSTRAINTS	MEETS STATION SPACING REQUIREMENTS	NEAR MAJOR EMPLOYMENT CENTER	ADDITIONAL FACTORS CONSIDERED
Hadley Ave	.8	✘		✓			End of line station Park and ride assumed for this project only. No official plans or funding for this park and ride
Century Ave	2	✓	✓	✓	✓		
White Bear Ave N	1.2	✓	✓	✓	✓		Potential connection to arterial BRT (East 7th Corridor)
English St	1.5	✓		✓	✓		New interchange under construction
Edgerton St	1.5	✓	✓	✓	✓		
Rice St	2	✓	✓	✓	✓		
Dale St	1.5	✓		✓	✓		Future bridge reconstruction in 2015
Rosedale Mall	3.4	✓	✓		✓	✓	Potential connection to arterial BRT (Snelling Ave Corridor)
N Brighton Rd	-	✓	✓		✓	✓	



Meets Existing Population and Employment Thresholds

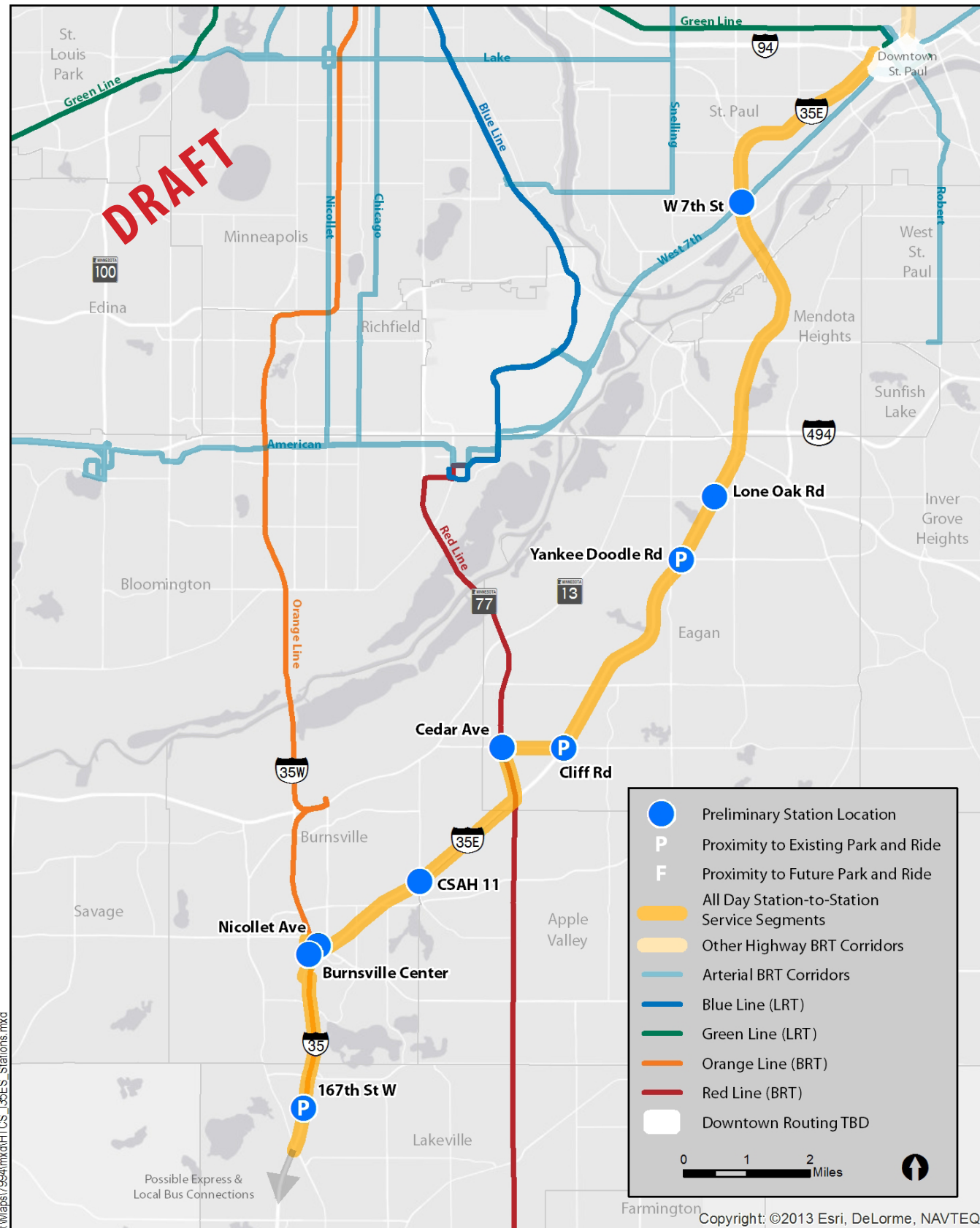


Meets Future Population and Employment Thresholds



Station added based on stakeholder input, but not included in screening analysis. Therefore there is no population and employment data calculated for this station.

I-35 E South Corridor - DRAFT Station Locations



STATION LOCATION	DISTANCE BETWEEN STATIONS	MEETS POPULATION AND EMPLOYMENT THRESHOLDS	GOOD TRANSIT CONNECTIONS	MINIMAL PHYSICAL CONSTRAINTS	MEETS STATION SPACING REQUIREMENTS	NEAR MAJOR EMPLOYMENT CENTER	ADDITIONAL FACTORS CONSIDERED
W 7th St	5.1	☑	✓	✓	✓		Potential connection to Arterial BRT line
Lone Oak Rd	1.1	☑	✓	✓	✓	✓	Station location is near I-494 employment center
Yankee Doodle	3.6	☑	✓	✓	✓	✓	Existing transit facility is located at the proposed station location
Cliff Rd	1.4	☑		✓	✓		Existing transit facility is located at the proposed station location
Cedar Ave	3.1	⊠	✓	✓	✓		Direction connection to Red Line Included per stakeholder input
CSAH 11	1.8	☑		✓	✓		High existing and future employment density near station location
Nicollet Ave	0.7	⊠	✓	✓	✓	✓	Station location is near Burnsville Center / CR 42 employment center
Burnsville Center	2.8	⊠	✓	✓	✓	✓	Direction connection to Orange Line Included per stakeholder input
167th Street W	-	☑		✓	✓		End of line station, existing transit facility is located at the proposed station location



Meets *Existing* Population and Employment Thresholds

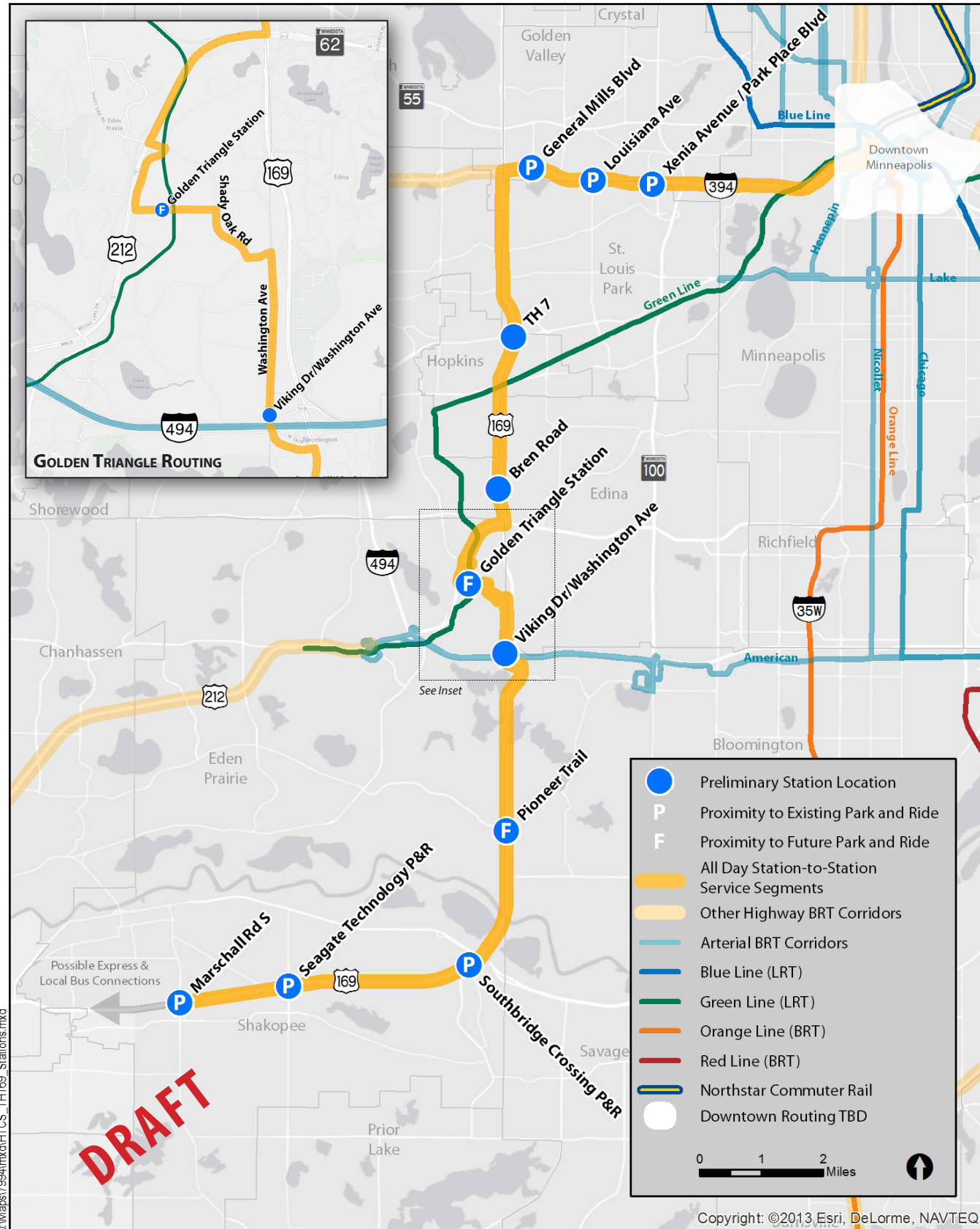


Meets *Future* Population and Employment Thresholds



Station added based on stakeholder input, but not included in screening analysis. Therefore there is no population and employment data calculated for this station.

169/394 Corridor - DRAFT Station Locations



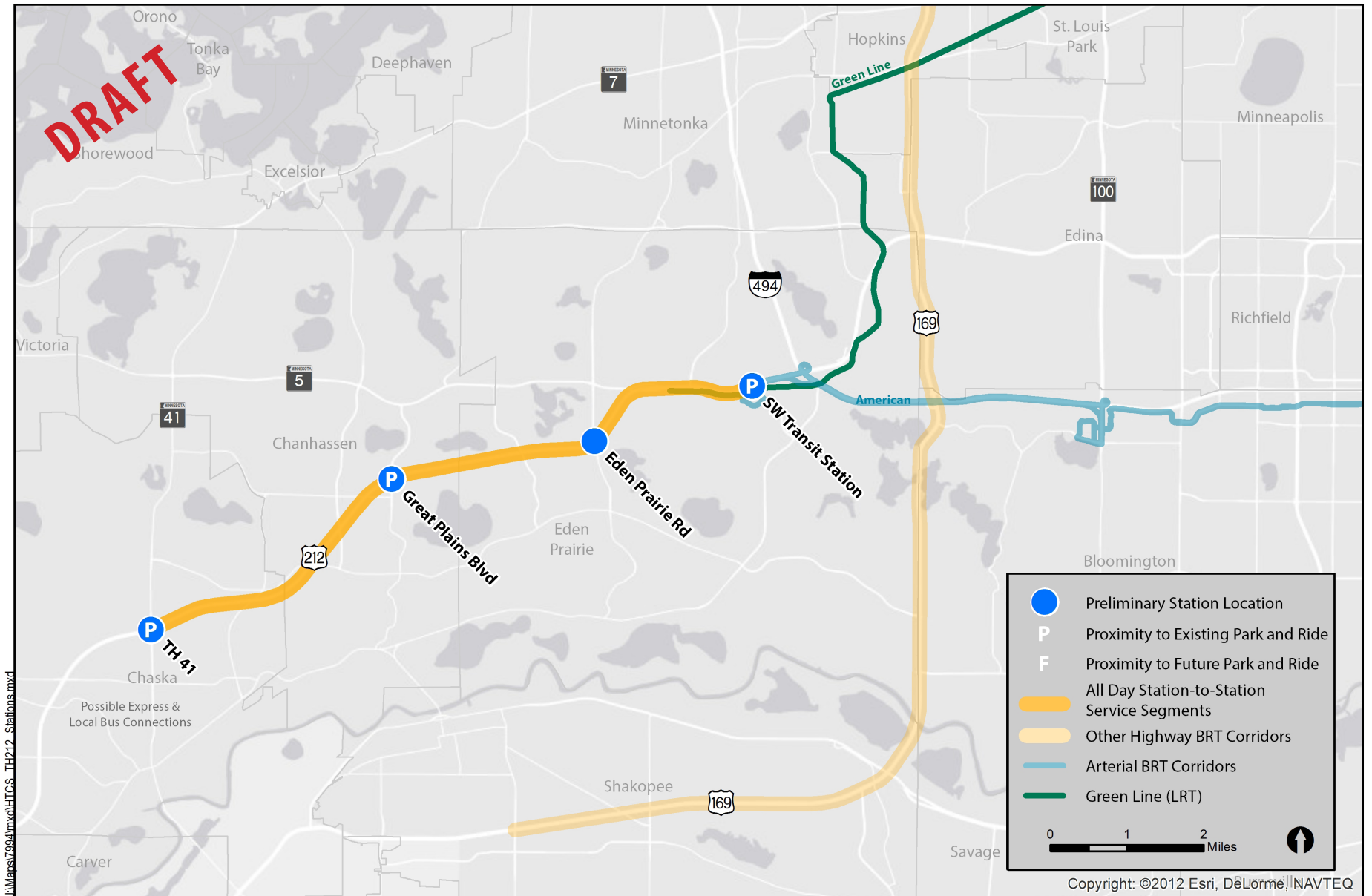
STATION LOCATION	DISTANCE BETWEEN STATIONS	MEETS POPULATION AND EMPLOYMENT THRESHOLDS	GOOD TRANSIT CONNECTIONS	MINIMAL PHYSICAL CONSTRAINTS	MEETS STATION SPACING REQUIREMENTS	NEAR MAJOR EMPLOYMENT CENTER	ADDITIONAL FACTORS CONSIDERED
TH 7	2.5	☑			☑		Replaces station location at Excelsior Blvd Excelsior station had major physical constraints and access issues.
Bren Rd W	2.6	☑	☑	☑	☑	☑	
Golden Triangle Station	1.6	☑	☑	☑	☑	☑	Connection to METRO Green Line (Southwest Corridor LRT)
Viking Dr/ Washington Ave	3.3	✖		☑	☑	☑	Potential connection to American Boulevard Arterial BRT
Pioneer Trail	3.7	☑	☑	☑	☑		Future park and ride based on SouthWest Transit's latest comprehensive plan
Southbridge Crossing Park and Ride	3				☑		Existing transit facility is located at the proposed station location
Seagate Technology Park and Ride	1.7		☑	☑	☑		Location of existing park and ride Included per stakeholder input
Marschall Rd	-			☑			Park and ride currenting under construction

☑ Meets Existing Population and Employment Thresholds

☑ Meets Future Population and Employment Thresholds

✖ Station added based on stakeholder input, but not included in screening analysis. Therefore there is no population and employment data calculated for this station.

U.S. 212 Corridor - DRAFT Station Locations



STATION LOCATION	DISTANCE BETWEEN STATIONS	MEETS POPULATION AND EMPLOYMENT THRESHOLDS	GOOD TRANSIT CONNECTIONS	MINIMAL PHYSICAL CONSTRAINTS	MEETS STATION SPACING REQUIREMENTS	NEAR MAJOR EMPLOYMENT CENTER	ADDITIONAL FACTORS CONSIDERED
MN TH 41	3.9		✓	✓	✓		End of line station
Great Plains Blvd	2.7		✓	✓	✓		
Eden Prairie Rd	2.4	✓	✓	✓	✓	✓	
Southwest Transit Center		✓	✓	✓	✓	✓	Existing transit facility is located at the proposed station location, potential to connect to LRT (Southwest Corridor)

Meets *Existing* Population and Employment Thresholds
 Meets *Future* Population and Employment Thresholds