



E Line

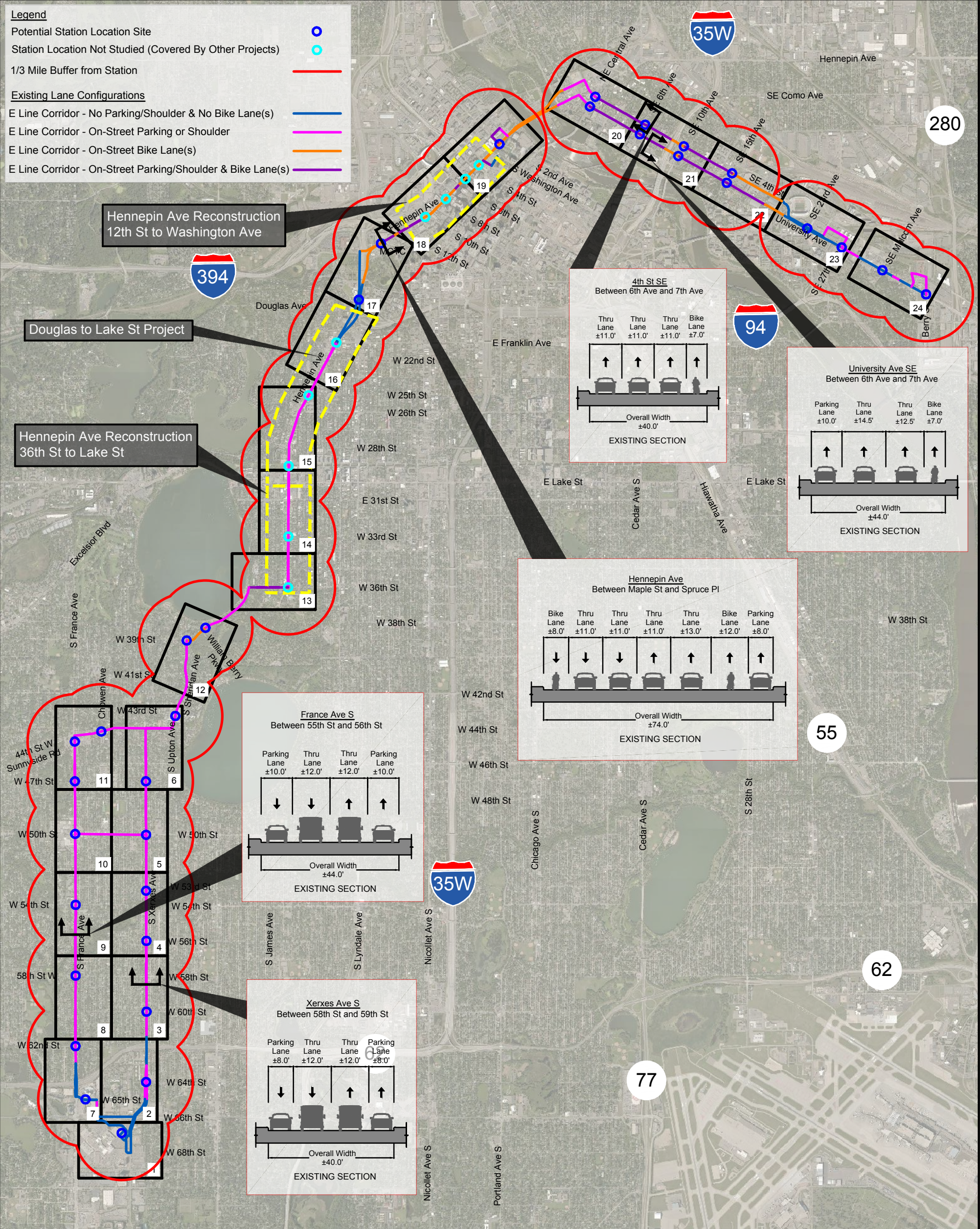
E Line Corridor Study

Appendix A

October 2019

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Figure 1: Proposed Station Locations and Existing Conditions



Sep. 19 2019 03:38 pm K:\TWC_Transit\MTVE Line Corridor Study\CAD\EXHIBITS\KeyProjectMap-Distances-20190918.dwg By: Scott.Yang

Table 1: Proposed Station Suitability Analysis

Station #	Direction	Mainline Corridor Street	Cross Street(s)	Station Location	Existing bus stop? (Y/N)	On Street Parking (Y/N)	Bike Lanes? (Y/N)	Existing Intersection Controls	Existing sidewalk width (X')	Existing width to ROW (if different than sidewalk width) (X')	ROW Impacts? (Y/N)	Width available for BRT station	Length available for platform (X')	Bumpout feasible? (Y/N)	Sufficient width available for curbside platform (Y/N)	Adjacent property type (Residential/ Commercial)	Feasibility? (Suitable, Candidate, Unsuitable)	Notes		
1	NB	Southdale Transit Center		Farside																
		Southdale Transit Center		Nearside																
		Southdale Transit Center		Midblock																
1	SB	Southdale Transit Center		Farside																
		Southdale Transit Center		Nearside																
		Southdale Transit Center		Midblock																
2	NB	Xerxes Ave	64th St	Farside	N	N	N	2-way stop on 64th	7.7	10.4	N	18	279.5	Y	N	Church	Suitable	Potential conflict with church sign.		
		Xerxes Ave	64th St	Nearside	N	N	N	2-way stop on 64th	7.7	10.5	N	19.4	58.4	Y	N	Residential	Unsuitable	Not enough available width for BRT station.		
		Xerxes Ave	64th St	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
	SB	Xerxes Ave	64th St	Farside	N	Y	N	2-way stop on 64th	4.5	3.2	Potentially	12.5	675.4	Y	N	Residential	Suitable	Has to be bumpout - minimal existing width to ROW.		
		Xerxes Ave	64th St	Nearside	Y	N	N	2-way stop on 64th	5.2	4.8-13.5	Potentially	17.3	443	Y	N	Residential	Suitable	Fire Hydrant at intersection, Station would fit north of hydrant. Must be bump out - minimal existing width to ROW.		
		Xerxes Ave	64th St	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
3	NB	Xerxes Ave	60th St	Farside	Y	Y	N	Full Signal	4.8	10.4	N	18.7	123.4	Y	N	Residential	Suitable	Intersection was recently reconstructed and a signal was put in. Big Tree in platform area		
		Xerxes Ave	60th St	Nearside	N	Y	N	Full Signal	4	11	N	19.8	589.1	Y	N	Residential	Suitable			
		Xerxes Ave	60th St	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
	SB	Xerxes Ave	60th St	Farside	Y	Y	N	Full Signal	6.1	8.3	N	16.4	N19C817-N19	Y	N	Residential	Suitable	Small retaining wall built adjacent to sidewalk. May need to reconstruct if BRT station is put in		
		Xerxes Ave	60th St	Nearside	N	Y	N	Full Signal	None	8	N	16	132.3	Y	N	Residential	Suitable			
		Xerxes Ave	60th St	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
4	NB	Xerxes Ave	56th St	Farside	N	Y	N	4-way stop	9.6	11	N	18	85.5	Y	N	Commercial	Suitable	Patio for Pizzeria Lola and Café Vin stick out of ROW on sidewalk, but plenty of space for bumpout platform		
		Xerxes Ave	56th St	Nearside	Y	Y	N	4-way stop	9.9	10.9	N	17.8	87	Y	N	Commercial	Suitable			
		Xerxes Ave	56th St	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
	SB	Xerxes Ave	56th St	Farside	N	Y	N	4-way stop	7.8	7.8	N	15.3	376	Y	N	Residential	Suitable	Not enough available width for BRT station. B17-N19		
		Xerxes Ave	56th St	Nearside	Y	Y	N	4-way stop	6.8	8	N	16.7	592	Y	N	Residential	Suitable	Has to be bumpout - retaining wall by adjacent property		
		Xerxes Ave	56th St	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
5	NB	Xerxes Ave	53rd St	Farside	N	Y	N	2-way stop on 53rd	7.7	15.5	N	22.1	401.3	Y	Y	Residential	Suitable	Potential grading issues		
		Xerxes Ave	53rd St	Nearside	Y	Y	N	2-way stop on 53rd	6.7	14.6	N	14.6	81.2	Y	Y	Residential	Suitable	Retaining wall directly adjacent to sidewalk. Need better dimension info to determine if platform will fit		
		Xerxes Ave	53rd St	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
	SB	Xerxes Ave	53rd St	Farside	N	Y	N	2-way stop on 53rd	7.3	8.4	N	15.3	406.7	Y	N	Residential	Candidate	Potential grading issues. Must be bump out		
		Xerxes Ave	53rd St	Nearside	Y	Y	N	2-way stop on 53rd	7.2	8.2	N	15.3	403.8	Y	N	Residential	Candidate	Fire Hydrant at intersection, Station would fit north of hydrant. Must be bump out		
		Xerxes Ave	53rd St	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
6	NB	Xerxes Ave	50th St	Farside	N	Y	N	Full Signal	12.1	12.1	N	19.9	32.7	Y	Y	Commercial	Unsuitable	Only feasible if you close a driveway access to the north of property on corner		
		Xerxes Ave	50th St	Nearside	Y	Y	N	Full Signal	10.2	12	N	23.6	34.3	Y	Y	Commercial	Unsuitable	Too many driveways and would need to close to allow sufficient length for platform		
		Xerxes Ave	50th St	Midblock	N	Y	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Midblock is feasible to the north and south		
	SB	Xerxes Ave	50th St	Farside	N	Y	N	Full Signal	9.5	7.3	N	15.5	232.5	Y	Y	Commercial	Suitable	Would need to do a bumpout as the businesses use the sidewalk but 17+ feet and parking make this work		
		Xerxes Ave	50th St	Nearside	Y	Y	N	Full Signal	7.3	7.3	N	15.2	60.5	Y	N	Mixed Use	Candidate	Very tight but there is 60' available. Awnings also stick out from buildings so not an ideal and has to be bumpout		
		Xerxes Ave	50th St	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
7	NB	Xerxes Ave	47th St	Farside	N	Y	N	2-way stop on 47th	7.7	13.1	N	20.2	122.9	Y	Y	Residential	Suitable	No Stop control		
		Xerxes Ave	47th St	Nearside	Y	Y	N	2-way stop on 47th	7.2	12.3	N	20.5	46.3	Y	Y	Residential	Unsuitable	Only 46' for a platform before a driveway and is only access for residential property		
		Xerxes Ave	47th St	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
	SB	Xerxes Ave	47th St	Farside	N	Y	N	2-way stop on 47th	7.1	7.1	N	15.5	192.4	Y	N	Residential	Suitable	No Stop control		
		Xerxes Ave	47th St	Nearside	Y	Y	N	2-way stop on 47th	8.4	8.4	N	15.8	57.9	Y	N	Residential	Unsuitable	No Stop control		
		Xerxes Ave	47th St	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
8	EB	66th St	Barrie Rd	Farside	N/A	N/A	N/A	Stop sign for SB Barrie	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Assuming the Bus would only stop at WB Station if it routes on 66th St	
		66th St	Barrie Rd	Nearside	N/A	N/A	N/A	Stop sign for SB Barrie	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Assuming the Bus would only stop at WB Station if it routes on 66th St	
		66th St	Barrie Rd	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Assuming the Bus would only stop at WB Station if it routes on 66th St	
	WB	66th St	Barrie Rd	Farside	N	N	N	Stop sign for SB Barrie	9.5	17.8	N	17.8	24.2	N	Y	Commercial	Unsuitable	Driveway too close		
		66th St	Barrie Rd	Nearside	Y	N	N	Stop sign for SB Barrie	10.7	16.7	N	16.7	121.6	Maybe	Y	Commercial	Suitable	No Signal, and to do a bumpout you would close furthest north lane. (there are 3 lanes today)		
		66th St	Barrie Rd	Midblock	N	N	N	None	9.5	17.8	N	17.8	133.2	Maybe	Y	Commercial	Suitable	There is adequate room past driveway for a station		
9	EB	65th St	Fairview Hospital	Farside	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
		65th St	Fairview Hospital	Nearside	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		65th St	Fairview Hospital	Midblock	Y	N	N	None	5.9	8.4	N	16.8	121.5	Y	N	Commercial	Suitable	Needs to be midblock and a bumpout w/out taking ROW. If midblock bumpout is acceptable this is fine.		
	WB	65th St	Fairview Hospital	Farside	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		65th St	Fairview Hospital	Nearside	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		65th St	Fairview Hospital	Midblock	Y	N	N	None	7.1	10.5	N	17.5	461.1	Y	Maybe	Commercial	Suitable	Needs to be midblock. Need to evaluate ROW as existing shelter seems to be outside roadway ROW		
10	NB	France Ave	62nd St	Farside	N	Y	N	1-way stop on 62nd	0	18.3	N	18.3	40	Y	Y	Residential	Unsuitable	Too many driveways		
		France Ave	62nd St	Nearside	N	Y	N	1-way stop on 62nd	0	36.4	N	36.4	44.3	Y	Y	Residential	Unsuitable	Too many driveways		
		France Ave	62nd St	Midblock	N	Y	N	N/A	0	40.5	N	40.5	89.4	Y	Y	Residential	Suitable	Too many driveways		
	SB	France Ave	62nd St	Farside	N	Y	N	1-way stop on 62nd	5.8	8.9	N	12.8	131.4	Y	Y	Residential	Suitable	Sidewalk to house will need to be removed or relocated		
		France Ave	62nd St	Nearside	Y	Y	N	1-way stop on 62nd	4.4	8.2	N	12.9	58.7	Y	Y	Residential	Unsuitable	Drive way too close		
		France Ave	62nd St	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Too many driveways	
11	NB	France Ave	60th St	Farside	N	Y	N	1-way stop on east W 60th	0	13.5	N	16.8	70.3	Y	Y	Residential	Candidate	Driveway may be too close		
		France Ave	60th St	Nearside	Y	Y	N	1-way stop on east W 60th	0	12.7	N	17.6	160.6	Y	Y	Residential	Suitable	No existing sidewalk		
		France Ave	60th St	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Too many driveways	
	SB	France Ave	60th St	Farside	N	Y	N	1-way stop on west W 60th	5.7	8.3	N	16.2	146	Y	N	Residential	Suitable	Retaining wall directly adjacent to sidewalk. Need better dimension info to determine if platform will fit		
		France Ave	60th St	Nearside	Y	Y	N	1-way stop on west W 60th	6.5	8.4	N	15.3	169.6	Y	N	Residential	Suitable	Retaining wall directly adjacent to sidewalk. Need better dimension info to determine if platform will fit		
		France Ave	60th St	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Too many driveways	
12	NB	France Ave	58th St	Farside	N	N	N	Full Signal	None	12.9	N	17.5	118.2	Y	Y	Residential	Suitable	Existing 4-5' shoulder that could be bumped out, adjacent yard has some slope to it		
		France Ave	58th St	Nearside	Y	N	N	Full Signal	None	12.6	N	16.1	60.1	Y	Y	Residential	Candidate	Not ideal as fence of property owner was built outside of their ROW and platform length would be reduced		
		France Ave	58th St	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
	SB	France Ave	58th St	Farside	N	N	N	Full Signal	5.9	8.4	N	12.2	93.4	Y	N	Residential	Candidate	Has to be bumpout - only 12' for platform even if it is a bumpout		
		France Ave	58th St	Nearside	Y	N	N	Full Signal	5.4	8.1	N	12.3	68.1	Y	N	Residential	Candidate	Not ideal as only a 68' platform could fit		
		France Ave	58th St	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
13	NB	France Ave	54th St	Farside	N	Y	N	Full Signal	9.1	15	N	23.7	36.6	N	Y	Both	Unsuitable	Bumpout prevented by driveway too close to the corner, but could have curbside platform after driveway		
		France Ave	54th St	Nearside	Y	Y	N	Full Signal	5.4	13.2	N	22.6	90.2	Y	Y	Commercial	Suitable			
		France Ave	54th St	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Bumpout prevented by driveway too close to the corner, but could have curbside platform after driveway	
	SB	France Ave	54th St	Farside	N	Y	N	Full Signal	5.3	8.3	N	18.6	79.4	Y	Y	Commercial	Suitable			
		France Ave	54th St	Nearside	Y	Y	N	Full Signal	5	6.6	N	18.2	110.3	Y	Y	Commercial	Suitable			
		France Ave	54th St	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
14	NB	France Ave	50th St	Farside	N	Y	N	Full Signal	8.2	11.3	N	22.1	275.4	Y	N	Commercial	Candidate	Awnings stick out and major utility issues here. Has to be bumpout to work		
		France Ave	50th St	Nearside	Y	Y	N	Full Signal	12											

Table 1: Proposed Station Suitability Analysis

Station #	Direction	Mainline Corridor Street	Cross Street(s)	Station Location	Existing bus stop? (Y/N)	On Street Parking (Y/N)	Bike Lanes? (Y/N)	Existing Intersection Controls	Existing sidewalk width (X')	Existing width to ROW (if different than sidewalk width) (X')	ROW Impacts? (Y/N)	Width available for BRT station	Length available for platform (X')	Bumpout feasible? (Y/N)	Sufficient width available for curbside platform (Y/N)	Adjacent property type (Residential/ Commercial)	Feasibility? (Suitable, Candidate, Unsuitable)	Notes		
18	EB	Upton Ave/Sheridan Ave	43rd St	Nearside	Y	Y	Y	Full Signal	13.4	18.8	N	22.5	147.6	Y	Maybe	Commercial	Candidate	Substantial infrastructure and trees built into sidewalk here but there seems to be room if that can be removed		
		Upton Ave/Sheridan Ave	43rd St	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
	WB	Upton Ave/Sheridan Ave	43rd St	Farside	N	Y	Y	Full Signal	10.8	10.8	N	19.8	91.8	Y	Maybe	Commercial	Candidate	Looks to have substantial grade issues		
		Upton Ave/Sheridan Ave	43rd St	Nearside	Y	Y	Y	Full Signal	12.4	8.0'-32.1'	N	22	96.3	Y	Maybe	Residential/Apartments	Suitable	Newly constructed apartments adjacent so would need to redo some of new sidewalk work		
19	NB/EB	Sheridan Ave	39th St	Farside	N	N	Y	Full Signal	4	10.8	N	10.8	37.7	Y	Maybe	Residential	Unsuitable	Not enough width or length for platform		
		Sheridan Ave	39th St	Nearside	Y	Y	N	Full Signal	11.2	11.2	N	18.51	68.1	Y	Maybe	Residential	Candidate	Feasible but reduced length platform		
	SB/WB	Sheridan Ave	39th St	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
		Sheridan Ave	39th St	Farside	Y	N	N	Full Signal	10.5	10.5	N	19.5	508.6	Y	N	Residential	Suitable			
20	NB/EB	Richfield Rd	William Berry Pkwy	Farside	N	N	N	Full Signal	None	None	N	25	439.2	Y	Y	Parkboard	Suitable	Curved roadway geometry and small shoulder but there is adequate space for bumpout		
		Richfield Rd	William Berry Pkwy	Nearside	Y	N	N	Full Signal	None	None	N	25	568	N	Y	Parkboard	Candidate	Steep roadway and thick vegetation directly adjacent to roadway		
	SB/WB	Richfield Rd	William Berry Pkwy	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
		Richfield Rd	William Berry Pkwy	Farside	Y	N	Y	Full Signal	6	9	N	19	75.3	Y	N	Parkboard	Candidate	Need to figure out bike lane routing and grade issues, also has to be a bumpout		
21	NB/EB	Hennepin Ave	36th St	Farside																
		Hennepin Ave	36th St	Nearside																
		Hennepin Ave	36th St	Midblock																
		Hennepin Ave	36th St	Farside																
	SB/WB	Hennepin Ave	36th St	Nearside																
		Hennepin Ave	36th St	Midblock																
		Hennepin Ave	36th St	Farside																
		Hennepin Ave	36th St	Nearside																
	22	NB/EB	Hennepin Ave	33rd St	Farside															
			Hennepin Ave	33rd St	Nearside															
		SB/WB	Hennepin Ave	33rd St	Midblock															
			Hennepin Ave	33rd St	Farside															
	23	NB/EB	Hennepin Ave	Uptown Transit Station	Farside															
			Hennepin Ave	Uptown Transit Station	Nearside															
		SB/WB	Hennepin Ave	Uptown Transit Station	Midblock															
			Hennepin Ave	Uptown Transit Station	Farside															
	24	NB/EB	Hennepin Ave	25th St	Farside															
			Hennepin Ave	25th St	Nearside															
		SB/WB	Hennepin Ave	25th St	Midblock															
			Hennepin Ave	25th St	Farside															
	25	NB/EB	Hennepin Ave	Franklin Ave	Farside															
			Hennepin Ave	Franklin Ave	Nearside															
		SB/WB	Hennepin Ave	Franklin Ave	Midblock															
			Hennepin Ave	Franklin Ave	Farside															
26	EB	Hennepin Ave	Groveland Ave	Transit Center	N	N	Y	Signalized	5.96	25.81	N	13.84	147.26	N	Y	Commercial	Suitable	Lengths pulled from near map. Unclear on ROW impacts due to new construction, but does not appear to be any. Currently calling ROW the edge of existing sidewalk		
		Hennepin Ave	Groveland Ave	Transit Center	Y	N	Y	Signalized	6.8	25.04	N	15.18	90.93	N	Y	Commercial	Suitable	Lengths pulled from near map. Unclear on ROW impacts due to new construction, but does not appear to be any. Currently calling ROW the edge of existing sidewalk		
	WB	Hennepin Ave	Groveland Ave	Transit Center	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
		Hennepin Ave	Groveland Ave	Transit Center	N	N	N	Signalized	6.27	18.04	N	18.04	213.5	N	Y	Commercial	Suitable	Lengths pulled from near map. Unclear on ROW impacts due to new construction, but does not appear to be any. Currently calling ROW the edge of existing sidewalk		
27	EB	Hennepin Ave	MCTC	Farside	N	N	Y	Signalized	13.9	4.8	Potentially	13.9	697	Y	Y	Commercial	Suitable	Remove on street parking to make bump out		
		Hennepin Ave	MCTC	Nearside	Y	Y	Y	Signalized	8.6		Potentially	13.9	697	Y	Y	Commercial	Suitable	Existing bus stop an infrastructure already past ROW		
	WB	Hennepin Ave	MCTC	Midblock	Y	N	Y	N/A	10.7	Y	Potentially	22.4	697	Y	Y	Commercial	Suitable	Bike lane and number of thru lanes makes a bump out difficult		
		Hennepin Ave	MCTC	Farside	N	N	Y	Signalized	13.5		Potentially	13.5	159.3	N	Y	Commercial	Suitable	Bike lane and number of thru lanes makes a bump out difficult		
28	EB	Hennepin Ave	10th St/11th St	Farside																
		Hennepin Ave	10th St/11th St	Nearside																
	WB	Hennepin Ave	10th St/11th St	Midblock																
		Hennepin Ave	10th St/11th St	Farside																
29	EB	Hennepin Ave	8th St	Farside																
		Hennepin Ave	8th St	Nearside																
	WB	Hennepin Ave	8th St	Midblock																
		Hennepin Ave	8th St	Farside																
30	EB	Hennepin Ave	5th St	Farside																
		Hennepin Ave	5th St	Nearside																
	WB	Hennepin Ave	5th St	Midblock																
		Hennepin Ave	5th St	Farside																
31	EB	Hennepin Ave	4th St/3rd St	Farside																
		Hennepin Ave	4th St/3rd St	Nearside																
	WB	Hennepin Ave	4th St/3rd St	Midblock																
		Hennepin Ave	4th St/3rd St	Farside																
32	EB	Hennepin Ave	2nd St	Farside	N	N	Y	Full Signal	16.9	16.9	N	22.1	325.5	Y	Y	Residential/Apartments	Suitable	Need to figure out bike lane but looks suitable		
		Hennepin Ave	2nd St	Nearside	Y	N	Y	Full Signal	9.5	16.7	N	23.1	276.9	Y	Y	Commercial	Suitable	Need to figure out bike lane but looks suitable		
	WB	Hennepin Ave	2nd St	Midblock																
		Hennepin Ave	2nd St	Farside	N	N	Y	Full Signal	16.7	9.5	Potentially	20.3	319.4	Y	Maybe	Residential/Apartments	Candidate			
33	EB	University Ave	Central Ave SE	Farside	N	N	Y	Full Signal	10.2	19.2	N	19.2	131.3	N	Y	Commercial	Suitable	Existing bike lane		
		University Ave	Central Ave SE	Nearside	Y	Y	N	Full Signal	10.9	20.6	N	20.6	211.5	Y	Y	Neither	Suitable	Adjacent property is a park: existing bus shelter is partially outside of ROW; there is room to widen SW if ROW is acquired from park		
	WB	University Ave	Central Ave SE	Midblock	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
		University Ave	Central Ave SE	Farside	N	Y		Full Signal	10.4	10.4	N	19.8	102.7	Y	N	Commercial	Suitable			
34	EB	University Ave	6th Ave	Farside	N	N	Y	Full Signal	6.5	20.7	N	20.7	78.5	Y	Y	Residential/Apartments	Suitable	Not quite a full 80' area but overall suitable		
		University Ave	6th Ave	Nearside	Y	N	Y	Full Signal	15.9	20.6	N	18	74.6	Y	Maybe	Commercial	Candidate	Alma uses sidewalk space to seat customers so could reduce the width available.		
	WB	University Ave	6th Ave	Midblock																
		University Ave	6th Ave	Farside	N	N	Y	Full Signal	5.1	16.9	N	22	70.2	Y	Y	Residential/Apartments	Suitable	Not quite a full 80' area but overall suitable		
EB	University Ave	10th Ave	Farside	N	N	Y	Full Signal	10.1	15.8	N	15.8	68	Y	Y	Residential	Candidate	Apartment building stairs may need to be reconfigured to make room for platform; also driveway is close to intersection			
	University Ave	10th Ave	Nearside	N	N	Y	Full Signal	16.4	16.4	N	16.4	184.1	Y	Y	Residential/Apartments	Suitable				



E Line

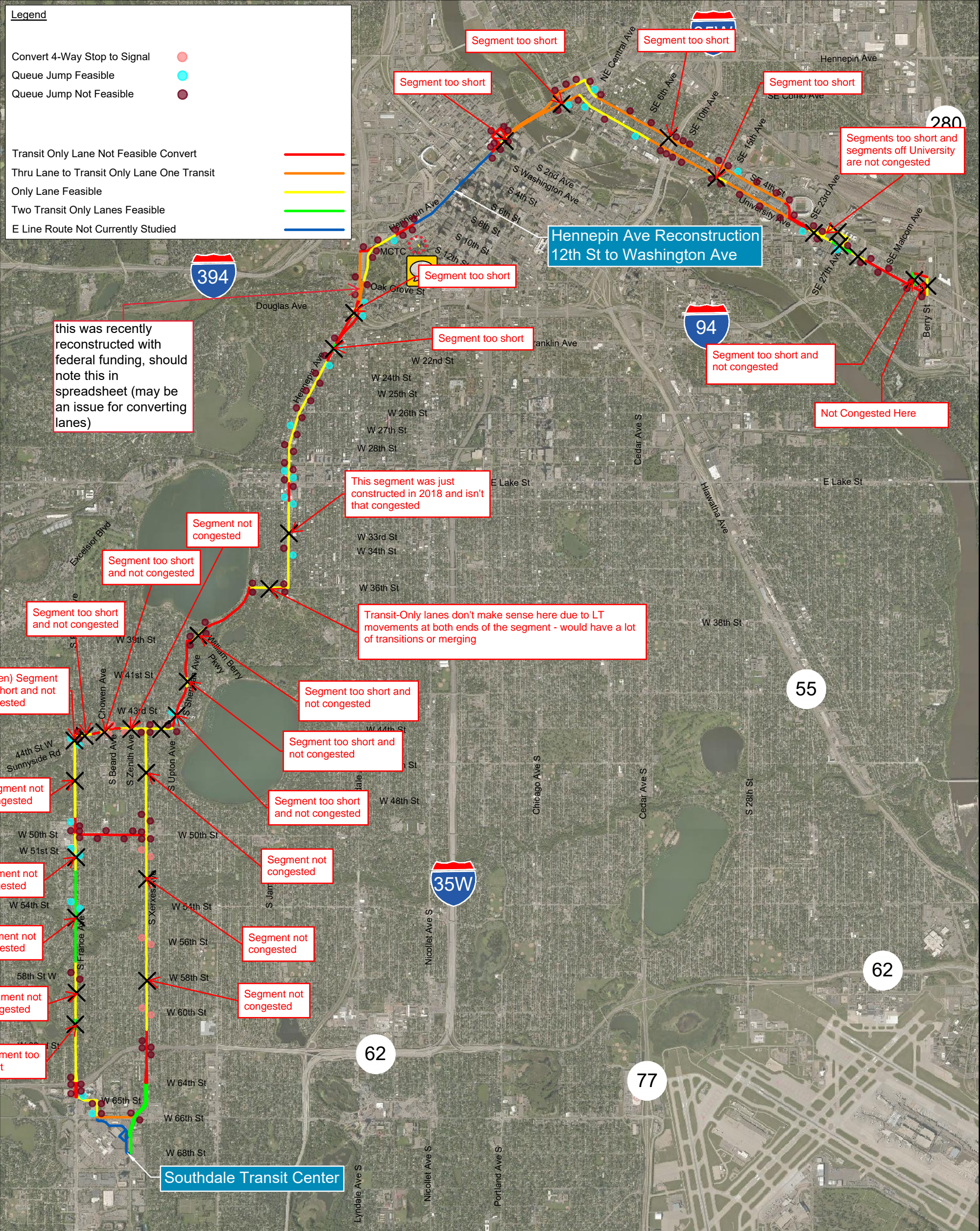
E Line Corridor Study

Appendix B

October 2019

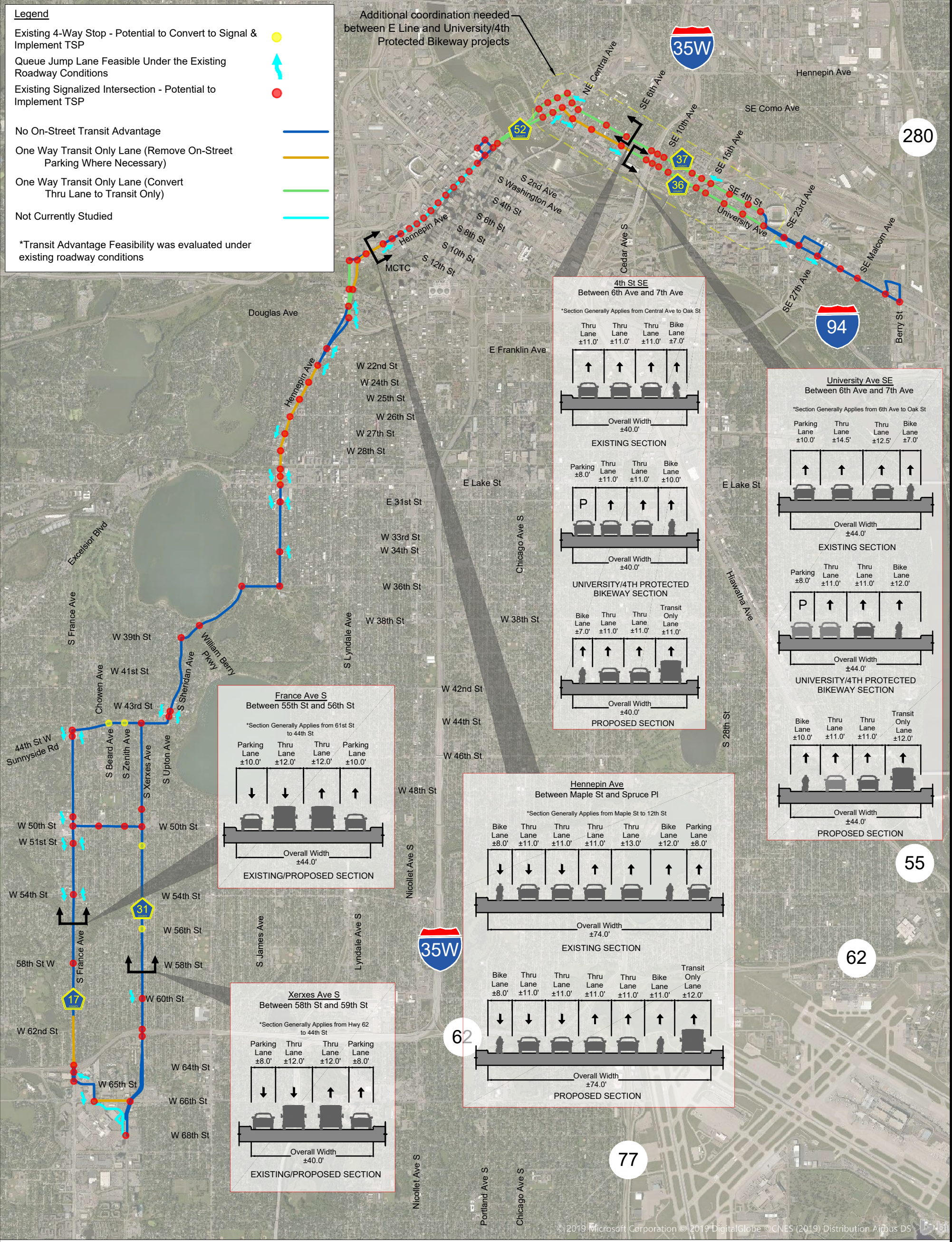
To stay in touch with project updates, you can sign up for the E Line newsletter at the project website at metrotransit.org/e-line-project

Figure 1: Transit Advantage Refinement



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Figure 2: Transit Advantage Recommendations



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Table 1: Physical Constraint Analysis

Alternative	Mainline Corridor Street	Cross Street	Intersection Type	Distance Between Intersections	FOC to FOC Dimensions (Between Blocks)	FOC to FOC Dimensions (Near side of Int moving S to N)	FOC to FOC Dimensions (Far Side of Int moving S to N)	Transit Only Lanes - Both Directions?	Transit Only Lane - One Way?	Queue Jump NB/EB?	Shoulder + Closest Lane Dimension (NB Xerxes/France EB University)	Queue Jump SB/WB?	Shoulder + Closest Lane Dimension (SB Xerxes/France WB 4th)	TSP?	Additional Notes
4 & 5	SB Drew Ave S	W 66th St	Signalized			32.3	46.3			N		N	15.1	Y	Entering the mall, this is only for the Southbound movement of buses
4 & 5	SB Drew Ave S	Between Blocks													Entering Southdale mall, no distance between blocks
4 & 5	York Ave S	W 66th St	Signalized			86.6	99.8			N	12.7	N		Y	The NB/EB queue jump lane is a left turn movement
4 & 5	W 66th St	Between Blocks		719	94.7			N	Convert Thru Lane						Reallocate one of the three thru lanes to accommodate transit lane
4 & 5	W 66th St	Barrie Rd	1-Way Stop			96.8	105.7			N		N		N	Reallocate one of the three thru lanes to accommodate transit lane
4 & 5	W 66th St	Between Blocks		670	94			N	Convert Thru Lane						Reallocate one of the three thru lanes to accommodate transit lane
4 & 5	W 66th St	Drew Ave S	Signalized			95.7	46.3			N	14.1	N		Y	
4 & 5	Drew Ave S	Between Blocks		660	40			N	Y						Restripe to create one transit only lane
4 & 5	Drew Ave S	W 65th St	4-Way Stop			40.8	43			N		N		Convert to Signal	
4 & 5	W 65th St	Between Blocks		805	40.9			N	Y						Restripe to create one transit only lane
4 & 5	W 65th St	France Ave	Signalized			45.7	95.2			N	13.2	N	13.8	Y	
4 & 5	France Ave	Between Blocks		345	102.4			N	N						Medians and freeway ramps do not allow for transit lanes to fit
4 & 5	France Ave	62 East	Signalized			75.9	81.4			N	13.1	N	14.3	Y	
4 & 5	France Ave	Between Blocks		259	77.2			N	N						Restriping and narrowing of the center median will allow for one transit only lane
4 & 5	France Ave	62 West	Signalized			77.2	74.9			N	12.3	N	15	Y	
4 & 5	France Ave	Between Blocks		1276	43.8			N	Y						Restripe and remove on street parking to create one transit lane
4 & 5	France Ave	W 62nd St	1-Way Stop			43.9	45.7			N		N		N	No Signal and left turn lane
4 & 5	France Ave	Between Blocks		596	45.1			N	Y						
4 & 5	France Ave	W 61st St/Halfax Ave	1-Way Stop			45.9	45.3			N		N		N	Left turn lane included
4 & 5	France Ave	Between Blocks		471	45			Y	Y						There are no left turn lanes in this range so with restriping you could theoretically fit in two transit only lanes
4 & 5	France Ave	W 60th St (West)	1-Way Stop			44.3	44			N		N		N	
4 & 5	France Ave	Between Blocks		233	44			N	Y						
4 & 5	France Ave	W 60th St (East)	1-Way Stop			44.8	44.2			N		N		N	Left turn lanes
4 & 5	France Ave	Between Blocks		1031	44-47			N	Y						
4 & 5	France Ave	Grimes Ln	1-Way Stop			45.4	45.6			N		N		N	No Left Turn lanes here (potential for transit only lanes North of W 60th St (east))
4 & 5	France Ave	Between Blocks		293	44.6			N	Y						
4 & 5	France Ave	W 58th St	Signalized			45.3	46.1			N	17.2	N	17	Y	Left turn lane for NB and SB - Signalized
4 & 5	France Ave	Between Blocks		552	44.8			N	Y						
4 & 5	France Ave	Wood end Dr	1-Way Stop			46.2	44.7			N		N		N	
4 & 5	France Ave	Between Blocks		115	45.5			Y	Y						No Left turn lanes, Two transit only lanes permitted
4 & 5	France Ave	W 57th St	1-Way Stop			46.2	44.7			N		N		N	
4 & 5	France Ave	Between Blocks		427	46.3			Y	Y						No Left turn lanes, Two transit only lanes permitted
4 & 5	France Ave	W 56th St	1-Way Stop			45	44.4			N		N		N	
4 & 5	France Ave	Between Blocks		885	44.9			Y	Y						No Left turn lanes, Two transit only lanes permitted
4 & 5	France Ave	W 55th St	1-Way Stop			44.2	44.8			N		N		N	
4 & 5	France Ave	Between Blocks		338	45.2			Y	Y						No Left turn lanes, Two transit only lanes permitted
4 & 5	France Ave	W Fuller St	1-Way Stop			45.7	44.3			N		N		N	
4 & 5	France Ave	Between Blocks		330	44.6			Y	Y						No Left turn lanes, Two transit only lanes permitted
4 & 5	France Ave	W 54th St	Signalized			44.5	46			Y	22.1	Y	23.7	Y	
4 & 5	France Ave	Between Blocks		657	44			Y	Y						No Left turn lanes, Two transit only lanes permitted
4 & 5	France Ave	W 53rd St	1-Way Stop			44.3	44.1			N		N		N	
4 & 5	France Ave	Between Blocks		561	44.2			Y	Y						No Left turn lanes, Two transit only lanes permitted
4 & 5	France Ave	W 52nd St	2-Way Stop			44.7	43.6			N		N		N	
4 & 5	France Ave	Between Blocks		666	42.6			N	Y						N left turn lane, can almost fit two transit lanes-potentially remeasure
4 & 5	France Ave	W 51st St	Signalized			42.6	43.8			Y	22.3	Y	22.6	Y	N left turn lane for NB at 50th, can almost fit two transit
4 & 5	France Ave	Between Blocks		659	43.3			N	Y						
4 & 5	France Ave	W 50th St	Signalized			41.6	39.6			N	19.2	N	11	Y	
4 & 5	France Ave	Between Blocks		354	40			N	N						4 lanes of traffic - no transit lanes permitted
5	France Ave	W 49.5 St /Market St	Signalized			41.8	40.6			N	10	Y	11.3	Y	SB RT lane to be used for queue jump
5	France Ave	Between Blocks		296	40.5			N	Y						No left turn lanes, one transit lane could fit
5	France Ave	W 49th St	2-Way Stop			38.9	39.8			N		N		N	
5	France Ave	Between Blocks		665	40.2			N	Y						No left turn lanes, one transit lane could fit
5	France Ave	W 48th St	2-Way Stop			40.1	40.4			N		N		N	
5	France Ave	Between Blocks		642	42			N	Y						No left turn lanes, one transit lane could fit
5	France Ave	W 47th St	2-Way Stop			39.9	39.8			N		N		N	
5	France Ave	Between Blocks		665	39.3			N	Y						No left turn lanes, one transit lane could fit
5	France Ave	W 46th St	1-Way Stop			39.2	41.3			N		N		N	
5	France Ave	Between Blocks		655	40.7			N	Y						No left turn lanes, one transit lane could fit
5	France Ave	W 45th St	1-Way Stop			39.7	43.9			N		N		N	
5	France Ave	Between Blocks		163	44.7			Y	Y						No left turn lanes, one transit lane could fit (Distance between intersections here is small, a transit lane may be cramped)
5	France Ave	Sunny Side Ave	Signalized			46.9	45.4			Y	24.3	Y	23.3	Y	No left turn lanes, one transit lane could fit (Distance between intersections here is small, a transit lane may be cramped)
5	France Ave	Between Blocks		223	46.9			Y	Y						No left turn lanes, one transit lane could fit (Distance between intersections here is small, a transit lane may be cramped)
5	France Ave	W 44th St	Signalized			46.7	38.4			N	23.2	N	19.2	Y	No queue jumps due to turn in route
5	W 44th St	Between Blocks		253	38.2			N	Y						
5	W 44th St	Sunny Side Ave	1-Way Stop			38.2	37.7			N		N		N	
5	W 44th St	Between Blocks		419	37.1			N	Y						Remove on street parking to create one transit lane
5	W 44th St	S Drew Ave	2-Way Stop			39	30.5			N		N		N	
5	W 44th St	Between Blocks		262	30.8			N	N						No transit lanes can fit (requires 33' of roadway)
5	W 44th St	S Chowen Ave (South)	1-Way Stop			30.5	33.3			N		N		N	
5	W 44th St	Between Blocks		80.7	33			N	Y						Shared roadway with bikes, no Turn lanes. Transit lanes can fit
5	W 44th St	S Chowen Ave (North)	1-Way Stop			33	38.8			N		N		N	
5	W 44th St	Between Blocks		334	39			N	Y						Take out on street parking, one transit lane would fit
5	W 44th St	S Beard Ave	4-Way Stop			39.2	26.5			N		N		Convert to Signal	
5	W 44th St	Between Blocks		343	38.3			N	N						Intersection at S Beard Ave too narrow to accommodate a transit lane
5	W 44th St	S Abbott Ave	2-Way Stop			38.3	38.8			N		N		N	
5	W 44th St	Between Blocks		327	38.3			N	Y						Remove on street parking to create one transit lane
5	W 44th St	S Zenith Ave	4-Way Stop			38.3	34.1			N		N		Convert to Signal	
5	W 44th St	Between Blocks		329	36.1			N	Y						Remove on street parking to create one transit lane
5	W 44th St	S York Ave	2-Way Stop			35.7	34.4			N		N		N	
5	W 44th St	Between Blocks		326	34.2			N	Y						Remove on street parking to create one transit lane
5	W 44th St	S Xerxes Ave	Signalized			34.5	34.9			N	20.6	N	13.4	Y	
Known	W 44th St	Between Blocks		337	34.9			N	Y						Remove on street parking to create one transit lane
Known	W 44th St	S Washburn Ave	1-Way Stop			34.9	34.3			N		N		N	
Known	W 44th St	Between Blocks		319	34.3			N	Y						Remove on street parking to create one transit lane
Known	W 44th St	S Vincent Ave	1-Way Stop			33.4	34.7			N		N		N	
Known	W 44th St	Between Blocks		329	34.8			N	Y						Remove on street parking to create one transit lane
Known	W 44th St	S Uptown Ave	4-Way Stop			34.8	46.8			N		N		Convert to Signal	
Known	W 44th St	Between Blocks		474	46.8			N	N						Between W 44th and 43rd avenue there is a small stretch of median that will not allow a transit lane to fit

Table 1: Physical Constraint Analysis

Alternative	Mainline Corridor Street	Cross Street	Intersection Type	Distance Between Intersections	FOC to FOC Dimensions (Between Blocks)	FOC to FOC Dimensions (Near Side of Int moving S to N)	FOC to FOC Dimensions (Far Side of Int moving S to N)	Transit Only Lanes - Both Directions?	Transit Only Lane - One Way?	Queue Jump NB/EB?	Shoulder + Closest Lane Dimension (NB Xerxes/France EB University)	Queue Jump SB/WB?	Shoulder + Closest Lane Dimension (SB Xerxes/France WB 4th)	TSP?	Additional Notes
Known	S Upton Ave	W 43rd St	Signalized	143	54.7	47.7	55.6	Maybe	Maybe	Y	23.5	Y	23.5	Y	Bike lane, through lane, and shoulder for the NB portion. SB has a landscaped median that might make a queue jump lane difficult
Known	S Upton Ave	Between Blocks													narrow median to accommodate transit and bike lanes
Known	S Sheridan Ave	S Uptown Ave	1-Way Stop	742	32.2	54.7	41	N	N	N		N	N	N	
Known	S Sheridan Ave	Between Blocks													
Known	S Sheridan Ave	W 42nd Ave (west)	1-Way Stop	312	32	31	32.3	N	N	N		N		N	road too narrow to accommodate transit lane
Known	S Sheridan Ave	Between Blocks													
Known	S Sheridan Ave	W 42nd Ave (east)	1-Way Stop	391	33.1	31.6	32.2	N	Y	N		N		N	road could fit one transit lane, remove on street parking
Known	S Sheridan Ave	Between Blocks													
Known	S Sheridan Ave	W 41st Ave	1-Way Stop	647	31.4	33	31.4	N	N	N		N		N	road too narrow to accommodate transit lane
Known	S Sheridan Ave	Between Blocks													
Known	S Sheridan Ave	W 40th Ave	2-Way Stop	668	29.6	36.9	33.4	N	N	N		N		N	road too narrow to accommodate transit lane
Known	S Sheridan Ave	Between Blocks													
Known	S Sheridan Ave	W 39th St	Signalized	215	31	29.6	30.2	N	N	N		N		Y	road too narrow to accommodate transit lane
Known	S Sheridan Ave	Between Blocks													
Known	W 39th St	Richfield Rd	Merge	673	33.1	31.3	30.4	N	Y	N		N		N	road too narrow to accommodate transit lane
Known	W 39th St	Between Blocks													
Known	Richfield Rd	William Berry Pkwy	Signalized	2302	31.9	33.1	41.7	N	N	N	15.9	N	11.2	Y	Queue jump lanes will not fit, shoulder and adjacent lane too small
Known	Richfield Rd	Between Blocks													
Known	Richfield Rd	W 36th St	Signalized	286	50.9	38.6	51.2	N	Y	N	22.2	N	24.7	Y	No queue jump lanes due to turn in route
Known	Richfield Rd	Between Blocks													Must also accommodate two bike lanes, one transit lane could fit
Known	W 36th St	S James Ave	1-Way Stop	181	50.6	50.9	50.6	N	Y	N		N		N	Must also accommodate two bike lanes, one transit lane could fit
Known	W 36th St	Between Blocks													
Known	W 36th St	S Irving Ave	1-Way Stop	323	48.5	50.6	49.8	N	Y	N		N		N	Must also accommodate two bike lanes, one transit lane could fit
Known	W 36th St	Between Blocks													
Known	W 36th St	S Humboldt Ave	1-Way Stop	340	47.1	48.5	48.2	N	Y	N		N		N	Must also accommodate two bike lanes, one transit lane could fit
Known	W 36th St	Between Blocks													
Known	W 36th St	S Holmes Ave	1-Way Stop	320	47	47.1	48.2	N	Y	N		N		N	Must also accommodate two bike lanes, one transit lane could fit
Known	W 36th St	Between Blocks													
4	France Ave S	W 50th St	Signalized	332	42.1	41.6	43	N	N	N	19.2	N	10.6	Y	SB queue lane would be a Left turn movement, both Queue jump lanes do not fit
4	France Ave S	Between Blocks													Left turn lane, and two through lanes, transit lane will not fit
4	W 50th St	S Ewing Ave	2-Way Stop	330	41.5	42.1	43.1	N	N	N		N		N	Left turn lane, and two through lanes, transit lane will not fit
4	W 50th St	Between Blocks													
4	W 50th St	S Drew Ave	2-Way Stop	326	42.8	41.5	44.1	N	N	N		N		N	Left turn lane, and two through lanes, transit lane will not fit
4	W 50th St	Between Blocks													
4	W 50th St	S Chowne Ave	Signalized	334	42.5	43.3	42.9	N	N	N	15.9	N	15.8	Y	Left turn lane, and two through lanes, Queue jump lane will not fit
4	W 50th St	Between Blocks													Left turn lane, and two through lanes, transit lane will not fit
4	W 50th St	S Beard Ave	2-Way Stop	328	41.3	41.7	43	N	N	N		N		N	Left turn lane, and two through lanes, transit lane will not fit
4	W 50th St	Between Blocks													
4	W 50th St	S Abbott Ave	2-Way Stop	333	39.5	42.3	41.2	N	N	N		N		N	Left turn lane, and two through lanes, transit lane will not fit
4	W 50th St	Between Blocks													
4	W 50th St	S Zenith Ave	Signalized	332	42.5	39.5	39.8	N	N	N	13.5	N	13.9	Y	Left turn lane, and two through lanes, Queue jump lane will not fit
4	W 50th St	Between Blocks													Left turn lane, and two through lanes, transit lane will not fit
4	W 50th St	S York Ave	2-Way Stop	329	41.5	43	43.6	N	N	N		N		N	Left turn lane, and two through lanes, transit lane will not fit
4	W 50th St	Between Blocks													
4	W 50th St	S Xerxes Ave	Signalized	329	41.5	44.6	40.3	N	N	N	16.2	N	19.3	Y	Queue jump lanes will not fit.
6	S Xerxes Ave	Southdale Center	Signalized	1345	88.6	48.1	88.8	N	N	N	12.8	N	13.2	Y	Restripe and narrow center median to accommodate two transit lanes
6	S Xerxes Ave	Between Blocks													
6	S Xerxes Ave	W 66th St	Signalized	817	91.4	86.6	82.1	Maybe	Maybe	N	12	N	19.6	Y	narrow median and two transit lanes could fit
6	S Xerxes Ave	Between Blocks													
6	S Xerxes Ave	W 65th St	1-Way Stop	657	104.8	104.8	107.6	Y	Y	N		N		N	Remove on street parking and two transit lanes can fit
6	S Xerxes Ave	Between Blocks													
6	S Xerxes Ave	64th St S	2-Way Stop	853	51.1	104.1	97.3	N	N	N		N		N	4 thru lanes in this stretch
6	S Xerxes Ave	Between Blocks													
6	S Xerxes Ave	Heritage Dr	1-Way Stop	331	50.5	52.1	49.2	N	N	N		N		N	4 thru lanes in this stretch
6	S Xerxes Ave	Between Blocks													
6	S Xerxes Ave	E 62	Signalized	273	46.6	50.3	45.7	N	N	N	12.9	N	11.4	Y	
6	S Xerxes Ave	Between Blocks													
6	S Xerxes Ave	W 62	Signalized	524	39.9	46.6	40.2	N	N	N	12.9	N	11.8	Y	
6	S Xerxes Ave	Between Blocks													
6	S Xerxes Ave	W 61st St	1-Way Stop	639	40.8	39.6	38.6	N	Y	N		N		N	Remove on street parking and one transit lane can fit
6	S Xerxes Ave	Between Blocks													
6	S Xerxes Ave	W 60th St	Signalized	671	40.8	40.4	41.1	N	Y	N	19.8	Y	21.3	Y	Remove on street parking and one transit lane can fit
6	S Xerxes Ave	Between Blocks													
6	S Xerxes Ave	W 59th St	2-Way Stop	661	41	39	39.3	N	Y	N		N		N	Remove on street parking and one transit lane can fit
6	S Xerxes Ave	Between Blocks													
6	S Xerxes Ave	W 58th St	2-Way Stop	652	41.1	41.7	41	N	Y	N		N		N	Remove on street parking and one transit lane can fit
6	S Xerxes Ave	Between Blocks													
6	S Xerxes Ave	W 57th St	1-Way Stop	663	40	40.1	38.9	N	Y	N		N		N	Remove on street parking and one transit lane can fit
6	S Xerxes Ave	Between Blocks													
6	S Xerxes Ave	W 56th St	4-Way Stop	662	40.5	40.8	39.7	N	Y	N		N		Convert to Signal	Remove on street parking and one transit lane can fit
6	S Xerxes Ave	Between Blocks													
6	S Xerxes Ave	W 55th St	2-Way Stop	647	39.9	39.7	38.8	N	Y	N		N		N	Remove on street parking and one transit lane can fit
6	S Xerxes Ave	Between Blocks													
6	S Xerxes Ave	W 54th St	2-Way Stop	662	37.7	40.9	39.1	N	Y	N		N		N	Remove on street parking and one transit lane can fit
6	S Xerxes Ave	Between Blocks													
6	S Xerxes Ave	W 53rd St	2-Way Stop	662	38.4	38.7	41.2	N	Y	N		N		N	Remove on street parking and one transit lane can fit
6	S Xerxes Ave	Between Blocks													
6	S Xerxes Ave	W 52nd St	2-Way Stop	659	38.7	38.4	37.7	N	Y	N		N		N	Remove on street parking and one transit lane can fit
6	S Xerxes Ave	Between Blocks													
6	S Xerxes Ave	W 51st St	4-Way Stop	659	39.2	40.4	39.5	N	Y	N		N		Convert to Signal	Remove on street parking and one transit lane can fit
6	S Xerxes Ave	Between Blocks													
4 & 6	S Xerxes Ave	W 50th St	Signalized	658	39.7	39	40.3	N	Y	N	19.4	N	19.3	Y	Not wide enough for queue jump lanes
4 & 6	S Xerxes Ave	Between Blocks													Remove on street parking and one transit lane can fit

Table 1: Physical Constraint Analysis

Alternative	Mainline Corridor Street	Cross Street	Intersection Type	Distance Between Intersections	FOC to FOC Dimensions (Between Blocks)	FOC to FOC Dimensions (Near side of Int moving S to N)	FOC to FOC Dimensions (Far Side of Int moving S to N)	Transit Only Lanes - Both Directions?	Transit Only Lane - One Way?	Queue Jump NB/EB?	Shoulder + Closest Lane Dimension (NB Xerxes/France EB University)	Queue Jump SB/WB?	Shoulder + Closest Lane Dimension (SB Xerxes/France WB 4th)	TSP?	Additional Notes
4 & 6	S Xerxes Ave	W 49th St	Signalized	666	39.4	40	38.5	N	Y	N	20.5	N	19.5	Y	Not wide enough for queue jump lanes
4 & 6	S Xerxes Ave	Between Blocks						N	Y	N		N		N	Remove on street parking and one transit lane can fit
4 & 6	S Xerxes Ave	W 48th St	2-Way Stop	667	39.7	39.2	37.7	N	Y	N		N		N	Remove on street parking and one transit lane can fit
4 & 6	S Xerxes Ave	Between Blocks						N	Y	N		N		N	Remove on street parking and one transit lane can fit
4 & 6	S Xerxes Ave	W 47th St	2-Way Stop	655	38.6	39.6	37.1	N	Y	N		N		N	Remove on street parking and one transit lane can fit
4 & 6	S Xerxes Ave	Between Blocks						N	Y	N		N		N	Remove on street parking and one transit lane can fit
4 & 6	S Xerxes Ave	W 46th St	2-Way Stop	659	38.3	39.4	38.7	N	Y	N		N		N	Remove on street parking and one transit lane can fit
4 & 6	S Xerxes Ave	Between Blocks						N	Y	N		N		N	Remove on street parking and one transit lane can fit
4 & 6	S Xerxes Ave	W 45th St	2-Way Stop	669	39.1	40	34.9	N	Y	N		N		N	Remove on street parking and one transit lane can fit
4 & 6	S Xerxes Ave	Between Blocks						N	Y	N		N		N	not wide enough for queue jump lanes
4 & 6	S Xerxes Ave	W 44th St	Signalized					N	Y	N	19.2	N	13.4	Y	not wide enough for queue jump lanes
Known	W 36th St	Hennepin Ave	Signalized	667	33.5	47	42.7	N	Y	N	25.9	N	22.4	Y	Must accommodate two bike lanes, queue lanes not feasible due to turn in route
Known	Hennepin Ave E	Between Blocks						N	Y	N		N		N	new aerial obtained from near map. Remove on street parking to create transit lane
Known	Hennepin Ave E	W 35th St	2-Way Stop	658	39.87	33	33.3	N	Y	N		N		N	new aerial obtained from near map. Remove on street parking to create transit lane
Known	Hennepin Ave E	Between Blocks						N	Y	N		N		N	new aerial obtained from near map. Remove on street parking to create transit lane
Known	Hennepin Ave E	W 34th St	Signalized	582	39.2	33	34.1	N	Y	Y	21.1	N	21	Y	Remove on street parking to fit queue lanes
Known	Hennepin Ave E	Between Blocks						N	Y	N		N		N	new aerial obtained from near map. Remove on street parking to create transit lane
Known	Hennepin Ave E	W 33rd St	2-Way Stop	657	40.3	34.2	33.7	N	Y	N		N		N	new aerial obtained from near map. Remove on street parking to create transit lane
Known	Hennepin Ave E	Between Blocks						N	Y	N		N		N	new aerial obtained from near map. Remove on street parking to create transit lane
Known	Hennepin Ave E	W 32nd St	2-Way Stop	680	39.4	33.1	34.6	N	Y	N		N		N	new aerial obtained from near map. Remove on street parking to create transit lane
Known	Hennepin Ave E	Between Blocks						N	Y	N		N		N	new aerial obtained from near map. Remove on street parking to create transit lane
Known	Hennepin Ave E	W 31st St	Signalized	648	32.7	40.5	37.5	N	N	Y	25.3	Y	21.1	Y	Remove on street parking to fit queue lanes
Known	Hennepin Ave E	Between Blocks						N	N	N		N		N	new aerial obtained from near map. Transit lane will not fit with reconstruction
Known	Hennepin Ave E	W Lake St	Signalized	327	59.7	43.1	60.3	N	Y	N	12.3	N	19.9	Y	remove on street parking to fit transit lane
Known	Hennepin Ave E	Between Blocks						N	Y	N		N		N	remove on street parking to fit transit lane
Known	Hennepin Ave E	Lagoon Ave	Signalized	283	59.4	59.4	58.7	N	Y	Y	21.6	Y	10.9	Y	Right turn lane to be used for queue jump for southbound
Known	Hennepin Ave E	Between Blocks						N	Y	N		N		N	remove on street parking to fit transit lane
Known	Hennepin Ave E	W 29th St	Signalized	700	60.3	59.9	71.4	N	Y	N	19.1	N	19.9	Y	remove on street parking to fit transit lane
Known	Hennepin Ave E	Between Blocks						N	Y	N		N		N	remove on street parking to fit transit lane
Known	Hennepin Ave E	W 28th St	Signalized	681	59.3	59.5	58.9	N	Y	N	20.1	N	17.5	Y	remove on street parking to fit transit lane
Known	Hennepin Ave E	Between Blocks						N	Y	N		N		N	remove on street parking to fit transit lane
Known	Hennepin Ave E	W 27th St	Signalized	349	59.2	60.7	60.7	N	Y	N	19.3	Y	21.1	Y	remove on street parking to fit transit lane
Known	Hennepin Ave E	Between Blocks						N	Y	N		N		N	remove on street parking to fit transit lane
Known	Hennepin Ave E	S Grand Ave	1-Way Stop	338	57.5	59.2	58.2	N	Y	N		N		N	remove on street parking to fit transit lane
Known	Hennepin Ave E	Between Blocks						N	Y	N		N		N	remove on street parking to fit transit lane
Known	Hennepin Ave E	W 26th St	Signalized	743	59.8	59	60.1	N	Y	N	20.1	N	21	Y	remove on street parking to fit transit lane
Known	Hennepin Ave E	Between Blocks						N	Y	N		N		N	remove on street parking to fit transit lane
Known	Hennepin Ave E	W 25th St	Signalized	368	59.4	59.6	59.5	N	Y	N	19.4	N	20	Y	remove on street parking to fit transit lane
Known	Hennepin Ave E	Between Blocks						N	Y	N		N		N	remove on street parking to fit transit lane
Known	Hennepin Ave E	S Fremont Ave	1-Way Stop	102	57.5	59	57.5	N	Y	N		N		N	remove on street parking to fit transit lane
Known	Hennepin Ave E	Between Blocks						N	Y	N		N		N	remove on street parking to fit transit lane
Known	Hennepin Ave E	S Emerson Ave	1-Way Stop	271	57.1	57.5	57.1	N	Y	N		N		N	remove on street parking to fit transit lane
Known	Hennepin Ave E	Between Blocks						N	Y	N		N		N	remove on street parking to fit transit lane
Known	Hennepin Ave E	W 24th St	Signalized	412	60.1	57.6	58.4	N	Y	N	18.9	N	19.7	Y	remove on street parking to fit transit lane
Known	Hennepin Ave E	Between Blocks						N	Y	N		N		N	remove on street parking to fit transit lane
Known	Hennepin Ave E	S Dupont Ave	1-Way Stop	331	57.6	58.1	58	N	Y	N		N		N	remove on street parking to fit transit lane
Known	Hennepin Ave E	Between Blocks						N	Y	N		N		N	remove on street parking to fit transit lane
Known	Hennepin Ave E	W 22nd St	Signalized	408	62.1	61.5	58.5	N	N	Y	25	N	19	Y	Remove on street parking for NB/EB queue jump lane
Known	Hennepin Ave E	Between Blocks						N	N	N		N		N	remove on street parking to fit transit lane
Known	Hennepin Ave E	S Colfax Ave	1-Way Stop	333	66.3	61.4	65.8	Y	Y	N		N		N	remove on street parking to fit transit lanes
Known	Hennepin Ave E	Between Blocks						Y	Y	N		N		N	remove on street parking to fit transit lanes
Known	Hennepin Ave E	W Franklin Ave	Signalized	1446	23.7	78.9	75.8	N	N	Y	21.5	N	11.5	Y	Transit lanes will not fit along this stretch
Known	NB Hennepin Ave E	Between Blocks						N	N	N		N		N	Transit lanes will not fit along this stretch
Known	NB Hennepin Ave E	Lyndale Ave S	Signalized	454	41.3	40.5	41.3	N	Convert Thru Lane	Maybe	14.9	N		Y	Convert thru lane to Queue jump
Known	NB Hennepin Ave E	Between Blocks						N	Convert Thru Lane	Y		N		Y	change thru lane to transit only lane
Known	NB Hennepin Ave E	Groveland Ave	Signalized	668	36	52.7	39.6	N	Convert Thru Lane	Y	15	N		Y	Not wide enough for Queue jump lane, Right turn lane can be used
Known	NB Hennepin Ave E	Between Blocks						N	Convert Thru Lane	N		N		Y	change thru lane to transit only lane
Known	NB Hennepin Ave E	W 15th St	Signalized	309	38.2	36	37	N	Y	N	11.2	N		Y	Must accommodate two thru lanes and a bike lane (current)
Known	NB Hennepin Ave E	Between Blocks						N	Y	N		N		N	Must accommodate two thru lanes and a bike lane (current)
Known	NB Hennepin Ave E	Harmon Pl	1-Way Stop	809	38.8	38.2	38.8	N	Y	N		N		N	Right turn, no queue jump lane
Known	NB Hennepin Ave E	Dunwoody Blvd	Signalized	433	67.1	39.5	67	N	Y	N	11.9	N		Y	Must accommodate a total of 4 thru lanes and one bike lane. With restriping, one transit lane could fit
Known	Hennepin Ave E	Between Blocks						N	Y	N		N		N	Must accommodate a total of 4 thru lanes and one bike lane. With restriping, one transit lane could fit
Known	Hennepin Ave E	Maple St	Signalized	764	72	62.6	62	N	Y	N	19.1	N	19.3	Y	Must accommodate a total of 4 thru lanes and two bike lanes. Remove on street parking to add transit lane
Known	Hennepin Ave E	Between Blocks						N	Y	N		N		N	Must accommodate a total of 4 thru lanes and two bike lanes. Remove on street parking to add transit lane
Known	Hennepin Ave E	Spruce Pl	Signalized	395	59.7	71.6	59.6	N	N	Y	15.4	N	18	Y	Remove on street parking for NB/EB queue jump lane
Known	Hennepin Ave E	Between Blocks						N	N	N		N		N	Must accommodate a total of 4 thru lanes and 2 bike lanes. Transit lane will not fit
Known	Hennepin Ave E	S 13th St	Signalized	391	60.4	60	60.1	N	N	N	18.2	N	16.7	Y	Must accommodate a total of 4 thru lanes and 2 bike lanes. Transit lane will not fit
Known	Hennepin Ave E	Between Blocks						N	N	N		N		N	Must accommodate a total of 4 thru lanes and 2 bike lanes. Transit lane will not fit
Known	Hennepin Ave E	S 12th St	Signalized			58.1	60.2	N	N	N	20.1	N	12.8	Y	Must accommodate a total of 4 thru lanes and 2 bike lanes. Transit lane will not fit
Known	SB Hennepin Ave E/Lyndale	Dunwoody Blvd	Signalized			35.6	47.7	N	N	N		N	10.8	Y	Not wide enough for transit lane
Known	SB Hennepin Ave E/Lyndale	Between Blocks				283	43.6	N	N	N		N		Y	Not wide enough for transit lane
Known	SB Hennepin Ave E/Lyndale	Hennepin Ave E	Signalized	1009	40	43.6	42	N	Convert Thru Lane	N		N	NA	Y	No Queue jump for the SB/WB because it's a left turn
Known	SB Hennepin Ave E/Lyndale	Between Blocks						N	Convert Thru Lane	N		N		Y	transit lane may not be feasible, lyndale and hennepin share this stretch
Known	SB Hennepin Ave E/Lyndale	Vineland Pl	Signalized	652	46.7	54.9	49.1	N	Convert Thru Lane	N		N	14.5	Y	Convert thru lane
Known	SB Hennepin Ave E/Lyndale	Between Blocks						N	Convert Thru Lane	N		N		Y	transit lane may not be feasible, lyndale and hennepin share this stretch
Known	SB Hennepin Ave E/Lyndale	Groveland Terrace	Signalized	273	32.6	68.8	32.6	N	N	N		N	11.2	Y	transit lane may not be feasible, lyndale and hennepin share this stretch
Known	SB Hennepin Ave E/Lyndale	Between Blocks						N	N	N		N		N	not wide enough for transit lane
Known	SB Hennepin Ave E/Lyndale	Douglas Ave	1-Way Stop	390	33.8	31.8	33.7	N	Y	N		N		N	Remove on street parking to make transit lane
Known	SB Hennepin Ave E/Lyndale	Between Blocks						N	Y	N		N		N	Remove on street parking to make transit lane
Known	SB Hennepin Ave E/Lyndale	Summit Ave	1-Way Stop	273	32.6	31.8	33.7	N	N	N		N		N	not wide enough for transit lane
Known	SB Hennepin Ave E/Lyndale	Between Blocks						N	N	N		N		N	not wide enough for transit lane
Known	SB Hennepin Ave E/Lyndale	Linc oh Ave	1-Way Stop	273	32.6	31.8	33.7	N	N	N		N		N	not wide enough for transit lane
Known	SB Hennepin Ave E/Lyndale	Between Blocks						N	N	N		N		N	not wide enough for transit lane

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Known	Hennepin Ave E	Washington Ave	Signalized			58.5	77.5			N	9.5	N	18	Y	
Known	Hennepin Ave E	Between Blocks		441	73.2			N	N						Must accommodate 4 thru lanes, one left turn lane and 2 bike lanes. Transit lane will not fit
Known	Hennepin Ave E	N 2nd St	Signalized			74.2	86.3			N	18.1	N		Y	
Known	Hennepin Ave E	Between Blocks		442	83.5			N	Maybe						Need to reduce median to fit in one transit lane
Known	Hennepin Ave E	N 1st St	Signalized			90	118			N	16.7	N		Y	
Known	Hennepin Ave E	Between Blocks		1590	43.4			N	Convert Thru Lane						Convert a thru lane to a transit only lane
Known	Hennepin Ave E	Wilder St	1-Way Stop			54.7	54.8			N		N		N	
Known	Hennepin Ave E	Between Blocks		669	39.4			N	Convert Thru Lane						Bike lane and three thru lanes not wide enough for transit only lane
Known	Hennepin Ave E	SE Main St	Signalized			40	37.7			N	14.8	N		Y	Bike lane and thru lane not wide enough for queue jump lane
Known	Hennepin Ave E	Between Blocks		176	45.2			N	Y						Remove on street parking and one transit lane can fit
Known	Hennepin Ave E	Lourdes Pl	1-Way Stop			45.2	45.2			N		N		N	
Known	Hennepin Ave E	Between Blocks		236	45.2			N	Convert Thru Lane						
Known	Hennepin Ave E	2nd St SE	Signalized			47.6	47.9			Y	21.5	N		Y	Remove on street parking and restripe to fit queue jump lane
Known	Hennepin Ave E	Between Blocks		415	51.2			N	Convert Thru Lane						
Known	Hennepin Ave E	SE University Ave	Signalized			49.9	59			N	22.3	N		Y	Remove on street parking and restripe to fit queue jump lane
Known	Hennepin Ave E	Between Blocks		303	58			N	Y						
Known	SE University Ave	Bank St SE	1-Way Stop			55.8	58.4			N		N		N	
Known	SE University Ave	Between Blocks		290	60			N	Y						Remove on street parking and one transit lane can fit
Known	SE University Ave	Central Ave SE	Signalized			50.4	58			Y	19.4	N		Y	
Known	SE University Ave	Between Blocks		413	43.2			N	Y				N/A		Space available in existing bus stop for queue jump
Known	SE University Ave	SE 2nd Ave	2-Way Stop			43.2	43.6			N		N		N	
Known	SE University Ave	Between Blocks		409	43			N	Maybe						Must remove parking lane for transit lane and accommodate right-side bike lane
Known	SE University Ave	SE 3rd Ave	Signalized			43.6	42.9			N		N		Y	
Known	SE University Ave	Between Blocks		406	43.9			N	Maybe						Must remove parking lane for transit lane and accommodate right-side bike lane
Known	SE University Ave	Se 4th Ave	1-Way Stop			44.4	42.1			N		N		N	
Known	SE University Ave	Between Blocks		484	40.2			N	Maybe						Must remove parking lane for transit lane and accommodate right-side bike lane
Known	SE University Ave	Se 5th Ave	2-Way Stop			40.1	41.2			N		N		N	
Known	SE University Ave	Between Blocks		415	40			N	Maybe						Must remove parking lane for transit lane and accommodate right-side bike lane
Known	SE University Ave	Se 6th Ave	Signalized			42.2	42.7			Y	21.2	N		Y	
Known	SE University Ave	Between Blocks		409	45.4			N	Maybe				N/A		Possible queue jump would impact bike lane. Need to remove parking
Known	SE University Ave	SE 7th Ave	2-Way Stop			40.2	43.4			N		N		N	
Known	SE University Ave	Between Blocks		412	42.6			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	SE University Ave	SE 8th ave	2-Way Stop			50.8	49.5			N		N		N	
Known	SE University Ave	Between Blocks		265.7	50.8			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	SE University Ave	35w SB on ramp	Signalized			49.5	52.1			N	19.2	N		Y	
Known	SE University Ave	Between Blocks		275	51.8			N	Convert Thru Lane				N/A		Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	SE University Ave	35W NB frontage road	Signalized			51.4	52.4			N	15.3	N		Y	
Known	SE University Ave	Between Blocks		282	49.6			N	Convert Thru Lane				N/A		Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	SE University Ave	10th Ave SE	Signalized			52.4	52.7			N	17.4	N		Y	
Known	SE University Ave	Between Blocks		402	46.1			N	Convert Thru Lane				N/A		Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	SE University Ave	11th Ave SE	Signalized			45.6	42.7			N	18.9	N		Y	
Known	SE University Ave	Between Blocks		423	43.2			N	Convert Thru Lane				N/A		Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	SE University Ave	12th Ave SE	1-Way Stop			43.5	43.6			N		N		N	
Known	SE University Ave	Between Blocks		407	43.8			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	SE University Ave	13th Ave SE	1-Way Stop			44.1	52.8			N		N		N	
Known	SE University Ave	Between Blocks		411	50.5			N	Y						Remove on street parking to fit transit lane
Known	SE University Ave	14th Ave SE	Signalized			50.6	50.2			N	18.6	N		Y	
Known	SE University Ave	Between Blocks		411	50.9			N	Y				N/A		Remove on street parking to fit transit lane
Known	SE University Ave	15th Ave SE	Signalized			51	42.9			N	18	N		Y	
Known	SE University Ave	Between Blocks		411	42.3			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	SE University Ave	16th Ave	1-Way Stop			42.3	41.1			N		N		N	
Known	SE University Ave	Between Blocks		408	42.7			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	SE University Ave	17th Ave SE	Signalized			41.4	43.1			N	17.8	N		Y	
Known	SE University Ave	Between Blocks		414	42.3			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	SE University Ave	18th Ave SE	1-Way Stop			42.3	43.4			N		N		N	
Known	SE University Ave	Between Blocks		406	43.9			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	SE University Ave	19th Ave SE	Signalized			43.1	42.8			N	17.1	N		Y	
Known	SE University Ave	Between Blocks		544	41.6			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	SE University Ave	Walnut St SE	1-Way Stop			42.2	42.7			N		N		N	
Known	SE University Ave	Between Blocks		380	47.6			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	University Ave SE	Oak St SE	Signalized			81.2	52.7			N		N	20.1	Y	
Known	University Ave SE	Between Blocks		466	57.8			N	N						Must remove traffic lane for transit lane
Known	Oak St SE	Oak St SE	Signalized			63.2	42.5			N		N	14.8	Y	
Known	Oak St SE	Between Blocks		550	41.9			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	Oak St SE	19th Ave SE	Signalized			40.7	41.1			N		N	17.9	Y	
Known	Oak St SE	Between Blocks		397	41.6			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	18th Ave SE	1-Way Stop			41.6	41.7			N		N		N	
Known	4th St SE	Between Blocks		413	42.9			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	17th Ave SE	Signalized			43.9	40.8			N		N	17.1	Y	
Known	4th St SE	Between Blocks		406	41.5			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	16th Ave SE	1-Way Stop			41.5	40.6			N		N		N	
Known	4th St SE	Between Blocks		406	52.6			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	15th Ave SE	Signalized			59.3	49.2			N		Y	17.1	Y	Dedicated RT lane
Known	4th St SE	Between Blocks		410	48.5			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	14th Ave SE	Signalized			47.9	46.8			N		N	17.2	Y	
Known	4th St SE	Between Blocks		146	46.9			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	13th Ave SE	Signalized			49.4	43.3			N		N	16.3	Y	
Known	4th St SE	Between Blocks		405	42.8			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	12th Ave SE	2-Way Stop			41.8	40.5			N		N		N	
Known	4th St SE	Between Blocks		412	41.9			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	11th Ave SE	2-Way Stop			42.9	42.4			N		N		N	
Known	4th St SE	Between Blocks		413	41.1			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	10th Ave SE	Signalized			40.2	51.7			N		N	15.7	Y	
Known	4th St SE	Between Blocks		285	50			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	I-35W East Frontage Rd	Signalized			50.9	51.8			N		N	17	Y	

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Known	4th St SE	Between Blocks		271	51.5			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	1-35W West Frontage Rd	Signalized			51.5	51.2	N	Y				18.3	Y	Must remove parking to fit transit lane
Known	4th St SE	Between Blocks		265	52			N	Y						Must remove parking to fit transit lane
Known	4th St SE	8th Ave SE	2-Way Stop			52.9	40.7	N	Convert Thru Lane					N	Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	Between Blocks		410	39.5			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	7th Ave SE	2-Way Stop			39.7	39.7	N	Convert Thru Lane					N	Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	Between Blocks		415	39.8			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	6th Ave SE	Signalized			39.7	41.2	N	Convert Thru Lane				17	Y	Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	Between Blocks		413	41			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	5th Ave SE	2-Way Stop			38.8	40.5	N	Convert Thru Lane					N	Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	Between Blocks		479	41.1			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	4th Ave SE	Signalized			40.1	39.7	N	Convert Thru Lane				15.3	Y	Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	Between Blocks		412	39.7			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	3rd Ave SE	2-Way Stop			39.6	41	N	Convert Thru Lane					N	Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	Between Blocks		410	38.9			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	2nd Ave SE	2-Way Stop			40.4	49.3	N	Convert Thru Lane					N	Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	Between Blocks		409	49.8			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	Central Ave SE	Signalized			49.5	54.7	N	Convert Thru Lane				17.1	Y	Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	4th St SE	Between Blocks		345	55.9			N	Y						Must remove parking to fit transit lane
Known	4th St NE	Hennepin Ave E	Signalized			55.8	52.9	N	Y		Y		21.6	Y	Queue jump fits if parking is removed
Known	4th St NE	Between Blocks		418	51.6			N	Y						Remove on street parking to fit transit lane
Known	4th St NE	1st Ave NE	Signalized			52.6	57.9	N	Y				31.4	Y	No Queue jump due to turn in route
Known	1st Ave NE	Between Blocks		413	57.1			N	Y						Remove on street parking to fit transit lane
Known	1st Ave NE	University Ave NE	Signalized			57.3	51.3	N	Convert Thru Lane				10.6	Y	Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	1st Ave NE	Between Blocks		411	48.1			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	1st Ave NE	2nd St NE	Signalized			48.3	50.7	N	Convert Thru Lane				12.8	Y	Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	1st Ave NE	Between Blocks		427	49.5			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	1st Ave NE	Main St NE	Signalized			50.4	43.7	N	Convert Thru Lane				17.6	Y	Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	1st Ave NE	Between Blocks		622	41			N	Convert Thru Lane						Must remove traffic lane for transit lane and accommodate right-side bike lane
Known	1st Ave NE	De La Salle Dr	1-Way Stop			46.9	54.4	N	Convert Thru Lane					N	Reallocate one of the three thru lanes
Known	1st Ave NE	Between Blocks		1708	42.1			N	Convert Thru Lane						Reallocate one of the three thru lanes
Known	1st Ave NE	N 1st St	Signalized			118	57.6	N	N					Y	No queue jump lanes due to turn in route
Known	N 1st st	Between Blocks		420	51.5			N	N						No queue jump lanes due to turn in route
Known	N 1st st	N 1st Ave	Signalized			56.2	51.5	N	N					Y	No queue jump lanes due to turn in route
Known	N 1st Ave	Between Blocks		425	51			N	N						No queue jump lanes due to turn in route
Known	N 1st Ave	N 2nd St	Signalized			48.8	46.9	N	N					Y	No queue jump lanes due to turn in route
Known	N 2nd St	Between Blocks		408	47.9			N	N						No queue jump lanes due to turn in route
Known	N 2nd St	Hennepin Ave	Signalized			47.2	74.2	N	N					Y	No queue jump lanes due to turn in route
Known	SE University Ave	SE Oak St	Signalized			52.4	81.2	N	N		17.9		20.8	Y	SB/WB Queue lane would be in a right turn lane. There are two dedicated right turn lanes for SB/WB. Median and Left turn lanes do not allow for transit lanes to fit
Known	SE University Ave	Between Blocks		275	81.2			N	N						Median and Left turn lanes do not allow for transit lanes to fit
Known	SE University Ave	Ontario St SE	1-Way Stop			78.5	76.7	N	N					N	TSP would be challenging due to LRT priority. Dedicated NB/EB right turn lane could be used for Queue jump
Known	SE University Ave	Between Blocks		609	77.9			N	N				13.9	Maybe	Restriping and removal of center median would allow for one transit lane
Known	SE University Ave	SE Huron Blvd	Signalized			84.5	73.5	N	Y	Y	13.1				Restriping and removal of center median would allow for one transit lane
Known	SE University Ave	Between Blocks		316	74.2			N	Y						Restriping and removal of center median would allow for one transit lane
Known	SE University Ave	SE Washington Ave	1-Way Stop			74.2	66.9	N	Y						Restriping and removal of center median would allow for one transit lane
Known	SE University Ave	Between Blocks		342	66.9			N	Y						Restriping and removal of center median would allow for one transit lane
Known	SE University Ave	25th Ave SE	Signalized			67.3	67.5	N	Y		12.2			Y	Restriping and removal of center median would allow for one transit lane
Known	SE University Ave	Between Blocks		397	68.4			N	Y						Restriping and removal of center median would allow for one transit lane
Known	SE University Ave	26th Ave SE	1-Way Stop			68.1	69.1	Y	Y						Restriping and removal of on street parking would allow for two transit lanes
Known	SE University Ave	Between Blocks		423	68.8			Y	Y						Restriping and removal of on street parking would allow for two transit lanes
Known	SE University Ave	27th Ave SE	Signalized			69.8	68.8	Y	Y	Y	21.5			Y	Restriping and removal of on street parking would allow for two transit lanes
Known	SE University Ave	Between Blocks		418	69.1			Y	Y						Restriping and removal of on street parking would allow for two transit lanes
Known	SE University Ave	St Marys Ave SE	1-Way Stop			68.4	70.1	N	Y						Restriping and removal of center median would allow for one transit lane
Known	SE University Ave	Between Blocks		570	69.1			N	Y						Restriping and removal of center median would allow for one transit lane
Known	SE University Ave	29th Ave SE	Signalized			71	77.4	N	N		11.3		13.1	Maybe	TSP would be challenging due to LRT priority
Known	SE University Ave	Between Blocks		180	77.4			N	N						Lightrail in median, side running pavement is not wide enough for transit only lane
Known	SE University Ave	Arthur Ave SE	1-Way Stop			76.8	77	N	N						Lightrail in median, side running pavement is not wide enough for transit only lane
Known	SE University Ave	Between Blocks		204	75.6			N	N						Lightrail in median, side running pavement is not wide enough for transit only lane
Known	SE University Ave	30th Ave SE	1-Way Stop			83.8	75.6	N	N						Lightrail in median, side running pavement is not wide enough for transit only lane
Known	SE University Ave	Between Blocks		372	87			N	N						Lightrail in median, side running pavement is not wide enough for transit only lane
Known	SE University Ave	Malcolm Ave SE	Signalized			92.8	96.5	N	N		12.7		11.9	Maybe	TSP would be challenging due to LRT priority
Known	SE University Ave	Between Blocks		349	89.7			N	N						Lightrail in median, side running pavement is not wide enough for transit only lane
Known	SE University Ave	Clarence Ave SE	Right in Right out			78.7	77.5	N	N						Lightrail in median, side running pavement is not wide enough for transit only lane
Known	SE University Ave	Between Blocks		842	88.1			N	N						Lightrail in median, side running pavement is not wide enough for transit only lane
Known	SE University Ave	Bedford St SE	Signalized			94	96.3	N	N		12.2			Maybe	TSP would be challenging due to LRT priority
Known	SE University Ave	Between Blocks		324	99.1			N	N						Lightrail Station in median, side running pavement is not wide enough for transit only lane
Known	SE University Ave	Berry St	Signalized			99.1	38.6	N	N		12.2			Maybe	NB/EB queue lane would be for a left turning movement. TSP would be challenging due to LRT priority
Known	Berry St	Between Blocks		660	39.6			N	Y						Restriping and removal of on street parking would allow for one transit lane
Known	Berry St	Territorial Rd	1-Way Stop			39.8	34.6	N	N						Remove all parking on private drive to accommodate transit lanes
Known	Territorial Rd	Between Blocks		563	19.8			N	N						Remove all parking on private drive to accommodate transit lanes
Known	Territorial Rd	Bedford St SE	Yield			43.9	41.2	N	N						Transit lanes will fit
Known	Bedford St SE	Between Blocks		512	43.1			Y	Y						Queue jump lane if for right turning movement
Known	Bedford St SE	University Ave NE	Signalized			42	94	N	N				10.5	Y	Queue jump lane if for right turning movement
Known	SE University Ave	SE 27th Ave	Signalized			68.8	39.1	N	Y					Y	No Queue jump lanes due to turn in route
Known	SE 27th Ave	Between Blocks		408	39.8			N	Y						Remove on street parking to make transit only lane
Known	SE 27th Ave	SE 4th St	1-Way Stop			39.8	41.7	N	Y					N	No queue jump lanes due to turn in route
Known	SE 4th St	Between Blocks		816	41.7			N	Y						Remove on street parking to make transit only lane
Known	SE 4th St	SE 25th Ave	2-Way Stop			39	46.2	N	Y					N	No queue jump lanes due to turn in route
Known	SE 25th St	Between Blocks		389	46.3			N	Y						Remove on street parking to make transit only lane
Known	SE 25th St	SE University Ave	Signalized			46.4	67.3	N	Y					Y	No queue jump lanes due to turn in route

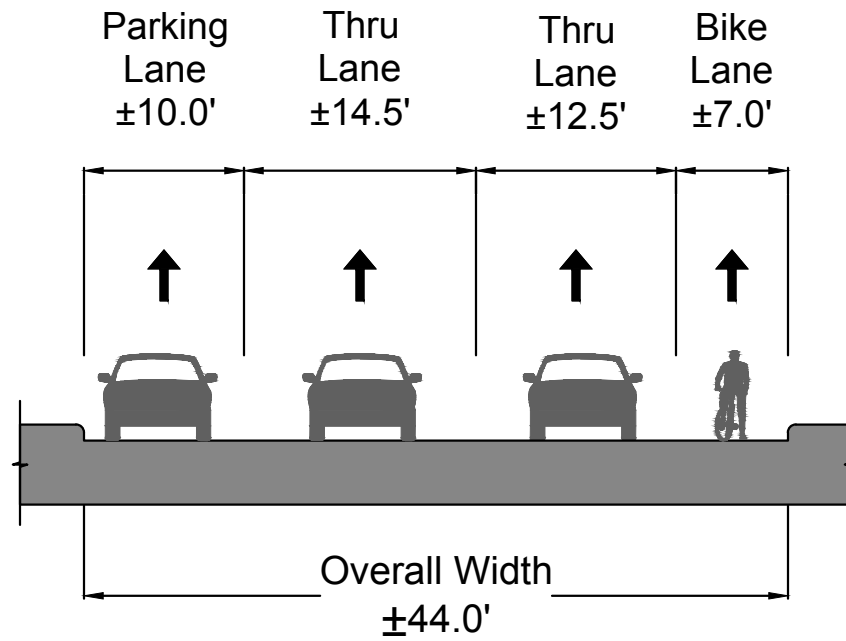
Table 1: Physical Constraint Analysis

Route	Total Number of Intersections	Transit Only Lanes - Both Directions (# of blocks)					Length (Route Feet)	Transit Only Lanes - One Way (# of blocks)					Length (Lane Feet)	Queue Jump NB/EB (# of intersections)			Queue Jump SB/WB (# of intersections)			TSP (# of intersections)			
		Yes	Maybe	Convert Thru Lane	No			Yes	Maybe	Convert Thru Lane	No			Yes	Maybe	No	Yes	Maybe	No	Yes	Maybe	Convert to Signal	No
Known E Line	138	4	1	0	130	1686	54	6	44	30	23382	13	1	124	6	0	132	74	5	1	58		
4	40	8	0	0	29	3784	24	0	2	11	14529	2	0	38	2	0	38	17	0	1	22		
5	41	10	0	0	29	4170	32	0	2	5	15933	3	0	38	4	0	37	14	0	3	24		
6	25	1	1	0	22	657	18	1	0	5	11868	0	0	25	1	0	24	8	0	2	15		

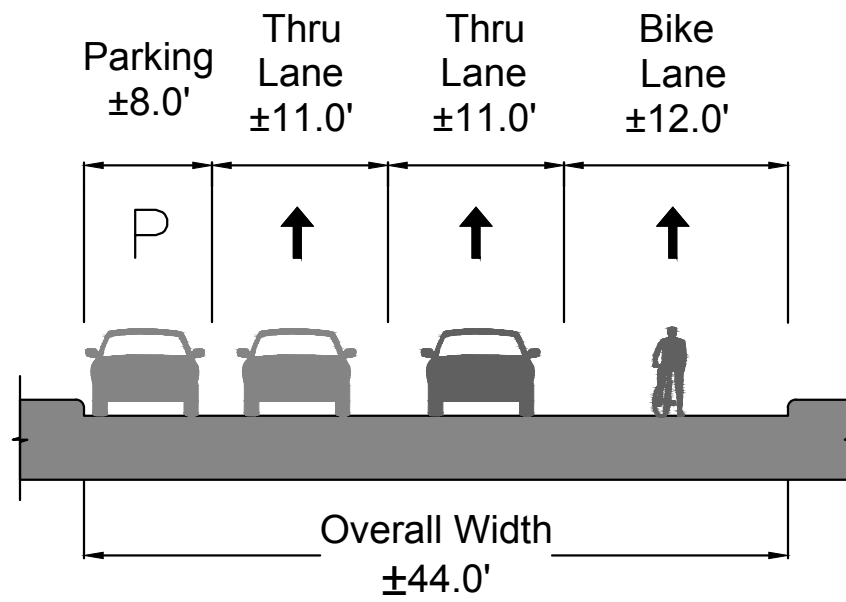
Figure 3: Typical Sections: University Avenue SE between 6th Avenue and 7th Avenue

University Ave SE Between 6th Ave and 7th Ave

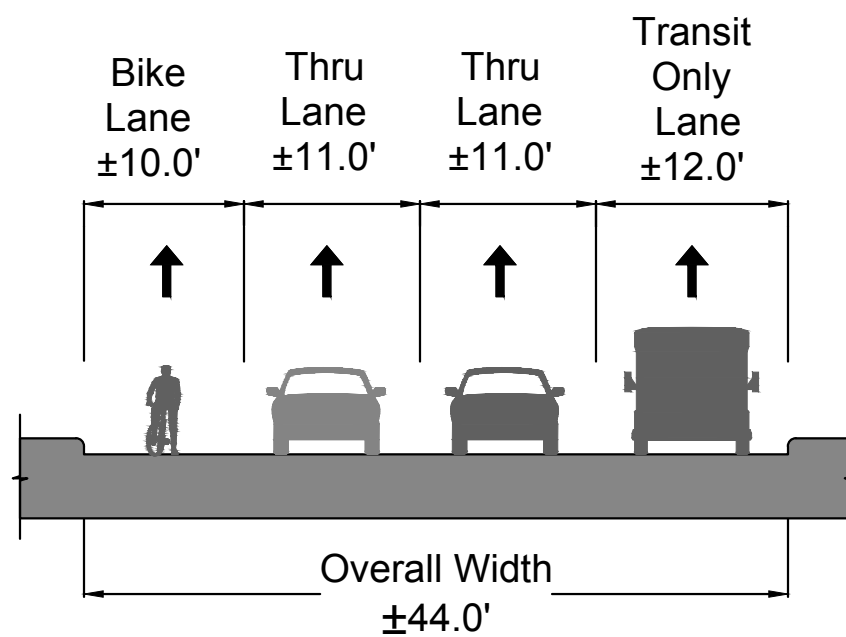
*Section Generally Applies from 6th Ave to Oak St



EXISTING SECTION



UNIVERSITY/4TH PROTECTED BIKEWAY SECTION



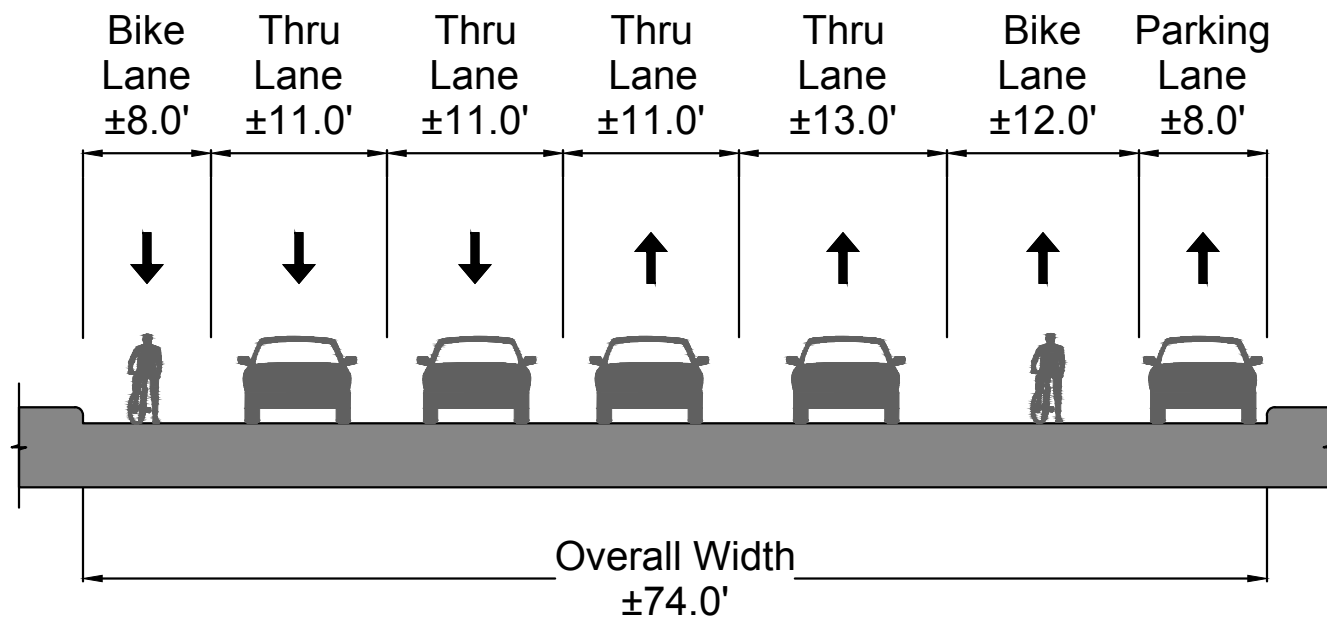
PROPOSED SECTION

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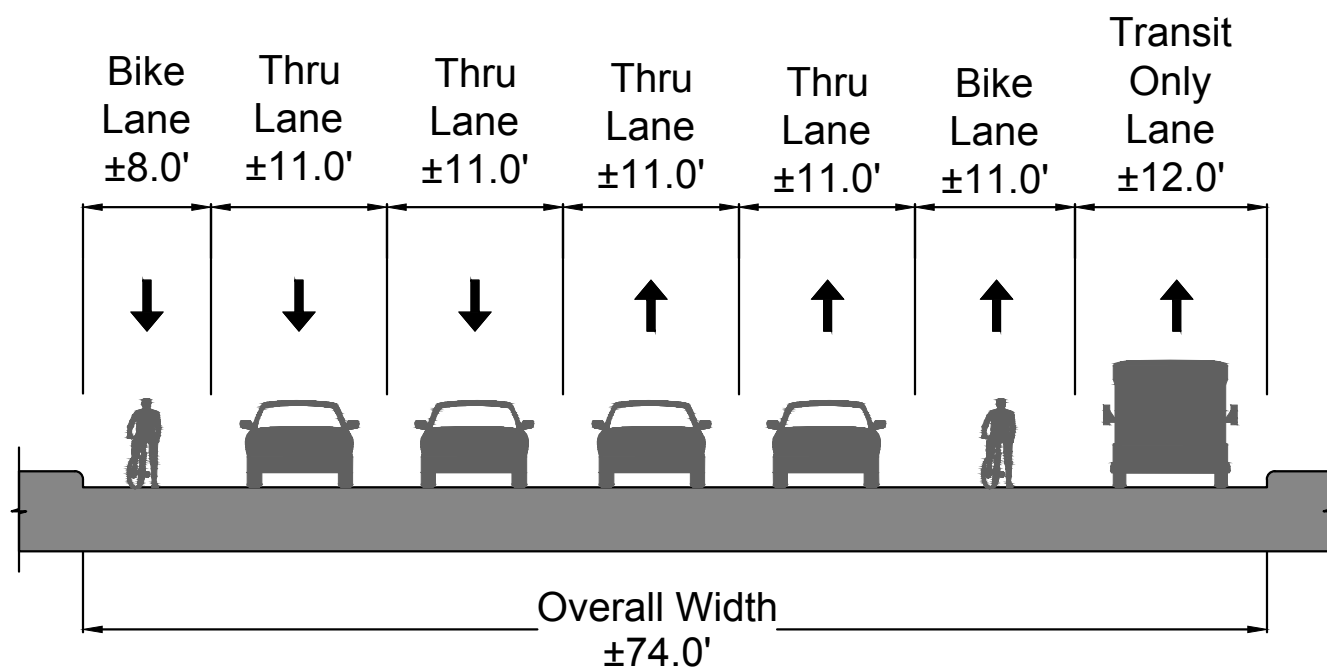
Figure 4: Typical Sections: Hennepin Avenue between Maple Street and Spruce Place

Hennepin Ave Between Maple St and Spruce Pl

*Section Generally Applies from Maple St to 12th St



EXISTING SECTION



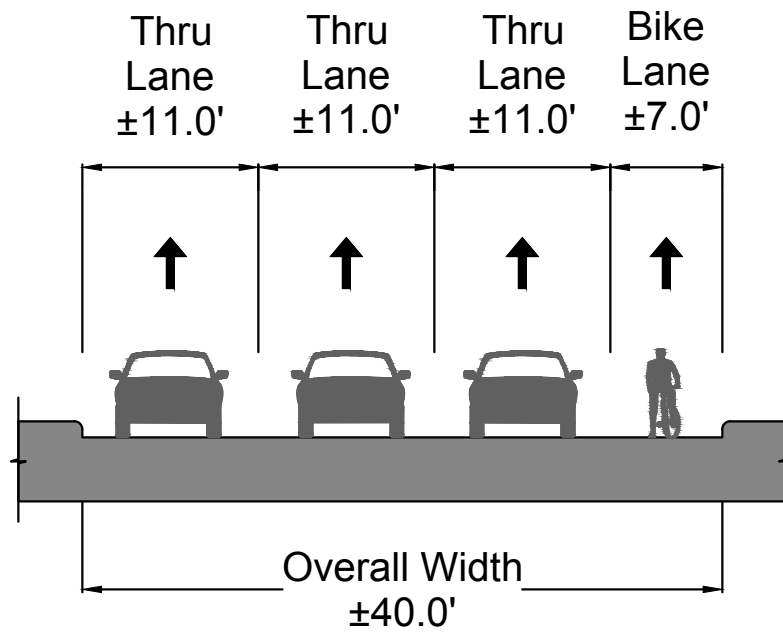
PROPOSED SECTION

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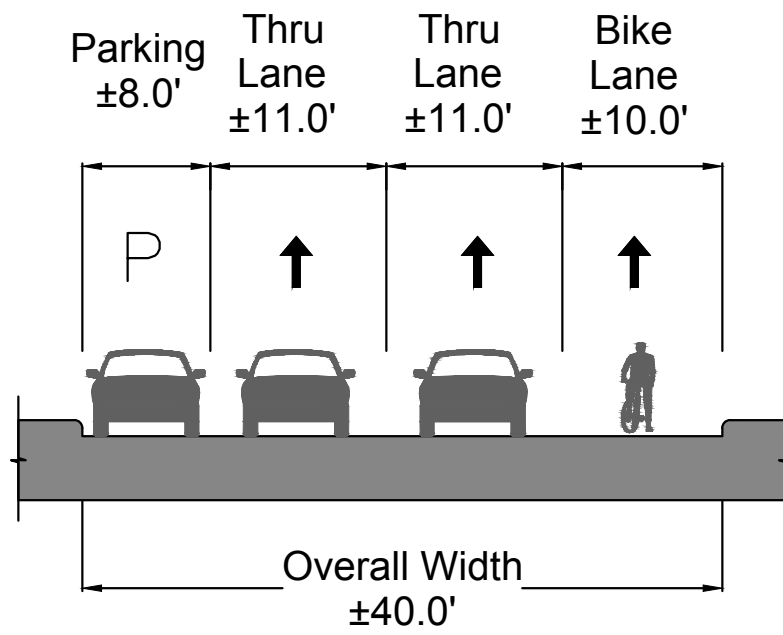
Figure 5: Typical Sections: 4th Street SE between 6th Avenue and 7th Avenue

4th St SE
Between 6th Ave and 7th Ave

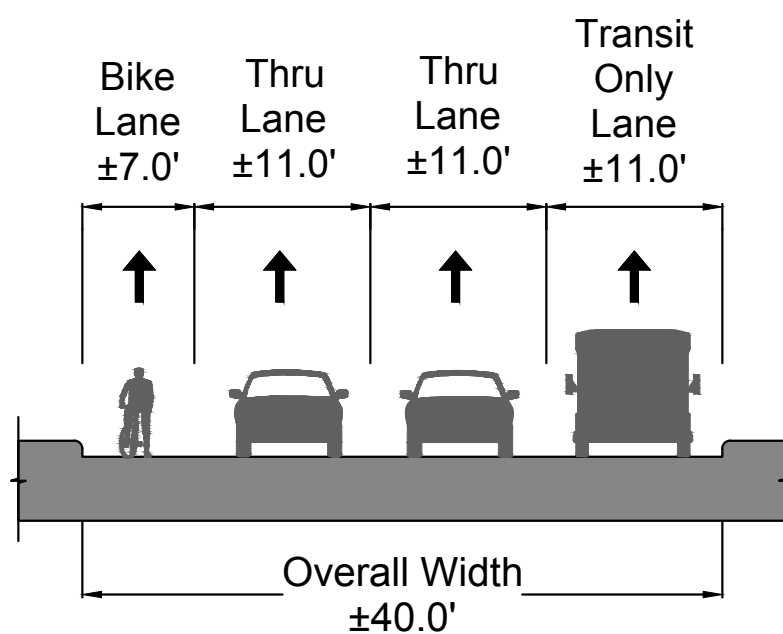
*Section Generally Applies from Central Ave to Oak St



EXISTING SECTION

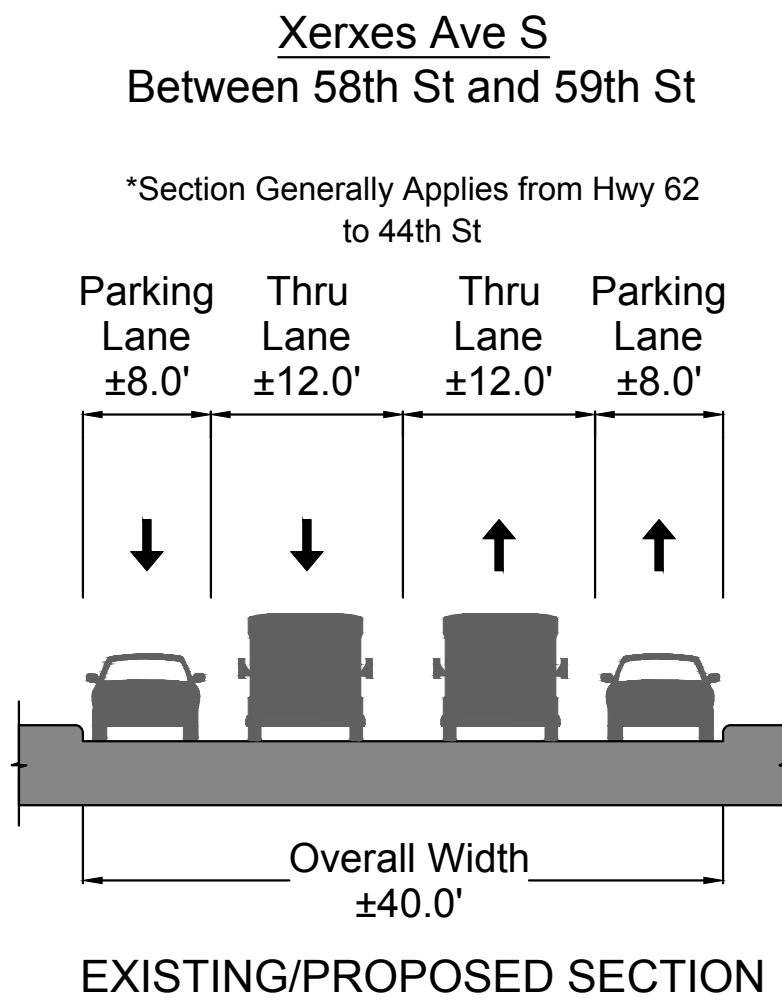


UNIVERSITY/4TH PROTECTED BIKEWAY SECTION



PROPOSED SECTION

Figure 6: Typical Section: Xerxes Avenue between 58th Street and 59th Street

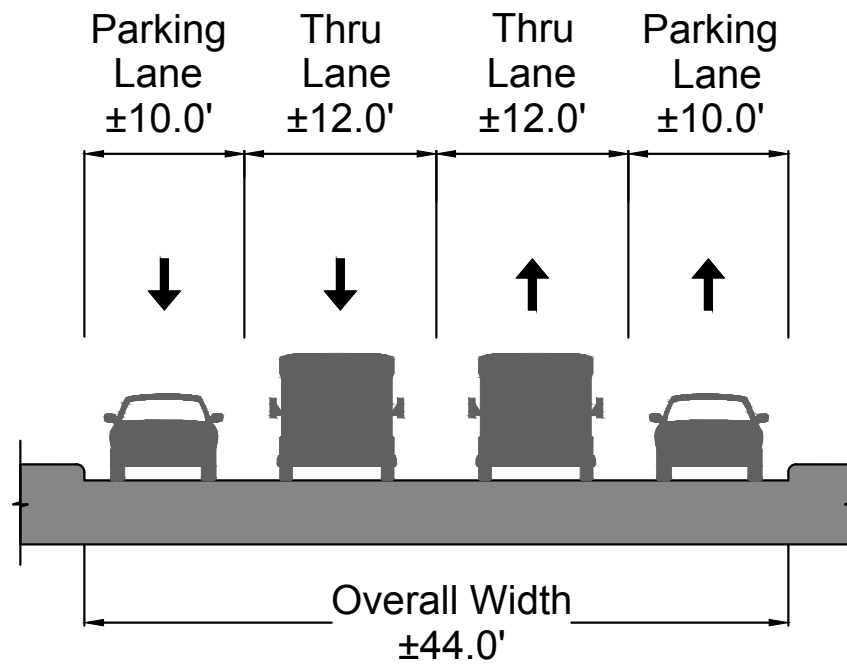


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Figure 7: Typical Section: France Avenue between 55th Street and 56th Street

France Ave S
Between 55th St and 56th St

*Section Generally Applies from 61st St
to 44th St



EXISTING/PROPOSED SECTION



E Line

E Line Corridor Study

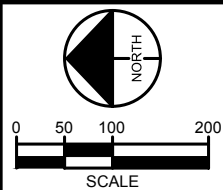
Appendix C

October 2019

To stay in touch with project updates, you can sign up for the E Line newsletter at the project website at metrotransit.org/e-line-project

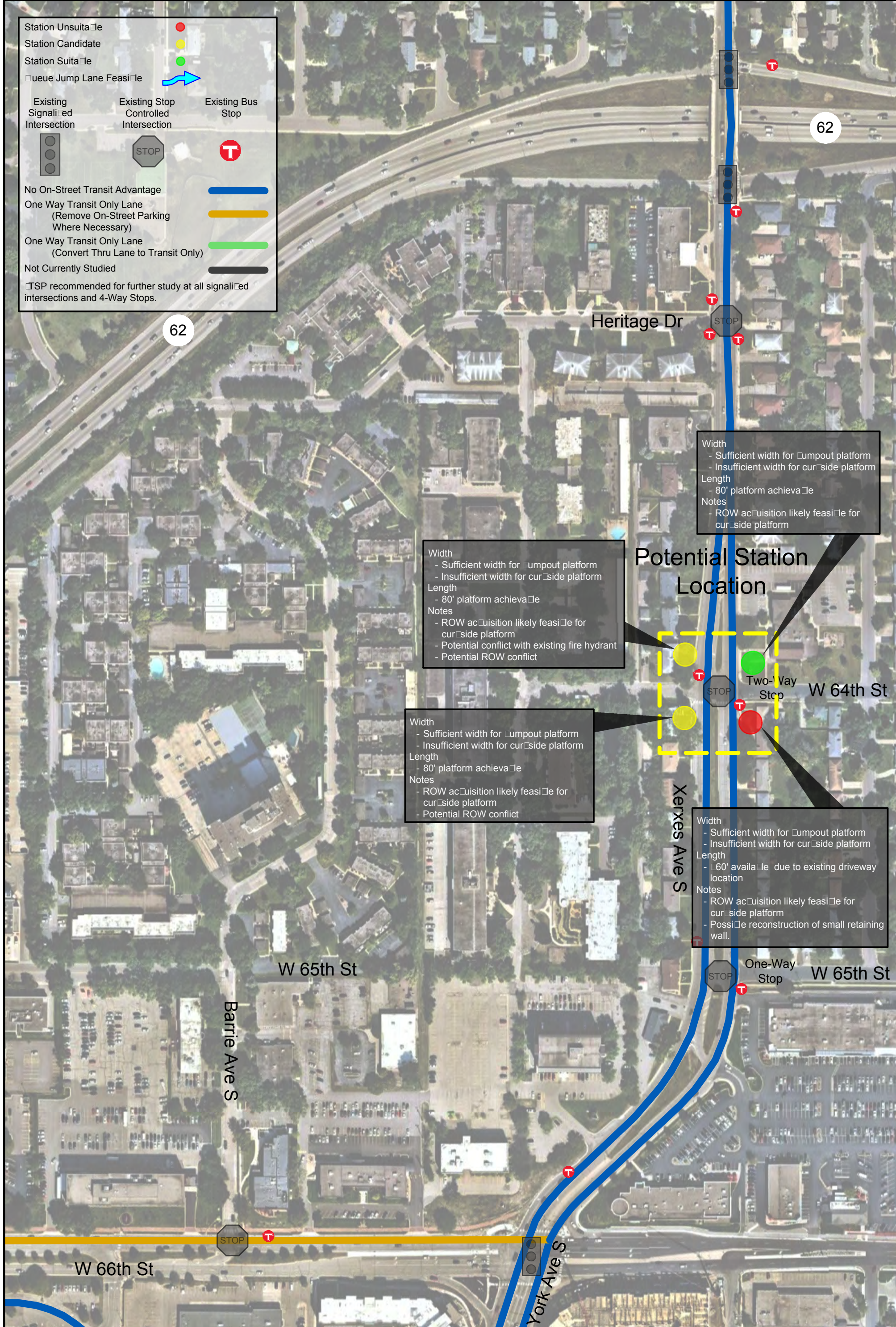
Station Unsuitable	
Station Candidate	
Station Suitable	
Queue Jump Lane Feasible	
Existing Signalized Intersection	
Existing Stop Controlled Intersection	
Existing Bus Stop	
No On-Street Transit Advantage	
One Way Transit Only Lane (Remove On-Street Parking Where Necessary)	
One Way Transit Only Lane (Convert Thru Lane to Transit Only)	
Not Currently Studied	

TSP recommended for further study at all signalized intersections and 4-Way Stops.



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Station Unsuitable (Red dot)
 Station Candidate (Yellow dot)
 Station Suitable (Green dot)
 Queue Jump Lane Feasible (Blue arrow)
 Existing Signalized Intersection (Traffic light icon)
 Existing Stop Controlled Intersection (STOP sign icon)
 Existing Bus Stop (Red T icon)
 No On-Street Transit Advantage (Blue line)
 One Way Transit Only Lane (Remove On-Street Parking Where Necessary) (Yellow line)
 One Way Transit Only Lane (Convert Thru Lane to Transit Only) (Green line)
 Not Currently Studied (Black line)
 TSP recommended for further study at all signalized intersections and 4-Way Stops.



Potential Station Location
 Width
 - Sufficient width for bumpout platform
 - Insufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - ROW acquisition likely feasible for curbside platform

Potential Station Location
 Width
 - Sufficient width for bumpout platform
 - Insufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - ROW acquisition likely feasible for curbside platform
 - Potential conflict with existing fire hydrant
 - Potential ROW conflict

Potential Station Location
 Width
 - Sufficient width for bumpout platform
 - Insufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - ROW acquisition likely feasible for curbside platform
 - Potential ROW conflict

Potential Station Location
 Width
 - Sufficient width for bumpout platform
 - Insufficient width for curbside platform
 Length
 - 60' available due to existing driveway location
 Notes
 - ROW acquisition likely feasible for curbside platform
 - Possible reconstruction of small retaining wall.

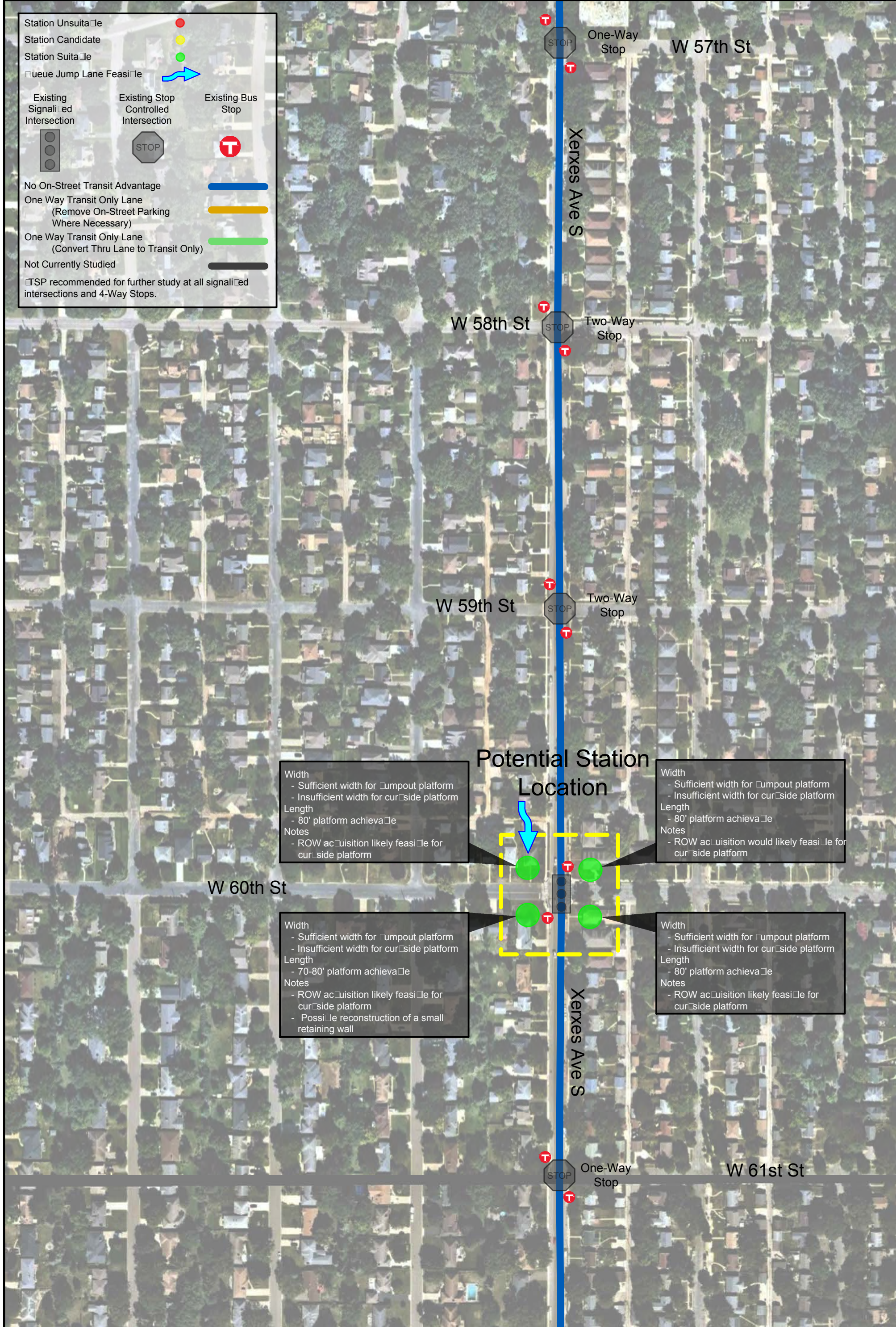
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 Station Candidate (Yellow dot)
 Station Suitable (Green dot)
 Queue Jump Lane Feasible (Blue arrow)

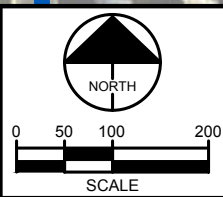
Existing Signalized Intersection (Traffic light icon)
 Existing Stop Controlled Intersection (STOP sign icon)
 Existing Bus Stop (Red 'T' icon)

No On-Street Transit Advantage (Blue line)
 One Way Transit Only Lane (Remove On-Street Parking Where Necessary) (Yellow line)
 One Way Transit Only Lane (Convert Thru Lane to Transit Only) (Green line)
 Not Currently Studied (Black line)

TSP recommended for further study at all signalized intersections and 4-Way Stops.



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Station Unsuitable	●
Station Candidate	●
Station Suitable	●
Queue Jump Lane Feasible	➔
Existing Signalized Intersection	
Existing Stop Controlled Intersection	
Existing Bus Stop	
No On-Street Transit Advantage	▬
One Way Transit Only Lane (Remove On-Street Parking Where Necessary)	▬
One Way Transit Only Lane (Convert Thru Lane to Transit Only)	▬
Not Currently Studied	▬
TSP recommended for further study at all signalized intersections and 4-Way Stops.	

Width
 - Sufficient width for bumpout platform
 - Insufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - ROW acquisition likely feasible for curbside platform
 - Potential conflict with fire hydrant

Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - Grade challenges on roadway
 - ROW acquisition likely feasible for curbside platform

Width
 - Sufficient width for bumpout platform
 - Insufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - Roadway profile looks steep and adjacent yards significantly higher than sidewalk
 - ROW acquisition likely feasible for curbside platform

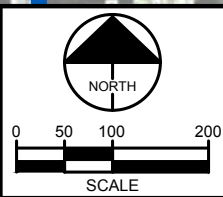
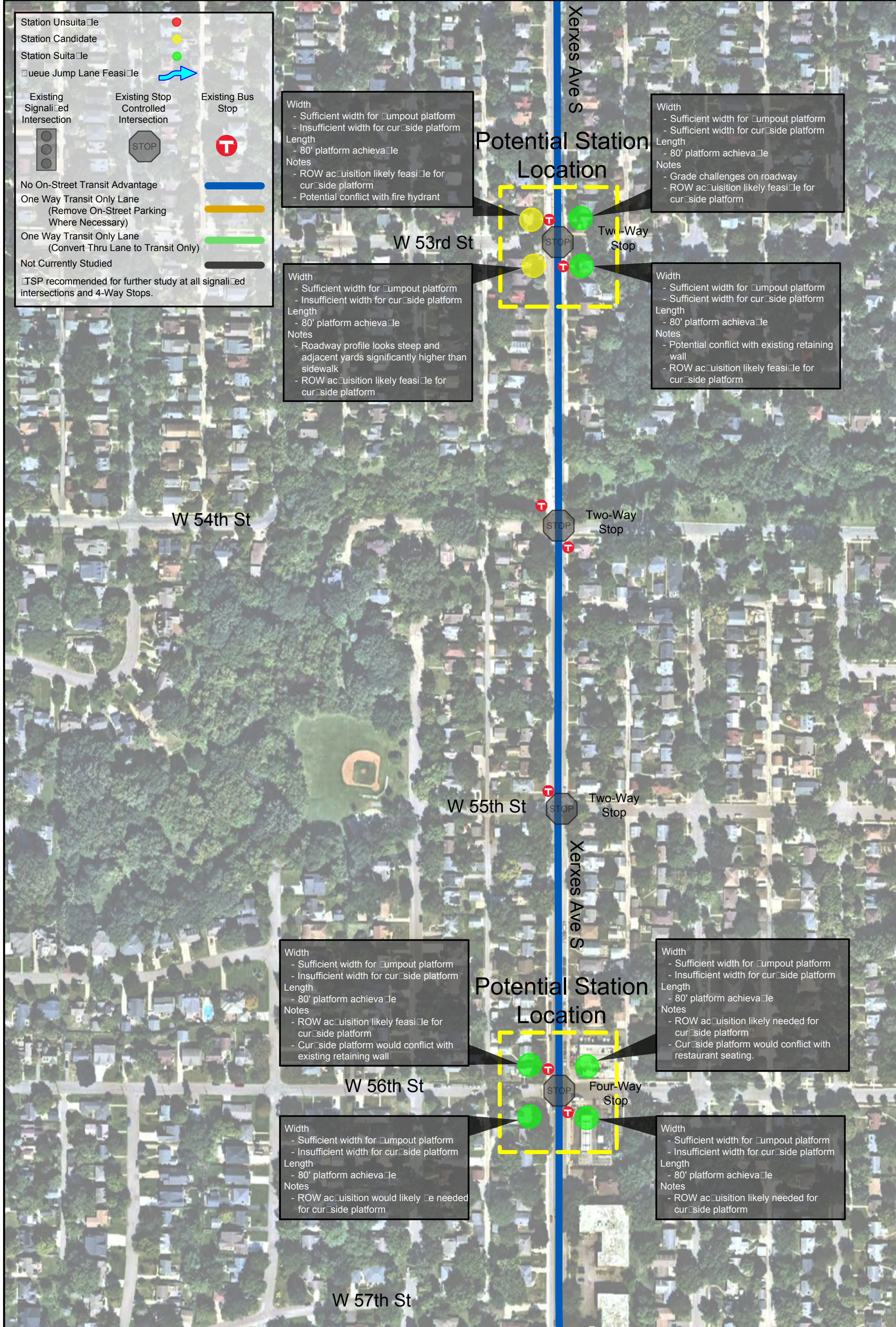
Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - Potential conflict with existing retaining wall
 - ROW acquisition likely feasible for curbside platform

Width
 - Sufficient width for bumpout platform
 - Insufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - ROW acquisition likely feasible for curbside platform
 - Curbside platform would conflict with existing retaining wall

Width
 - Sufficient width for bumpout platform
 - Insufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - ROW acquisition likely needed for curbside platform
 - Curbside platform would conflict with restaurant seating.

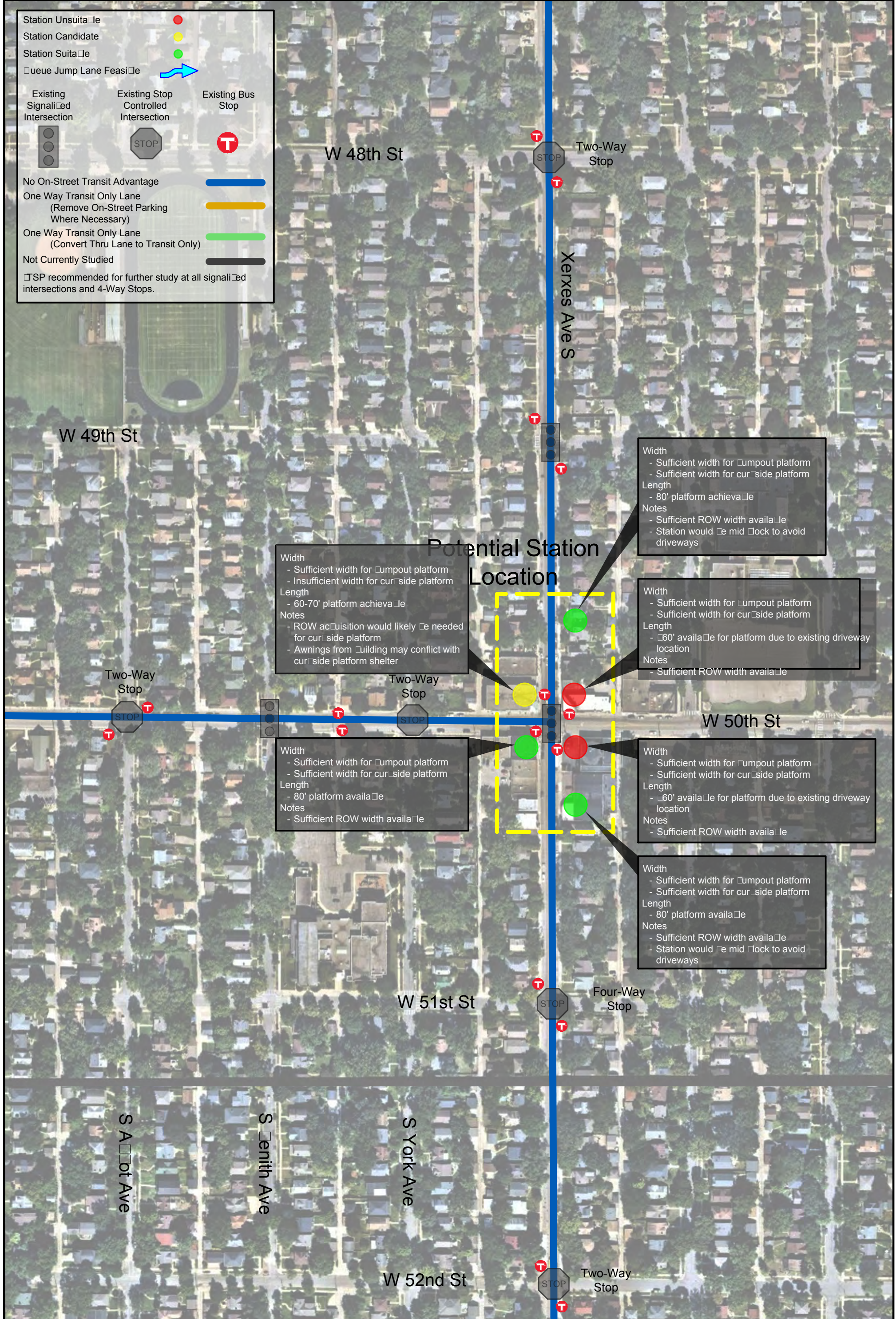
Width
 - Sufficient width for bumpout platform
 - Insufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - ROW acquisition would likely be needed for curbside platform

Width
 - Sufficient width for bumpout platform
 - Insufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - ROW acquisition likely needed for curbside platform



Station Unsuitable	●
Station Candidate	●
Station Suitable	●
Queue Jump Lane Feasible	➔
Existing Signalized Intersection	
Existing Stop Controlled Intersection	
Existing Bus Stop	
No On-Street Transit Advantage	—
One Way Transit Only Lane (Remove On-Street Parking Where Necessary)	—
One Way Transit Only Lane (Convert Thru Lane to Transit Only)	—
Not Currently Studied	—

TSP recommended for further study at all signalized intersections and 4-Way Stops.



Potential Station Location

Width
 - Sufficient width for bumpout platform
 - Insufficient width for curbside platform
 Length
 - 60-70' platform achievable
 Notes
 - ROW acquisition would likely be needed for curbside platform
 - Awning from building may conflict with curbside platform shelter

Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - Sufficient ROW width available
 - Station would be mid block to avoid driveways

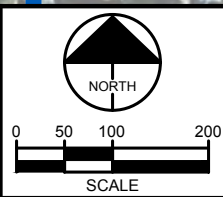
Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
 Length
 - 60' available for platform due to existing driveway location
 Notes
 - Sufficient ROW width available

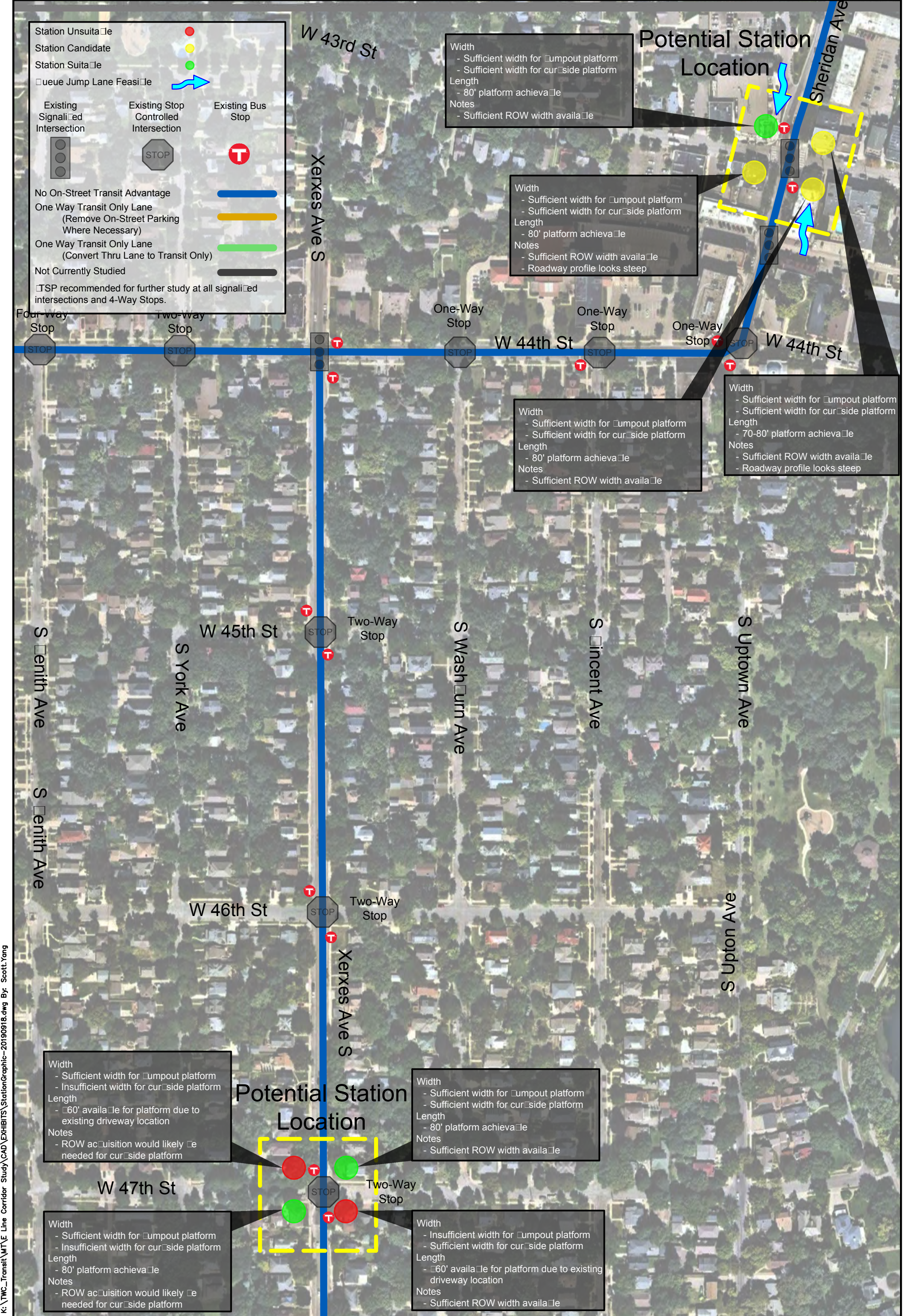
Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
 Length
 - 80' platform available
 Notes
 - Sufficient ROW width available

Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
 Length
 - 60' available for platform due to existing driveway location
 Notes
 - Sufficient ROW width available

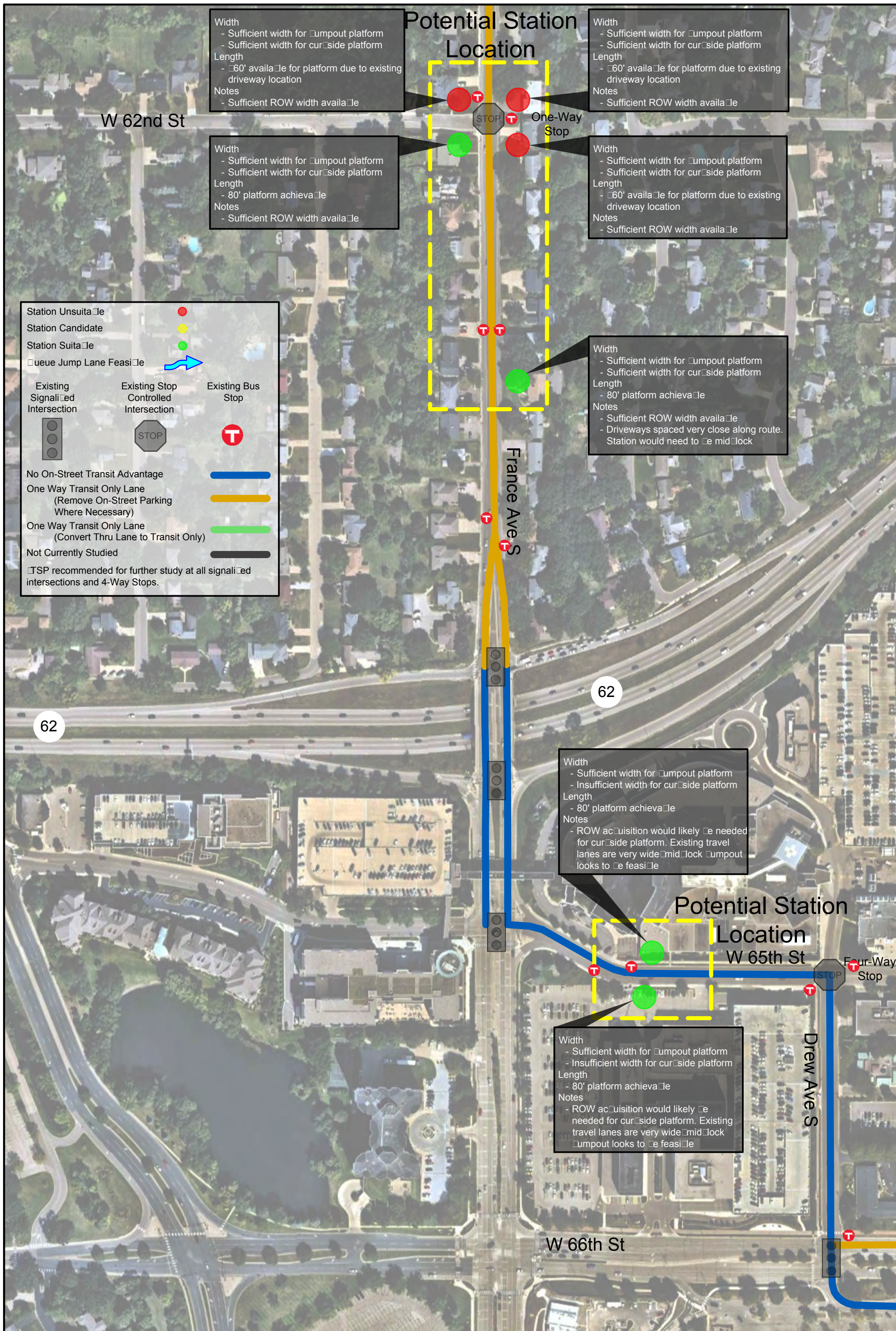
Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
 Length
 - 80' platform available
 Notes
 - Sufficient ROW width available
 - Station would be mid block to avoid driveways

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Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
Length
 - 60' available for platform due to existing driveway location
Notes
 - Sufficient ROW width available

Potential Station Location

Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
Length
 - 60' available for platform due to existing driveway location
Notes
 - Sufficient ROW width available

Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - Sufficient ROW width available

Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
Length
 - 60' available for platform due to existing driveway location
Notes
 - Sufficient ROW width available

Station Unsuitable	●
Station Candidate	●
Station Suitable	●
Queue Jump Lane Feasible	➔
Existing Signalized Intersection	⬮
Existing Stop Controlled Intersection	STOP
Existing Bus Stop	T
No On-Street Transit Advantage	—
One Way Transit Only Lane (Remove On-Street Parking Where Necessary)	—
One Way Transit Only Lane (Convert Thru Lane to Transit Only)	—
Not Currently Studied	—

TSP recommended for further study at all signalized intersections and 4-Way Stops.

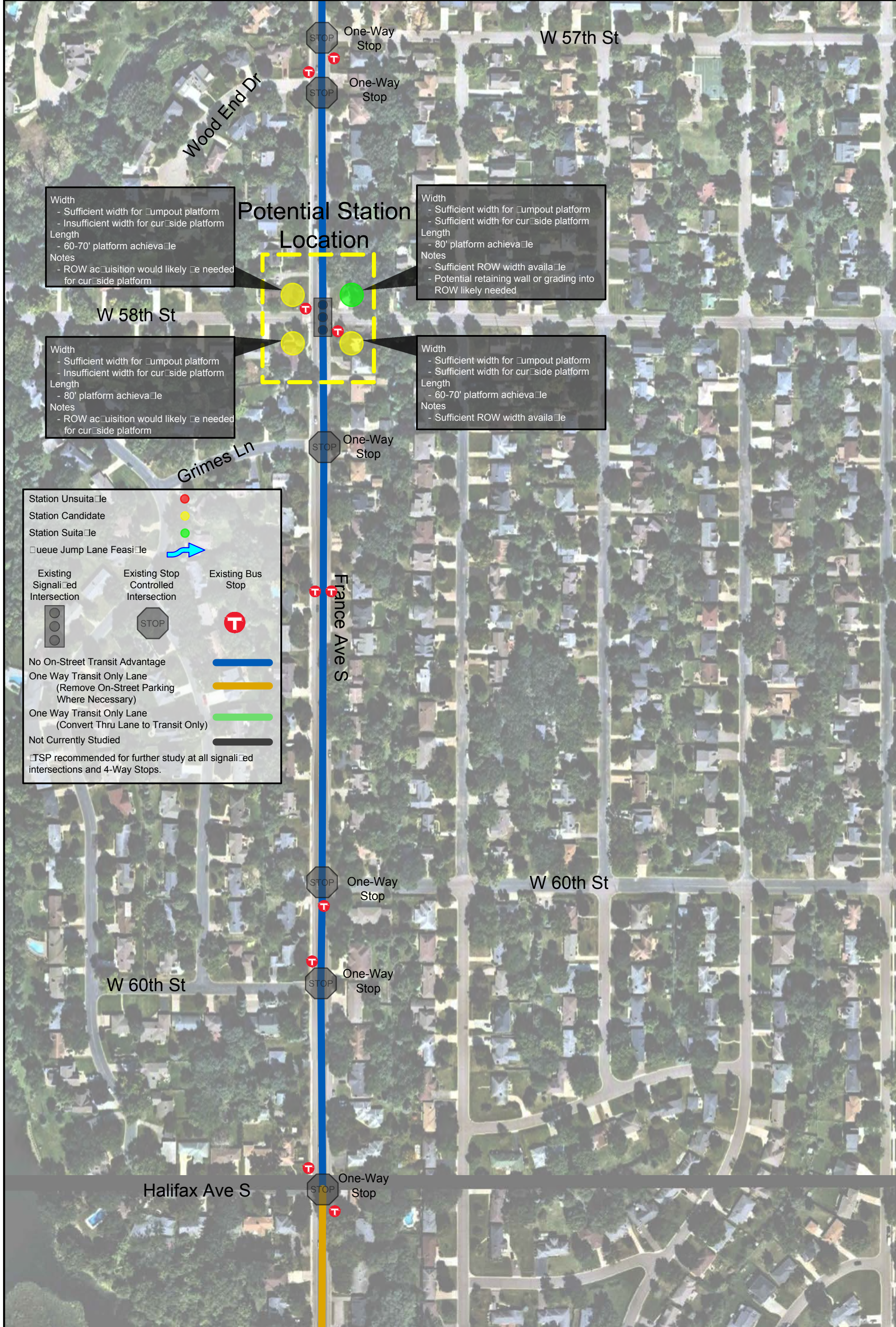
Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - Sufficient ROW width available
 - Driveways spaced very close along route. Station would need to be midblock

Width
 - Sufficient width for bumpout platform
 - Insufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - ROW acquisition would likely be needed for curbside platform. Existing travel lanes are very wide midblock bumpout looks to be feasible

Potential Station Location

Width
 - Sufficient width for bumpout platform
 - Insufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - ROW acquisition would likely be needed for curbside platform. Existing travel lanes are very wide midblock bumpout looks to be feasible

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Width
 - Sufficient width for bumpout platform
 - Insufficient width for curbside platform
Length
 - 60-70' platform achievable
Notes
 - ROW acquisition would likely be needed for curbside platform

Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - Sufficient ROW width available
 - Potential retaining wall or grading into ROW likely needed

Width
 - Sufficient width for bumpout platform
 - Insufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - ROW acquisition would likely be needed for curbside platform

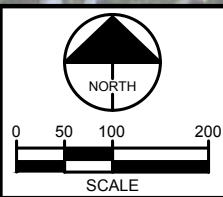
Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
Length
 - 60-70' platform achievable
Notes
 - Sufficient ROW width available

Station Unsuitable (Red dot)
Station Candidate (Yellow dot)
Station Suitable (Green dot)
Queue Jump Lane Feasible (Blue arrow)

Existing Signalized Intersection (Traffic light icon)
Existing Stop Controlled Intersection (STOP sign icon)
Existing Bus Stop (T icon)

No On-Street Transit Advantage (Blue line)
One Way Transit Only Lane (Remove On-Street Parking Where Necessary) (Yellow line)
One Way Transit Only Lane (Convert Thru Lane to Transit Only) (Green line)
Not Currently Studied (Grey line)

TSP recommended for further study at all signalized intersections and 4-Way Stops.



Station Unsuitable (Red dot)
 Station Candidate (Yellow dot)
 Station Suitable (Green dot)
 Queue Jump Lane Feasible (Blue arrow)

Existing Signalized Intersection (Traffic light icon)
 Existing Stop Controlled Intersection (STOP sign icon)
 Existing Bus Stop (Red T icon)

No On-Street Transit Advantage (Blue line)
 One Way Transit Only Lane (Remove On-Street Parking Where Necessary) (Yellow line)
 One Way Transit Only Lane (Convert Thru Lane to Transit Only) (Green line)
 Not Currently Studied (Grey line)

TSP recommended for further study at all signalized intersections and 4-Way Stops.

Potential Station Location

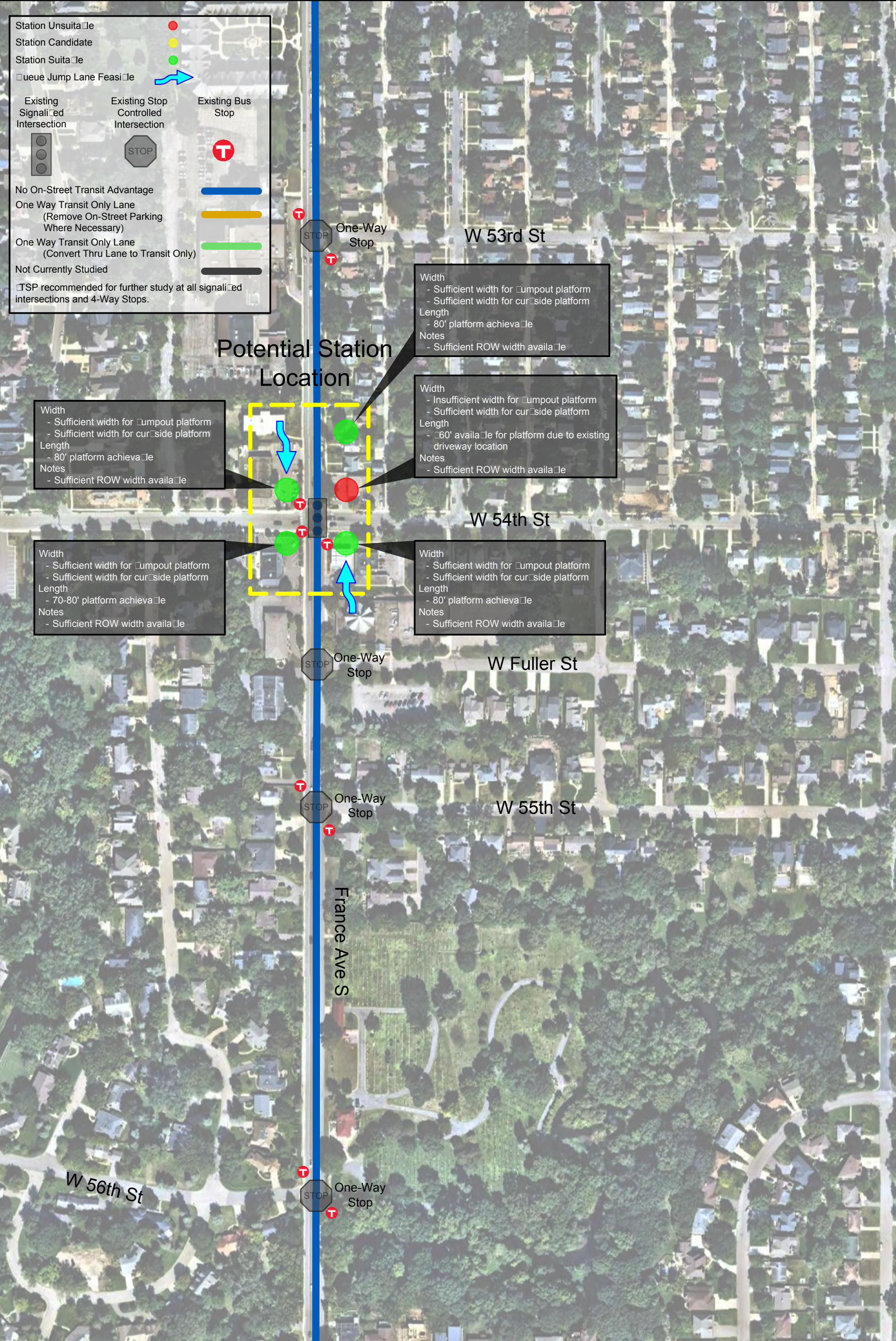
Width
 - Sufficient width for curbside platform
 - Sufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - Sufficient ROW width available

Width
 - Insufficient width for curbside platform
 - Sufficient width for curbside platform
 Length
 - 60' available for platform due to existing driveway location
 Notes
 - Sufficient ROW width available

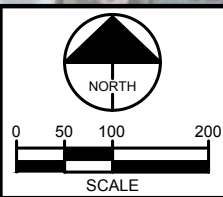
Width
 - Sufficient width for curbside platform
 - Sufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - Sufficient ROW width available

Width
 - Sufficient width for curbside platform
 - Sufficient width for curbside platform
 Length
 - 70-80' platform achievable
 Notes
 - Sufficient ROW width available

Width
 - Sufficient width for curbside platform
 - Sufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - Sufficient ROW width available



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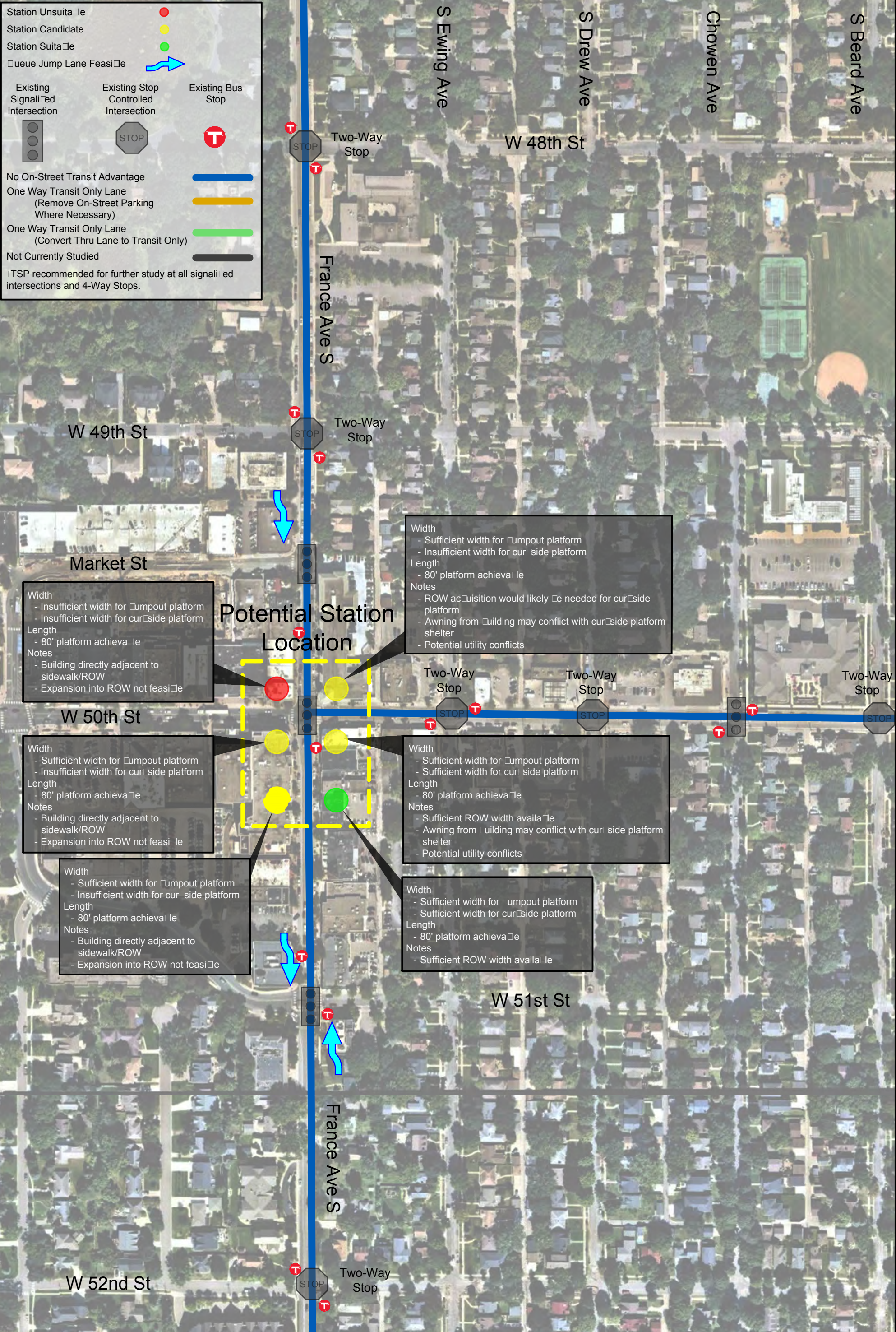


Station Unsuitable (Red dot)
 Station Candidate (Yellow dot)
 Station Suitable (Green dot)
 Queue Jump Lane Feasible (Blue arrow)

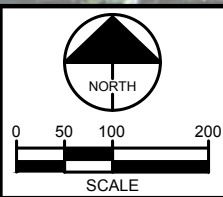
Existing Signalized Intersection (Traffic light icon)
 Existing Stop Controlled Intersection (STOP sign icon)
 Existing Bus Stop (T icon)

No On-Street Transit Advantage (Blue line)
 One Way Transit Only Lane (Remove On-Street Parking Where Necessary) (Yellow line)
 One Way Transit Only Lane (Convert Thru Lane to Transit Only) (Green line)
 Not Currently Studied (Black line)

TSP recommended for further study at all signalized intersections and 4-Way Stops.



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Station Unsuitable (Red dot)
 Station Candidate (Yellow dot)
 Station Suitable (Green dot)
 Queue Jump Lane Feasible (Blue arrow)

Existing Signalized Intersection (Traffic light icon)
 Existing Stop Controlled Intersection (STOP sign icon)
 Existing Bus Stop (Red T icon)

No On-Street Transit Advantage (Blue line)
 One Way Transit Only Lane (Remove On-Street Parking Where Necessary) (Yellow line)
 One Way Transit Only Lane (Convert Thru Lane to Transit Only) (Green line)
 Not Currently Studied (Grey line)

TSP recommended for further study at all signalized intersections and 4-Way Stops.

France Ave S

Potential Station Location

Potential Station Location

Potential Station Location

Width
 - Sufficient width for curbside platform
 - Insufficient width for curbside platform
 Length
 - 60-70' platform achievable
 Notes
 - Building directly adjacent to sidewalk/ROW
 - Expansion into ROW not feasible

Width
 - Sufficient width for curbside platform
 - Sufficient width for curbside platform
 Length
 - 60' available for platform due to existing driveway location
 Notes
 - Sufficient ROW width available

Width
 - Sufficient width for curbside platform
 - Sufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - Sufficient ROW width available

Width
 - Sufficient width for curbside platform
 - Insufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - Building directly adjacent to sidewalk/ROW
 - Expansion into ROW not feasible

Width
 - Insufficient width for curbside platform
 - Insufficient width for curbside platform
 Length
 - 60' available for platform due to existing driveway location
 Notes
 - ROW acquisition would likely be required

Width
 - Insufficient width for curbside platform
 - Sufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - Sufficient ROW width available

Width
 - Sufficient width for curbside platform
 - Sufficient width for curbside platform
 Length
 - 60-70' platform achievable
 Notes
 - Sufficient ROW width available
 - Potential conflict with intersection skew and curbside platform

Width
 - Insufficient width for curbside platform
 - Insufficient width for curbside platform
 Length
 - 60' available for platform due to existing driveway location
 Notes
 - Building directly adjacent to sidewalk/ROW
 - Expansion into ROW not feasible

Width
 - Sufficient width for curbside platform
 - Insufficient width for curbside platform
 Length
 - 60' available for platform due to existing driveway location
 Notes
 - ROW acquisition would likely be needed for curbside platform

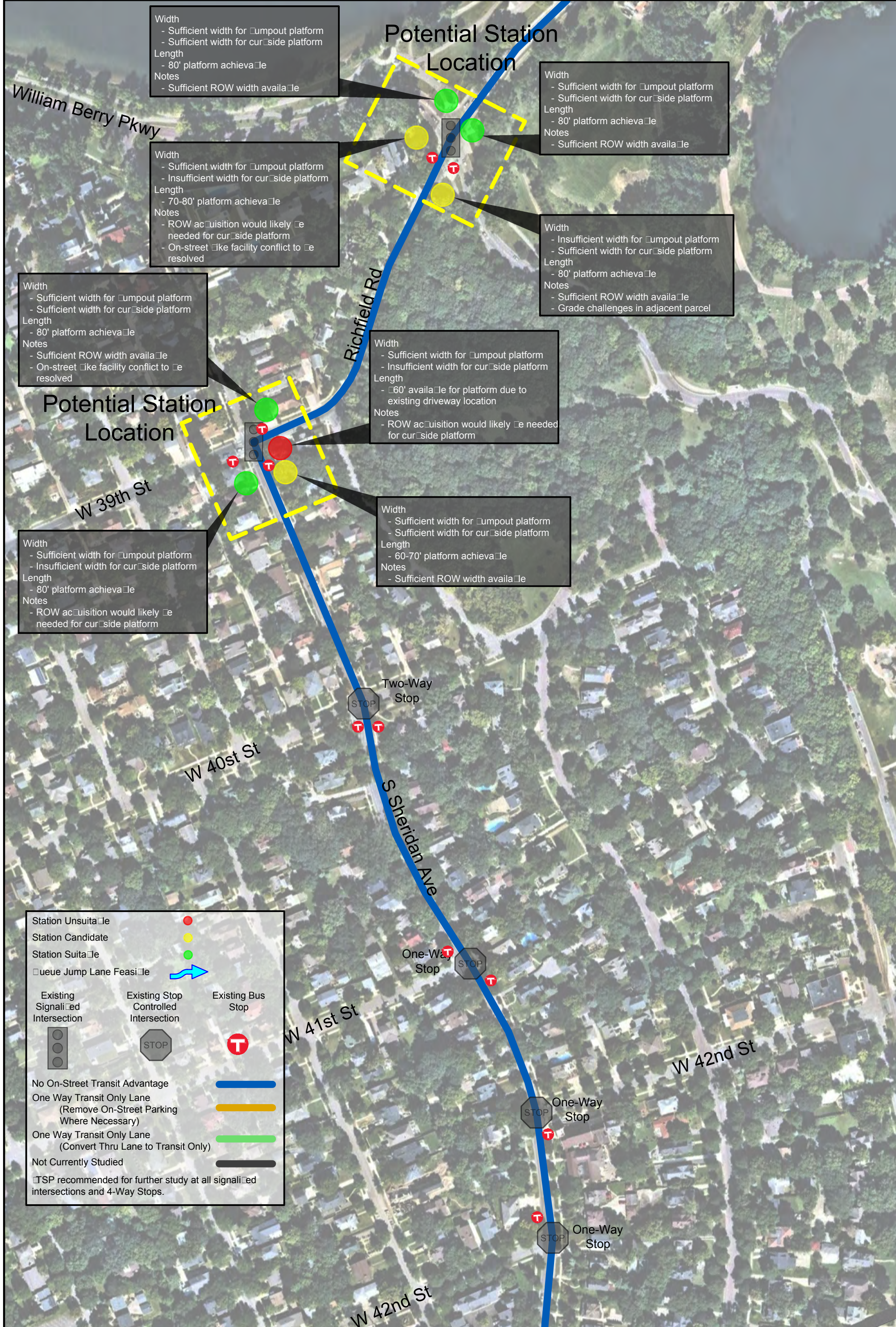
Width
 - Sufficient width for curbside platform
 - Sufficient width for curbside platform
 Length
 - 60' available for platform due to existing driveway location
 Notes
 - Sufficient ROW width available
 - Minor grading impact or small retaining wall may be necessary
 - Potential impact to adjacent stairs (curbside)

Width
 - Sufficient width for curbside platform
 - Insufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - ROW acquisition would likely be needed for curbside platform

Width
 - Sufficient width for curbside platform
 - Sufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - Sufficient ROW width available
 - Minor grading impact or small retaining wall may be necessary
 - Potential impact to adjacent stairs (curbside)

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Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - Sufficient ROW width available

Potential Station Location

Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - Sufficient ROW width available

Width
 - Sufficient width for bumpout platform
 - Insufficient width for curbside platform
Length
 - 70-80' platform achievable
Notes
 - ROW acquisition would likely be needed for curbside platform
 - On-street bike facility conflict to be resolved

Width
 - Insufficient width for bumpout platform
 - Sufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - Sufficient ROW width available
 - Grade challenges in adjacent parcel

Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - Sufficient ROW width available
 - On-street bike facility conflict to be resolved

Width
 - Sufficient width for bumpout platform
 - Insufficient width for curbside platform
Length
 - 60' available for platform due to existing driveway location
Notes
 - ROW acquisition would likely be needed for curbside platform

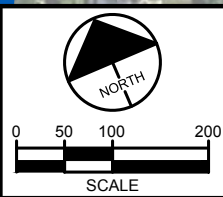
Potential Station Location

Width
 - Sufficient width for bumpout platform
 - Insufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - ROW acquisition would likely be needed for curbside platform

Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
Length
 - 60-70' platform achievable
Notes
 - Sufficient ROW width available

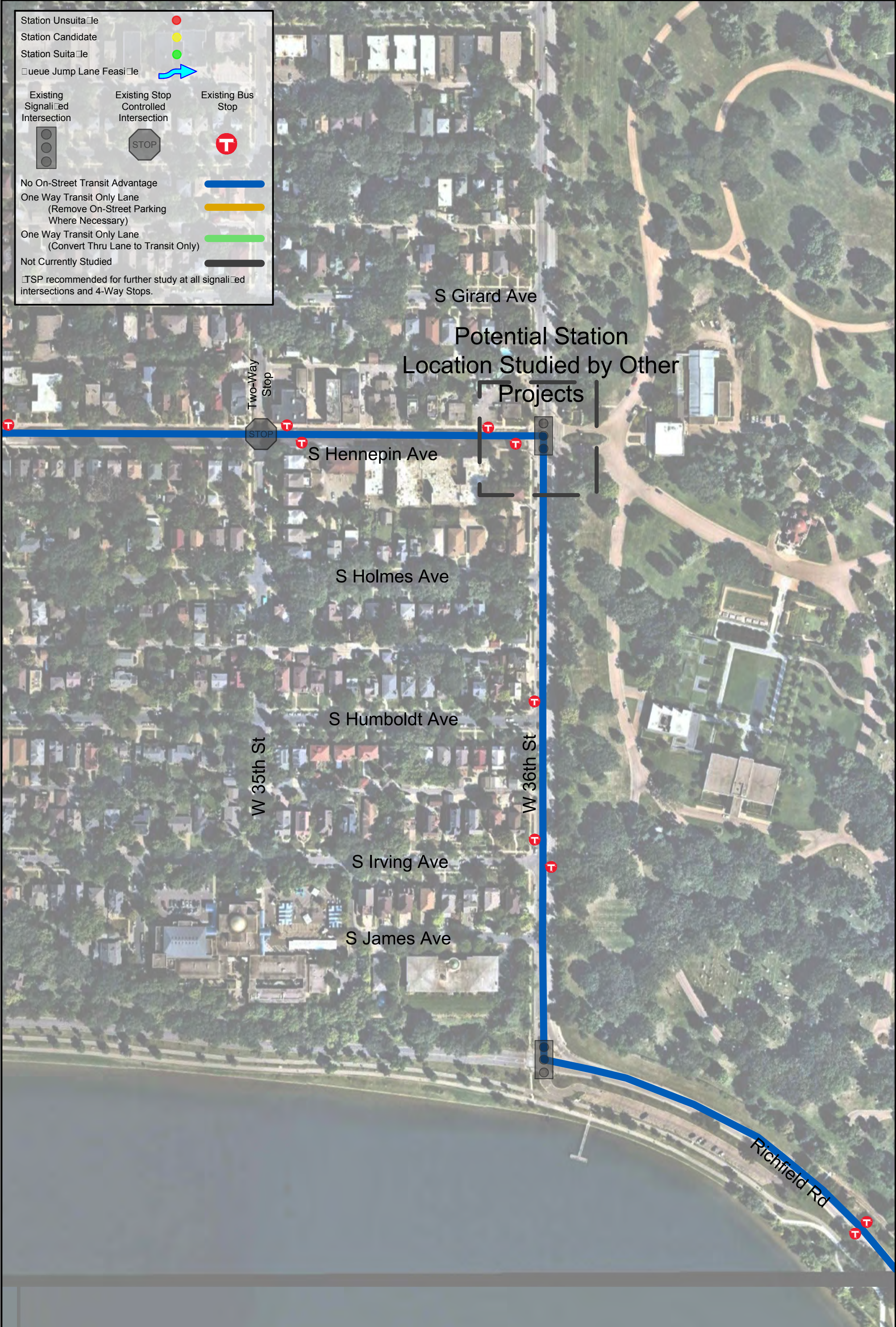
Station Unsuitable	●
Station Candidate	●
Station Suitable	●
Queue Jump Lane Feasible	➔
Existing Signalized Intersection	
Existing Stop Controlled Intersection	
Existing Bus Stop	
No On-Street Transit Advantage	—
One Way Transit Only Lane (Remove On-Street Parking Where Necessary)	—
One Way Transit Only Lane (Convert Thru Lane to Transit Only)	—
Not Currently Studied	—

ⓘ TSP recommended for further study at all signalized intersections and 4-Way Stops.



Station Unsuitable	●
Station Candidate	●
Station Suitable	●
Queue Jump Lane Feasible	➔
Existing Signalized Intersection	
Existing Stop Controlled Intersection	
Existing Bus Stop	
No On-Street Transit Advantage	—
One Way Transit Only Lane (Remove On-Street Parking Where Necessary)	—
One Way Transit Only Lane (Convert Thru Lane to Transit Only)	—
Not Currently Studied	—

TSP recommended for further study at all signalized intersections and 4-Way Stops.

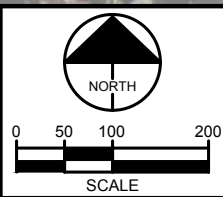
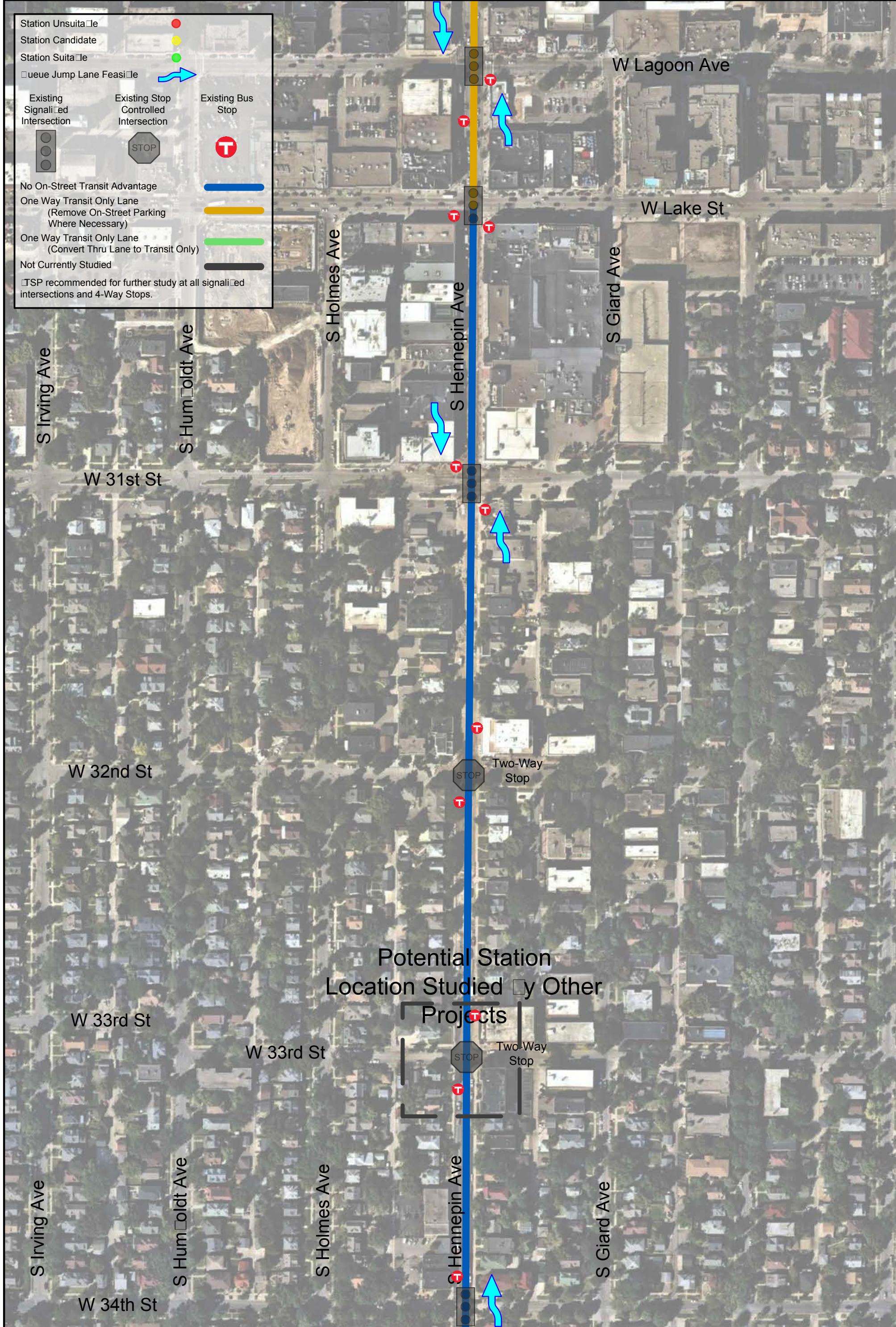


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Station Unsuitable	
Station Candidate	
Station Suitable	
Queue Jump Lane Feasible	
Existing Signalized Intersection	
Existing Stop Controlled Intersection	
Existing Bus Stop	
No On-Street Transit Advantage	
One Way Transit Only Lane (Remove On-Street Parking Where Necessary)	
One Way Transit Only Lane (Convert Thru Lane to Transit Only)	
Not Currently Studied	

TSP recommended for further study at all signalized intersections and 4-Way Stops.

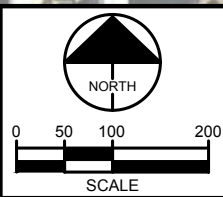


Station Unsuitable	
Station Candidate	
Station Suitable	
Queue Jump Lane Feasible	
Existing Signalized Intersection	
Existing Stop Controlled Intersection	
Existing Bus Stop	
No On-Street Transit Advantage	
One Way Transit Only Lane (Remove On-Street Parking Where Necessary)	
One Way Transit Only Lane (Convert Thru Lane to Transit Only)	
Not Currently Studied	

TSP recommended for further study at all signalized intersections and 4-Way Stops.

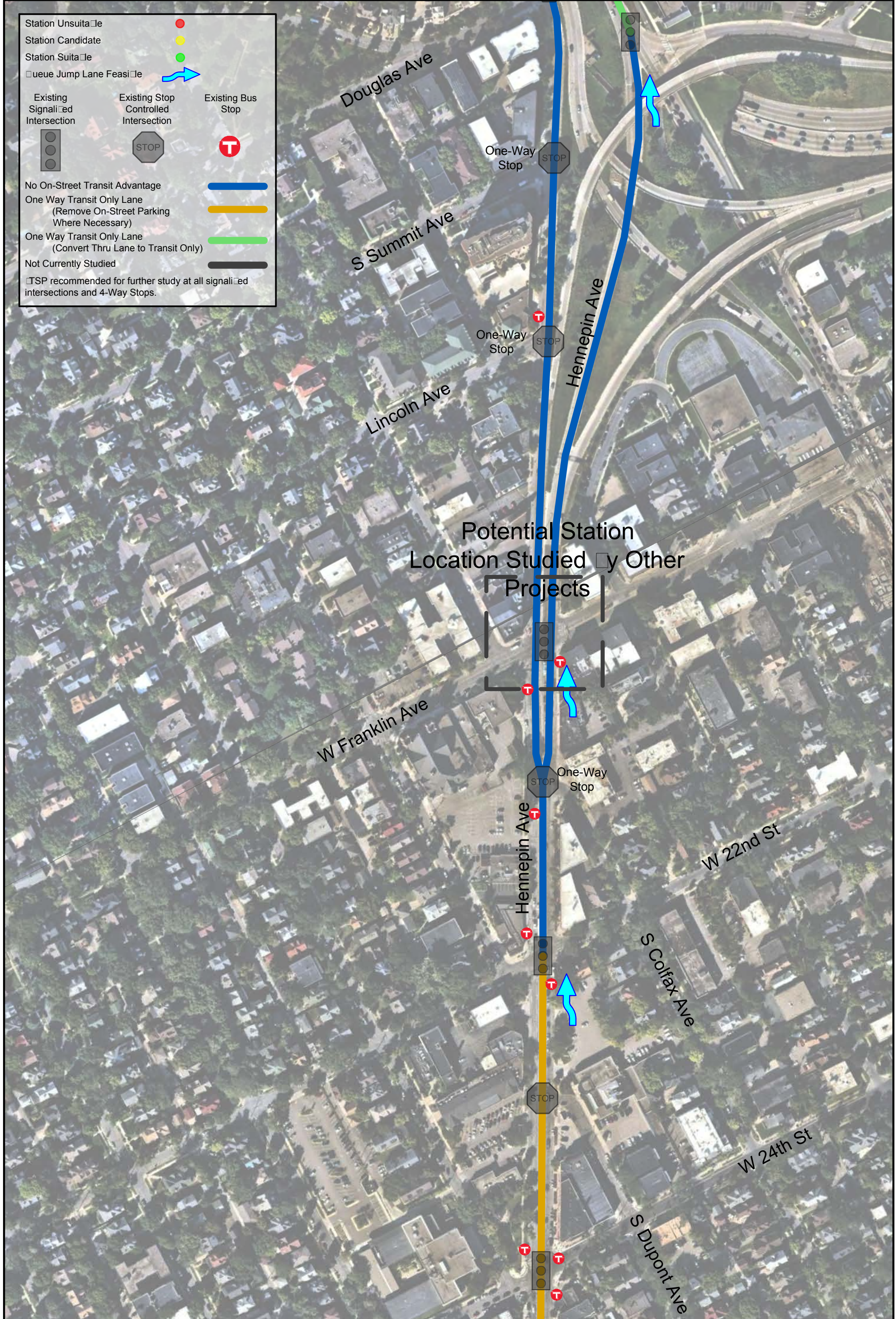


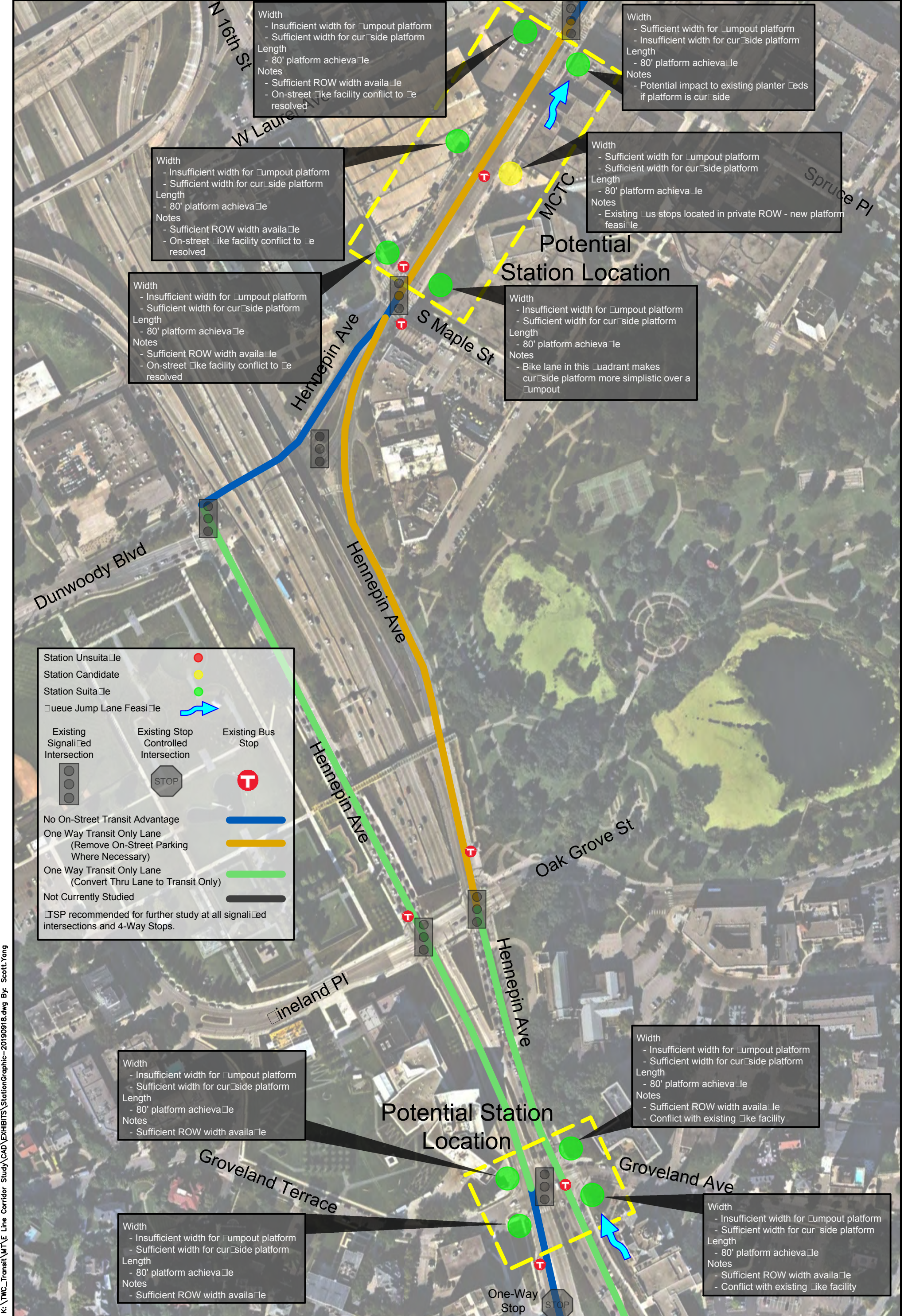
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Station Unsuitable	
Station Candidate	
Station Suitable	
Queue Jump Lane Feasible	
Existing Signalized Intersection	
Existing Stop Controlled Intersection	
Existing Bus Stop	
No On-Street Transit Advantage	
One Way Transit Only Lane (Remove On-Street Parking Where Necessary)	
One Way Transit Only Lane (Convert Thru Lane to Transit Only)	
Not Currently Studied	

TSP recommended for further study at all signalized intersections and 4-Way Stops.





Width
 - Insufficient width for platform
 - Sufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - Sufficient ROW width available
 - On-street bike facility conflict to be resolved

Width
 - Sufficient width for platform
 - Insufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - Potential impact to existing planters if platform is curbside

Width
 - Insufficient width for platform
 - Sufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - Sufficient ROW width available
 - On-street bike facility conflict to be resolved

Width
 - Sufficient width for platform
 - Sufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - Existing bus stops located in private ROW - new platform feasible

Width
 - Insufficient width for platform
 - Sufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - Sufficient ROW width available
 - On-street bike facility conflict to be resolved

Width
 - Insufficient width for platform
 - Sufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - Bike lane in this quadrant makes curbside platform more simplistic over a platform

Station Unsuitable (Red dot)
 Station Candidate (Yellow dot)
 Station Suitable (Green dot)
 Queue Jump Lane Feasible (Blue arrow)

Existing Signalized Intersection (Traffic light icon)
 Existing Stop Controlled Intersection (STOP sign icon)
 Existing Bus Stop (T icon)

No On-Street Transit Advantage (Blue line)
 One Way Transit Only Lane (Remove On-Street Parking Where Necessary) (Yellow line)
 One Way Transit Only Lane (Convert Thru Lane to Transit Only) (Green line)
 Not Currently Studied (Grey line)

TSP recommended for further study at all signalized intersections and 4-Way Stops.

Width
 - Insufficient width for platform
 - Sufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - Sufficient ROW width available

Width
 - Insufficient width for platform
 - Sufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - Sufficient ROW width available
 - Conflict with existing bike facility

Width
 - Insufficient width for platform
 - Sufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - Sufficient ROW width available

Width
 - Insufficient width for platform
 - Sufficient width for curbside platform
 Length
 - 80' platform achievable
 Notes
 - Sufficient ROW width available
 - Conflict with existing bike facility

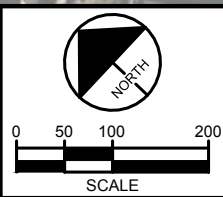
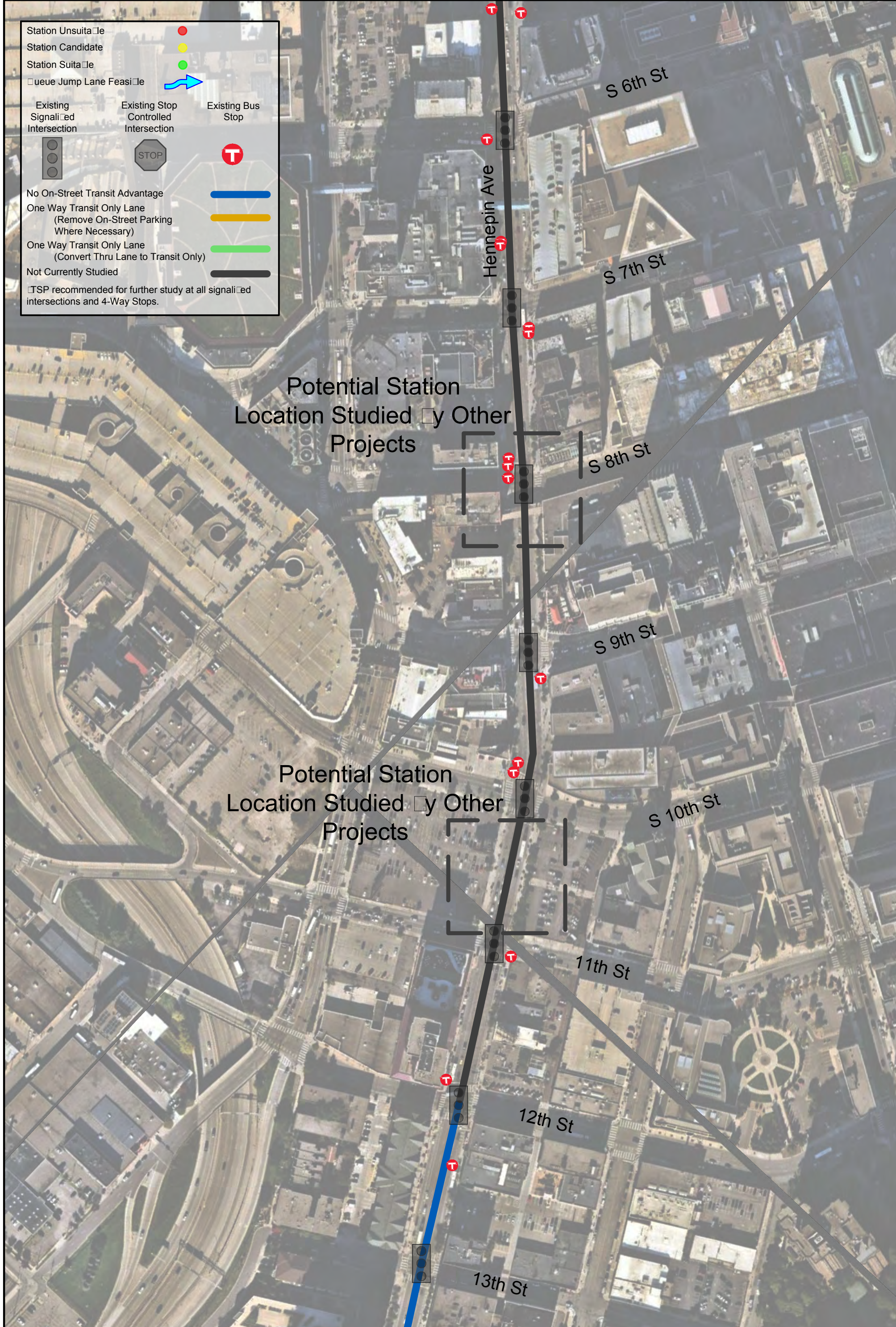
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Station Unsuitable	
Station Candidate	
Station Suitable	
Queue Jump Lane Feasible	
Existing Signalized Intersection	
Existing Stop Controlled Intersection	
Existing Bus Stop	
No On-Street Transit Advantage	
One Way Transit Only Lane (Remove On-Street Parking Where Necessary)	
One Way Transit Only Lane (Convert Thru Lane to Transit Only)	
Not Currently Studied	

TSP recommended for further study at all signalized intersections and 4-Way Stops.

Potential Station Location Studied by Other Projects

Potential Station Location Studied by Other Projects



Station Unsuitable (Red dot)
 Station Candidate (Yellow dot)
 Station Suitable (Green dot)
 Queue Jump Lane Feasible (Blue arrow)

Existing Signalized Intersection (Traffic light icon)
 Existing Stop Controlled Intersection (STOP sign icon)
 Existing Bus Stop (T icon)

No On-Street Transit Advantage (Blue line)
 One Way Transit Only Lane (Remove On-Street Parking Where Necessary) (Yellow line)
 One Way Transit Only Lane (Convert Thru Lane to Transit Only) (Green line)
 Not Currently Studied (Black line)

TSP recommended for further study at all signalized intersections and 4-Way Stops.

Potential Station Location

Width
 - Sufficient width for curbside platform
 - Insufficient width for curbside platform

Length
 - 80' platform available

Notes
 - Building directly adjacent to sidewalk/ROW
 - Expansion into ROW not feasible
 - Potential conflict with apartment patio

Potential Station Location

Width
 - Sufficient width for curbside platform
 - Sufficient width for curbside platform

Length
 - 80' platform available

Notes
 - Sufficient ROW width available
 - On-street bike facility conflict to be resolved

Potential Station Location

Width
 - Sufficient width for curbside platform
 - Insufficient width for curbside platform

Length
 - 80' platform available

Notes
 - Potential impact to existing planter beds if platform is curbside

Potential Station Location

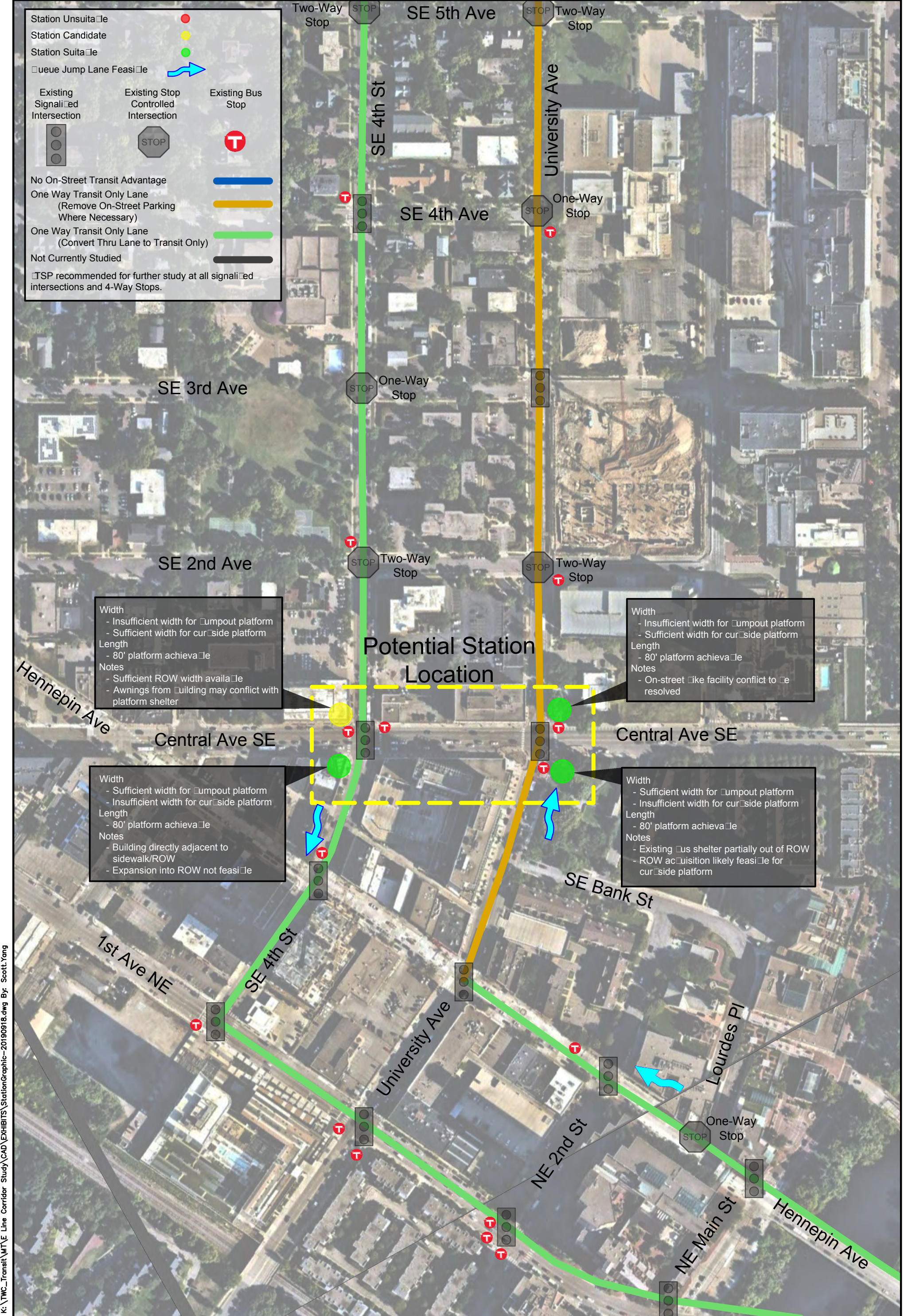
Width
 - Sufficient width for curbside platform
 - Sufficient width for curbside platform

Length
 - 80' platform available

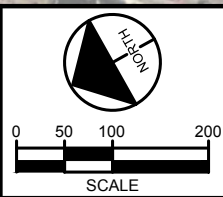
Notes
 - Sufficient ROW width available
 - On-street bike facility conflict to be resolved

Potential Station Location Studied by Other Projects

Potential Station Location Studied by Other Projects



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Station Unsuitable	●
Station Candidate	●
Station Suitable	●
Queue Jump Lane Feasible	➔
Existing Signalized Intersection	
Existing Stop Controlled Intersection	
Existing Bus Stop	
No On-Street Transit Advantage	
One Way Transit Only Lane (Remove On-Street Parking Where Necessary)	
One Way Transit Only Lane (Convert Thru Lane to Transit Only)	
Not Currently Studied	
TSP recommended for further study at all signalized intersections and 4-Way Stops.	

Two-Way Stop SE 12th Ave One-Way Stop

Two-Way Stop

SE 11th Ave

Potential Station Location

Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - Sufficient ROW width available

Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
Length
 - 60-70' platform achievable
Notes
 - Sufficient ROW width available
 - Apartment stairs may be impacted curbside

SE 10th Ave

Width
 - Sufficient width for bumpout platform
 - Insufficient width for curbside platform
Length
 - 70-80' platform achievable
Notes
 - ROW acquisition would likely be required
 - Potential conflict with I-35 NB merging traffic
 - On-street bike facility conflict to be resolved

Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - Sufficient ROW width available
 - On-street bike facility conflict to be resolved

Frontage Road

I-35W

Frontage Road

SE 8th Ave

SE 4th St

University Ave

SE 7th Ave

Potential Station Location

Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
Length
 - 80' platform achievable
Notes
 - Sufficient ROW width available

Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
Length
 - 70-80' platform achievable
Notes
 - Sufficient ROW width available

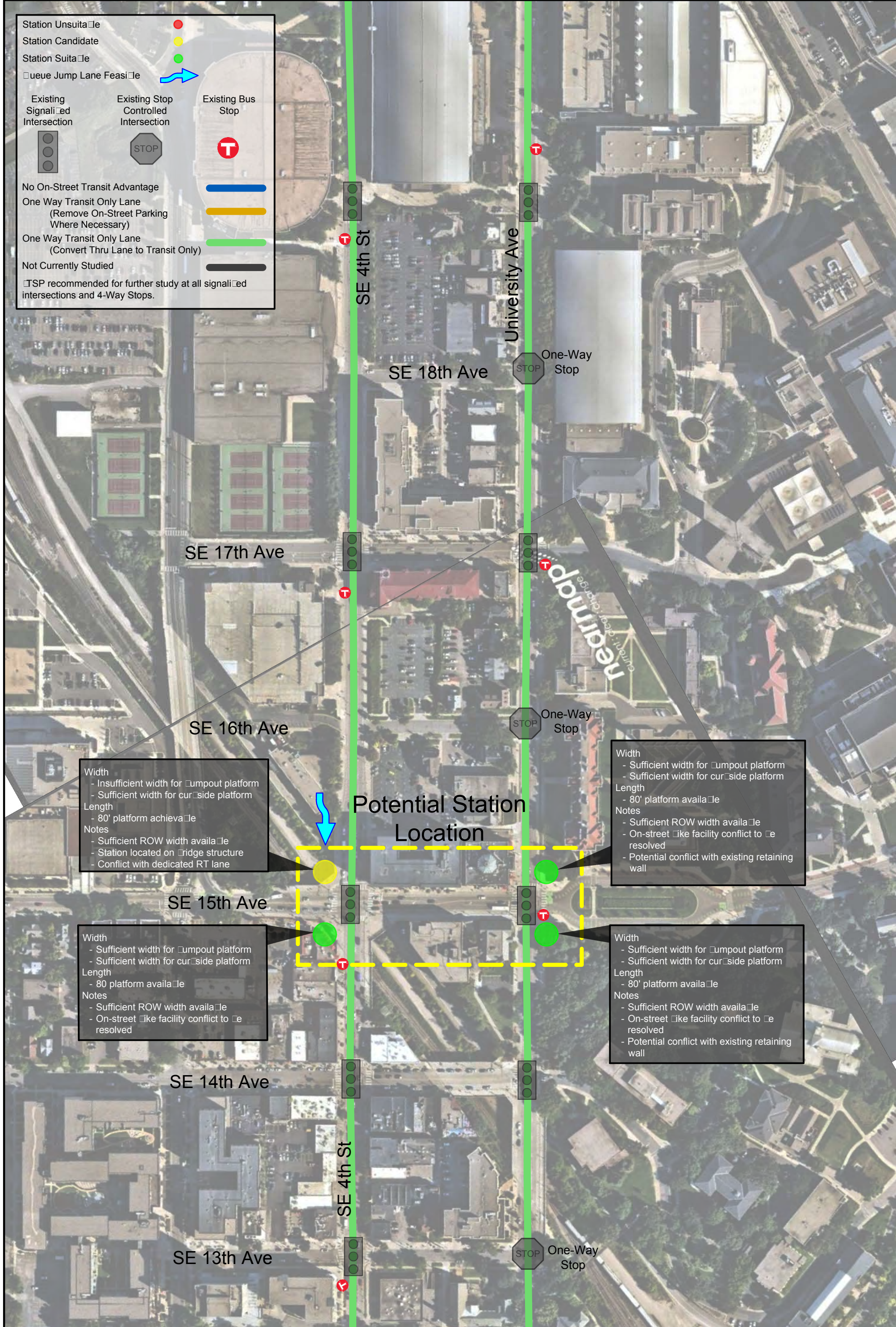
SE 6th Ave

Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
Length
 - 70-80' platform achievable
Notes
 - Sufficient ROW width available

Width
 - Sufficient width for bumpout platform
 - Sufficient width for curbside platform
Length
 - 70-80' platform achievable
Notes
 - Sufficient ROW width available
 - Potential conflict with restaurant seating

Sep. 19 2019 03:49 pm K:\TWC_Transit\MTVE Line Corridor Study\CAD\EXHIBITS\StationGraphic-20190918.dwg By: Scott.Yang

Station Unsuitable	●
Station Candidate	●
Station Suitable	●
Queue Jump Lane Feasible	➔
Existing Signalized Intersection	
Existing Stop Controlled Intersection	
Existing Bus Stop	
No On-Street Transit Advantage	
One Way Transit Only Lane (Remove On-Street Parking Where Necessary)	
One Way Transit Only Lane (Convert Thru Lane to Transit Only)	
Not Currently Studied	
TSP recommended for further study at all signalized intersections and 4-Way Stops.	



Width

- Insufficient width for bumpout platform
- Sufficient width for curbside platform

Length

- 80' platform achievable

Notes

- Sufficient ROW width available
- Station located on bridge structure
- Conflict with dedicated RT lane

Width

- Sufficient width for bumpout platform
- Sufficient width for curbside platform

Length

- 80' platform available

Notes

- Sufficient ROW width available
- On-street bike facility conflict to be resolved
- Potential conflict with existing retaining wall

Width

- Sufficient width for bumpout platform
- Sufficient width for curbside platform

Length

- 80' platform available

Notes

- Sufficient ROW width available
- On-street bike facility conflict to be resolved

Width

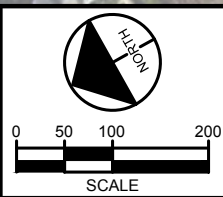
- Sufficient width for bumpout platform
- Sufficient width for curbside platform

Length

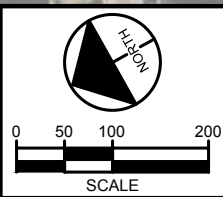
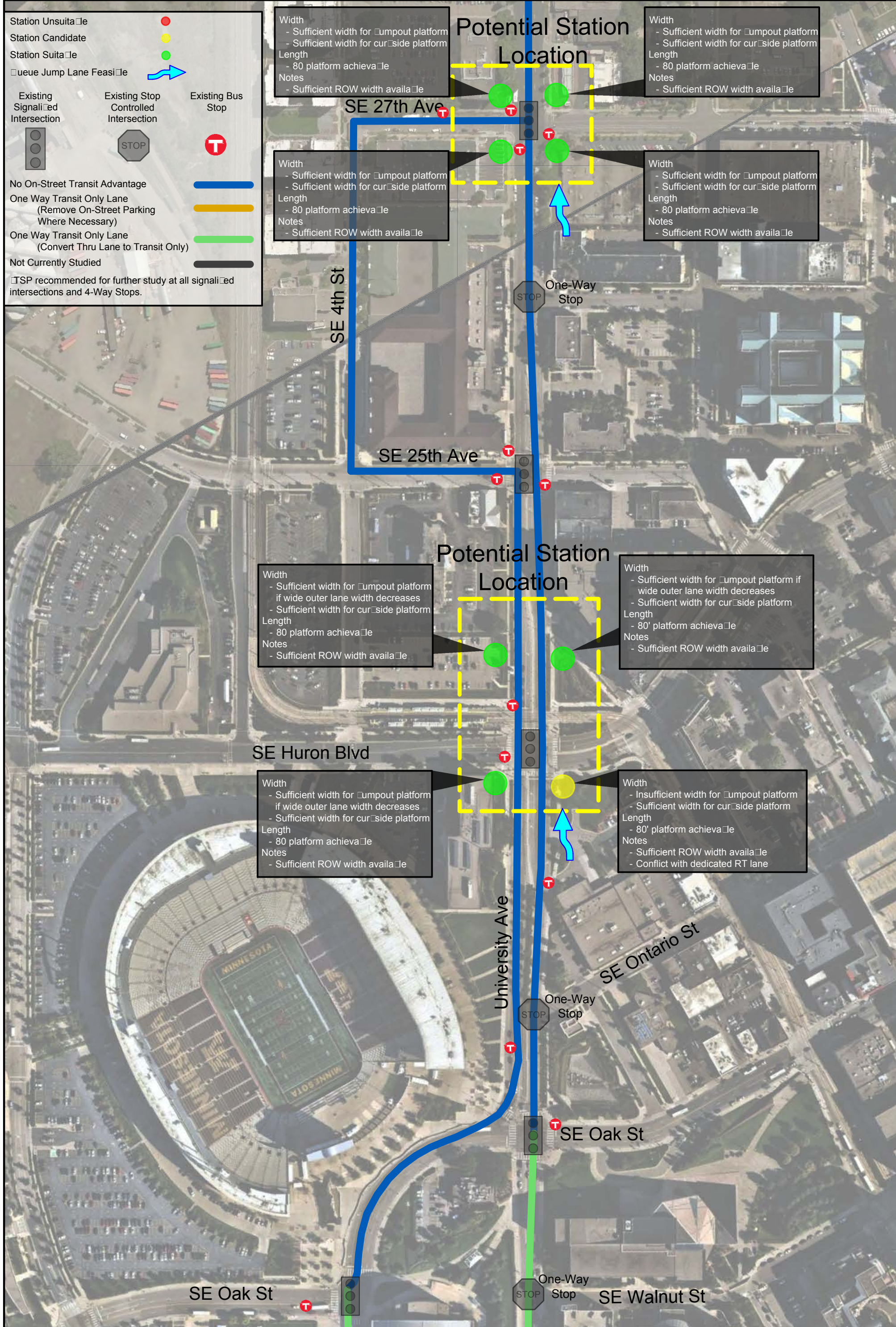
- 80' platform available

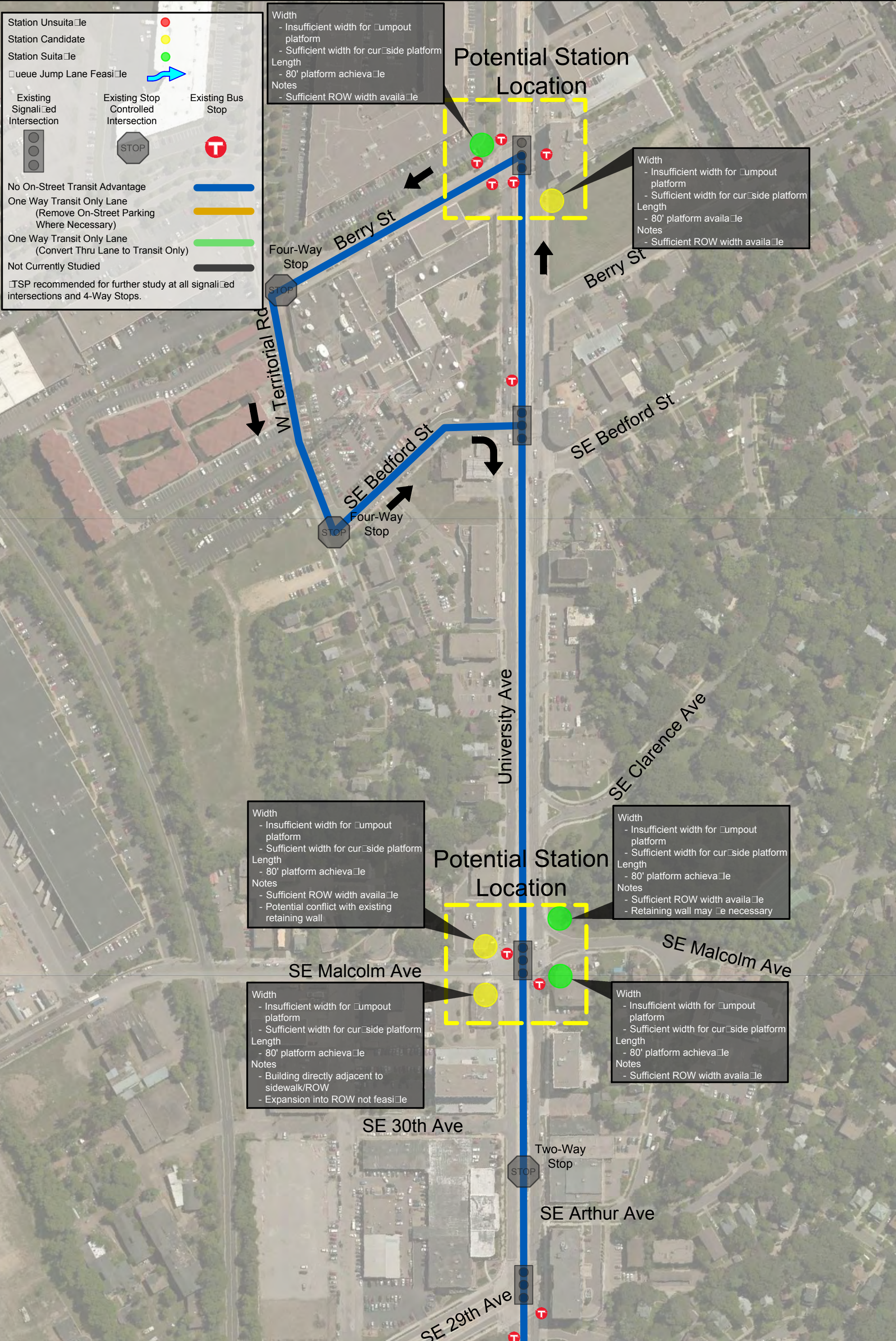
Notes

- Sufficient ROW width available
- On-street bike facility conflict to be resolved
- Potential conflict with existing retaining wall



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Station Unsuitable (Red circle)

Station Candidate (Yellow circle)

Station Suitable (Green circle)

Queue Jump Lane Feasible (Blue arrow)

Existing Signalized Intersection (Traffic light icon)

Existing Stop Controlled Intersection (STOP sign icon)

Existing Bus Stop (Red T icon)

No On-Street Transit Advantage (Blue line)

One Way Transit Only Lane (Remove On-Street Parking Where Necessary) (Yellow line)

One Way Transit Only Lane (Convert Thru Lane to Transit Only) (Green line)

Not Currently Studied (Black line)

TSP recommended for further study at all signalized intersections and 4-Way Stops.

Width

- Insufficient width for curbside platform
- Sufficient width for curbside platform

Length

- 80' platform achievable

Notes

- Sufficient ROW width available

Potential Station Location

Width

- Insufficient width for curbside platform
- Sufficient width for curbside platform

Length

- 80' platform available

Notes

- Sufficient ROW width available

Width

- Insufficient width for curbside platform
- Sufficient width for curbside platform

Length

- 80' platform achievable

Notes

- Sufficient ROW width available
- Potential conflict with existing retaining wall

Potential Station Location

Width

- Insufficient width for curbside platform
- Sufficient width for curbside platform

Length

- 80' platform achievable

Notes

- Sufficient ROW width available
- Retaining wall may be necessary

Width

- Insufficient width for curbside platform
- Sufficient width for curbside platform

Length

- 80' platform achievable

Notes

- Building directly adjacent to sidewalk/ROW
- Expansion into ROW not feasible

Width

- Insufficient width for curbside platform
- Sufficient width for curbside platform

Length

- 80' platform achievable

Notes

- Sufficient ROW width available

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E Line

E Line Corridor Study

Appendix D: Capital Cost Estimation Methodology and
Assumptions

October 2019

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Introduction

The Metro Transit E Line Bus Rapid Transit project is a planned improvement project that will substantially replace parts of Route 6 in the Hennepin Avenue corridor, one of the region’s busiest transit corridors. Route 6 is the primary transit route along Hennepin Avenue and runs approximately 12 miles from Stadium Village to Southdale Center. This improvement project will provide better amenities, faster and more reliable service, and a better overall transit experience.

During the E Line Corridor Study, a cost estimate was prepared for each of the potential alignment alternatives along the corridor, including the current known E Line alignment. The cost estimate reflects the various refinements that were made during the corridor study based on the existing conditions of the alternative routes. This report summarizes the assumptions that were used to develop the cost estimate.

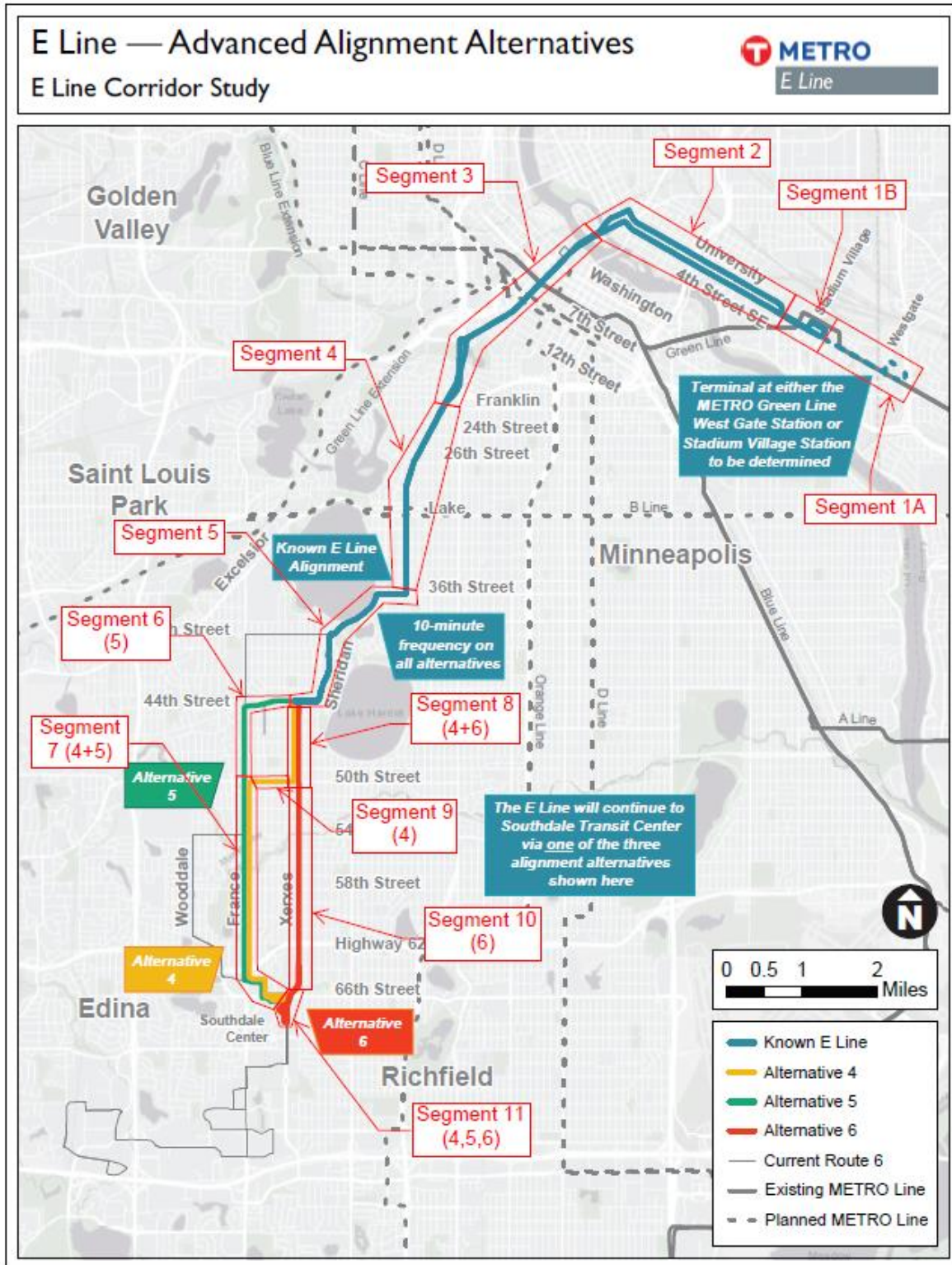
Alternatives Overview

Six different potential alignment alternatives were considered when assembling the cost estimate based on a graphic received by Metro Transit called “E Line – Advanced Alignment Alternatives”. Figure 1 shows this graphic and lays out additional segment splits necessary for cost estimating to come up with a total cost for the E Line project. Each alternative alignment will run for approximately 12 miles from either West Gate Station or Stadium Village southward toward the Southdale Center. The route will vary from 44th Street to Southdale Center depending on the alignment. Table 1 below and Figure 1 below highlight the six potential alignments and their route combinations that were considered when pulling quantities for the cost estimate.

Table 1: Alignment Alternatives

Alignment	Alignment Route Descriptions
1	Alt 4 (Segments 11, 7, 9 & 8) + Known E Line (Segments 5, 4, 3, & 2) + Segment 1A&1B
2	Alt 5 (Segments 11, 7, & 6) + Known E Line (Segments 5, 4, 3, & 2) + Segment 1A&1B
3	Alt 6 (Segments 11, 10, & 8) + Known E Line (Segments 5, 4, 3, & 2) + Segment 1A&1B
4	Alt 4 (Segments 11, 7, 9 & 8) + Known E Line (Segments 5, 4, 3, & 2) + Segment 1B
5	Alt 5 (Segments 11, 7, & 6) + Known E Line (Segments 5, 4, 3, & 2) + Segment 1B
6	Alt 6 (Segments 11, 10, & 8) + Known E Line (Segments 5, 4, 3, & 2) + Segment 1B

Figure 1: Advanced Alignment Alternatives



Capital Cost Estimate Methodology

Capital cost estimates were prepared using a similar format to the D Line cost estimate that was provided to Kimley-Horn by Metro Transit as a template for the expected level of detail. The cost estimates were pulled together for the entirety of the E Line corridor and summarized into the alignment alternatives described above. The categories of items included in the cost estimate include platform construction, transit advantages, station elements (shelter/pylon purchases, fare collection, & station technology) and corridor technology. Soft costs were not included for professional/technical services such as engineering, construction services, insurance, and owner's costs as part of this cost estimate. Additional vehicle fleet costs and potential right-of-way acquisition costs were also excluded from the cost estimates that Kimley-Horn completed.

The following parameters were used to develop the capital cost estimate:

- **Base Year:** Year 2019 (Costs were not inflated to a specific anticipated construction year)
- **Allocated Contingencies:** Allocated contingencies are contingencies that are associated with each individual cost estimate category. These contingencies are meant to compensate for potential unforeseen work, quantity changes, and changes in unit costs as the project moves on to more detailed phases. The level of allocated contingency per item reflects the potential variability of those items. The following contingencies were used for the capital cost estimates:
 - Platform Construction – 20%
 - Transit Advantages:
 - TSP Implementations and Queue Jump Lane Additions – 20%
 - Transit Only Lanes – 40%
 - Shelter/Pylon Purchases – 20%
 - Fare Collection – 10%
 - Station Technology – 10%

- Corridor Technology – 20%
- **Unallocated Contingency:** A 20% unallocated contingency is included in the capital cost estimates. This contingency is applied to the total estimated capital cost for each alternative and is added to any specific estimating contingencies that are included or allocated to the various cost categories.

Corridor Technology & Fiber Cost Details

This category includes all costs associated with corridor technology & fiber/communications necessary for a new BRT line. The itemized list below and unit costs for these items were provided by Metro Transit from the D Line bus rapid transit project cost estimate. These values were inflated to match the current year (2019) and an estimated cost per linear foot was established for utilization on this cost estimate.

The items intended to be included in the overall category are listed below:

- Directional Boring
- Conduit
- Locate Wire
- Handhole
- Locate Post
- 144-strand cable (Furnish & Install)
- Splice & case
- OH/Admin

Stations

This category includes costs associated with station platform construction, shelters, pylons, fare collection machines, and various other technology. All unit costs were provided by Metro Transit, and the typical unit cost line items in this category include:

- Platform Construction – Descriptions of the types of platform construction and an explanation of unit pricing is shown below:
 - Standard
 - This includes standard “Pocket Construction” where platforms are constructed independently of other roadway reconstruction projects in the area. This includes all stations outside of downtown (defined below) and the unit price was provided by Metro Transit from the D Line Estimate.
 - Urban (Downtown)
 - This includes the cost for construction of station platforms in an urban environment, which included all stations north of Franklin Ave except for those that are coordinated with roadway reconstruction projects. The unit price for these stations were calculated by averaging the bid prices received and engineer’s estimate from the 8th Street BRT project (spreadsheet provided by Metro Transit). Due to the complexity of the work in downtown the cost for these stations are slightly higher than standard platform construction.
 - Hennepin North (Coordinated w/Street Project)
 - This includes the cost of station construction between 12th St and Washington Ave in Downtown. Most of the station infrastructure will already be in place when E Line is constructed in coordination with the Hennepin Ave project. Based on this a unit price of \$25,000 was used for each station, per Metro Transit’s direction, to account for the additional work that may be required.
 - Hennepin South (Coordinated w/Street Project)
 - Some of the infrastructure will also be in place between 36th Ave and Lake Street when E Line is constructed, and these stations were quantified separately per Metro Transit direction. The unit price is the

same as standard platform construction per direction from Metro Transit.

- Shelter – Includes two large shelters per station (one per platform)
- Pylon – Includes two 2nd generation pylons per station (one per platform)
- Fare Collection – Includes four ticket vending machines (TVM) and two fare card validators (FCV) per station
- Technology – Includes TVM cameras, switch, FP module, Power Supply, Support, accessories, computer, mounting, warranty, and accessories

Depending on the individual site constraints present at each platform location, station platforms will be constructed as a bumpout or a curbside configuration with a minimum length of 60 feet. This estimate did not designate the station type but applied the same unit cost at this level of design. A description of the station intersections included in each alignment alternative are described below:

The following stations are included in all alternative alignments:

- University Ave/4th St and 15th Ave
- University Ave/4th St and 10th Ave
- University Ave/4th St and 6th Ave
- University Ave/4th St and Central Ave SE
- 1st Ave and 2nd St
- Hennepin Ave and 2nd St
- Hennepin Ave and MCTC
- Hennepin Ave and Groveland Ave
- Hennepin Ave and Franklin Ave
- Uptown Transit Station
- Hennepin Ave and 25th st
- Hennepin Ave and 33rd St
- Hennepin Ave and 36th St
- Richfield Road and William Berry Pkwy
- Sheridan Ave and 39th St
- Stadium Village
- Westgate Station (Only included in segment 1A Alternatives)

The following are proposed stations along the Alternative 4 alignment from Xerxes Ave and 44th Street to the Southdale Center:

- Upton Ave/Sheridan Ave & 43rd St
- Xerxes Ave and 47th St

- Xerxes Ave and 50th St
- France Ave and 47th St
- France Ave and 50th St
- France Ave and 54th St
- France Ave and 58th St
- France Ave and 62nd St
- 65th St and Fairview Hospital
- Southdale Center

The following stations are proposed stations along the Alternative 5 alignment from Xerxes Ave and 44th Street to the Southdale Center:

- 44th St and Chowen Ave
- France Ave and Sunnyside Rd
- France Ave and 47th St
- France Ave and 50th St
- France Ave and 54th St
- France Ave and 58th St
- France Ave and 62nd St
- 65th St and Fairview Hospital
- Southdale Center

The following stations are proposed stations along the Alternative 6 alignment from Xerxes Ave and 44th Street to the Southdale Center:

- Upton Ave/Sheridan Ave & 43rd St
- Xerxes Ave and 47th St
- Xerxes Ave and 50th St
- Xerxes Ave and 53rd St
- Xerxes Ave and 56th St
- Xerxes Ave and 60th St
- Xerxes Ave and 64th
- Southdale Center

The following stations will have most of the required infrastructure built as part of the Hennepin Avenue Reconstruction Project (anticipated construction starting in 2020). Costs were reduced for these stations as they will be constructed prior to the rest of E Line:

- Hennepin Ave/4th St and 3rd St
- Hennepin Ave and 5th St
- Hennepin Ave and 8th St
- Hennepin Ave/10th St and 11th St

Transit Advantages

The E Line corridor study also included costs for transit advantages in the capital cost estimate. Transit advantages include anything that helps improve the travel time and level service for the BRT system. Unit costs were developed for the following transit advantages and each alignment alternative was studied to determine where these could be implemented:

- Transit Signal Priority (TSP) Implementation at existing signal – This cost includes required modifications to an existing traffic signal
- TSP Implementation at existing 4-way stop – This cost includes constructing a new traffic signal with TSP capabilities.
- Addition of Queue Jump Lane – Includes costs for signal modifications and roadway improvements (signing/striping only).
- Addition of Transit Only Lane (Striping Modifications) – Includes costs for signing and striping modifications only (no roadway improvements)
- Addition of Transit Only Lane (Curb & Striping Modifications) – Includes costs for pavement, aggregate base, excavation, and curb & gutter modifications.
 - Required if modifications to curb will be necessary

Capital Cost Estimate Summary

Table 2 below summarizes the capital costs for each of the alignment alternatives described above. Costs are shown in 2019 dollars.

COST CATEGORY	Alignment Alternative				
	Alternative 4	Alternative 5	Alternative 6	Known E Line (to Stadium Village Station)	Known E Line (to Westgate Station)
Platform Construction	\$7,000,000	\$7,880,000	\$6,130,000	\$16,690,000	\$18,560,000
Shelter/Pylon Purchases	\$1,410,000	\$1,590,000	\$1,240,000	\$3,180,000	\$3,540,000
Fare Collection	\$780,000	\$870,000	\$680,000	\$2,140,000	\$2,330,000
Station Technology	\$260,000	\$300,000	\$230,000	\$700,000	\$760,000
Corridor Technology	\$460,000	\$450,000	\$320,000	\$860,000	\$960,000
Construction Total	\$10,180,000	\$12,130,000	\$9,450,000	\$25,730,000	\$28,360,000
Non-fleet Subtotal	\$10,180,000	\$12,130,000	\$9,450,000	\$25,730,000	\$28,360,000
Unallocated Contingency	\$2,040,000	\$2,430,000	\$1,890,000	\$5,140,000	\$5,670,000
Non-fleet Project Total	\$12,220,000	\$14,560,000	\$11,340,000	\$30,870,000	\$34,030,000



E Line

E Line Corridor Study

Appendix E

October 2019

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Table 1: E Line Cost Estimates

E Line Corridor - Cost Alternatives
10/29/2019

ALTERNATIVE	Project Quantities					Extension (Rounded Numbers - Split By Alternative)				
	Known ELine + Seg 1A&1B	Known ELine + Seg 1B	Alternative 4	Alternative 5	Alternative 6	Known ELine + Seg 1A&1B	Known ELine + Seg 1B	Alternative 4	Alternative 5	Alternative 6
PLATFORM CONSTRUCTION						\$ 18,560,000	\$ 16,690,000	\$ 7,000,000	\$ 7,880,000	\$ 6,130,000
Urban (Downtown)	26	22	0	0	0					
Standard	10	10	16	18	14					
Hennepin North (Coordinated w/ Street Project)	8	8	0	0	0					
Hennepin South (Coordinated w/Street Project)	4	4	0	0	0					
TRANSIT ADVANTAGES						\$ 2,210,000	\$ 2,160,000	\$ 270,000	\$ 1,040,000	\$ 850,000
TSP Implementation at existing signal	83	79	12	12	7					
TSP Implementation at existing 4-way stop	0	0	0	2	2					
Add Queue Jump Lane	20	20	6	9	1					
Add Transit Only Lane (Striping Modifications)	34489	34489	2192	2192	0					
Add Transit Only Lane (Curb & Striping Modifications)	0	0	0	0	0					
SHELTER / PYLON PURCHASES						\$ 3,540,000	\$ 3,180,000	\$ 1,410,000	\$ 1,590,000	\$ 1,240,000
Small	0	0	0	0	0					
Medium	0	0	0	0	0					
Large	40	36	16	18	14					
Pylon (2nd Gen)	40	36	16	18	14					
FARE COLLECTION						\$ 2,330,000	\$ 2,140,000	\$ 780,000	\$ 870,000	\$ 680,000
TVM	96	88	32	36	28					
FCV	48	44	16	18	14					
TVM Cameras	96	88	32	36	28					
STATION TECHNOLOGY						\$ 760,000	\$ 700,000	\$ 260,000	\$ 300,000	\$ 230,000
Ethernet Switch										
Switch	48	44	16	18	14					
SFP Module	88	80	32	36	28					
Power Supply	40	36	16	18	14					
Support	40	36	16	18	14					
Accessories	192	176	64	72	56					
Passenger Info System										
Computer	48	44	16	18	14					
Mounting	48	44	16	18	14					
Warranty	48	44	16	18	14					
Accessories	48	44	16	18	14					
CORRIDOR TECHNOLOGY						\$ 960,000	\$ 860,000	\$ 460,000	\$ 450,000	\$ 320,000
Fiber Optic installation (Linear Feet)	55311	49409	26458	26176	18738					
CONSTRUCTION TOTAL						\$ 28,360,000	\$ 25,730,000	\$ 10,180,000	\$ 12,130,000	\$ 9,450,000
STAFF TIME										
ENGINEERING										
ROW										
NON-FLEET SUBTOTAL						\$ 28,360,000	\$ 25,730,000	\$ 10,180,000	\$ 12,130,000	\$ 9,450,000
UNALLOCATED CONTINGENCY						\$ 5,670,000	\$ 5,140,000	\$ 2,040,000	\$ 2,430,000	\$ 1,890,000
NON-FLEET PROJECT TOTAL						\$ 34,030,000	\$ 30,870,000	\$ 12,220,000	\$ 14,560,000	\$ 11,340,000
FLEET										
Diesel articulated bus						\$ -	\$ -	\$ -	\$ -	\$ -
Electric Increment						\$ -	\$ -	\$ -	\$ -	\$ -
Project total with base (diesel) fleet						\$ 34,030,000	\$ 30,870,000	\$ 12,220,000	\$ 14,560,000	\$ 11,340,000
Project total with electric fleet						\$ 34,030,000	\$ 30,870,000	\$ 12,220,000	\$ 14,560,000	\$ 11,340,000



E Line

E Line Corridor Study

Appendix F

October 2019

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Date: September 21, 2019
To: Lisa Wall and Mary Karlsson, Kimley-Horn
From: Ashutosh Kumar, Connetics Transportation Group, Inc. (CTG)
Re: E-Line Corridor Study – Task 2 Ridership Tech Memo

Introduction

This technical memorandum summarizes CTG’s assessment of the ridership potential for the advanced E Line Corridor alternatives. The E Line is a planned rapid bus (arterial BRT) line that will substantially replace parts of Route 6 in the Hennepin Avenue corridor in Minneapolis. The purpose of the ridership task was to develop order of magnitude ridership forecasts for the E Line alternatives using methodologies that do not require detailed level of transit service inputs, generate results that can be compared across alternatives, and incorporate the impacts of both E Line and the underlying local bus services. Metro Transit staff provided the three advanced alternatives to be evaluated for ridership potential.

The technical memorandum provides a brief summary of the existing conditions in the E Line corridor, followed by an overview of the modeled alternatives, ridership results and the key findings.

Existing Conditions

Existing Service Levels

The E Line corridor is currently served by Route 6, primarily between Southdale Transit Center and University of Minnesota (approximately 12 miles). Downtown Minneapolis is the key destination, with Route 6 serving the market every 6-7 minutes during the peak periods and every 10 minutes during the midday period on a weekday. Different patterns of Route 6 operate during the day, including trips that go further south to the Edinborough Industrial Park and to the northwest quadrant of Interstate 494 and Highway 100 in Edina. The local bus serves over 160 stops in each direction, operating at an average speed of 12.2 miles per hour. Other key routes that serve part of the corridor/market are Routes 2, 4, 12, 17, 113, 122, 535, and Green Line.

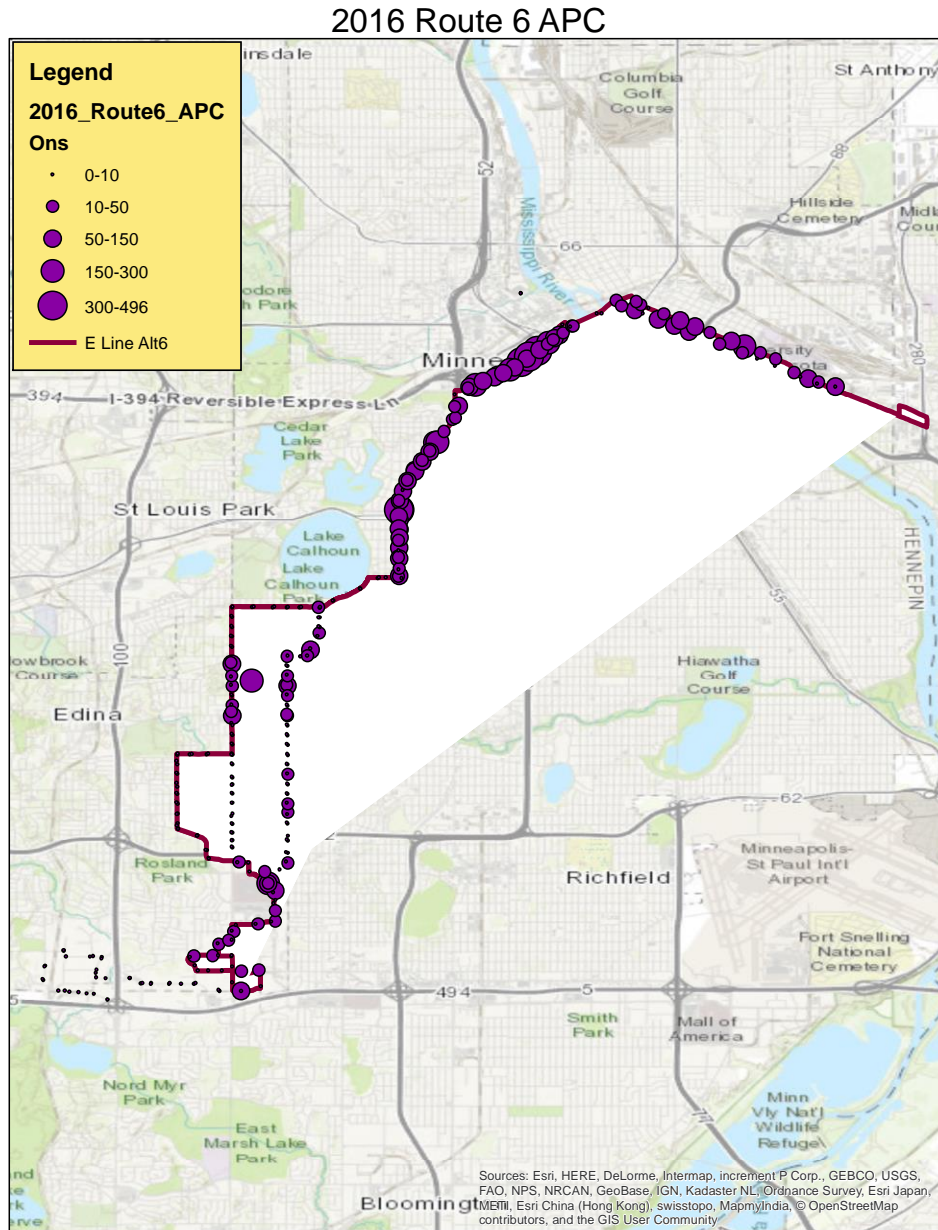
Existing Ridership Levels

Route 6 is one of the most productive routes in the Metro Transit system, averaging approximately 8,600 boardings per weekday in the year 2016 (when the last systemwide on-board survey was conducted in the region). 55 percent of the boardings on Route 6 occur during the AM and PM peak periods. 40 percent of the trips are from households without a car. The travel patterns are mainly home-oriented trips with 91 percent of the trips starting at home. Overall, 43 percent of the trips are home-based-work (HBW) trips and 48 percent of the trips are home-based-other (HBO) trips.

The primary destinations of the Route 6 riders are downtown (37 percent) and University of Minnesota (15 percent). 31 percent of the trips originate from the Hennepin Avenue portion of the route south of the downtown (i.e. in and around Uptown Transit Center area).

Figure 1 shows the 2016 ridership data on Route 6. A vast majority of the ridership activity (86 percent) occur at stops north of West 44th Street. The two Route 6 branches, along France Avenue and Xerxes Avenue, have relatively low but similar level of ridership activity.

Figure 1: Route 6 Stop-Level Boardings



Modeled Alternatives

Three alternatives were considered by Metro Transit for further evaluation based on the feedback received from Technical Advisory Committee, corridor stakeholders, policy makers, and the public. These proposed alternatives would provide 10-minute all day rapid bus service between Southdale Transit Center and Stadium Village Station/Westgate Station (terminus to be

determined). The E Line service would stop at 30 stops and on an average run at 15.5 miles per hour travel speed, a 20-25 percent improvement in run time compared to the existing Route 6 service.

Along with the proposed local bus service changes, the alternatives provide substantial increase in transit service in the corridor. The following summarizes the key changes to the service:

- University of Minnesota is served by six trips every hour during the peak and off-peak periods in all three alternatives compared to three to four trips every hour currently served by Route 6
- The number of trips serving downtown during the off-peak period goes up by three trips every hour under all three alternatives compared to the current Route 6 service
- Travel time on the E Line will be 20-25 percent faster than the time it currently takes on Route 6
- The three alternatives are similar in terms of vehicle miles and vehicle hours, except for the additional Route 36 service between Southdale Transit Center and Uptown Transit Center in Alternatives 4 and 5.

Table 1 shows that the existing Route 6 boardings along the three proposed alternatives are similar.

Figure 2: Modeled Alternatives

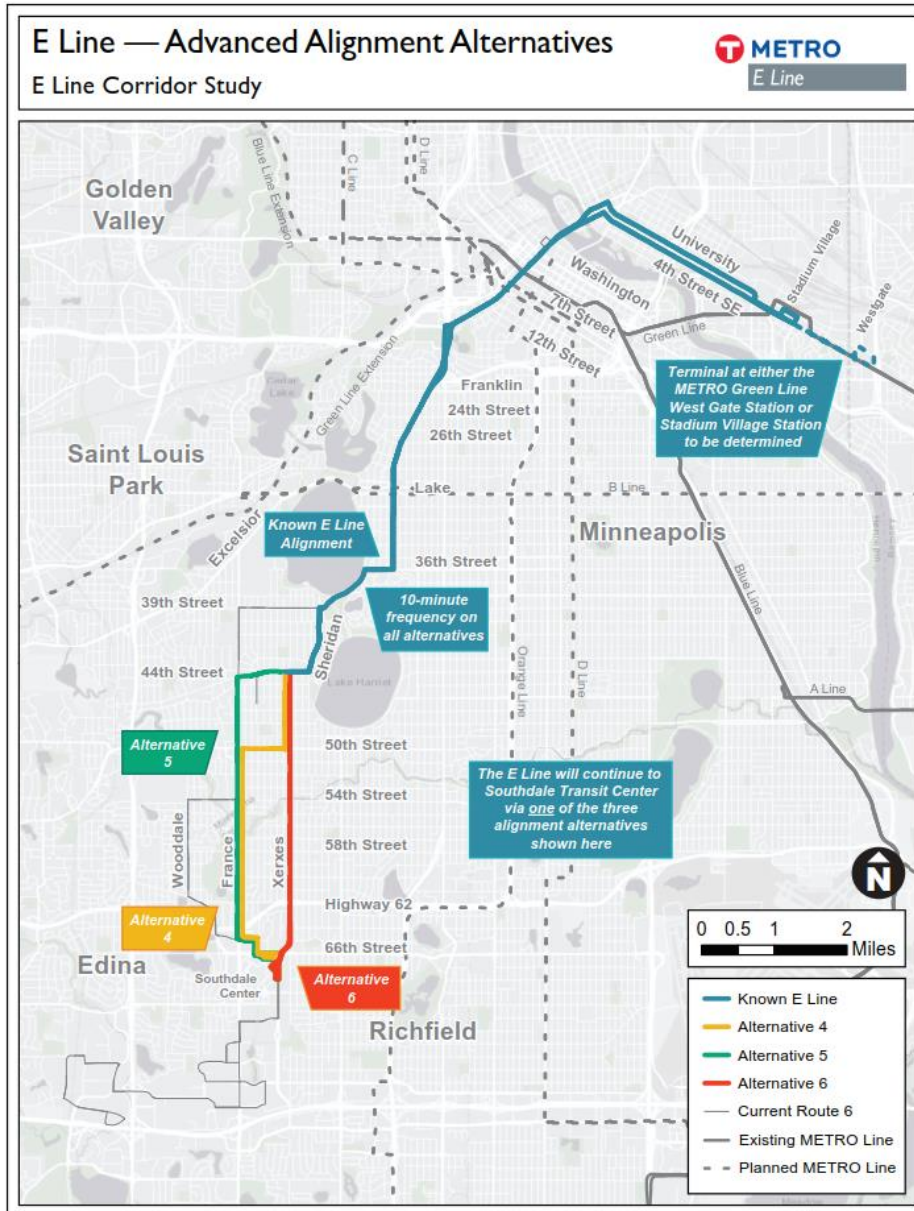


Table 1: Route 6 Boardings by Various E Line Segments (Refer to Figure 2 for Segment Definition)

Segment	Boardings
Common Segment (Xerxes & 44 th St to Univ & 27 th Ave)	7,400
Alt 4 Segment (Orange Segment)	410
Alt 5 Segment (Green Segment)	310
Alt 6 Segment (Red Segment)	400

Ridership Methodology

After internal discussions and considering the alternatives advanced for ridership evaluation, the study team decided to use STOPS model for ridership forecasting. STOPS has been successfully used for similar studies across the country. It provides detailed evaluation measures that were helpful in selecting/refining the final alternative (stop/segment-level activities, route-level impacts on competing/connecting routes, overall transfer activities, new transit trips, VMT impacts etc.). In addition, STOPS outputs can also be used for evaluating accessibility measures.

A reasonably well calibrated STOPS model from the ongoing Gold Line and Rush Line studies was readily available to the team, which could be used for the E Line corridor with minor adjustments within project schedule and budget. The model utilizes version v2.5 of STOPS (release date: 5/25/2018) and uses the 2016 systemwide on-board survey. The modeling years are 2016 (Current Year) and 2040 (Horizon Year) and represents an annual average weekday estimate of travel. It should be noted that this E Line STOPS model does not reflect the ongoing updates to the model based on FTA’s feedback on representation of park-and-ride trips in the region; although, this update is not likely to impact the E Line corridor analysis.

The initial ridership results from STOPS application showed high diversion of trips to the E Line from parallel/competing routes and appeared to be very sensitive to the “travel time savings” offered by E Line. It was proposed that a lower end of ridership estimates be developed by modeling another scenario where travel time savings on the E Line are half of the current estimates (i.e. average end-to-end speed on E Line is ~14 mph instead of ~15.5 mph). The lower speed may be more realistic north of Uptown Transit Center because of much higher ridership activities and denser land uses.

Ridership Results

STOPS provides both current year and horizon year estimates. A range of ridership estimates is presented in this section based on different assumptions on the travel time savings offered by E Line. The STOPS results suggest that the three alternatives are similar to each other in terms of ridership, which ranges from 8,600 to 10,300 on the E Line service and from 11,400 to 12,300 for the corridor in the current year 2016. This represents a 33%-43 percent increase in the overall

ridership in the corridor routes (E Line, Route 6, and Route 36). One-third of the increase is due to riders new to transit and the remaining two-third increase is due to diversion on trips from other routes in the system to the corridor routes because of the enhanced service.

The year 2040 ridership on Route 6 will increase by 15 percent (from 8,600 in 2016 to 9,900 in 2040) under the no build conditions (i.e. no changes to the Route 6 service), which reflects a generally built-out nature of the corridor. Similar to the current year estimates, a further 33-45 percent increase in ridership can be expected on the corridor routes in 2040 and the three alternatives will be similar in terms of 2040 ridership forecasts. The E Line ridership will range between 9,800 to 12,100, and the corridor ridership will be between 13,200 to 14,400. Tables 2 and 3 provide a summary of the current year and horizon year ridership estimates.

Table 4 shows the segment level boardings on E Line for the horizon year. Almost 87 percent of the boardings on the E Line occur in the common segment between the three alternatives, i.e. north of 44th Street.

Table 2: Current Year 2016 Ridership Estimates (Low- and High-End Estimates)

Route	Observed	Alt 4 Build		Alt 5 Build		Alt 6 Build	
		Low	High	Low	High	Low	High
E Line		8,600	10,100	8,700	9,900	9,200	10,300
Route 6	8,600	2,400	1,700	2,600	1,900	2,300	2,000
Route 36		400	400	300	300	-	-
Corridor Total	8,600	11,400	12,200	11,600	12,100	11,600	12,300
Change Observed	cf.	+33%	+42%	+35%	+41%	+35%	+43%

Table 3: Horizon Year 2040 Ridership Estimates (Low- and High-End Estimates)

Route	2040 No Build	2040 Alt 4 Build		2040 Alt 5 Build		2040 Alt 6 Build	
		Low	High	Low	High	Low	High
E Line		9,900	11,900	9,800	11,600	10,800	12,100
Route 6	9,900	2,900	2,000	3,200	2,200	2,600	2,300
Route 36		500	500	400	400		
Corridor Total	9,900	13,200	14,300	13,400	14,200	13,400	14,400
Change Build	cf. No	+33%	+44%	+35%	+43%	+35%	+45%

Table 4: Horizon Year 2040 Boardings on E Line by Various Segments

Segment	Alt 4	Alt 5	Alt 6
Common Segment (Xerxes & 44 th St to Univ & 27 th Ave)	8,600-10,600	8,800-10,400	9,400-10,800
Segment with Different Alignments (south of Xerxes & 44 th St)	1,200-1,300	1,000-1,100	1,300-1,300

Summary

The ridership forecasts suggest that all three alternatives are very similar from a ridership perspective. The year 2040 E Line ridership estimate is between 10,000-12,000, while the corridor 2040 ridership estimation will be in the range 13,000-14,500. Based on Metro's A Line experience and observed ridership elasticities, ridership can be expected to be on the lower end of the range provided above. In addition, similar to the existing Route 6 ridership activity, most (87 percent) of the boardings will occur north of 44th Street.



E Line

E Line Corridor Study

Appendix G

October 2019

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Date: September 26, 2019
To: Lisa Wall and Mary Karlsson, Kimley-Horn
From: Ashutosh Kumar, Connetics Transportation Group, Inc. (CTG)
Re: E-Line Corridor Study – Task 11 Aggregate Measures Evaluation Tech Memo (DRAFT)

Introduction

This technical memorandum summarizes the metrics used to evaluate the aggregate network impacts of the three advanced E Line alternatives. The E Line is a planned rapid bus (arterial BRT) line that will substantially replace parts of Route 6 in the Hennepin Avenue corridor in Minneapolis. The purpose of this task was to confirm that the build alternatives overall perform better than the existing service and to evaluate the differences between the three build alternatives in terms of aggregate network effects measures.

The technical memorandum provides a brief explanation of the measures used and the results to evaluate the network effects of the three advanced E Line alternatives.

Evaluation Measures and Results

Three measures were evaluated for the E Line study that provide overall network effects of the build alternatives. The range provided for the first two measures in the sections below represents two modeling scenarios used in STOPS to provide a potential ridership range for E Line.

1. Automobile Person Miles Traveled (PMT) Savings

This measure evaluates the extent of the reduction in automobile travel in the region because of the improvements in transit service. The automobile travel savings will be due to the diversion of automobile trips to transit.

This measure is derived directly from STOPS output. STOPS estimates new transit trips and distance between each Traffic Analysis Zone (TAZ) pair in the region. The sum of the product of new transit trips and distance over all TAZ pairs is the automobile person miles traveled savings.

Table 1 provides the PMT savings for the three alternatives for the current year 2016 conditions. As can be seen from the table, the three alternatives are basically similar in terms of PMT savings.

Table 1: PMT Savings Over Existing Conditions (Year 2016)

Alternative	PMT Savings
Alt 4	8,700-10,800 Miles
Alt 5	8,800-10,600 Miles
Alt 6	8,100-10,100 Miles

2. Person Hours Traveled (PHT) Savings

This measure evaluates the total person hour travel savings for the existing riders due to enhanced transit service in the E Line corridor. It is calculated using STOPS outputs of the existing transit trips and the travel time changes between build and existing alternatives, summed over all TAZs.

Table 2 provides the PHT savings for all three alternatives for the current year. All three alternatives save few minutes of travel time for the existing corridor riders as reflected in the table. The hours in the table corresponds to 2-5 minutes of average travel time savings for the riders, assuming 8,600 total existing Route 6 boardings. Alternative 6 performs slightly better and saves an average of 2 minutes more than the other alternatives (for existing Route 6 riders). This is because of the slightly faster E Line service in Alternative 6 compared to Alternative 4 and Alternative 5 and one seat ride to downtown for patrons along Wooddale Avenue and France Avenue.

Table 2: PHT Savings over Existing Conditions (Year 2016)

Alternative	PHT Savings
Alt 4	320-400 Hours
Alt 5	310-390 Hours
Alt 6	600-730 Hours

3. Access to Jobs Measure

This methodology used for E Line is similar to the one developed by University of Minnesota’s Accessibility Observatory (<http://access.umn.edu/publications/america/>). The measure accounts for transit service coverage, frequency of service, time period, transfer opportunities, accessibility to transit stops and bus speeds.

For its application in the E Line study, TAZs from the STOPS model was used as the geography for analysis (as opposed to Census blocks used in the University of Minnesota method). The demographics data was obtained from the 2014 Metropolitan Council TAZ regional model (employment) and the 2006-2010 ACS CTPP (workers). The pedestrian network was represented by the TIGER street layer used in STOPS and the transit network was represented by the GTFS network for each alternative. The travel time components – walk time, wait time, in-vehicle time and transfer time – are obtained from the E Line STOPS output files.

Average Number of Jobs Accessible to each Worker within 60 minutes

This measure provides the average number of jobs accessible to each worker in the region by transit within 60 minutes. The travel time includes walk time, wait time, transfer time and in-vehicle time during the AM peak as obtained for each TAZ pair from STOPS. The average is weighted by the number of workers in each TAZ.

Table 3 provides the estimated number of jobs (obtained from Metropolitan Council’s TAZ level employment estimates for the year 2014) accessible to each worker (obtained from 2006-2010 ACS CTPP data) for existing conditions and the three alternatives. It shows that the build

alternatives show slight increase in the job accessibility over the existing conditions. All three alternatives are very similar in terms of job accessibility.

Table 3: Average Number of Jobs (2014 Employment) Accessible to each Worker by Transit

Alternative	# Jobs Accessible
Existing	87,500
Alt 4	89,000
Alt 5	89,000
Alt 6	90,000

Weighted Accessibility Index

Weighted accessibility measure is an index that gives more weightage to destinations/jobs reachable in shorter travel times compared to destinations/jobs reachable in longer times. In other words, the alternative that provides access to more destinations/jobs in shorter travel time performs better than the other alternatives. This index is unitless and can be used for comparative purposes only. The detailed methodology on Weighted Accessibility Ranking is available at <http://cts.umn.edu/Publications/ResearchReports/pdfdownload.pl?id=2920>.

Table 4 presents the index value for the existing and the three alternatives. The build alternatives show slight increase in the weighted accessibility measure and the three alternatives are very similar to each other.

Table 4: Weighted Accessibility Index by Alternative

Alternative	Weighted Accessibility Index
Existing	1,307
Alt 4	1,326
Alt 5	1,327
Alt 6	1,357

60-Minute Accessibility Values at TAZ Level

Figures 1, 2 and 3 show the change in number of jobs (2014 employment) accessible within 60 minutes of transit during the AM peak for the three alternatives in comparison to the existing network. All three figures indicate a significant improvement in accessibility along the E Line segments which provides enhanced service. Some locations show reduced accessibility because of small reduction in overall service or due to the increased stop spacings on the rapid bus. It should be noted that some of the small variations observed in these figures is because of the size of TAZs used in STOPS.

Figure 1: Alternative 4 – Change in Number of Jobs Accessible within 60 minutes for each TAZ

Alt 4: Change in Number of Jobs Accessible by Transit within 60 minutes during AM peak (Alt - Existing)

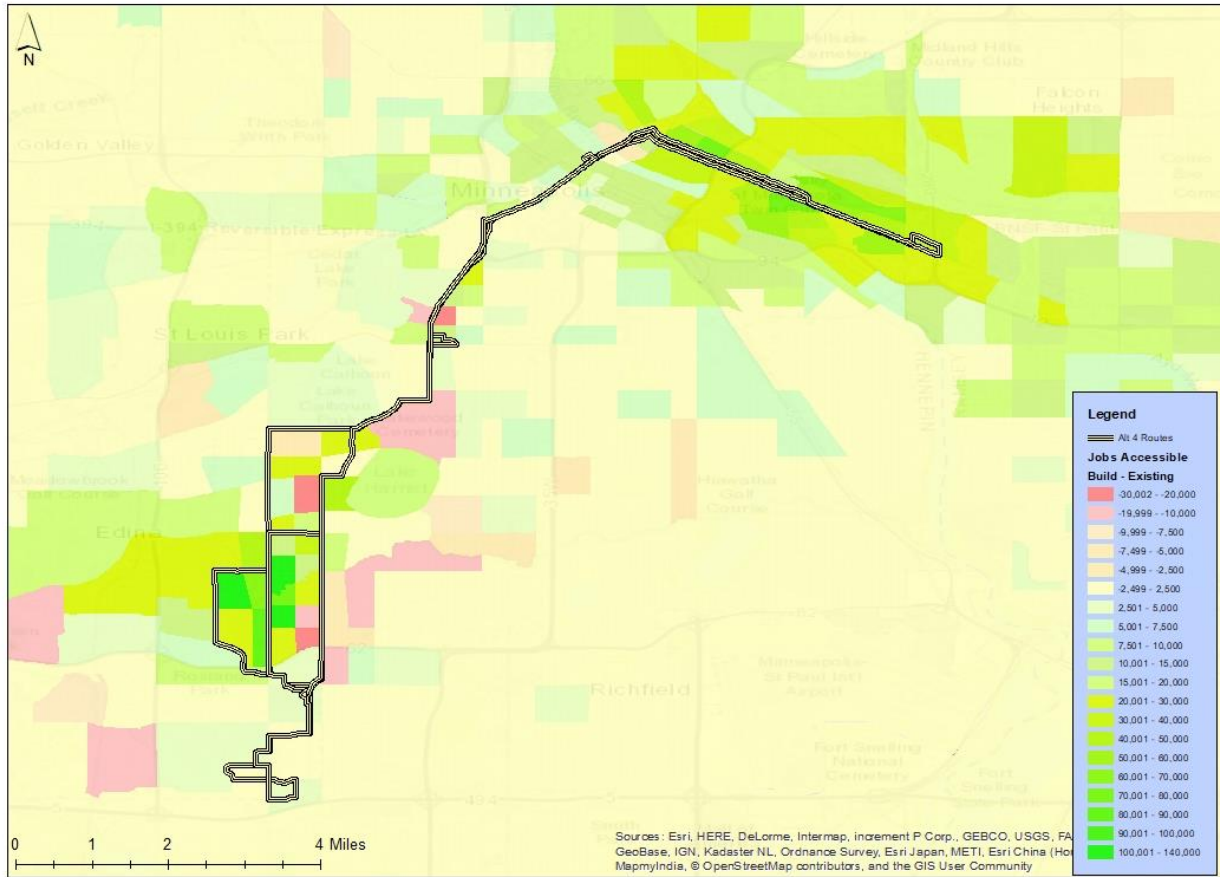


Figure 2: Alternative 5 – Change in Number of Jobs Accessible within 60 minutes for each TAZ

Alt 5: Change in Number of Jobs Accessible by Transit within 60 minutes during AM peak (Alt - Existing)

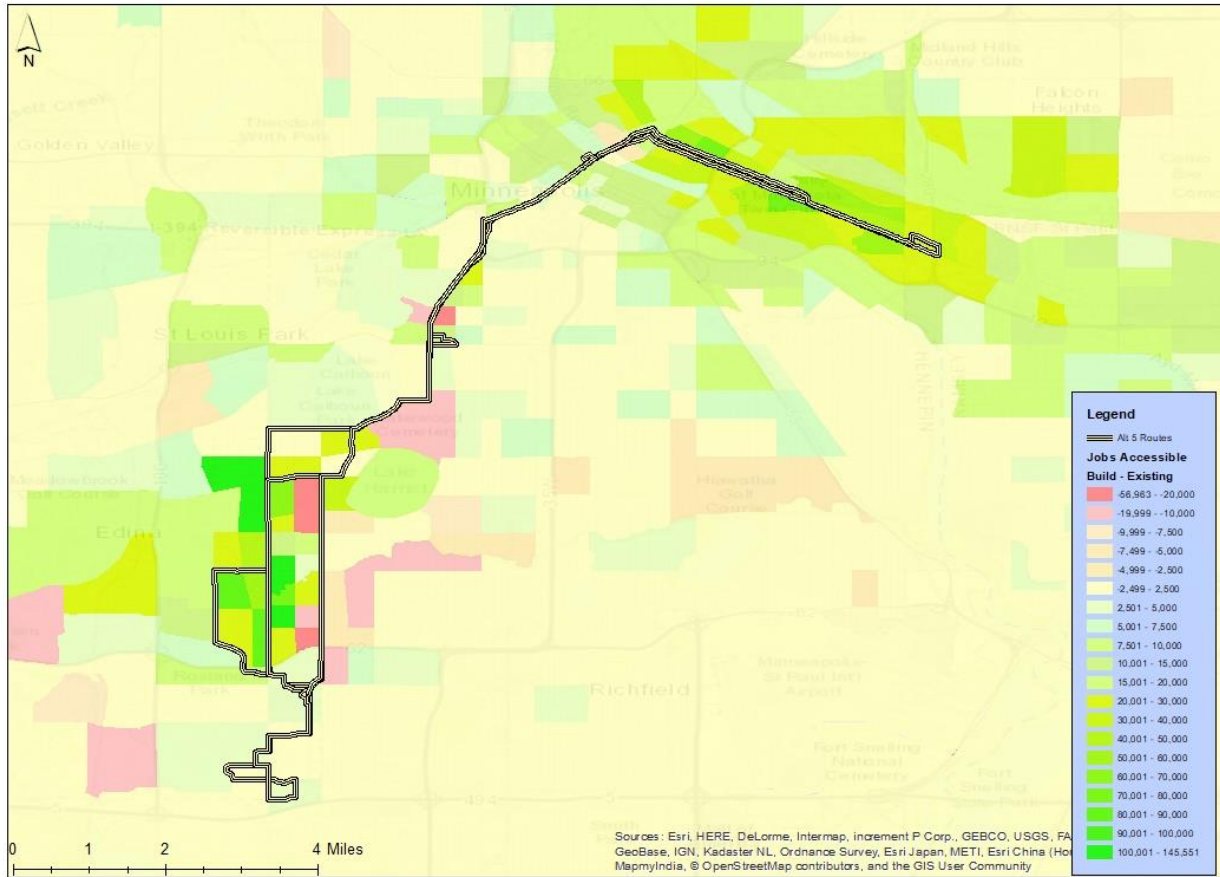
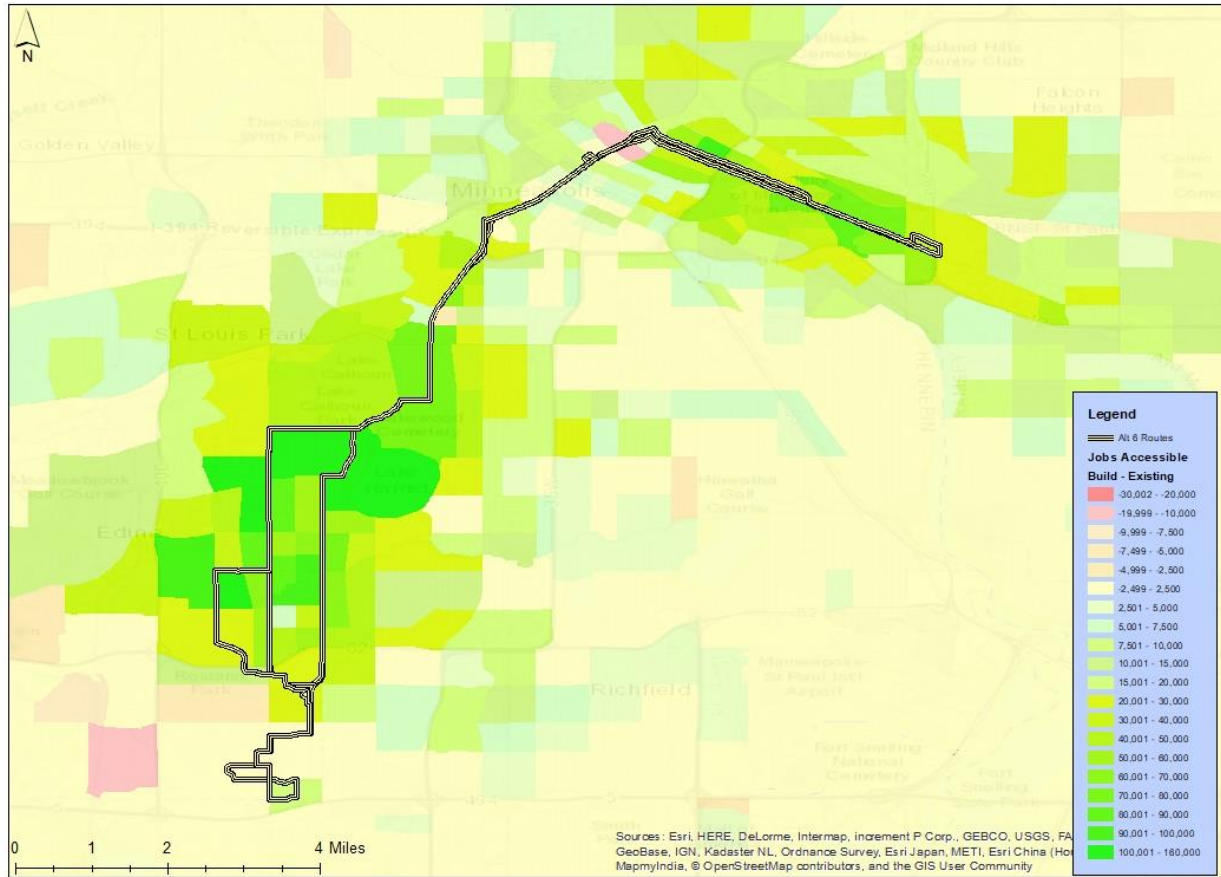


Figure 3: Alternative 6 – Change in Number of Jobs Accessible within 60 minutes for each TAZ

Alt 6: Change in Number of Jobs Accessible by Transit within 60 minutes during AM peak (Alt - Existing)



Summary

This analysis confirms that all the three advanced build alternatives show net positive aggregate benefits compared to the existing service using the three measures presented in this technical memorandum. It also confirms that the three build alternatives are very similar to each other in terms of the overall network effects.



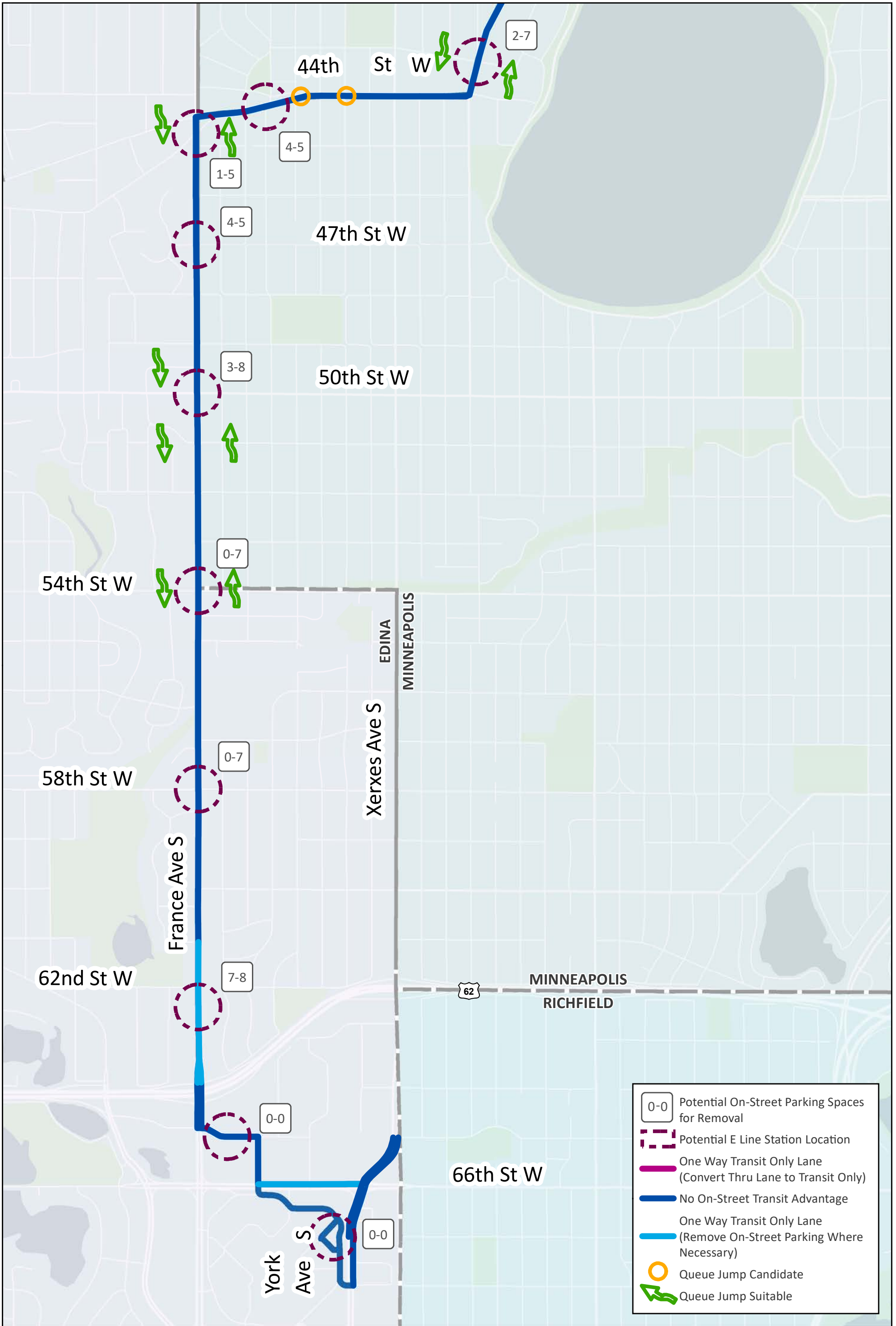
E Line

E Line Corridor Study

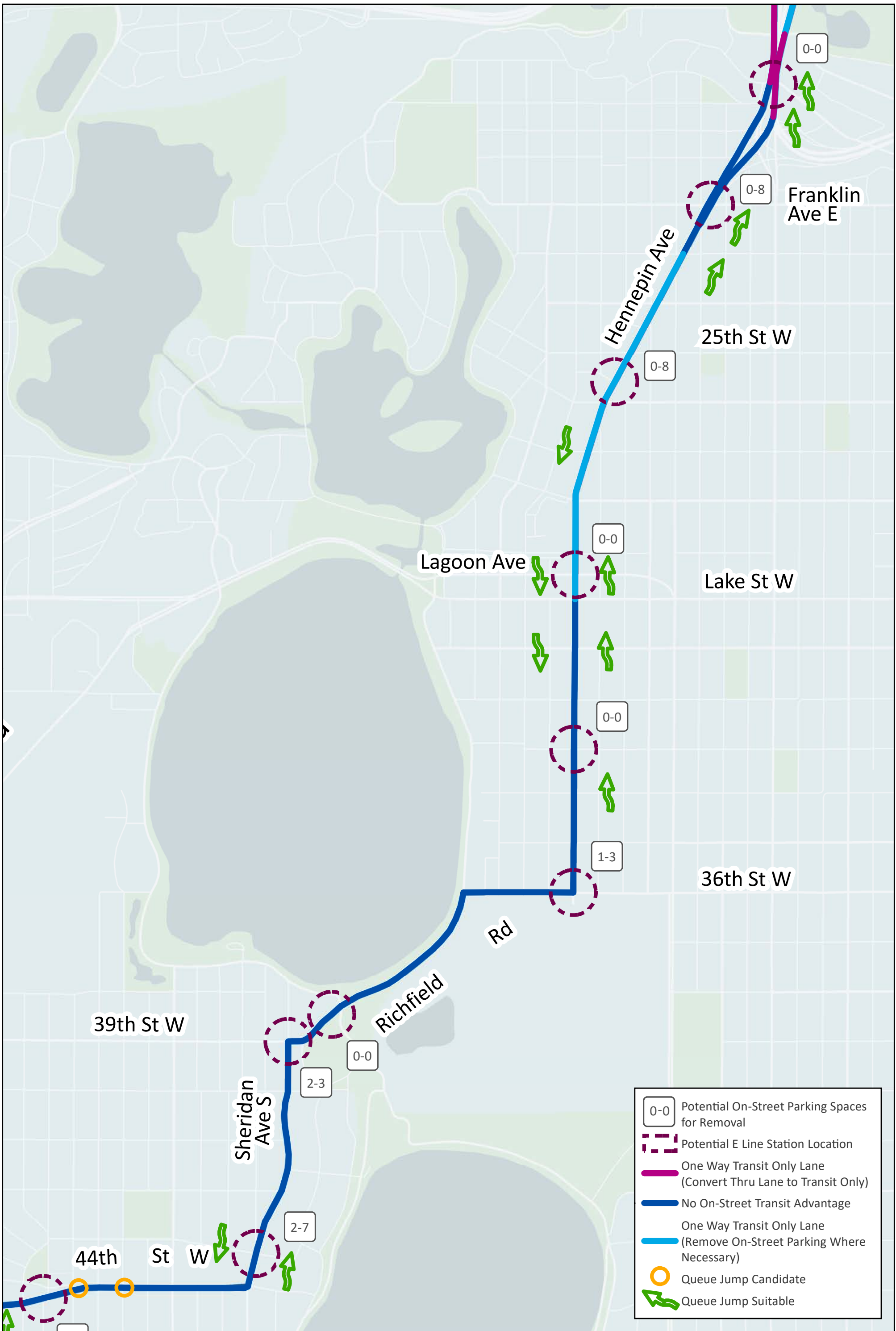
Appendix H

October 2019

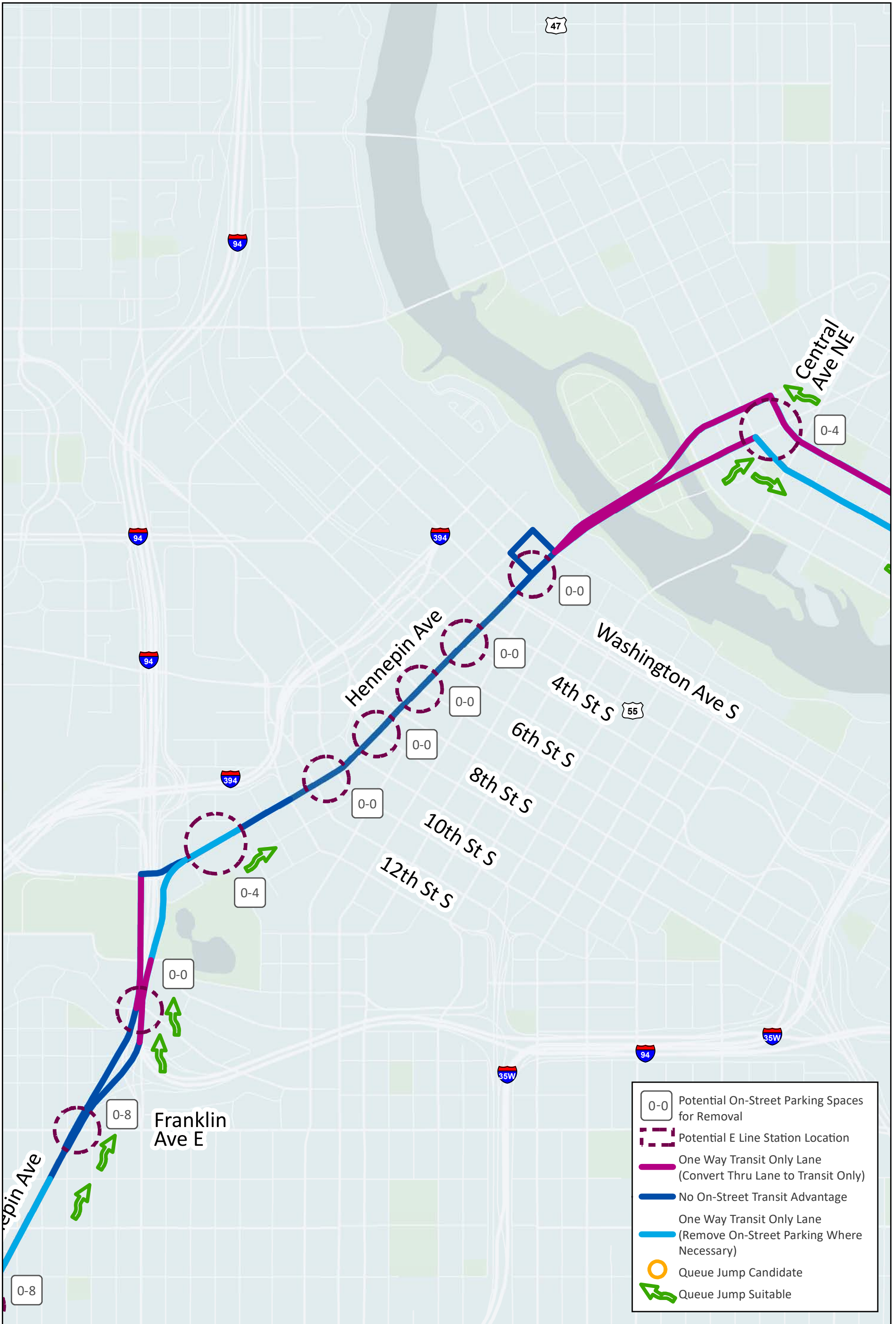
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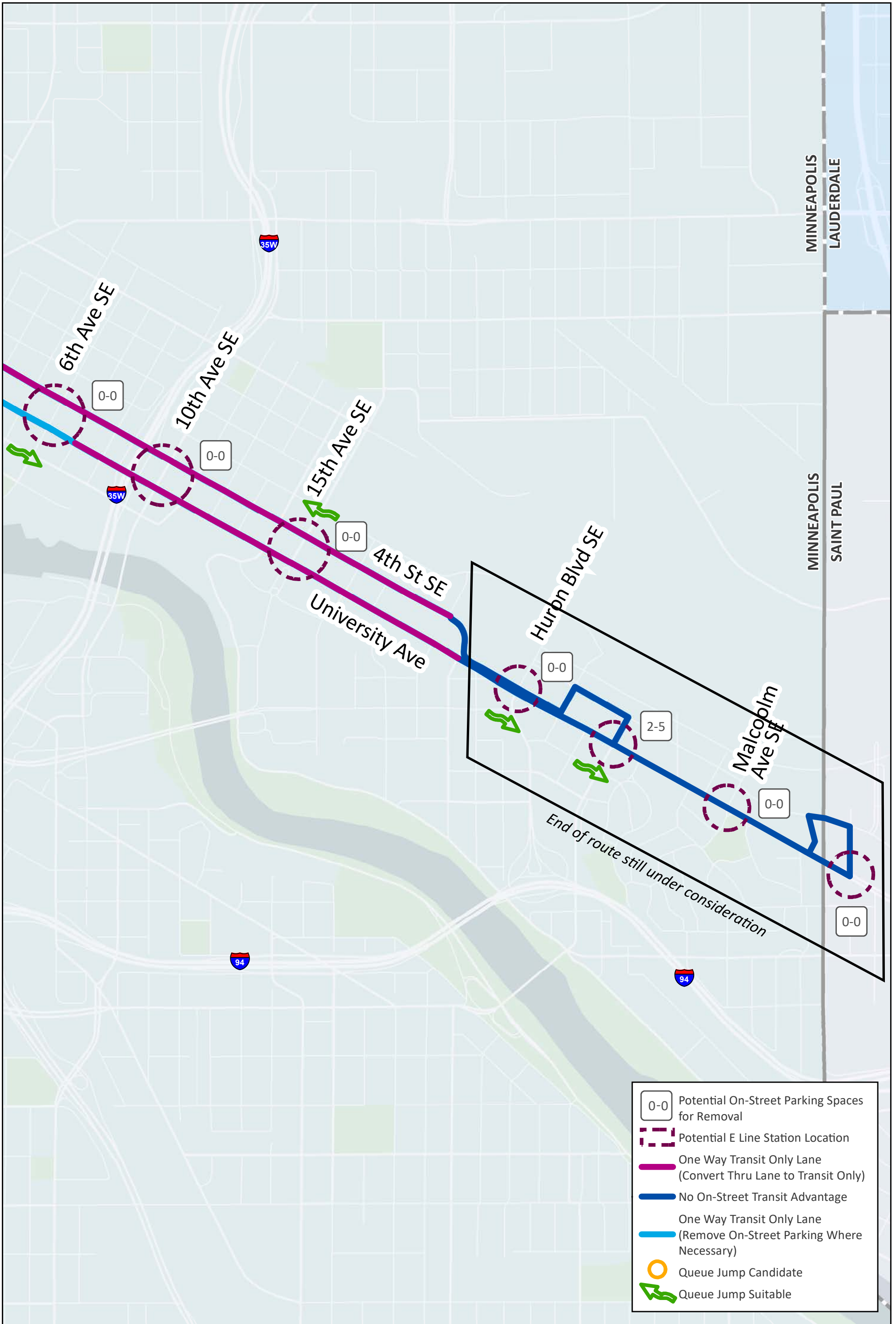


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	No On-Street Transit Advantage
	One Way Transit Only Lane (Remove On-Street Parking Where Necessary)
	Queue Jump Candidate
	Queue Jump Suitable



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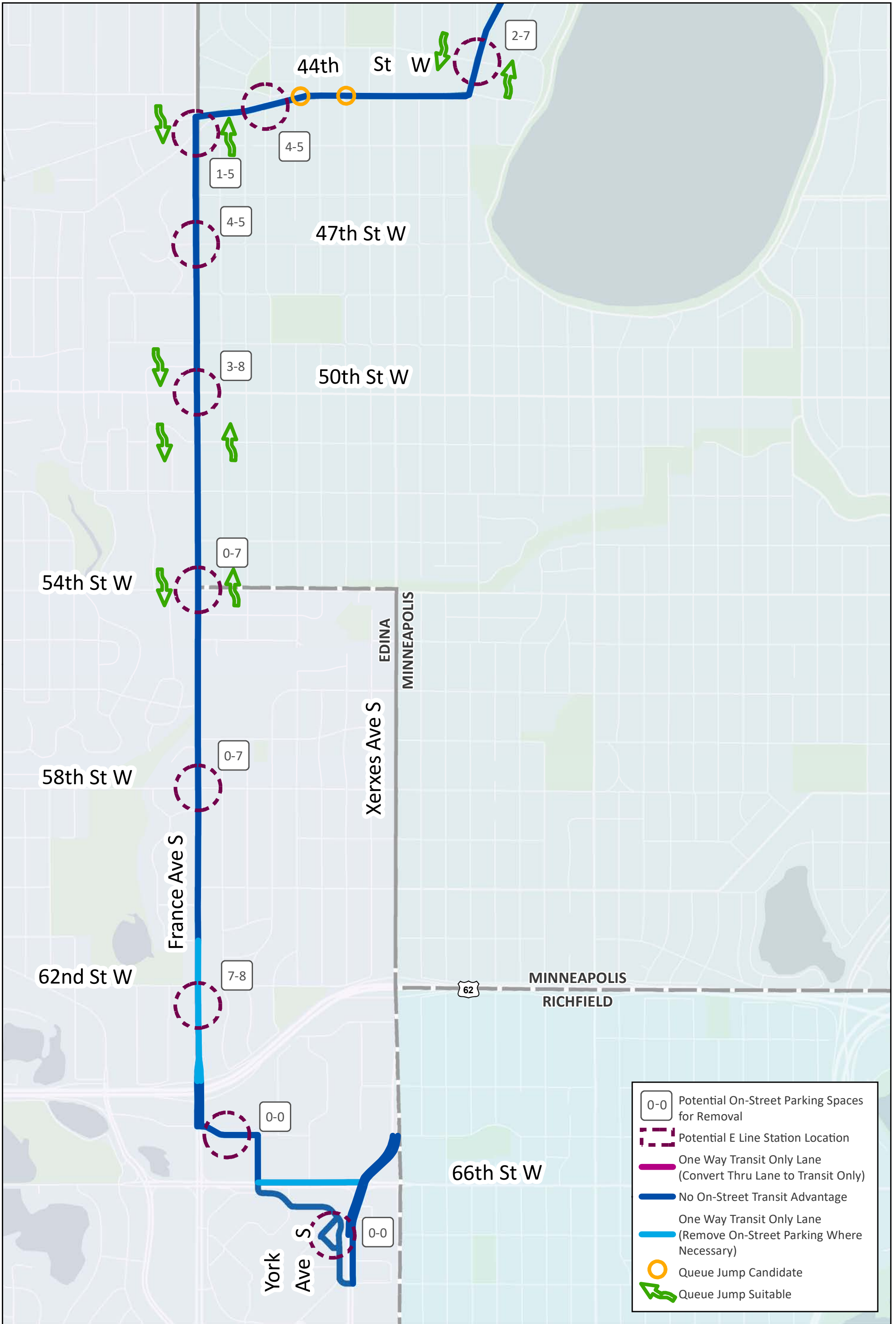
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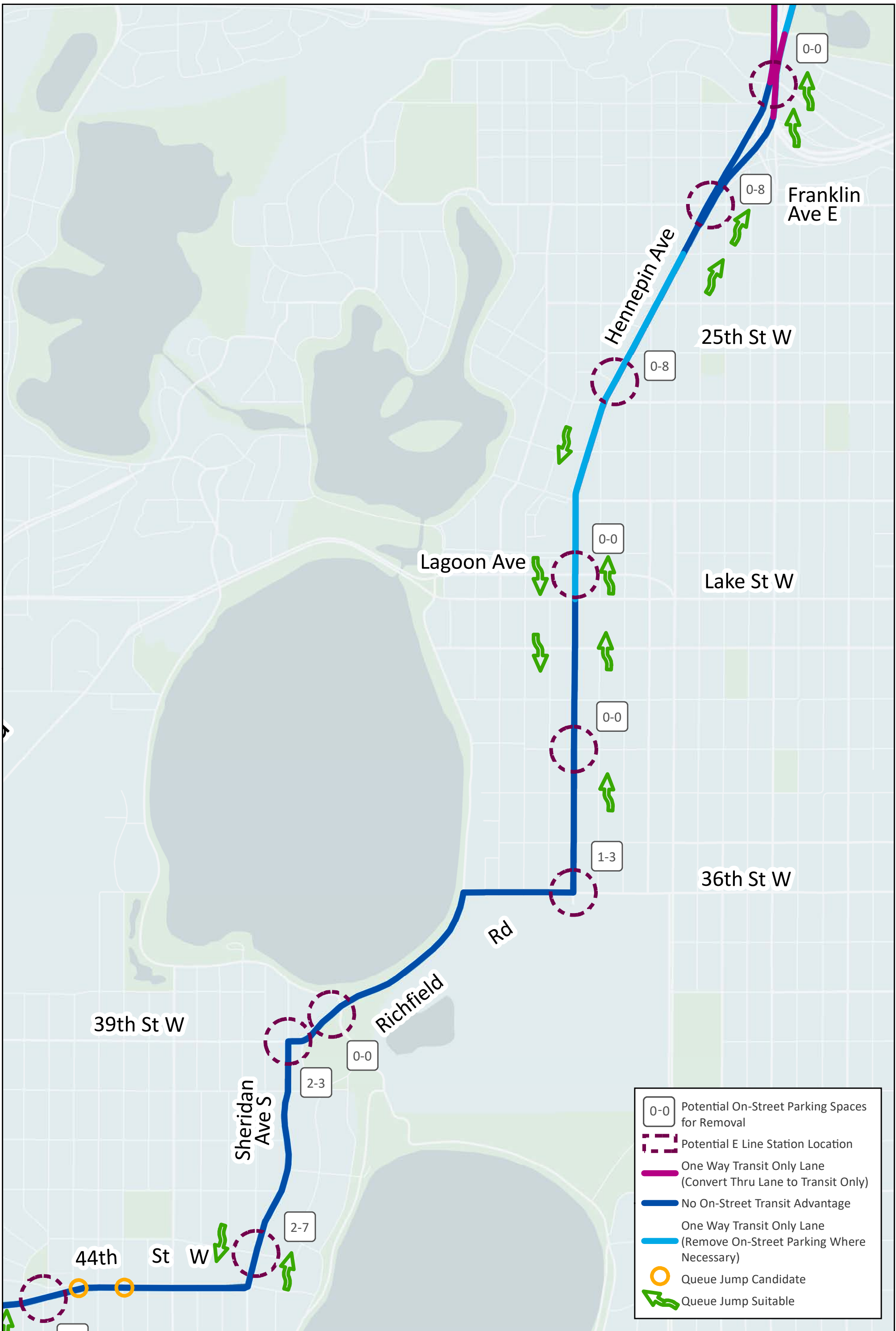
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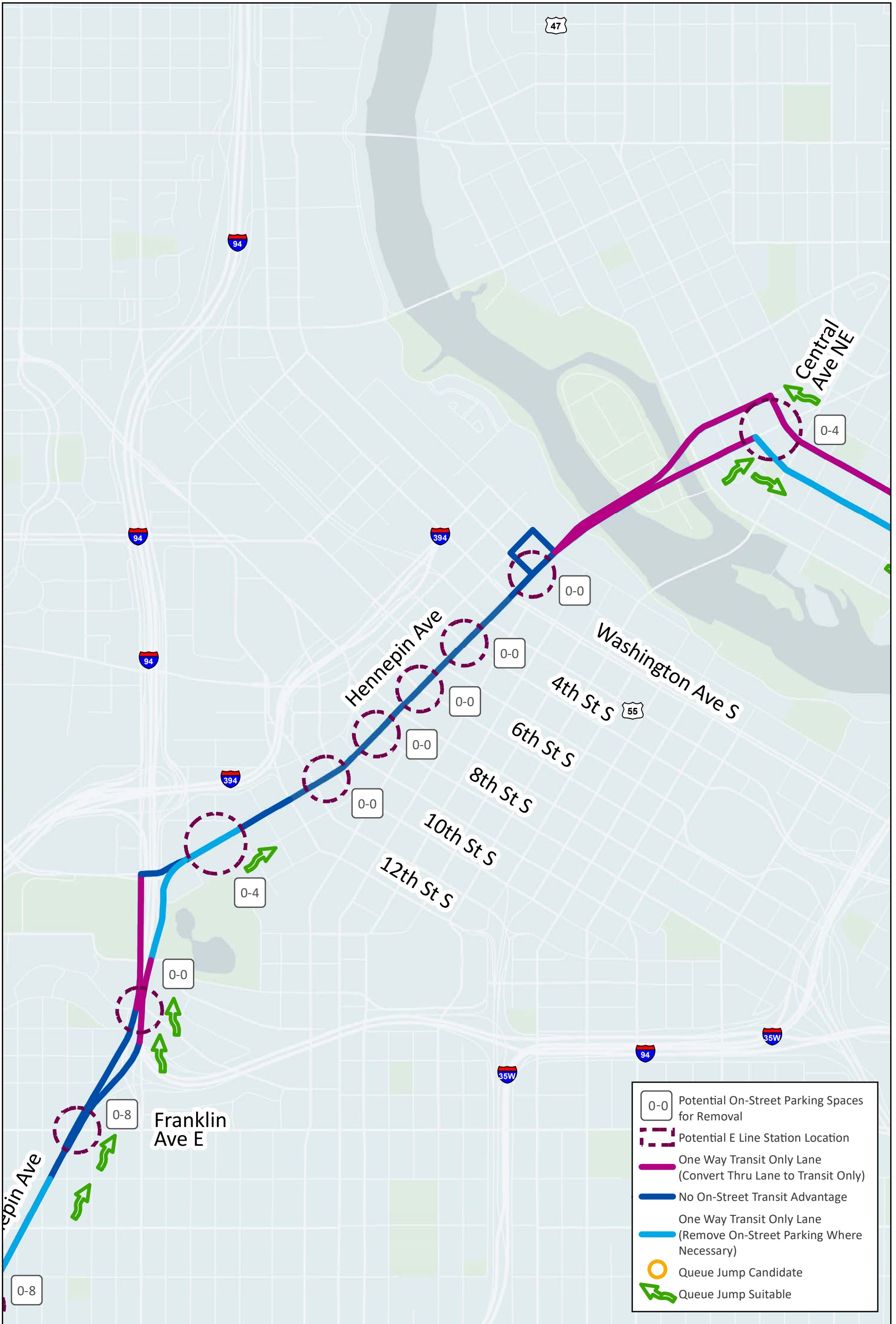
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