



West Broadway Transit Study

Preliminary Traffic Analysis Results

August 14, 2015



Objectives

- Assess alternatives' impact on general traffic:
 - Streetcar
 - ABRT
- Determine feasibility of a streetcar based on potential impacts to general traffic.
- Identify potential areas of operational deficiencies.

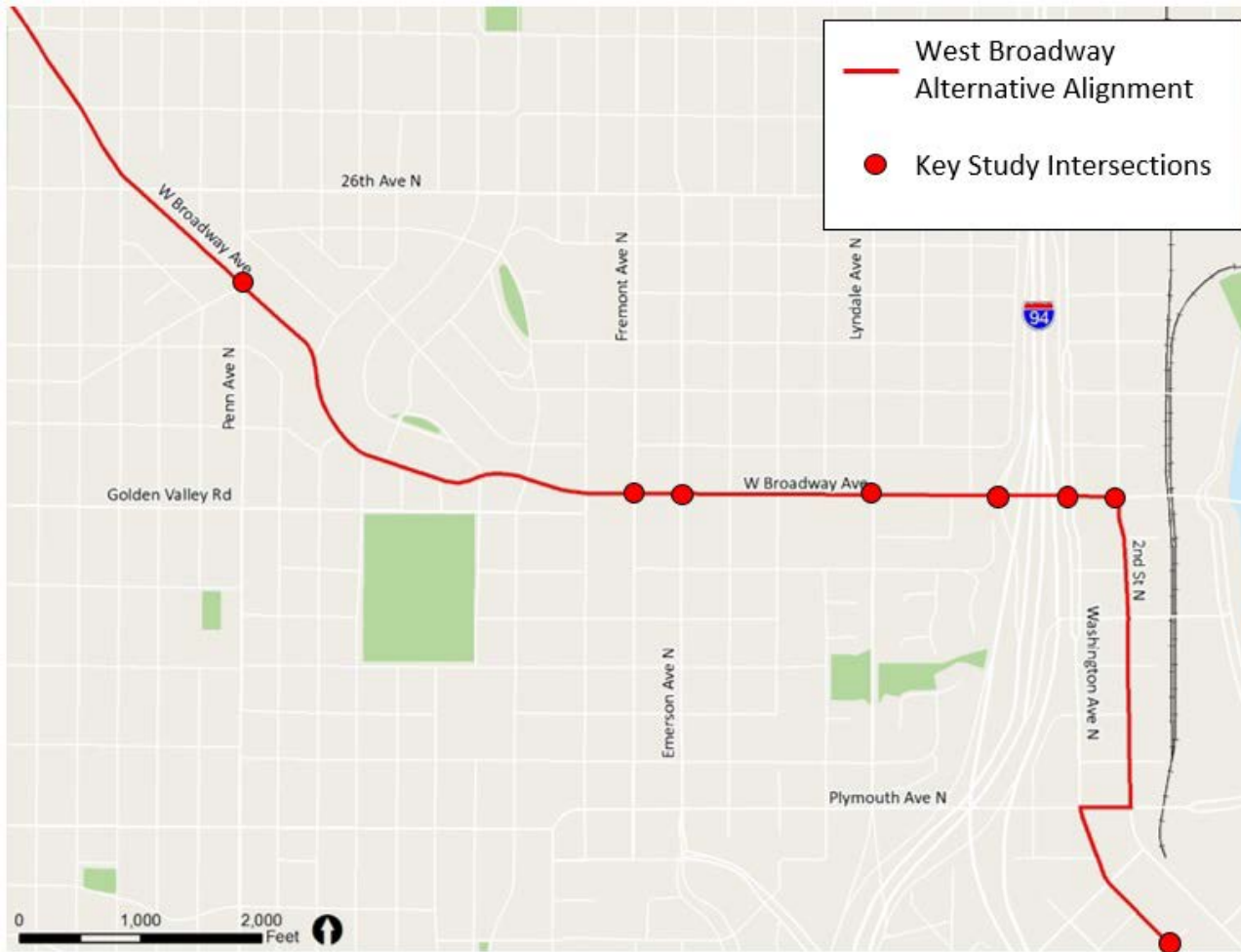
Methodology

- AM and PM peak hours analyzed at 8 key intersections:
 - West Broadway at Penn Avenue N
 - West Broadway at Fremont Avenue N
 - West Broadway at Emerson Avenue N
 - West Broadway at Lyndale Avenue N
 - West Broadway at I-94 West Ramps
 - West Broadway at N Washington Avenue
 - West Broadway at N 2nd Street
 - North Washington at N 6th Avenue

Methodology

- 5 Scenarios evaluated:
 - Existing Conditions
 - 2015 Build Conditions
 - Year 2040 No Build Conditions
 - Year 2040 Build Conditions
 - Year 2040 Build Conditions with TSP
- 2 Alternatives evaluated to accommodate NB left-turn of the streetcar at West Broadway & 2nd Street:
 - Split Phasing
 - Protected Movement with Transit Priority

Streetcar Alignment



Assumptions

- 2015 volumes would grow by 20% on West Broadway and 10% on other approaches to get projected 2040 volumes. This is consistent with Hennepin County Forecasts.
- Signal timing would be updated with implementation of the streetcar.
- Streetcar operates on 15-minute headways.
- Streetcar can only turn left during a protected phase.

West Broadway/2nd Street Signal Options

- Compared Split Phasing vs Transit Priority
- Split Phasing increased NB and SB Delay at 2nd Street
- Transit Priority decreased delay in 2040 compared to No Build

Intersecti	Approach	2015 Existing	2015 Build (Split Phase)	2015 Build (Transit Priority)	2040 No Build	2040 Build (Split Phase)	2040 Build (Transit Priority)
		Delay	Delay	Delay	Delay	Delay	Delay
W Broadway & I-94 Ramps	Southbound	32.7	32.7	32.8	35.6	35.6	35.9
	Eastbound	15.4	15.2	15.5	16.5	16.6	16.9
	Westbound	8.4	9.7	8.3	9.0	9.7	9.1
W Broadway & Washington	Northbound	43.5	43.6	43.6	43.9	44.5	44.3
	Southbound	29.5	29.7	29.6	28.2	28.5	28.4
	Eastbound	12.8	12.1	13.3	16.7	16.2	17.8
	Westbound	8.5	5.8	8.7	10.2	7.3	10.4
W Broadway & 2nd Street	Northbound	24.8	33.3	24.9	25.8	34.4	25.5
	Southbound	29.3	52.9	29.8	30.9	52.3	31.3
	Eastbound	5.4	7.8	6.6	5.9	7.2	7.4
	Westbound	11.9	13.9	13.1	13.0	15.3	14.2

Intersecti	Approach	2015 Existing	2015 Build (Split Phase)	2015 Build (Transit Priority)	2040 No Build	2040 Build (Split Phase)	2040 Build (Transit Priority)
		Delay	Delay	Delay	Delay	Delay	Delay
W Broadway & I-94 Ramps	Southbound	24.6	27.2	27.1	26.2	28.7	28.5
	Eastbound	14.7	14.6	13.9	16.4	17.8	17.0
	Westbound	13.4	10.7	12.0	21.1	15.9	16.5
W Broadway & Washington	Northbound	54.8	55.8	55.7	48.3	45.8	44.9
	Southbound	19.6	19.9	19.7	23.0	22.8	22.7
	Eastbound	24.0	25.0	24.0	34.8	32.8	32.5
	Westbound	17.0	15.4	17.9	27.9	22.7	27.3
W Broadway & 2nd Street	Northbound	27.0	44.0	28.5	57.4	50.6	36.5
	Southbound	22.3	50.9	24.4	54.1	61.6	32.7
	Eastbound	21.8	16.0	22.1	21.9	16.3	22.4
	Westbound	21.5	20.5	22.8	29.3	25.9	29.5

Traffic Simulation No Build vs Build 2nd Street and Washington Ave

2040 No Build

2040 Build

Traffic Simulation Year 2040 vs Year 2040 TSP Emerson Ave and Fremont Ave

2040 Build

2040 Build TSP

AM Peak Model Results

- Transit Priority at 2nd Street
- Intersection Delay
 - LOS C or better
- Approach Delay
 - LOS D or better

Intersection	VISSIM LOS & Travel Time Results											
	2015 Existing		2015 Build		2015 Build TSP		2040 No Build		2040 Build		2040 Build TSP	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
West Broadway and Penn	28.6	C	28.7	C	29.0	C	29.5	C	29.6	C	29.6	C
West Broadway and Fremont	18.1	B	18.3	B	18.0	B	18.8	B	19.0	B	18.7	B
West Broadway and Emerson	11.0	B	11.1	B	11.5	B	10.8	B	11.0	B	11.4	B
West Broadway and Lyndale	19.0	B	19.5	B	19.1	B	20.2	C	20.8	C	20.3	C
West Broadway and I-94 Ramps	25.6	C	25.7	C	25.6	C	27.4	C	27.8	C	27.8	C
West Broadway and Washington	20.9	C	21.1	C	21.6	C	22.5	C	23.1	C	23.5	C
West Broadway and 2nd	10.9	B	12.0	B	12.2	B	11.8	B	13.0	B	13.0	B
Washington and 6th	5.4	A	6.9	A	6.8	A	5.6	A	7.6	A	7.4	A
EB Streetcar Travel Time (minutes)	-		13.8		13.1		-		14.0		13.2	
WB Streetcar Travel Time (minutes)	-		14.9		13.8		-		14.9		13.9	

PM Peak Model Results

- Transit Priority at 2nd Street
- Intersection Delay
 - LOS C or better
- Approach Delay
 - LOS D/E for NB Approach at Washington Ave and 2nd Street

Intersection	VISSIM LOS & Travel Time Results											
	2015 Existing		2015 Build		2015 Build TSP		2040 No Build		2040 Build		2040 Build TSP	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
West Broadway and Penn	32.8	C	32.9	C	33.9	C	34.4	C	34.6	C	35.3	D
West Broadway and Fremont	20.3	C	20.6	C	20.0	C	21.0	C	21.4	C	21.1	C
West Broadway and Emerson	16.8	B	17.1	B	17.9	B	17.3	B	17.7	B	18.5	B
West Broadway and Lyndale	22.2	C	22.8	C	22.6	C	24.2	C	24.8	C	24.6	C
West Broadway and I-94 Ramps	18.4	B	18.8	B	19.3	B	20.0	B	21.1	C	21.5	C
West Broadway and Washington	31.6	C	32.2	C	33.6	C	35.7	D	33.8	C	35.2	D
West Broadway and 2nd	22.6	C	23.8	C	23.2	C	34.3	C	29.2	C	32.6	C
Washington and 6th	8.2	A	10.0	B	10.1	B	8.8	A	11.4	B	11.4	B
EB Streetcar Travel Time (minutes)	-		14.5		13.2		-		14.7		13.1	
WB Streetcar Travel Time (minutes)	-		15.2		13.9		-		15.4		14.3	

Key Findings

- Streetcar can be implemented without a significant impact to general traffic:
 - Key areas of interaction are at West Broadway/2nd Street and West Broadway/Washington Avenue.
 - Interaction of streetcar at West Broadway/2nd Street will be similar at Washington Avenue/10th Avenue (protected left-turn phase needed).
- Future signal timing will need to be modified to allow intersections in the area of I-94 to clear queueing.
 - TSP is an option
- Transit priority at the West Broadway/2nd Street intersection operates more efficiently than split phasing.