Signal, Timing, Evaluation, Verification, and Enhancement (STEVE)

(Various Locations: NW 139th Street to Padden Parkway)

PROJECT TYPE

Signal Timing Enhancements

PROJECT OBJECTIVES

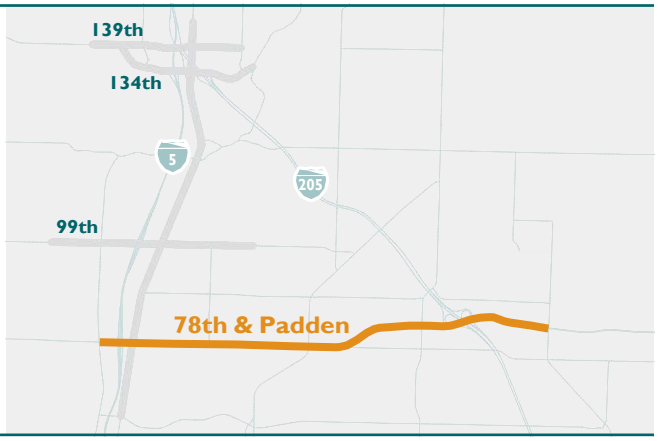
1. Progress traffic eastbound and westbound from NW 9th Ave to NE Hwy 99.
2. Manage eastbound queues from I-5 NB ramps to NE Hwy 99.
3. Manage westbound queues at NE 47th Ave.
4. Minimize backups on I-5 NB off-ramp.

PROJECT DESCRIPTIONS

- SynchroGreen adaptive traffic signal system was implemented on the entire corridor on September 2, 2019.The signals are scheduled to run adaptive operation during the day (6:30 am - 8:00 pm) and actuated operation during nighttime.
- Converted six signals on the corridor to run pedestrian-friendly flashing yellow arrow operation

CORRIDOR OVERVIEW

Length: 4.8 mi
Functional classification: Other principal arterial
Typical cross section: 4 lanes with turn lanes
Access management: Centerline barrier on Padden Pkwy



KEY ISSUES & CORRIDOR CHARACTERISTICS

A. High pedestrian volumes at NE Hazel Dell Ave.

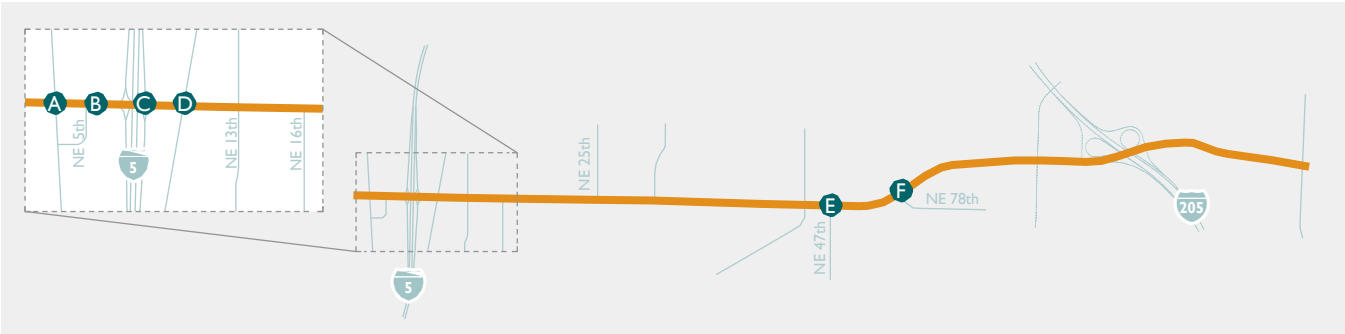
B. Frequent emergency preemption at NE 5th Ave disrupts signal coordination.

C. Heavy eastbound left turn movements at 78th Street/ Hwy 99. Queuing from northbound right turn movements backs onto I-5 off-ramp during the PM peak.

D. High crash rate and high pedestrian volumes at NE Hwy 99. Installed pedestrian hybrid beacon nearby may impact signal coordination.

E. Heavy NB and SB volumes on NE Saint Johns Rd. Railroad preemption due to switching at Rye yard and Linde Gas stops vehicular movements at NE 47th Ave and NE Saint Johns Rd signals and causes delays on NE 78th St. Occasionally, westbound traffic backs up onto railroad tracks. NE 47th Ave signal programmed to clear westbound queue on railroad when preempted.

F. Signals operate as two separate groups. Signals from NW 9th Ave (west of the corridor) to NE 25th Ave are coordinated throughout the day. Signals from NE 25th Ave to NE 47th Ave join coordination typically during the PM peak.



RESULTS

Slightly improved progression and travel time reliability on the west side of the corridor between Hwy 99 and NW 9th Ave.

- The average travel times for both directions between 9th Avenue and Hwy 99 remain at a similar level in all time-of-day periods.
- The travel time reliability for eastbound traffic was improved in the after period, with a decreased planning time index from 4.32 to 3.79.

Reduced queuing from I-5 northbound exit ramps to Hwy 99.

- Percent arrivals on green for eastbound traffic at 78th Street/Hwy 99 during PM peak hours increased from 66 percent to 80 percent, which has resulted in reduced queuing eastbound on 78th Street.

Reduced delay and queuing resulting from railroad preemption.

- Percent arrivals on green increased from 72–83 percent to 88 percent during the day.

Reduced queue spill back on I-5 northbound exit ramp.

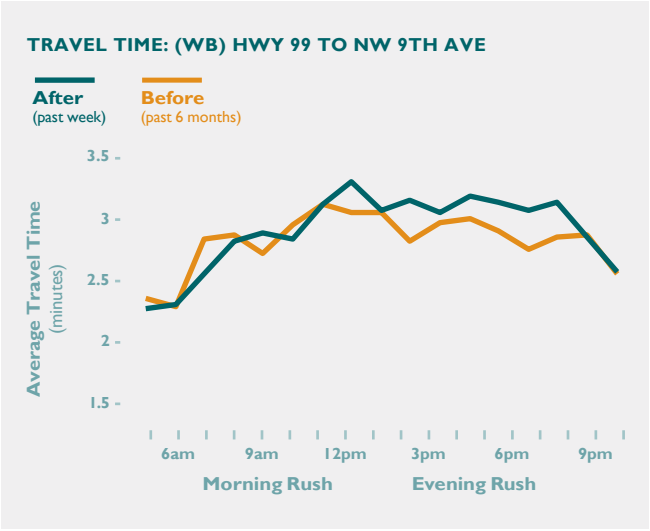
- Daily occurrences of northbound split failure decreased from 8.5 to 6.

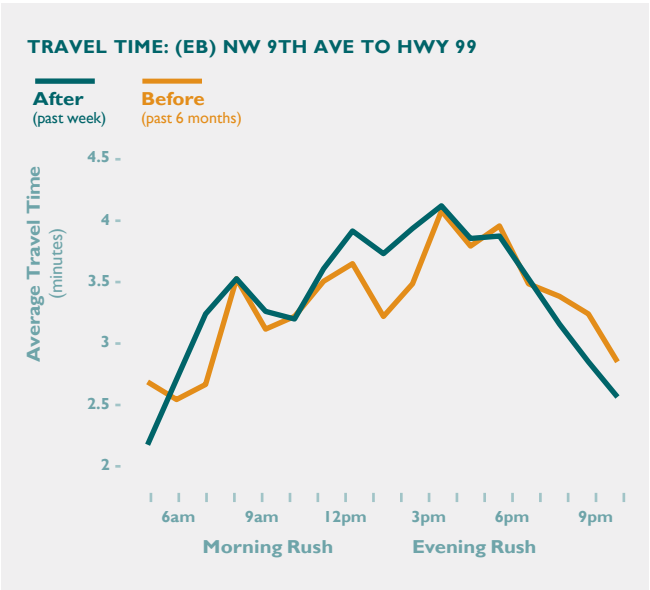
PROJECT OBJECTIVE 1

Progress traffic eastbound and westbound from NW 9th Ave to NE Hwy 99.

RELEVANT PERFORMANCE MEASURE

Eastbound and westbound from NW 9th Ave to Hwy 99: Travel time



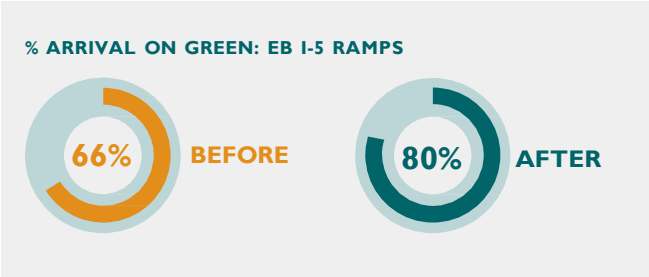


PROJECT OBJECTIVE 2

Manage eastbound queues from I-5 northbound ramps to NE Hwy 99.

RELEVANT PERFORMANCE MEASURE

Eastbound between I-5 ramps and Hwy 99:
Percent arrival on green (during PM peak)

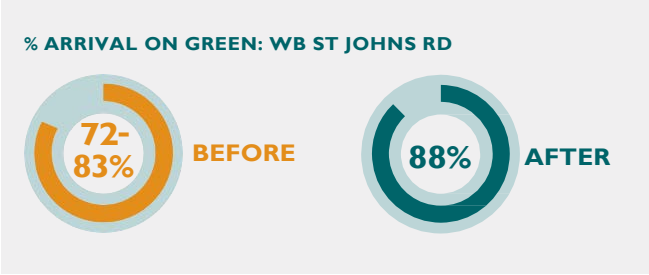


PROJECT OBJECTIVE 3

Manage westbound queues at NE 47th Ave.

RELEVANT PERFORMANCE MEASURE

Westbound between Saint Johns Rd and NE 47th Ave:
Percent arrival on green

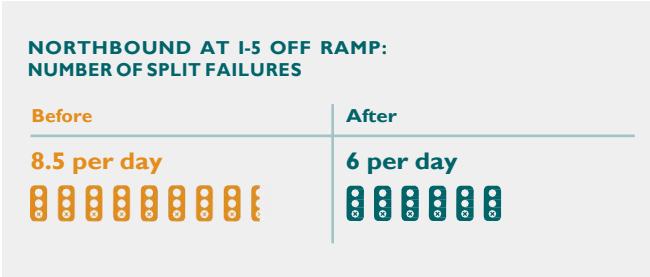


PROJECT OBJECTIVE 4

Minimize backups on I-5 northbound off-ramp.

RELEVANT PERFORMANCE MEASURE

Northbound at I-5 off ramp:
Number of split failures per day



PROJECT SCORECARD

Objective 1: Progress traffic eastbound and westbound from NW 9th Ave to NE Hwy 99.	⊕ **Slightly improved**
Objective 2: Manage eastbound queues from I-5 northbound ramps to NE Hwy 99.	⊕ ⊕ ⊕ **Significantly improved**
Objective 3: Manage westbound queues at NE 47th Ave.	⊕ ⊕ **Moderately improved**
Objective 4: Minimize backups on I-5 northbound off-ramp.	⊕ **Slightly improved**

PROJECT INFORMATION

Federal Funding Program: **CMAQ Program**
RTC Awarded Funding: **$920,000**
Total Project Cost: **$1,365,000**
Project Type: **TSMO**
Project Length: **4.8 miles**

PROJECT FUNDING

`	Year	Federal Funds	Other Funds	Total
Design	2015	$360,000	$255,000	$615,000
Right of Way	2017	$0	$3,000	$3,000
Construction	2016	$560,000	$187,000	$747,000
Total		$920,000	$445,000	$1,365,000