

# PROGRAM FOR ARTERIAL SYSTEM SYNCHRONIZATION (PASS) FY13/14 CYCLE

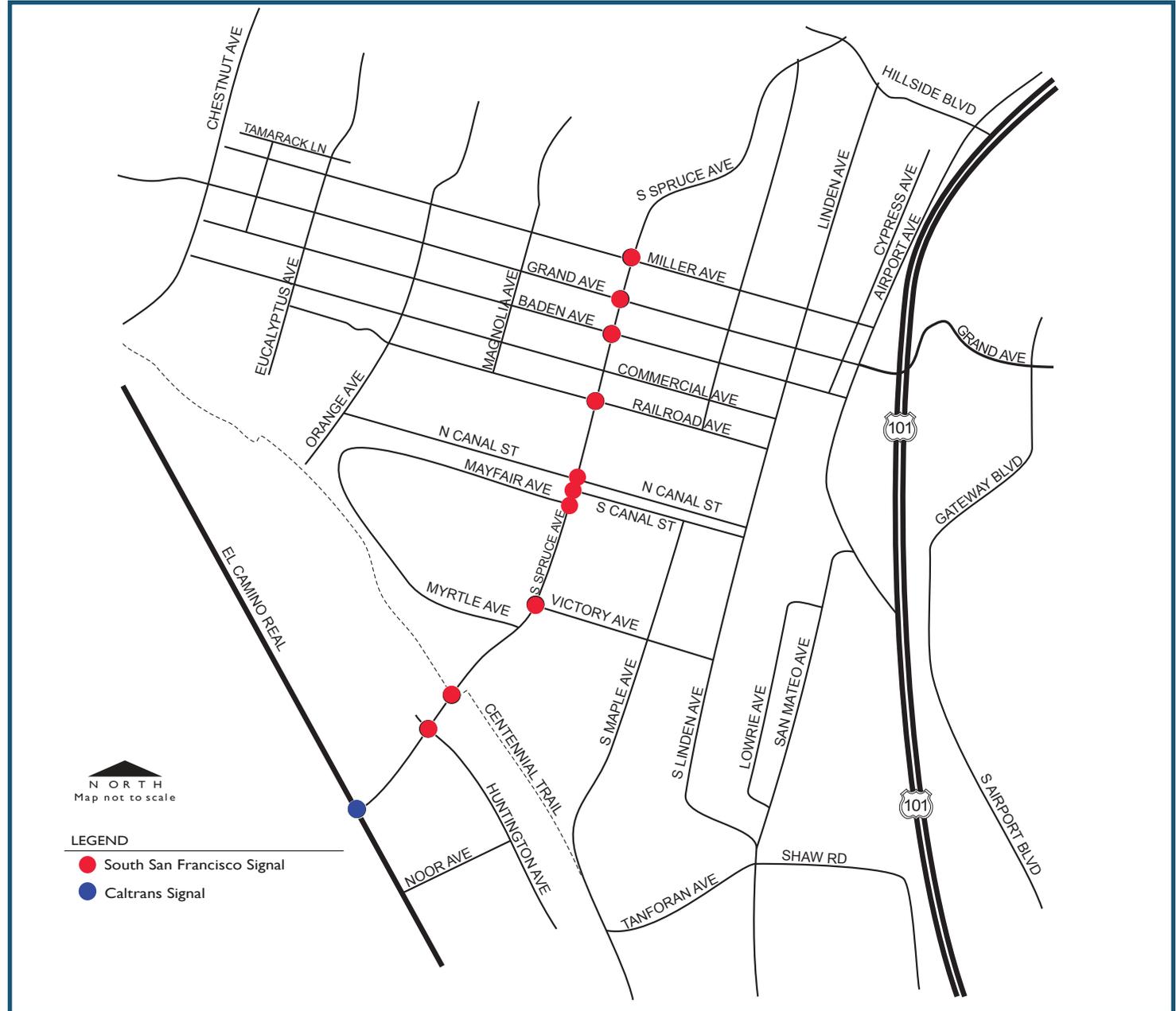
# Spruce Ave. Traffic Signal Timing Project

City of South San Francisco | Caltrans | Metropolitan Transportation Commission

## PROJECT OVERVIEW

The City of South San Francisco and Caltrans received a grant from the Metropolitan Transportation Commission's Program for Arterial System Synchronization (PASS) to develop and implement optimized timing plans for weekday AM, midday, and PM peak periods for 11 signals along Spruce Avenue. Spruce Avenue is a north-south arterial in the City of South San Francisco and provides access to the San Bruno BART station and downtown of South San Francisco. Spruce Avenue is a designated truck route carrying significant volumes during peak periods.

The traffic signals along Spruce Avenue are closely spaced and have not been retimed since 1997. This results in motorists experiencing frequent stops while traveling along Spruce Avenue because of the outdated timing plans. This PASS project involved the completion of the following major tasks: 1) collecting traffic volumes and turning movement counts, including bike and pedestrian counts, at all project intersections; 2) analyzing this traffic data including collision data to develop optimized signal timing plans; 3) implementing and fine-tuning the plans in the field; and 4) conducting travel time surveys to analyze the performance of the new timing plans, including a benefit-cost analysis.



## GPS SIGNAL COMMUNICATIONS

To provide a common time-source and enable communication between the City and Caltrans signals cost-effectively, GPS devices were installed at two project intersections. These devices enable the signal controllers to regularly synchronize their clocks, efficiently deploy the timing plans at the same time, and thus help maintain the efficiency of signal coordination.

## BENEFITS TO VARIOUS MODES



**BENEFITS TO BICYCLISTS:** Per the new California MUTCD, the minimum green time was increased for the through movements at each study intersection to enhance traffic safety for bicyclists traveling along the Spruce Avenue corridor.



**BENEFITS TO PEDESTRIANS:** The Walk timing and Flash Don't Walk clearance timing parameters were also updated to provide adequate time for children and seniors to safely cross the intersections. The updated timing parameters are expected to enhance safe school crossing at intersections on Spruce Avenue between Miller Avenue and Baden Avenue.



**BENEFITS TO TRAFFIC SAFETY:** To enhance traffic safety, the yellow clearance timing parameters were updated based on posted speed limits along the study corridors, and the all red clearance timing parameters were updated based on the results of the collision analysis presented in the existing conditions analysis.

### Project Costs

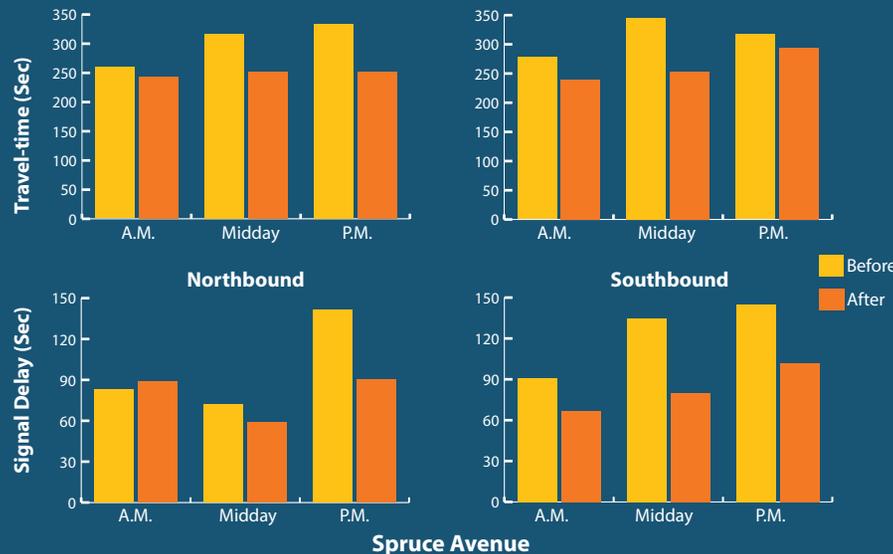
Consultant Costs (Signal Timing Plans - Weekday AM, Midday, PM)	\$29,700
Other Project Costs (GPS, additional analysis, etc.)	\$6,570
Agency Staff Costs (Estimate)	\$7,425
<b>Total Costs</b>	<b>\$43,695</b>

### Project Benefits

Measures	First Year		Lifetime (5 Years)	
	Savings	Monetized Savings	Savings	Monetized Savings
Travel Time Savings	14,063 hrs.	\$274,449	37,725 hrs.	\$736,226
Fuel Consumption Savings	31,515 gal.	\$121,620	84,540 gal.	\$326,254
ROG Emissions Reduction	0.125 tons	\$158	0.337 tons	\$424
NOx Emissions Reduction	0.069 tons	\$1,244	0.185 tons	\$3,338
PM2.5 Emissions Reduction	0.004 tons	\$1,256	0.011 tons	\$3,370
CO Emissions Reduction	0.868 tons	\$67	2.329 tons	\$180
<b>Total Lifetime Benefits</b>				<b>\$1,069,791</b>

### Overall Project Benefits

	Auto
Average Decrease in Travel Time	17%
Average Speed Increase	20%
Average Fuel Savings	12%
Average Reduction in Signal Delay	24%
Average Reduction in Number of Stops	18%
<b>Overall Benefit-Cost Ratio</b>	<b>28:1</b>



## PROJECT BENEFITS SUMMARY



**Average Reduction in Auto Signal Delay: 24%**

**Average Reduction in Number of Stops: 18%**

**Auto Fuel Consumption Savings: 12% or 84,540 gallons**



**Total Emissions Reduced (ROG, Nox, PM10, CO): 2.87 tons**

**Auto Travel Time Savings: 17% or 37,725 hours**



**Overall Project Benefit-cost Ratio = 28:1**

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