

# COORDINATED ADAPTIVE RAMP METERING PROJECT

## OVERVIEW

With a population of over 1.1 million residents in 19 cities, and its strategic location east of San Francisco, Contra Costa County has experienced significant growth since the year 2000. This has resulted in a 68% increase in morning (AM) traffic volumes causing noticeable degradation in travel time reliability and an increase in traffic collisions on Interstate 680 (I-680). In some instances, this results in a natural diversion of freeway traffic onto the local street network.

At present, there is congestion along I-680 in the northbound direction beginning at El Pintado Road during the AM peak period and at Treat Boulevard during the afternoon (PM) peak period, with both areas of congestion propagating and ultimately extending south to Sycamore Valley Road. The ramp meter system does not automatically operate in response to crashes and lane blocking events on the freeway, nor does it coordinate metering rates across multiple ramps, or distribute queues on the ramps. Current traffic monitoring infrastructure provides lower resolution information on mainline traffic performance and incident identification.

## SOLUTION

The Coordinated Adaptive Ramp Metering (CARM) project will implement an adaptive ramp metering system on northbound I-680 between Alcosta Boulevard and Olympic Boulevard initially, and a future phase will expand that to both directions of I-680 in Contra Costa to proactively manage recurrent and non-recurrent congestion. The isolated nature of the bottleneck observed in the northbound direction during the AM peak period (and recurring during the PM peak period) suggests that the northbound direction would be a

strong candidate for an initial segment of CARM implementation. This project will supplement and upgrade the existing Caltrans Traffic Operations Systems by adding traffic detection, domain awareness, and communication bandwidth as well as necessary freeway ramp modifications.

Installation of CARM, in addition to mainline intelligent transportation systems, will alleviate existing deficiencies, accommodate projected growth, and enhance the overall traffic flow by improving operations to accommodate regional traffic demand. Specifically, the proposed improvements would work collaboratively to increase ramp storage to minimize backup to local streets, improve congestion and incident detection, synchronize freeway and ramp throughput in real-time to achieve smoother flow, and improve reliability and productivity on I-680.

## GOALS



### MANAGE CONGESTION

Proactively manage congestion to improve productivity and reliability of the I-680 corridor.



### OPTIMIZE PERFORMANCE

Balance freeway performance objectives and ramp queues.



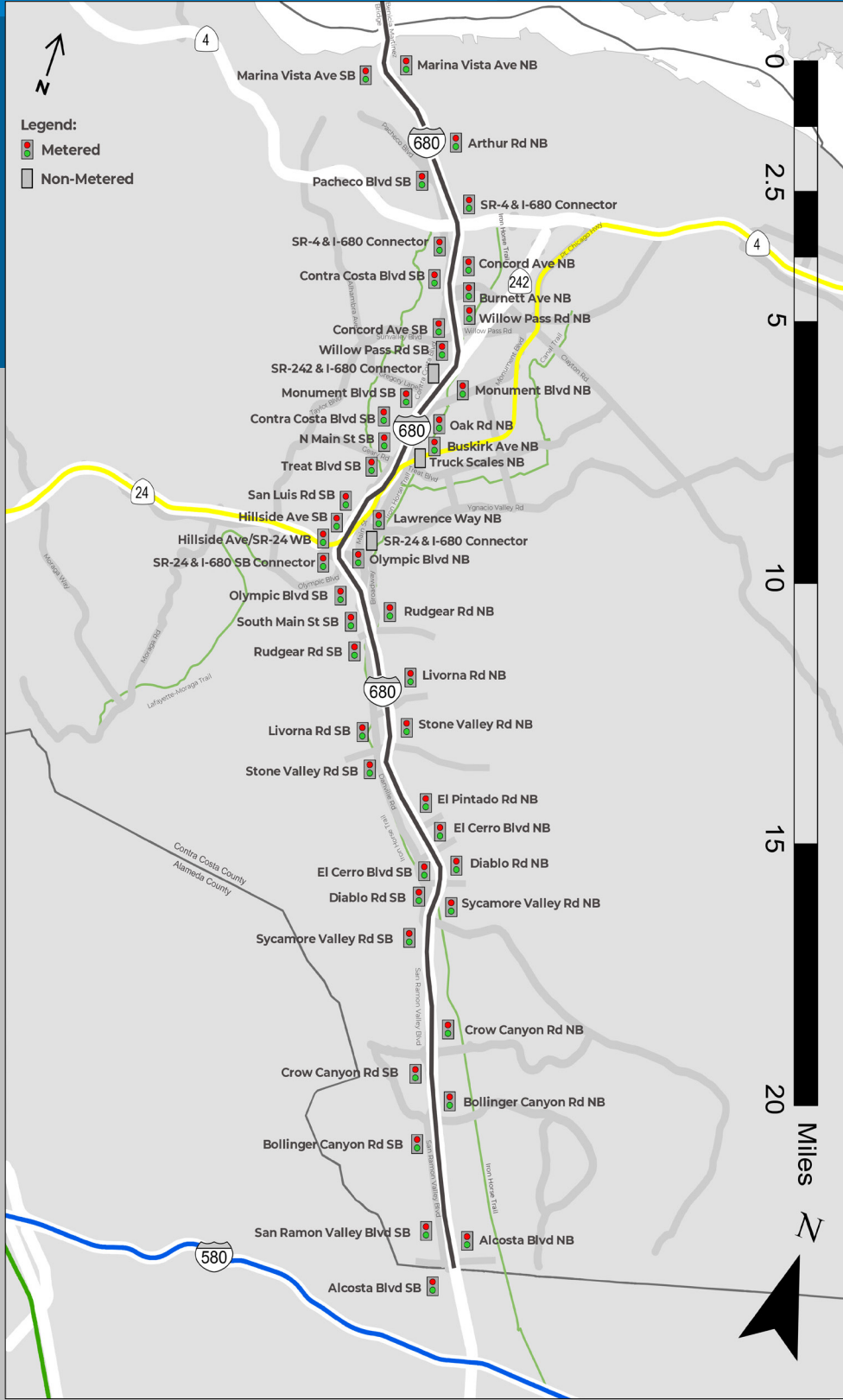
### IMPROVE DETECTION

Improve the detection of traffic and incidents to support real-time traffic management.



### COORDINATE OPERATIONS

Encourage collaboration amongst agencies to address regional and local mobility objectives.



**KEY MILESTONES**

**PLANNING**  
 Project Study Report  
 completed November 2021

**ENVIRONMENTAL  
 DOCUMENT &  
 PROJECT APPROVAL**  
 Planned completion  
 June 2023

**DESIGN**  
 Planned completion  
 June 2024

**CONSTRUCTION**  
 Planned completion  
 Spring 2027

**CONTACT**

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