

McCain Dramatically Reduces Congestion on the Second Busiest Arterial in San Diego County

CASE STUDY

QuicTrac™ Adaptive Control Delivers Delay Reductions up to 44% on San Marcos Boulevard.

EXECUTIVE SUMMARY:

San Marcos Achieves “Smart Corridor” through Optimized, Real-Time Traffic Signal Control

The City of San Marcos transformed San Marcos Boulevard, it's most congested arterial, into a “smart corridor” through the successful implementation of QuicTrac adaptive signal control, resulting in maximum benefits for the motoring public at a minimal cost to the City.

Data was collected across the Boulevard's four peak travel times, yielding dramatic results up to:

- 46.0% less delay
- 39.1% fewer stops
- 7.8% less fuel consumption
- \$645,000 in first year benefits

THE SITUATION:

High Volume Arterial with Increasing Congestion and Delays Impacted by Schools & Businesses

San Marcos Boulevard is the second busiest surface arterial in San Diego County, with an average daily traffic volume of 22,000 - 46,000. Comprised of both major and minor intersections, the corridor intersects a major highway, and is lined with businesses and schools.

Even with a previously coordinated traffic signal plan in place, the City still experienced significant congestion during four peak travel periods:

- Morning Peak (AM)
- Midday Peak (MD)
- Evening Peak (PM)
- School Hours / Off Peak (OFF)

Project at a Glance

CORRIDOR

San Marcos Boulevard faced several challenges:

- 22,000 - 46,000 average daily traffic
- Four peak periods
- Significant congestion levels
- Major & minor intersections

SOLUTION

McCain's QuicTrac adaptive control software optimized traffic flow by making real-time adjustments to signal coordination based on demand.

TOP BENEFITS / RESULTS

- ✓ Delay reductions as high as 46%
- ✓ Lifetime benefit-cost ratio of 8:1
- ✓ Minimal displacement to traffic going opposite the optimized direction of traffic
- ✓ \$645,000 in benefits to the public during the first year of operation
- ✓ Delivered maximum public benefit at minimal cost

CASE STUDY

THE SOLUTION:

Optimize Signal Coordination Based on Prevailing Conditions with QuicTrac Adaptive Control

An adaptive control system was identified as the optimum solution to improve traffic flow on the corridor. FHWA studies show that adaptive systems have an average of 10% or more improvements in performance metrics including travel time, delay, stops, emissions and fuel consumption.

System Selection: After researching available technologies, the City of San Marcos selected McCain's QuicTrac adaptive control for reasons that include:

- Compatible with City's existing controllers
- Cost-effective and easy to setup & maintain
- Provides real-time signal adjustments

System Deployment: The corridor was configured into three adaptive groups for optimum performance.

The overall system deployment utilized existing infrastructure, loop and video detectors, and controllers, where available. Communications and infrastructure upgrades were completed, as needed, along the corridor.

THE RESULTS:

Significantly Reduced Vehicle Delays, Stops, and Fuel Consumption Earns San Marcos Top Honors

Results showed significant improvements in travel time, delay, and corridor speed, far exceeding expectations. With a benefit-cost ratio of 8:1, the system has succeeded in offering a maximum benefit to the public at a minimal cost to the City.

Traveling eastbound, the most congested direction, during the Boulevard's four peak periods produced an average:

- 29.7% less delay

Results show significant improvements in travel time, delay, and corridor speed, far exceeding expectations.

- 19.6% fewer stops
- 10.4% reduced travel times
- 11.8% speed increase

The City of San Marcos has been recognized for their "Smart Corridor" project locally and nationally as a showcase for the benefits of ITS solutions. As a technology leader in Southern California, the City is well positioned for future ITS deployments including Connected Vehicle Research.

Results at a Glance

AVERAGE REDUCTION IN DELAY: 29.7%

Eastbound (optimized)	Benefits (% reduction)			
	Delay	Stops	Travel Time	Fuel Consumption
Peak Period				
AM (7:00 a.m. - 9:00 a.m.)	19.1%	12.5%	2.7%	4.5%
MD (11:30 a.m. - 2:00 p.m.)	31.5%	16.7%	13.6%	18.3%
PM (3:00 p.m. - 6:00 p.m.)	46.0%	39.1%	13.2%	15.7%
OFF (9:00 a.m. - 11:30 a.m.)	22.3%	10%	12.2%	13.1%