

# GRIDSMART.

## CASE STUDY: Bell Road Highway, AZ

### THE SETUP

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Traffic problems plagued nearly half of the 31-miles of Bell Road Highway in Arizona. The six-lane highway serves an average daily traffic (vpd) of 75,000 cars. A six-lane highway typically serves a vpd of 45,000 vehicles, placing Bell Road over capacity by 30% on its busiest days. Local agencies were also faced with an influx of almost 2 million fans for the Cactus League MLB Spring Training Events and needed a solution.

To reduce travel times and high traffic volume, seven agencies jointly implemented the Bell Road Adaptive Signal Control Technology (ASCT) Project. ASCT had four goals: create a seamless commute, keep up with changing traffic patterns, provide signal timing progression, and improve overall travel time and safety. The project had a target of 50 traffic signals on Bell Road with a focus on areas around freeway interchanges.

Before beginning the project, costs of widening the roads to accommodate additional traffic was compared against implementing a technology solution. Widening roads would cost up to \$24 million with an annual operating cost of \$100,000, while a technological solution would require only \$1.6 million with an annual operating cost between \$30,000 - \$50,000. Intelligent technology was the most cost-effective solution with the least right-of-way impact.

The pilot project tested adaptive signal control technology in four different areas. Area 1 covered 21 intersections operated by the City of Surprise and ADOT, and the agencies were tasked with traffic efficiency during the MLB Spring Training events. It was vital to deploy a solution allowing traffic to recover quickly from unexpected events, accidents, or lane blockages, along with effectively adjusting timings to accommodate seasonal swings in traffic volume. The GRIDSMART System was selected for detection and data collection and Kadence by Kimley Horn for adaptive control.

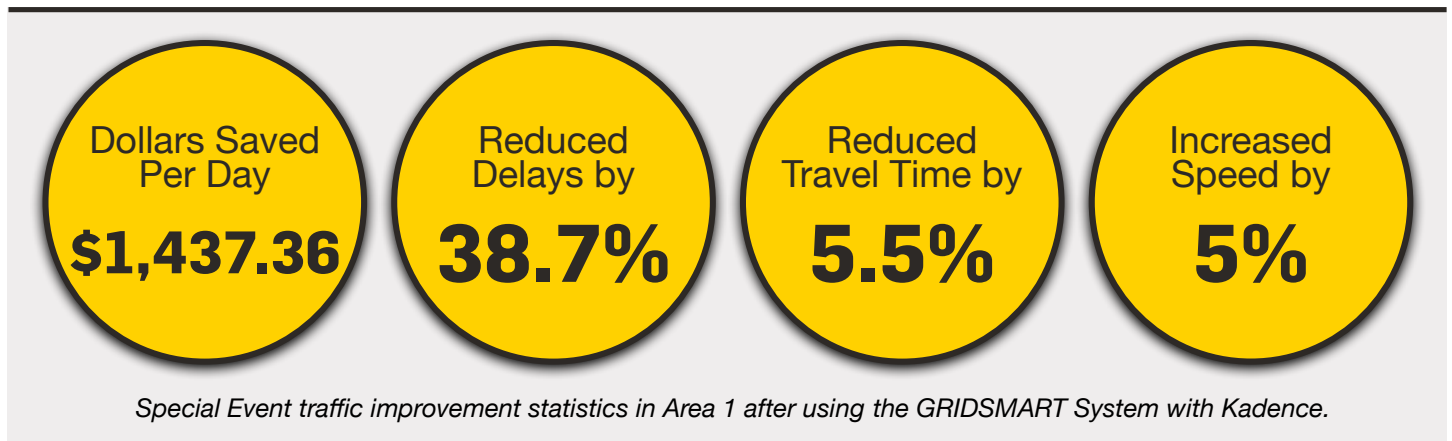
“ GRIDSMART’s **open API** makes it a **flexible solution**...to retrieve data and images from the GRIDSMART Processor or automate the retrieval of counts or real-time data. ”

## THE SOLUTION

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The GRIDSMART System is a single-camera system for intersection actuation. GRIDSMART’s open API makes it a flexible solution that allows users to retrieve data and images from the GRIDSMART Processor and automate the retrieval of counts or real-time data. While GRIDSMART collected vital traffic data, Kadence input this data into an algorithm, suggesting new cycle lengths, splits, offsets, and timing plans for project Area 1, and the City of Surprise and ADOT implemented these plans into their intersections.

The results of Area 1 using GRIDSMART and Kadence are compelling. Delays, calculated as any vehicle traveling less than 5mph, were reduced by 20% on weekdays and 43% on weekends. Travel times were reduced by 2% each day, and the overall speed of the corridor was increased by 1.8%. For special occasions such as the MLB Spring Training Event, the City of Surprise and ADOT reduced delays by 38.7%, reduced travel times by 5.5%, and increased the overall speed of traffic by 5% each day.



To quantify the success of this deployment, the City of Surprise and ADOT assigned a monetary cost of time for calculations and compared the month before implementation and the month after. Using the calculation of \$17.91 per hour for passenger vehicles and \$100.49 per hour for freight vehicles, the standard monetary cost of time used by the Regional Integrated Transportation Information System (RITIS) and Texas Transportation Institute, the ASCT saved \$9,500 each day and \$1437.36 each day of special events.

With its open API, accurate data collection, and offer of situational awareness, GRIDSMART was a perfect pairing with Kimley Horn’s Kadence and helped the City of Surprise and ADOT improve travel time and intersection efficiency.