



# It's about (real) time



Real-time simulation is demonstrating the potential to transform traffic management. And the ability to forecast and simulate network conditions means that rather than simply reacting to congestion, system managers can now anticipate and alleviate problems before they even occur.

WORDS BY **MATTHEW JUCKES**

**I**n 2010, Interstate 15 in San Diego was chosen as one of the US pilot sites for developing, implementing and operating an Integrated Corridor Management System (ICMS). The I-15 ICMS project is one of the first working examples of management integrated with prediction, which allows the anticipatory administration of an area that is very complex in terms of transport and mobility.

This project aims to operate and manage individual transport systems as a unified corridor including the highway network, toll lanes, the surrounding arterials and the public transport network in the area. The I-15 ICMS is designed to optimise capacity and efficiency, reducing delays and obtaining more reliable journey times

**The I-15 around San Diego has some of the most advanced ITS infrastructure available**

without the need for investment in additional infrastructure (namely, more lanes for private traffic).

The general vision of I-15 ICMS is the use of real-time tools to obtain predictions for the whole project network in order to obtain strategies for managing congestion pre-emptively. For example, combining the controls of ramp access to the highway with changes in the control plans in the arterial network to manage recurring rush hour congestion, together with route diversions, properly monitored to avoid greater disturbance in non-recurring incident situations.

The San Diego Association of Governments (SANDAG) is leading the project and works alongside the Department of Transportation (US DOT), Caltrans, the Metropolitan Transit System, the North County

Transit District and the Cities of Escondido, Poway and San Diego with Delcan Corporation as project integrator.

## AWARD WINNER

Following several years of site selection and project development, the Interstate 15 Integrated Corridor Management (ICM) project went live in San Diego in March 2013. Led by the San Diego Association of Governments (SANDAG), the ICM project has now been operating successfully for a full 18 months and has won the ITS America Best of ITS award for Best New Innovative Practices in April 2013 and the CTF award for Operational Efficiency Program of the Year in May 2014.

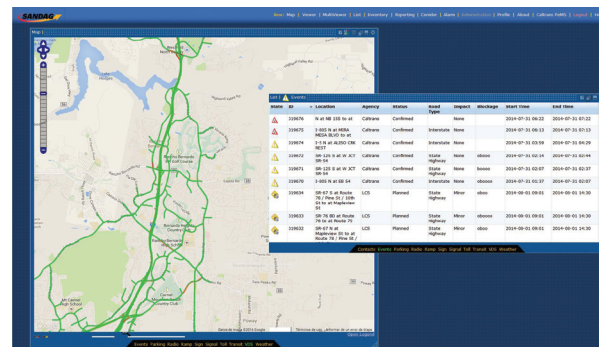
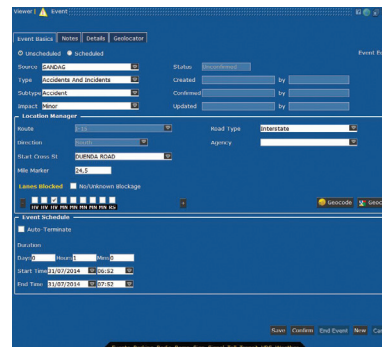
Focusing on a 20-mile stretch of Interstate 15 between San



Diego and Escondido, the project introduces 'smart' traffic management technologies and concepts never used before in the US: the project's pioneering Decision Support System (DSS) uses strategies such as network traffic prediction, online microsimulation analysis and real-time response strategy assessment to give system managers comprehensive awareness of the current and predicted future performance of the entire corridor. Rather than reacting to traffic conditions, managers can now anticipate problems before they arise and take preventative action using ICM strategies such as responsive traffic light synchronization, coordinated ramp metering or bus priority on arterials. One of the reasons the I-15 was selected as a test bed was that the I-15 environment includes some of the most advanced ITS infrastructure available: dynamic ratio ramp metering, adaptive control on roads parallel to the interstate, reversible high occupancy vehicle (HOV) lanes and high occupancy tolls (HOT) with dynamic pricing along with systems for disseminating advance information about traffic incidents.

Core to the ICM solution is the ability to forecast and simulate congestion and capacity imbalances in real time or near real time. The DSS allows continuous predictions every 5 minutes, to monitor and anticipate congestion hot spots and launch evaluations of the available strategies to select the best response, therefore minimizing congestion and guaranteeing more accurate journey times for both drivers and users of public transport. The multimodal Decision Support System (DSS) integrates two tools: the Delcan Intelligent NETWORKS ATMS, for field device monitoring and control, centre-to-centre data fusion, event management and response plan generation, and Aimsun Online, a tool from TSS-Transport Simulation Systems. Aimsun Online uses live data feeds and simulations to dynamically

**“The DSS allows continuous predictions every five minutes”**



forecast traffic conditions based on the current state of the network, which helps system managers to evaluate incident response or congestion management strategies.

## NEW DEVELOPMENTS

The free 511 San Diego mobile application (available for iOS and Android) is the most recent innovation to come from the ICM project. Funded by the US Department of Transportation, the app provides real-time predictions from Aimsun Online and system based advisories, letting users view predictive travel times on I-15; current traffic conditions; MTS bus routes, fares, arrival times; real-time dynamic toll rates for the I-15 Express Lanes; and it also uses text-to-speak to give users alerts for the latest incident and construction information in the region. Since its launch in May 2014 it has already had over 22,000 downloads. (Visit 511sd.com/app to learn more.)

Another recent improvement is that the system is now running in an automated stage where the system takes automatic control of signals and ramps when recommended by the simulated evaluations. This may be the first time in the US that traffic management decisions are being successfully made entirely based on automatically triggered real-time simulations of the entire multi-modal transportation network.

A future improvement that should be in place in late fall is the



**Predictive traffic is now a key element of driver information**

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installation of arterial way finding drum signs. The concept is that SANDAG is going to install 8 rotary drum signs along the principal arterials to help guide motorists during response plan active re-routing.

## CHANGING THE FACE OF TRAFFIC MANAGEMENT

SANDAG expects the ICM project to help with the implementation of multimodal and smart growth principles, to improve safety throughout the corridor, increase traveller information mechanisms, institutional partnerships and networked transportation systems, both during recurrent and non-recurrent conditions. The USDOT's end objective is to roll out ICM nationwide, so that every large city can derive some benefit from what is being achieved in San Diego.

Alex Estrella, Senior Transportation Planner and ICM Functional Project Manager at SANDAG, says that real-time simulation has the potential to completely transform traffic management. “The San Diego ICM system is unique for incorporating both the network prediction subsystem (NPS) and real-time simulation subsystem (RTSS); now traffic management decisions are based on both current and predicted traffic conditions, a capability that has so far been missing from ATMS solutions. I believe we are creating one of the most comprehensive and intelligent decision support systems in the industry today.”