Integrated Corridor Management on I-15 in San Diego

READER ENQUIRY NO. 513

The world's transportation network is the most extensive, high-profile and expensive public utility ever built. Undoubtedly visionary for its time, transportation infrastructure is increasingly being squeezed, with more vehicles on the road than ever before, increased commute times in most metropolitan areas and more vehicle miles traveled per person. These challenges – largely driven by an increase in the world's population, plus economic advances – have created a difficult environment for those charged with maintaining and operating these systems. Traffic system managers strive to improve mobility, safety, air quality, and return on taxpayer investments. In the midst of declining resources and increasingly complex political dynamics, their job is more challenging than ever.

Current transportation networks are made up of multiple independent systems managed by various agencies and, until recently, efforts to manage these networks to improve mobility, safety and reliability focused on optimizing each individual system. The limitation with this approach is that the independent transportation systems – freeways, public transit, bus systems and local arterial roads – do not have the capacity to respond to demands from other networks. Another limitation has been the application of ATMS that have typically been reactive systems designed to detect adverse conditions (such as a traffic incident or recurring congestion), verify the situation and provide a response.

When the USDOT conceived the concept of Integrated Corridor Management (ICM), it was designed to address these challenges. The vision was for metropolitan areas to realize significant improvements in the efficient movement of people and goods through aggressive, proactive integration of existing infrastructure along major corridors.

ICM is being implemented in four phases. Phase 1 conducted research into the current state of corridor management in the USA as well as around the world. Phase 2, though – which runs concurrently with Phases 3 and 4 – develops analytic tools and methods that enable the implementation and evaluation of ICM strategies. The ICM program recently completed Phase 3 (Corridor Site Development, Analysis and Demonstration), in which San Diego and Dallas were selected as pioneer sites to demonstrate their strategies. Phase 4 will be Outreach, Knowledge and Technology Transfer.

Need to know?

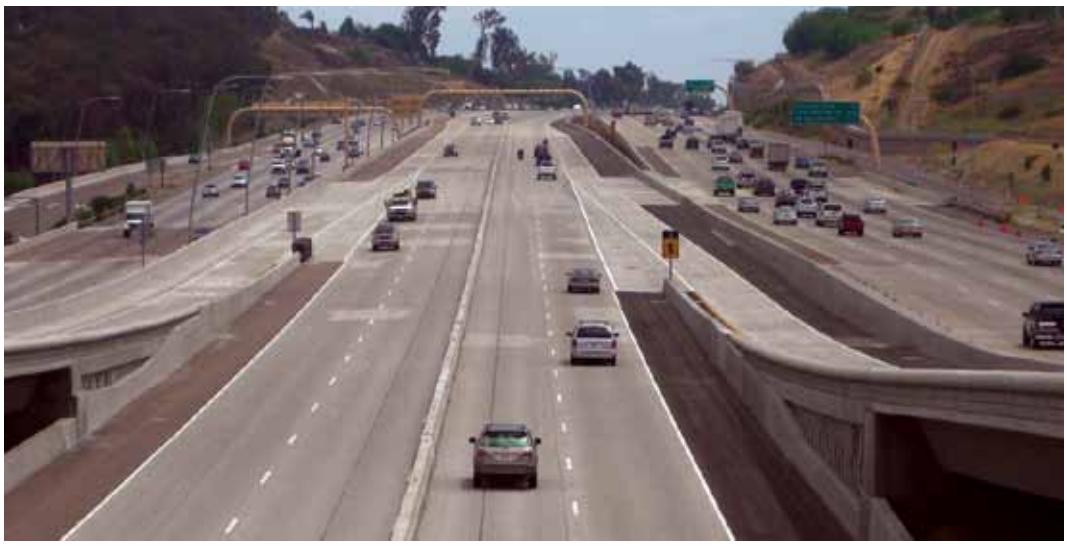
The inside story on how a four-phase project in San Diego is leading the way in ICM deployment in the USA

- Demand outstripping supply has led operators of transport networks to look to ICM as a capacity-increasing solution
- A phased approach helps ensure that all players are working toward the same aims at the same times
- Achieving a number of specific goals (defined at the start of the process) will demonstrate the benefits of ICM in a highly tangible way

ICM in California

The San Diego ICM corridor is Interstate 15 (I-15), a congested north-south interstate corridor. This 20-mile facility – stretching from SR 78 in Escondido to SR 163 in San Diego – forms the primary artery for the movement of commuters, goods and services from northern San Diego County to downtown San Diego. It is already a model for the deployment of the latest technologies for data collection, demand management and pricing strategies through its I-15 HOV Express Lanes project.

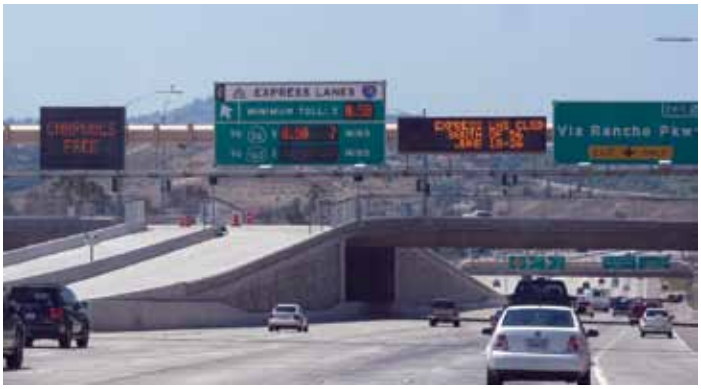
With the San Diego Association of Governments (SANDAG) taking the lead, a strong group of agencies



worked together to make this project a success. Project partners include Caltrans, the cities of San Diego, Escondido and Poway, the Metropolitan Transit System and the North County Transit District.

These agencies collaborated to set five primary goals for San Diego's ICM. The first goal is that the corridor's multimodal and smart-growth approach should improve accessibility to travel options and attain an enhanced level of mobility for corridor travelers. Next, the corridor's safety record should be enhanced through an integrated multimodal approach. The third goal is that the corridor's travelers should have the informational tools needed to make smart travel choices within the corridor. The institutional partners also committed to employing an integrated approach through a corridor-wide perspective to resolve problems. The final goal is for the corridor's networks to be managed holistically under both normal operating and incident/event conditions in a collaborative, coordinated way.

To achieve these goals, a number of Active Traffic Management (ATM) strategies were deployed to proactively manage multiple modes through and along the corridor. Strategies to empower the motorist and aid their decision-making include



(Top) **I-15 is a congested north-south corridor**
(Above) **The HOV Express Lanes**

I-15 forms the artery of transportation between northern San Diego County and downtown San Diego

both pre-trip and en-route traveler information.

On-road activities involve everything from freeway-coordinated adaptive ramp metering and signal coordination on arterials with freeway ramp metering to regional arterial management.

Further operational strategies include real-time multimodal decision support, network traffic prediction, online microsimulation analysis, and real-time response strategy assessment.

Tools to succeed

As the nucleus of the ICM solution, Delcan's Intelligent NETworks ATMS is used for field device monitoring and control, center-to-center data fusion, event management and intelligent decision support system (DSS) response plan generation. This adds to a list of successful ATM and/or ICM projects for Delcan, including its award-winning Route 8 project in Hong Kong.

In addition to the Delcan product, at the heart of the DSS is Aimsun Online, a simulation-based prediction system from TSS-Transport Simulation Systems. Aimsun Online uses live data feeds and simulations to dynamically forecast traffic conditions based on the current state of the network, and to help operators evaluate incident response or congestion management strategies.

"The San Diego ICM project is unique for incorporating both the network prediction subsystem (NPS) and real-time simulation subsystem (RTSS)," notes Peter Thompson, technical manager at SANDAG. "Through the use of these tools, decisions are made based both on current and predicted traffic conditions, a capability that has been missing from ATMS solutions over the past 20 years."

Alex Estrella, SANDAG ICM project manager, highlights the importance of the project to the region: "Its completion will augment this region's longstanding commitment for working together and demonstrate the San Diego region's ability to develop and implement innovative solutions and strategies for addressing congestion."

Through the deployment of these tools, a 'smart' traffic management system will give operators comprehensive awareness of the current and likely future performance of the entire corridor. Building upon the systems already in use on I-15, operators can now take proactive steps to prevent system breakdown using enhanced controls across multi-jurisdictional devices, such as traffic signals, ramp meters and DMS.

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