Unified Disaster Council Meeting

Thursday, December 10, 2015

SANDAG's I-15 Integrated Corridor Management Project Overview

Regional Vision

- Traveler Information
- Electronic Payment Systems
- Multi Modal Integration, Performance Based Corridor Management
- Vehicle Automation (New)
- Universal Transportation Account (New)
- ITS for Transit and Transit Infrastructure Electrification (New)
- Active Traffic and Demand Management (New under TDM)

Early Efforts: Strategic Assessment

	Level 1 Silo	Level 2 Centralized	Level 3 Integrated	Level 4 Multimodal Integrated	Level 5 Multimodal Optimized
Planning	Functional Area Planning (single mode)	Project-based Planning (single mode)	Integrated agency wide planning (single mode)	Integrated corridor-based multimodal planning	Integrated regional multimodal planning
Data Collection (vehicle tracking)	Limited or Manual Input	Near real-time for major routes	Real-time for major routes using multiple inputs	System-wide Real-time data collection (single mode)	System-wide Real-time data collection across all modes
Data Integration	Limited	Networked	Common user interface	2-way system integration	Extended integration
Network Operations	Ad-Hoc, Single Mode	Centralized, Single Mode	Automated, Single Mode	Automated, Multimodal	Multimodal Real-time Optimized
Incident Management	Manual detection, response and recovery	Manual detection, coordinated response, manual recovery	Automatic detection, coordinated response and manual recovery	Automated pre-planned multimodal recovery plans	Dynamic multimodal recovery plans based on real-time data
Analytics	Ad-hoc analysis	Periodic, Systematic analysis	High-level analysis in near real-time	Detailed analysis in real-time	Multi-modal analysis in real-time
Demand Management	Individual static measures	Individual measures, with long term variability	Coordinated measures, with short term variability	Dynamic pricing	Multimodal dynamic pricing
Payment Methods	Manual Cash Collection	Automatic Cash Machines	Electronic Payments	Multimodal integrated fare card	Multimodal, multi-channel (fare cards, cell phones, etc)
User Information Services	Static Information	Real-time information by mode	Multimodal Real-time trip planning.	Location-based, on-journey multimodal information	Location-based, multimodal proactive re-routing
Performance Measurement	Minimal	Defined metrics by mode	Limited multimodal metrics	System-wide multimodal system-wide metrics	Continuous system-wide performance measurement

Fast Forward: I-15 Integrated Corridor Management Project

1. Main Lanes
2. Express Lanes
3. DAR
4. Transit
5. *Rapid* Transit Station
6. Arterial Network

Why ICM:

1. The corridor's multi-modal and smart-growth approach shall i**mprove accessibility** to travel options and attain an enhanced level of mobility for corridor travelers.

2. The corridor's safety record shall be enhanced through an **integrated multimodal** approach.

3. The corridor's **travelers** shall have the informational tools to make smart travel **choices** within the corridor.

4. The corridor's **institutional partners** shall employ an integrated approach through a corridor-wide perspective to resolve problems.

5. The corridor corridors networks shall be **managed holistically** under both normal operating and incident/event conditions in a collaborative and coordinated way

Why ICM: Change How We Manage and Operate Transportation Assets

Institutional **Integration**

- **Commitment** - collaboration between various agencies, modes, and jurisdictions that transcends institutional boundaries

Operational **Integration**

- **All inclusive customer focus** - Joint operational objectives and strategies to manage and balance the total capacity and demand of the corridor

Technical **Integration**

- **Sharing and distribution -** of information and system operations control functions to support the analysis and immediate response

ICM It's About:

- Operations and management of a corridor
- Management implies planning for, and responding to, what is happening across ALL Networks

Overall ICM Strategies

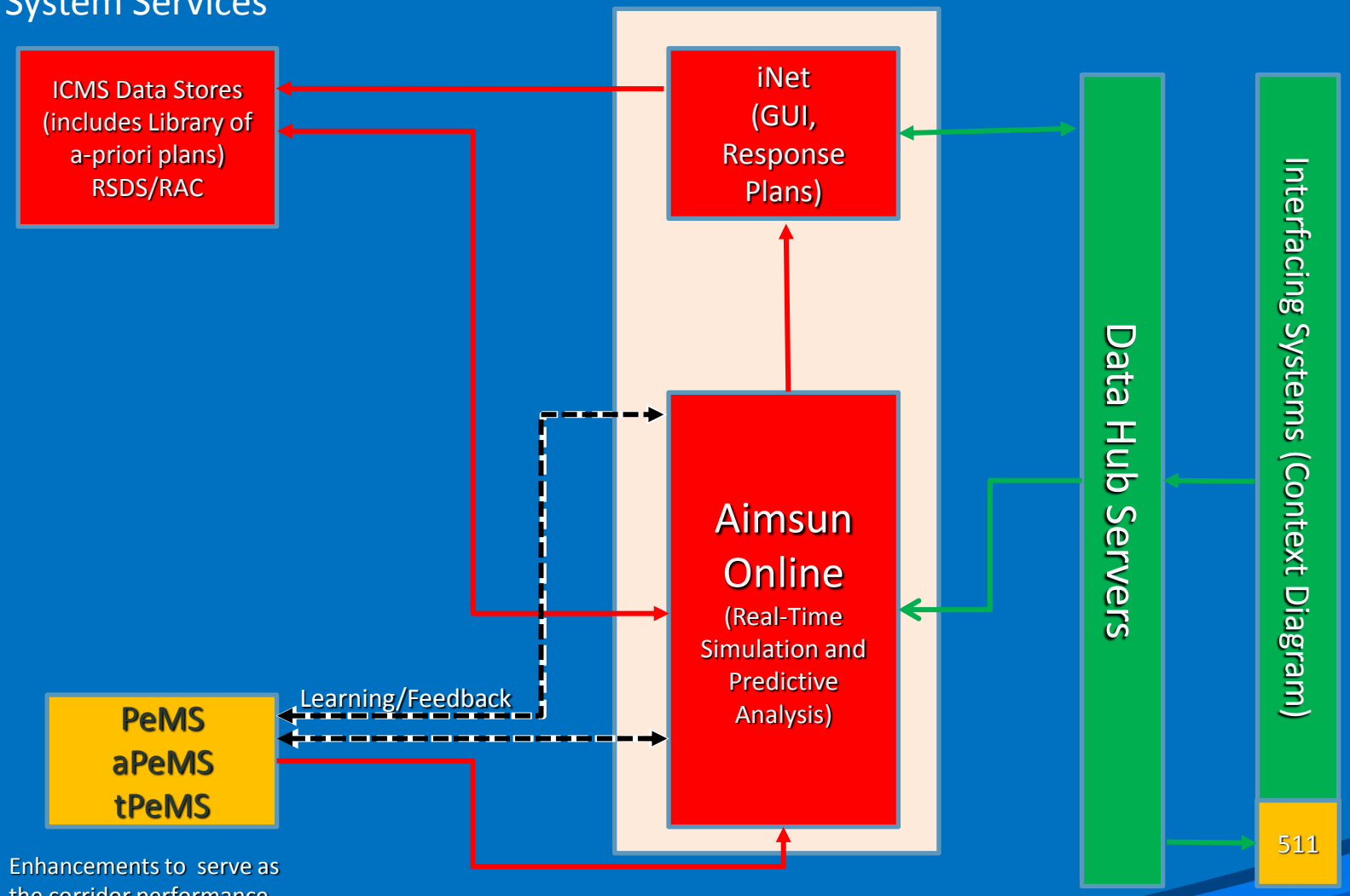
- Implement Active Traffic Management (ATM):
- First in the nation real-time multimodal response and control (DSS System)
  - Proactively manage multiple modes through and along the corridor
  - En-route traveler information (CMS Signs, 511 San Diego mobile app)
  - Pre-trip traveler information (511 San Diego mobile app, 511 phone system)
  - Signal coordination on local roadways with freeway ramp metering
  - Transit rerouting
- Dynamic rerouting – January 2016
- Corridor ramp metering – December 2016

What Are The ICMS Components

- Data Integration / Fusion Engine
- Business Rules Engine
- Corridor Visualization
- Real-Time Network Prediction
- Response Plan Evaluation Engine
- Automation Workflow Engine
- Performance Data Warehouse

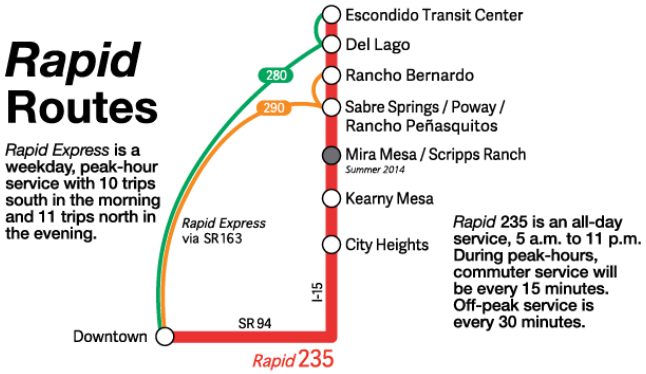
ICM System Components

System Services

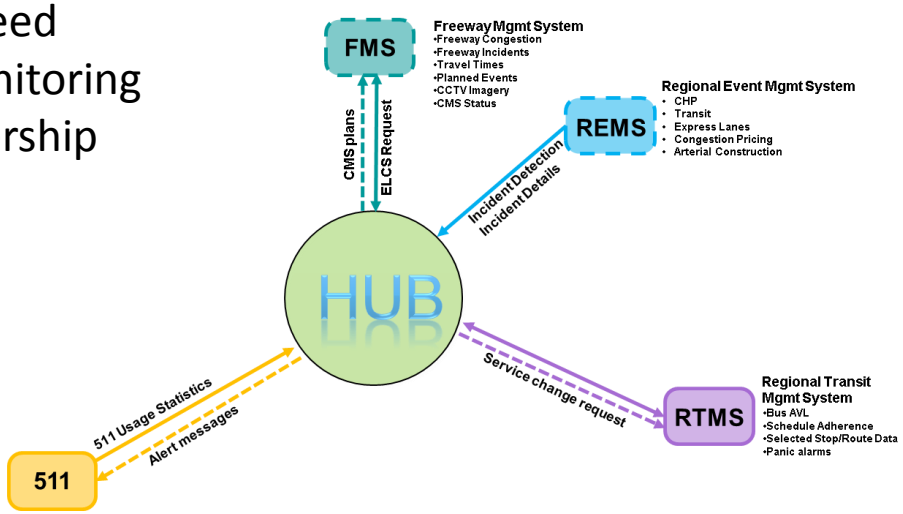


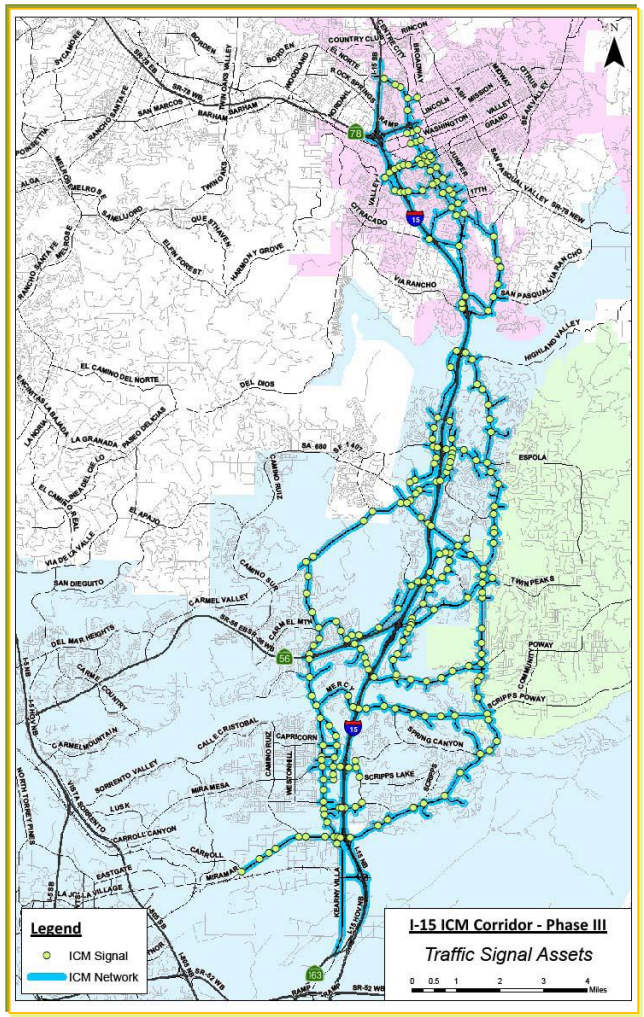
Enhancements to serve as the corridor performance management element of DSS

ICMS Assets

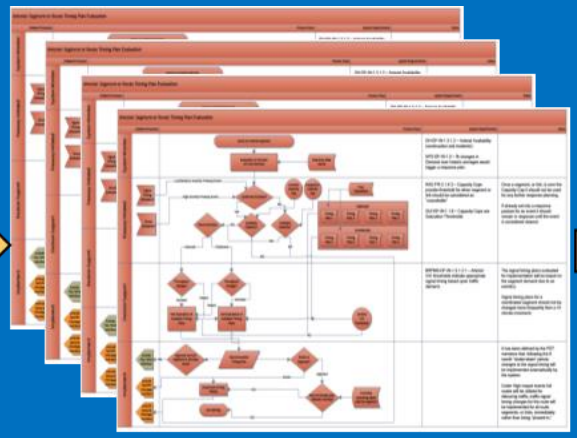


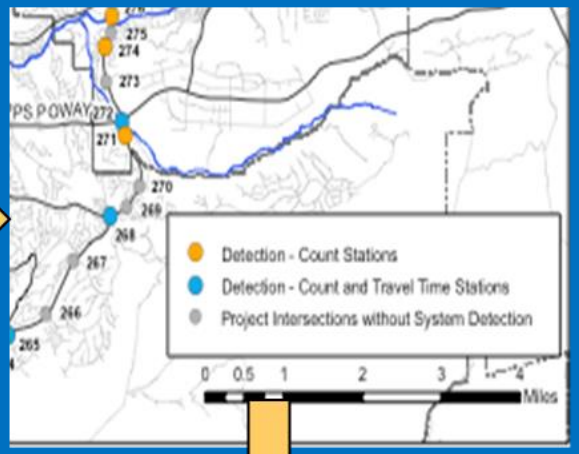
- Transit location
- Transit speed
- Route monitoring
- Route ridership





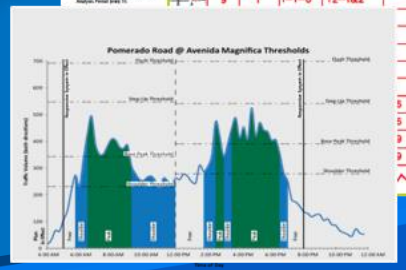
Technical Path: Vision to Development





Operational Framework

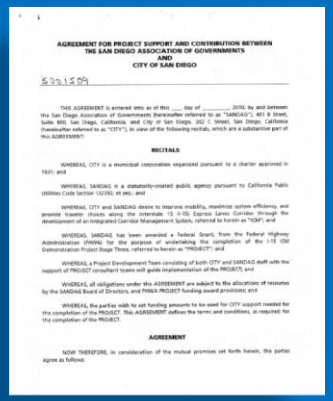
- **Sets Strategies**
- **Sets Conditions for use**
- **Sets Dependencies**



Expres Lanes	Transit	Traveler Information	Traffic Signal Timing	Ramp Metering
• Not used	• Action Plan 1	• Action Plan 1	• Action Plan 1	• Action Plan 1
• Action Plan 1		• Action Plan 2	• Action Plan 2	• Action Plan 2
• Action Plan 2		• Action Plan 3	• Action Plan 3	• Action Plan 3
		• Action Plan 4	• Action Plan 4	• Action Plan 4

Institutional Path: Vision to Implementation

MOUs

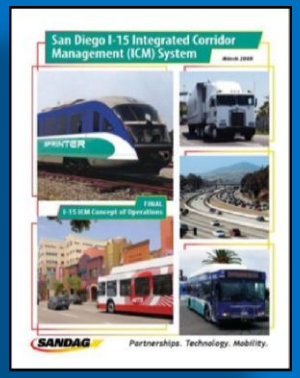

AGREEMENT FOR PROJECT SUPPORT AND CONTRIBUTION BETWEEN THE SAN DIEGO ASSOCIATION OF GOVERNMENTS AND CITY OF SAN DIEGO

Management Framework

Technical Memorandum

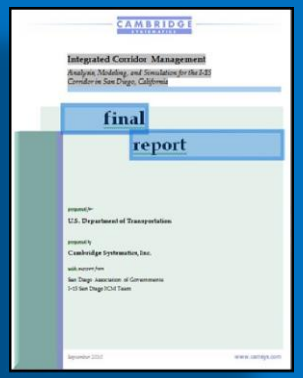
Common Vision – Management/Operations – Day to Day Operations

Stage 1



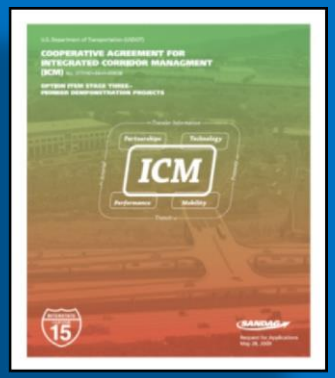
Concept Development and Draft Reqs. – Partnership Commitment

Phase 2



Advanced Modelling & Simulation – Operational and Management Guidance

Stage 3



Implementing Vision

Phase 3

Corridor Management and Operations in Practice

Beyond

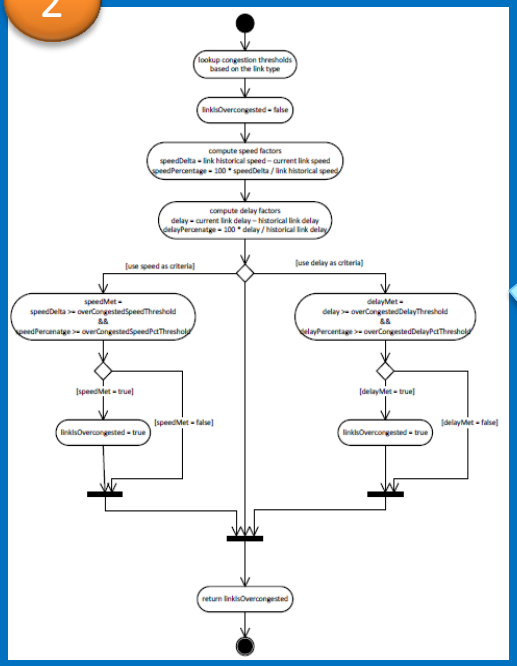
ICMS Process

Inventory + Prediction

1

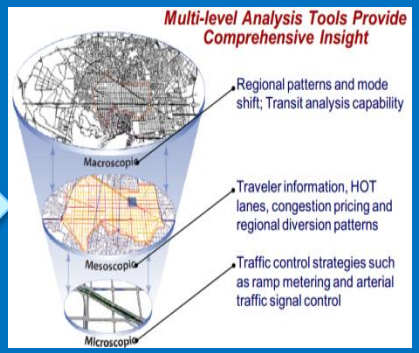
Business Rules Engine

2



Event Response Suite

3



4

Corridor MOE

5

{0.00, -13.28, 11.14, 1.19, 7.81, 2.2}

6

Recommended Response Plan

ATMS - Internet Explorer

https://www.icmsd.net/atms/atmslite.jsp

SANDAG

New: Map | Viewer | MultiViewer | List | Inventory | Reporting | Corridor | Alarm | Administration | Profile | About | PeMS | Logout | Help

Viewer | Confirmed Event 625977 : I-15 S at TED WILLIAMS FREEWAY (SR-56)

Event Basics | Notes | Details | Geolocator | Response Plans

Show ☑ Predictions ☑ Assets ☑ Diversions

Predictions: Time (minutes) 15 30 45 60

Color Prediction By LOS V/C Speed

2014-06-02 08:20

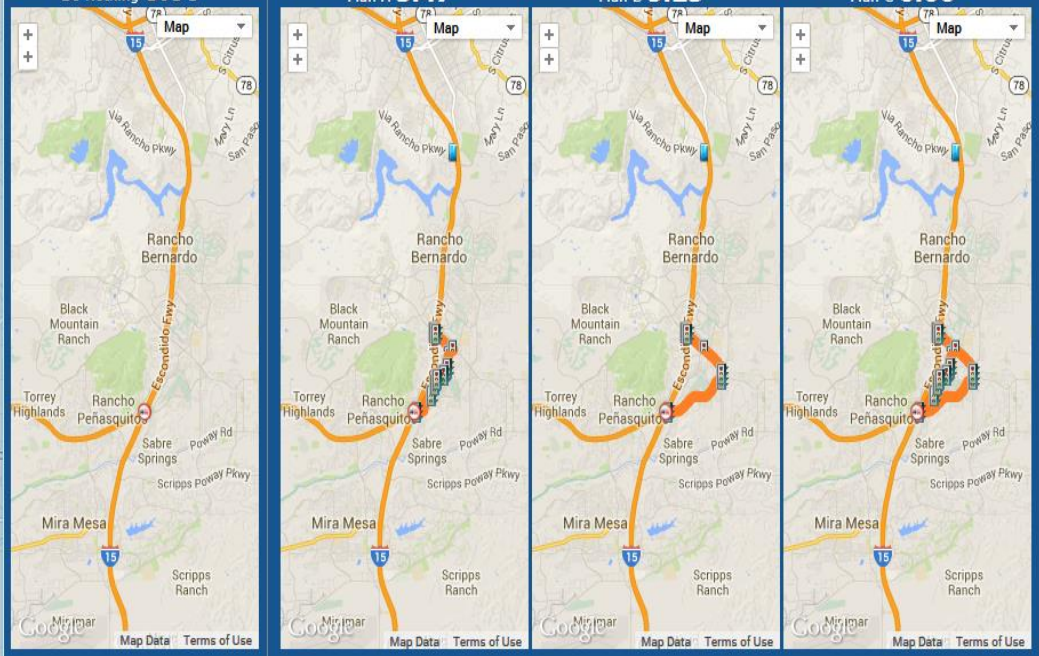
Evaluations
- Plan A
- Plan B
- Plan C

Do Nothing **0.00**

Plan A **3.47**

Plan B **5.23**

Plan C **6.66**



Approval Needed

2014-06-02 08:19
Caltrans
I-15 S at Camino Del Norte

Sign ID: CMS 37
Status: Not in Queue
RP (Active):
RP (Queue):

ACCIDENT
EXPRESS LANES
OPEN TO ALL

SB 15 At Camino Del Norte

Status: OK Caltrans View Only

I-15 S at Camino Del Norte 2014-06-02 08:21:37

Status: OK I-15 S at Camino Del Norte Mozilla

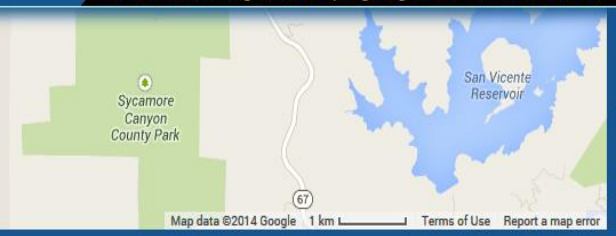
Video Size

Open Presets

ZOOM FOCUS IRIS

Select a Device

CCTV Events Parking Radio Ramp Sign Signal Toll Transit VDS Weather



ICMS Control
Canceled
Unavailable

Precipitation
Rain Light
Rain Moderate
Rain Heavy

Open Icon Layering

Close Legend

CCTV Events Parking Radio Ramp Sign Signal Toll Transit VDS Weather

ATMS Login - Intern... | ATMS - Internet Expl... | Document1 - Micros... | Inbox - aes@sandag.... | Desktop | 8:21 AM

Baseline Establishment: Understanding Response Plans

Date	Tuesday, June 30, 2015	Event ID:	853963				SUMMARY
Response Plan ID:	31039	Score:	6.6	@	3:04 PM		

Begin	End	Duration	Severity	Dir	Post Mile	Roadway	Event Location	Description
2:34 PM	3:30 PM	55mins,51sec	Major	NB	23.9	I-15 N	Rancho Bernardo Rd.	Congestion on North I-15 near Rancho Bernardo Rd. Consider alternate route.

PROPOSED CHANGE LIST:
DIVERSION: Exit at Ted Williams to Pomerado North and re-enter at Pomerado on ramp

ID	NAME	CURRENT	PROPOSED
Poway.24	Pomerado Hospital @ Pomerado	6A	6A
Poway.38	Pomerado @ Casa Avenida	Free	6A
Poway.54	Pomerado @ Monte Vista	6A	6A
Poway.21	Ted Williams @ Pomerado	Free	6A
Poway.22	SR-103 Colony Drive @ Pomerado	Free	6A
Caltrans.135	I-15 @ POMERDO HIGHLAND	Free	Free
Caltrans.126	I-15 @ TED WILLIAMS PKWY	2A	2A
SanDiego.1119	Greens East @ Pomerado	6A	6A
SanDiego.1118	Oaks North @ Pomerado	6A	6A
SanDiego.1116	Mirasol @ Pomerado	6A	6A
SanDiego.1115	Escala @ Pomerado	6A	6A
SanDiego.1114	Highland Valley @ Pomerado	Free	6A
SanDiego.1124	Bernardo Heights @ Pomerado	2A	6A
SanDiego.1122	Higa Place @ Pomerado	2A	6A
SanDiego.1123	Pomerado @ Stone Canyon	6A	6A
SanDiego.1241	Paseo Del Verano @ Pomerado	Free	6A

PROPOSED CHANGE LIST:

ID	NAME	DIR	CURRENT vplph (Rate Code)	PROPOSED vplph (Rate Code)
RMIS.12704	Pomerado/W Bernardo	NB	996 (1)	996 (1)
RMIS.12602	Bernardo Center Dr	NB	461 (15)	461 (15)

APPROVED LIST:

ID	NAME	DIR	CURRENT	PROPOSED
CMS 36	Camino Del Norte	NB		SLOWING AT RANCHO BERNARDO EXPECT DELAYS

Traffic Signals

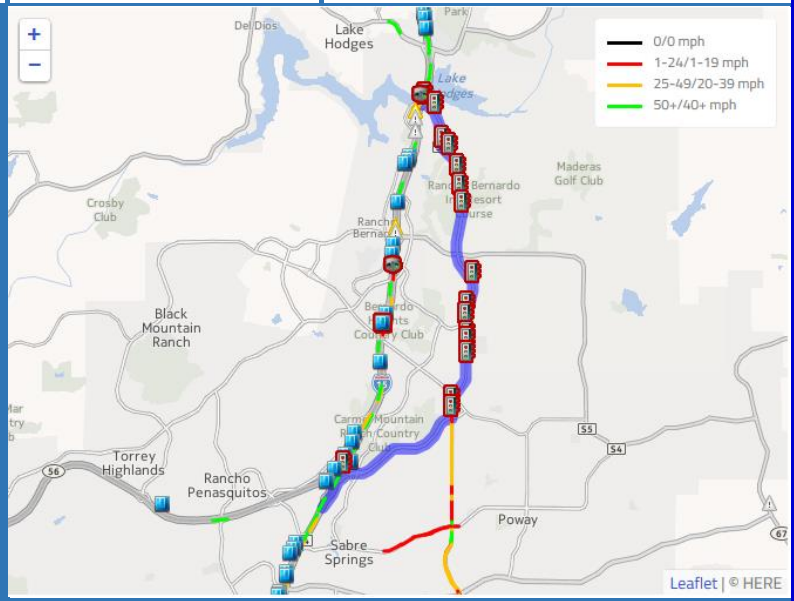
16

Ramp Meters

2

CMS

1



I-15 North at JSO Camino Del Norte

511 Message: Congestion on north I-15 near Rancho Bernardo Rd. Consider alternate routes inlcuding Exit at Ted Williams to Pomerado North and re-enter at Pomerado on ramp.

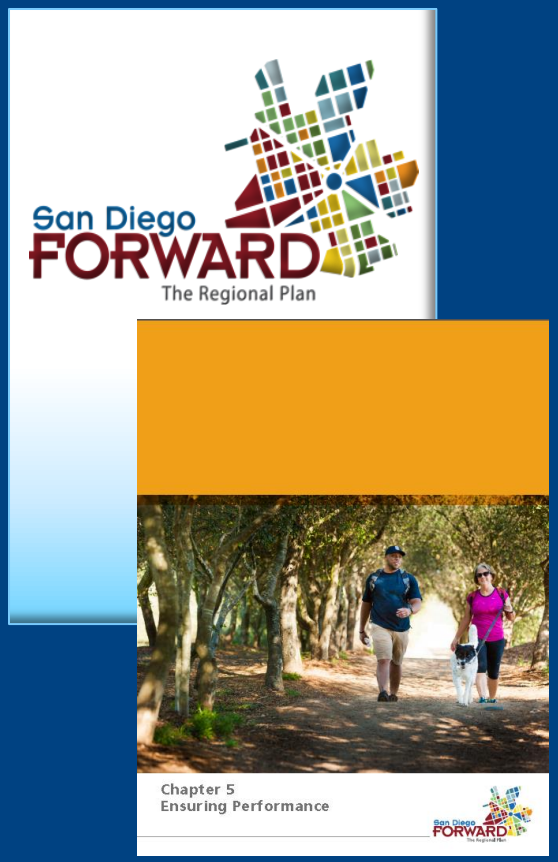
Notes:

Data along the response plan generated arterial route shows a clear increase in vehicle flow. This increase in flow, however, shows no negative impact on the speeds or travel times, as is demonstrated by INRIX data along Ted Williams Pkwy and Pomerado Rd. Travel time remains relatively consistent to normal day operations for that route. Reasons behind a lack of improvement in travel time along the route could be attributed to weather conditions (rain and thunderstorms) during that time frame. Heavy rainfal began approximately around 2:30pm which is when the event was generated. Event did not trigger until 3pm, however, once congestion had accumulated along the I-15 North.

So What is Happening Now?

- SANDAG; Caltrans; cities of San Diego, Poway, and Escondido; NCTD; and MTS are working together
- ICM system allows partners to address congestion in real-time, holistically under 'normal' and incident conditions
- Alternate route signs are being installed on surface streets along the I-15 corridor to reroute motorists in the event of major incidents

Next Steps:



- **Actions to Implement Plan**
  - **Next ICM Corridors - Develop Next Concept of Operations**
  - **Develop a TSMO**

- **More Info/Questions:**

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Alex.Estrella@Sandag.org

www.sandag.org/ICM