

Caltrans District 7 Los Angeles Regional Transportation Management Center (LARTMC)

"Innovative Technologies at Work"



October 2007



The LARTMC – What is It?

- ❖ The LARTMC is a high-technology facility designed solely for purposes of managing traffic within the highly congested LA and Ventura County regions.



- ❖ The LARTMC serves forty three (43) distinct government functions and was designed with the technologies to support joint operations and act as the center for Intelligent Transportation Systems (ITS) and Emergency Response operations for the next 30 years.

LARTMC – Who does it help?

- ❖ The LARTMC systems assist nearly 9.6 million people living in LA alone, not to mention the 20 million people living in the Southern California, a great deal of which travel to LA each day.



- ❖ Motorists are assisted through:
 - ☑ Roadway congestion monitoring on 525 miles of mainline roadway
 - ☑ Real-time information posted to nearly 20 real-time traffic websites – 24x7
 - ☑ Real-time traffic and video displayed on television stations daily
 - ☑ Display or real-time incident and travel time messages on nearly 109 changeable message signs daily
 - ☑ Prompt motorist aid as well as incident detection, verification and clearance both improving travel flows and reducing secondary incidents

Agencies Involved



Vendors/Contractors Involved

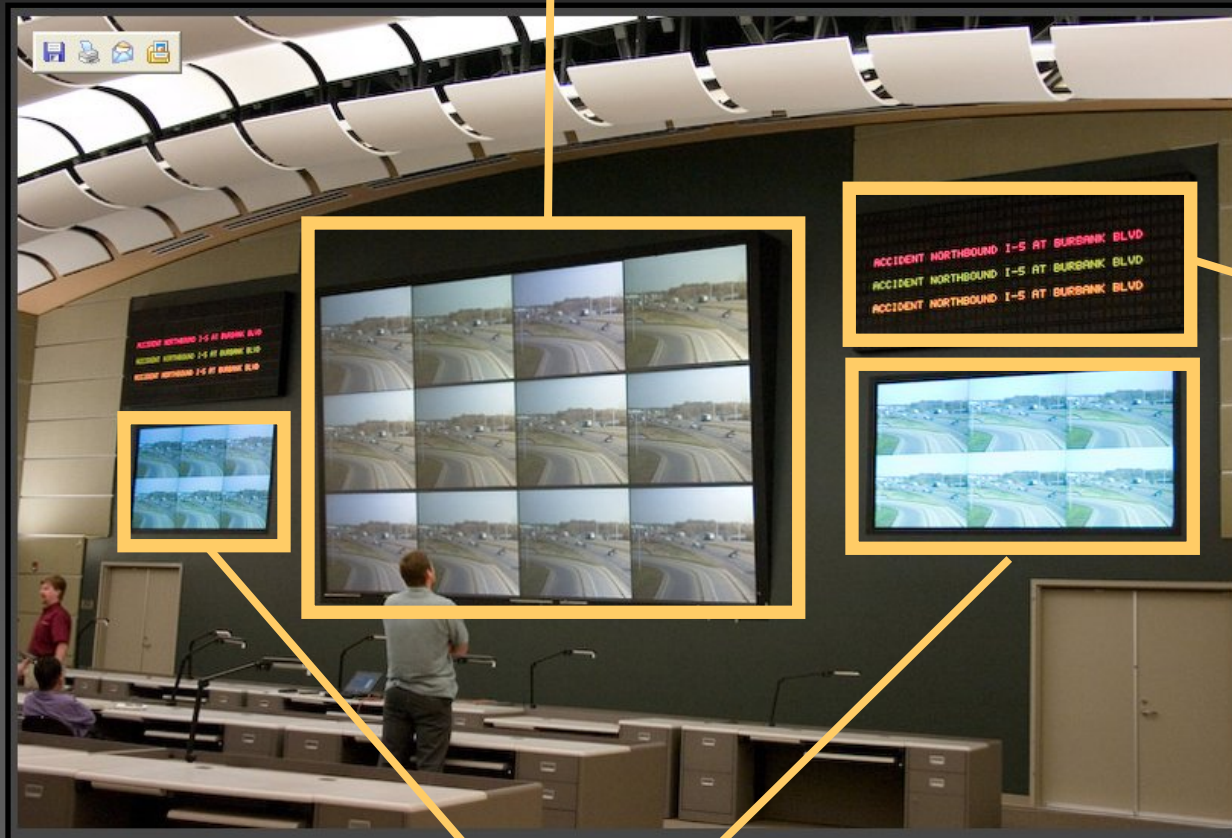


LARTMC Technologies and Innovations

- ❖ Audio/Visual System
- ❖ Advanced Transportation Management System (ATMS) Software
- ❖ Real Time Traffic Data Portals
- ❖ ITS Fiber Optic Field Communications

LARTMC Audio Visual System

Twelve 84" Dual Bulb Digital Light projection (DLP) displays

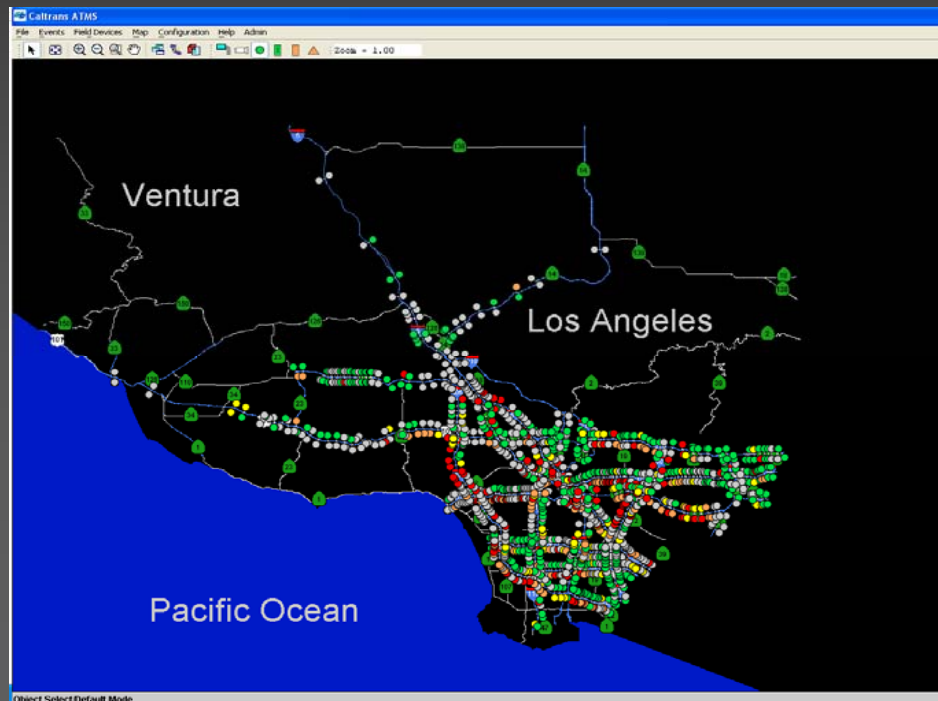


Two 10-Line,
40-character
Electronic
Message
Boards (EMB)

Twelve 50" Digital Light Projection
(DLP) display cubes

The ATMS software:

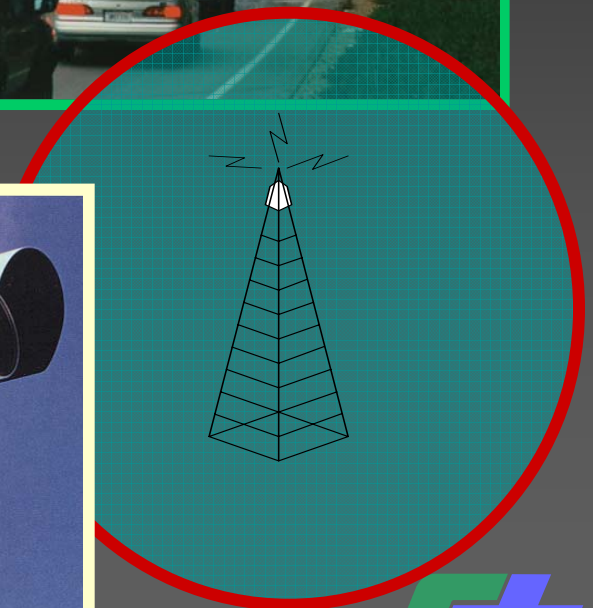
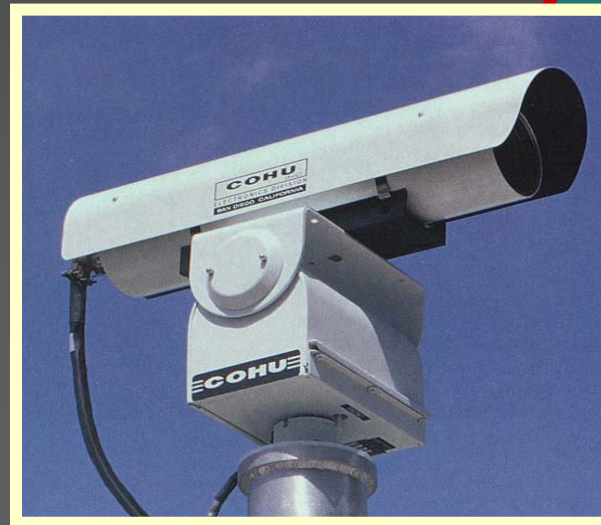
- Monitors over 525 miles of monitored freeway and highway
- 1,280 Traffic Monitoring Stations (TMS)
- Over 10,000 Inductive Loop sensors



*Real-Time
ATMS Map
displaying
1280 vehicle
detector
stations*

The ATMS Controls the following field devices:

- 109 Changeable Message Signs
- 960 Ramp Metering Systems
- 15 Highway Advisory Radio Stations
- 350 Closed Circuit television (CCTV) Cameras

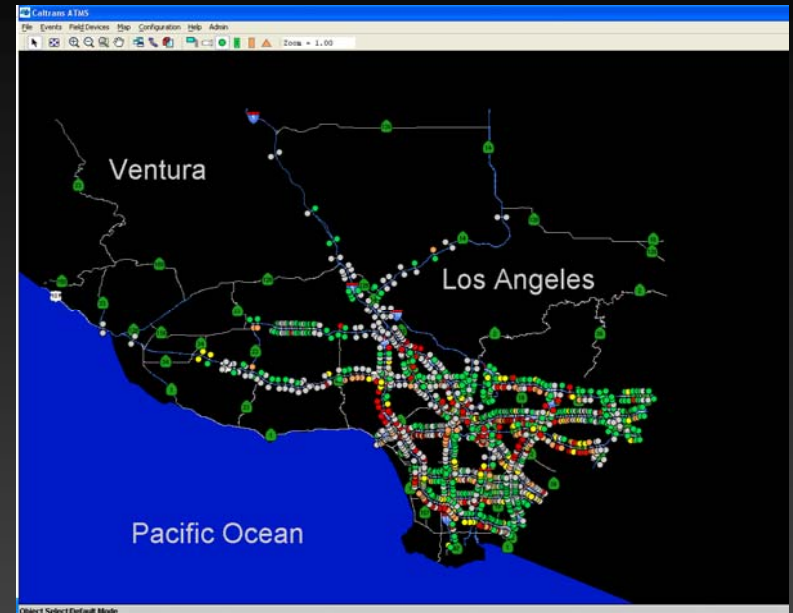


ATMS Software Features



ATMS "Base Map"

- **Map of Region**
 - **Depicts Roadways**
 - **Freeways, State Highways, Major & Minor Arterials**
 - **Shows Field Element Locations & Status**
 - **Induction Loops, Ramp Meters, CMS, CCTV, HAR & Beacons**
- **Overview of All ATMS Operations**
 - **Freeway Congestion**
 - **Ramp Metering Operations**
 - **Current and Scheduled Planned Event Operations**



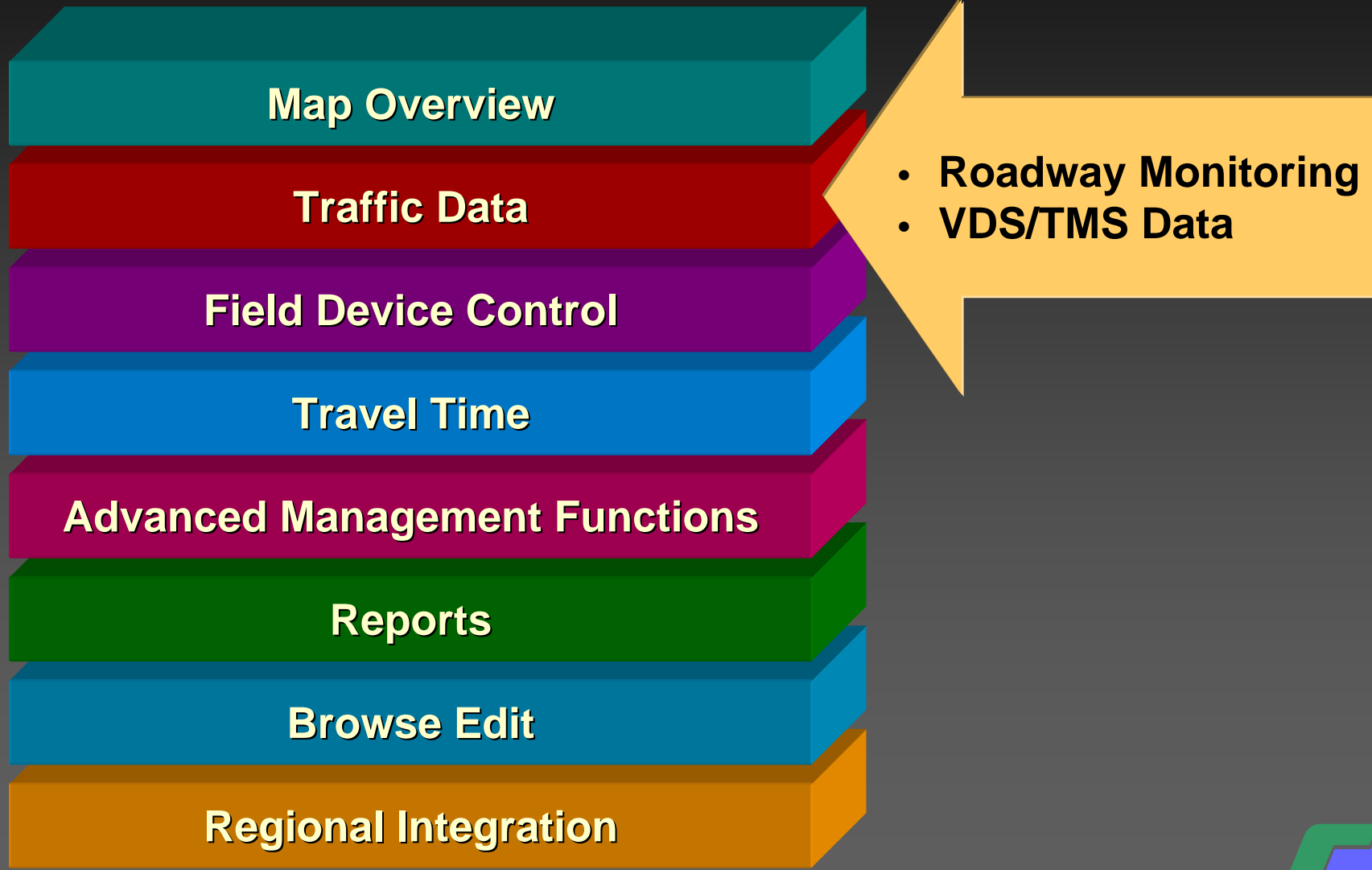
Functionality of Base Map

- **Map Manipulation**
 - Multiple Pan & Zoom Options
 - Map Overview
 - New Map
 - Legend
- **Control of Map Layers**
 - Automatic “Decluttering”
 - User Controllable Views



Grabber Pan. Select an anchor point drag the View to the desired position.

ATMS Software



VDS Data Dialogue

VDS 1213

Jun 27, 2005 2:57 PM

VDS ID: 717590 Data at: Jun 27, 2005

MS ID: 1213

County: Los Angeles

Location: SR134 W

Postmile: 8.76

Cross Street: HARVEY

VDS ID: 715473

Status: All Loops Good

Memory Pages...

Loop Enable/Disable...

Freeze Data

Lane	Status	Volume (15 Min)	Volume (5 Min)	Volume (30 Sec)	Occupancy	Estimated Speed
HOV1	OK	107	39	3	1.6	65
ML1	OK	301	111	6	2.6	70
ML2	OK	324	119	13	6.1	70
ML3	OK	216	82	10	5.9	69
ML4	OK	106	39	4	2.0	70
ML Average:		7.9	8.8	8.2	4.2	69.6
ML Total:		947	351	33		

Zoom to Area OK

Accumulated Loop Volumes (5, 15 min)

30 Second Loop Data

- Volume
- Occupancy
- Estimated Speed

Loop Status

Loop Location


Station Totals

Multiple Station Data Display

Adjacent VDS Data / 30-Second Volume

Jun 15, 2005 4:59 PM

Freeway: I210 W Data at: Jun 15, 2005 15:58:30

Freeze Data Data Display ▾ 

Lane	GRAND 2 41.68		GRAND 1 41.50		CITRUS 40.26		AZUSA 2 39.62		AZUSA 1 39.52	
	Speed	Vol	Speed	Vol	Speed	Vol	Speed	Vol	Speed	Vol
HOV1	70	10	70	6	65	5	70	4	63	3
ML1	69	18	70	15	70	15	70	16	70	17
ML2	70	14	69	18	70	9	70	11	70	15
ML3	50	10	51	9	70	11	70	14	54	11
Average:	65.0	14.0	63.9	12.8	69.9	11.0	69.1	12.2	65.6	12.0
Status:	Some Loops Bad		All Loops Good		All Loops Good		All Loops Good		All Loops Good	

Speed = MPH Vol = Veh / 30Sec

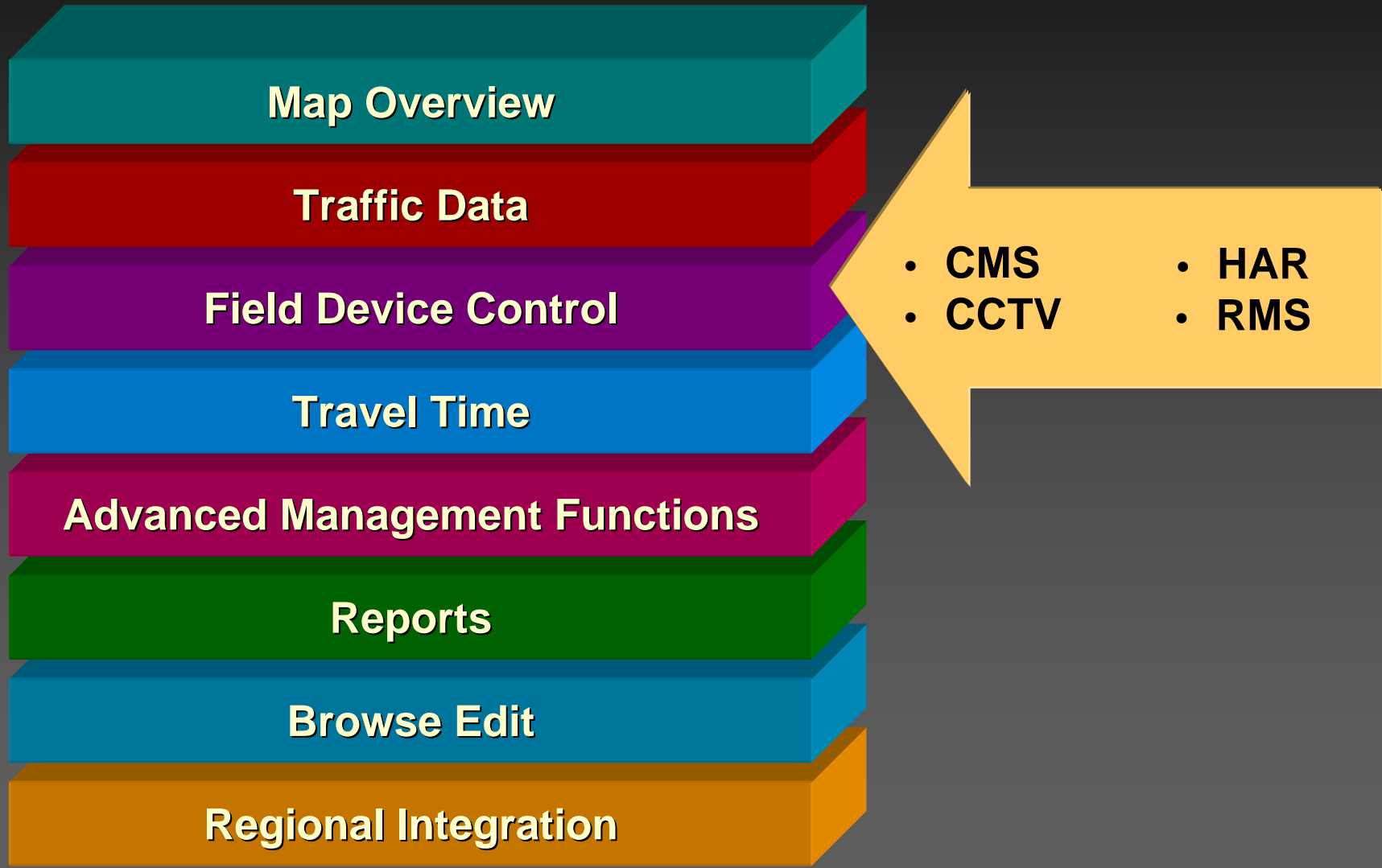
Upstream

Primary
VDS

Downstream

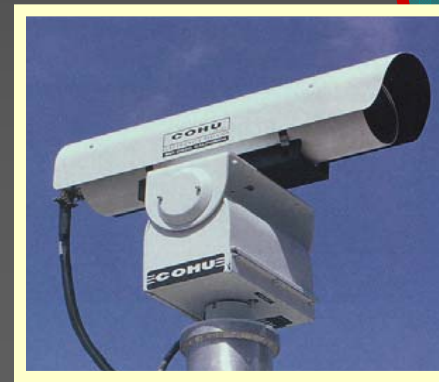
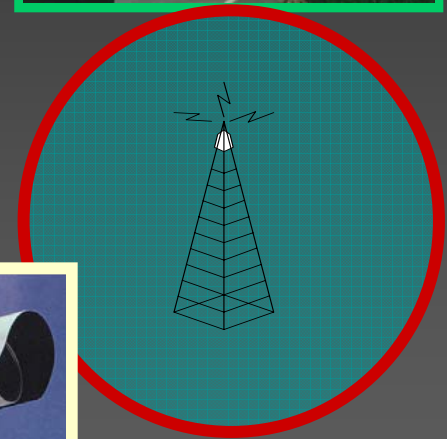


ATMS Software










Device Control

- Changeable Message Signs
 - Operational Status
 - Manual User Control
 - System Scheduled
- RMS
 - Operational Status (Mode, Rate)
 - Central Algorithm Configuration (SWARM)
- HAR & Beacons
 - Operational Status
- CCTV
 - Camera Selection (point and click)
 - Pan / Tilt / Zoom / Iris
 - Video Wall Control
 - Video Snapshot Configuration



Field Devices - Icon Display

Field Device Icon Display

Legend	Name	Visible	Control	Default	Display	Filter
	Changeable Message Signs (CMS)	<input type="checkbox"/>	Default	0.6	Normal	All
	CCTV	<input type="checkbox"/>	Default	0.5		
	HAR	<input checked="" type="checkbox"/>	On	0.5		
	Vehicle Detector Stations (VDS)	<input checked="" type="checkbox"/>	Default	1.0	Speed	All
	RMS, OnRamp Metered	<input type="checkbox"/>	Default	0.2		All
	OnRamp, Unmetered	<input type="checkbox"/>	Default	0.2		All
	OffRamp	<input type="checkbox"/>	Default	0.2		All

All On All Off Default OK

CMS Manual Control

CMS 95 Nov 14, 2005 5:30 PM

Multiple CMS Single CMS Detail

CMS DETAILS

CMS ID: 95
County: Los Angeles
Location: 15 N
Cross Street: OSBORNE ST
Postmile: 37.37
Type: MODEL 500
Status: Good

EDIT

2 Phase 1 Phase

Display Time: 2 Seconds

Immediate Schedule

Phase 1
XXXXXXXXXX
XXXXXXXXXX

CMS Control Nov 14, 2005 5:29 PM

Multiple CMS Single CMS Detail

PLAN

CMS	Location	Cross Street	Status	Proposed	Current	CCTV
<input checked="" type="checkbox"/>	95	15 N	OSBORNE ST	Good		
<input type="checkbox"/>	1	1405 N	135TH ST	Bad		
<input type="checkbox"/>	2	1405 N	MANHATTAN BCH BLVD	Good		
<input type="checkbox"/>	3	110 E	DORCHESTER AVE	Good		
<input type="checkbox"/>	4	SR91 W	W/O CENTRAL AVE	Good		
<input type="checkbox"/>	6	110 E	E/O WASHINGTON BLVD	Good		
<input type="checkbox"/>	7	SR101 S	WHITSETT AVE	Good		
<input type="checkbox"/>	8	SR101 N	W/O WOODMAN AVE	Good		
<input type="checkbox"/>	9	15 N	DITMAN AVE	Good		
<input type="checkbox"/>	10	1110 S	NINTH ST	Bad		
<input type="checkbox"/>	13	SR101 S	MELROSE AVE	Good		
<input type="checkbox"/>	14	110 E	CRENSHAW BLVD	Good		
<input type="checkbox"/>	15	110 W	ALAMEDA ST	Good		
<input type="checkbox"/>	16	1110 N	GAGE	Good		
<input type="checkbox"/>	17	1710 N	WASHINGTON BLVD	Good		
<input type="checkbox"/>	18	110 E	WESTERN AVE	Good		
<input type="checkbox"/>	19	1405 N	BEL AIR CREST RD	Good		

View

Summary
 Msg Details
 Schedule

EDIT

2 Phase 1 Phase

Display Time: 2 Seconds

Immediate Schedule

Phase 1
XXXXXXXXXX
XXXXXXXXXX

Phase 2
XXXXXXXXXX
XXXXXXXXXX

CMS System Schedule

The image displays a software interface for scheduling messages on a CMS system. It features a dialog box for setting message times, a main control panel with buttons for Send, Blank, and Reset, and an EDIT section with phase settings and a preview area.

Enter message start and end time (Nov 15, 2005, 10:21 AM)

Start Time: Tue 15:00 Duration: 6 hr 0 min

Now 12:00 14:00 16:00 18:00 20:00 22:00 00:00 02:00 04:00 06:00 08:00 10:00

End Time: Tue 21:00

Now 12:00 14:00 16:00 18:00 20:00 22:00 00:00 02:00 04:00 06:00 08:00 10:00

OK Cancel

10:12 AM

15:00

Send >> A message is scheduled for this sign.

Blank >>

Reset >>

EDIT

2 Phase 1 Phase

Display Time: 2 Seconds

Immediate At 15:00

Phase 1

SCHEDULE

TEST MESSAGE

Phase 2

Preview

Clear

History

Library

OK

CMS Message History

...	Location	Cross Street	Phase1	Phase2	Start	End	Du...	Operator
81	I210 W	ALLEN AVE.	XXXXXXXXXXXXXXXXXXXX YYYYYYYYYYYYYYYYYYY	TESTING 1 TESTING 2	2005.06.23 16:37	2005.06.23 16:39	00:01	testd7
81	I210 W	ALLEN AVE.	XXXXXXXXXXXXXXXXXXXX YYYYYYYYYYYYYYYYYYY	TESTING 1 TESTING 2	2005.06.23 16:39	2005.06.23 16:39	00:00	testd7
81	I210 W	ALLEN AVE.	TEST TEST1 TEST		2005.06.23 16:41	2005.06.23 16:41	00:00	testd7
81	I210 W	ALLEN AVE.			2005.06.23 18:15	2005.06.23 18:25	00:10	testd7
81	I210 W	ALLEN AVE.	A TEST MESSAGE		2005.06.24 08:56	2005.06.24 08:56	00:00	testd7
81	I210 W	ALLEN AVE.	PHASE 1 MESSAGE		2005.06.24 08:58	2005.06.24 08:59	00:00	testd7
81	I210 W	ALLEN AVE.	2 PHASE PART 1	2 PHASE PART 2	2005.06.24 08:59	2005.06.24 08:59	00:00	testd7
81	I210 W	ALLEN AVE.	SCHEDULED 1 PHASE MESSAGE		2005.06.24 09:04	2005.06.24 09:05	00:00	testd7
81	I210 W	ALLEN AVE.	SCHEDULED 2 PHASE - PART1	SCHEDULED 2 PHASE - PART 2	2005.06.24 09:07	2005.06.24 09:07	00:00	testd7
81	I210 W	ALLEN AVE.	TESTING AAA		2005.06.27 11:48	2005.06.27 13:24	01:35	testd7
81	I210 W	ALLEN AVE.	TEST AMBER ALERT		2005.06.27 13:38	2005.06.27 13:39	00:01	testd7

OK Cancel

CMS Message Library

ID	Title	Phase1	Phase2	Last Modified	Operator
1	TEST MESSAGE - 2 ...	TEST LINE 1 TEST LINE 2	TEST LINE 3 TEST LINE 4	2005.07.11 12:06	testd7
2	CONGESTION	CONGESTION AHEAD		2005.11.15 10:51	testd7
3	WINDY	GUSTY WINDS AHEAD		2005.11.15 10:51	testd7
4	DUSTY	POOR VISIBILITY AHEAD		2005.11.15 10:51	testd7
5					
6					
7					
8					
9					
10					

Buttons: Modify, New, Delete, OK, Cancel

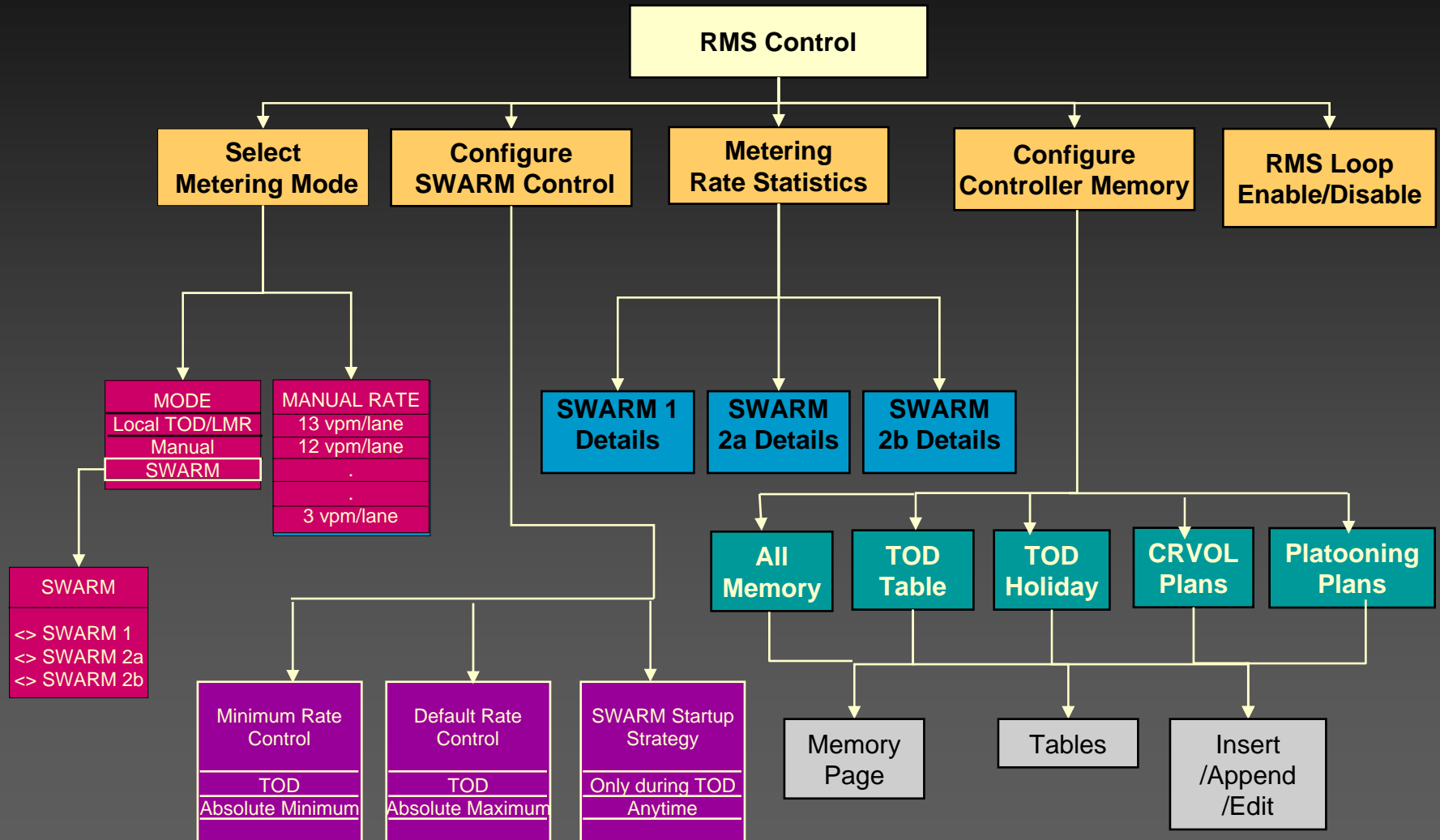


Grabber Pan. Select an anchor point drag the View to the desired position.

Ramp Metering

- Manual Control
 - Traditional Time of Day & Local Responsive
 - Controller Memory Configuration
- Multiple “Automated” Modes
 - 3 Central Algorithms
 - Swarm 1 - Adaptive System-wide
 - Swarm 2a - Headway-based local responsive
 - Swarm 2b - Density-based local responsive

Flow of RMS Windows



Ramp Metering Control

RMS 1288

Jun 15, 2005 7:15 PM

RMS ID: 716612 **Data at: Jun 15, 2005 18:14:30**

MS ID: 1288 **Metering Status:** Not Currently Metering

County: Los Angeles **Metering Mode:** Local: TOD

Location: I210 W **Metering Rate:** Off

Postmile: 40.26 **Controller Override:** None

Cross Street: CITRUS **% Violations:** 0

LDS ID: 715515 **Metered Lanes:** 2

Status: Good **Ramp Lanes:** 2

HOV Lane Location: None

Platoon Meter Ramp: No

Select Metering Mode

Configure SWARM Control

Metering Rate Statistics

Configure Controller Memory

Loop Enable/Disable...

Freeze Data

RMS Type: OR		Accumulated Volume			30 Second Data		
Loop Type	Loop Status	15 Min	5 Min	1 Min	Volume	Occupancy	Estimated Speed
OR	OK	116	37	7	3	1.7	70
PA	OK	116	37	7	2	1.0	70
DM	OK	118	38	8	3	1.5	70
QU	OK	106	32	5	3	3.5	42

Zoom to Area

OK

CCTV Interface


CCTV 578
Jul 14, 2005 2:47 PM

Camera ID: 578
County: Los Angeles
Location: I5 S
Postmile: 8.90
Cross Street: PARAMOUNT BLVD

◀ Previous ▶ Next

Video Wall ...

Capture ...



CAM 578
S5 - Paramount Blvd

IRIS: Auto Manual Open Close

ZOOM: In Out

FOCUS: Near Far

Zoom to Area OK

D7 TMC Video Wall, CCTV 590

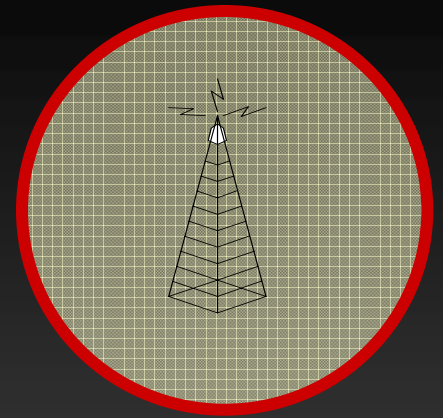
1	3	5	MAP	7	9
2	4	6		8	10

OK



HAR & Beacon Control

- Notepad serves as a place for users to record HAR use and beacon use
- Programmatic interface to HAR under development



HAR HAR-02 Nov 15, 2005 3:12 PM

Multiple HAR Single HAR Detail

HAR DETAILS

HAR ID:	HAR-02
County:	Los Angeles
Location:	SR14 S
Cross Street:	14/138 AT PALMDALE
Postmile:	59.78
Type:	HIS
Status:	Device Off

Proposed: testd7

testing har message

Current:

Beacons

Beacons

EDIT

testing har message

Electronic Message Board (EMB) - EMB CMS (for LARTMC)



Electronic Message Board Control

Jun 27, 2005 3:07 PM

CMS Board Event Board

Manual Automatic

CMS #	MESSAGE	CMS #	MESSAGE
5	CONV CTR 13 MIN	1	TRAVEL TO
	I-710 20 MIN		LAX 4 MIN
9	SR60 4 MIN	2	41 MIN TO
	SR170S 31 MIN		R. REAGAN FRWY
11	SR19 13 MIN	42	TRAVEL TO
	AZUSA AV 25 MIN		I-105 3 MIN
3	CONV CTR 16 MIN		
	CSULA 23 MIN		
6	TRAVEL TO		
	CONV CTR 9 MIN		

Send Clear OK

Agenda

Map Overview

Traffic Data

Field Device Control

Travel Time

Advanced Management Functions

Reports

Browse Edit

Regional Integration

- **Signing Configuration**
- **Signing Scheduler**
- **Target Selection**

Congestion Signing Configuration

Activate
 Deactivate

Scheduler ...

CMS	Location	Cross Street	Status	Congestion Signing
<input type="checkbox"/>	1	I405 N	135TH ST	Good Active
<input type="checkbox"/>	2	I405 N	MANHATTAN BCH BLVD	Good Active
<input type="checkbox"/>	3	I10 E	DORCHESTER AVE	Good Active
<input type="checkbox"/>	4	SR91 W	W/O CENTRAL AVE	Good Active
<input type="checkbox"/>	5	I10 E	MOTOR AVE	Good Active
<input type="checkbox"/>	6	I10 E	E/O WASHINGTON BLVD	Good Active
<input type="checkbox"/>	7	SR101 S	WHITSETT AVE	Good Active
<input type="checkbox"/>	8	SR101 N	W/O WOODMAN AVE	Good Active
<input type="checkbox"/>	9	I5 N	DITMAN AVE	Good Active
<input type="checkbox"/>	10	I110 S	NINTH ST	Good Active
<input type="checkbox"/>	11	SR60 E	INDIANA ST	Good Active
<input type="checkbox"/>	12	SR101 S	WHITE OAK AVE	Good Active
<input type="checkbox"/>	13	SR101 S	MELROSE AVE	Good Active
<input type="checkbox"/>	14	I10 E	CRENSHAW BLVD	Good Active
<input type="checkbox"/>	15	I10 W	ALAMEDA ST	Good Active
<input type="checkbox"/>	16	I110 N	GAGE	Good Active
<input type="checkbox"/>	17	I710 N	WASHINGTON BLVD	Good Active
<input type="checkbox"/>	18	I10 E	WESTERN AVE	Good Active
<input type="checkbox"/>	19	I405 N	BEL AIR CREST RD	Good Active
<input type="checkbox"/>	20	I5 S	S/O BROADWAY	Good Active
<input type="checkbox"/>	21	I110 N	EXPOSITION	Good Active
<input type="checkbox"/>	22	SR91 W	DOWNEY AVE	Good Active
<input type="checkbox"/>	23	I10 W	WESTERN AVE	Good Active
<input type="checkbox"/>	24	SR101 N	MELROSE AVE	Good Active
<input type="checkbox"/>	25	I5 N	N/O PIONEER BLVD	Good Active
<input type="checkbox"/>	26	I10 W	CRENSHAW BLVD	Good Active
<input type="checkbox"/>	27	I10 W	W/O NATIONAL BLVD	Good Active
<input type="checkbox"/>	28	I10 W	E/O ROBERTSON	Good Active
<input type="checkbox"/>	29	I405 S	VAN OWEN ST	Good Active
<input type="checkbox"/>	30	I10 E	CITY TERRACE O/C	Good Active
<input type="checkbox"/>	31	I10 E	MAPLE ST	Good Active




Sample Travel Time Message

CMS 11 Aug 22, 2005 5:57 PM

Multiple CMS Single CMS Detail

CMS DETAILS

CMS ID: 11 

County: Los Angeles

Location: SR60 E

Cross Street: INDIANA ST

Postmile: 1.92

Type: MODEL 500

Status: Good

Proposed: Send >>

Blank >>

Reset >>

Current: TT_MGR

TRAVEL TO
RTE 605. 14 MIN
RTE 57.. 45 MIN

EDIT

2 Phase 1 Phase

Display Time: 2 Seconds

Immediate Schedule

Phase 1 Phase 2

Agenda

Map Overview

Traffic Data

Field Device Control

Travel Time

Advanced Management Functions

Reports

Browse Edit

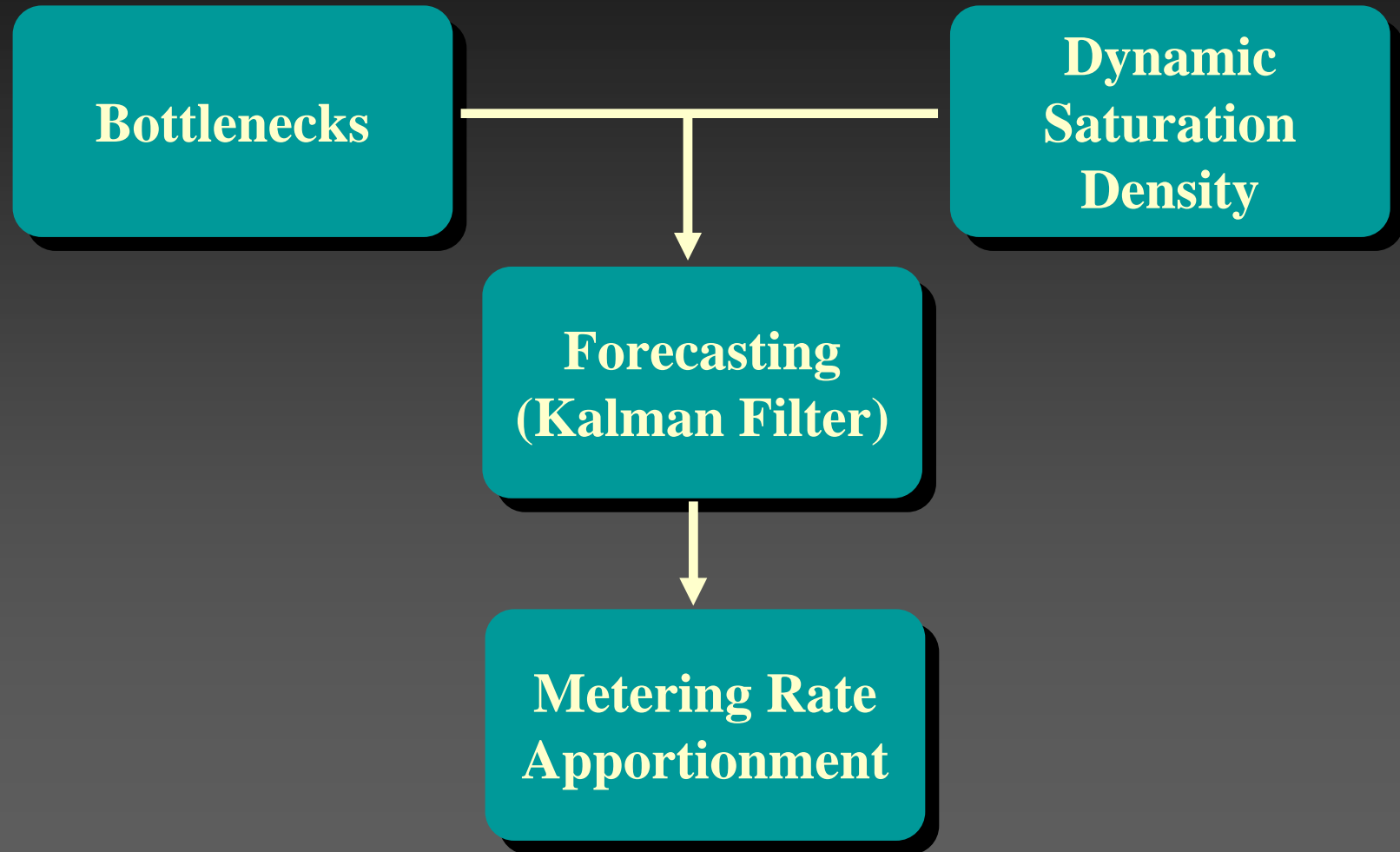
Regional Integration

- SWARM
- Incident Detection
- Event Management

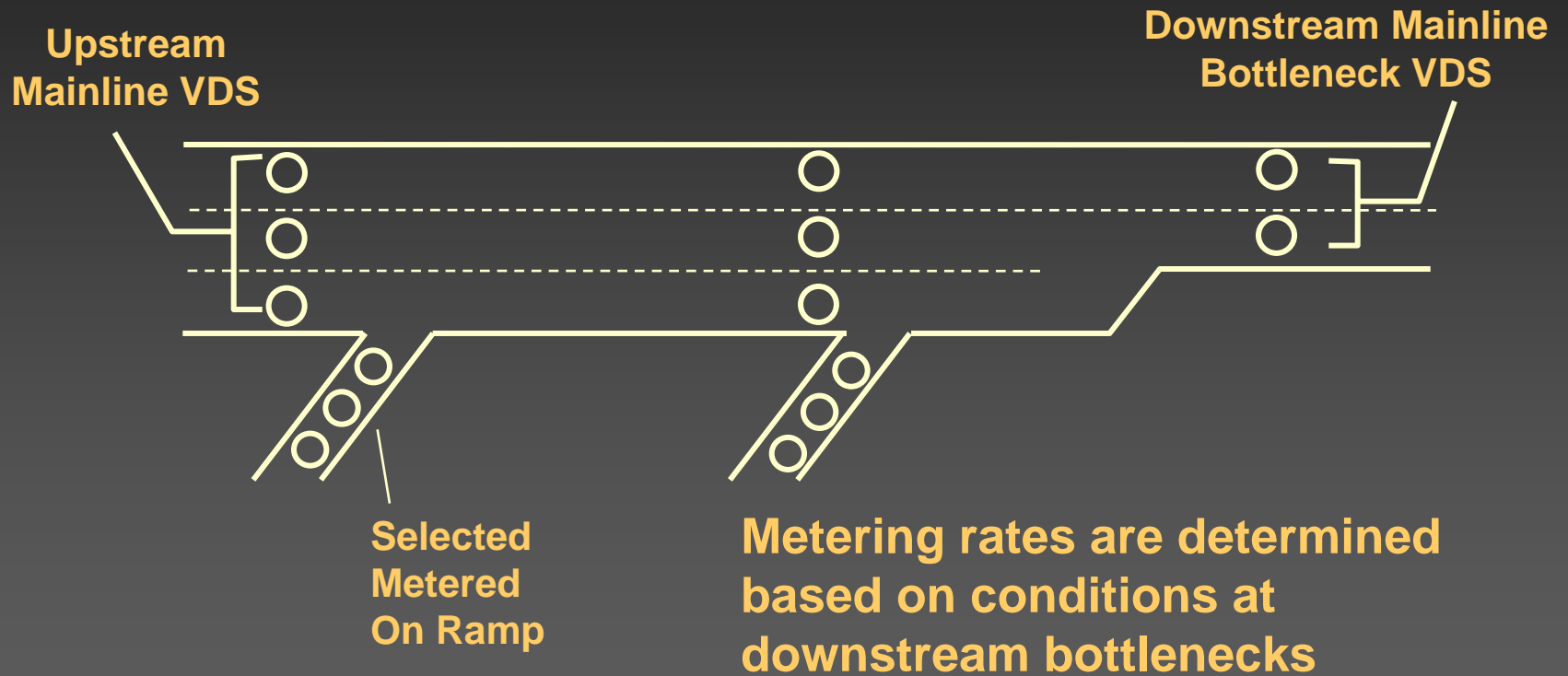
System Wide Adaptive Ramp Metering

- Develops metering rates based on real time conditions
- SWARM 1 - Network
 - Looks at the complete system
 - Forecasts traffic conditions x minutes into the future
 - Changes metering rates now to avoid predicted future problems
- SWARM 2
 - Looks at local traffic conditions near ramp
 - Based on current data
 - SWARM 2a - Headway (time between vehicles)
 - SWARM 2b - Storage

SWARM 1



SWARM 1 VDS Locations




Ramp Metering Control

RMS 1288 7:15 PM

Jun 15, 2005 Data at: Jun 15, 2005 18:14:30

RMS ID: 716612	Metering Status: Not Currently Metering
MS ID: 1288	Metering Mode: Local: TOD
County: Los Angeles	Metering Rate: Off
Location: I210 W	Controller Override: None
Postmile: 40.26	% Violations: 0
Cross Street: CITRUS	Metered Lanes: 2
LDS ID: 715515	Ramp Lanes: 2
Status: Good	HOV Lane Location: None
	Platoon Meter Ramp: No


 Freeze Data

RMS Type: OR		Accumulated Volume			30 Second Data		
Loop Type	Loop Status	15 Min	5 Min	1 Min	Volume	Occupancy	Estimated Speed
OR	OK	116	37	7	3	1.7	70
PA	OK	116	37	7	2	1.0	70
DM	OK	118	38	8	3	1.5	70
QU	OK	106	32	5	3	3.5	42

Configure SWARM Control

Configure SWARM Control ✕

Jun 15, 2005 7:18 PM

Data at: Jun 15, 2005 18:18:00

RMS ID: 716612	Metering Status: Not Currently Metering
MS ID: 1288	Metering Mode: Local: TOD
County: Los Angeles	Metering Rate: Off
Location: I210 W	Controller Override: None
Postmile: 40.26	% Violations: 0
Cross Street: CITRUS	Metered Lanes: 2
LDS ID: 715515	Ramp Lanes: 2
Status: Good	HOV Lane Location: None
	Meter Head Location: Both
	Platoon Meter Ramp: No

	Proposed	Commanded
Minimum Rate Control:	TOD Table <input type="button" value="v"/>	TOD Table
Default Rate Control:	TOD Table <input type="button" value="v"/>	TOD Table
SWARM Startup Strategy:	Operate SWARM Anytime <input type="button" value="v"/>	

Set controls that govern how SWARM rates are determined and implemented

Metering rate statistics

Metering Rate Statistics 7:19 PM

Jun 15, 2005 Data at: Jun 15, 2005 18:19:30

RMS ID:	716612	Metering Status:	Not Currently Metering
MS ID:	1288	Metering Mode:	Local: TOD
County:	Los Angeles	Metering Rate:	Off
Location:	I210 W	Controller Override:	None
Postmile:	40.26	% Violations:	0
Cross Street:	CITRUS	Metered Lanes:	2
LDS ID:	715515	Ramp Lanes:	2
Status:	Good	HOV Lane Location:	None
		Meter Head Location:	Both
		Platoon Meter Ramp:	No

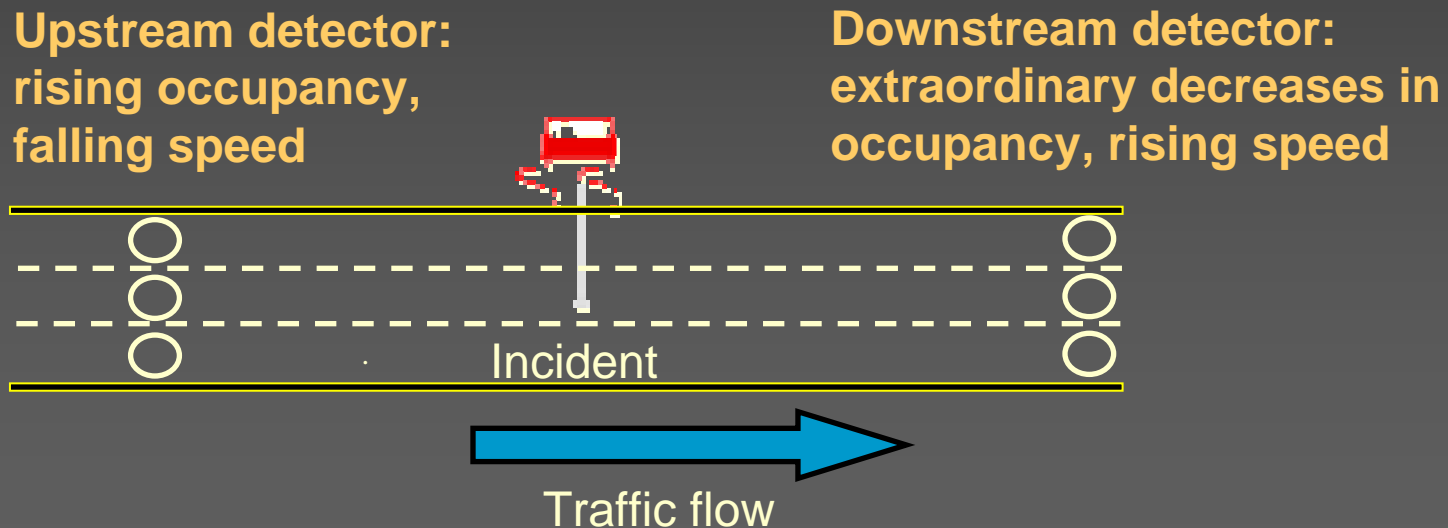
	RATE (veh/min)	Metering Mode
COMMANDED:	<input type="text"/>	<input type="text"/>
Time-of-Day Rate:	<input type="text" value="Off"/>	
SWARM1 (Network) Rate:	<input type="text" value="30"/>	<input type="button" value="SWARM 1 Details..."/>
SWARM2a (Headway) Rate:	<input type="text" value="30"/>	<input type="button" value="SWARM 2a Details..."/>
SWARM2b (Storage) Rate:	<input type="text" value="30"/>	<input type="button" value="SWARM 2b Details..."/>
Absolute Minimum Rate:	<input type="text" value="6"/>	
Absolute Maximum Rate:	<input type="text" value="30"/>	

Automatic Incident Detection

- Uses APID: All Purpose Incident Detection algorithm
- Algorithm considers Prevailing Congestion Levels
- Algorithm Tuned for Each Mainline VDS
- Operator “Alarmed” for Potential Incident

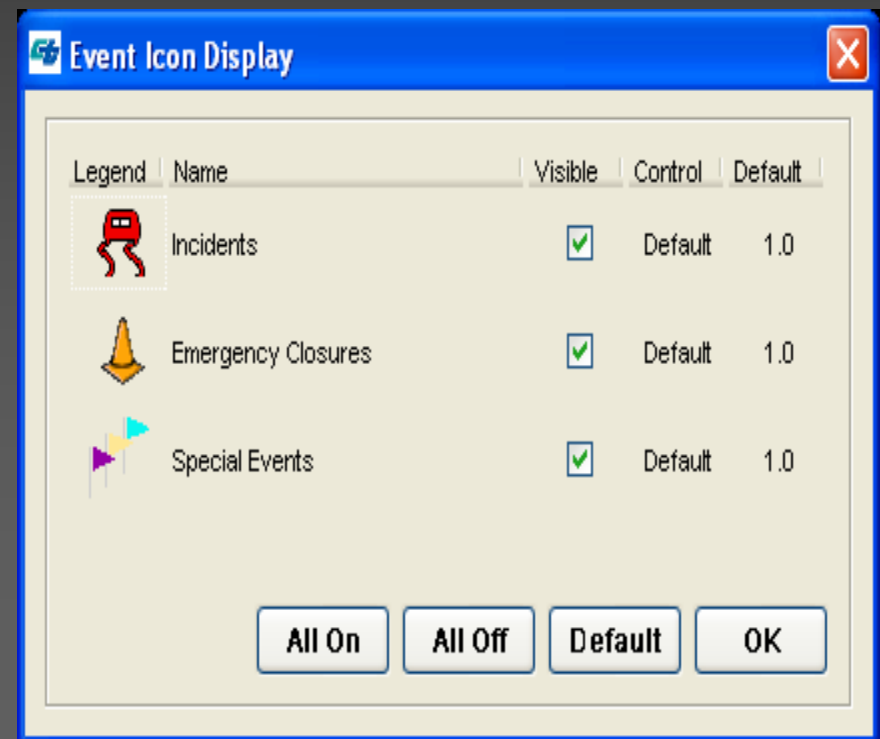
APID

- Compare upstream and downstream stations for differences in occupancy
- Test individual stations for rates of increase and decrease in occupancy
- Test upstream stations for extraordinary increases in occupancy



Event Management

- Multiple Types of “Events”
 - Incidents (Manual or Automatic)
 - Emergency Closures
 - Special Events
- Response Plan Generation
 - Automatically Generated
 - Manually Generated



Event Details

Event 97171 5:48 PM

Jul 7, 2005

Event ID: 97171 **Last Update at:** 07/07 17:48
Event Type: Incident
County: LA
Route: 2 E
At: R18.91 HOLLY DR
Roadway Type: ML
Event State: Confirmed

Placement/Confirmation | Monitoring | **Details** | Response Plan | Comments

BACKGROUND INFORMATION

Source: Operator/CCTV **CAD #:**
Weather Condition: No Factor **CAD Code:**
Field Command Post:
Field CP Phone Number:

ATTRIBUTES

<input type="text" value="Incident Type ..."/> collision.	<input type="checkbox"/> Construction Zone
<input type="text" value="Vehicles ..."/> 2: passenger car.	<input type="checkbox"/> Major Media Coverage
<input type="text" value="Injuries ..."/> 0:	<input type="checkbox"/> Politically Sensitive
<input type="text" value="Fatalities ..."/> 0:	<input type="checkbox"/> Evacuate Area
<input type="text" value="Caltrans Property Damage..."/>	<input type="checkbox"/> Gawking <input type="text" value="Opposite Side"/>

BLOCKAGE PATTERN

Lane Type: LS	MAINLINE	RS	Clear <input type="checkbox"/>
Lane Status: <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	Blocked <input type="checkbox"/>



Response Plan Generation

- Expert System Generated
 - Rules-based system for generating responses to a complex set of conditions
 - Provides a scaleable, adaptable solution
 - Developed utilizing agency expertise for operational responses
 - Aids operators in management of complex events
 - Standardized responses
- Operator Scripted

Response Plan Elements



AMBER alert

The screenshot shows the 'CMS Control' software interface. At the top, it displays the date 'Jul 7, 2005' and the time '5:32 PM'. Below this, there are radio buttons for 'Multiple CMS' (selected) and 'Single CMS Detail'. The main area is titled 'PLAN' and contains a table with columns for 'CMS', 'Proposed Message', 'Current Message', and 'Sched.'. The 'Proposed Message' column is further divided into 'Sch', 'Phase1', and 'Phase2'. The 'Current Message' column is divided into 'Phase1' and 'Phase2'. The table lists 10 rows, each with a checked checkbox in the 'CMS' column and the text 'TESTING AMBER ALERT' in the 'Current Message' Phase1 column. To the right of the table is a 'View' section with radio buttons for 'Summary', 'Msg Details' (selected), and 'Schedule'. Below the 'View' section are several buttons: 'Add', 'Add All', 'Add Active', 'Delete', 'Select All', 'Deselect All', 'Send', 'Blank', and 'Reset'. Below the table is an 'EDIT' section with radio buttons for '2 Phase' (selected) and '1 Phase', a 'Display Time' dropdown set to '2 Seconds', radio buttons for 'Immediate' (selected) and 'Schedule', and two preview boxes for 'Phase 1' and 'Phase 2' showing the message 'TESTING AMBER ALERT'. At the bottom right of the 'EDIT' section are buttons for 'Preview', 'Clear', 'History', and 'Library'. An 'OK' button is centered at the bottom of the interface.

CMS	Proposed Message			Current Message		Sched.
	Sch	Phase1	Phase2	Phase1	Phase2	
<input checked="" type="checkbox"/>	1			TESTING AMBER ALERT		
<input checked="" type="checkbox"/>	2			TESTING AMBER ALERT		
<input checked="" type="checkbox"/>	3			TESTING AMBER ALERT		
<input checked="" type="checkbox"/>	4			TESTING AMBER ALERT		
<input checked="" type="checkbox"/>	5			TESTING AMBER ALERT		
<input checked="" type="checkbox"/>	6			TESTING AMBER ALERT		
<input checked="" type="checkbox"/>	7			TESTING AMBER ALERT		
<input checked="" type="checkbox"/>	8			TESTING AMBER ALERT		
<input checked="" type="checkbox"/>	9			TESTING AMBER ALERT		
<input checked="" type="checkbox"/>	10			TESTING AMBER ALERT		

Can select all signs and send messages
with single mouse click

Agenda

Map Overview

Traffic Data

Field Device Control

Travel Time

Advanced Management Functions

Reports

Browse Edit

Regional Integration



Types of Traffic Data Reports (36 total reports)

- Traffic Data Reports
- Traffic Data Plots
- System Performance Reports
- Special Applications Reports
- Ramp Metering Reports

*Five Years if data is stored on a 4
Terabyte RAID system*

Sample Report Output

RUNTIME: 07-19-2005, 10:48

TRAFFIC DATA REPORT
30 Second Loop Data

FROM: 07-19-2005 09:00:00 TO: 07-19-2005 09:30:00

STATUS:
1=Good, 2=suspect, 3=soft failed,
4=hard failed, 5=no response, 6=disabled, 0=unknown

A = Adjusted, ND = NO DATA, NA = NOT APPLICABLE
All values are suspect until verified by engineer

Page: 1

TDS DESCRIPTION: LA-91-M, PM: P 19.40 SHOWMAKER			Main Line / HOV										VDS ID: 76555										
JUL-19-2005 NOV 1			ML 1			ML 2			ML 3			ML 4			ML STATION								
TUESDAY	VOL	OCC	SPD	ST	VOL	OCC	SPD	ST	VOL	OCC	SPD	ST	VOL	OCC	SPD	ST	TOT VOL	AVG OCC	EST SPD				
09:00:30	9	4.3	72	1	19	9.9	66	1	13	6.3	70	1	9	11.3	33	1	12	6.9	83	1	53	8.6	65
09:01:00	4	1.5	59	1	36	20.4	60	2	6	2.7	76	1	7	6.9	41	1	5	2.8	86	1	54	8.2	62
09:01:30	1	26.5	1	1	0	0.0	NA	2	0	0.0	NA	2	0	47.8	NA	2	1	27.6	2	1	1	18.9	2
09:02:00	9	15.5	20	1	15	7.3	70	1	15	7.1	72	1	11	11.5	39	1	6	3.7	78	1	47	7.4	65
09:02:30	5	3.3	51	1	27	14.3	64	2	16	7.0	78	1	6	7.0	35	1	6	8.0	36	1	55	9.1	62
09:03:00	6	5.3	39	1	10	5.2	65	1	12	5.9	69	1	8	8.0	41	1	12	8.8	65	1	42	7.0	62
09:03:30	6	29.9	7	1	12	6.5	63	1	14	6.9	70	1	11	12.2	37	1	4	2.5	76	1	41	7.0	59
09:04:00	0	69.8	NA	2	25	14.4	59	2	15	7.2	71	1	8	6.4	51	1	7	4.1	81	1	55	8.0	64
09:04:30	0	69.8	NA	2	36	24.1	51	2	9	3.8	80	1	10	9.4	43	1	8	4.8	79	1	63	10.5	58
09:05:00	0	69.8	NA	2	19	9.0	72	1	17	7.9	73	1	13	10.3	52	1	10	7.0	68	1	59	8.6	67
Smt:	40				199				117				83				71				470		
09:05:30	0	69.8	NA	2	9	4.5	68	1	9	4.4	69	1	6	7.8	31	1	7	4.3	78	1	31	5.2	64
09:06:00	0	69.8	NA	3	17	7.7	75	1	16	7.2	75	1	10	10.1	40	1	5	5.9	41	1	48	7.7	64
09:06:30	ND	ND	NA	ND	ND	ND	NA	ND	ND	ND	NA	ND	ND	ND	NA	ND	ND	ND	NA	ND	ND	ND	NA
09:07:00	0	69.8	NA	3	14	17.1	28	1	12	5.1	80	1	9	8.7	42	1	6	5.7	50	1	41	9.2	50
09:07:30	0	69.8	NA	3	32	25.2	43	2	11	5.6	67	1	9	9.1	40	1	11	6.9	76	1	63	11.7	53
09:08:00	0	69.8	NA	3	0	0.0	NA	2	0	0.0	NA	2	1	29.2	1	1	1	24.9	2	1	2	13.5	2
09:08:30	0	69.8	NA	3	26	15.3	58	2	12	5.8	71	1	11	11.9	38	1	12	8.1	65	1	60	10.3	58
09:09:00	0	69.8	NA	3	21	9.4	76	1	12	5.6	73	1	10	11.5	36	1	7	4.9	68	1	50	7.8	66
09:09:30	2	60.8	NA	3	32	18.9	58	2	17	8.1	72	1	9	8.6	43	1	5	6.3	38	1	63	10.5	58
09:10:00	13	12.3	NA	3	15	8.0	64	1	10	4.6	75	1	11	7.5	60	1	11	10.0	53	1	47	7.5	63
Smt:	0A				184A				110A				84A				71A				449		
09:10:30	4	4.4	NA	3	29	16.9	58	2	17	8.5	68	1	14	12.3	47	1	10	8.2	58	1	70	11.5	58
09:11:00	3	3.5	30	1	17	10.4	56	1	10	4.9	70	1	10	9.2	44	1	7	6.0	56	1	44	7.6	56
09:11:30	0	0.0	NA	2	0	0.0	NA	2	0	0.0	NA	2	0	0.0	NA	2	1	19.3	2	1	1	4.8	2
09:12:00	3	1.9	55	1	14	6.7	71	1	13	7.0	63	1	7	12.9	22	1	6	3.2	89	1	40	7.5	63
09:12:30	10	6.0	57	1	24	16.1	51	2	16	8.8	62	1	12	12.7	39	1	12	8.3	69	1	64	11.4	55
09:13:00	4	18.2	7	1	17	8.6	67	1	15	7.3	70	1	12	14.0	35	1	7	6.6	51	1	51	9.1	58
09:13:30	2	68.9	1	2	26	13.4	66	2	13	7.6	59	1	9	8.7	42	1	10	6.8	70	1	58	9.1	61
09:14:00	0	69.8	NA	2	1	15.2	2	1	0	0.0	NA	2	1	21.2	2	1	1	47.0	1	1	3	20.8	2
09:14:30	0	69.8	NA	2	29	15.9	62	2	13	6.8	65	1	8	9.3	35	1	4	5.1	38	1	54	9.3	57
09:15:00	0	69.8	NA	2	17	7.6	76	1	13	6.4	69	1	7	7.5	38	1	7	8.1	41	1	44	7.4	63
Smt:	24A				174				110				80				65				429		
15mt:	93A				558A				337A				247A				207A				1349		



Sample Special Applications Report: CMS Message Approval

Runtime: 11-14-2005, 18:27		SPECIAL APPLICATION REPORT CMS Message Approval History				Page: 65		
		FROM: 07-01-2005 00:00:00		TO: 07-15-2005 18:26:30				
CMS ID	DATE	ACTIVATION TIME	DEACTIVATION TIME	MESSAGE DURATION	MESSAGE APPROVED	TIME DISPLAYED	EVENT ID	OPERATOR ID
74	07-02-2005	14:32:06	15:04:54	00:32:48	LINE 1 S 605 CARPOOL LN LINE 2 CLSD AT PECK LINE 3 LINE 4 LINE 5 LINE 6		97244	shollo
94	07-02-2005	14:32:06	15:04:54	00:32:48	LINE 1 S 605 CARPOOL LN LINE 2 CLSD AT PECK LINE 3 LINE 4 LINE 5 LINE 6		97244	shollo
74	07-02-2005	15:04:54	09:00:51	17:55:57	LINE 1 ARRIVE ALIVE LINE 2 DON'T DRINK LINE 3 AND DRIVE LINE 4 LINE 5 LINE 6			shollo
94	07-02-2005	15:04:54	09:00:37	17:55:43	LINE 1 ARRIVE ALIVE LINE 2 DON'T DRINK LINE 3 AND DRIVE LINE 4 LINE 5 LINE 6			shollo



Agenda

Map Overview

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Reports

Browse Edit

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Browser and Editor

The screenshot shows the Oracle VDS BROWSE application window. The title bar includes 'File Edit Configuration Parameter Preferences Window' and 'ORACLE'. The main window is titled 'VDS BROWSE'. It features a dark blue background with white text and form fields. At the top left is an 'Update Record' button. To its right are input fields for 'Equipment ID' (715898) and 'MS ID' (2029). Below this is a section for 'Name' (PHOEBE) and 'Description'. Further down are fields for 'Date Created' (12/19/1995), 'Last Modified' (01/15/1996), and 'Active' (Y). The 'County' is set to 'LA', 'Route' to '5', and 'Direction' to 'S'. 'Postmile' is .710, 'ABS Postmile' is .710, and 'City' is 'LA MIRADA'. 'Latitude' is 33.880012 and 'Longitude' is -118.021667. A 'State Plane Coordinates' section includes 'X (Easting)' (6555.2) and 'Y (Northing)' (1778.7). Below these are fields for 'VDS Type' (ML), 'High Offpeak Start' (0), 'Assoc HOV VDS ID', 'Speed Station' (N), 'High Offpeak Stop' (0), 'Number Of Loops' (3), 'Peak Start' (0), 'Low Offpeak Start' (0), 'Physical Lanes' (3), 'Peak Stop' (0), 'Low Offpeak Stop' (0), 'VDS Mainline Type', and 'FOSD Map ID' (463). A table with columns 'Logical Position', 'Loop Type', 'Lane Installed', 'Active', 'LDS ID', 'Reports Volume Flag', and 'Description' contains three rows of data. At the bottom, there is a navigation bar with 'Record 1 of 1529', search criteria, and buttons for navigation and 'Dismiss'.

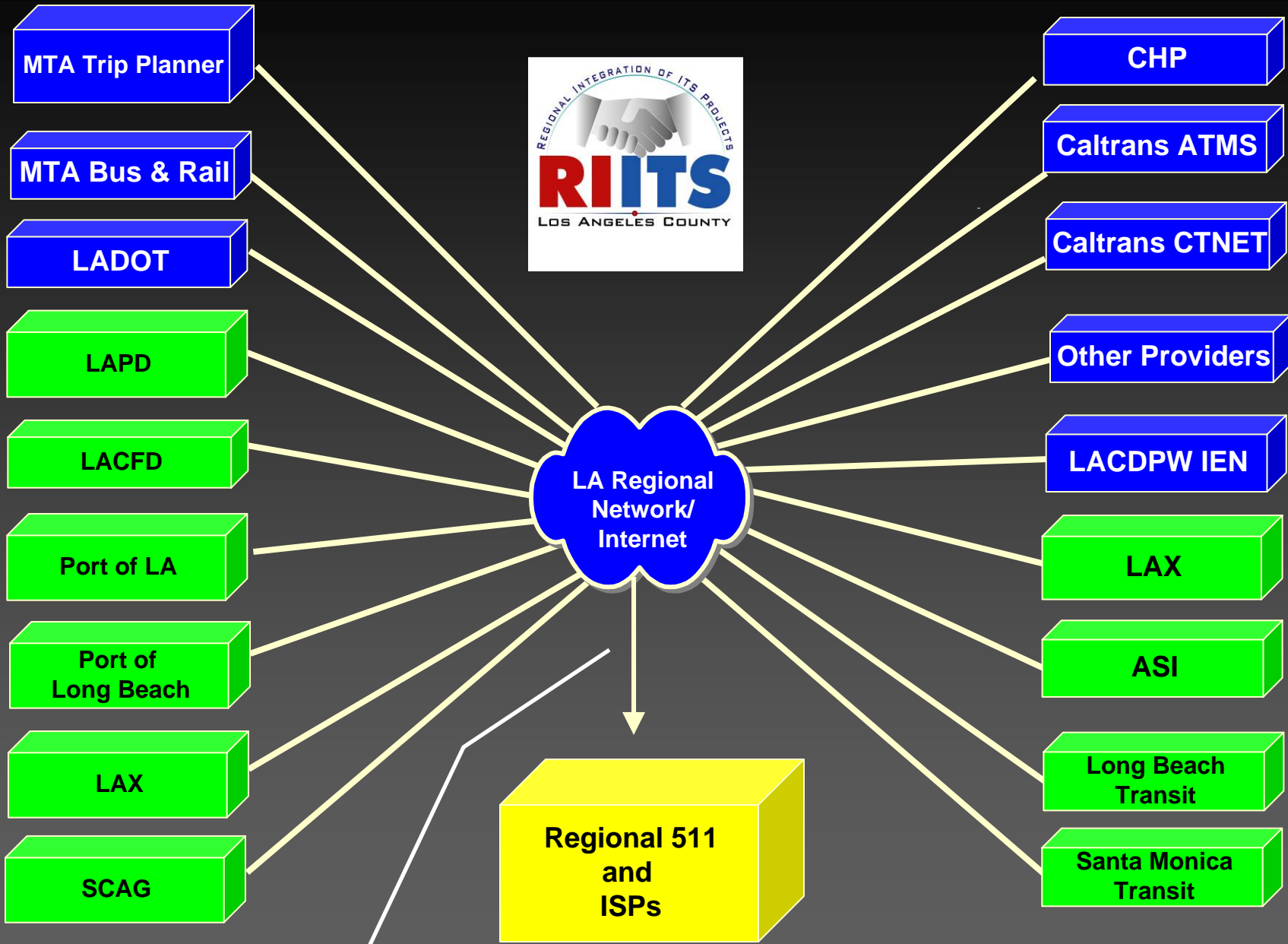
Logical Position	Loop Type	Lane Installed	Active	LDS ID	Reports Volume Flag	Description
1	ML	1	Y	715668		
2	ML	2	Y	715668		
3	ML	3	Y	715668		

- Allows user to view information from the database
- Filters can be used to narrow the number of records to be viewed
- Users with proper access privileges may edit information

LARTMC Traffic Data Portal

- ❖ Numerous other agencies and information service providers receive data from Caltrans via the TMC systems
- ❖ RIITS is the key traffic information data portal system, whose equipment is housed at the LARTMC





Agency recipients

All Regional Freeway, Arterial, Bus, Rail, and Emergency Response data



RIITS

RIITS - Los Angeles Real Time Traffic - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Regional Integration of ITS Projects
RIITS
LOS ANGELES COUNTY

Logout
Version 1.0
Regional Integration of Intelligent Transportation Systems

Zoom Control [- | | | +]

Map Bus Rail Events

Freeways City Streets

Map Legend

- Video - Live
- Video - Snapshot
- CMS - Active
- Event - Unscheduled
- Event - Scheduled
- Bus - Active
- Bus Timepoint
- Metro Train
- Metro Rail Stop
- Metro Red Line
- Metro Blue Line
- Metro Gold Line
- Metro Green Line

Freeway Speeds

- 0 - 19 mph
- 20 - 34 mph
- 35 - 50 mph
- > 51 mph
- No Data Available

City Street Speeds

- 0 - 10 mph
- 11 - 20 mph
- > 21 mph
- No Data Available

Sign Caltrans-D7 Sign #102
11/02/2004 11:34 AM

RIITS

HIGH WINDS
RTE 118 THRU

Started at: 11/01/2004 07:18 AM
210 West @ WHEATLAND

Speed Caltrans-D7
11/02/2004 11:32 AM

RIITS

Avg. Speed: 60 mph
HOV: 55 mph

I-10 West @ TEMPLE CITY

Camera Caltrans-D7 Camera #531
11/02/2004 11:34 AM

RIITS

CAM 531
60 East @ HACIENDA BLVD
11/02/2004 11:33 AM

60 East @ HACIENDA BLVD

Local intranet 11:33 AM

start | Inbox - Microsoft ... | RIITS - Microsoft ... | RIITS - Los Angel... | Camera ... | Speed ... | Sign ...



Current Information Service Providers

- ❖ ClearChannel (Airwatch)
- ❖ Eeminder
- ❖ Fox-TV
- ❖ Inrix
- ❖ KABC-TV
- ❖ KKTU Fox-11
- ❖ KCOP UPN-13
- ❖ Traffic.com
- ❖ Jaytu Technolgies (Sigalert.com)
- ❖ Traveler Advisory News Network
- ❖ TrafficGauge, Inc.
- ❖ Westwood One

LARTMC Communications Technologies

- ☒ Synchronous Optical Network (SONET) for data
- ☒ Fiber Optic multiplexer video transmission system (analog video with digital transmission over fiber)
- ☒ Next Generation (2.5G) mobile telephone
 - ☒ GPRS and CDMA2000
 - ☒ Used for communications with certain CMS, VDS and RMS (Construction Zones)

Current Communications Network

☒ Two Parts:

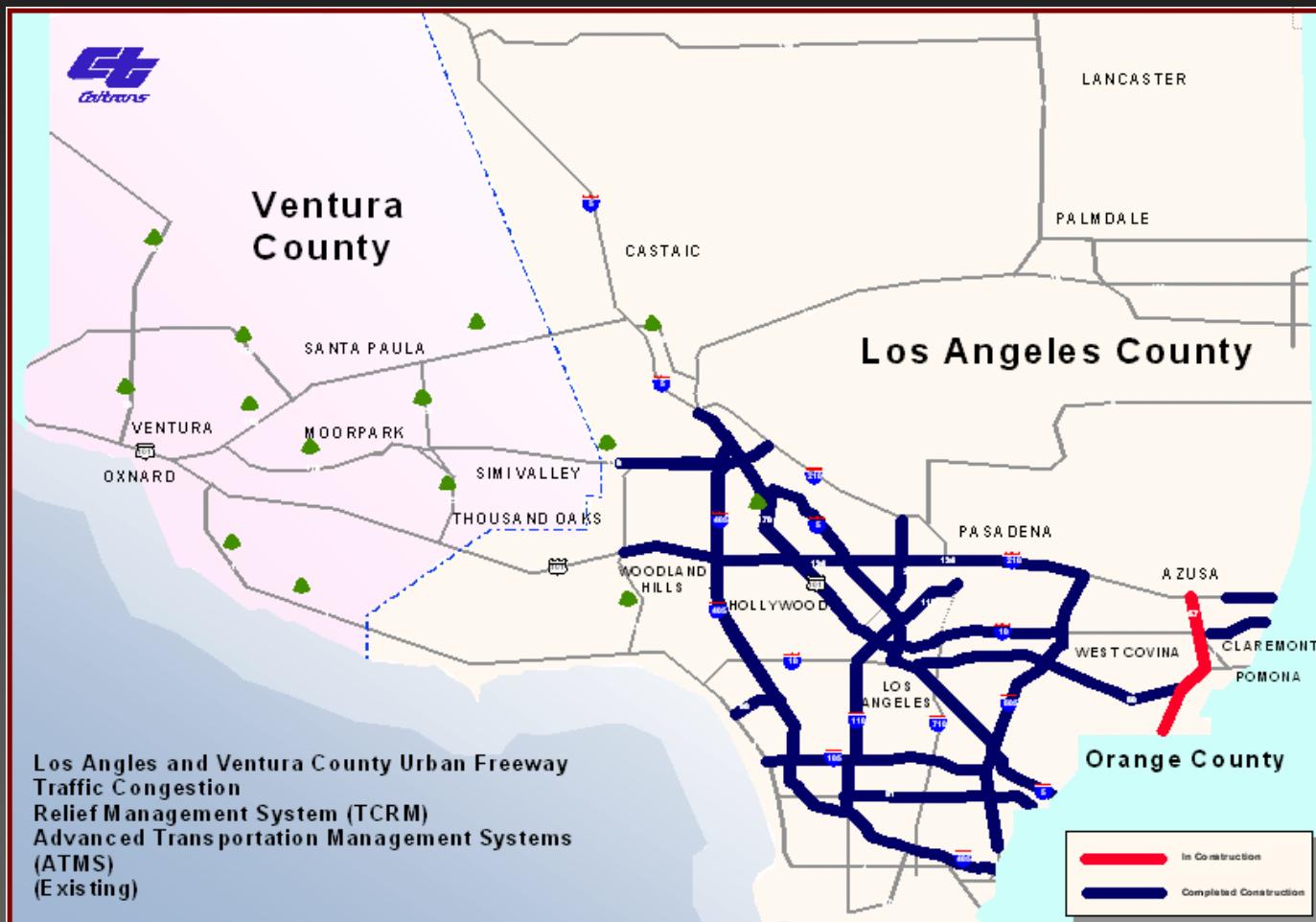
☒ Data Subsystem

- Fiber Optic SONET Ring Backbone
- Data nodes with D4 channel banks act as field data concentrators

☒ Video Subsystem

- Video nodes with digital fiber multiplexers act as field video site concentrators
- Communication hubs are secondary concentration and testing points

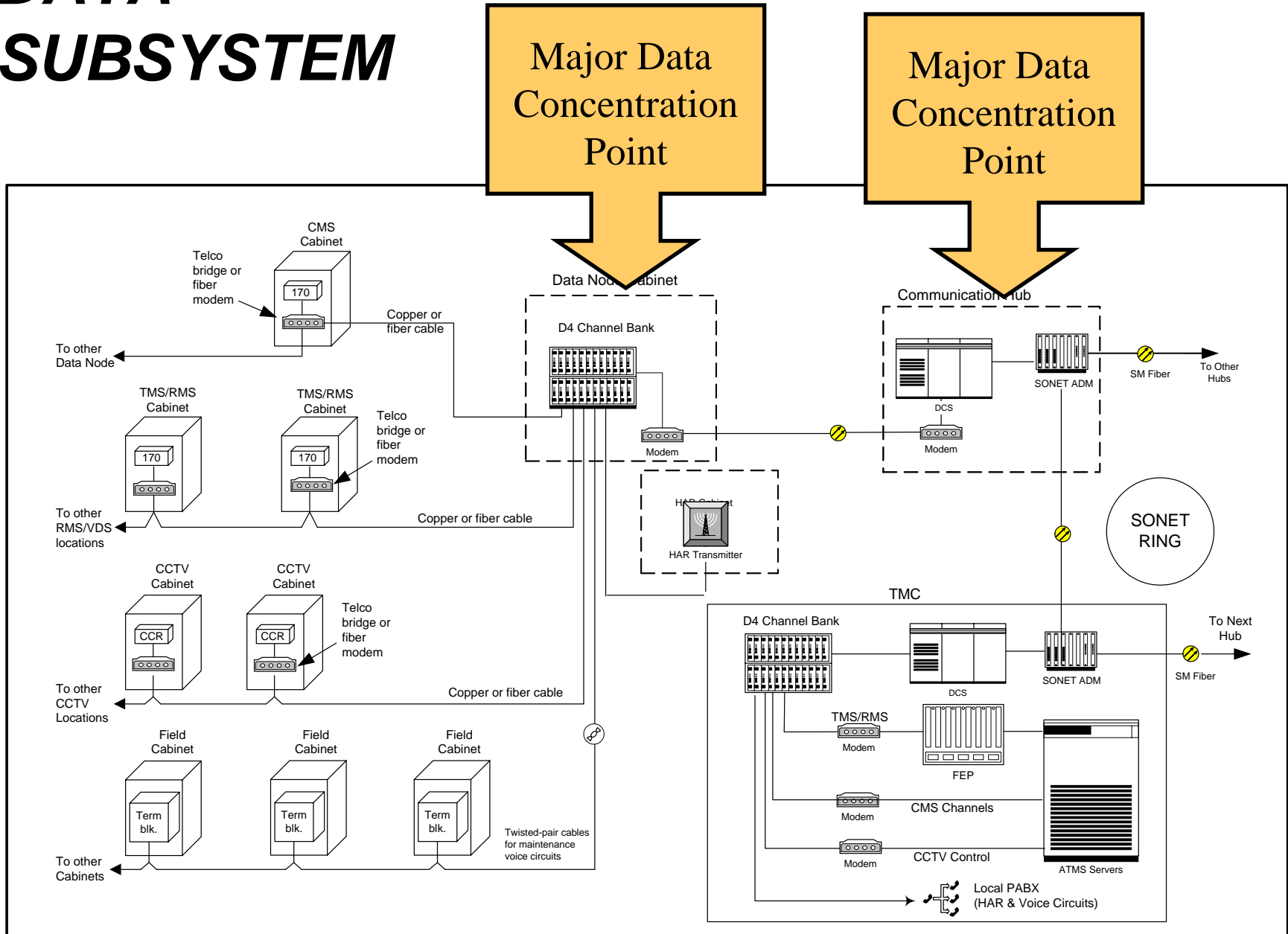
Existing ITS Infrastructure



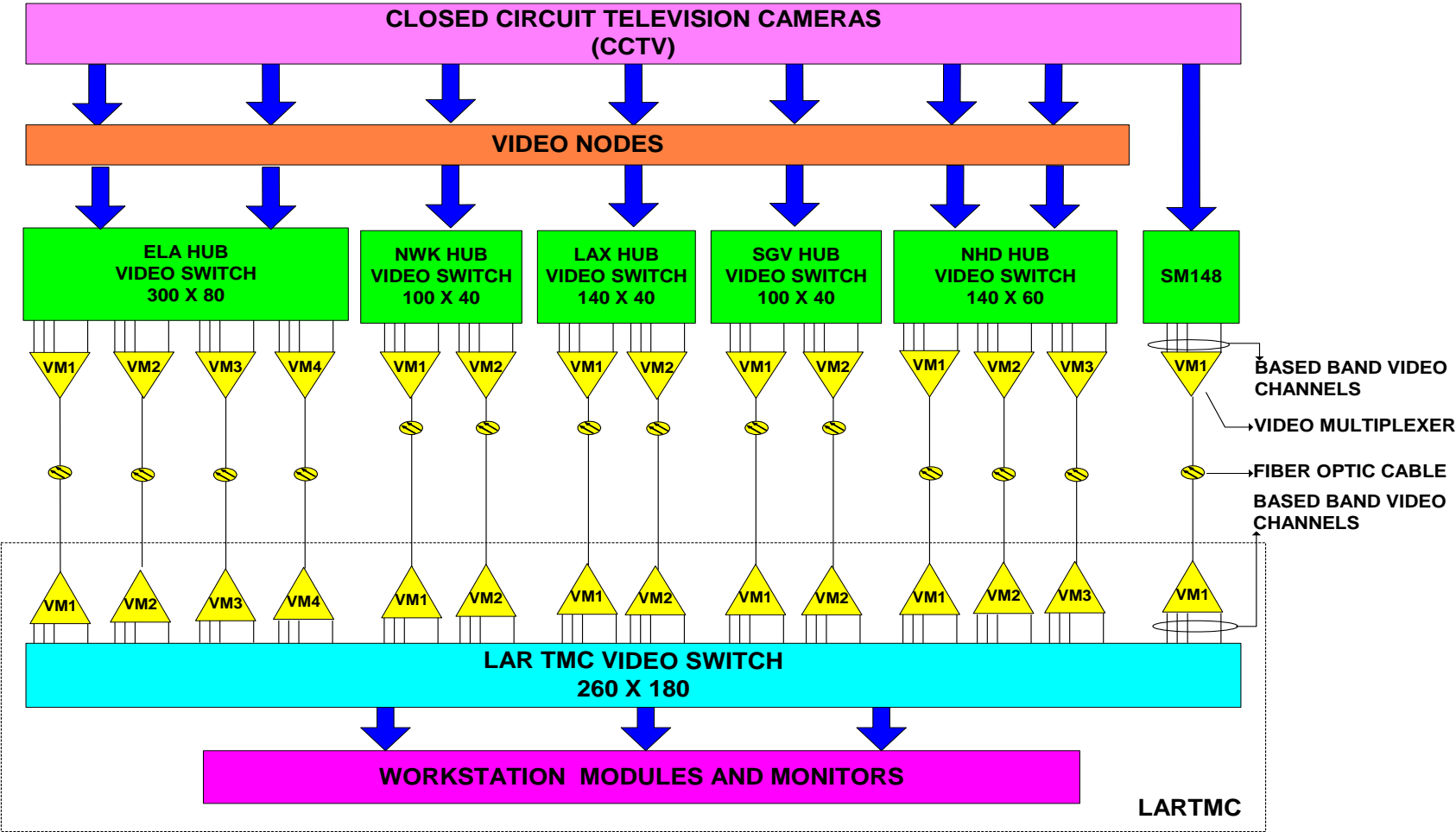
Dark Blue represents existing fiber optic cable plant



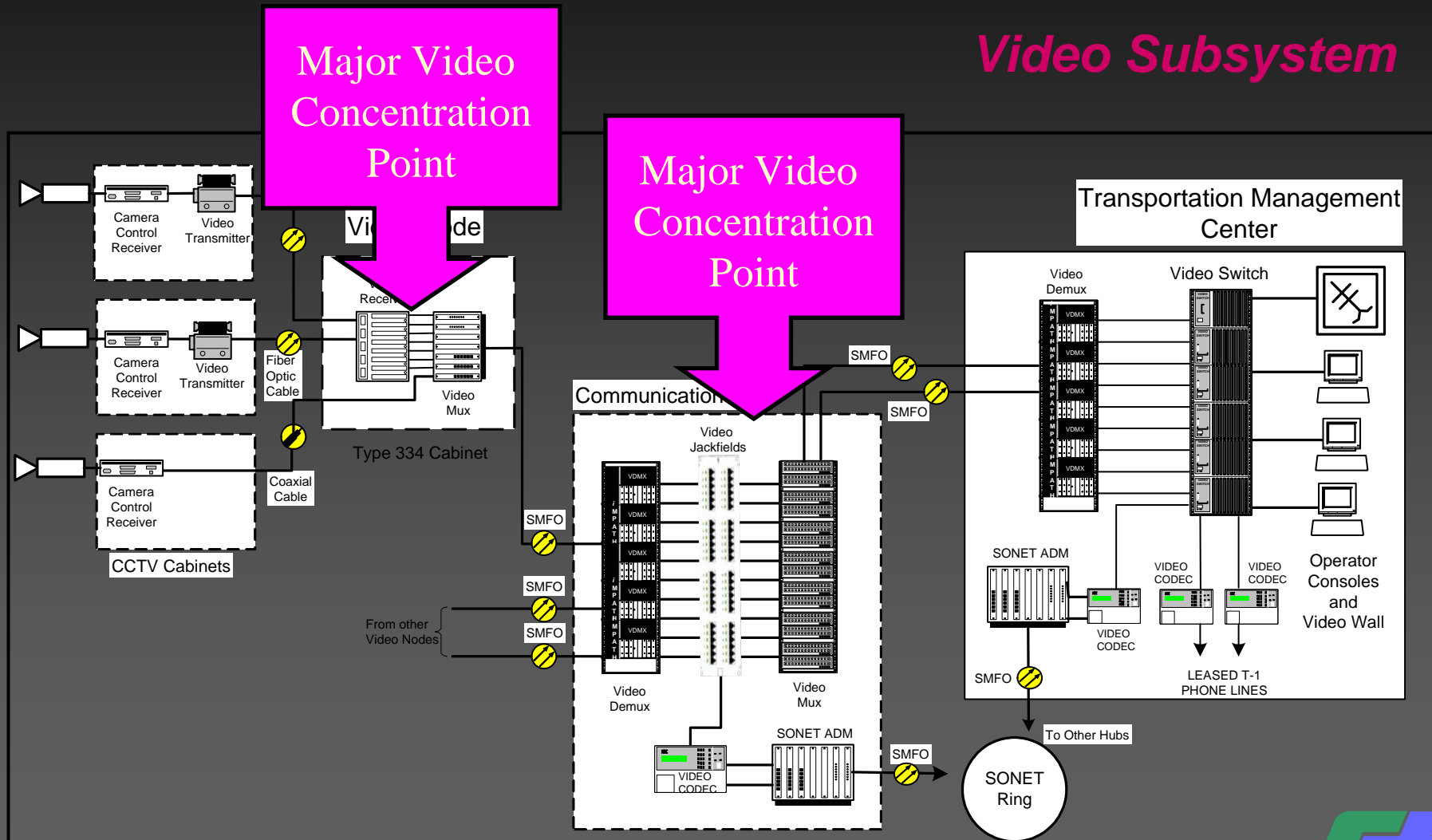
DATA SUBSYSTEM



Video Subsystem



Video Subsystem



The End

