

CDOT ITS Maintenance Program Overview

Presentation For
National Rural ITS-2006

by

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The Beginning



Colorado Statewide ITS Infrastructure

- Existing Statewide ITS Infrastructure '98
Controlled and Operated by ITS
 - 14 Variable Message Signs
 - 3 Dial Up Closed Circuit Television Cameras
 - 5 Highway Advisory Radios
 - 22 Call Boxes

Meeting Operational Requirements

- Reliability Devices
- High Visibility
- Effectiveness
- Customer Satisfaction

ITS Staff Reassignment

- CDOT's staff levels by state statute must not exceed a given FTE. Remained the same for last 7 years.
- CDOT is currently limited in the ability to hire new staff
- CDOT ITS Maintenance Growth/reassignment
- Vehicle Resources
- Growth of the System
- Local Competition for experienced personnel
- Type of technical personnel in CDOT and their expertise.

Colorado Statewide ITS Infrastructure 2005

- Existing Statewide ITS Infrastructure
 - 214 Variable Message Signs
 - 204 Closed Circuit Television Cameras
 - 19 Highway Advisory Radios
 - 72 Ramp Meters
 - 112 Call Boxes
 - 84 Weather Stations
 - 11 Weigh-in-Motion Locations
 - 100 Automatic Traffic Recorders (Not by ITS)
 - 400+ miles of fiber & wireless communications

Colorado Transportation Management Center (CTMC)

- Key Services Provided
 - 24/7 Operation/Maintenance
 - www.COTRIP.org website
 - 511
 - Statewide Road & Weather Information Phone Line
 - Broadcast fax
 - Support chain law requirements
 - Support AMBER alert
 - Support construction & special events
 - Support nine corridor incident management plans
 - Dispatch for Mile High Courtesy Patrol Program
 - Coordination with other Centers- TOC's, Police, Fire etc

Need for Contract Services

- Technical Superior Team
- Local Small Company
- Earn their Keep Daily
- Extension of CDOT Staff w/CDOT's Interest
- Flexible and Reasonable
- CDOT did not put all the requirements on Contractor – If you do, you will pay
- Meeting Operational Requirements

Contract Services

- Staffed Somewhat Regionally
- Experts on RWIS, VMS, CCTV, WIM, Call Boxes, HAR and Fiber Optics
- Cross Training
- Will Staff/Train According to Customers Needs
- True Partner

Future of ITS Maintenance

Maintenance Asset Tracking System (MATS)



New Record Save Record Delete Record Filter Asset Type **VMS** Find Filter Maintained TOC

Maintains	TOC	Antenna	N/A	450
ID Number	VMS-E-US6Jct. US 40	Controller	170 CONTROLLER	
Location	006E257	Sensors	N/A	
Asset Type	VMS	Cabinet	170 CONTROLLER CABINET	
Road	US Highway 6	Communication Type	Dedicated Phone Line (303) 567-9641 Skyline sign address: 71	
Direction	Eastbound	Maintenance Interval	6 months	
Mile Post	257	Structure	Pole Mounted	
X Meters	463203.961	Closure	Right Shoulder	
Y Meters	4399238.52	Access	Ladder Access	
Z Meters	2220	MTBF Values	3-5 1/2 Months on lamps	
Manufacturer	Skyline	Parts	AC DC Transformer, Area Heater, Dimmer Card, Modem, UPS.	
Type	3 lines X 13 Characters	Region	1	
Style	Flip Fiber Line Matrix			
Software	ATMS Software, VMS 4.91 SKYLINE (windows 98)			

Specs

Spec

Record: 1 of 1

Action

Action_Date	Action	It

Work Order New Laborer New Labor Codes New Failure Code New Work Type New Squad Equipment Failure Report

Device Type	Location	ID Number	Problem	Field Notes	Failure Time	Repair Time
VMS	025S015	VMS-S-I25- Trinidad	875 Pixel Errors	Both LED low	6/26/2004 7:45:37 AM	
VMS	025N256	VMS-N-I25-Colo 402	1 pixel error	stuck off	7/9/2004 6:33:08 AM	
VMS	025N192	VMS-N-I25-Lincoln Ave	Comms failure	parts on order	7/30/2004 2:25:55 PM	
VMS	025N015	VMS-N-I25-Trinidad	Comms failure	no answer	7/31/2004 7:42:32 AM	



Equipment Failure Report

System	Location	ID_Number	Failure Code	Problem	Field Notes	Failure Time	Work Type
VMS							
	025N015	VMS-N-125-Trinidad	NON-OP	Comms failure	no answer	7/31/2004 7:42:32 AM	RO
	025N192	VMS-N-125-Lincoln Ave	OP	Comms failure	parts on order	7/30/2004 2:25:55 PM	RO
	025N256	VMS-N-125-Colo 402	OP	1 pixel error	stuck off	7/9/2004 6:33:08 AM	RO
	025S015	VMS-S-125- Trinidad	OP	875 Pixel Errors	Both LED low	6/26/2004 7:45:37 AM	RO
Weather Station							
	072W044	WS-W-S72-Ward	NON-OP	Last report 7/23		7/23/2004 6:34:37 AM	RO
	025N213	WS-N-125-Mousetrap	NON-OP	Last report 7/29	(E/B I-70 deck)	7/29/2004 6:49:42 AM	RO

In addition to the day to day tracking of Equipment Failures for both Operations and Maintenance , MATS has also aided the CTMC in the following areas:

- Population of COTRIP. Org web-page syncing geo-spatial data from MATS with ESRI ArcMap application
- Planning for future projects (I.e. Fiber installation, corridor management)
- Supplying pertinent data related to CDOT ITS performance measures
- Inventory of CDOT owned assets
- Helped to secure future funding for Maintenance and Operations

Conclusion

- Your agency have or will face the same issues...so start early
- It takes time...no overnight results
- No need to re-invent the wheel
- For more information on CDOT ITS
Contact:

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Additional Cost Benefits if the ITS System is Operational

I-70 Mountain Corridor Incident Management: A Case Study

Incident on October 8, 2003- Fatal Accident Involving Truck

Time	Action
5:06 AM	CSP Dispatch notifies EJT TOC about the Incident
5:14 AM	CSP calls in for I-70 Westbound closure
5: 14 AM	Alternate Route (US-6 Loveland Pass) issued by EJT
5:19 AM	EJT calls CTMC to activate VMS Signs & HAR at suggested locations (See Figure 1)
Starting 5:19 AM	CTMC Implements <ul style="list-style-type: none"> • Messages on 5 VMS's & 1 HAR • COTRIP website updated • Broadcast Fax Message Sent • Interactive Voice Response System Updated • Maintain contact with CSP, EJT and Media
9:21 AM	Incident Cleared by CSP & I-70 Reopens
9:25 AM	EJT notifies CTMC. VMS's & HAR deactivated

I-70 Mountain Corridor Incident Management: A Case Study

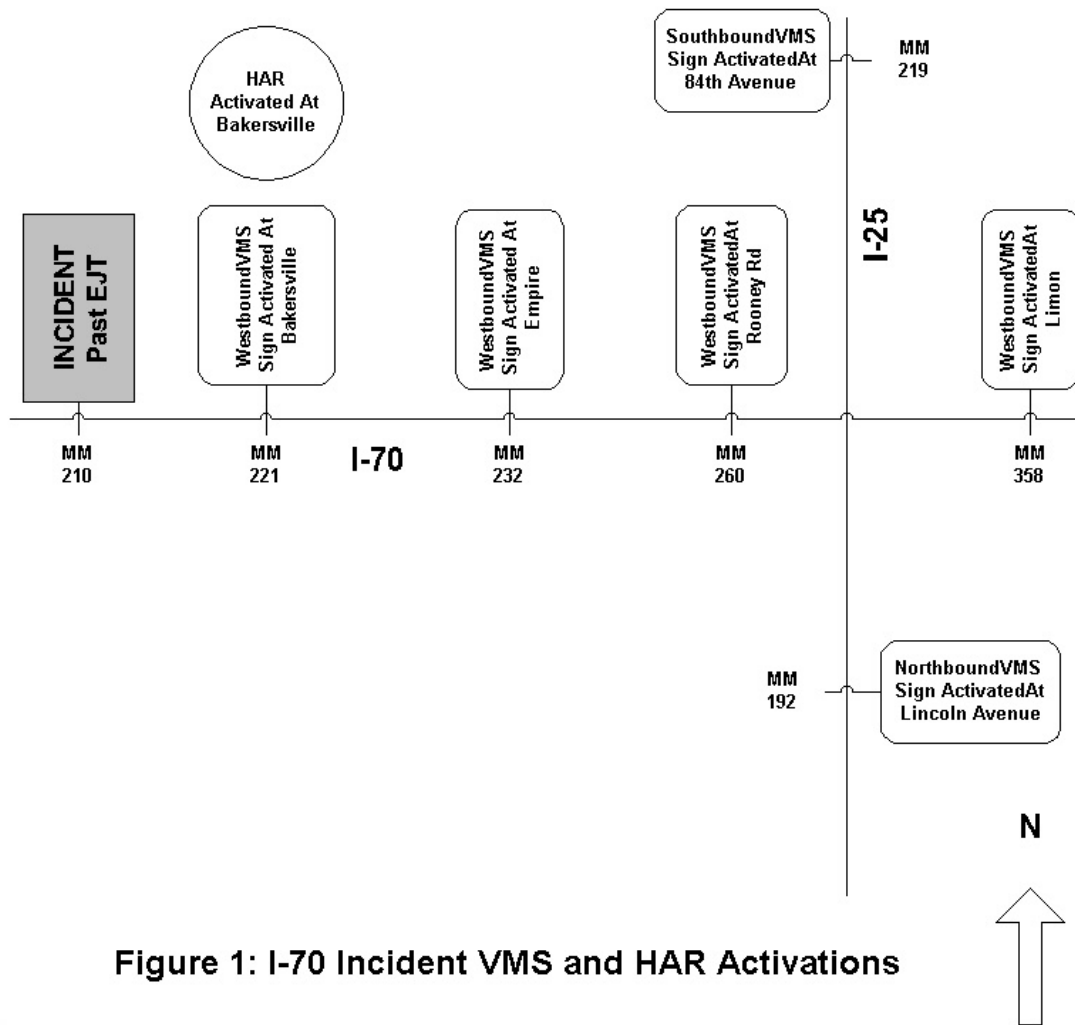


Figure 1: I-70 Incident VMS and HAR Activations

I-70 Mountain Corridor Incident Management: A Case Study

- Benefits

- Over 32,000 vehicles provided with en-route incident information
- Percent of traffic reduction attributable to traveler information on I-70 at Idaho Springs: 10%
- Total delay averted: 2,799 vehicle hours
- Average delay avoided per vehicle: 1.4 hours
- Savings of time to drivers: Over \$40,000

Weigh-In-Motion Benefits for 2003

- Number of trucks using pre-pass: 1.47 Million
- Cost savings (Travel time & Fuel Consumption): \$7.42 Million
- Air Pollutant Reductions
 - Nearly 10,225 lbs of Hydrocarbons (HC)
 - Nearly 107,346 lbs of Carbon Monoxide (CO)