I-95 CORRIDOR COALITION

COMPUTER AIDED DISPATCH: WAYS TO INTEGRATE INTO TMC SYSTEMS

October 12, 2017

Q FREE OPEN ROADS

DEPARTMENT OF TRANSPORTATION

SwRI SOUTHWEST RESEARCH INSTITUTE

Call Number: 1-719-867-1571 - Enter 7254375 # at the prompt

Webinar & Audio Information

- The call-in phone number is: 1-719-867-1571 & enter 7254375# at the prompt
- **Participants will be in "Listen Only" mode throughout the webinar**
- Please press *0 to speak to an operator for questions regarding audio
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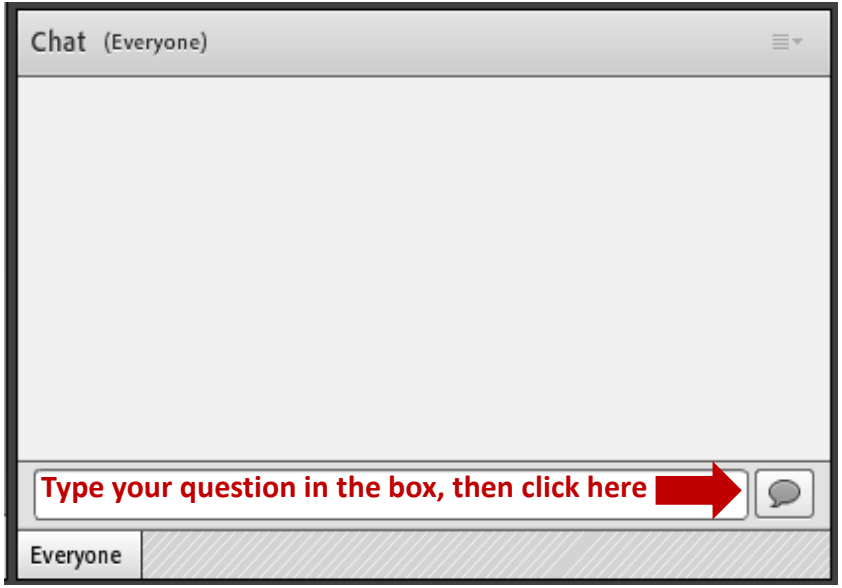
- The webinar will be recorded
- Presentations will be posted to the I-95 Corridor Coalition website. Participants will receive a link to the presentations after they are posted.

Asking Questions

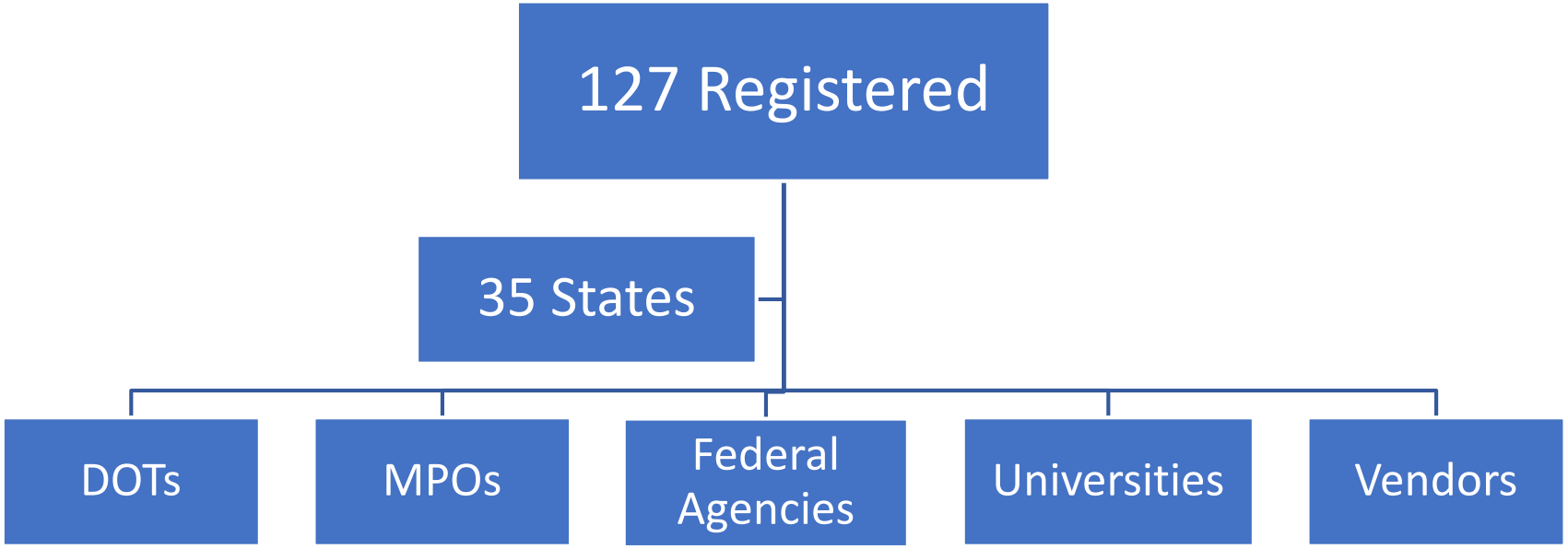
- Please pose your questions using the chat box
- Questions will be monitored then answered by the speakers at the end of the webinar



Welcome

Welcome & Overview	Denise Markow, PE I-95 Corridor Coalition
ATMS CAD Integration	Robert Heller, PhD Southwest Research Institute
Computer Aided Dispatch (CAD) Integrations: Perspectives and Lessons Learned	John Horner, PE Q-Free North America
Minnesota DOT & State Patrol CAD Integration for Traffic & Incident Management	John McClellan Minnesota DOT
Instant Polls – To gather info on participant experience with CAD Integration	All

I-95 Corridor Coalition Sponsored Event



Instant Poll

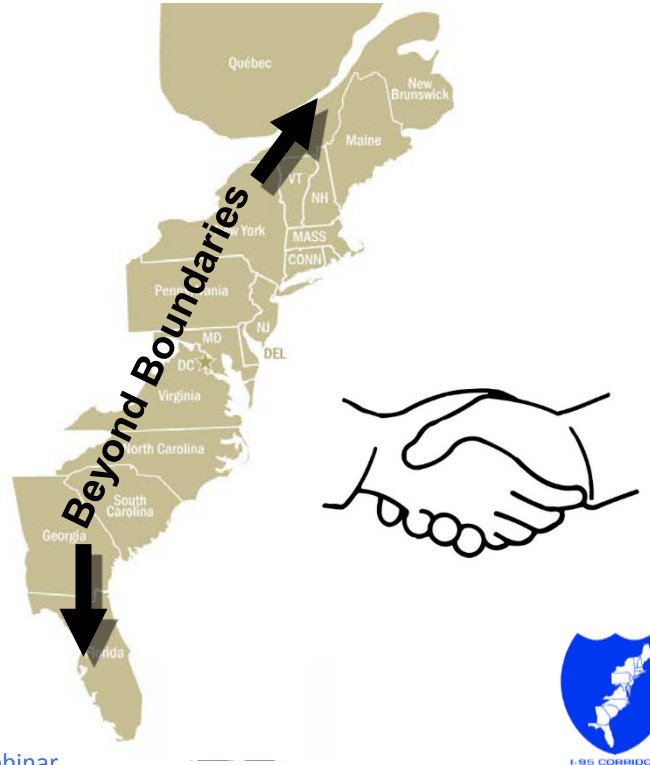
1 Have you done CAD integration with your ATMS or TMC systems?

___ Yes
___ No

Who is the I-95 Corridor Coalition?

- 16 States and the District of Columbia
- 35% of nation's VMT (21% of road miles)
- 565 million long-distance (>100 miles) trips a
- Corridor = third largest economy in world

How can we better message TSMO strategies Regionally?



…a partnership of multi-state, multi-modal public agencies working together to create a seamless and efficient transportation system

Introductions

Denise Markow, PE

I-95 Corridor Coalition

TSMO Program Coordinator

Robert Heller, PhD

Southwest Research Institute

Program Director

John Horner, PE

Q-Free North America

Director of ATMS Product Strategy

John McClellan

Minnesota DOT

Freeway Operations Supervisor

Instant Poll

2 Why integrate CAD into your system?
(Check all that apply)

__ Improve incident response and quicker clearance
__ To receive timely data from incident responders
__ To automate data input
__ To improve data to populate our traveler information systems
__ We had no real-time source for incident data in our current system

ATMS CAD INTEGRATION

Robert Heller, PhD
Southwest Research Institute

ATMS CAD INTEGRATION

ROBERT W. HELLER, PH.D.

PROGRAM DIRECTOR

SOUTHWEST RESEARCH INSTITUTE

SWRI ATMS CAD INTEGRATION

- SwRI has implemented multiple interfaces
  - 2007 FDOT SunGuide Release 3
  - 2015 NHDOT New England Compass

- TxDOT Lonestar, FDOT SunGuide, NE Compass
  - SwRI developed common code base
  - State owned software (work for hire)
  - States license software to SwRI

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FLORIDA DOT CHARACTERISTICS

- Filtered feed
- Single statewide CAD vendor
  - One CAD install per FHP Troop
  - FHP Troop ≠ FDOT District
  - Provides <latitude, longitude>
- CAD pushes file / Troop to common site
  - Files contain new events and update
  - Events open until no longer appear in file
  - Individual Troops may fail to publish file update
- SG FHP interface processes file
  - Subscriptions based on county & roadway
  - SG process data

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NEW HAMPSHIRE DOT CHARACTERISTICS

- Filtered feed
- Single NH State Police center
- Connect directly to CAD system interface
- CAD codes translated into ATMS event fields
- Location information
  - County, City, street address
  - No <latitude, longitude>
- Stripped of fields with potential Personally Identifiable Information (PII)

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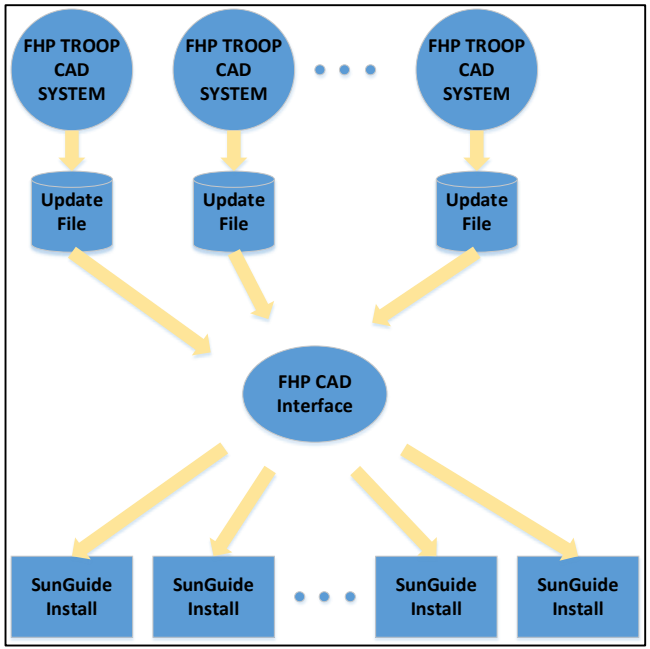
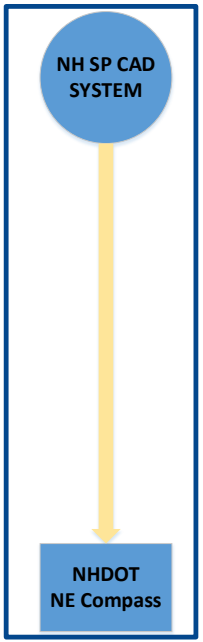
FDOT VS. NHDOT FLOW

FHP CAD to FDOT SunGuide Data Flow



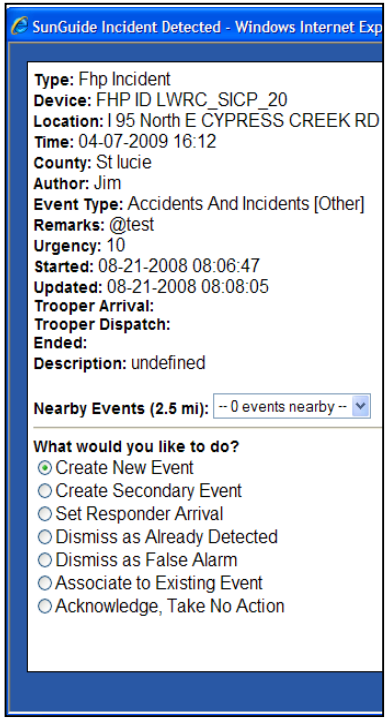
NH SP to NE Compass Data Flow



WHAT DOES AN OPERATOR SEE?

- Operator sees event alert
- Operator creates an event
- Operator completes or updates fields in the event
- Event is managed by the ATMS

- CAD updates may modify the event
- ATMS does not update CAD



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COMMON EXPERIENCE

- Documentation errors
  - FDOT: file naming, field format, field order
  - NHDOT: connection information, disposition codes, changes to closed events
- CAD operations cause issues
  - Both: roadway names, location accuracy, abbreviations
  - FDOT: <latitude, longitude> accuracy
  - NHDOT: street address not <latitude, longitude>
- Update frequency
  - Data lag
  - Work incident vs update data

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INCREASE PROBABILITY OF SUCCESS

- **Realize two contracting agencies, two developers**
- **Developer POCs for information exchange**
  - Facilitates immediate corrections to documentation
  - PM level POCs cause delays in information
- **Coordinate schedules**
  - Priorities need to be coordinated
  - Delays either side cause issues
- **Access to test feed early**
  - FDOT: no access to feed until acceptance testing
  - NHDOT: feed was not being updated

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QUESTIONS?

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Robert W. Heller, Ph.D.
Program Director, Southwest Research Institute
robert.heller@swri.org

Instant Poll

3 What have you encountered as, or feel are, the obstacles to integrating the data? *(Check all that apply)*

__ Cost
__ Law Enforcement Sensitivity
__ Lack of Stakeholder Interest and Involvement
__ Not sure how to proceed
__ Obstacles with outside IT Agency

COMPUTER AIDED DISPATCH (CAD) INTEGRATIONS: PERSPECTIVES AND LESSONS LEARNED

John Horner, PE
Q-Free North America

Computer Aided Dispatch (CAD) Integrations

Perspectives and Lessons Learned

October 2017

FREE

LEADING THE WAY

Outline

- What is CAD integration
- Perspective and Background
- What is the value
- Where to go to get the data
- How to get the data
- How to use the data
- Success factors

What is it?

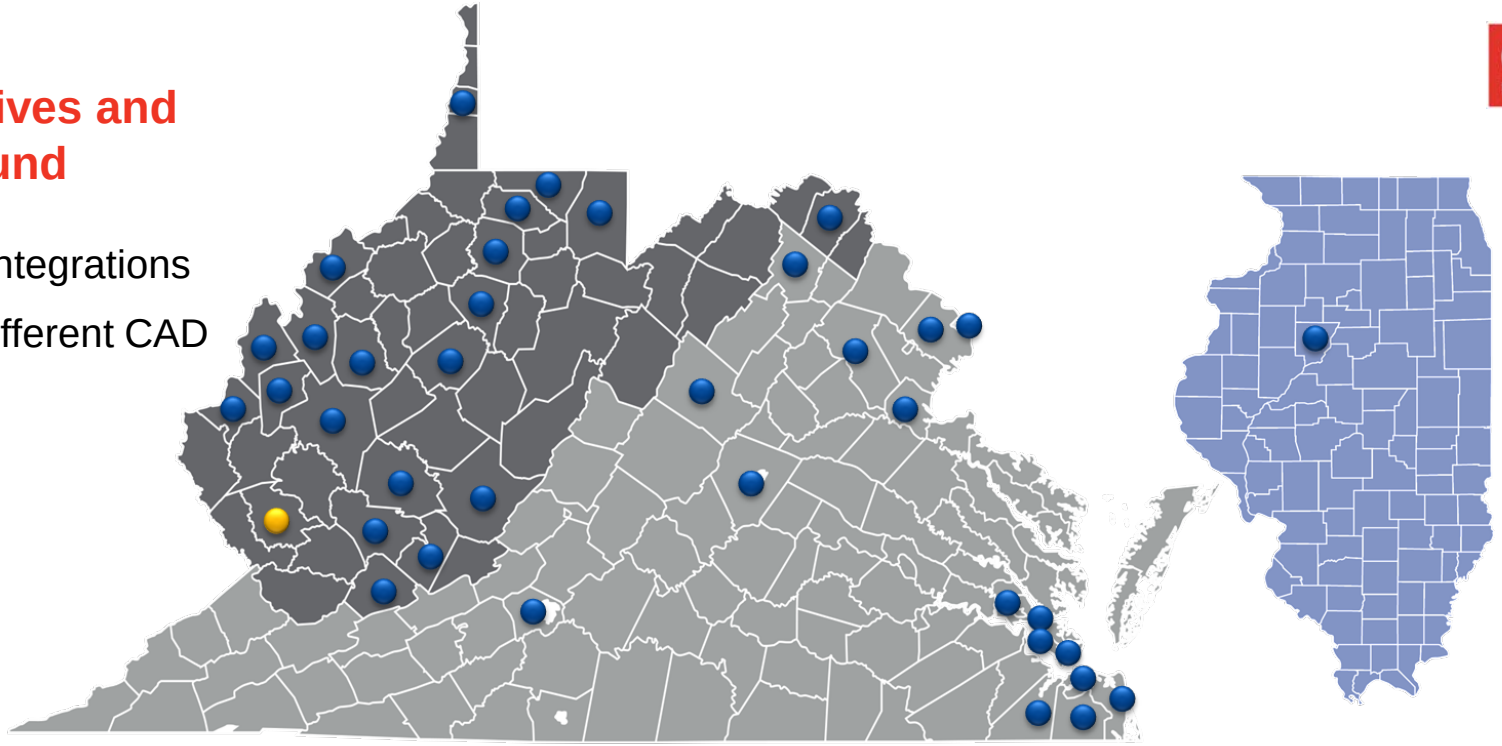
- Real-time data sharing system
- Cross agency, cross jurisdictional
- 911 (PSAP) CAD systems → DOT ATMS
- Automatic flow of event data between systems

Perspectives and Background

- Virginia System
  - Virginia State Police Integration in 2004
  - Albemarle integration 2005
  - Hampton Roads Regional system launched 2007
  - Northern Virginia Regional system
  - I-81 Regional system
  - Statewide consolidation 2011
- West Virginia System
  - Launched 2009
  - Goal to cover all jurisdictions with Interstates

Perspectives and Background

- Over 40 Integrations
- Twelve Different CAD Vendors



IN PROGRESS
Logan Co. WV

COMPLETE					
Albemarle Co., VA	Fayette Co., WV	Kanawha Co., WV	Norfolk, VA	Roanoke, VA	Wood Co., WV
Berkeley Co., WV	Frederick Co., VA	Lewis Co. WV	Ohio Co., WV	Rockingham Co., VA	York Co., VA
Braxton Co. WV	Greenbrier Co., WV	Marion Co., WV	Peoria, IL	Stafford Co., VA	
Cabell Co., WV	Hampton, VA	Mason Co. WV	Preston Co., WV	Suffolk, VA	
Chesapeake, VA	Harrison Co., WV	Mercer Co., WV	Putnam Co., WV	Summers Co., WV	
Fairfax, VA	Jackson Co., WV	Monongalia Co., WV	Raleigh Co., WV	Virginia Beach, VA	
Fauquier Co., VA	James City Co., VA	Newport News, VA	Roane Co. WV	Virginia State Police	

What is the value of CAD Integration?

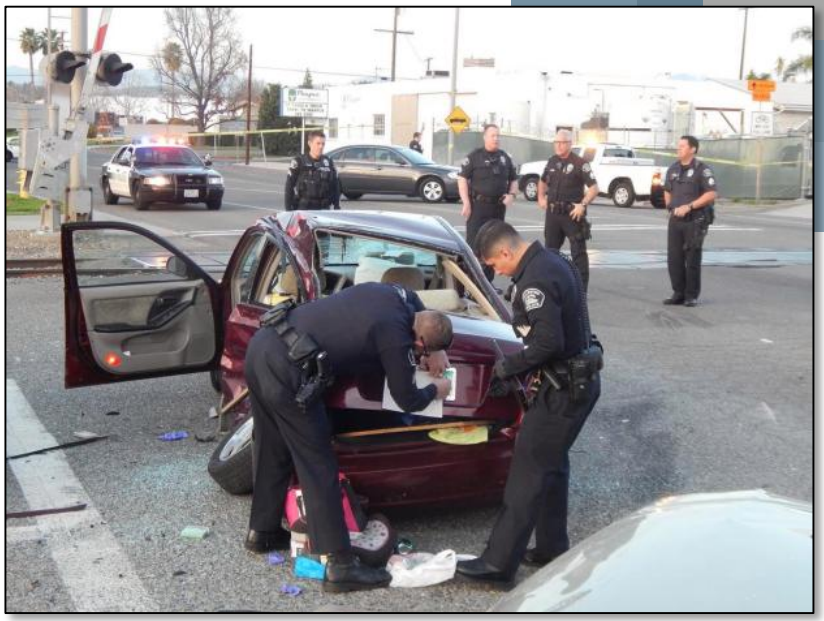
- Immediate value to DOT
  - VDOT -- up to 88% of crash discovery was by VSP CAD
  - VDOT -- 34% reduction in clearance time across 67 miles of I-95
- Additional value to integration partners
  - Reduced communication workload
  - Improved situational awareness
  - Often intangible

Where to Go to Get the Data

- Law enforcement responsibility is a patchwork
- Dispatch responsibility may be different from patrol responsibility
- Look for pre-existing integrations
- Use road network as a guide
- Use relationships as a guide
- Use existing CAD integrations as a guide

How to Get the Data

- Institutional Issues
  - LE culture very different from DOT
  - May be reluctant to share data
  - Emphasize zero impact on 911 ops
  - Look for champions (SHRP 2 converts)
  - Do not let IT take over project
  - Consider written institutional agreements
  - Talk to: PSAP Director
- Technical Issues
  - Most CAD systems support export
  - Get creative with older ones
  - May not make distinction between secure and non-secure data



How to Get the Data

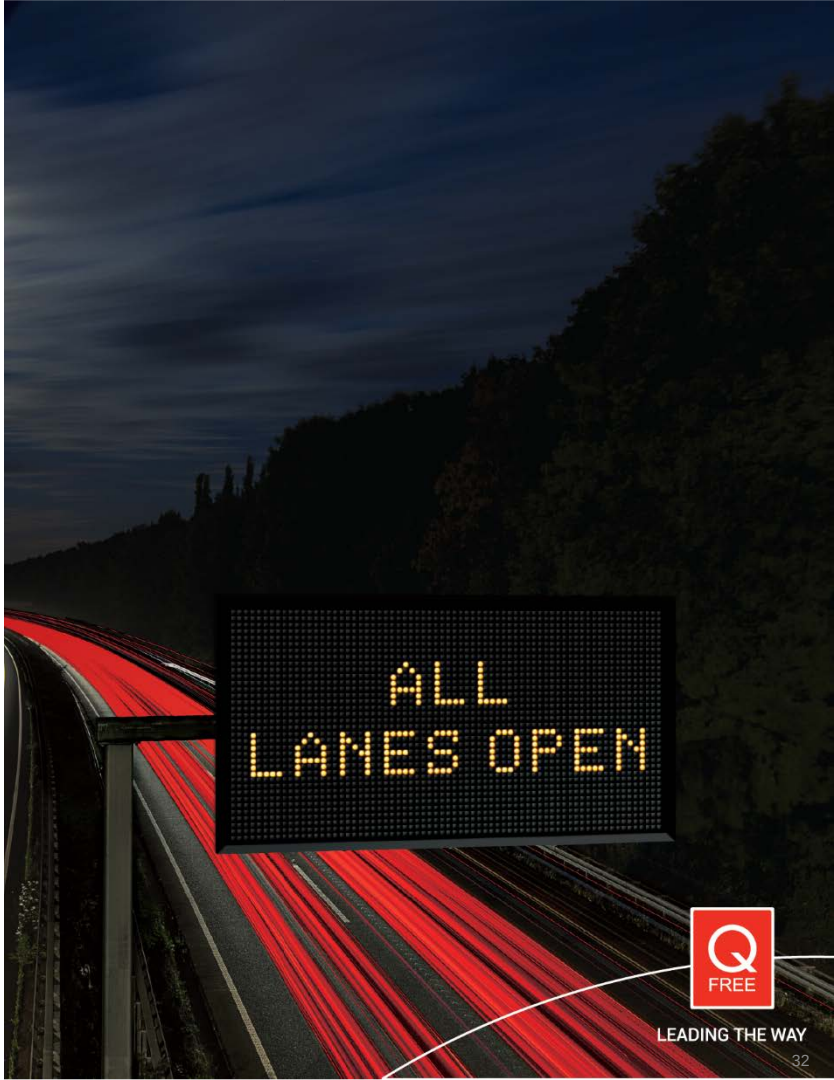
- Security
  - Place local hardware (or VM)
  - No inbound connections
  - Use strong encryption
  - Existing integration with law enforcement data source may constrain options
  - Talk to: IT Manager
- Filtering
  - Event types
  - Field selection
  - Content selection
  - Geographic selection
  - Narrative field always an issue
  - Talk to: CAD Administrator, Operations Manager

How to Use the Data

- Have appropriate expectations
  - Unverified
  - 911 not concerned with traffic management
  - Not all integrations provide the same value
  - Excellent source for incident detection
- Start with small steps
  - Put in infrastructure first

Success Factors

- Good filtering is essential – work to find Goldilocks spot
- Integrate into existing operational tools and practices
- Plan for maintenance activities and cost
- Have a plan for CAD system changes/upgrades
- Look for simple operational improvements that the integration enables: ROADI



John Horner
John.Horner@q-free.com
757-335-0181

Our vision:

CHANGING the *movements of life*

Instant Poll

4 What is your preferred method of CAD integration?

__The use of an integration software/system
__ A direct link to our ATMS and/or TMC system
__ Not sure

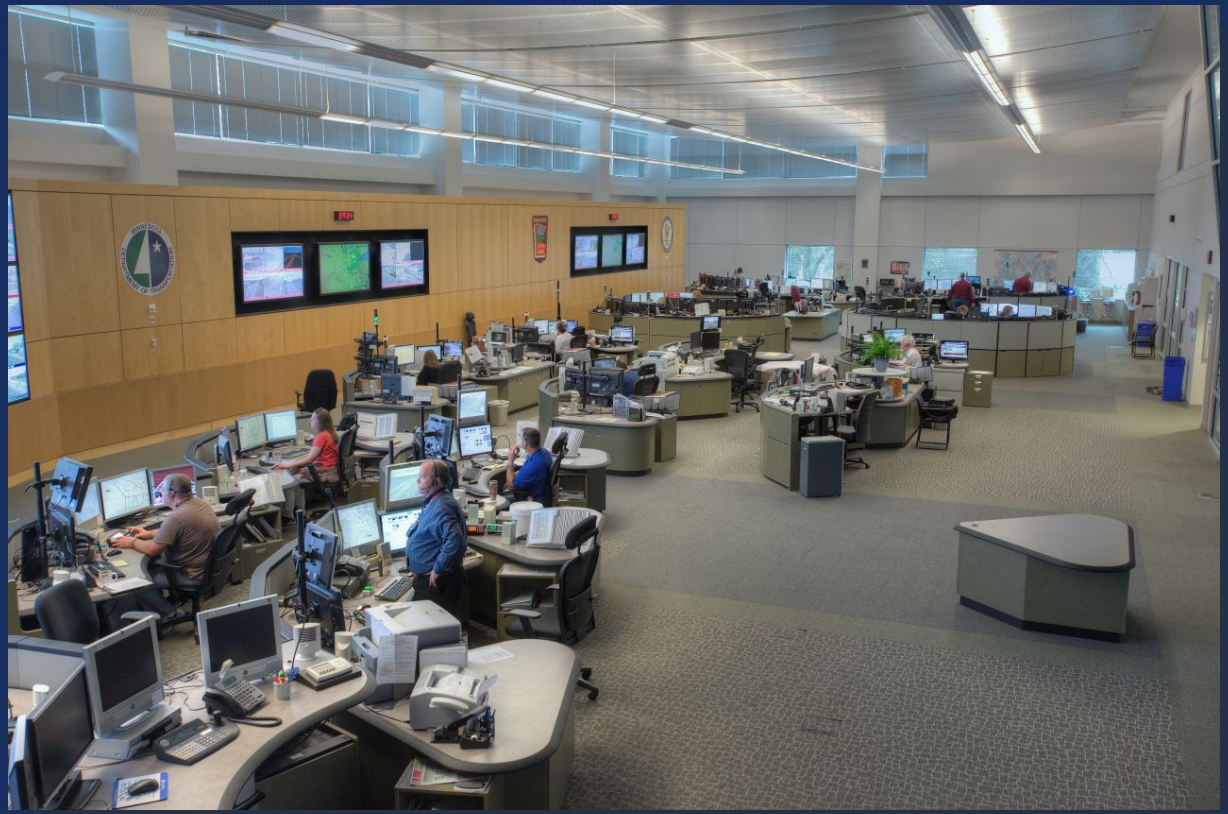
MINNESOTA DOT & STATE PATROL CAD INTEGRATION FOR TRAFFIC & INCIDENT MANAGEMENT

John McClellan
Minnesota DOT

Minnesota DOT & State Patrol Computer Aided Dispatch (CAD) Integration for Traffic & Incident Management

John McClellan
Freeway Operations Supervisor
MNDOT Regional Transportation Management Center (RTMC)

RTMC Dispatch Floor



DOT TMC Day to Day Operations

- Traffic Management – ramp meters & HOV / HOT (“MNPASS”)
- Traveler Information – cameras, detection data, 511, travel times, DMS advisories
- Congestion Data for Planning
- Incident Management…

Our Goal – Awareness of EVERY incident on the Metro Freeway Sys!

Every incident – crash, stall, debris, fire, jumper, etc. - Pin down on camera within 20 seconds of dispatch and begin triage.

- Send FIRST (MNDOT FSP)
- Deploy overhead signs
- Call SP to correct location

- Incident report sources
  - Listening to Patrol dispatch radio
  - Monitoring Patrol camera usage
  - CAD

FIRST – Freeway Incident Response Safety Team

TMC Incident Data History

1997-2008 ➢ TMC operators entered data in MS-Access database

2002 to 2008 ➢ "view only" console of SP CAD.

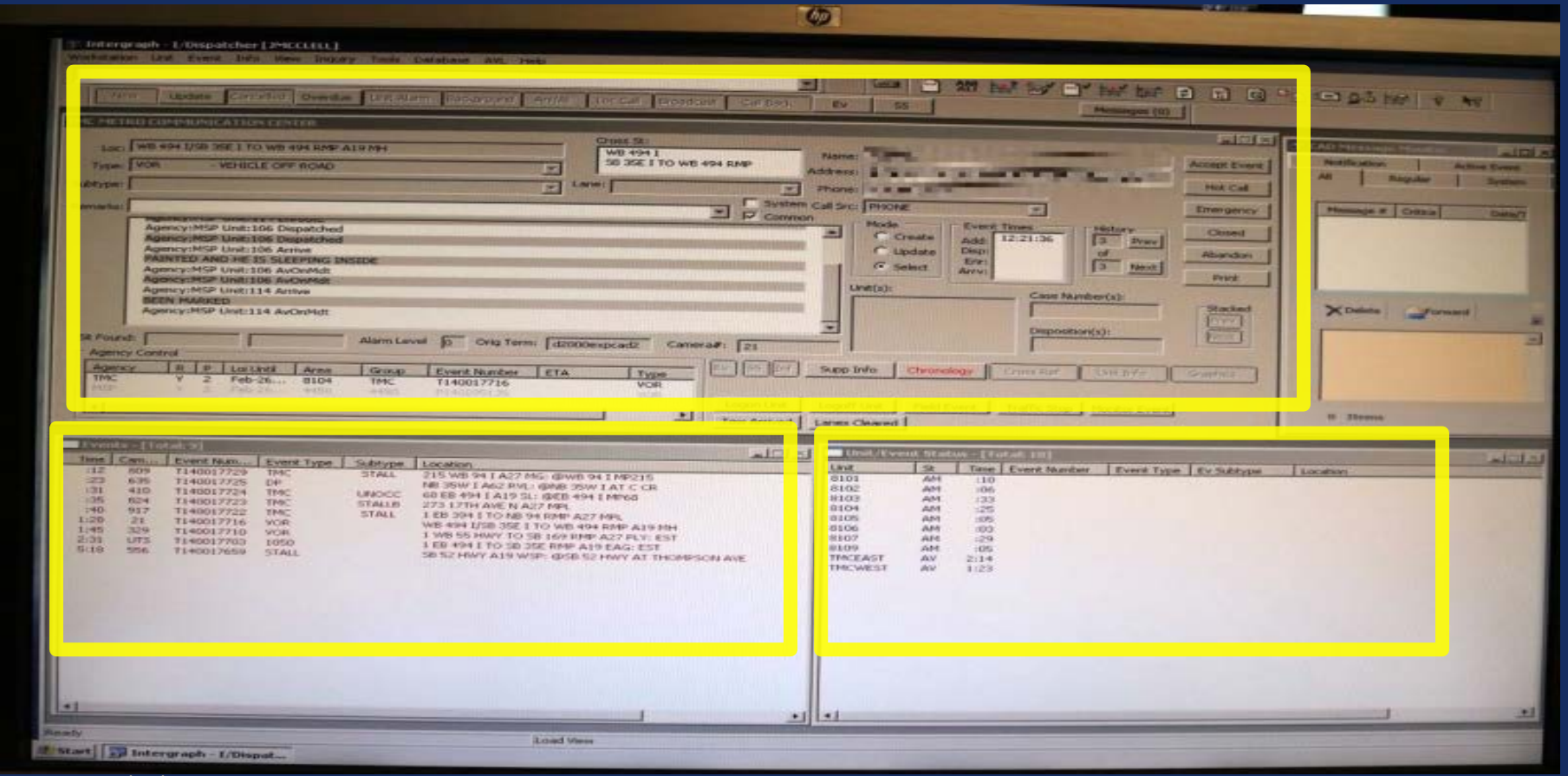
2008 ➢ Full TMC integration with SP CAD (Intergraph)

- TMC & FIRST (FSP) response logged in CAD
- Benchmarks (lanes clear, road clear, arrival times)
- FIRST work performed (gas, tire change, pushing a vehicle, etc.) & AVL data.

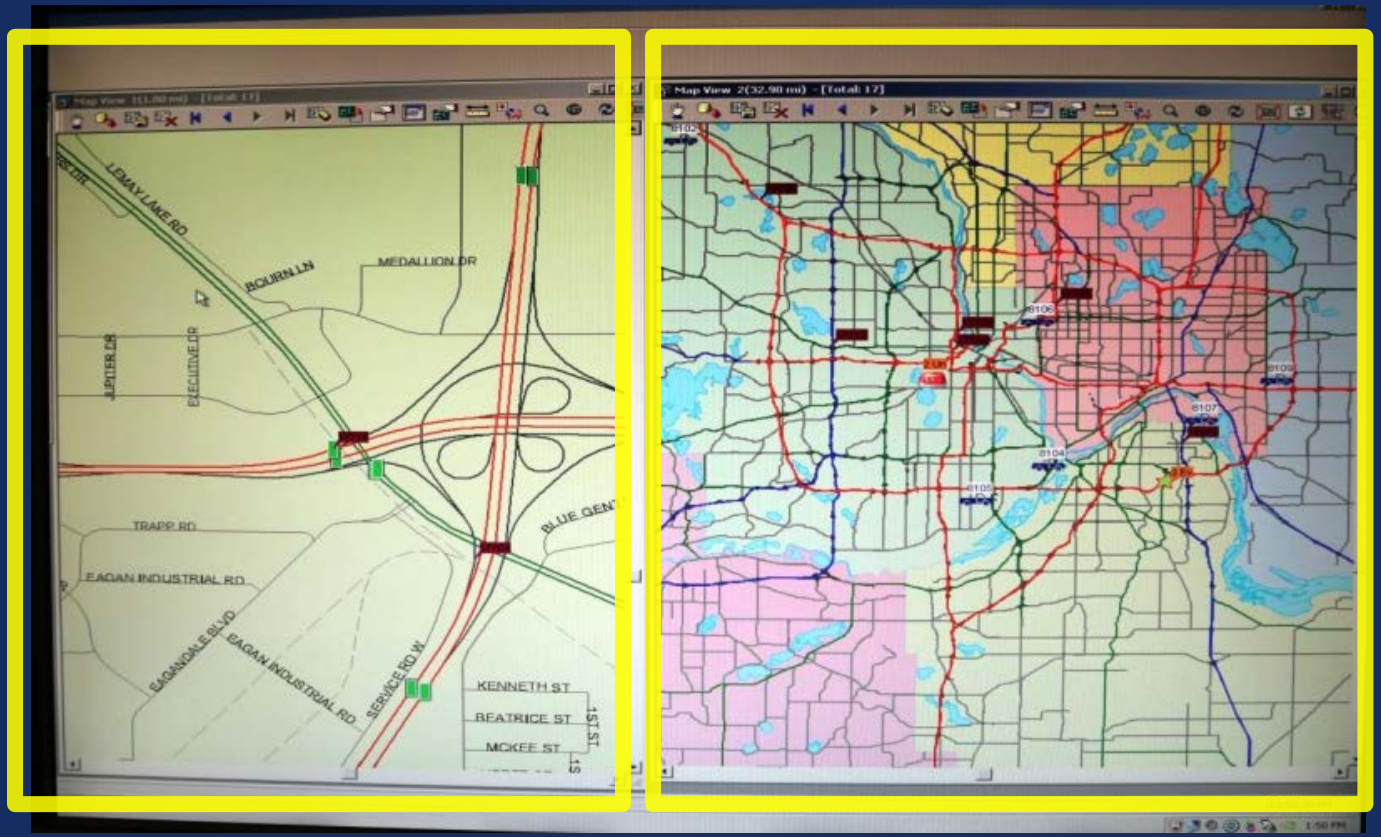
TMC / FIRST Dispatch Workstation

- Cameras
- IRIS & Email
- Radio
- MSP CAD

TMC tools – CAD 1st screen



TMC tools – CAD 2nd screen



How it works

- TMC receives a linked-copy of traffic related events created by State Patrol dispatchers
  - Common: Location, event type, remarks
  - Distinct: Incident close time

- TMC / FSP creates own events for stalls, etc. that Patrol is not responding to
  - TMC created events can be merged into Patrol events as needed for continuity

Getting data out of CAD for TMC use

- 2008 to 2014 – Annual data dump from SP
  - OK for annual benchmarks, but no real time benefits
- 2014 to present – Purchased module from vendor that provides clear XML feed of traffic related events, times, and TMC entered remarks (InterCAD)
  - TMC captures real time & stores in Postgres database
  - XML includes: Lat/Long, event type, common name, start & close times, unit status times, FIRST AVL breadcrumbs, TMC remarks.
  - Reformat to CSV & pushed out by FTP to CARS511 (Castle Rock)
  - Ingested by ATMS software – IRIS (in house, open source)
  - Reports viewable using Django web framework (open source Python)
  - CARS & IRIS have their own public XML feeds (to Waze, etc.)

Security & Privacy issues????

- TMC is firewalled off from Criminal Justice Interface (CJI) databases
  - Plates entered by TMC only search the common Patrol Location of Interest (LOI) database. No warrants, driver or owner info, etc.
  - SP entries are encrypted / unreadable.
  - TMC entries are clear text / readable.
- FIRST uses LOI for tracking “frequent flyers” for gas assists. Patrol can see those too.
- FIRST impounds are entered by SP dispatch to get Registered Owner info and enter into FBI’s NCIC database.
- A basic training on CJI data provided by State BCA for “incidental users” like TMC & FIRST.

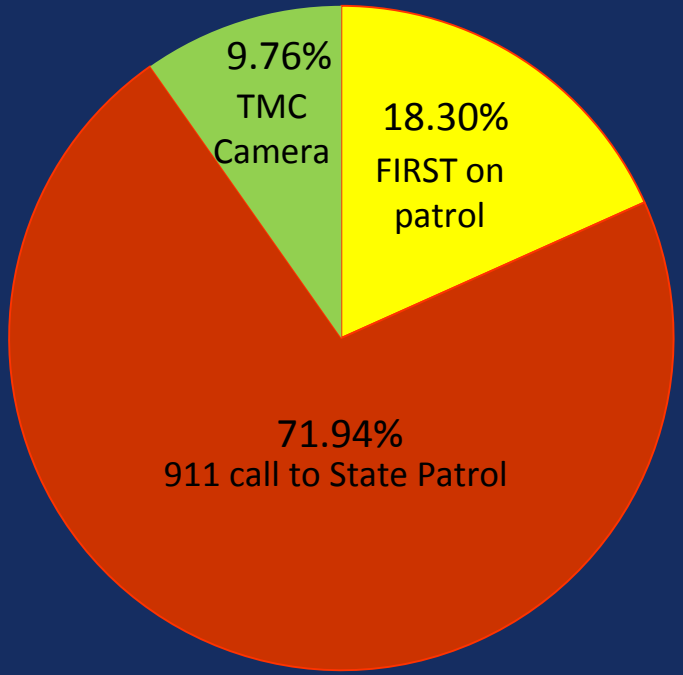
How does TMC use the CAD data?

#1 – Real time incident management!!

- Shared awareness for TMC staff
- Eliminate duplicate data entry
- Increase interagency coordination with Patrol

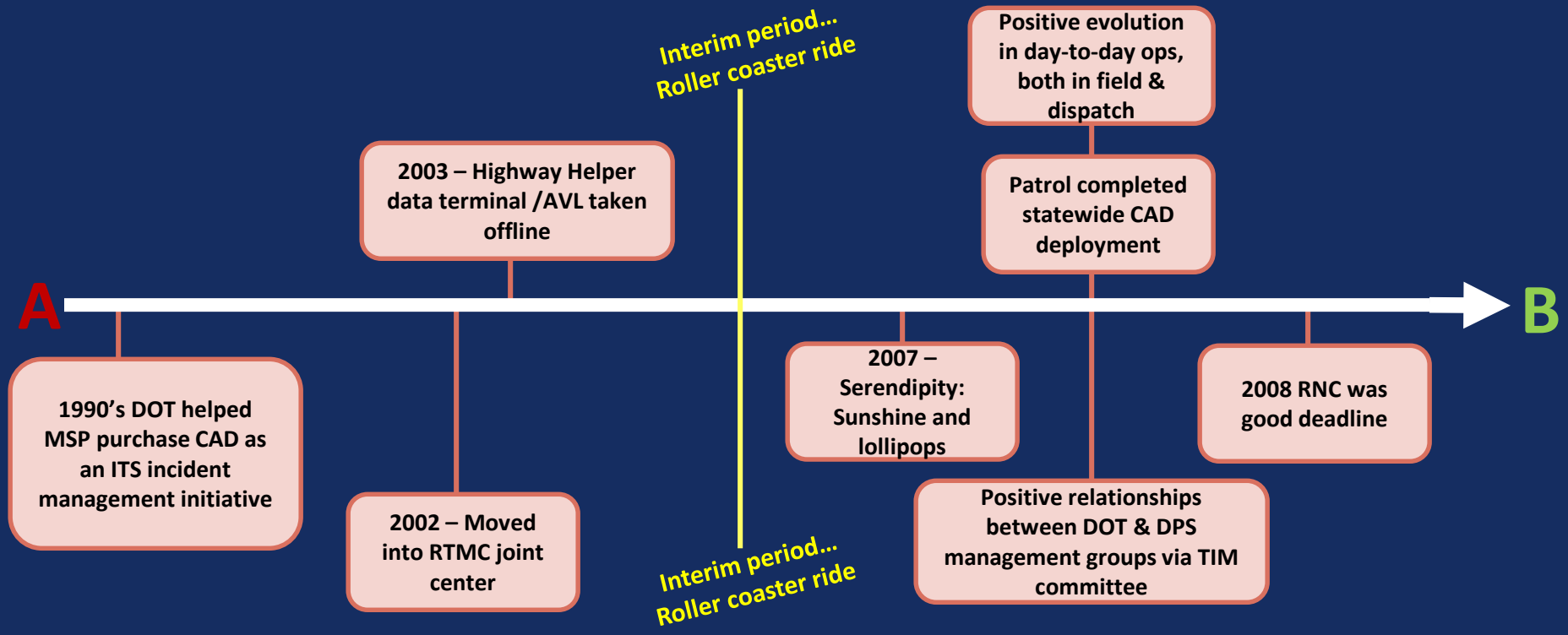
- 511 & ATMS
- Automated tool to track incidents with WZ's
- Some specific queries (WW's, FIRST)
- FHWA TIM SA & Upper level staff reports
- Lots more things possible… video wall automation, custom camera salvos, weather messaging…

TMC Event Source



2015 CAD events
SP 911 – 48,000
FIRST – 12,000
TMC – 6,500

How'd we get from A to B?



DOT Operator Training?

- For FIRST - pretty easy – mostly touchscreen buttons.
  - A few retirements occurred before implementation
  - Overall EXTREMLY positive about getting CAD
- For Dispatchers – mostly drag & drop. Syntax for creating events more involved – but not difficult for dispatch staff relative to other duties.
  - Example: "@NB 35W I AT LAKE ST%"

Secondary Crash Analysis Project

C	D	E	F
location	cdts	xdts	camera
I 35W NB @ WASHINGTON AVE	8/22/2016 5:18	8/22/2016 5:21	NONE
I 35W SB @ 35TH ST	8/22/2016 5:44	8/22/2016 6:34	6221
HWY 169 NB @ HWY 610	8/22/2016 5:54	8/22/2016 8:27	688
PORTLAND AVE @ 3RD ST S	8/22/2016 6:06	8/22/2016 6:22	NONE
I 35 NB @ HWY 95	8/22/2016 6:07	8/22/2016 6:10	NONE
I 35E NB @ RANDOLPH AVE	8/22/2016 6:56	8/22/2016 12:26	1021
BUSH LAKE RD @ EAST BUSH LAKE RD	8/22/2016 7:06	8/22/2016 9:07	426
BUSH LAKE RD @ EAST BUSH LAKE RD	8/22/2016 7:07	8/22/2016 7:08	DUP
I 494 EB @ EB 494 I TO BUSH LAKE RD E RMP	8/22/2016 7:07	8/22/2016 7:10	DUP
VALLEY CREEK RD TO NB 494	8/22/2016 7:09	8/22/2016 7:21	400
I 694 EB @ MAIN ST	8/22/2016 7:22	8/22/2016 7:37	702
I 694 NB @ 10TH ST	8/22/2016 7:32	8/22/2016 7:46	1021
I 94 EB @ EB 94 I TO MAPLE GROVE PKWY N RMP	8/22/2016 7:48	8/22/2016 10:53	808
HWY 55 @ PLEASANT DR	8/22/2016 7:55	8/22/2016 9:02	NONE
HWY 169 SB @ GATEWAY DR	8/22/2016 7:56	8/22/2016 9:25	NONE
I 94 EB @ EB 94 I TO MAPLE GROVE PKWY N RMP	8/22/2016 7:57	8/22/2016 8:25	NONE
NB HWY 169 @ HWY 41	8/22/2016 8:07	8/22/2016 8:17	1021
HWY 36 WB @ LEXINGTON AVE	8/22/2016 8:25	8/22/2016 9:32	NONE
I 494 WB @ CONCORD BLVD	8/22/2016 8:48	8/22/2016 8:49	NONE
I 94 WB @ CEDAR ST	8/22/2016 9:04	8/22/2016 9:18	852
I 94 WB @ MINNESOTA ST	8/22/2016 9:21	8/22/2016 10:25	852
HWY 62 EB @ FRANCE AVE	8/22/2016 10:04	8/22/2016 13:43	1021
FRANKLIN AVE @ FRANKLIN AVE	8/22/2016 11:25	8/22/2016 12:39	624
I 35W SB @ CR 42	8/22/2016 11:35	8/22/2016 12:36	NONE
I 94 WB @ HIAWATHA	8/22/2016 12:45	8/22/2016 14:00	625
NB I 35W TO 5TH AVE S RMP	8/22/2016 12:47	8/22/2016 13:32	NONE
HWY 169 SB @ I 394	8/22/2016 12:56	8/22/2016 13:17	DUP
BETTY CROCKER DR @ BETTY CROCKER DR	8/22/2016 12:56	8/22/2016 13:32	906
HWY 169 NB @ CANTERBURY DOWNS BL	8/22/2016 13:00	8/22/2016 14:39	NONE

- On the wish list for 5+ years
- InterCAD project made data much easier to get to
- Secondary crashes, visibility of crash cause, 911 notification time

Results of Secondary Crash Analysis

- 2 weeks in August - 4:30am-10pm Mon - Fri
- Average 81 crash events per day in Metro area
  - 60% had vehicles visible on playback (48 crashes)
  - 40% not visible: Dups, outside cam coverage, minor bump & go H&R's, 10-21 events
- Of the per-day average – 48 crash scenes visible
  - Rear end collisions in recurring congestion
  - 18% actual crash visible
  - 4% classifiable as "secondary crash"
  - About 2 secondary crashes per day

Any questions?

Contact Info

John McClellan, MNDOT
(651) 234-7025, john.mcclellan@state.mn.us

DEPARTMENT OF TRANSPORTATION

Instant Poll

5 The traffic system technology for your agency is…

__ Run by your organization completely
__ Run by a consultant
__ Run by a separate state IT agency
__ A mixture of several entities

Now that you have heard the presentations-

Questions?

- Remaining Questions from the CHAT Box

Wrap Up

Contact Information

- Denise Markow, PE, I-95 Corridor Coalition, TSMO Program Coordinator
  301-789-9088, dmarkow@i95coalition.org

- Robert Heller, PhD, Southwest Research Institute, Program Director
  robert.heller@swri.org

- John Horner, PE, Q-Free North America, Director of ATMS Product Strategy
  john.horner@q-free.com

- John McClellan, Minnesota DOT, Freeway Operations Supervisor
  john.mcclellan@state.mn.us

Thank You!