Using Data to Improve Traffic Incident Management

Next Generation TIM

every day counts
An Innovation Partnership with States

U.S. Department of Transportation
Federal Highway Administration

What is Traffic Incident Management?

TIM is the process of coordinating resources of many agencies and companies to detect, respond to and clear traffic incidents as quickly as possible.

- Increase responder safety
- Prevent secondary crashes
- Reduce congestion

What are Traffic Incidents?

Unplanned roadway occurrences that adversely affect traffic

- Crashes – **5.6 million annually**
- Disabled vehicles
- Roadway debris
- Police activity

Police, fire, EMS, transportation and towing agencies work alone and together to clear thousands of incidents every day.

Effective Mitigation of Roadway Incidents

TIM Programs/Committees - (Houston, Austin)

Training

- National TIM Responder
- Training Program (EDC-2)

  Nationally - 216,000

  Texas - 16,000

Data Collection

Various Other Activities

Why Should We Collect TIM Data?

You can't improve what you don't measure.

Improve safety and operations

- Identify where improvements are possible
- Reduce secondary crashes

Get better outcomes

- Save more lives, money and time

Increase transparency

- Demonstrate program effectiveness
- Future funding and planning
- Meet national goals

What Data Should be Collected?

3 Key/Standard Performance Measures:

1. Roadway Clearance Time – From the time an agency becomes aware of an incident and records it, to all lanes open for traffic flow.

2. Incident Clearance Time – From the time an agency becomes aware of an incident and records it, to time the last responder leaves the scene.

3. Secondary Crashes – The number of unplanned crashes recorded after the original incident either within the incident scene or within the queue in either direction.

How do We Collect Data? Using…

Transportation

- Traffic management centers
- Freeway service patrols

Law Enforcement

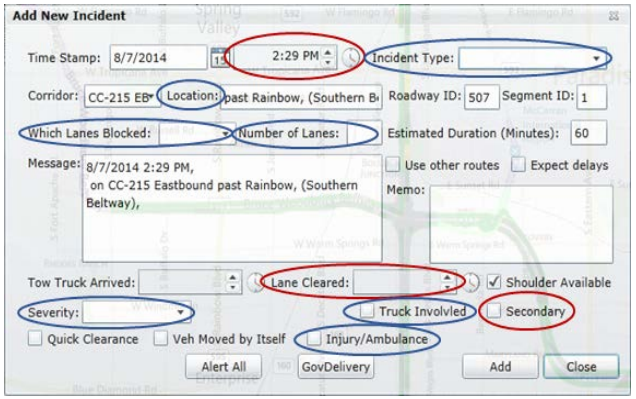
- Electronic crash reports
- Incident reports
- Computer-aided dispatch (CAD) systems

Fire Department CAD

EMS CAD

Towing companies

FAST Incident Entry Screen



Source: Freeway and Arterial System of Traffic

Florida Highway Patrol Electronic Crash Reporting System

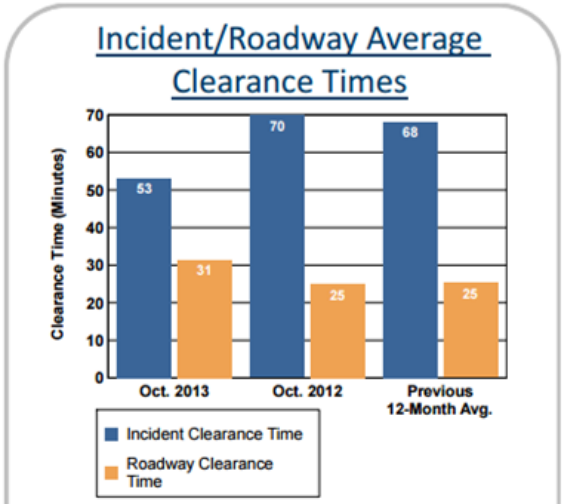
Source: Florida Highway Patrol

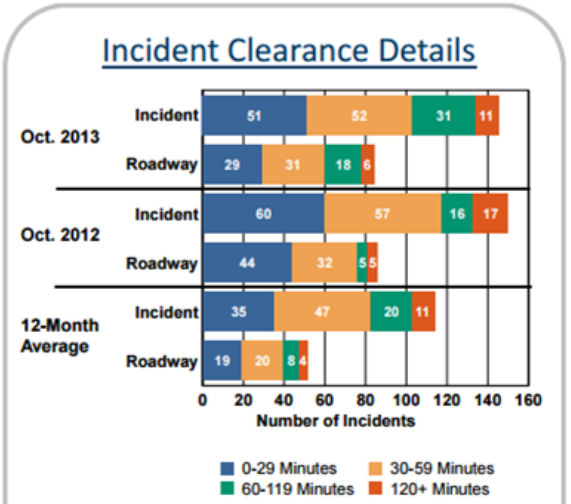
Who Could Use this Innovation?

- State and Local DOTs
  - Traffic Management Centers
  - Crash Records Section
  - Safety Sections
- State and Local Police
  - Responders
  - Fire, EMS, Towing
- National Highway Safety Administration
- Traffic Records Coordinating Committee
- Governors Highway Safety Office

Michigan DOT

From Michigan DOT Monthly Performance Report





"Incident clearance time" is defined as the time between the awareness of an **Incident** and the time when all vehicles are removed from the scene. "Roadway clearance time" is defined as the time between the awareness of an incident and confirmation that all lanes are open to traffic. MDOT's goal is to minimize delays caused by incidents as well as the occurrences of secondary incidents.

First responders and MDOT share a goal of clearing **Incidents** from the roadway and reducing incident clearance times to limit the risk to the incident site and responders, and safely restore normal traffic flow. Effective response and clearance improves safety for motorists as well as first responders.

Secondary Crashes

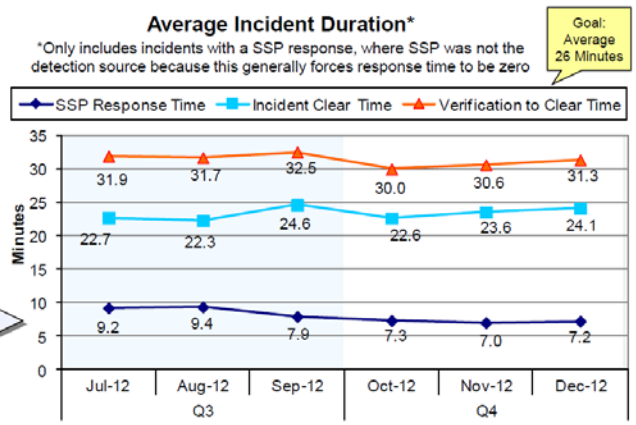
Out of the 116 total crashes this month, 22 (19 percent) were **Secondary Crashes**.

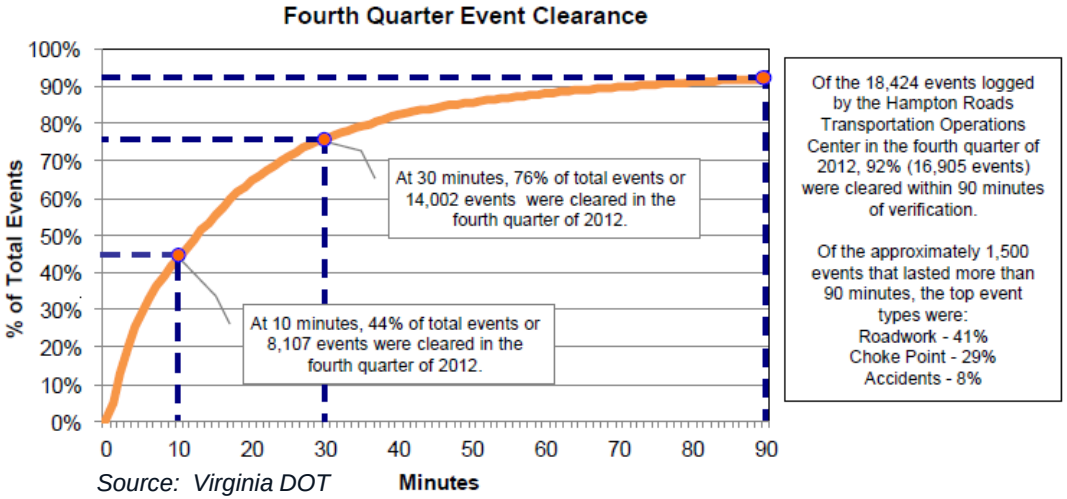
Source: Michigan DOT Monthly Performance Report

Virginia DOT

Fourth Quarter 2012 Performance Measures Report, Hampton Roads TOC

This line graph shows the average SSP Response time - duration from the time an incident is verified to when a SSP truck arrives on scene; the average Incident Clear Time - duration from SSP arrival until the incident is cleared or the SSP is relieved by an outside agency; and the total amount of time from initial verification to clearance for Q3 and Q4 2012.
In Q4 the average SSP response time decreased by over a minute and incident clear time remained constant, causing the average incident duration to decrease from 32 minutes in Q3 to 31 minutes in Q4.



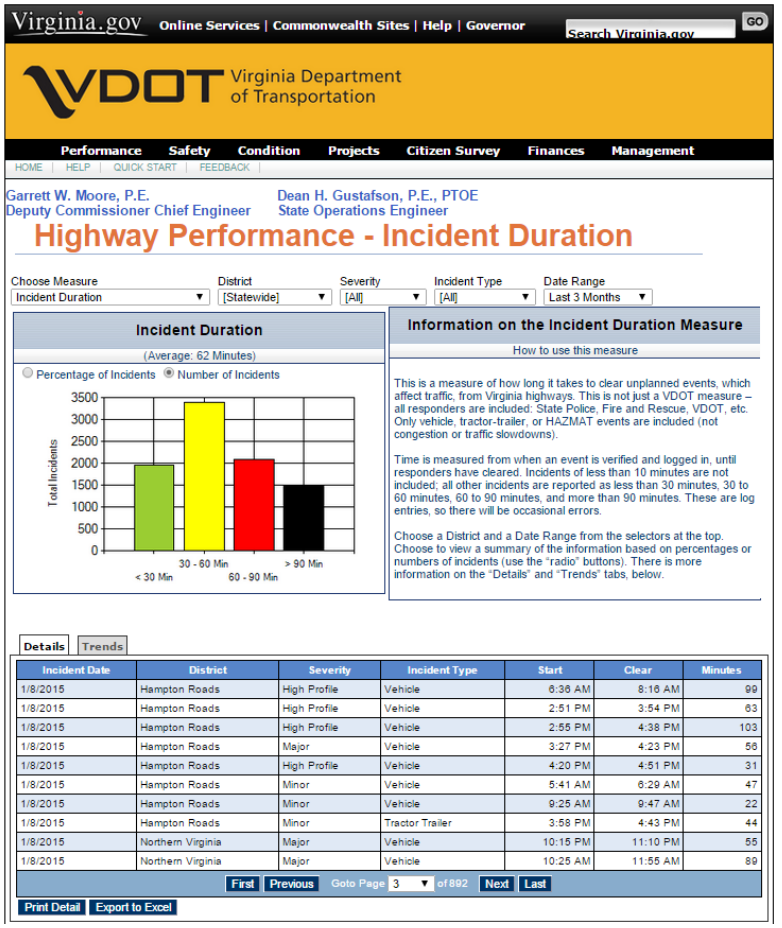


Of the 18,424 events logged by the Hampton Roads Transportation Operations Center in the fourth quarter of 2012, 92% (16,905 events) were cleared within 90 minutes of verification.

Of the approximately 1,500 events that lasted more than 90 minutes, the top event types were:
Roadwork - 41%
Choke Point - 29%
Accidents - 8%

Source: Virginia DOT

VDOT Dashboard



Source: Virginia DOT

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TIM Data Collection

ARIZONA DEPARTMENT OF PUBLIC SAFETY

COLLISION SUPPLEMENT

DR Number	Date	Time	Type	Highway	Milepost	Ramp	Badge	DPS / INV
	06/17/2015	14:48					06199	☐ Yes ☐ No

DPS Collision Supplement Number	Injuries	Fatalities	Vehicles Involved	Time of Call	10-97 Time	10-98 Time
	0		0	14:48		

Latitude	Longitude	Secondary Collision	Secondary to Initial Crash	Secondary Involved a Responder
		☑ Yes ☐ No	☑ Yes ☐ No	☐ Yes ☑ No

County	Location Code

Collision Type
1 ☐ Pedestrian
2 ☐ Motor Vehicle
3 ☐ Motorcycle
4 ☐ Railway Train
5 ☐ Bicycle
6 ☐ Animal
7 ☐ Fixed Object
8 ☐ Other

Non Collision Type
1 ☐ Fire
2 ☐ Mechanical Failure
3 ☐ Rollover
4 ☐ Other

Weather Conditions
1 ☐ Clear
2 ☐ Raining
3 ☐ Cloudy
4 ☐ Snowing
5 ☐ Strong Wind
6 ☐ Dust
7 ☐ Fog

Intersection Related
1 ☐ Yes
2 ☐ No

Highway Barrier Involvement
1 ☐ None
2 ☐ Guardrail
3 ☐ Median Cable
4 ☐ Median Wall
5 ☐ Crash Barrels
6 ☐ Right-of-Way Fence
7 ☐ Other

Road Condition
1 ☐ Dry
2 ☐ Wet
3 ☐ Sand / Gravel
4 ☐ Snowy - Icy
5 ☐ Fresh Oil
6 ☐ Other
7 ☐ Unknown

Highway Type
1 ☐ Interstate - Divided
2 ☐ Frontage
3 ☐ Ramp
4 ☐ Highway - Divided
5 ☐ 2-Way Highway

Direction of Travel
1 ☐ North
2 ☐ South
3 ☐ East
4 ☐ West

Highway Blockage

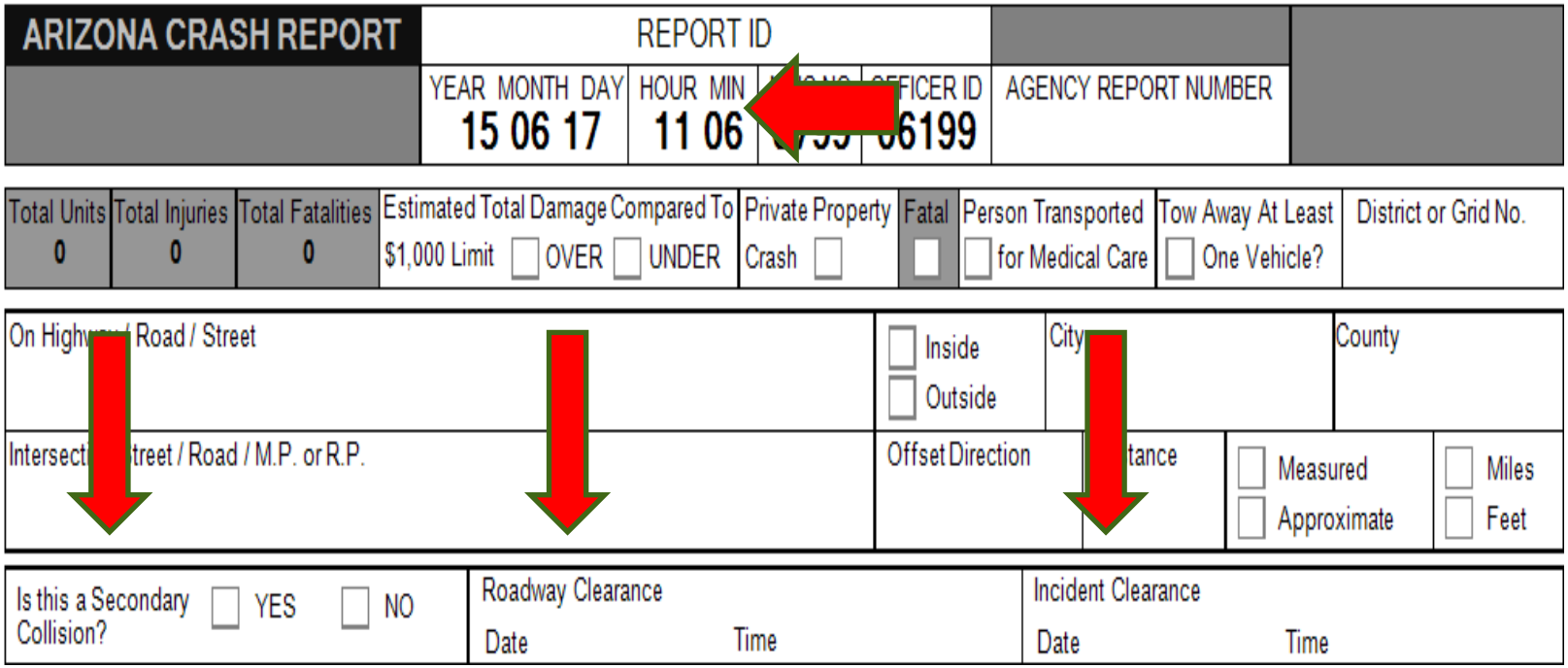
Time Blockage Reopened	Time Off Highway

Construction Zone	DPS Photo Taken
1 ☐ Yes	1 ☐ Yes
2 ☐ No	2 ☐ No

TIM Data Collection

Traffic and Criminal Software (TraCS)

- Public Safety Data Collection Software
- Used by troopers to electronically document collision reports, enforcement actions, vehicle tows, supplemental forms, etc.
- Downloaded daily to Arizona Dept. of Transportation in XML file format
- Captures TIM Performance Measures



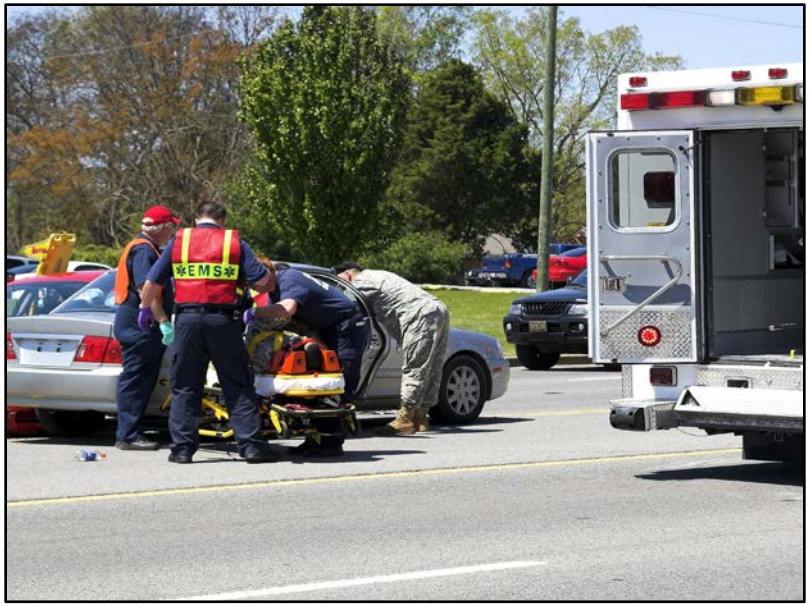
How do Arizona Stakeholders Apply TIM Data?

- Governor's Office Scorecard
- Department 28-Day Review
- Traffic Operations Center Co-Location Project
- TraCS Office supports/trains other agencies to improve TIM data collection through an electronic platform
- Ongoing analysis of TIM data to improve safety and accountability with other stakeholders (ADOT, GOHS, MAG, AZTECH, SHSP, first responders, FHWA)
- Dedicated analysts review/analyze TIM data, identify trends, inform Highway Patrol Division staff

What are the Local/State EDC-4 TIM Goals?

Start or Expand collection of uniform TIM data.

Analyze data to identify areas for improvement.



How Do You Reach the Goals?

Collect all 3 TIM performance measures (PM)

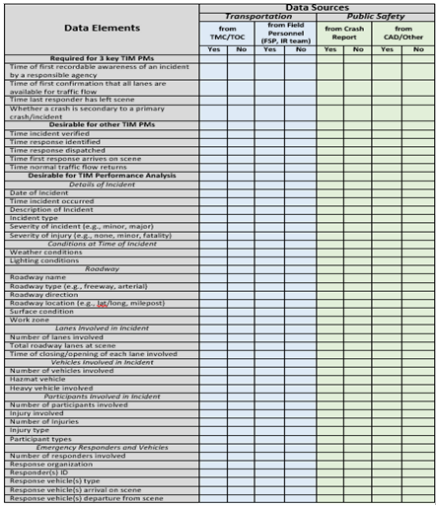
Incorporate police data

Add at least 1 PM to electronic crash reports

Increase one level when applying the TIM Capability Maturity Level

Initiative Resources

- Webinars
- Peer exchanges
- Workshops
- Step by Step Guidance
- On-site technical assistance
- Check list: TIM PM data elements
- TIM PM outreach document
- Brochure: Making the Case for TIM PM



Data Elements	Data Sources							
	Transportation				*Public Safety*			
	from TMC/TOC		from Field Personnel (FSP, IR team)		from Crash Report		from CAD/Other	
	Yes	No	Yes	No	Yes	No	Yes	No
Required for 3 key TIM PMs								
Time of first recordable awareness of an incident by a responsible agency								
Time of first confirmation that all lanes are available for traffic flow								
Time last responder has left scene								
Whether a crash is secondary to a primary crash/incident								
Desirable for other TIM PMs								
Time incident verified								
Time response identified								
Time response dispatched								
Time first response arrives on scene								
Time normal traffic flow returns								
Desirable for TIM Performance Analysis								
Details of Incident								
Date of incident								
Time incident occurred								
Description of incident								
Incident type								
Severity of incident (e.g., minor, major)								
Severity of injury (e.g., none, minor, fatality)								
Conditions at Time of Incident								
Weather conditions								
Lighting conditions								
Roadway								
Roadway name								
Roadway type (e.g., freeway, arterial)								
Roadway direction								
Roadway location (e.g., lat/long, milepost)								
Surface condition								
Work zone								
Lanes Involved in Incident								
Number of lanes involved								
Total roadway lanes at scene								
Time of closing/opening of each lane involved								
Vehicles Involved in Incident								
Number of vehicles involved								
Hazmat vehicle								
Heavy vehicle involved								
Participants Involved in Incident								
Number of participants involved								
Injury involved								
Number of injuries								
Injury type								
Participant types								
Emergency Responders and Vehicles								
Number of responders involved								
Response organization								
Responder(s) ID								
Response vehicle(s) type								
Response vehicle(s) arrival on scene								
Response vehicle(s) departure from scene								

TIM PM Data Check List by Source

Questions?

Paul Jodoin

Paul.Jodoin@dot.gov

(202) 366-5465