

Using Data to Improve Traffic Incident Management

Next Generation TIM



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

The screenshot shows the 'Add New Incident' form in the FAST system. Key fields and their values are: Time Stamp: 8/7/2014 2:29 PM; Incident Type: (dropdown); Corridor: CC-215 EB; Location: past Rainbow, (Southern B); Roadway ID: 507; Segment ID: 1; Which Lanes Blocked: (dropdown); Number of Lanes: (dropdown); Estimated Duration (Minutes): 60; Message: 8/7/2014 2:29 PM, on CC-215 Eastbound past Rainbow, (Southern Beltway); Lane Cleared: (dropdown); Severity: (dropdown); and checkboxes for 'Truck Involved' and 'Secondary'.

Source: Freeway and Arterial System of Traffic

Florida Highway Patrol Electronic Crash Reporting System

The screenshot shows the 'Florida Highway Patrol Electronic Crash Reporting System' form. Key fields and their values are: County: DUVAL; City: JACKSONVILLE; Reported to Agency Date/Time: 02/16/2012 03:07 PM; Investigation Complete Date/Time: (dropdown); Law Enforcement Source ORI: LAW ENFORCEMENT AGENCY; Crash Sequence Order: SECONDARY; and Roadway Cleared Date/Time: (dropdown).

Source: Florida Highway Patrol

Who Could Use this Innovation?

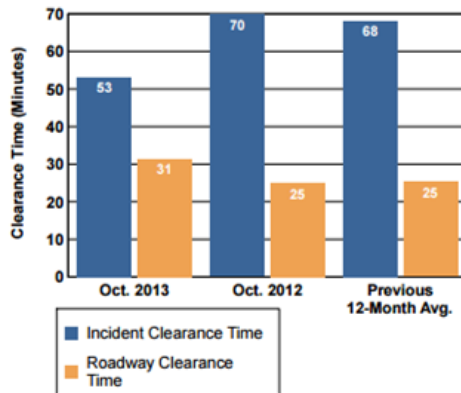
- State and Local DOTs
 - Traffic Management Centers
 - Crash Records Section
 - Safety Sections
- State and Local Police
 - Responders
 - Fire, EMS, Towing
- National Highway Safety Administration
- Traffic Records Coordinating Committee
- Governors Highway Safety Office



Michigan DOT

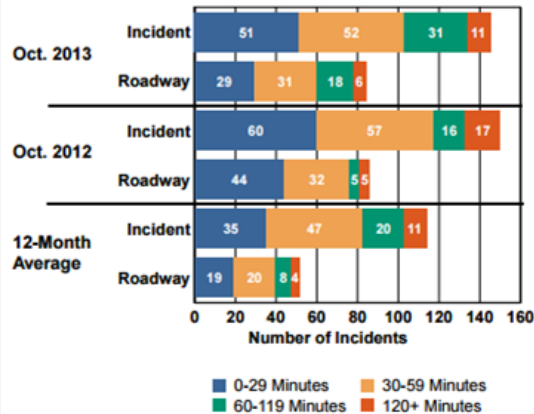
From Michigan DOT Monthly Performance Report

Incident/Roadway Average Clearance Times



"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.

Incident Clearance Details



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

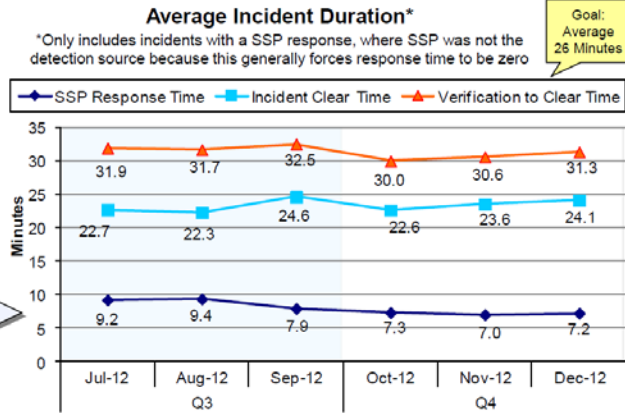
Out of the **116** total crashes this month, **22 (19 percent)** were **Secondary Crashes**.

Source: Michigan DOT Monthly Performance Report

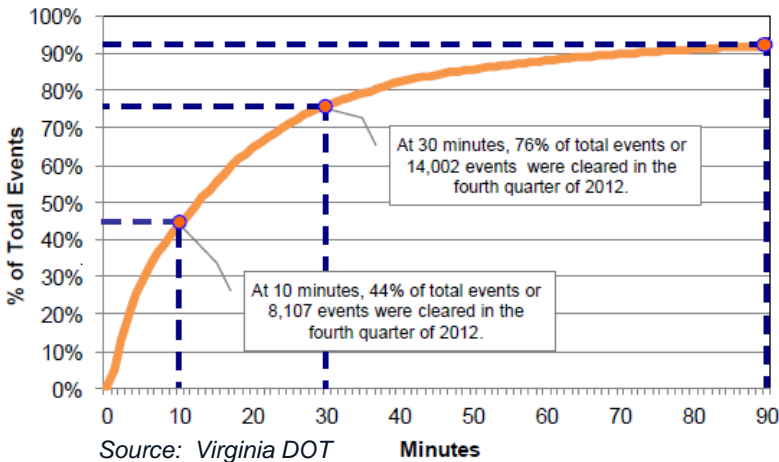
Virginia DOT

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.



Fourth Quarter Event Clearance



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%

VDOT Dashboard

Virginia.gov Online Services | Commonwealth Sites | Help | Governor Search Virginia.gov GO

VDOT Virginia Department of Transportation

Performance Safety Condition Projects Citizen Survey Finances Management

HOME HELP QUICK START FEEDBACK

Garrett W. Moore, P.E. Deputy Commissioner Chief Engineer Dean H. Gustafson, P.E., PTOE State Operations Engineer

Highway Performance - Incident Duration

Choose Measure: Incident Duration District: [Statewide] Severity: [All] Incident Type: [All] Date Range: Last 3 Months

Incident Duration

(Average: 62 Minutes)

Percentage of Incidents Number of Incidents

Information on the Incident Duration Measure

How to use this measure

This is a measure of how long it takes to clear unplanned events, which affect traffic from Virginia highways. This is not just a VDOT measure - all responders are included: State Police, Fire and Rescue, VDOT, etc. Only vehicle, tractor-trailer, or HAZMAT events are included (not congestion or traffic slowdowns).

Time is measured from when an event is verified and logged in, until responders have cleared. Incidents of less than 10 minutes are not included; all other incidents are reported as less than 30 minutes, 30 to 60 minutes, 60 to 90 minutes, and more than 90 minutes. These are log entries, so there will be occasional errors.

Choose a District and a Date Range from the selectors at the top. Choose to view a summary of the information based on percentages or numbers of incidents (use the "radio" buttons). There is more information on the "Details" and "Trends" tabs, below.

Details Trends

Incident Date	District	Severity	Incident Type	Start	Clear	Minutes
1/8/2015	Hampton Roads	High Profile	Vehicle	6:36 AM	8:16 AM	99
1/8/2015	Hampton Roads	High Profile	Vehicle	2:51 PM	3:54 PM	63
1/8/2015	Hampton Roads	High Profile	Vehicle	2:55 PM	4:38 PM	103
1/8/2015	Hampton Roads	Major	Vehicle	3:27 PM	4:23 PM	56
1/8/2015	Hampton Roads	High Profile	Vehicle	4:20 PM	4:51 PM	31
1/8/2015	Hampton Roads	Minor	Vehicle	5:41 AM	6:29 AM	47
1/8/2015	Hampton Roads	Minor	Vehicle	9:25 AM	9:47 AM	22
1/8/2015	Hampton Roads	Minor	Tractor Trailer	3:58 PM	4:43 PM	44
1/8/2015	Northern Virginia	Major	Vehicle	10:15 PM	11:10 PM	55
1/8/2015	Northern Virginia	Major	Vehicle	10:25 AM	11:55 AM	89

Print Detail Export to Excel

Source: Virginia DOT

TIM Data Collection



ARIZONA DEPARTMENT OF PUBLIC SAFETY

COLLISION SUPPLEMENT

DR Number	Date 06/17/2015	Time 14:48	Type	Highway	Milepost	Ramp	Badge 06199	DPS / INV <input type="checkbox"/> Yes <input type="checkbox"/> No
DPS Collision Supplement Number	Injuries 0	Fatalities	Vehicles Involved 0	Time of Call 14:48	10-97 Time	10-98 Time		
Latitude	Longitude	Secondary Collision <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Secondary to Initial Crash <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Secondary Involved a Responder <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
County	Location Code							
Collision Type 1 <input type="checkbox"/> Pedestrian 2 <input type="checkbox"/> Motor Vehicle 3 <input type="checkbox"/> Motorcycle 4 <input type="checkbox"/> Railway Train 5 <input type="checkbox"/> Bicycle 6 <input type="checkbox"/> Animal 7 <input type="checkbox"/> Fixed Object 8 <input type="checkbox"/> Other	Non Collision Type 1 <input type="checkbox"/> Fire 2 <input type="checkbox"/> Mechanical Failure 3 <input type="checkbox"/> Rollover 4 <input type="checkbox"/> Other	Weather Conditions 1 <input type="checkbox"/> Clear 2 <input type="checkbox"/> Raining 3 <input type="checkbox"/> Cloudy 4 <input type="checkbox"/> Snowing 5 <input type="checkbox"/> Strong Wind 6 <input type="checkbox"/> Dust 7 <input type="checkbox"/> Fog	Intersection Related 1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No Highway Barrier Involvement 1 <input type="checkbox"/> None 2 <input type="checkbox"/> Guardrail 3 <input type="checkbox"/> Median Cable 4 <input type="checkbox"/> Median Wall 5 <input type="checkbox"/> Crash Barrels 6 <input type="checkbox"/> Right-of-Way Fence 7 <input type="checkbox"/> Other					
Road Condition 1 <input type="checkbox"/> Dry 2 <input type="checkbox"/> Wet 3 <input type="checkbox"/> Sand / Gravel 4 <input type="checkbox"/> Snowy - Icy 5 <input type="checkbox"/> Fresh Oil 6 <input type="checkbox"/> Other 7 <input type="checkbox"/> Unknown	Highway Type 1 <input type="checkbox"/> Interstate - Divided 2 <input type="checkbox"/> Frontage 3 <input type="checkbox"/> Ramp 4 <input type="checkbox"/> Highway - Divided 5 <input type="checkbox"/> 2-Way Highway	Direction of Travel 1 <input type="checkbox"/> North 2 <input type="checkbox"/> South 3 <input type="checkbox"/> East 4 <input type="checkbox"/> West	Highway Blockage Time Blockage Reopened					Time Off Highway
			Construction Zone 1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	DPS Photo Taken 1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> 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

ARIZONA CRASH REPORT			REPORT ID					
YEAR MONTH DAY		HOUR MIN		OFFICER ID	AGENCY REPORT NUMBER			
15 06 17		11 06		06199				
Total Units	Total Injuries	Total Fatalities	Estimated Total Damage Compared To \$1,000 Limit	Private Property Crash	Fatal	Person Transported for Medical Care	Tow Away At Least One Vehicle?	District or Grid No.
0	0	0	<input type="checkbox"/> OVER <input type="checkbox"/> UNDER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
On Highway / Road / Street				<input type="checkbox"/> Inside <input type="checkbox"/> Outside		City		County
Intersecting Street / Road / M.P. or R.P.				Offset Direction		Distance		<input type="checkbox"/> Measured <input type="checkbox"/> Miles <input type="checkbox"/> Approximate <input type="checkbox"/> Feet
Is this a Secondary Collision? <input type="checkbox"/> YES <input type="checkbox"/> NO			Roadway Clearance			Incident Clearance		
			Date Time			Date Time		

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/TIC	from Field (e.g., W team)	Personnel	from Crash Report	from CAD/Other	from 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								
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 name								
Roadway type (e.g., freeway, arterial)								
Roadway direction								
Roadway location (e.g., @/along, 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								
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								
Response type								
Response vehicle(s) type								
Response vehicle(s) arrival at scene								
Response vehicle(s) departure from scene								

TIM PM Data Check List by Source

Questions?

Paul Jodoin

Paul.Jodoin@dot.gov

(202) 366-5465