

2018 Transportation Systems Management and Operations Performance Report

Q1 EDITION



TSMO



Traffic Management Center (TMC) Performance

Introduction

This initial TSMO Performance Report is focused on providing information for PennDOT Traffic Management Centers (TMCs) with regards to the detection of reportable crashes, available tools, times of peak roadway performance, and to offer a snapshot of incident clearance times by county. All analysis uses 2017 data and is limited to the “core roadway network”¹.

One of the primary goals of PennDOT’s Traffic Management Centers (TMCs) is to maintain situational awareness, especially to capture unplanned incidents affecting traffic operations. Comparing crash reports to RCRS crash entries provides a preliminary glimpse of how TMCs are involved in the situational awareness of crashes.

The below table outlines the percentage of reportable crashes that occurred on the core roadway network in 2017 that have been linked to crash events in RCRS.

TABLE 1. REPORTABLE CRASHES AND RCRS CRASHES ON CORE ROADWAY NETWORK

Traffic Management Centers (TMC)	2017 Reportable Crashes ²	Reportable Crashes Linked to RCRS Crash ³	% of Reportable Crashes Linked to an RCRS Crash
<i>Southeastern RTMC (D6)</i>	4,799	1,970	41%
<i>Eastern RTMC (D8)</i>	4,931	1,704	35%
District 4	185	30	16%
District 4 (D8)	476	40	8%
District 5	1,112	321	29%
District 5 (D8)	714	99	14%
District 8	2,444	1,214	50%
<i>Central RTMC (D2)</i>	953	216	23%
District 2	388	151	39%
District 3	375	47	13%
District 9	190	18	9%
<i>Western RTMC (D11)</i>	2,235	827	37%
District 1	115	9	8%
District 1 (D11)	147	11	7%
District 10	205	27	13%
District 11	1,319	698	53%
District 12	449	82	18%
<i>Statewide</i>	12,918	4,717	37%

Sources: Roadway Condition Reporting System (RCRS), Crash Reporting System (CRS)

¹ Pennsylvania’s “Core Roadway Network” was established in 2011 for 511PA, and includes state owned interstates, limited access roads, and other major routes throughout the Commonwealth.

² A reportable crash is one in which an injury or a fatality occurs or if at least one of the vehicles involved required towing from the scene.

³ Reportable crashes are determined to be linked to an RCRS event if there is an RCRS “crash” entry within 1500 meters (~1 mile) of the location of any crash report, and with a start time within 45 minutes of the date and time on any crash report.

As shown in Table 1, RTMC Districts have a consistently higher rate of capturing reportable crashes in their home District as compared to their support for member Districts.

Future Analysis:

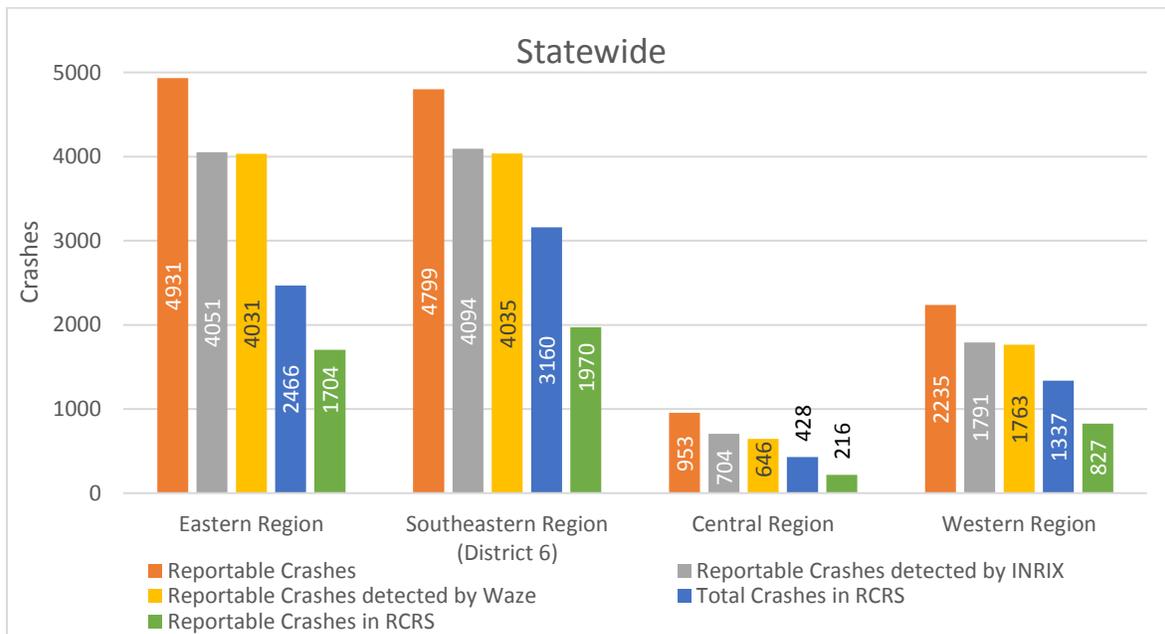
- Reportable crashes with a police recorded lane restriction or closure, correlated to appropriate RCRS entries
- Breakdown showing crash capture rates by County to summarize effectiveness of information sharing with the TMC
- District high crash locations to highlight areas of attention during regional operations

Data Notes:

The percentage of reportable crashes linked to RCRS crash events is still being finalized in the Traffic Operations Incident Timeline tool (<https://analytics.penndot.gov/#/apphome/TOA>). As the two databases continue to be correlated, these numbers may change.

Crash Detection by Data Source (Waze⁴, INRIX⁵, and RCRS³)

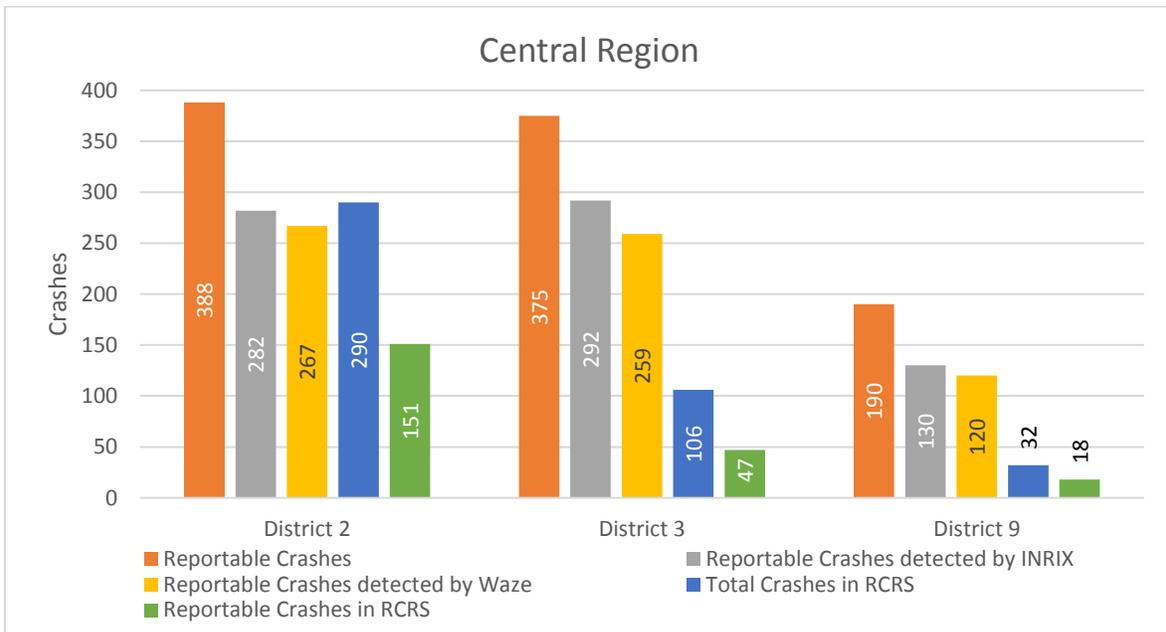
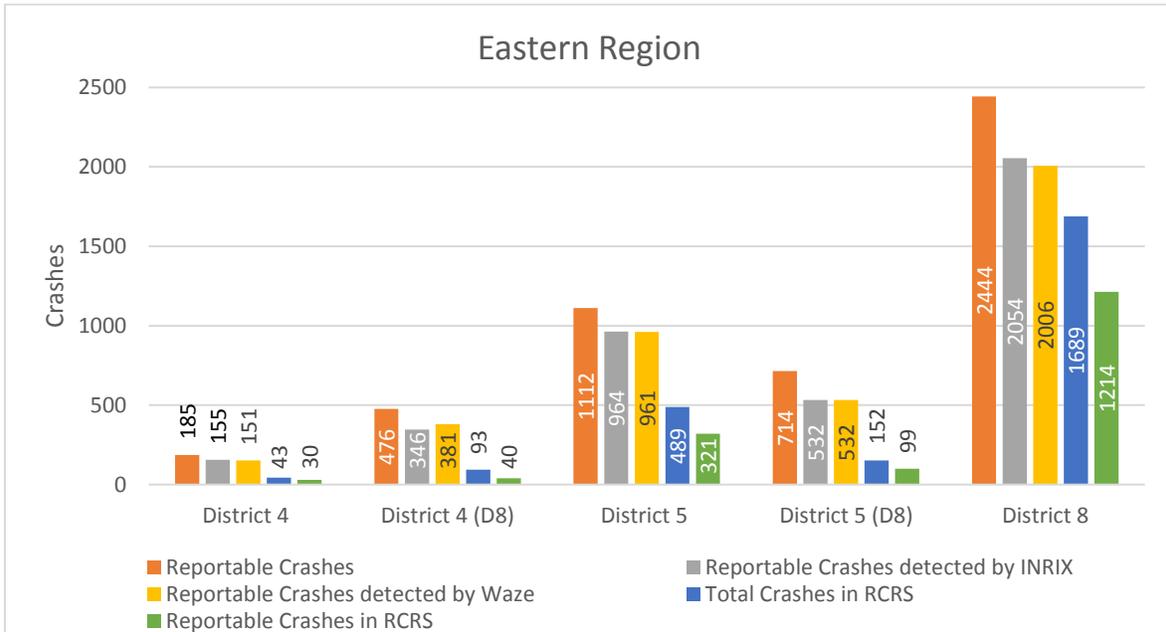
The following charts highlight how available data sources, such as Waze and INRIX, perform at detecting reportable crashes. The graphs provide a comparison to the number of reportable crashes currently linked in RCRS, and the total crash events captured in RCRS (reportable and non-reportable).



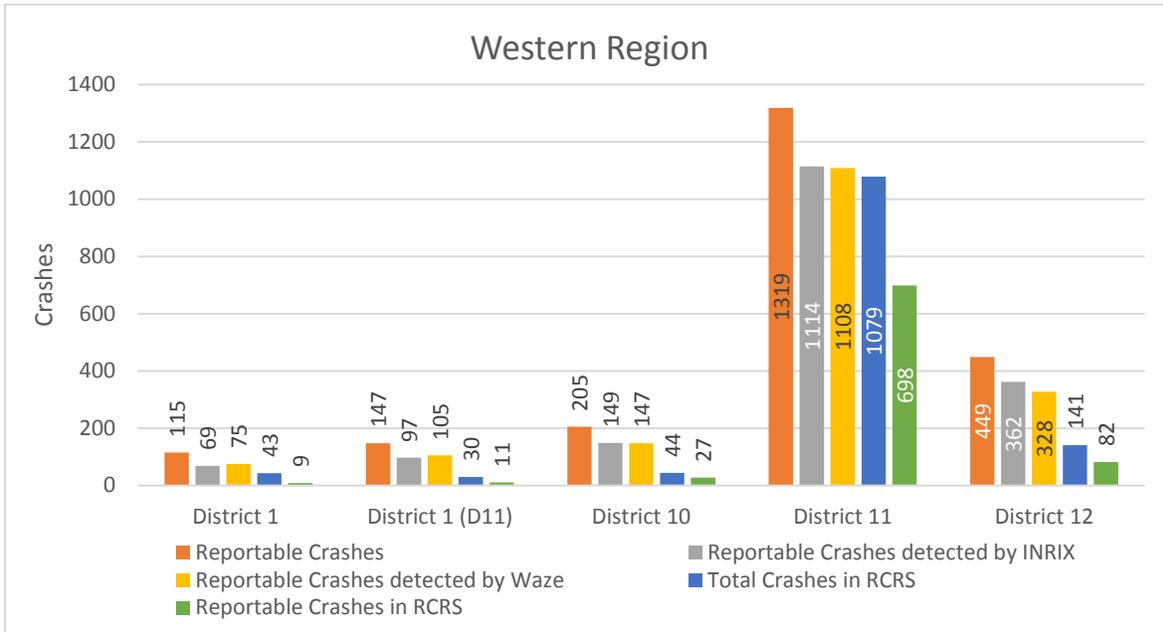
Sources: CRS, INRIX and Waze incident archive as analyzed by PennDOT's Traffic Operations Analytics (TOA) tool, RCRS

⁴ A reportable crash is determined to be linked to a Waze accident if the Waze incident occurs within 1000 meters of the crash report and has a start time within 30 minutes of the crash report time.

⁵ A reportable crash is determined to be linked to an INRIX non-recurring congestion event if the INRIX congestion occurs within the six nearest INRIX XD segments from the crash, and within 30 minutes of the crash report time.



Sources: CRS, INRIX and Waze incident archive as analyzed by PennDOT's Traffic Operations Analytics (TOA) tool, RCRS



Sources: CRS, INRIX and Waze incident archive as analyzed by PennDOT's Traffic Operations Analytics (TOA) tool, RCRS

Waze Alert Application

Districts with Service Patrol have been receiving Waze alert emails through their TMC resource accounts during 2017 to aide in prompting investigation into potential assists. Recently, the Waze alerts have been re-focused to proven datasets, and major or minor crashes, to help eliminate excessive communication. This initiative is slated for expansion in 2018 with a roll out of a Waze analytics application that will provide a real-time incident feed for the core roadway network.

The table on the following page explains the correlation of Waze alerts with reportable crashes in 2017 (see footnote 4 on page 2 for methodology).

TABLE 2. REPORTABLE CRASHES AND WAZE CRASHES ON CORE ROADWAY NETWORK

Traffic Management Centers (TMC)	2017 Reportable Crashes	Reportable Crashes Detected by Waze	% of Crashes Detected by Waze
<i>Southeastern RTMC (D6)</i>	4799	4035	84%
<i>Eastern RTMC (D8)</i>	4931	4031	82%
District 4	185	151	82%
District 4 (D8)	476	381	80%
District 5	1112	961	86%
District 5 (D8)	714	532	75%
District 8	2444	2006	82%
<i>Central RTMC (D2)</i>	953	646	68%
District 2	388	267	69%
District 3	375	259	69%
District 9	190	120	63%
<i>Western RTMC (D11)</i>	2235	1763	79%
District 1	115	75	65%
District 1 (D11)	147	105	71%
District 10	205	147	72%
District 11	1319	1108	84%
District 12	449	328	73%
<i>Statewide</i>	12918	10475	81%

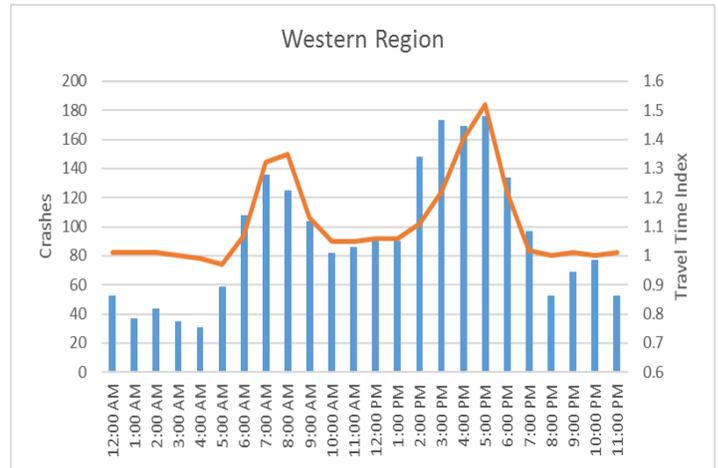
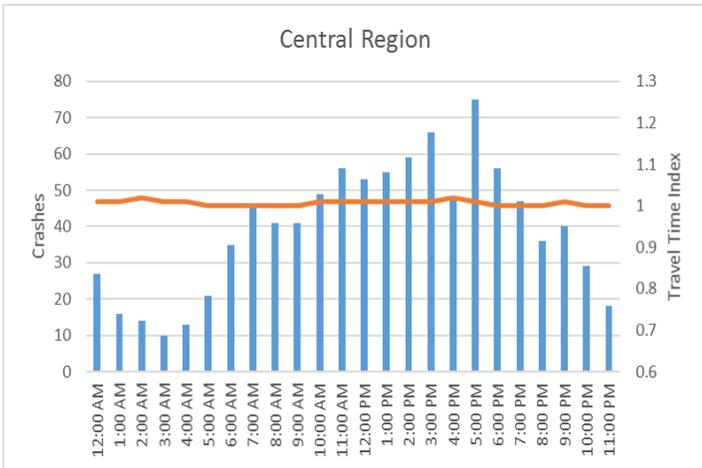
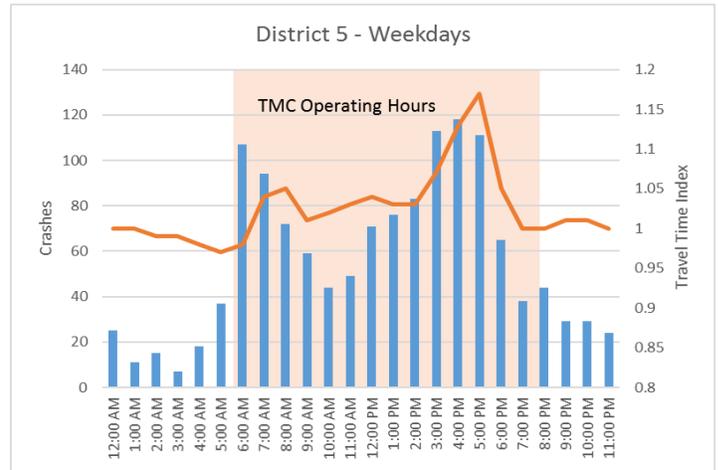
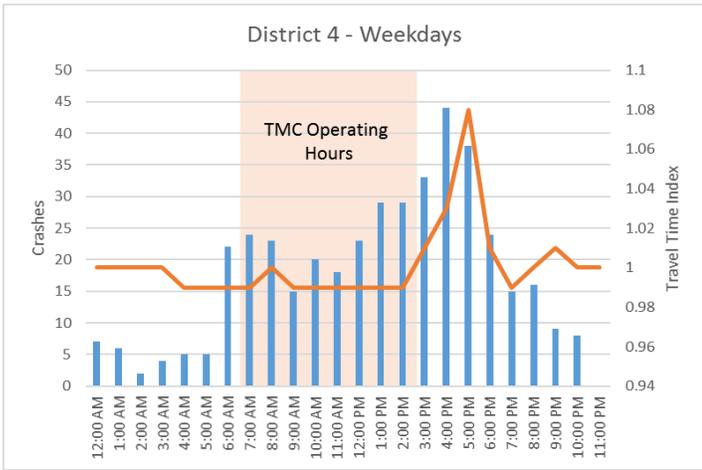
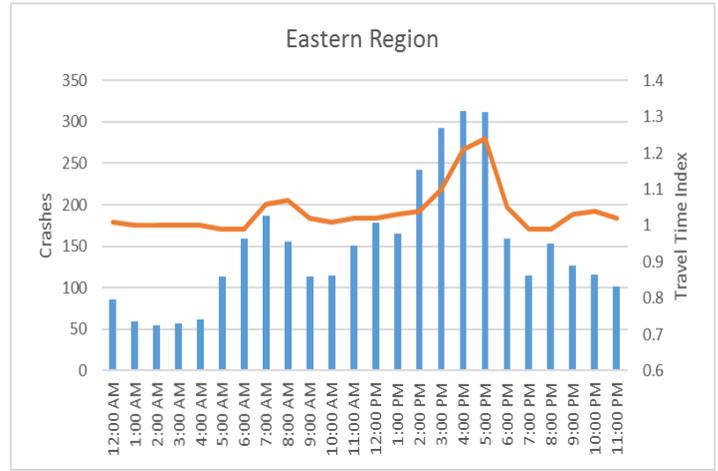
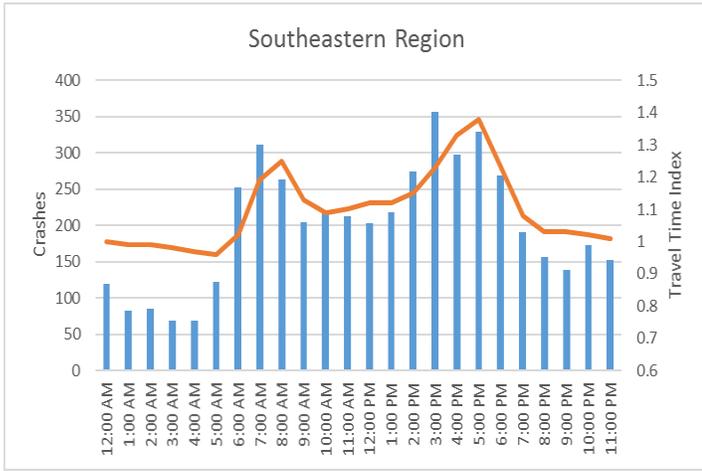
Sources: CRS, Waze incident archive as analyzed by PennDOT's Traffic Operations Incident Timeline tool

As seen in Table 2 and the charts on previous pages, using tools for identifying crashes, such as Waze and INRIX, will help increase RCRS capture rates.

Crash and Congestion Data by Operational Times

The charts on the following page show the number of reportable crashes and the average travel time index⁶ (as a measure of recurring congestion) by time of day for each TMC/RTMC. This information is presented to assist Districts with evaluating TMC staffing, operating hours, and other resource allocations based on when crashes and congestion most frequently occur in their region or district.

⁶ Travel Time Index is defined as the ratio of the current travel time to the travel time under free-flowing condition. For these charts, travel time index is calculated only on Core Roadway Network route sections that are in more populated areas, and as a result are subject to recurring congestion.



Sources: Crash Reporting System, INRIX Speed Data via the University of Maryland's Probe Data Analytics Suite.

Average Incident Clearance Time by County

Traffic incidents can significantly impact roadway congestion while an incident is being cleared. Working to minimize the duration of an incident's influence on traffic promotes PennDOT's TSMO goal of moving people and goods from Point A to B safely and efficiently.

TABLE 3. 2017 AVERAGE INCIDENT CLEARANCE TIME BY COUNTY

	Incident Clearance Time (min)	# of Incidents		Incident Clearance Time (min)	# of Incidents
District 1	185	69	District 2	116	230
CRAWFORD	317	5	CENTRE	130	87
ERIE	170	29	CLEARFIELD	101	79
MERCER	141	28	CLINTON	150	36
VENANGO	326	7	JUNIATA	79	3
			MIFFLIN	74	25
District 3	164	103	District 4	106	127
COLUMBIA	188	11	LACKAWANNA	68	51
LYCOMING	135	24	LUZERNE	122	48
MONTOUR	244	8	PIKE	125	17
NORTHUMBERLAND	211	11	SUSQUEHANNA	157	6
SNYDER	123	9	WAYNE	222	5
TIOGA	111	12			
UNION	175	28			
District 5	75	766	District 6	50	3593
BERKS	111	114	BUCKS	55	298
CARBON	144	6	CHESTER	54	285
LEHIGH	59	352	DELAWARE	59	491
MONROE	104	71	MONTGOMERY	57	757
NORTHAMPTON	62	205	PHILADELPHIA	53	1762
SCHUYLKILL	175	18			
District 8	74	1901	District 9	128	37
ADAMS	122	22	BEDFORD	20	1
CUMBERLAND	78	433	BLAIR	82	19
DAUPHIN	70	608	CAMBRIA	78	6
FRANKLIN	86	61	FULTON	279	9
LANCASTER	79	281	SOMERSET	90	2
LEBANON	108	66			
PERRY	98	23			
YORK	62	407			
District 10	208	36	District 11	64	1402
BUTLER	161	14	ALLEGHENY	63	1394
CLARION	229	9	BEAVER	63	3
JEFFERSON	243	13	LAWRENCE	138	5
District 12	122	153			
FAYETTE	121	5			
GREENE	170	7			
WASHINGTON	137	87			
WESTMORELAND	92	54			

Sources: RCRS, INRIX and Waze incident archive as analyzed by PennDOT's Traffic Operations Incident Timeline tool