


# Building PennDOT's TSMO Program

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PA Department of Transportation

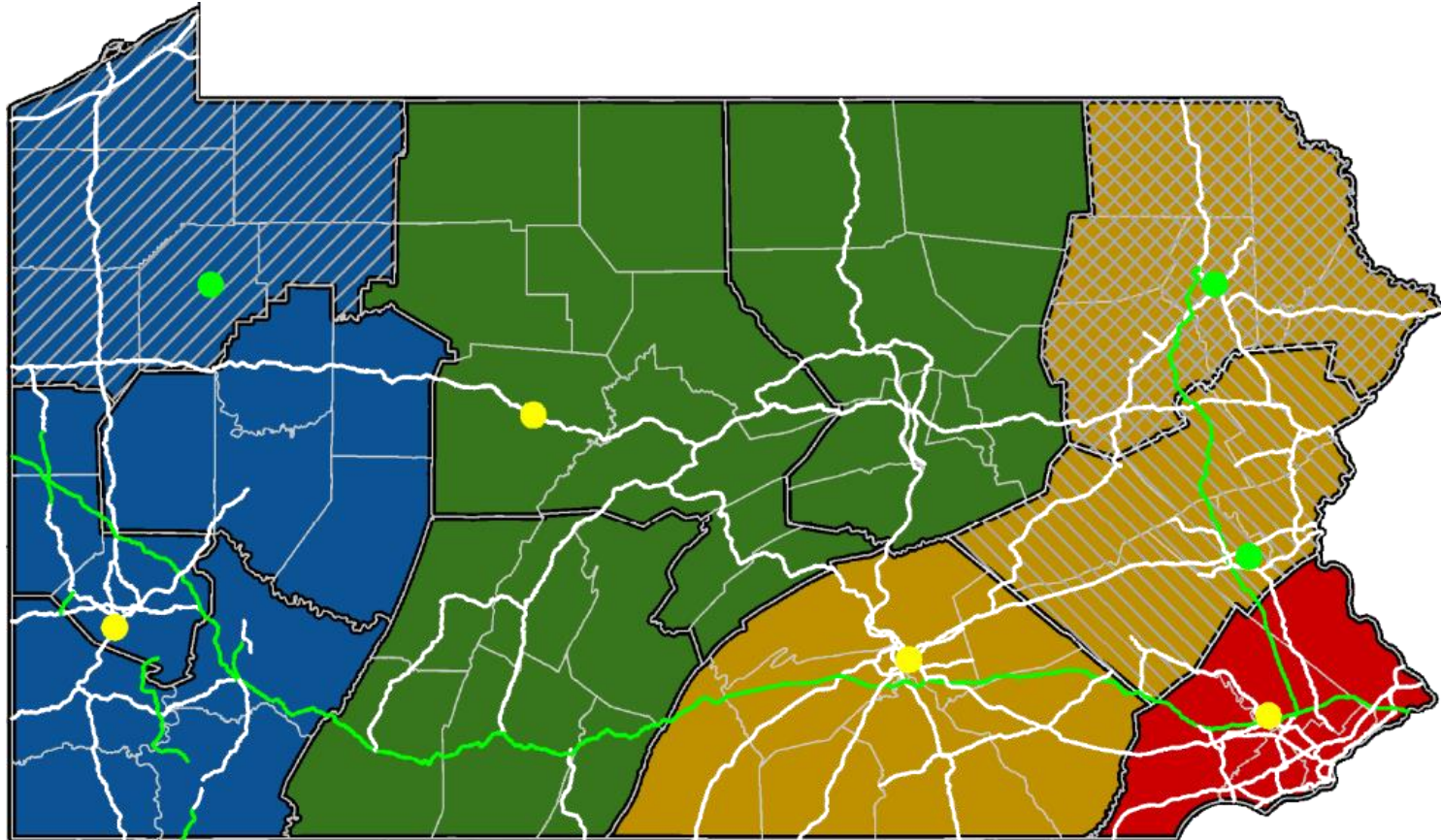
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www.penndot.gov (  TSMO )



# TSMO Regions



● District Offices

● District Offices

— Pennsylvania Turnpike Network

▬ PennDOT Core Road Network

▨ District 5 (M-F 05:45 to 20:00)

▩ District 4 (M-F 06:00 to 18:00)

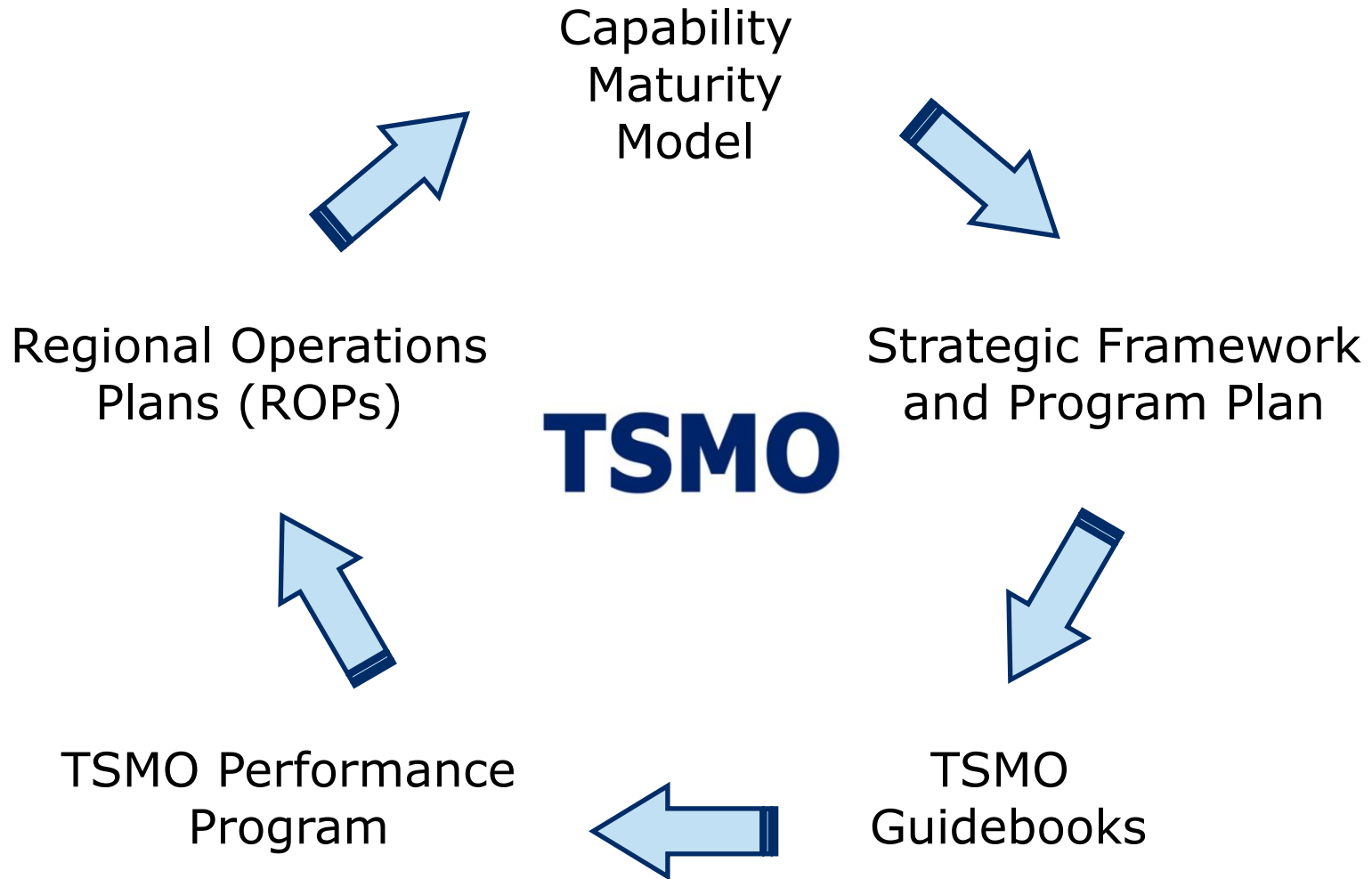
▨ District 1 (24/7 November 1st to April 1st)

■ Western Region

■ Southeastern Region

■ Eastern Region

■ Central Region



# Capability Maturity for TSMO

## Self-Assessment

Elements	Level 1 Performed	Level 2 Managed	Level 3 Integrated	Level 4 Optimizing
Planning & Programming	▼			
Systems & Technology	▼			
Performance	▼			
Culture		▼		
Organization & Staffing	▼			
Collaboration		▼		

# Capability Maturity for TSMO

## Target

Elements	Level 1 Performed	Level 2 Managed	Level 3 Integrated	Level 4 Optimizing
Planning & Programming			▼	
Systems & Technology			▼	
Performance			▼	
Culture			▼	
Organization & Staffing			▼	
Collaboration			▼	

# TSMO Strategic Framework

## ➤ What is TSMO?

- The Pennsylvania Perspective

## ➤ Why TSMO?

- The Mobility Issue
- The Safety Issue
- The Funding Issue

## ➤ Current State of the Practice

- Organizational Structure
- Project Development Process
- PennDOT CMM Assessment

## ➤ TSMO Strategic Direction

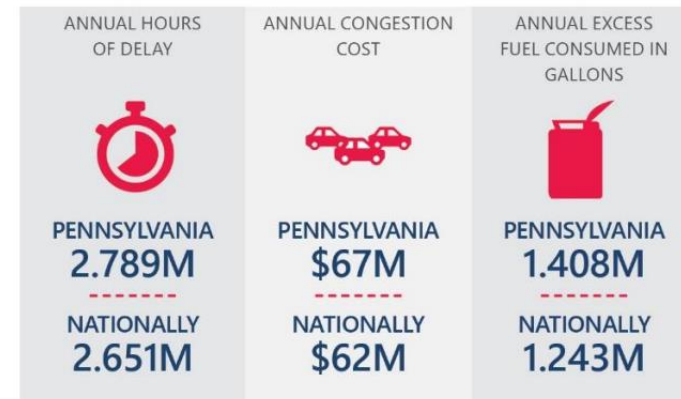
- Vision, Mission, and Goals
- How to Use the TSMO Documents

### PENNSYLVANIA'S CONGESTION RELATED COSTS ARE HIGHER THAN THE NATIONAL AVERAGE

#### URBAN (≥ 500,000 PEOPLE)



#### RURAL (< 500,000 PEOPLE)

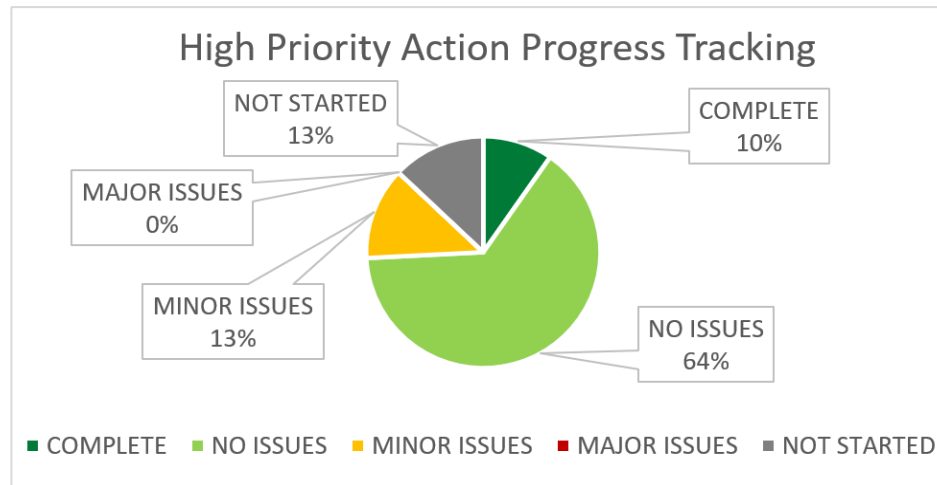


## Needs

- Consider Operations Throughout Project Life Cycle
- Provide Adequate Funding & Guidance
- Establish Performance Measures
- Foster Knowledge & Provide Training
- Improve Intra-Agency Coordination
- Improve Interagency Coordination
- Appropriate Staffing & Org Structure
- Proper Documentation & Tools
- Document Operations Policies and Procedures



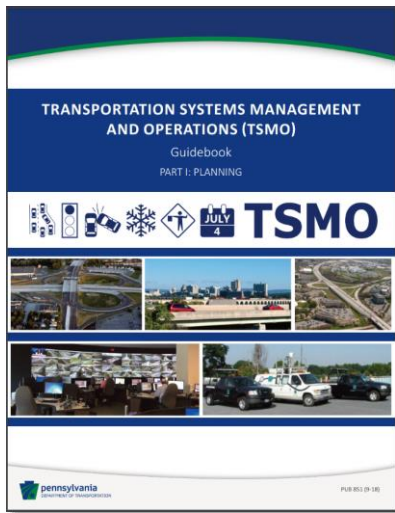
# TSMO Program Plan Tracking



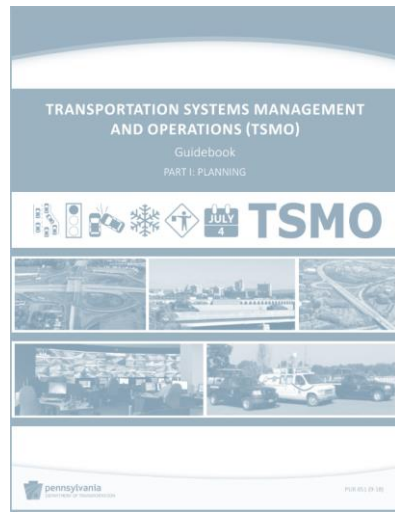
TSMO LEVEL	PRIORITY	ACTION	ACTION STATUS	SECTION	ACTION MANAGER	PROJECT MANAGER	PROJECT STATUS	PROJECTS	ACTION / PROJECT DESCRIPTION	TARGET DATE
L1 to L2	HIGH	BP07.01	MINOR ISSUES	Fiber	Mark Kopko	x	x	BP07.01 Overall	Develop Fiber/Communication Deployment Policies and Procedures	
L1 to L2	HIGH	BP07.01	x	Fiber	Mark Kopko	Pierce Sube	MINOR ISSUES	Project 1	Issue Fiber Policy for existing and future ITS devices via	12/31/2021
L1 to L2	HIGH	BP07.01	x	Fiber	Mark Kopko	Pierce Sube	MINOR ISSUES	Project 2	Update fiber standards/specifications in Pub. 408 (Proje	10/31/2021
L1 to L2	HIGH	BP07.01	x	Fiber	Mark Kopko	Mark Kopko	NO ISSUES	Project 3	Develop a list of statewide fiber deployment locations u	5/1/2022
L1 to L2	HIGH	BP07.01	x	Fiber	Mark Kopko	Mark Kopko	NO ISSUES	Project 4	Identify need to deploy fiber for CV/AV testing facilities	4/30/2022



# TSMO Guidebooks Series



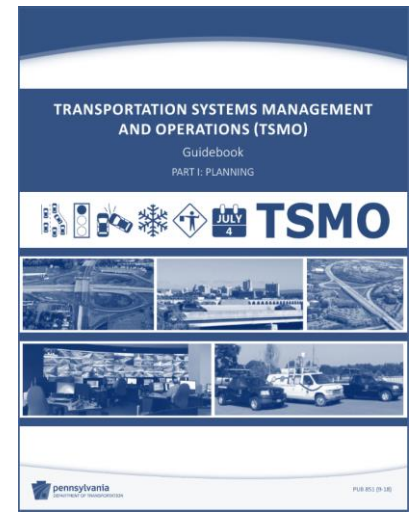
Planning



Design



Maintenance

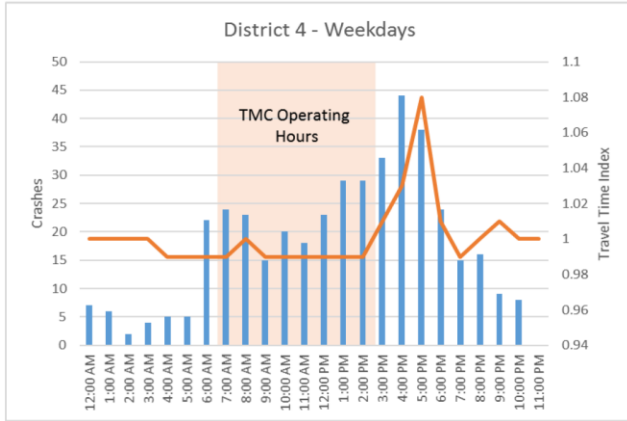


Operations

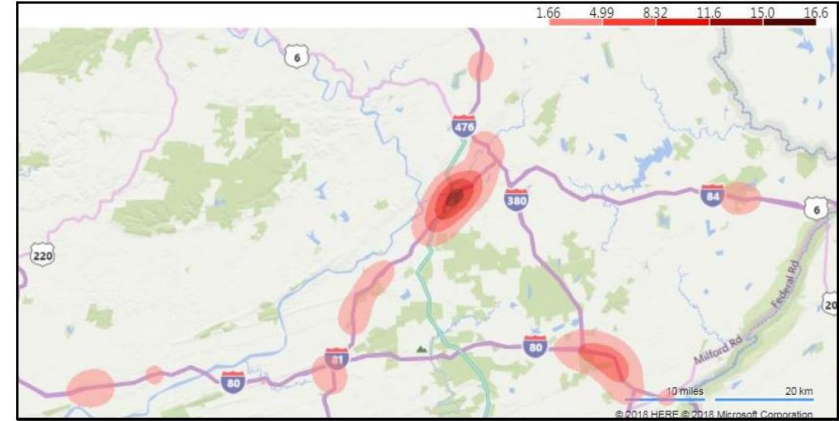
## **GUIDANCE:**

Develop metrics that say “something” about which the engineering districts can react to.

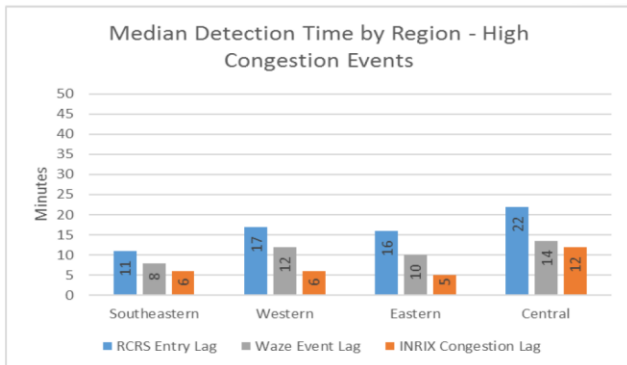
# TSMO Performance Reports



➡ Modified TMC hours



➡ Hotspots influence planning



➡ Developed Traffic Alerts Dashboard

# Traffic Alerts Dashboard

Filter & Legend

Search:

Search Filter .Ex. I-81, Major Accident, Active

Source	District	Road	Direction	AlertType	Severity	Congestion	Reported Time	Status	Dismiss
Inrix	D06	I-76	Westbound	Congestion(Inrix)	2-Moderate	1.84 miles	2:35 PM (a minute ago)	active (v.3)	<input type="checkbox"/>
Inrix	D06	I-476	Southbound	Congestion(Inrix)	2-Moderate	4.61 miles	2:34 PM (2 mins ago)	active (v.7)	<input type="checkbox"/>
Waze/Inrix	D06	I-476	Southbound	Congestion(Inrix)	2-Moderate	1.68 miles	2:33 PM (3 mins ago)	active (v.2)	<input type="checkbox"/>
Waze/RCRS/Inrix	D06	I-76	Westbound	Congestion(Inrix)	1-Low	1.59 miles	2:32 PM (4 mins ago)	active (v.14)	<input type="checkbox"/>
Waze/RCRS/Inrix	D06	I-76	Eastbound	Congestion(Inrix)	2-Moderate	2.06 miles	2:32 PM (4 mins ago)	active (v.8)	<input type="checkbox"/>
Waze/Inrix					2-Moderate	1.33 miles	2:32 PM (4 mins ago)	active (v.3)	<input type="checkbox"/>
Waze/Inrix					2-Moderate	1.70 miles	2:29 PM (7 mins ago)	cleared (v.12)	<input type="checkbox"/>
Waze/Inrix					3-High	0.00 miles	2:27 PM (9 mins ago)	active (v.1)	<input type="checkbox"/>
Waze/Inrix					2-Moderate	0.00 miles	2:24 PM (12 mins ago)	cleared (v.5)	<input type="checkbox"/>
Waze/Inrix					0-Minimal	1.56 miles	2:20 PM (16 mins ago)	cleared (v.7)	<input type="checkbox"/>
Waze/Inrix					1-Low	1.42 miles	2:17 PM (19 mins ago)	cleared (v.13)	<input type="checkbox"/>
Waze/Inrix					1-Low	0.73 miles	2:16 PM (20 mins ago)	cleared (v.27)	<input type="checkbox"/>
Waze/Inrix					3-High	3.02 miles	2:15 PM (21 mins ago)	active (v.9)	<input type="checkbox"/>
Inrix					2-Moderate	1.31 miles	1:21 PM (an hour ago)	active (v.1)	<input type="checkbox"/>

**Inrix Incident Details**

[Incident Timeline](#)

Inrix v3: Delays of six minutes and delays increasing on I-76 Westbound between US-1 Roosevelt Expy and Exit 338 Belmont Ave. Average speed 15 mph.

**InrixID:** 149370241

**Status:** active

**Severity:** 2-Moderate

**Impacting:** Yes

**Road:** I-76

**Type:** Congestion

**Direction:** Westbound

**Location:** between I-76 / US-1 Roosevelt Expy and I-76 Exit 338 / Belmont Ave

**Reported Time:** Starts at 6/23/2021 2:27 PM, ends at 6/23/2021 3:13 PM.

**Delay Impact**

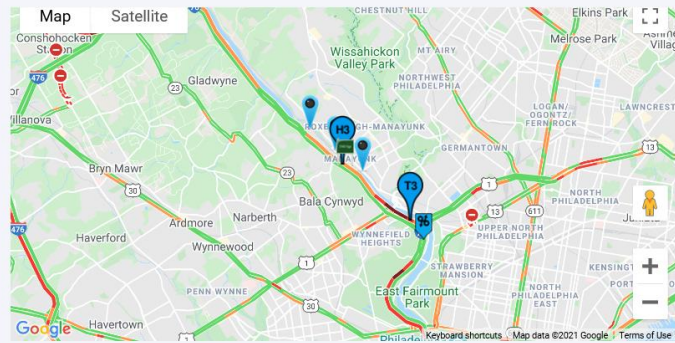
**Delay Minutes:** 5.00 mins

**Abnormal:** No

**Congestion Length:** 1.84 miles

**Traffic Camera**

- CM 743 located on I-76 WB east of Belmont Ave
- CM 718 located on I-76 EB @ Belmont Ave
- CM 719 located on I-76 WB east of Belmont Ave



# Traffic Operations Analytics

Select Dates: 6/1/2021 6/13/2021

Select all  
 Core Network  
 Non-Core Netw...

Select all  
 Road Closed  
 Lane Restriction  
 No Lane Restrict...

Route Number  
Search

Day of week  
All

**Source**

Select all  
 RCRS  
 Non-RCRS

Select all  
 WAZE  
 Non-WAZE

Select all  
 Crash  
 Non-Crash

Select all  
 12:00 AM  
 1:00 AM

TMC Name  
All

RCRS Verify  
All

Camera  
All

Camera Distance  
0 8044

## Incident Timeline Summary - All Sources

\*Darker shaded areas in map represent a higher average incident influence time relative to lighter shaded areas. Click on map regions to filter the bar charts and data grid.

Cong Severity  
All

Crash - Inrix Dire...  
All

Interstate  
All

Municipality  
Search

Select all  
 (Blank)  
 Abington Twp, ...  
 Adams Twp, But...

TMC Region

District

County

Incident Influence Duration by Region

Incident Influence Duration by District

Incident Influence Duration by County

Incident Influence Duration by Municipa...

Incident Count **5066**

Crash Count **166**

Avg Inc Influence **46 mins**

Avg Inc Clearance **83 mins**

Avg Road Clearance **86 mins**

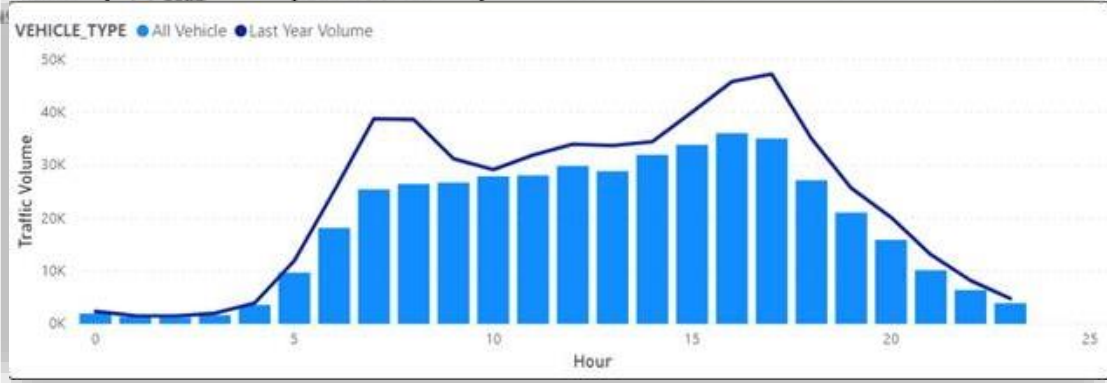
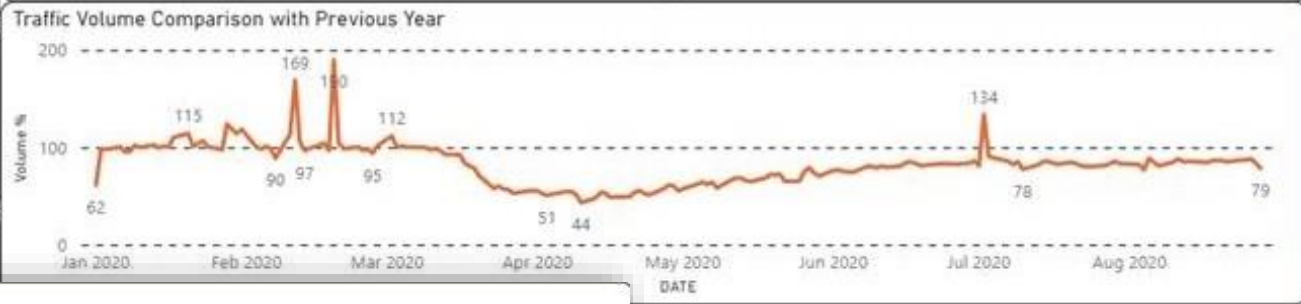
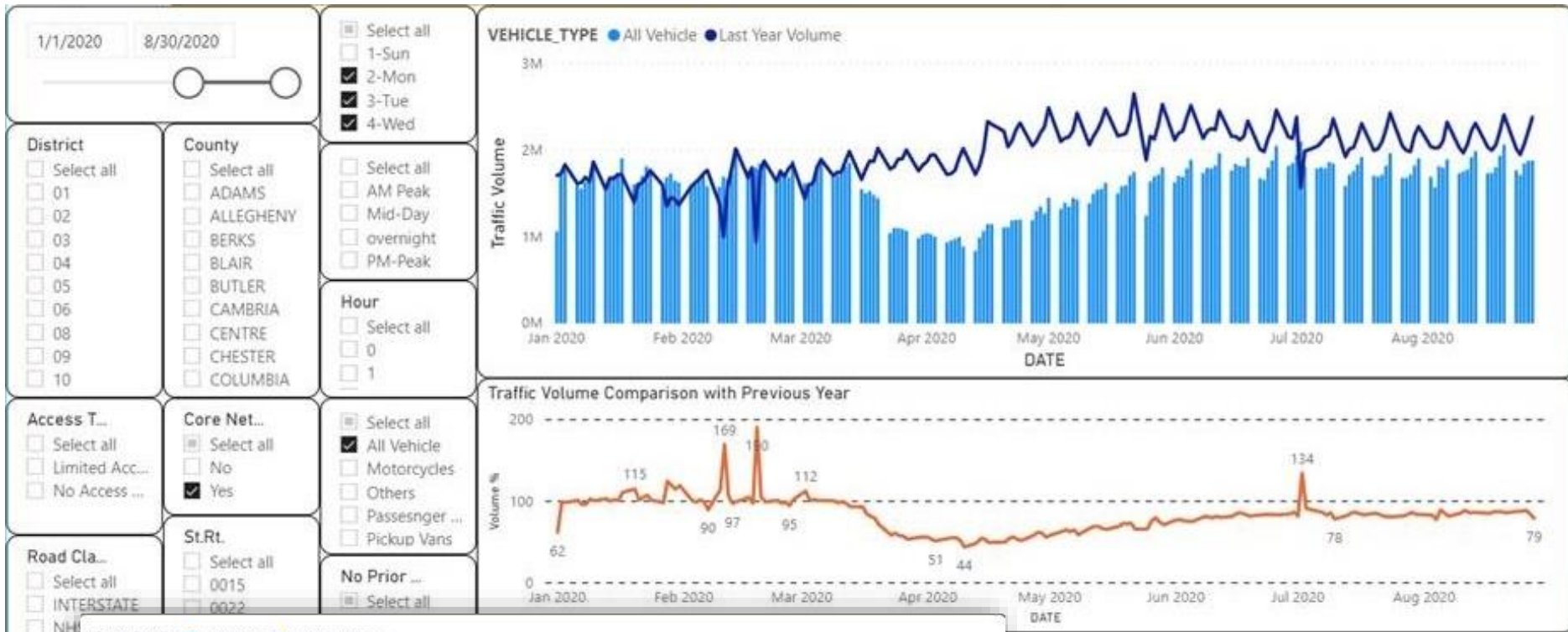
\*To drill through to single incident detail view, right-click on the incident column for the specific incident to view.

Incident	County	Municipality	Road	Bearing	RCRS Id	RCRS R
6344988	Philadelphia	Philadelphia City	ROOSEVELT EXPYJU...	W	598150	1
6344989	Philadelphia	Philadelphia City	I-95 DELAWARE EXPY	E	598639	95
6344993	Erie	North East Twp	I-90 AM VETS MEM...	E	598625	90
6344994	Lehigh	Salisbury Twp	S CEDAR CREST BLV...	N	598035	29
6344995	Erie	North East Twp	I-90 AM VETS MEM...	E	598625	90

Summary - RCRS Events    Reportable Crashes Captured    **Summary - All Sources**    Summary - CRASH-Centric    Clearance Summary    Single Incident    Single Incident - Search

TSMO

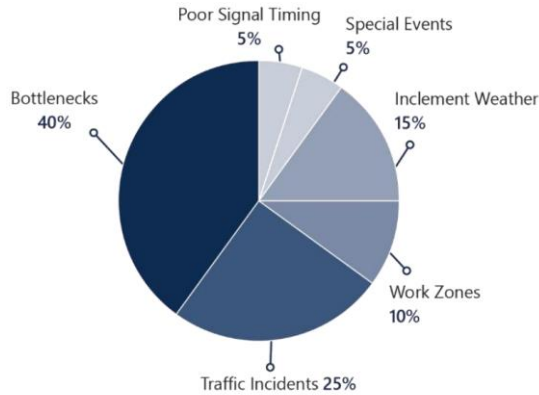
# Traffic Volume Analysis



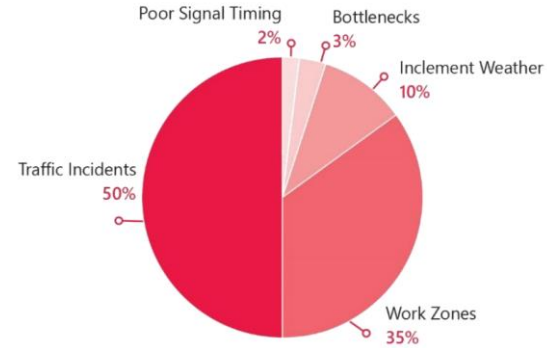


# PA-Specific Congestion Pie Charts

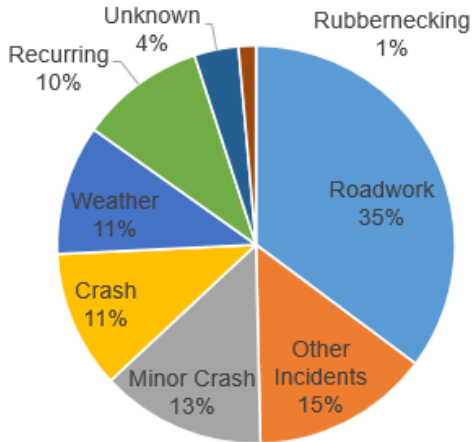
URBAN CONGESTION PERSPECTIVE



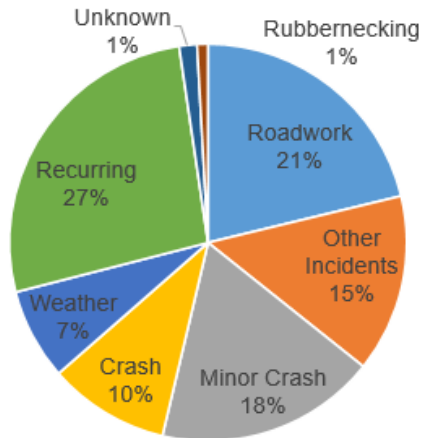
RURAL CONGESTION PERSPECTIVE



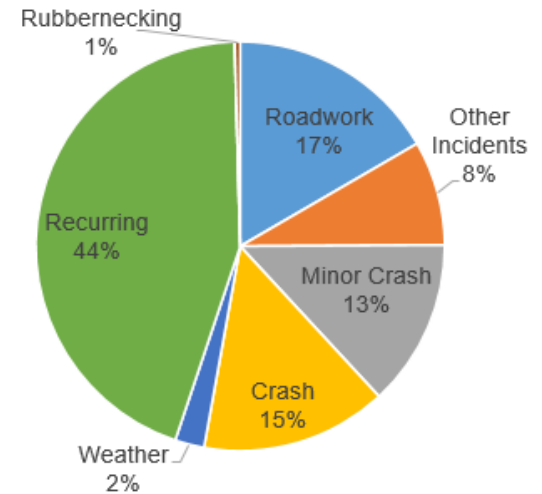
Pennsylvania



Philadelphia Metro



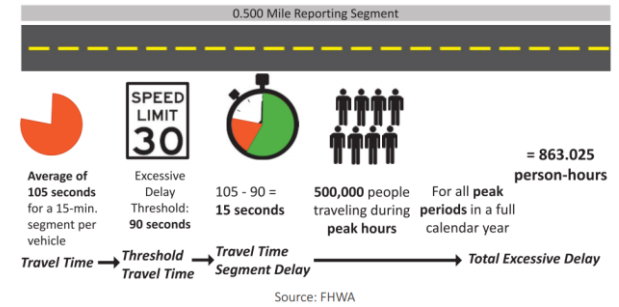
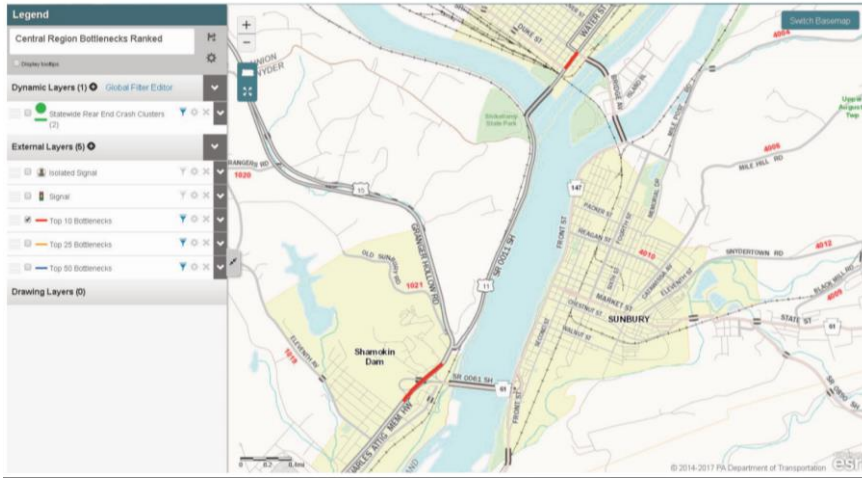
I-95 in Philadelphia





# Regional Operations Plans

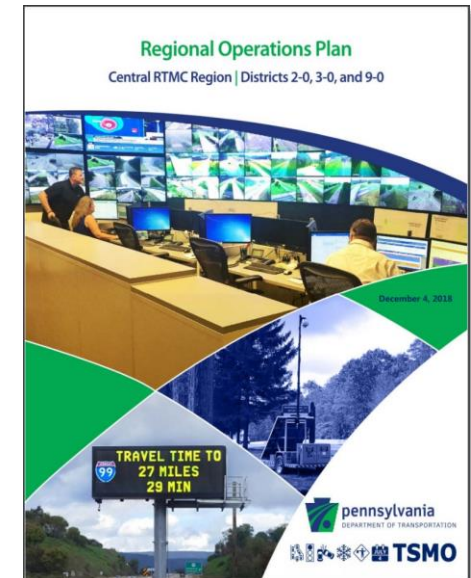
## Identify congestion issues in the region



## Mitigation of Congestion

TSMO Solution	Causes of Congestion					
	Recurring Congestion		Unplanned Events		Planned Events	
	Bottlenecks	Poor Signal Timing	Traffic Incidents	Inclement Weather	Work Zones	Special Events

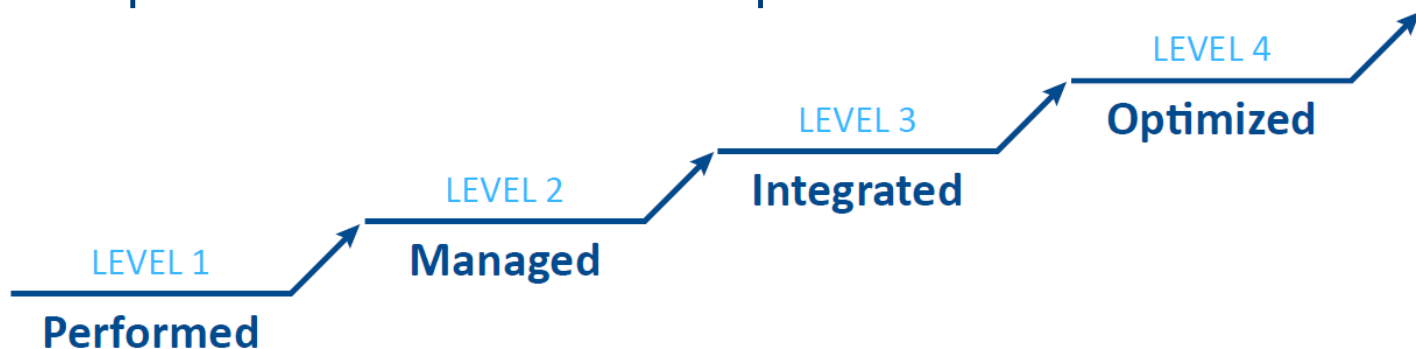
## Solutions using TSMO Toolbox



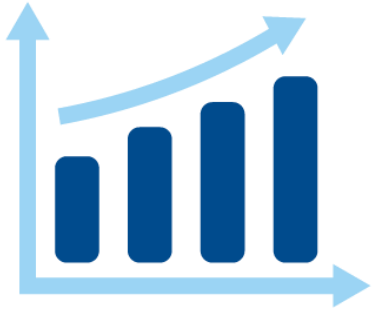


# Key TSMO Results

- Interstate funding for antiquated devices, ITS gaps, comm
- Creation of TSMO Capital Grant
- Consideration for TSMO/ITS as part of the Interstate TIP
- Leadership support for TSMO Guidebook series
- Strong relationship building with the IT office
- Developing plan for future fiber deployment
- Working to integrate TSMO into the planning process
- District and planning partner support for TSMO
- Interest in using performance data to make decisions
- Development of TMC Bootcamp



Thank You



## TSMO Vision

A less congested, more reliable network.

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