

The Use of Real-Time and Archived Operations Data for Congestion Planning and Incident Management

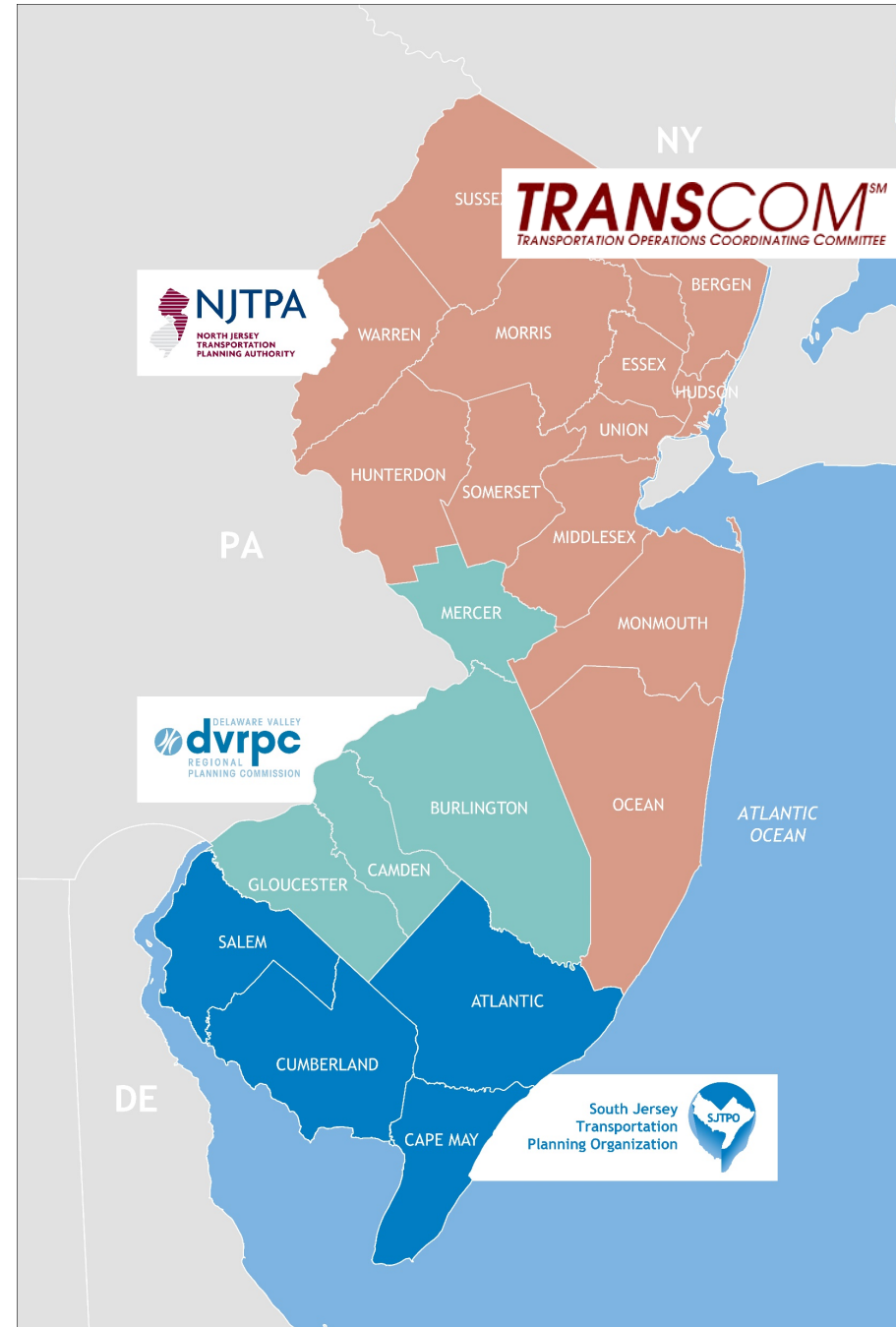
TransAction 2019
Wednesday, April 17th
Andrew Tracy, SJTPO



South Jersey
Transportation
Planning Organization

Panelists

- Andrew Tracy (SJTPO)
- Tom Edinger (DVRPC)
- Brian Fineman (NJTPA)
- Bob Glantzberg (TRANSCOM)



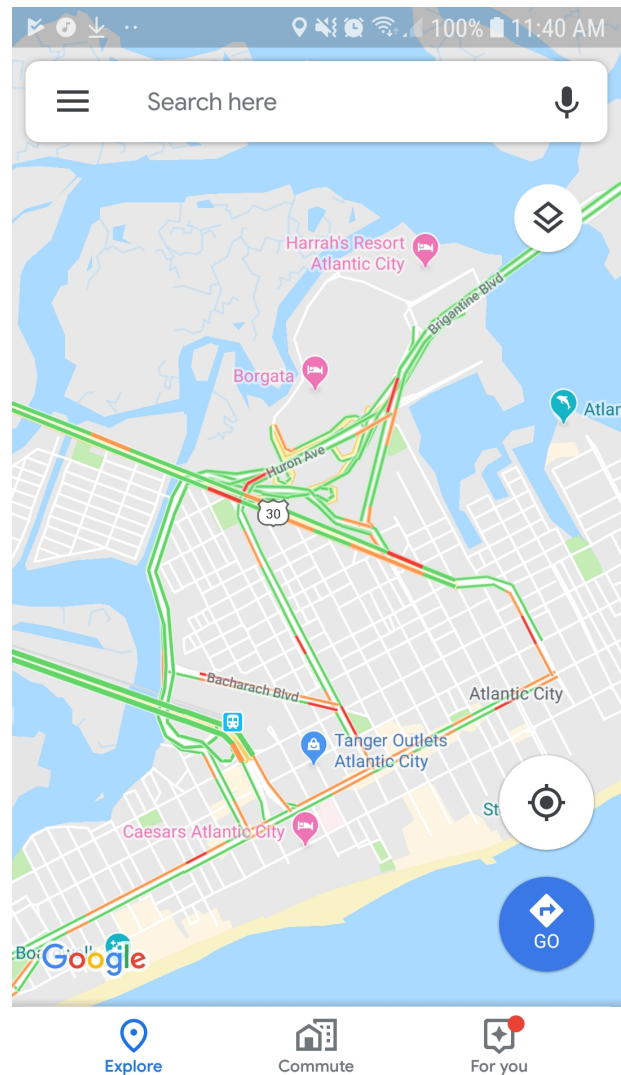
What is Operations Data?

- Traffic, transit, bike, pedestrian, construction, and weather information
- Usually collected in **real-time** by ITS infrastructure and **archived** for planning use
- Used for monitoring and managing transportation system
- Used for **performance-based planning**

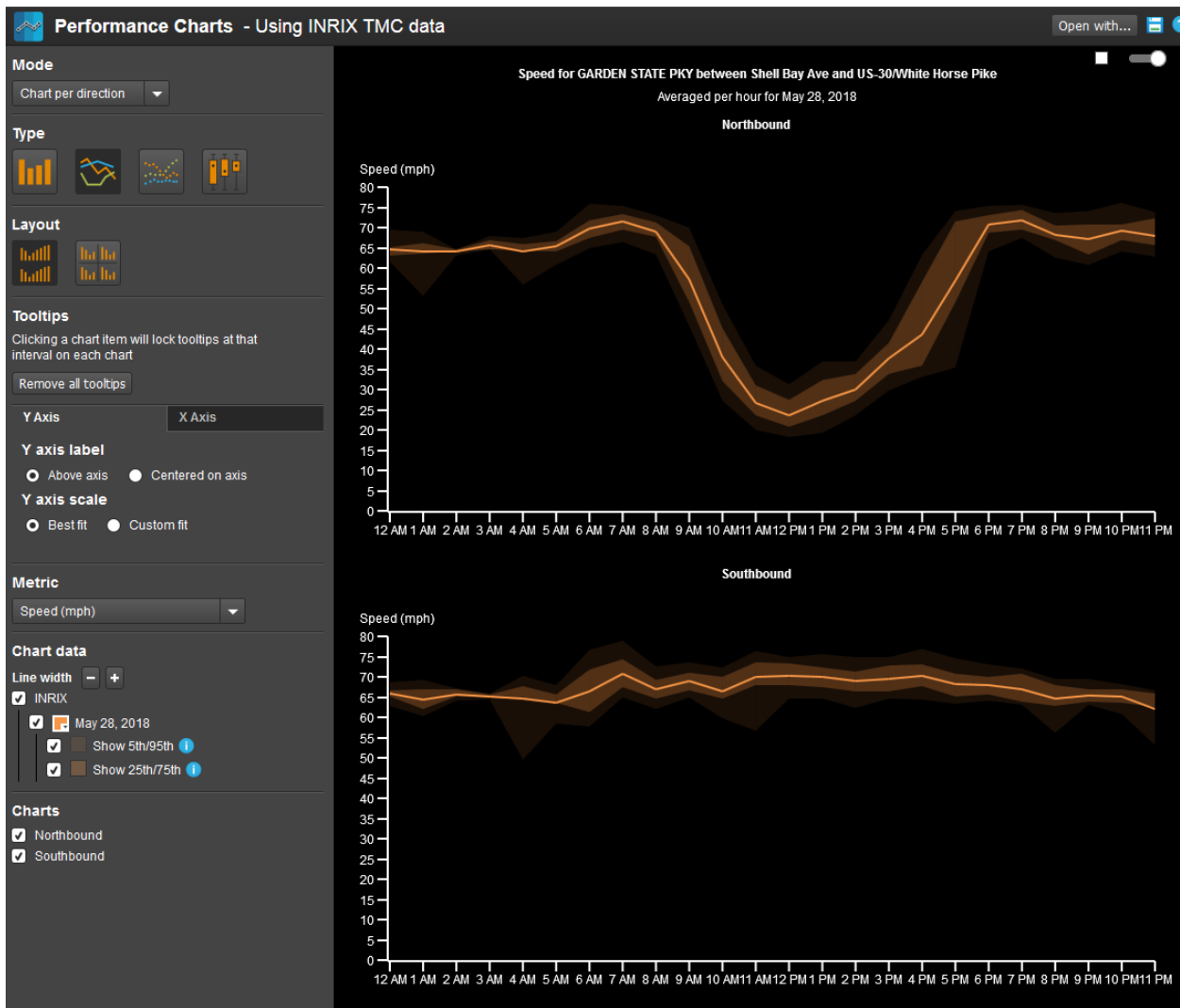


What is Operations Data?

Real Time:



Archived:



Types of Archived Operations Data

- Traffic volume, speed, and vehicle classification
 - From **point-based** sources (loops, sensors, etc.) or from **probe-based** sources (vehicle and phone GPS, etc.)
- Event, work zone, and incident data
- Weather data
- Surveillance video
- Device status (roadside message signs, weather stations, etc.)
- Traffic signal performance measures
- Emergency dispatch information
- O-D data
- ...and more

FHWA Every Day Counts

- FHWA Initiative: **Crowdsourcing for Operations**
- Use of social media, third-party vendors, and mobile apps for TSMO and performance-based planning

 U.S. Department of Transportation
Federal Highway Administration

About Programs Resources Briefing Room Contact Search FHWA



Center for Accelerating Innovation

Search Accelerating Innovation

FHWA Home / OIPO / Accelerating Innovation / Every Day Counts / EDC-5: Crowdsourcing for Operations

CAI Home Every Day Counts STIC Network AID Demonstration AMR Program Resources



Traffic Incident Traffic Operation Center Real-time Driver Data

Crowdsourcing for Operations

Crowdsourcing turns transportation system users into real-time sensors on system performance, providing low-cost, high-quality data on traffic operations, roadway conditions, travel patterns, and more.

State and local transportation systems management and operations (TSMO) programs strive to optimize the use of existing roadway facilities through traveler information, incident management, road weather management, arterial management, and other strategies targeting the causes of congestion. TSMO programs require real-time, high-quality, and wide-ranging roadway information. However, gaps in geographic coverage, lags in information timeliness, life-cycle costs for field equipment, and jurisdictional stovepipes associated with fixed sensor and camera monitoring can limit agencies' ability to proactively operate the system.

Public agencies at the Federal, State, and local levels are increasing both their situational awareness and the quality and quantity of operations data using crowdsourcing, which enables agency staff to cost-effectively apply proactive strategies and make better decisions that lead to safer and more reliable travel.

Real-Time, Low-Cost, Valuable Data

Three common mechanisms for crowdsourcing include data extracted from social media platforms, data acquired from third-party crowdsource providers, and data collected from specially developed mobile apps. These data can be passively or actively transmitted and

Contacts

James Colyar
FHWA Office of Operations
(360) 753-9408
James.Colyar@dot.gov

Paul Jodoin
FHWA Office of Operations
(202) 366-5465
Paul.Jodoin@dot.gov

Resources

[Factsheet](#)

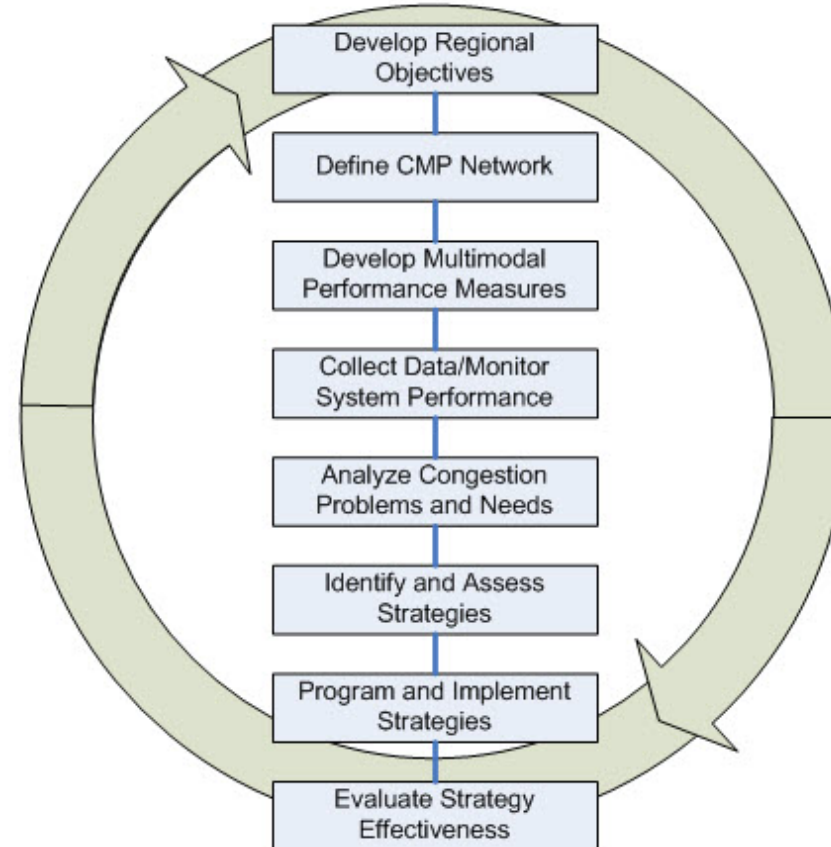
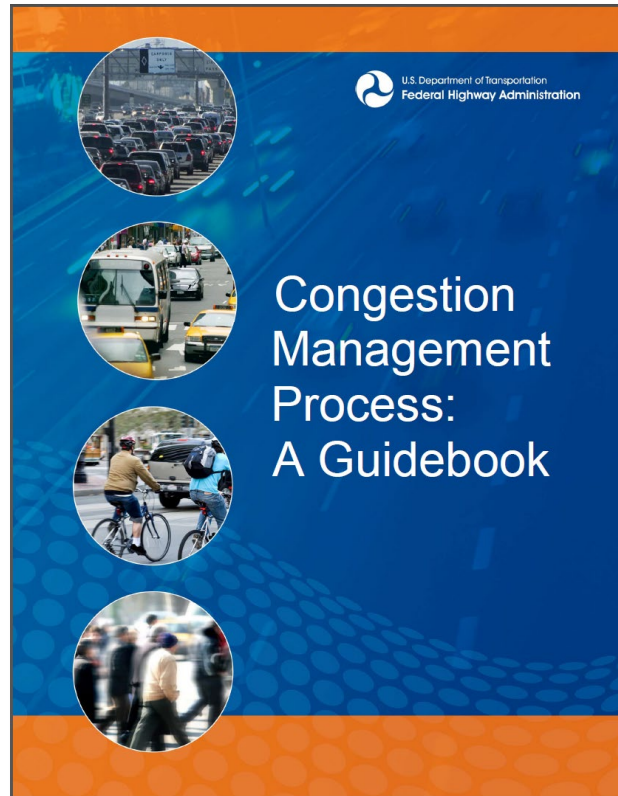
[EDC-5 Orientation Webinar](#)

Benefits of Archived Operations Data

- Performance-based Planning and Programming
 - **Identifying** transportation system needs and problems
 - **Prioritizing** projects and programs for investment
 - **Monitoring** impacts of projects
- Provides a more complete picture of system performance
- Enables more relatable and user-friendly measures
- Enables more sophisticated modeling

SJTPO Congestion Management Process

- CMP overhauled in 2018 to incorporate archived operations data and MAP-21 and FAST Act changes
- Best practices from **FHWA CMP Guidebook**
- Modeled after **eight-step process** from FHWA CMP Guidebook



Probe Data Analytics Suite

- Real-time and archived travel time data
- Corridor-level and region-wide performance measurement
- Travel time data provides direct measure of roadway user experience
- All major roadways, all time periods

Probe Data Analytics Suite

REGION EXPLORER
Explore the relationships between bottlenecks and traffic events in real-time and in the past.
[Tutorial](#) [Help](#)

MASSIVE DATA DOWNLOADER
Download raw probe data from our archive for offline analysis.
[Tutorial](#) [Help](#) [History](#)

CONGESTION SCAN
Analyze the rise and fall of congested conditions on a stretch of road.
[Tutorial](#) [Help](#) [History](#)

TREND MAP
Create animated maps of roadway conditions.
[Tutorial](#) [Help](#) [History](#)

PERFORMANCE CHARTS
Chart performance metrics over time.
[Tutorial](#) [Help](#) [History](#)

PERFORMANCE SUMMARIES
Report on Buffer Time Index, Planning Time Index, and other performance metrics.
[Tutorial](#) [Help](#) [History](#)

BOTTLENECK RANKING
Rank bottlenecks and discover which ones have the greatest impact.
[Tutorial](#) [Help](#) [History](#)

USER DELAY COST ANALYSIS
Put a dollar amount on how much a road's performance impacts its users.
[Tutorial](#) [Help](#) [History](#)

DASHBOARD
Create your own personal dashboards to monitor corridor performance in regions of interest.
[Tutorial](#) [Help](#)

TUTORIALS
Learn how to use each of the tools in the suite.

MAP-21
Create a dashboard widget to monitor states', MPOs', and Urbanized Areas' performances against the new MAP-21 ruling.
[Help](#)

What's New 03/15/19

SPONSORED BY

CATT
CALIFORNIA ADVANCED TRANSPORTATION TECHNOLOGY

I-95 COMMISSION
CHARTERED

MDOT
MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

MDOT
MICHIGAN DEPARTMENT OF TRANSPORTATION

pennsylvania
DEPARTMENT OF TRANSPORTATION



























UNIVERSITY OF MARYLAND

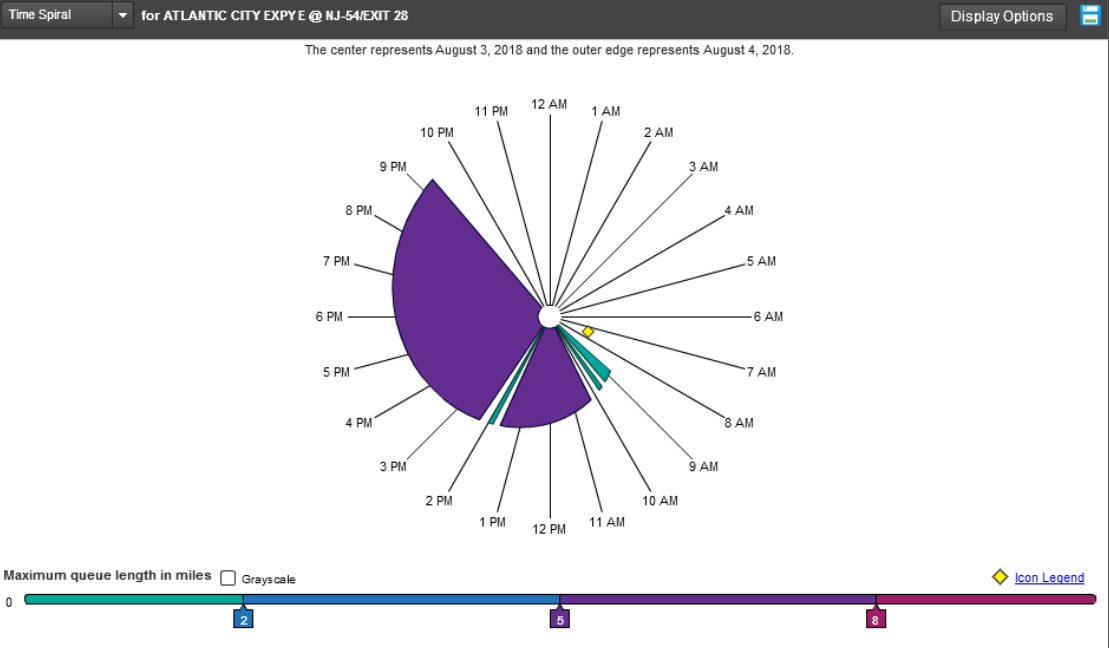
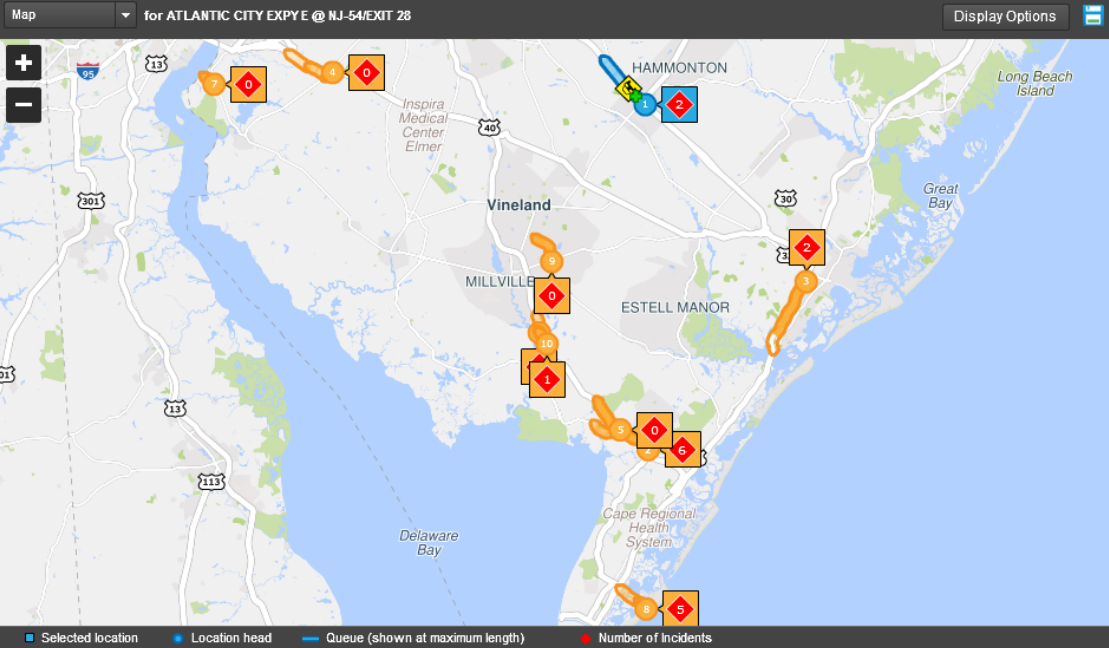
- In the SJTPO Region:
1,556 roadway segments covered (INRIX TMC data)

Probe Data Analytics Suite

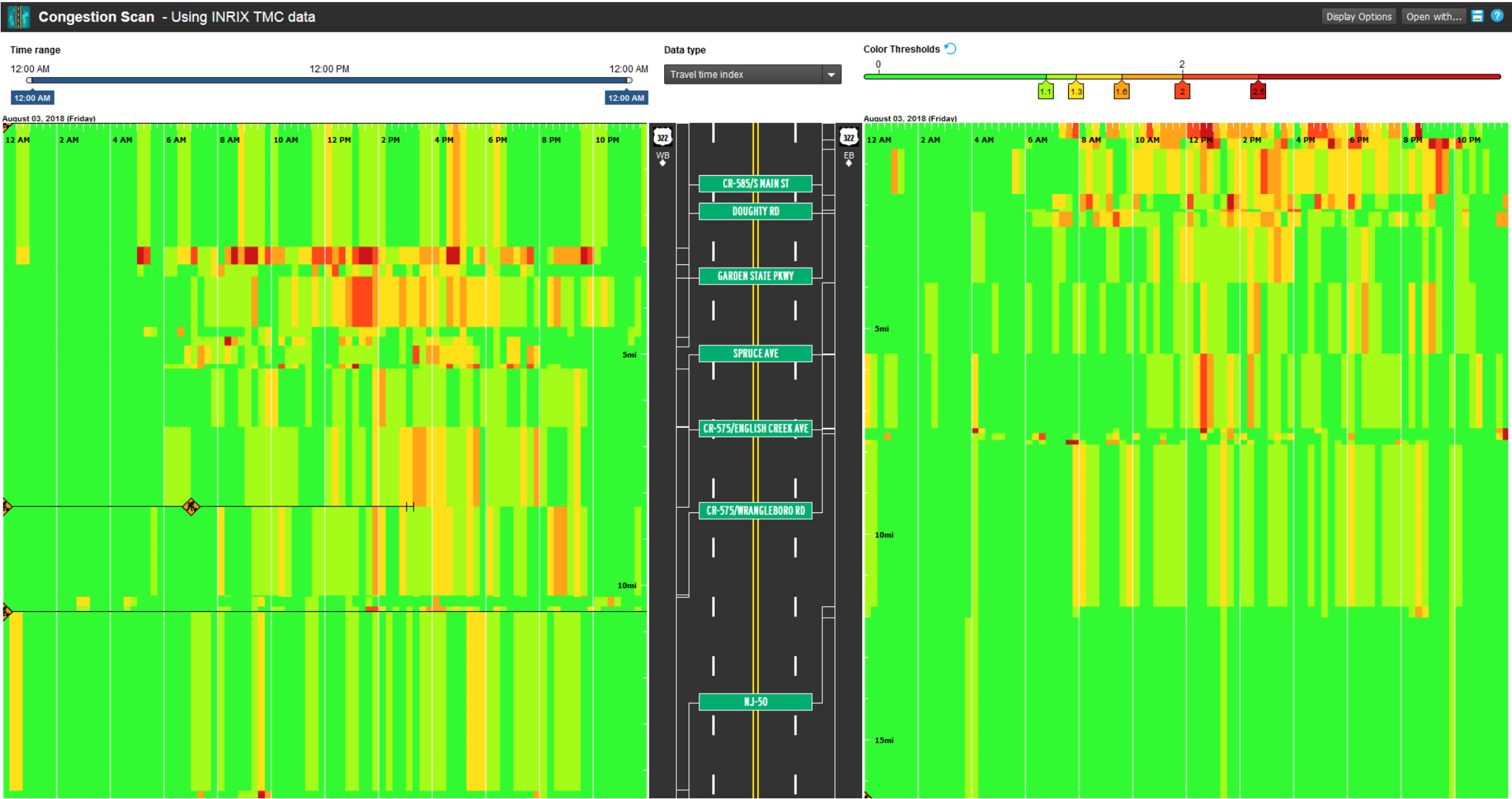
#1 Bottleneck Ranking - Using INRIX data

Bottleneck Ranking Table for 4 counties in New Jersey (1556 TMCs) between August 3, 2018 and August 3, 2018 (563 total)

Rank	Map	Head Location (approximate)	Bottleneck Profile			Influences		Base impact weighted by				External Tool Links
			Average max lengt...	Average daily duration	Total duration	All Events/Incidents	▽ Base Impact	Speed differential	Congestion	TOTAL DELAY		
1	<input checked="" type="checkbox"/>	ATLANTIC CITY EXPY E @ NJ-54/EXIT 28	2.71	11 h 17 m	11 h 17 m	2	2,184	114,885	7,419	3,333,202	 	
2	<input checked="" type="checkbox"/>	NJ-47 S @ NJ-83	4.63	7 h 01 m	7 h 01 m	6	1,571	41,199	2,143	385,549	 	
3	<input checked="" type="checkbox"/>	GARDEN STATE PKY N @ TILTON RD/EXIT 36	6.72	3 h 11 m	3 h 11 m	2	1,219	47,403	2,521	1,031,402	 	
4	<input checked="" type="checkbox"/>	US-40 E @ NJ-45/N MAIN ST	1.41	5 h 07 m	5 h 07 m	0	397	7,647	553	137,900	 	
5	<input checked="" type="checkbox"/>	NJ-347 S @ NJ-47/DELSEA DR	3.39	1 h 53 m	1 h 53 m	0	383	9,478	445	28,979	 	
6	<input checked="" type="checkbox"/>	NJ-55 S @ NJ-47	0.62	6 h 44 m	6 h 44 m	2	369	12,924	619	72,071	 	
7	<input checked="" type="checkbox"/>	HARVARD RD S @ FORT MOTT RD	1.09	4 h 00 m	4 h 00 m	0	262	3,278	529	0	 	
8	<input checked="" type="checkbox"/>	NJ-47 S @ PACIFIC AVE	0.86	4 h 43 m	4 h 43 m	5	248	3,218	289	80,281	 	
9	<input checked="" type="checkbox"/>	CR-552 E @ MAYS LANDING RD	2.61	1 h 33 m	1 h 33 m	0	242	5,084	308	0	 	
10	<input checked="" type="checkbox"/>	NJ-47 S @ CR-548/BROADWAY ST	1.20	3 h 14 m	3 h 14 m	1	229	5,773	284	41,047	 	
11	<input type="checkbox"/>	NJ-49 W @ CR-634	3.68	1 h 02 m	1 h 02 m	0	228	6,024	313	34,893	 	
12	<input type="checkbox"/>	NJ-54 S @ NJ-542/CENTRAL AVE/HORTON ST	1.04	3 h 38 m	3 h 38 m	0	227	3,012	266	0	 	
13	<input type="checkbox"/>	NJ-49 E @ CR-617/WOODBINE RD	1.98	1 h 46 m	1 h 46 m	0	209	5,752	263	0	 	
14	<input type="checkbox"/>	NJ-47 N @ US-9	0.54	6 h 45 m	6 h 45 m	0	207	3,025	278	54,800		



Probe Data Analytics Suite



SJTPO Congestion Management Process

- PDA Suite data used to generate congestion screening lists
- Meetings with county and municipal stakeholders
 - Local knowledge of congestion sources
 - Prioritization of congested locations
 - Problem Statement development
- Methodology Update adopted by Policy Board on November 26, 2018



SJTPO Congestion Management Process

The screenshot shows the SJTPO website with a blue header containing navigation links: Announcements, RFPs, Employment, FAQs, Contact Us, Library, English (dropdown), Login, and Search. Below the header is a navigation bar with icons for ABOUT, PLANNING, SAFETY, PROGRAMS, and GET INVOLVED. The main content area features a large blue banner for the "Congestion Management Process" with a sub-header "Draft FY 2017-2020 CMP Report" and a button "Draft FY 2017-2020 CMP Report". To the right of the banner is a thumbnail for the "Congestion Management Process: Methodology Report FY 2017-2020". Below the banner is a sidebar with a list of navigation items: LONG-RANGE PLANNING (RTP), THE BUDGET (UPWP), CONGESTION MANAGEMENT PROCESS (CMP) (highlighted), FUNDED PROJECTS & PROGRAMS (TIP), PERFORMANCE MEASUREMENT, TRANSPORTATION MODES, THE PUBLIC INVOLVEMENT PLAN (PIP), TRAVEL DEMAND MODEL, ENVIRONMENT & AIR QUALITY, and SAFETY PLANNING. The main content area below the banner has a section titled "What is the Congestion Management Process?" followed by a paragraph explaining the CMP. Below this is a section titled "CMP Methodology" followed by a paragraph explaining the methodology. At the bottom, a small line of text reads: "The SJTPO CMP follows an eight-step process modelled after the state-of-the-practice described in the Federal Highway"

Announcements RFPs Employment FAQs Contact Us Library English Login Search

South Jersey Transportation Planning Organization

ABOUT PLANNING SAFETY PROGRAMS GET INVOLVED

Congestion Management Process

The SJTPO Congestion Management Process (CMP) is an ongoing process which uses analytic tools to identify congested roadways in the region and select appropriate strategies to reduce congestion or mitigate its impacts. The CMP was revised in 2018 to take advantage of newly available data sources.

[Draft FY 2017-2020 CMP Report](#)

Congestion Management Process: Methodology Report FY 2017-2020

South Jersey Transportation Planning Organization

- > LONG-RANGE PLANNING (RTP)
- > THE BUDGET (UPWP)
- > CONGESTION MANAGEMENT PROCESS (CMP)**
- > FUNDED PROJECTS & PROGRAMS (TIP)
- > PERFORMANCE MEASUREMENT
- > TRANSPORTATION MODES
- > THE PUBLIC INVOLVEMENT PLAN (PIP)
- > TRAVEL DEMAND MODEL
- > ENVIRONMENT & AIR QUALITY
- > SAFETY PLANNING

What is the Congestion Management Process?

The Congestion Management Process (CMP) is a federally-required process for metropolitan planning areas with population exceeding 200,000, including the SJTPO region. The CMP is a systematic process that provides for safe and effective integrated management and operation of the multimodal transportation system. The CMP is used to identify congested roadways, establish multimodal performance measures, identify congestion management strategies and means of implementation, and evaluate the effectiveness of implemented strategies.

CMP Methodology

In preparation for the upcoming Regional Transportation Plan update, SJTPO has revised its CMP methodology. The revised methodology takes advantage of newly available travel time data to measure travel time reliability and other congestion performance measures on all major regional roadways. Archived travel time data is made available to New Jersey metropolitan planning organizations through the Probe Data Analytics Suite, a product of the University of Maryland, under contract with NJDOT. This data can be used to measure the extent and severity of congestion regionwide, and the use of travel time data is now the state-of-the-practice for congestion screening. Other minor changes have been made to the CMP report to make it streamlined and project-oriented. The revised CMP Report shall be incorporated into the 2020 Regional Transportation Plan Update.

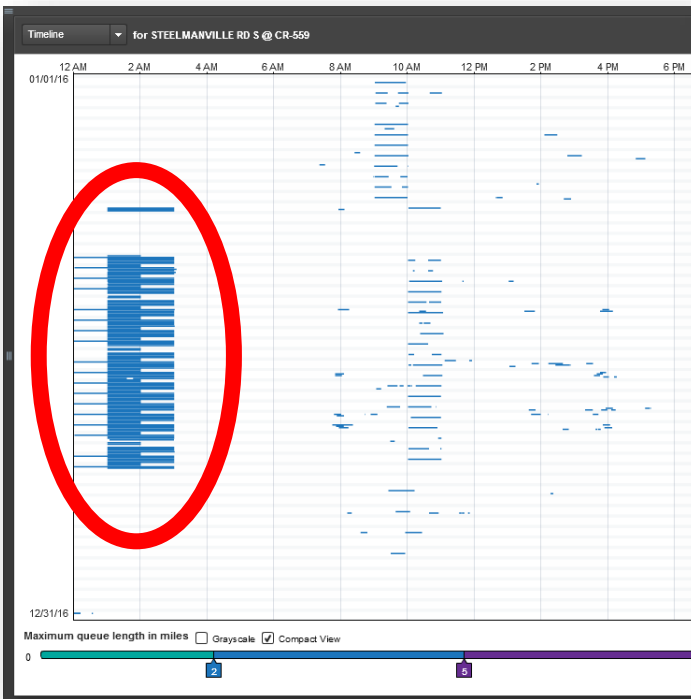
The SJTPO CMP follows an eight-step process modelled after the state-of-the-practice described in the Federal Highway

- CMP content, including Methodology Report, on SJTPO website
- www.sjtpo.org/CMP

“Big Data” Pitfalls

- False positive congestion

Bad:



Mixed:

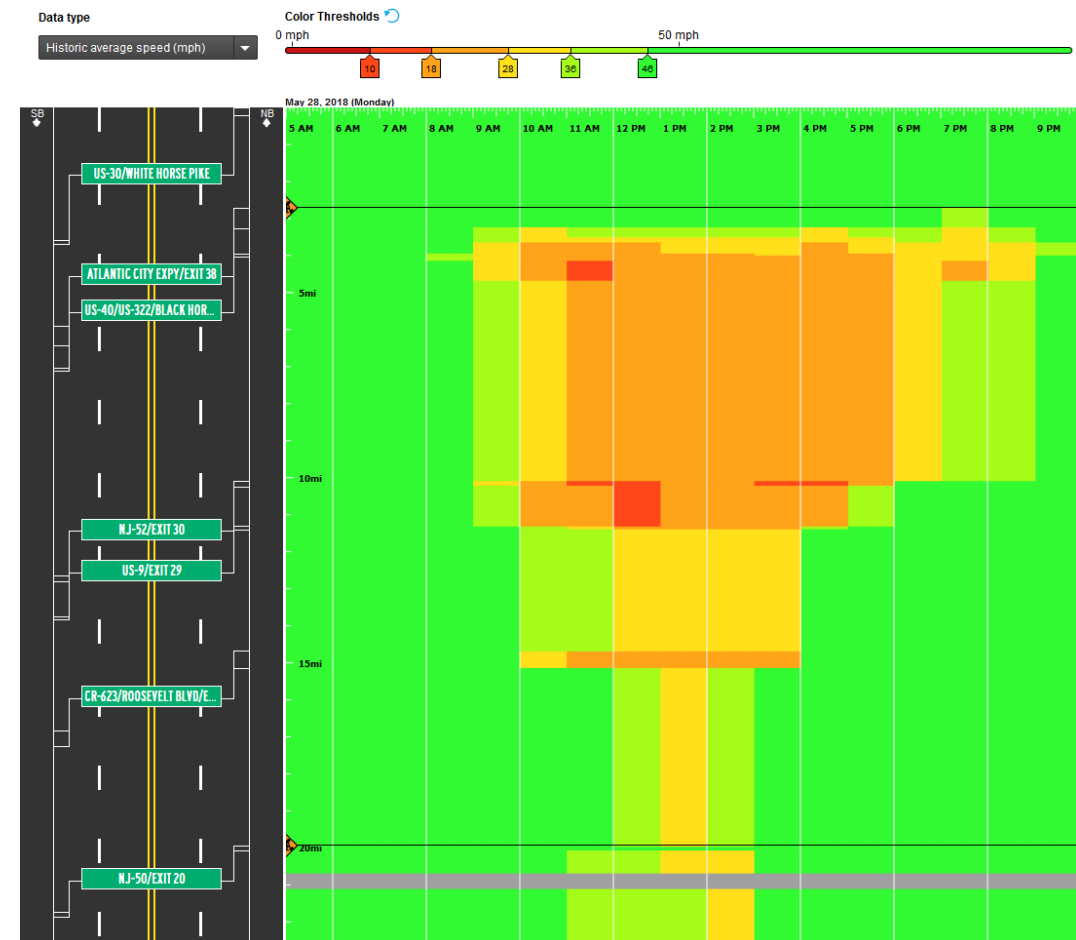
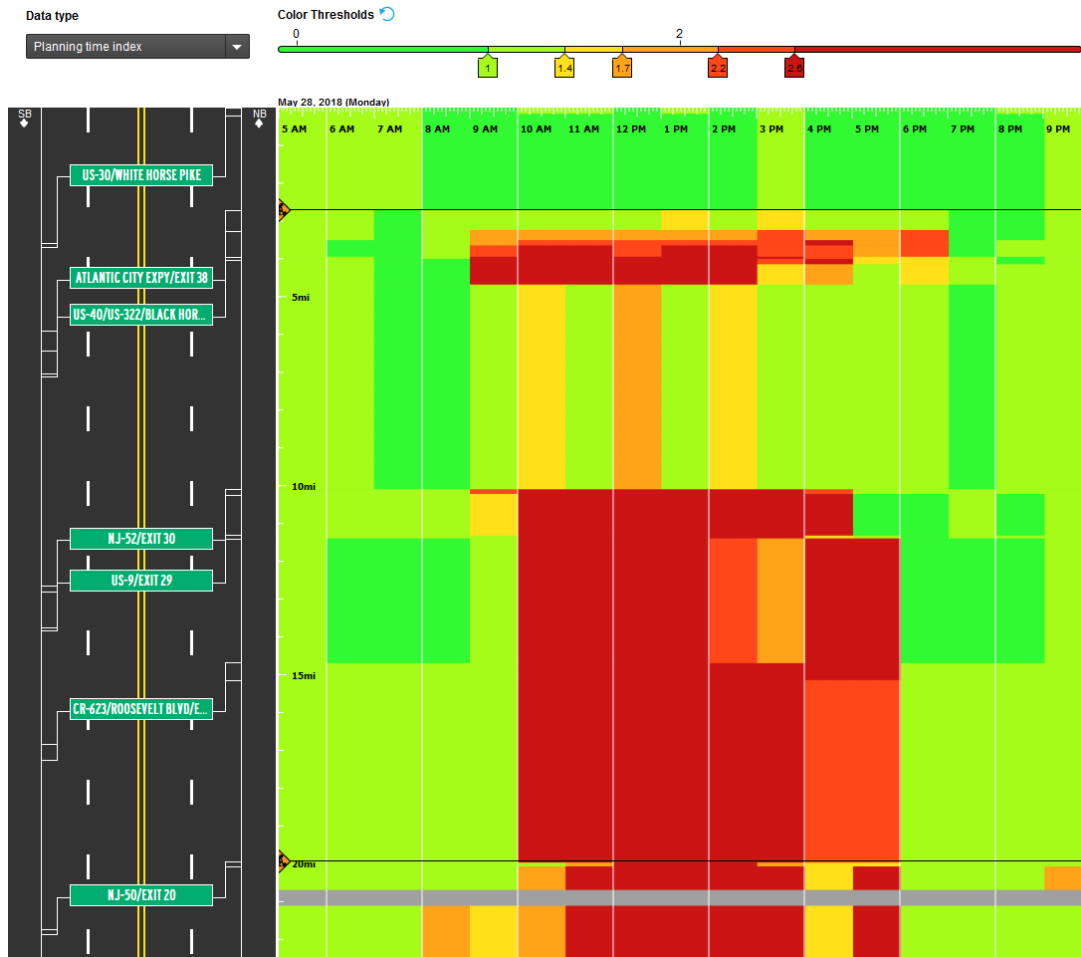


Good:



“Big Data” Pitfalls

- Must use **consistent methodology**
- Same data, two measures:



The Use of Real-Time and Archived Operations Data for Congestion Planning and Incident Management

Thank you!
Visit us at sjtpo.org

TransAction 2019
Wednesday, April 17th
Andrew Tracy, SJTPO