# Green Light-Go Program

Daniel Farley, PennDOT
Chief, Traffic Operations Deployment and Maintenance
dfarley@pa.gov ; (717) 783 - 0333

PA SAFETY SYMPOSIUM
toward zero deaths

# Green Light-Go Program

**Original: PA Act 89 of 2012 (November 25, 2012)**

**Amended: PA Act 101 of 2016 (July 20, 2016)**

**Up to $ 40 Million Annually**

**Goal:** To enhance traffic signal management, maintenance, and operations and make the Commonwealth's signalized corridors more safe and efficient.

**Objectives:**
- Ensure all Funding is addressing key maintenance and operations concerns.
- Focuses on traffic signal improvements/upgrades to address safety and mobility
- Promote and encourage multi-municipal cooperation
- Maintenance and Operations Accountability concerns.

## Eligible Projects

- Study and Removal of Unwarranted Traffic Signals
- Traffic Signal Retiming
- Development of Detour, Special Event and Operations Plans
- LED Replacement
- Asset Management
- Traffic Signal Operations (Real-Time Monitoring)
- Traffic Signal Maintenance
- Innovative Technologies (e.g. Adaptive signals)
- Communications
- Connections back to Traffic Management Center (TMC)
- Detection Upgrades
- Controller Upgrades
- Modernization Upgrades (poles, etc….)
- Other Traffic Signal Improvements
- **ITS applications such as autonomous connected related technology (DSRC)**

## Municipal Match Options

- Municipal General Funds
- Liquid Fuels Funds
- Pennsylvania Infrastructure Bank (PIB) loans
- Municipal private loans
- Developer contributions
- Act 209 (Transportation Impact fees)
- In-Kind services (with PennDOT approval)
- Act 89 funding (Title 75, County $5 Fee)
- Other Department approved match options
- **Regional, State, or Federal funds not associated with the Transportation Improvement Program (TIP) – Most PennDOT funds except Liquid fuels and maintenance funds.**

# Green Light-Go Program

**Original: PA Act 89 of 2012 (November 25, 2012)**

**Amended: PA Act 101 of 2016 (July 20, 2016)**

**Up to $ 40 Million Annually**

## Year 1 (SFY 14-15)
## Year 2 (SFY 15-16)

- Existing Signals on State Hwys
- Minimum 50% Municipal Match using local or private funds
- Designated Corridors (AADT <10,000) – Local Managed through dotGrants; Critical Corridors (AADT >10,000) – PennDOT Managed through ECMS
- Applicant can only be municipality
- Projects expected to be completed by end of fiscal year

## Year 3 (SFY 16-17) and Thereafter

- Existing Signals on State and Local Hwys
- Minimum 20% Match using local, private, regional, state or federal funds (Non-TIP related)
- All Reimbursement Grants all Local Managed through dotGrants unless otherwise identified by PennDOT
- Applicant can be municipality, county, or planning organization
- Projects expected to be completed by the end of the next fiscal year
- PennDOT Management
  - Pilot Program
  - Necessary ownership previously identified

# Green Light-Go Program Next Steps

**Year 3 (SFY 16-17)**

- **All Guidance Materials Updated on Traffic Signal Portal Page**
- **Pa Bulletin Announcement (August 6, 2016)**
- **Year 3 Application Period from August 8th through September 30, 2016**
- **Year 4 Application Period anticipated in January 2017**

# Current Green Light-Go Program Summary

**Goal:** To enhance traffic signal management, maintenance, and operations and make the Commonwealth's signalized corridors more safe and efficient.

**Objectives:**
- Ensure all Funding is addressing key maintenance and operations concerns.
- Focuses on traffic signal improvements/upgrades to address safety and mobility
- Promote and encourage multi-municipal cooperation
- Maintenance and Operations Accountability concerns.

## Updated Local Grant Program

- Counties, Municipalities, and Planning Partners Eligible Applicants
- All Existing Traffic Signals on State and Local Highways Eligible
- 20% Match (Except State/Federal TIP dollars)
- All Projects Municipal Managed unless otherwise indicated by PennDOT
- Eligible Activities: LED, regional operations, retiming, special event timing, monitoring, maintenance, and equipment upgrades
- Also added ITS applications such as autonomous connected related technology (DSRC)

## PennDOT Management

- Establishes a pilot program for PennDOT to assume ownership and maintenance responsibility
- Necessary Legislative and Regulation language is now in place to move forward
- Focus on Super-Critical Corridors (AADT above 25,000)
- Currently Prioritizing Corridors for each region
  - Communication back to TMC and Signal Performance Measures on all corridors

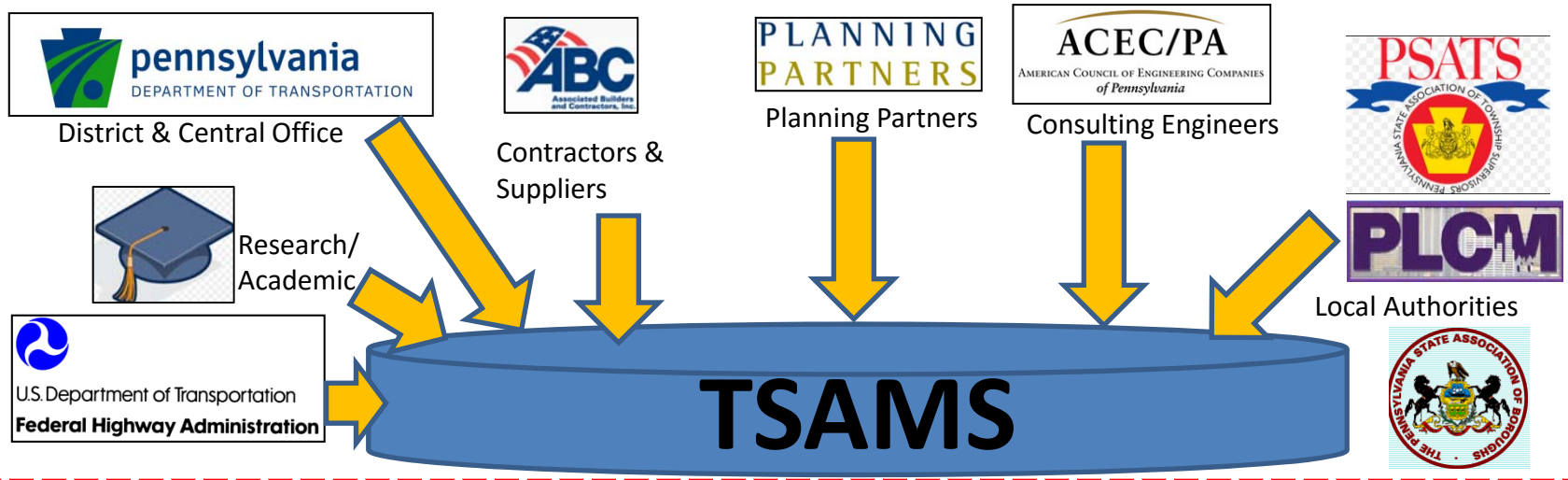
# Other Key Innovative Traffic Signal Improvements

- Traffic Signal Asset Management System (TSAMS)
- Remote Communications
- Transportation Systems Management and Operations (TSMO)
- Signal Performance Metrics (SPMs)
- Big Data and Data Analytics
- Connected/Automated Vehicles
- I-76 Regional Project

PA SAFETY SYMPOSIUM toward zero deaths

# Traffic Signal Asset Management System (TSAMS)

## Users & Schedule




| Completed (Aug-2015) | Completed (July-2016) | Planned Completion (Late 2016) | Planned Completion (2017+) |
|---|---|---|---|
| Stage 1 | Stage 2 | Stage 3 | Stage 4 |
| • PennDOT Central Office Users<br>• Inventory Module<br>• Product Approval Database<br>• Database Structure | • Roles Based Access to All Users<br>• Basic GIS<br>• Responsive Maintenance Module<br>• Data Collection Upload | • Preventative Maintenance Module<br>• Inspection Module<br>• Enhanced GIS<br>• Projects Module<br>• Enhanced GIS<br>• Field Maintenance & Inspection Forms/App | • Reporting<br>• Customer Complaints<br>• Integration with other PennDOT Systems<br>• Full GIS Capabilities<br>• Workflow<br>• Data & Life Cycle Analysis and Modeling<br>• Other Assets (ITS)<br>• Other Requirements to be determined |

PA SAFETY SYMPOSIUM toward zero deaths

# Traffic Signal Asset Management System (TSAMS)

## Login Page

System Test
pennsylvania
DEPARTMENT OF TRANSPORTATION

*https://www.dot17.pa.gov/tsams*

TSAMS

### Traffic Signal Asset Management System

**WELCOME** to PennDOT's Traffic Signal Asset Management System (TSAMS).

TSAMS is a web-based application featuring...

- Signal and Non-Signal Asset Inventories
  - Traffic Signals
  - Emergency Traffic Signals
  - Electronic Signs
  - Flashing Warning Devices
  - In-Roadway Warning Lights
  - Intersection Control Beacons
  - Ramp Meters
  - Rectangular Rapid Flashing Beacons
  - Roundabouts
  - School Zone Speed Limit Signs
- GIS Integration
- Maintenance Activity Tracking
- Signal and Non-Signal Systems Identification
- Approved Products Database
- Reporting & Advance Search

It is available **FREE** of cost to all stakeholders. If you are a new user click **here** to create an account.

### Login

For TSAMS users only. To request an authorized user account, please click **here**.

**User ID**
tsamsca

**Password**
••••••••••

Login

Forgot Your Password?

### Quick Links

Traffic Signal Portal
PennDOT Publications
Traffic Engineering Forms (TE-Forms)
511PA
Engineering and Construction Management System (ECMS)
ePermitting System (EPS)

Release: 2.3

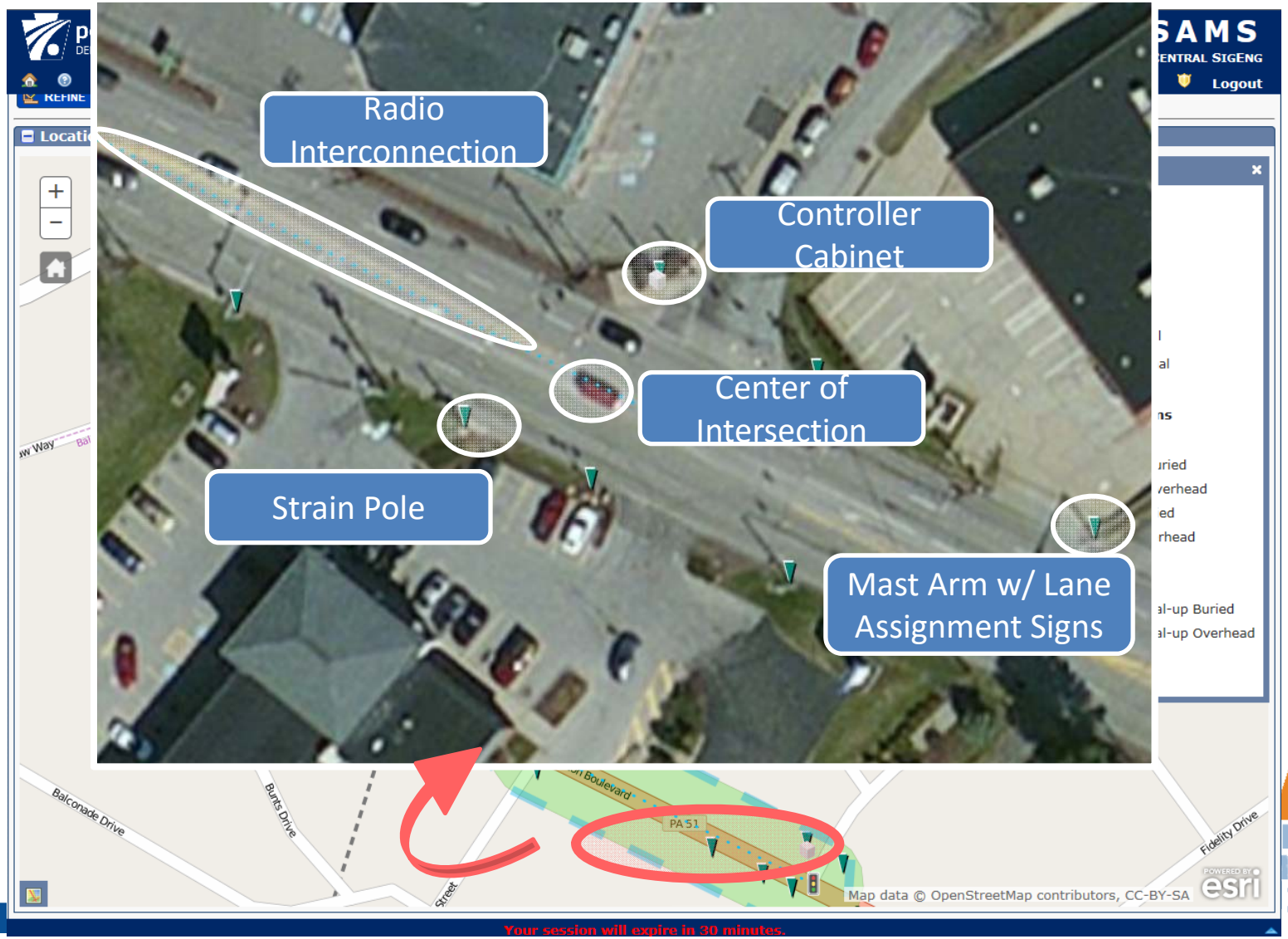
Copyright © 2016 Pennsylvania Department of Transportation. All Rights Reserved.

Tue, Jun 28, 2016 8:15:16 AM EDT

PennDOT Privacy Policy

# Traffic Signal Asset Management System (TSAMS)

## Mapping/Systems




ETY
IPOSIUM
zero deaths

# Traffic Signal Asset Management System (TSAMS)

## Document Mgmt

**Manage Documents**

Records 1 to 10 of 16 — Page 1 of 2 — Records Per Page: 10

| Date | Name | Type | Description | Attached By | Source |
|---|---|---|---|---|---|
| 05/23/2016 11:36 AM | SCAN_2016_03_16_14_04_15_378.pdf | Studies | Traffic Study | bkr\alexander.thomas | TSAMS |
| 05/23/2016 11:35 AM | SCAN_2016_03_16_14_00_08_302.pdf | Permits | Permit Sheet 2 of 4 Coordination | bkr\alexander.thomas | TSAMS |
| 12/05/2008 12:00 AM | SCAN_2016_03_16_13_59_39_572.pdf | Correspondence-Activities | Letter regarding Emergency Vehicle Preemption Permit revisions | bkr\alexander.thomas | TSAMS |
| 11/24/2008 12:00 AM | T-097 Center St.(SR1015) - Creekside Dr. - Pumping Station DWY 4of4.pdf | Permits | Permit Sheet 4 of 4 Plan | bkr\alexander.thomas | TSAMS |
| 11/24/2008 12:00 AM | T-097 Center St.(SR1015) - Creekside Dr. - Pumping Station DWY 3of4.pdf | Permits | Permit Sheet 3 of 4 Plan | bkr\alexander.thomas | TSAMS |
| 11/05/2008 12:00 AM | SCAN_2016_03_16_14_00_21_315.pdf | Correspondence-Activities | Correspondence regarding Permit revisions | bkr\alexander.thomas | TSAMS |
| 08/03/2007 12:00 AM | SCAN_2016_03_16_14_00_45_017.pdf | Correspondence-Activities | Letter regarding timing revisions | bkr\alexander.thomas | TSAMS |
| 05/24/2000 12:00 AM | SCAN_2016_03_16_14_01_36_426.pdf | Agreements | Traffic Signal Description | bkr\alexander.thomas | TSAMS |
| 01/24/2000 12:00 AM | SCAN_2016_03_16_14_01_47_705.pdf | Correspondence-Activities | Letter regarding end of signal operations testing period | bkr\alexander.thomas | TSAMS |
| 01/21/2000 12:00 AM | SCAN_2016_03_16_14_01_20_856.pdf | Correspondence-Activities | Letter regarding Traffic Signal Permit | bkr\alexander.thomas | TSAMS |

**The following document types can be uploaded to TSAMS:**

**Document Type** *

Select

- Select
- Agreements
- Correspondence-Activities
- Design Documents & Drawings
- Financials
- Permits
- Photographs
- Studies
- Traffic Analysis

PA SAFETY SYMPOSIUM toward zero deaths

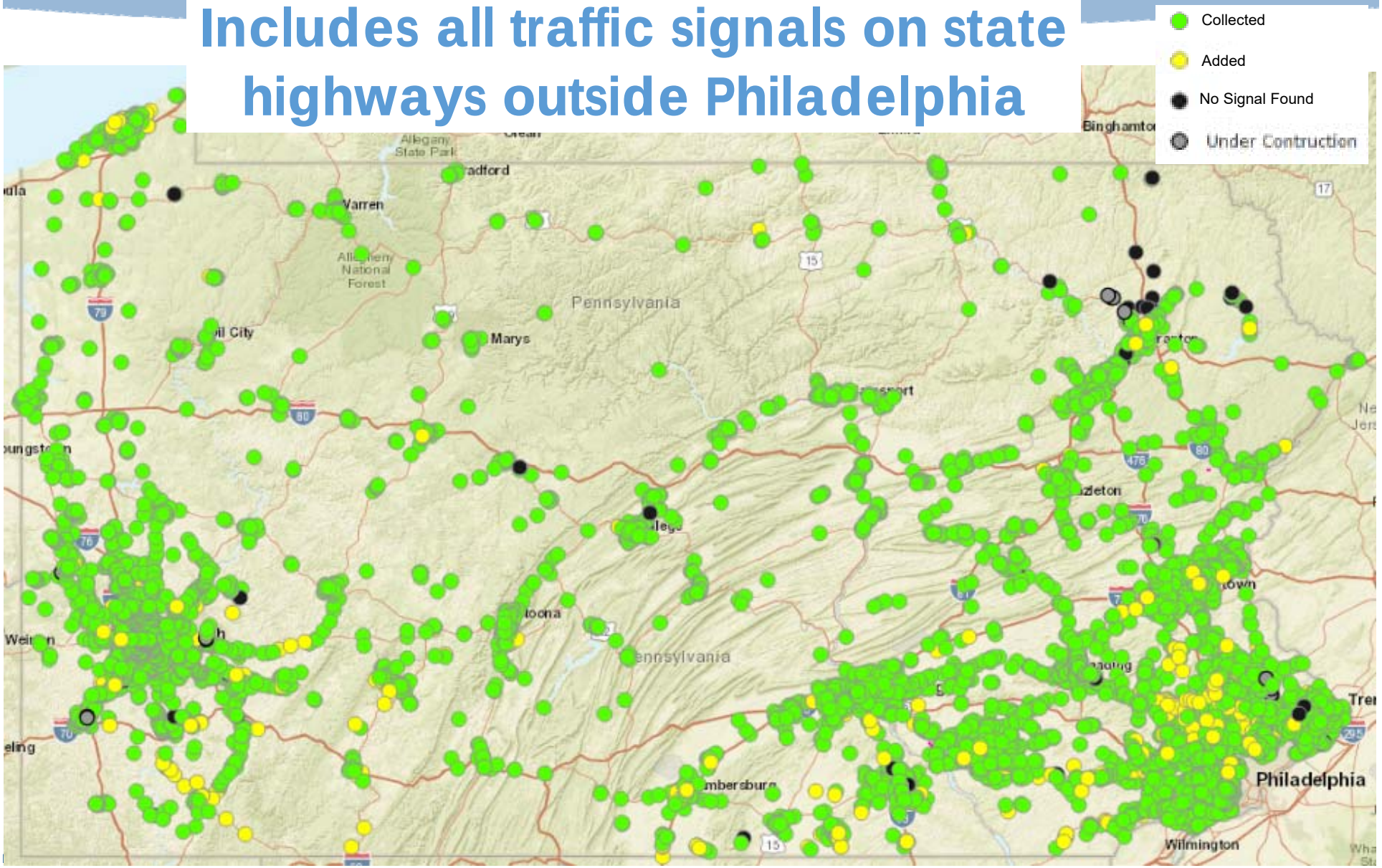
# Traffic Signal Asset Management System (TSAMS)

## Expected Benefits

- Consistency Statewide (Policy)
- Uniform Data Collection
- One-Stop-Shop for Data & Documents
- Free for all Stakeholders
- Better Budgeting & Planning
- Cost Analysis Driven Decisions
- Component/Equipment Service Life
- Data Mining & Metrics
- Canned & Ad-hoc Reporting
- Approved Products Listing
- Product Manufacturer Information

# Traffic Signal Asset Management System (TSAMS) Data Collection

## Includes all traffic signals on state highways outside Philadelphia



# Traffic Signal Asset Management System (TSAMS) Data Collection

## Collection Team Approach

### Mobile LiDAR

- Capture 3D location (point cloud) of exposed signal components
- Extract visible signal asset attributes with dimensions
- Capture 360-degree spherical images
- Lady Bug Images

### Stakeholder Data Acquisition

- PennDOT Central Office
- PennDOT Districts
- Municipal Signal Owners
- Planning Organizations
- Maintenance Contractors
- Vendors

### Field Inspection

- Capture elements unable to be collected by other methods (inside controller cabinets)
- Custom iPad application (created by Baker)
- Validate information collected by LiDAR

Permit files

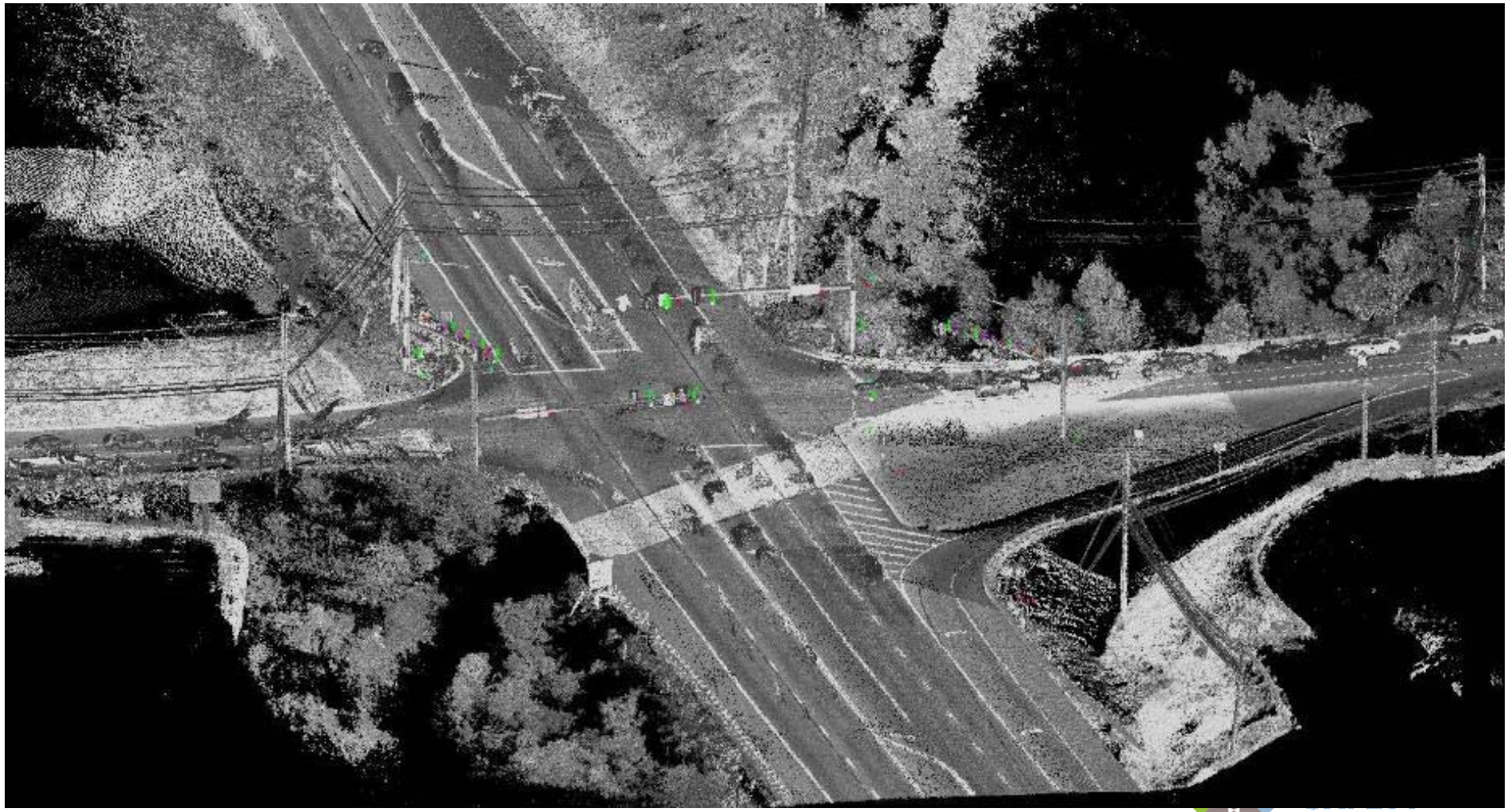
- All electronic files
- Scan relevant paper documents
- Over 77,000 documents statewide

PA SAFETY SYMPOSIUM toward zero deaths

# Traffic Signal Asset Management System (TSAMS)

- Geospatial information
  - 3D Point Cloud
- Visual information
  - Spherical photography
- Purpose of using LiDAR
  - Improved precision
  - Accelerated collection
  - Eliminate traffic impacts
  - Technician Safety
- Data Fields
  - Structures
  - Signs
  - Signal Heads & Indications
  - Controller Cabinet (dimensions)

# Traffic Signal Asset Management System (TSAMS) Data Collection



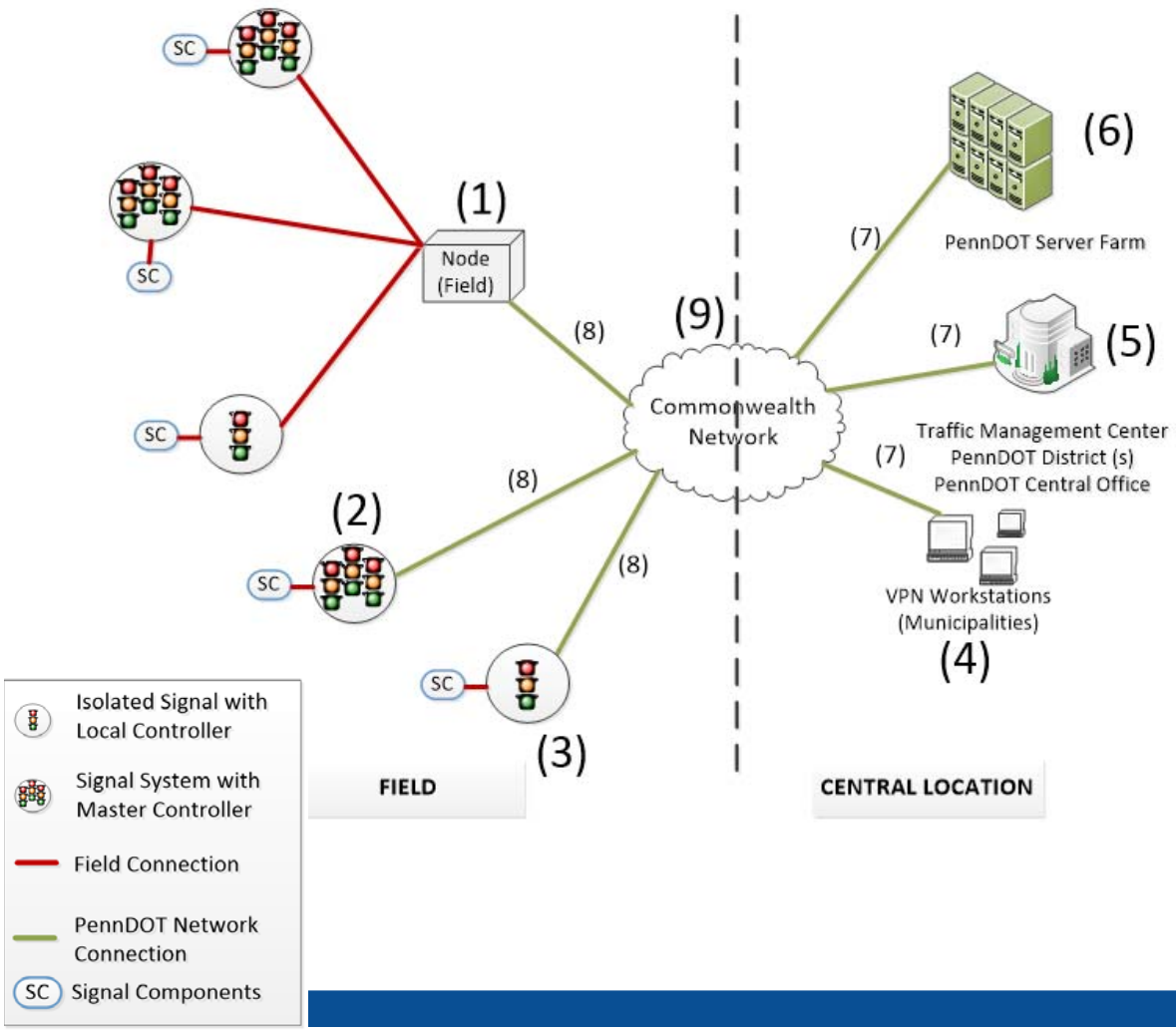
SYMPOSIUM toward zero deaths

# Traffic Signal Asset Management System (TSAMS) Data Collection

toward zero deaths

# Traffic Signal Remote Communication Policy and Guidance Document

**Strike-off Letter (SOL) 494-16-02**
**(Effective: February 12, 2016)**

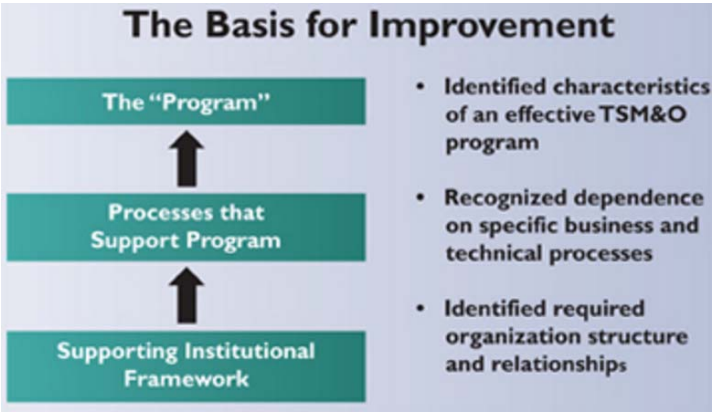



**Purposes of this document:**

- Statewide Consistency
- Process and Procedure for requesting access to PA Commonwealth network
- Improved Security through Dedicated Commonwealth VPN IP assignment
- Policy identifies the roles and responsibilities
- Provides requirements for the remote communication
- Provides design guidelines for new remote communication requests
- Provides controlled access to outside partners

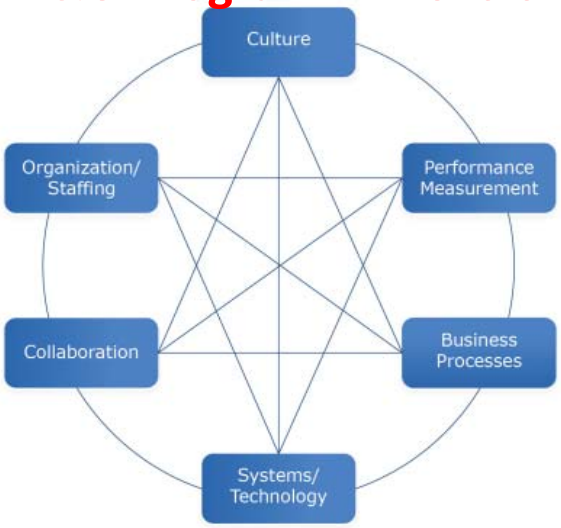
# Transportation Systems Management and Operations (TSMO)

## How are we Improving Traffic Operations?




**Ensure GOST is being followed**

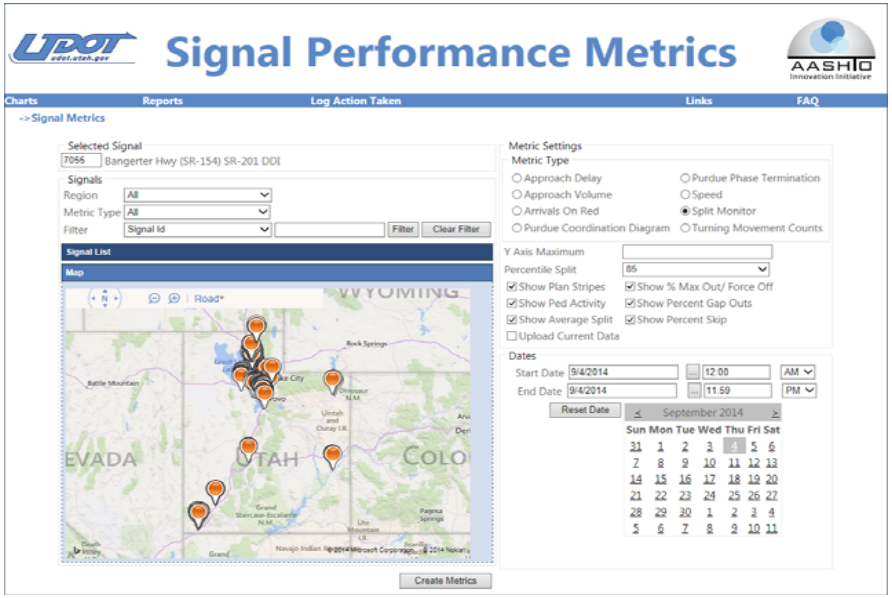
**TSM&O Program Dimensions**

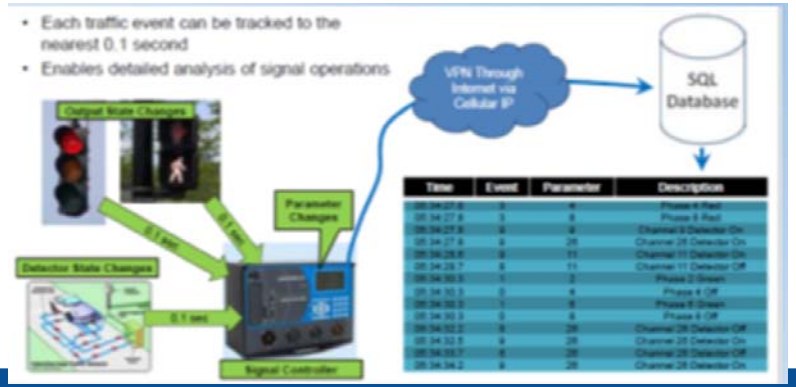



**Capability Maturity Model Levels**

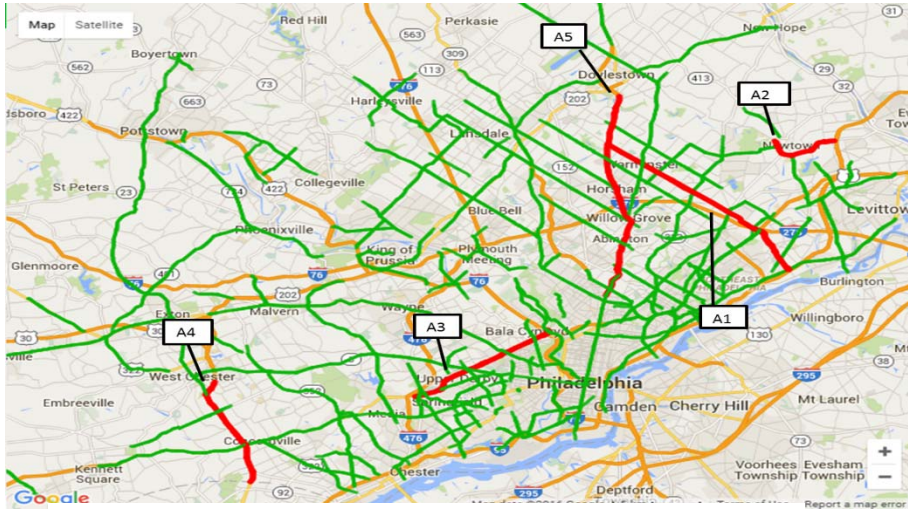
# Signal Performance Metrics and Data Analytics

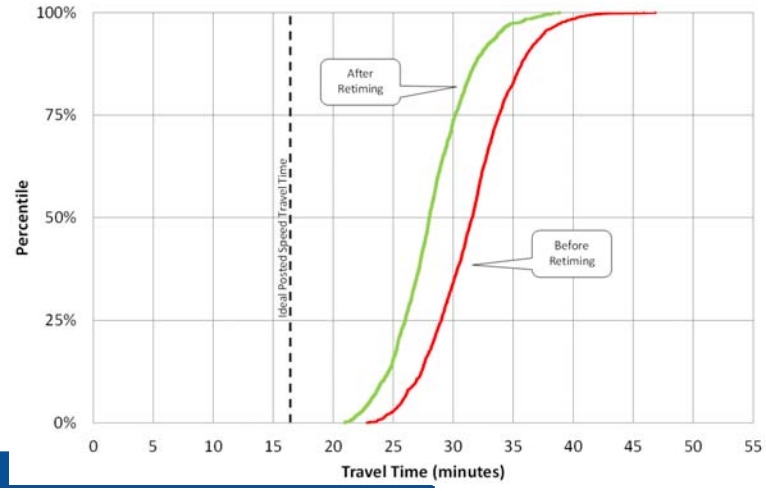
## High Resolution Data/ Automated SPMs



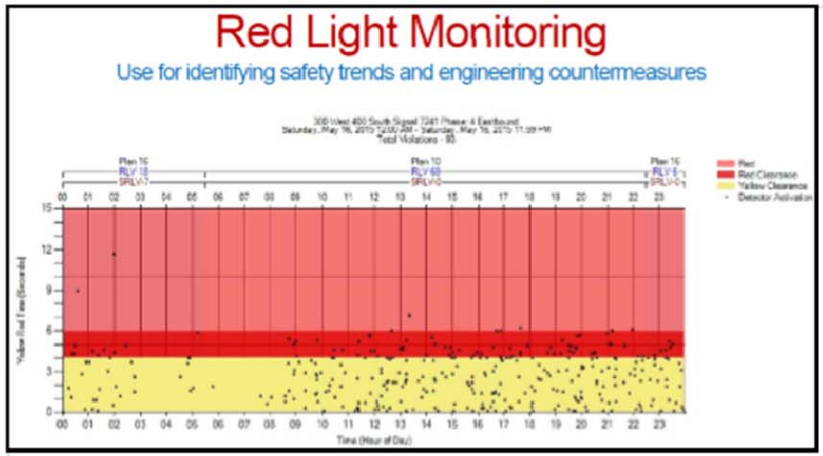

## Vehicle Probe Data

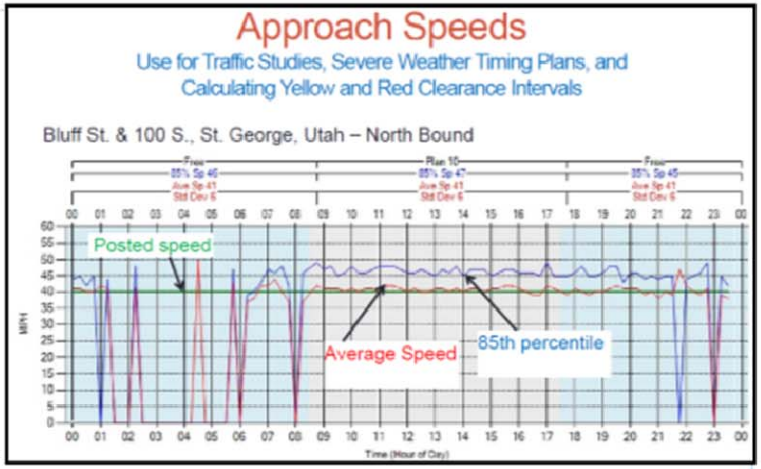


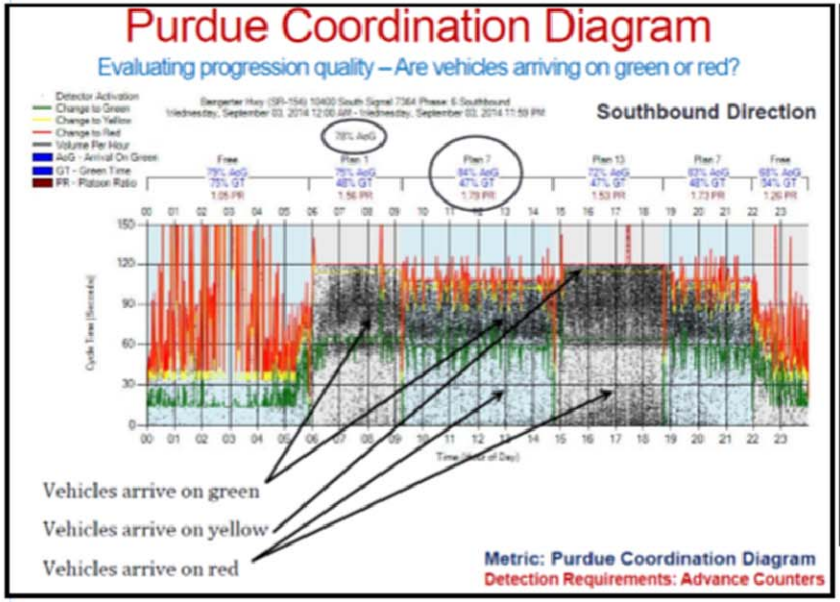



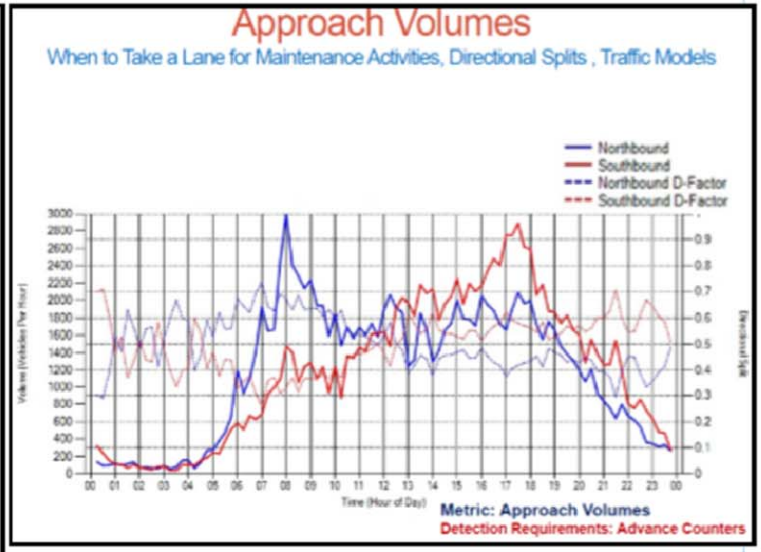
# Signal Performance Metrics and Data Analytics

## High Resolution Data/ Automated SPMs



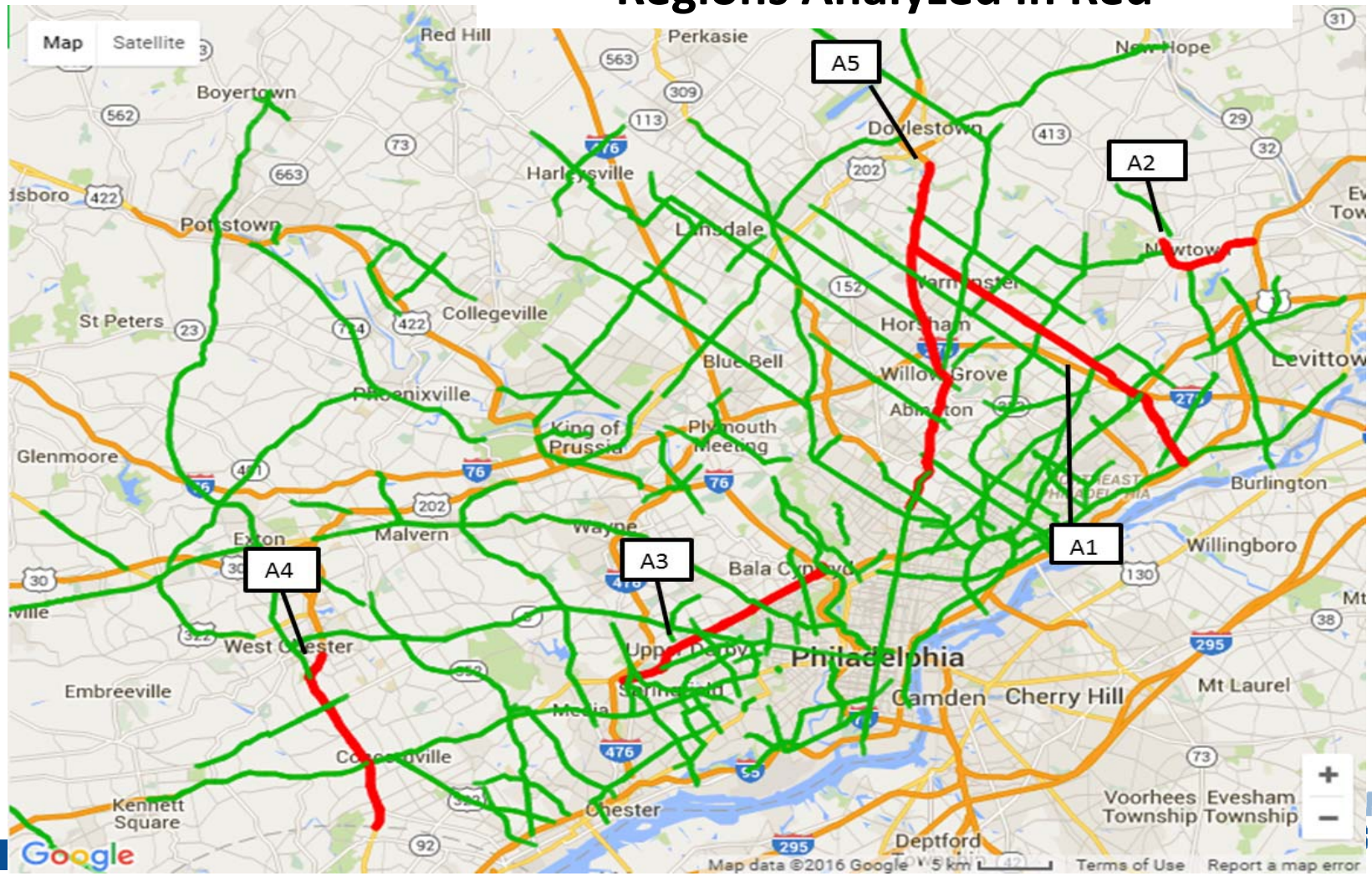



# Signal Performance Metrics and Data Analytics

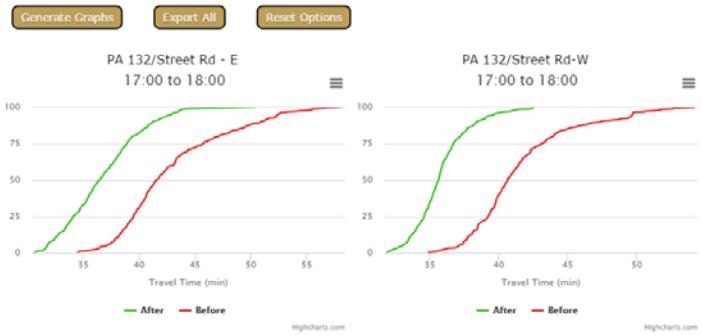
## Vehicle Probe Data

## PennDOT District 6 (Philadelphia) Regions Analyzed in Red



# Signal Performance Metrics and Data Analytics

## Vehicle Probe Data




| Corridor ID | Corridor Name | AADT (Vehicles) | Length (mi) | Signal Count | Date Range – Before– | Date Range – After– |
|---|---|---|---|---|---|---|
| A1 | PA 132/Street Rd | 33,965 | 15.2 | 50 (21) | 10/12/2015–11/23/2015 | 1/4/2016–2/15/2016 |
| A2 | Newtown Bypass (PA 332) | 35,015 | 4.8 | 12 (12) | 2/22/2016–4/4/2016 | 4/25/2016–6/6/2016 |
| A3 | US 1/State Rd/Twp Line Rd/City Ave | 35,268 | 10.0 | 40 (4) | 10/12/2015–11/23/2015 | 3/7/2016–4/18/2016 |
| A4 | US 202/Wilmington Pk | 46,553 | 8.6 | 16 (9) | 9/4/2015 10/26/2015 | 1/4/2016 2/15/2016 |
| A5 | PA 611/Old York Rd & Easton Rd | 30,919 | 16.3 | 68 (15) | 4/27/2015–6/8/2015 | 1/4/2016–2/15/2016 |

| | A1 | A2 | A3 | A4 | A5 |
|---|---|---|---|---|---|
| Weekday | $1,794,000 | $356,000 | $1,679,000 | $1,082,000 | -$300,000 |
| Weekend | $2,131,000 | $389,000 | $2,125,000 | $1,967,000 | $167,000 |

**Results from User Benefits Calculation**

**Total Amount = $11,139,000**

PA SAFETY SYMPOSIUM toward zero deaths

# BIG DATA in Pennsylvania

## - SOURCES -

- Internal
- Public Partners
- INRIX
- Waze

## - EXCHANGE -

- Online Portal
- Incident Data
- Traffic Cameras
- Data Warehouse

## - PROCESSING -

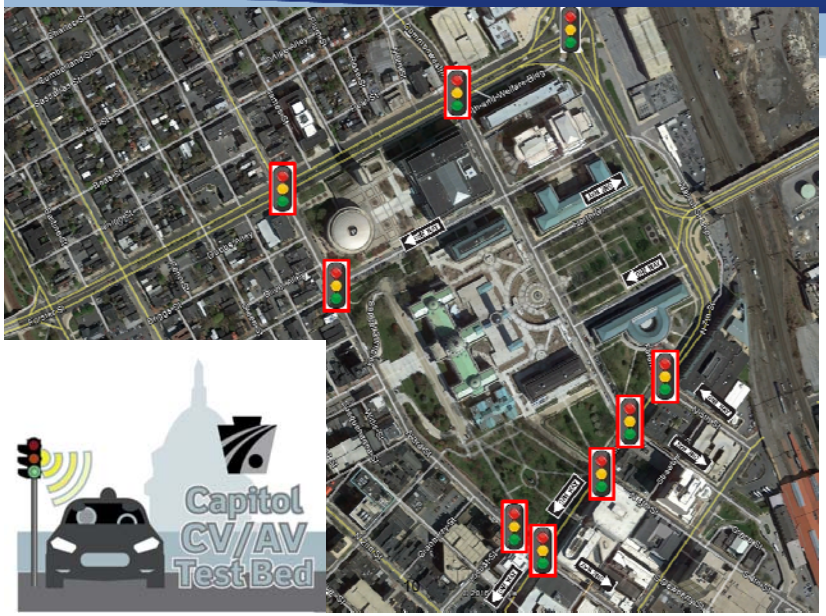
- Travel Times
- Expand Detection
- Data Manipulation

## - METRICS -

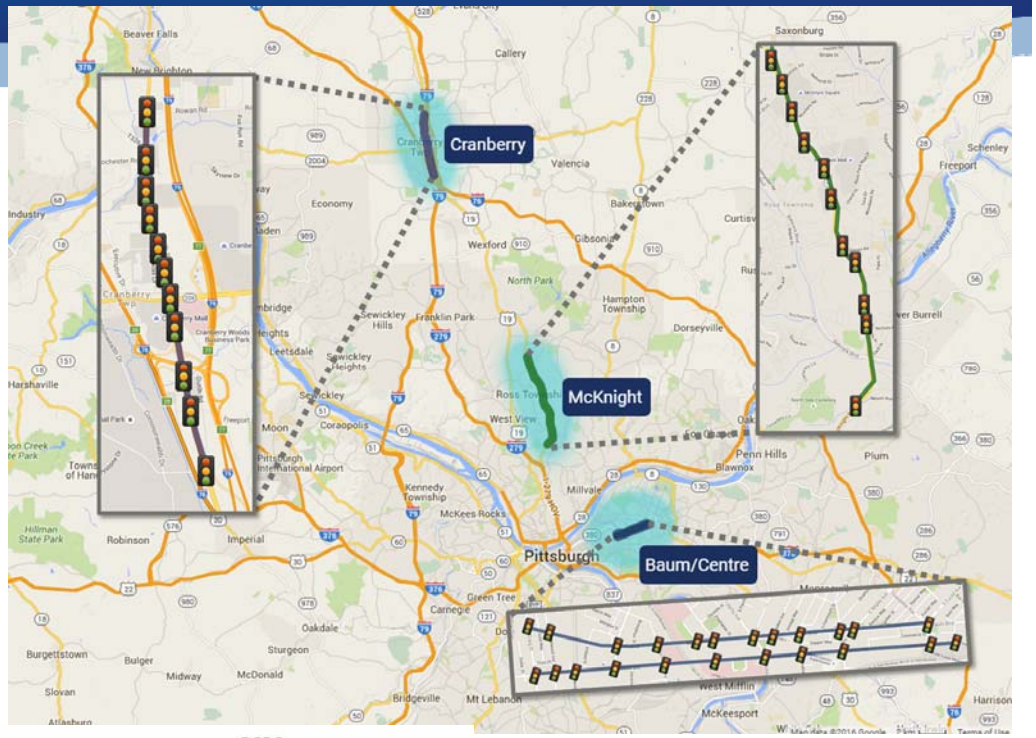
- Understandable
- Actionable
- Credibility
- Efficiency

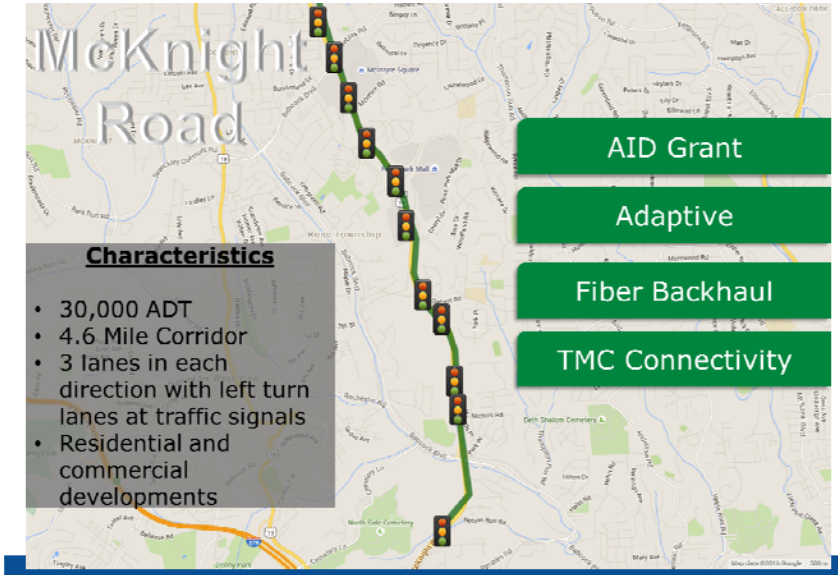
PA SAFETY SYMPOSIUM toward zero deaths

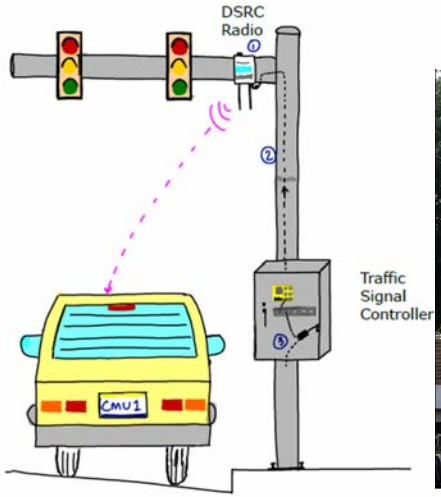
# Connected/Automated Vehicles



Capitol CV/AV Test Bed



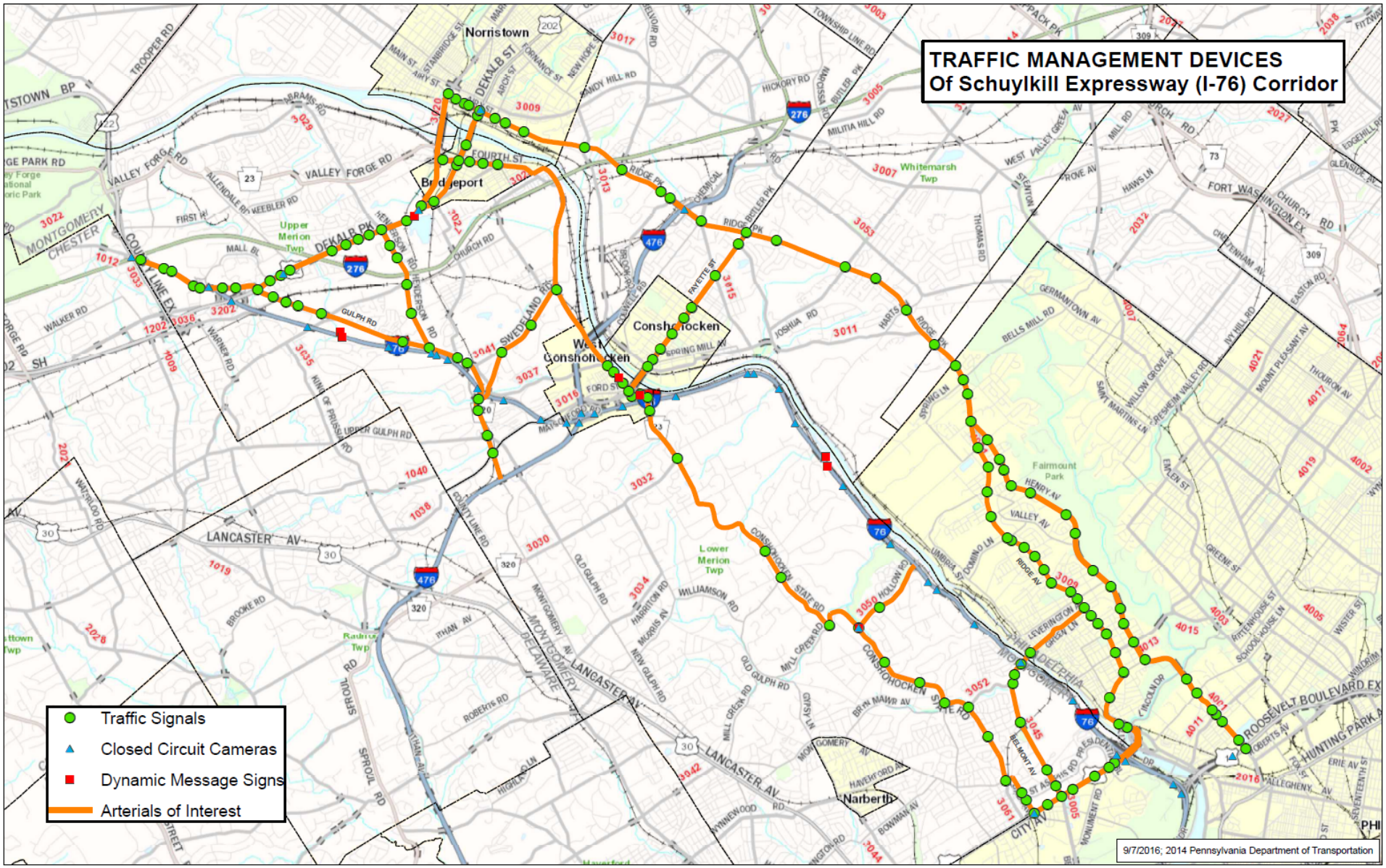



# I-76 Regional Project

**Transportation Management Strategies:**

- Variable Speed Limits
- Queue Detection
- Ramp Metering
- Junction Control
- Part-time Shoulder Usage
- Multi-Modal Improvements
- Proactive Management of Traffic Signals along Adjacent Arterials

# I-76 Regional Project



# Questions

## www.dot.state.pa.us/signals

Traffic Signal Portal

Menu

Thursday, August 11, 2016

### 2016 - Green Light-Go Program (Year 3) Program Updates and Application Period

**PennDOT will be accepting applications for the 2016 Green Light-Go Funding Program (Year 3) from August 8th through September 30th. The 2016 Green Light-Go Program has Up to $40 million for the competitive application and reimbursement grant program for existing traffic signal improvements such as: light-emitting diode technology and intelligent transportation applications, such as autonomous and connected vehicle-related technology, performing regional operations such as retiming, developing special event plans and monitoring traffic signals and for maintaining and operating traffic signals.**

Recently enacted Act 101 of 2016 (Enhancing Pennsylvania's Green Light-Go Program), Updated the Green Light-Go Program by providing the following enhancements:

- Reduction of the Municipal Match from 50% to 20%.
- Expands and clarifies the potential applicants.
- Expansion to allow existing state highways on local roadways to be considered for the program.
- Expansion to allow other state or federal funding opportunities to be considered except for Transportation Improvement Plan funding.
- Expands to allow additional activities such as Intelligent Transportation Systems (ITS) to be considered.
- Adjustment to allow focus on a municipal grant reimbursement program. Therefore awarded municipalities would manage their projects instead of PennDOT (unless otherwise specified).

| | | |
|---|---|---|
| Publications | Green Light-Go Program | Laws & Regulations |
| Strike-off Letters | ARLE Program | Traffic Signal Location Maps |
| Traffic Engineering Forms | Approved Products Listing (eCAMMS) | Traffic Signal Training Courses |
| Analysis & Design (Excel Workbooks) | Manufacturer Structure Drawings | MUTCD (2009 Edition) |

Traffic Signal Asset Management System (TSAMS)

***Daniel Farley***
***dfarley@pa.gov***
***(717) 783-0333***

SYMPOSIUM toward zero deaths