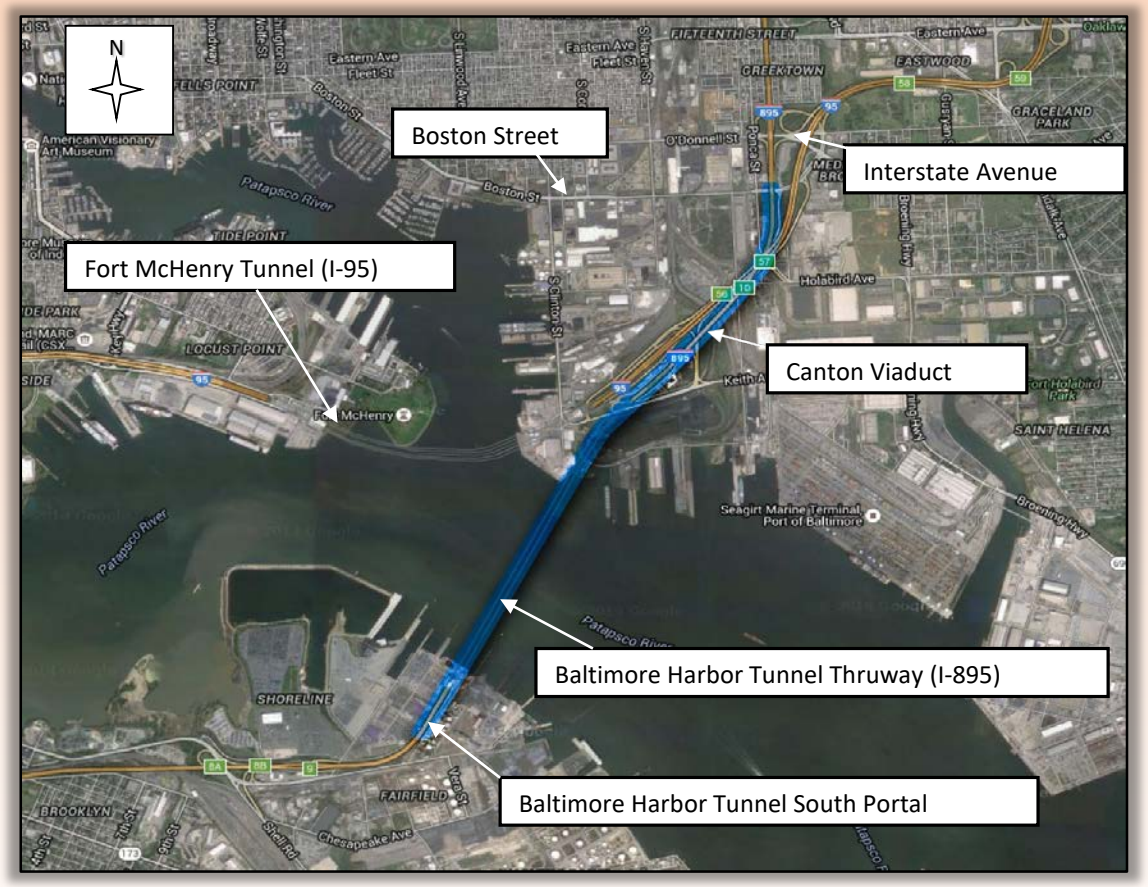
MDTA's I895 Bridge Project
Smart Work Zone Implementation



SWZ – Smart Work Zone

- **Agencies can use a variety of ITS applications to enhance work zone mobility and safety.**
- *Real-time traveler information systems* provide drivers with real-time travel conditions prior to and within a work zone, and may also provide information on alternative routes in the corridor. The goal is to divert drivers away from the work zone when congestion exists.
- *Queue warning systems* quickly detect the presence of congestion at the work zone and warn approaching motorists that traffic is slowed or stopped ahead.
- *Dynamic lane merge systems* encourage motorists to merge at specific points as they approach a lane closure, depending on current operating conditions.
- *Incident management systems* enable agencies, contractors, and responders to detect incidents in the work zone faster, allowing quicker response and clearance.
- *Variable speed limit systems* harmonize speeds before and within the work zone, calming traffic flow and warning of slowed or stopped traffic ahead.
- *Automated enforcement systems* detect and capture images of speeding vehicles for enforcement purposes.
- *Entering/exiting vehicle notification* warns drivers of slow-moving construction vehicles that may be entering the travel lane. It can also warn travelers that a work vehicle is exiting the travel lane and not to follow it into the work space.
- *Performance measurement systems* monitor and archive data on traffic conditions to support real-time traveler information dissemination, modify operations, and facilitate evaluation.

SWZ – Common Applications

Queue Warnings

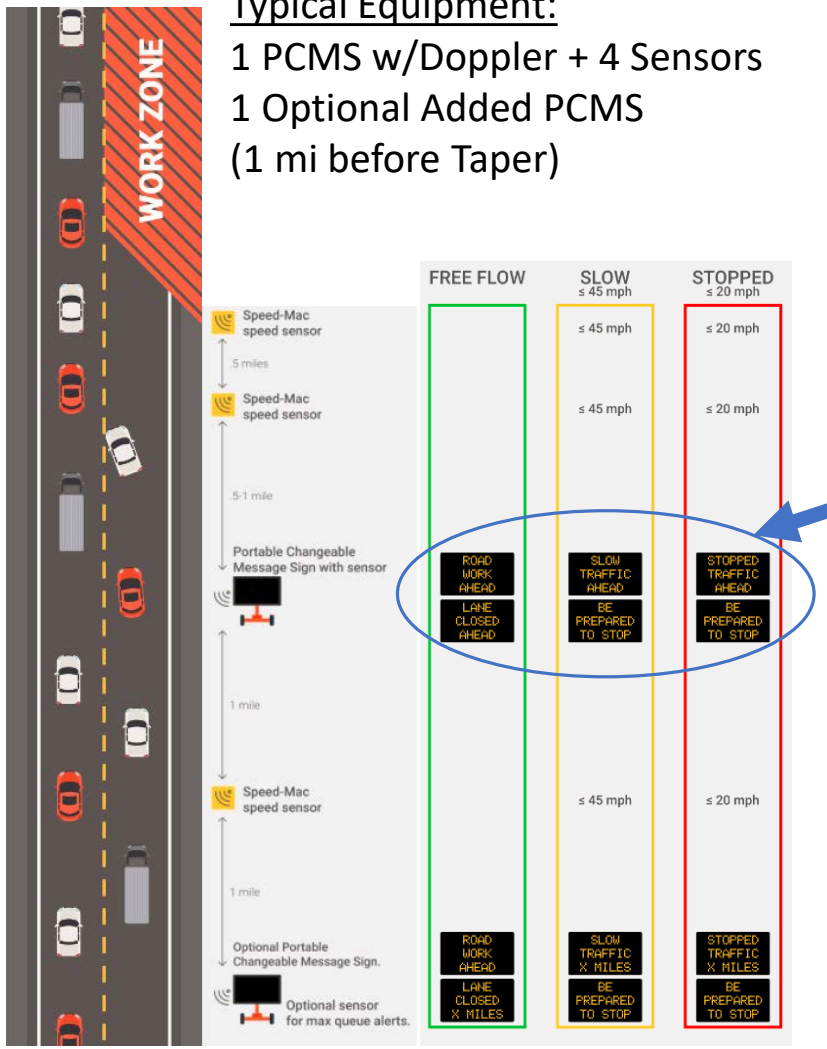
Truck Entry Systems

Variable Speed Limits

Applications

Zipper (Late) Merge

SWZ – Queue Warning Systems



Typical Equipment:

1 PCMS w/Doppler + 4 Sensors

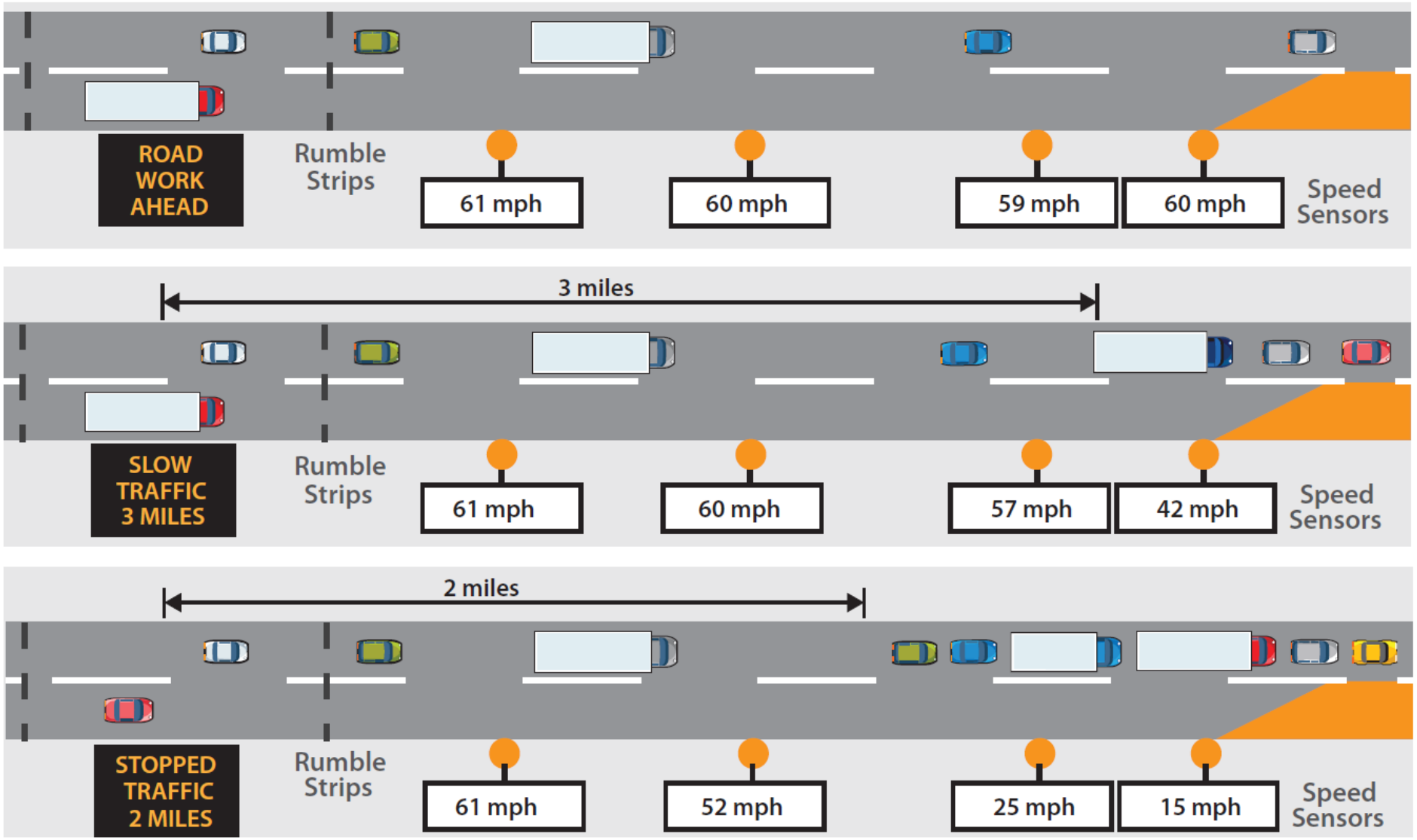
1 Optional Added PCMS

(1 mi before Taper)

Typical Benefits:

Reduce Chance of Rear End Crashes by 18-45%

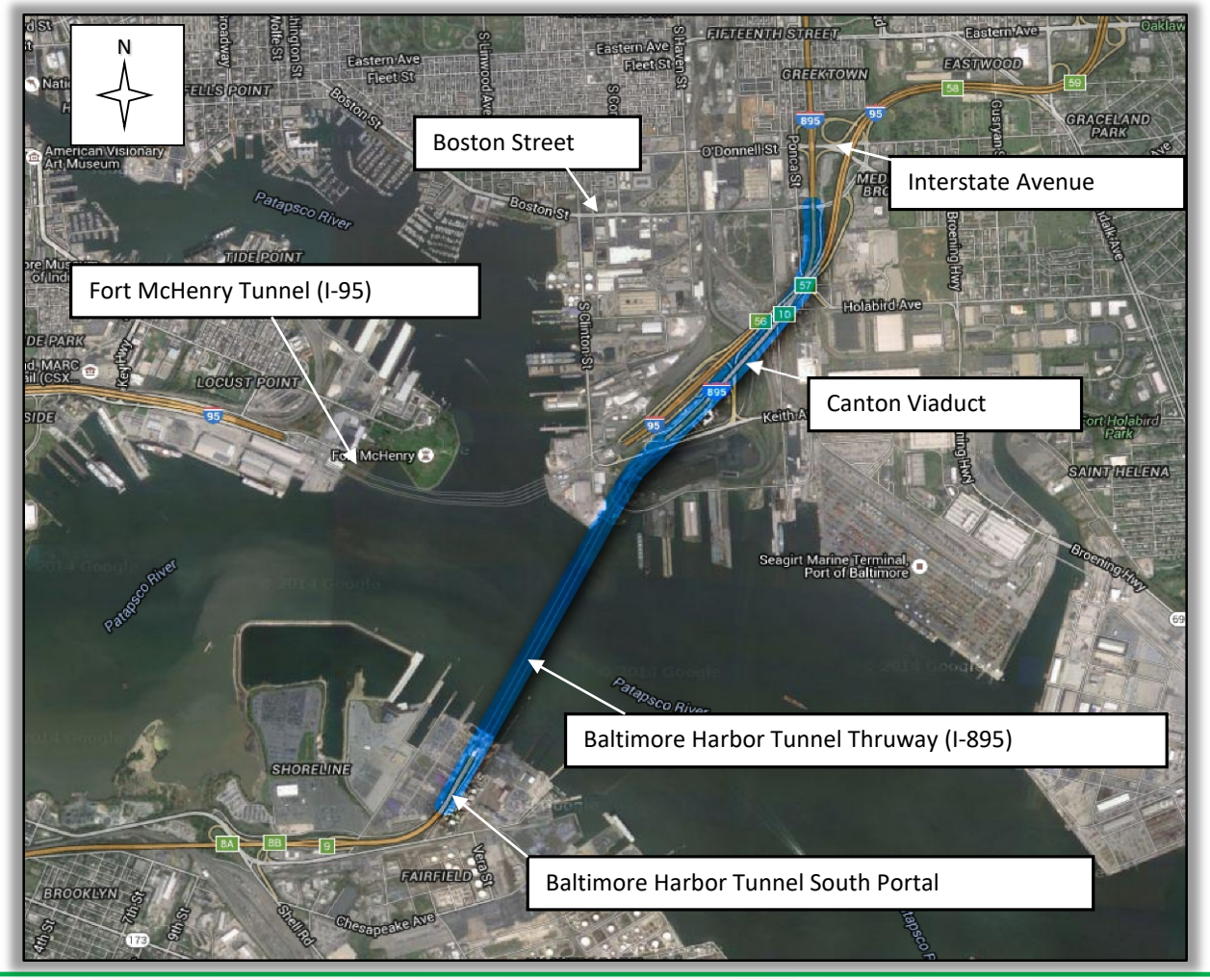
SWZ – Queue Warning Systems



Source: ARTBA Work Zone Safety Consortium (Sept 2015)

I-895 Bridge Project– SWZ Overview

I-895 Project Area



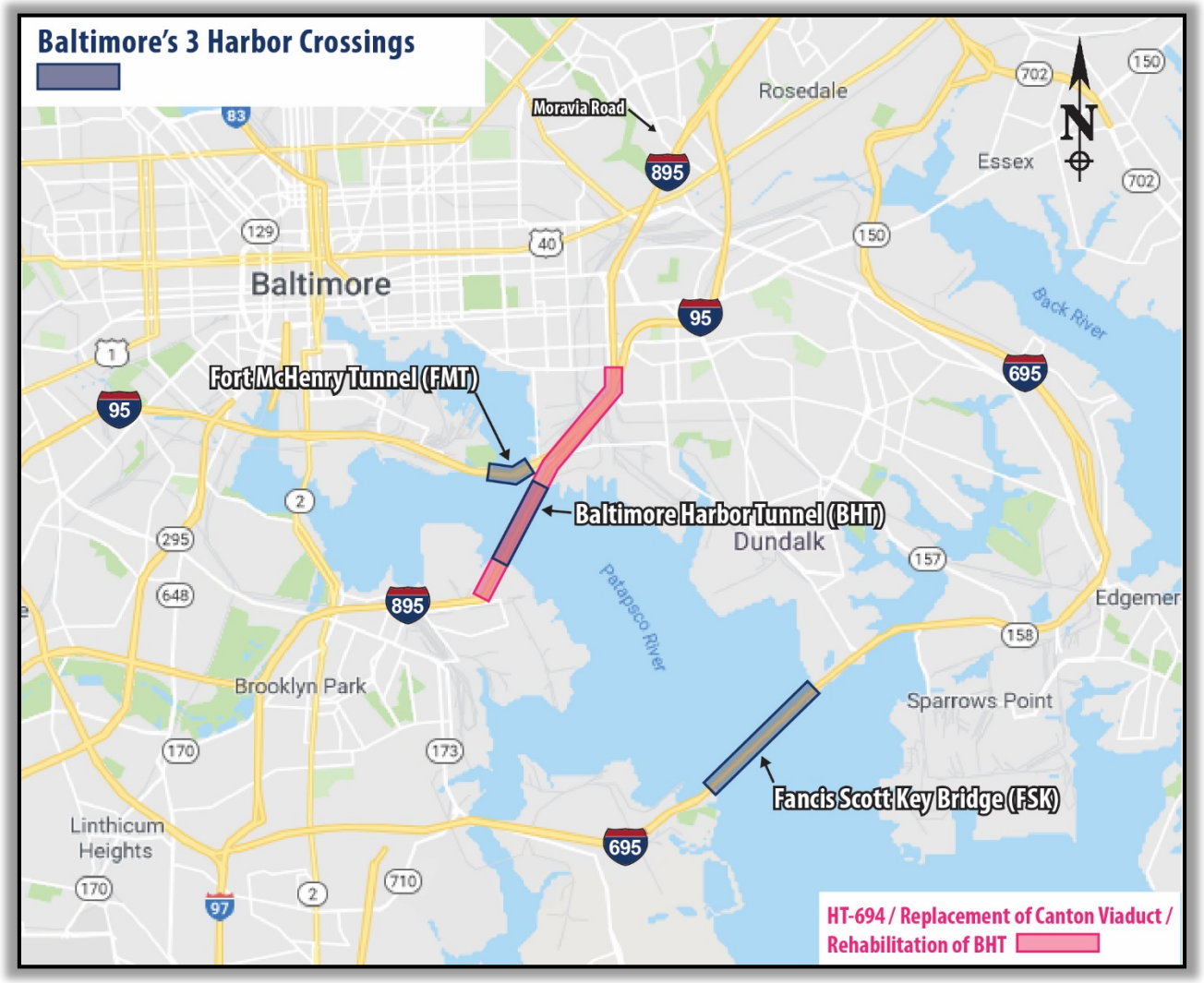
Project Limits:

- 1,000 FT South of Tunnel (MM 8.80) to Interstate Ave / Boston St (MM 11.65)
- Project will extend about 3 miles (bridge ~ ¾ mile long)

Scope of Work

- Replacement of Canton Viaduct
  - Complete replacement of the 60 year-old, Canton Viaduct and Holabird Ave. Ramp Bridges
- Rehabilitation to the BHT
  - Tunnel deck
  - Portal approaches and retaining walls
  - Interior tiles
  - Fire main and standpipe
  - Rehabilitation of tunnel approach roadway and retaining walls

I-895 – SWZ Overview



Schedule:

Advertisement: Summer 2017

NTP: April 2018

Main Bridge Construction: November 2018

Reduced Lanes only after I-95 Improvements complete

After Thanksgiving

Construction Complete: Summer 2021

Impacts & Other Project Scheduling

- 3 major harbor crossings
  - I-95 (Major North/South Route)
  - I-895 (Parallels I-95, Thruway)
  - I-695 (Baltimore Beltway)
- All harbor crossings are tolled facilities operated by MDTA

I-895 – SWZ Overview

- I-95
  - I-895 diversion route with excess capacity
  - FT-3003 / I-95 from Moravia Road to the Fort McHenry Tunnel
    - Capacity Improvements
- I-695
  - I-895 diversion route with excess capacity
  - KB-3003 / Maintenance and Repairs of Curtis Creek Drawbridges
    - Reduced capacity on I-695; Completed before Canton Viaduct Stage 2
- I-895
  - HT-2658 / I-895 Over Patapsco River Flats Superstructure Replacement
    - Reduced capacity on I-895; Already Encourages diversion from I-895

I-895 – SWZ Overview

Maintenance of Traffic -

- Stage 1
  - Two lanes each direction
  - Sub-stages 1A, 1A-1,1B and 1C
- Stage 2
  - One lane each direction (southbound bridge)
  - Closure of Holabird Avenue Ramp
  - Sub-stages 2A,2B and 2C
- Stage 3
  - One lane each direction (northbound bridge)
  - Sub-stages 3A, 3B-1,3B-2 and 3C
- Stage 4
  - Two lanes each direction

- Short Term Roadway Closures (Nights & Weekends)
- Long Term Roadway Closures (24/7)
- Two-way Traffic Operations in each bore maintained for majority of Stages

I-895 – SWZ Overview

I-895 Traffic Management System

GENERAL SYSTEM SPECIFICATION:

- The project utilizes Portable Traffic Sensors (PTS) and Portable Variable Message Sign(PVMS).
- PTSs and PVMSs used are self contained trailer mounted portable units.
- All PVMSs AND PTSs are proposed to use solar power.
- All PVMSs AND PTSs are proposed to communicate using cellular or wireless internet communications.
- All PVMSs incorporate a branding sign for the project as shown in the plans and specifications.
- The contractor was required to install the above devices for construction stages 2, 3 AND 4, including all associated sub-stages, OR as needed by engineer.

I-895 – SWZ Overview

- Contractor Installed/Maintained

  Operational for Stages 2,3 and 4

- Real-Time Congestion Warning

- Regional Deployment of Devices

  10 Portable Traffic Sensors

  I-895

I-895 – SWZ Overview

- Regional Deployment of Devices

13 Portable Variable Message Signs

I-895	– I-95
I-695	– I-97
MD 295	– MD 2
US 40	– Moravia Road

I-895 – SWZ Overview

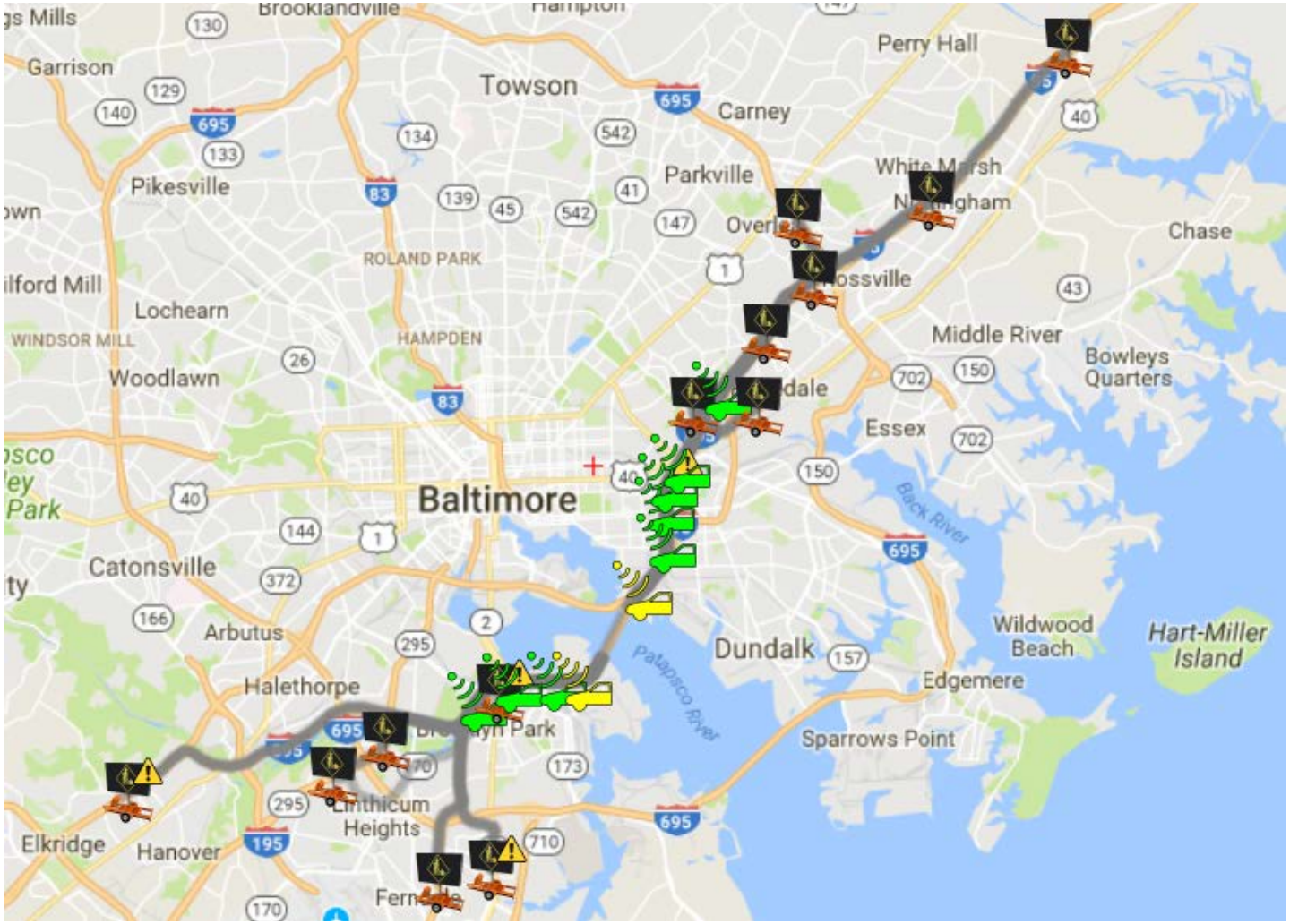
- Regional Deployment of Devices

13 Portable Variable Message Signs

I-895	– I-95
I-695	– I-97
MD 295	– MD 2
US 40	– Moravia Road

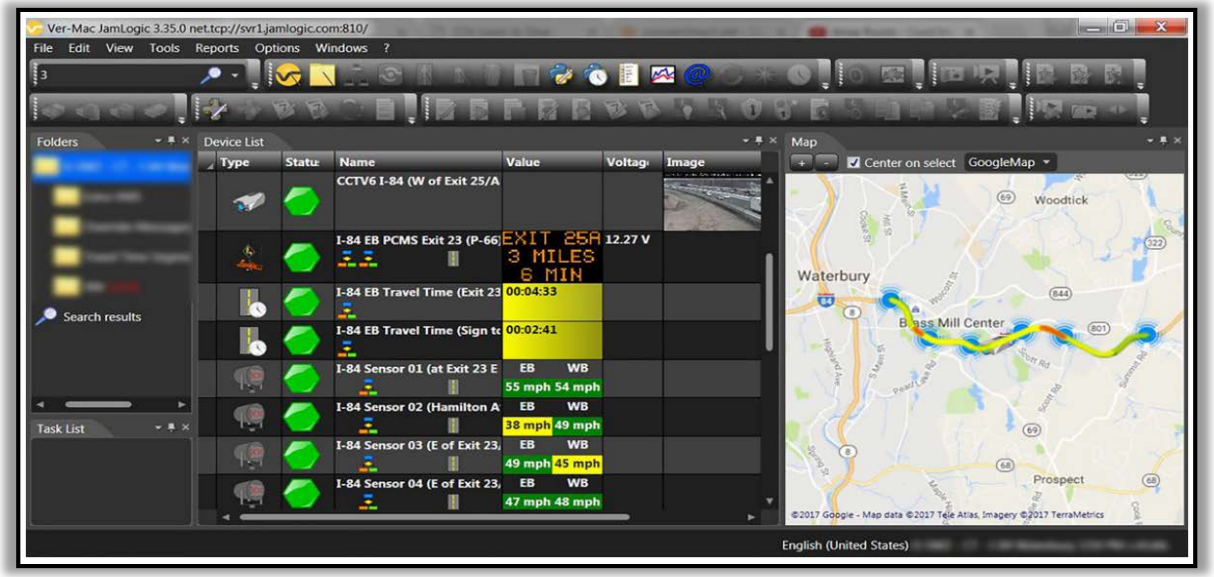
I-895 – SWZ Overview

System Map



I-895 – SWZ Overview

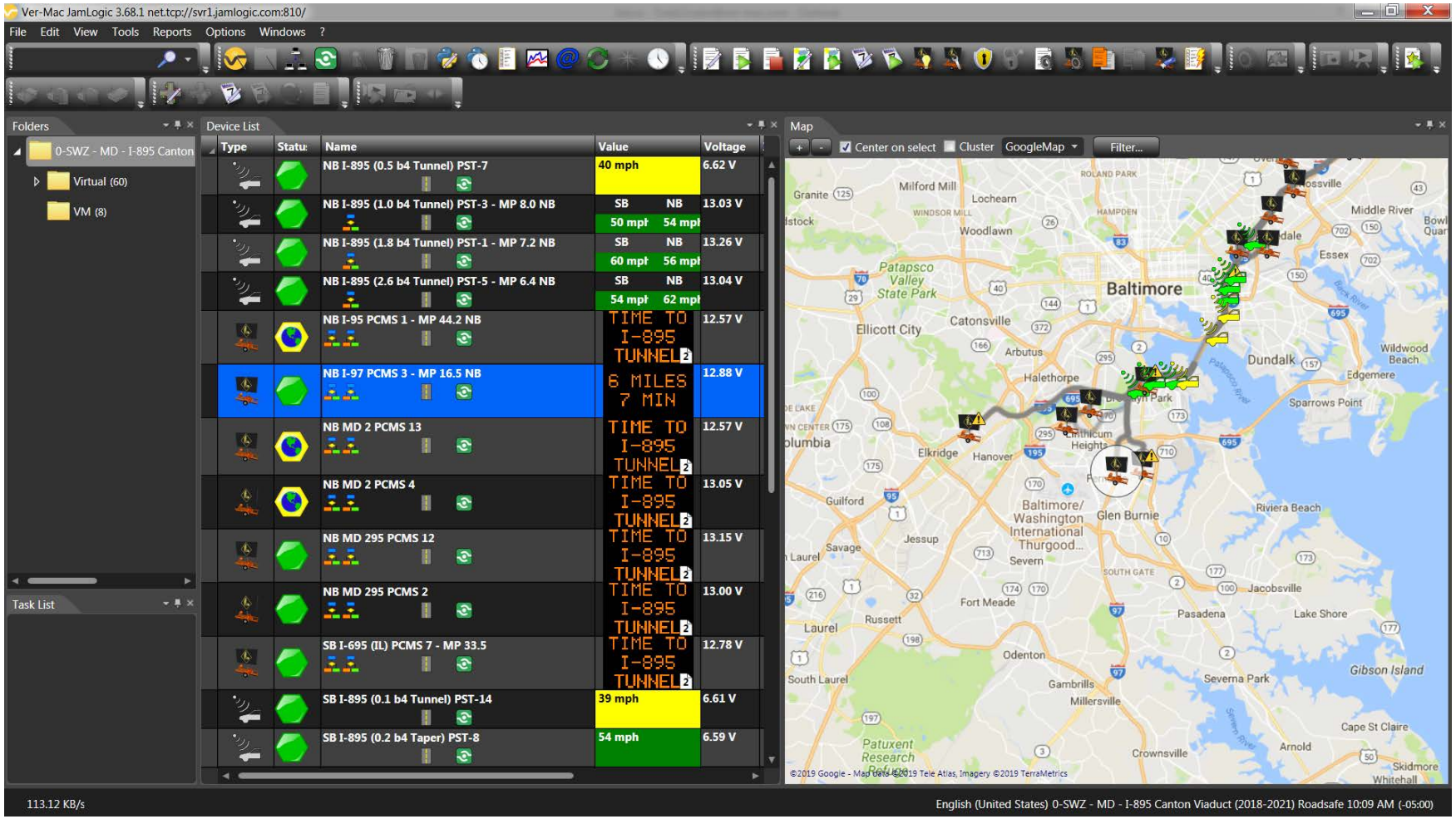
- Remote Data Collection and Automated Data Processing
  - Speed Thresholds
  - Volumes
  - Lane Occupancy
- Web-based System Management
- User Notifications
  - Email or Text
- MDTA System Override
  - Avoid Conflicting Messages



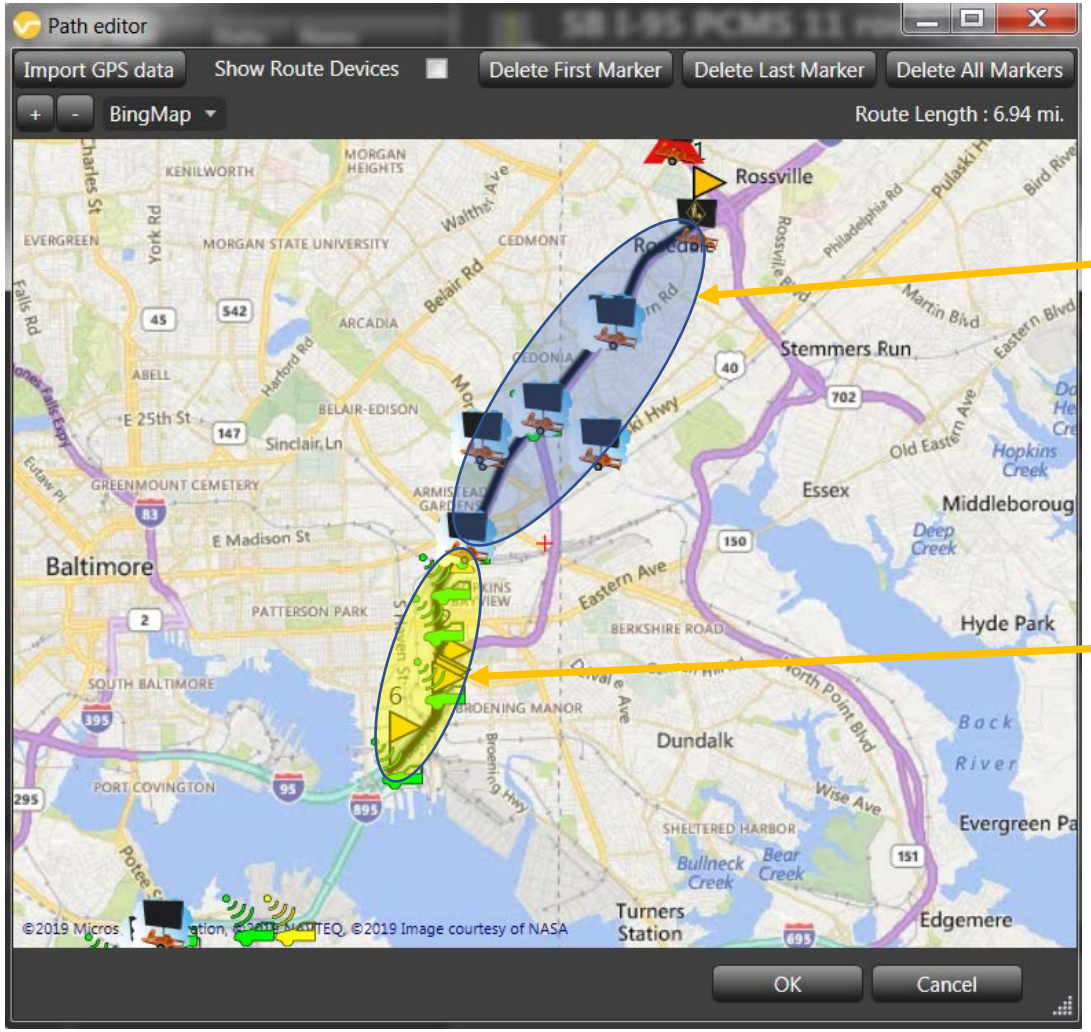
I-895 – SWZ Overview

- Penalties for Non-Operational System
  - $2,500 per day first 10 days
  - $5,000 per day every day after 10
- Project "Branding"
- Contract Unit Cost
  - $690,000 Lump Sum

I-895 – SWZ Overview



I-895 – Hybrid Routes



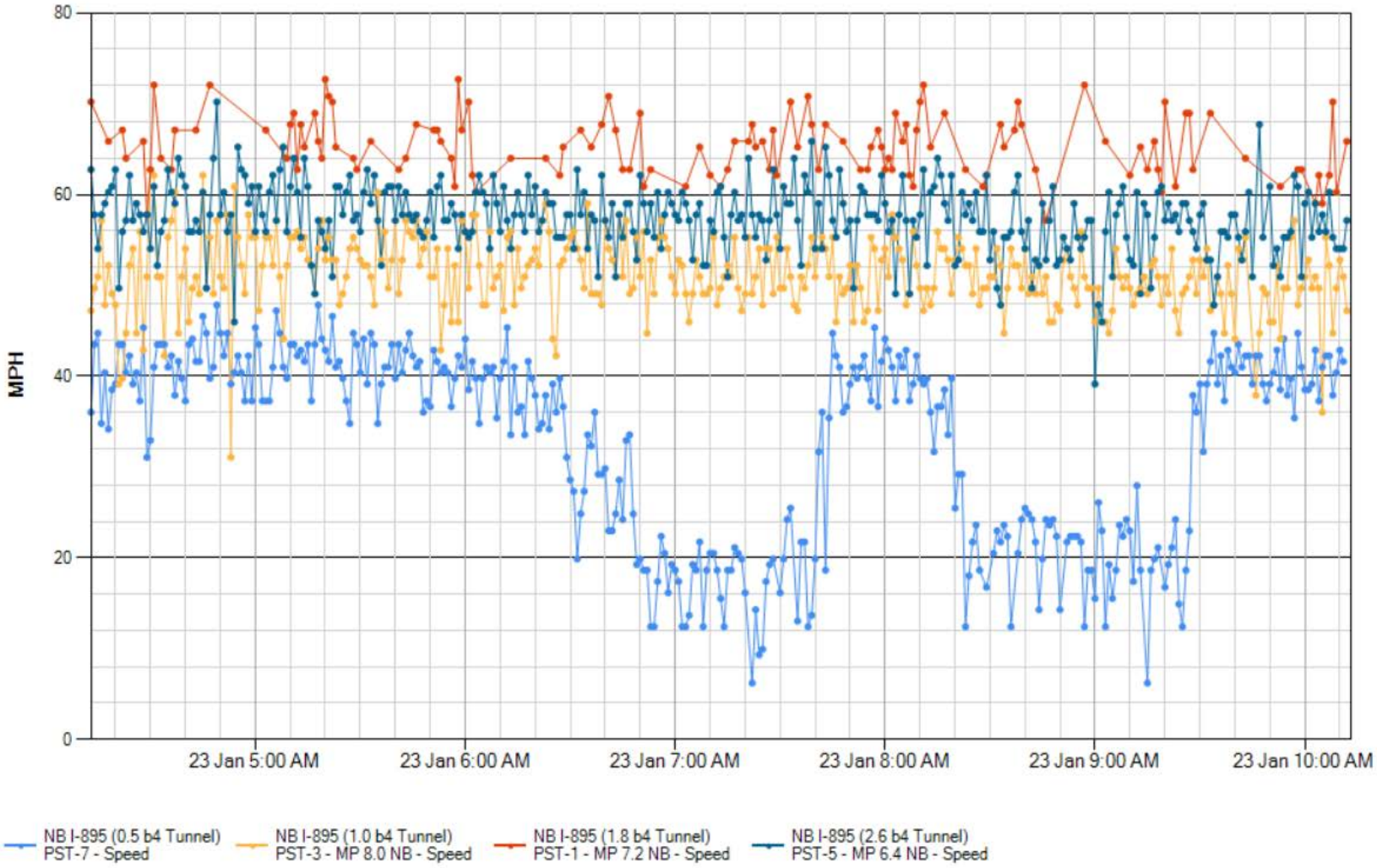
3rd Party TT Data
(From PCMS to Sensor)

Combined 3rd Party & Portable Sensor Route

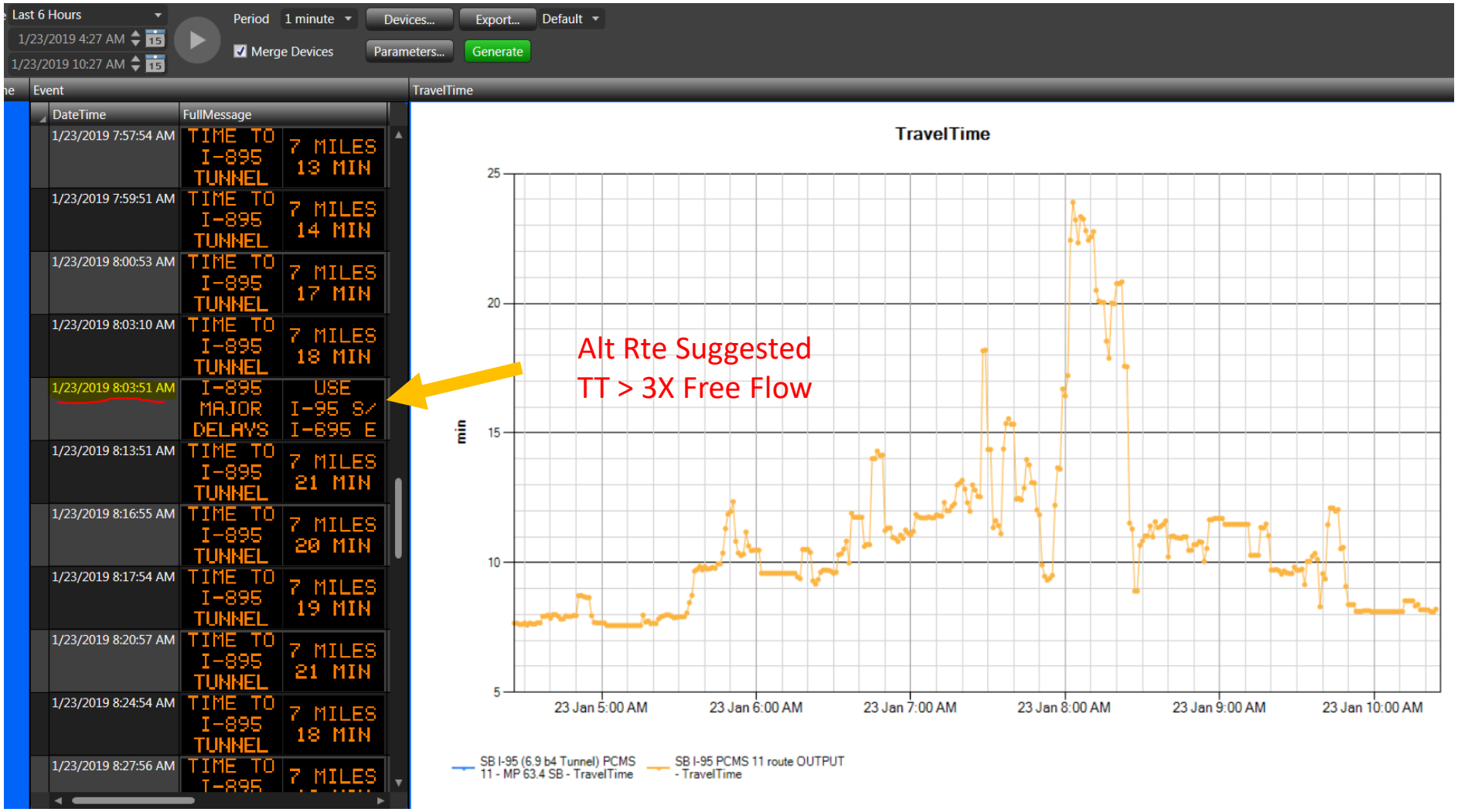
Portable Sensors
(From Closest PCMS to Tunnel)

Results in Cost-Effective Best Travel Time Data

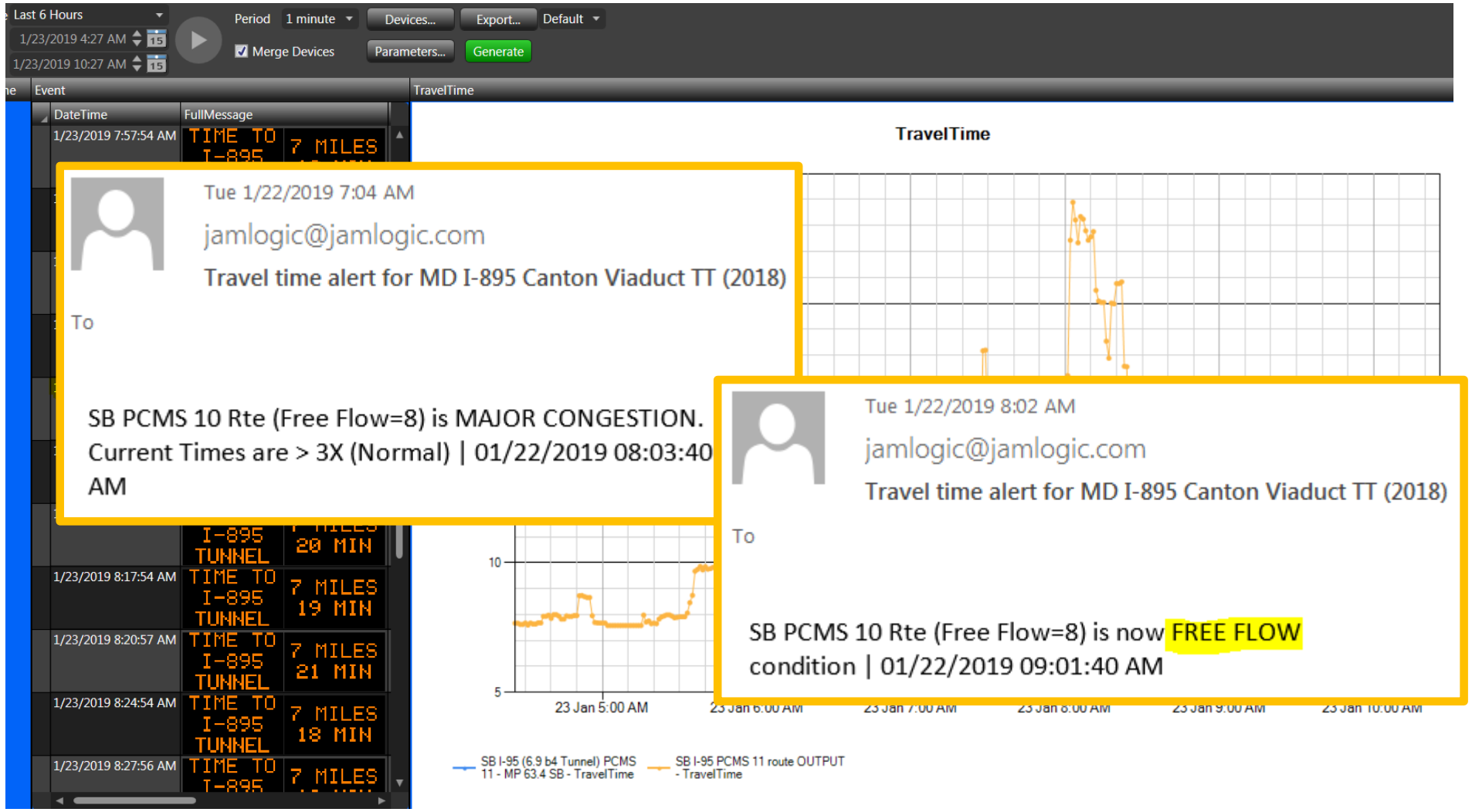
I-895 – Real Time Sensor Speeds



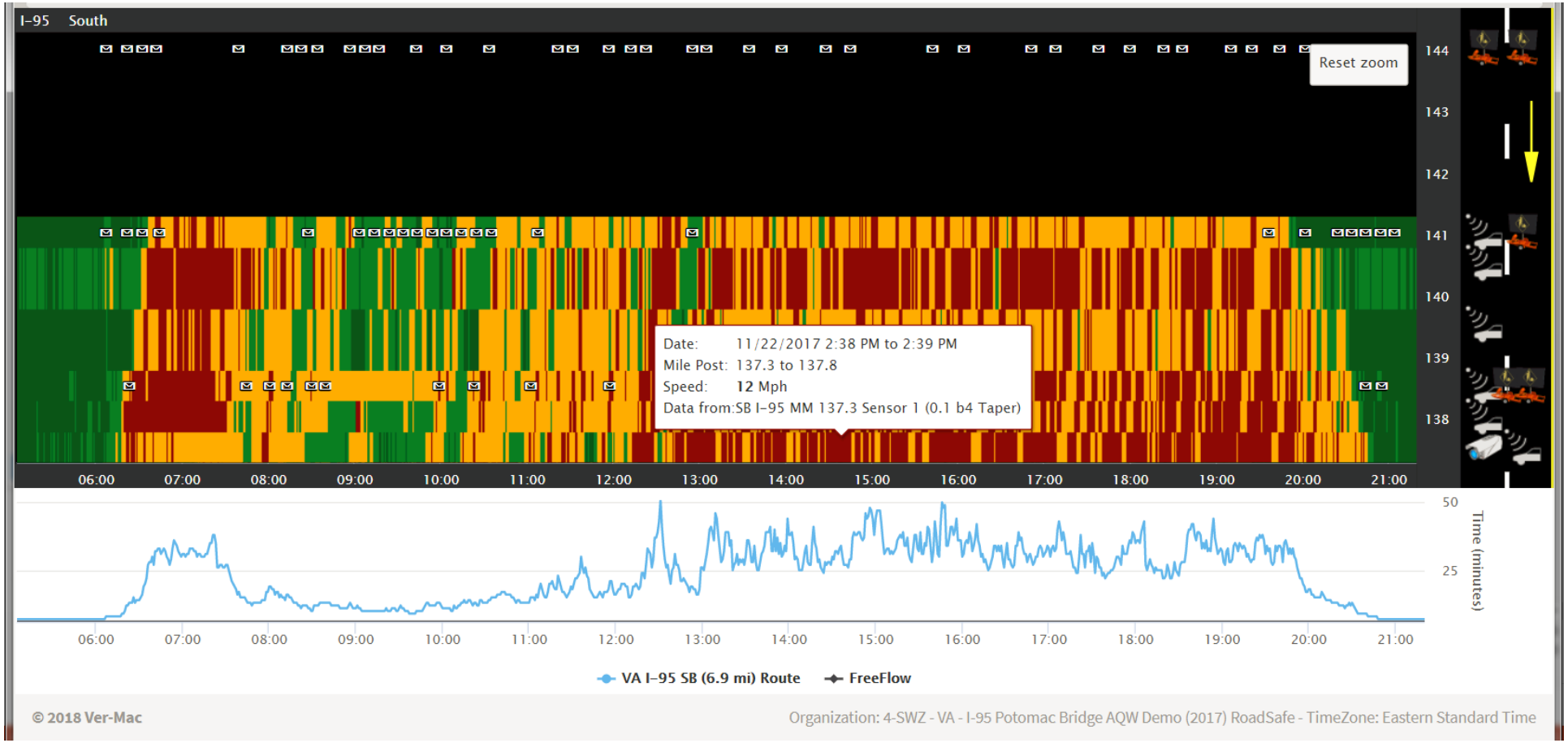
I-895 – Message History & TT Data



I-895 – Automated Alerts to TMC



SWZ – Heat Map Reports



SWZ – Heat Map Reports

See All Message Sign Change History

Hover Over Any Sensor Speed to See Details