

The Vehicle Probe Project Bi-Annual Program Update



What is Available

- **Monitoring Site**
- **Data Feed**
(real-time access for integration into applications)
- **Data Archive**
(1-min archive)
- **VPP Suite (Performance Measures) and Archive**
(real-time & historical tools for operations and planning)



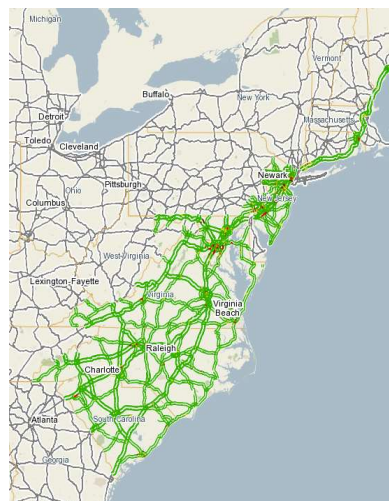
How it is Used

- **Operations Center**
(Real-Time Traffic Monitoring)
- **TMC Software Integration**
- **Cross-border Incident & Traffic Monitoring**
- **Travel Times on**
 - Signs
 - Websites
 - 511 IVR
 - Traffic Tile Overlay on 511 Site

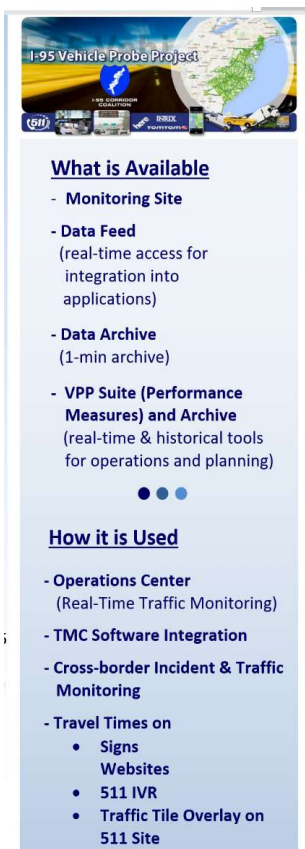
*A Traffic Probe Data Marketplace for State Partners
Overseen by the I-95 Corridor Coalition and University of Maryland*

“The VPP works with a “traffic probe data marketplace” first created in 2008. Three highly qualified vendors (HERE, INRIX and TomTom) were selected by a team of agency members to provide data to agencies at a cost that was negotiated by the Corridor. The data is subjected to rigorous validation for reliability. In addition, all data, regardless of vendor, is available to each of the participating agencies providing a truly shared effort.”

“The use of the marketplace results in a savings of 55 - 62% per lane mile from free market pricing” depending on vendor.



Agenda



(Technical) Validation Program Status Update

- 2018 Status – Year in Review
- 2019 Status- Next six months
- Technical Process Change Request
- Quarterly Report Formatting Update

(Marketing) Program Status Update

- New Ancillary Products (Inrix, HERE, TomTom)
- Website Update
- Data Use Sharing Agreement

(Contracting) Finance Update

Process Change
Quick Start Sheet
New RFP
State Contracts

Technical

✓ ***2018 Validations Year in Review***

✓ ***Completed Reports***

State	Route	Month Completed
Georgia	I-75	February
New Jersey	US 1/ US 9	April
Maryland	US 40	June
North Carolina	NC 55	September

<https://i95coalition.org/projects/vehicle-probe-project/>

Technical

✓ ***2019 Planned Validations***

✓ ***Six month look out***

State	Route	Planned Month
Georgia	SR 21/80	February
Pennsylvania	US-22	April
New Jersey	TBD	Spring
Arterial Report Update	N/A	June

Technical

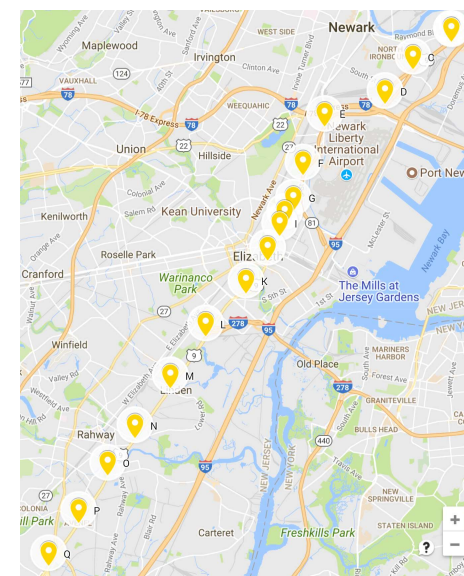
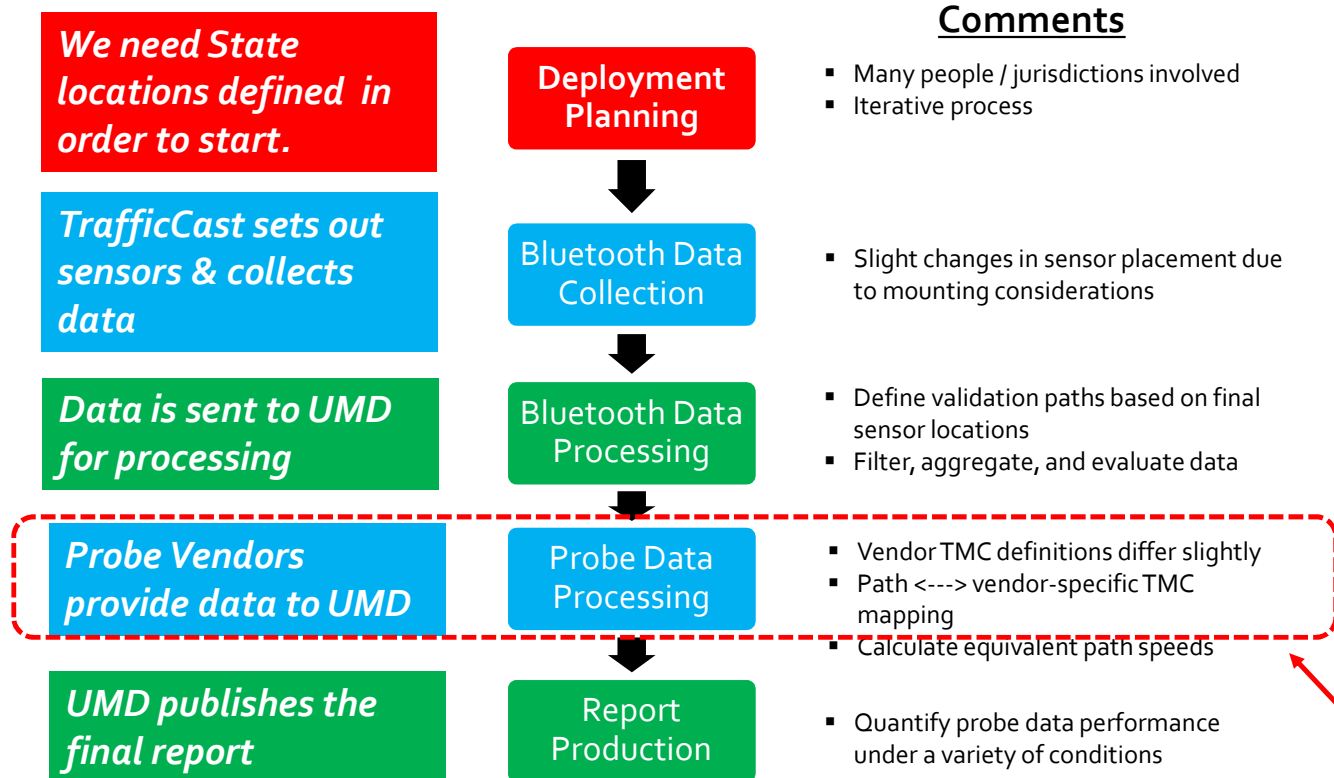
✓ The Arterial Report

What does this mean?

- ✓ The arterial report would provide an update to an original report published in 2015 (see www.i95coalition.org) under the VPP section which investigated the quality of INRIX probe data on arterials based on a number of separate validation efforts.
- ✓ The update on the report would focus on tracking trends in both traditional validation metrics and slowdown metrics since 2015, and additionally include results for two additional probe vendors (HERE and TomTom)

Technical

✓ Major Steps in the Data Validation Program



Room for improvement!

I-95 Corridor Coalition – VPP Validation

Technical

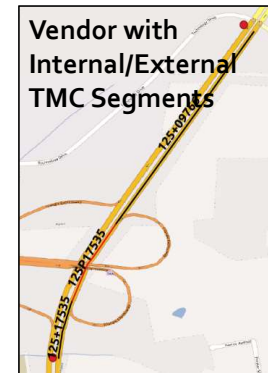
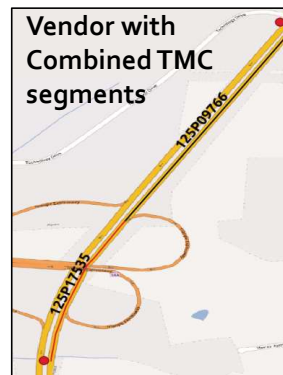
✓ Probe Data Processing Step

✓ Challenges

Goal: Compare vendor speeds to observed ground truth speeds on the **same road segments**

Challenges:

- Vendor segments (TMC-based) not the same as validation segments (defined by sensor locations)
 - Need to calculate “equivalent vendor speed” on validation segment
- Vendors already have slightly different TMC segment definitions (see below)
- Vendors now have more spatially granular data available level (e.g., XD, sub-TMC)



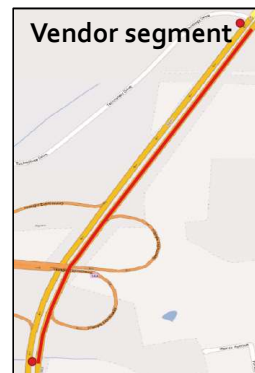
Technical

✓ Probe Data Processing Step

✓ Improvement Opportunity

Proposed Solution: Ask vendors to report speeds on **validation segment** geometry

- *Note:* we will not share ground-truth re-identification data with vendors until after the evaluation



Potential Benefits:

- Apples-to-apples comparison across vendors (all would report at the same granularity)
- More transparency (vendors would directly report speeds on the segments for which they will be evaluated)
- Easier for vendors to identify areas of weakness and improve their algorithms
- Speed up the validation process!

Technical **✓ Quarterly Reporting**

October 2018 Quarterly I-95 Corridor Coalition VPP Validation Status Report

- ☐ January, April, July, October
- ☐ Every state will be on the same page
- ☐ Using the PennDOT template
- ☐ Provided via email from Kathy Frankle

July

- The Maryland report was finalized and uploaded to the I-95 Corridor Coalition website.
- Bluetooth data from North Carolina was processed and probe vendors were contacted for speed data.
- Investigation and planning began for potential sensor locations for deployments in Pennsylvania and Georgia.

August

- Both standard validation and slowdown analyses were conducted and finalized for North Carolina and a draft report was prepared.
- Work began on O-D and travel time analyses for a supplemental North Carolina report.
- Coordination continued with Pennsylvania and Georgia DOTs to identify locations for upcoming fall validations.

September

- Final edits were made and the standard North Carolina validation report was completed and uploaded to the I-95 Corridor Coalition website.
- Work continued on O-D and travel time analyses in North Carolina and the draft supplemental report was begun.
- Sensor locations were submitted for an October deployment in Georgia and a November deployment in Pennsylvania.

October

- The draft of the supplemental O-D / travel time analysis report for North Carolina was completed.
- Sensors were deployed and began collecting data on arterial roads near the Port of Savannah in Georgia.
- Collection and organization of data from previous arterial validations was started in preparation for an updated report on arterial data quality performance over the last few years.

Marketing

- ✓ ***New Ancillary Briefs***
- ✓ ***HERE * INRIX * TomTom***

Modifications to current contracts:

- ✓ **Inrix in place**
- ✓ **HERE awaiting pricing for modules**
- ✓ **TomTom – mods and pricing almost complete**



****These Options are added as part of Task 1 in the Work Plan /MOU now.**

Version 2.0: I-95 Corridor Coalition Vehicle Probe Project Marketplace



NPMRDS Extensions – HELP Dangerous Slowdowns – Trip Reports (See new ancillary products listed below)



INRIX's VPP contract includes negotiated pricing for core real-time traffic data services and five additional Ancillary Products available as separate options independent of the core service. These prices are the best available from INRIX for these services, discounted from standard pricing for Coalition members. Core services are scaled by road mileage and type, with a large discount for statewide coverage. Ancillary products vary in pricing based on population of state/region to be covered – all immediately available.

The Inrix "Core Bundle" What is included with your probe data procurement?

- ✓ An agency selects and funds road coverage based on pre-agreed pricing.
- ✓ Any Coalition member agency with an executed VPP Data Use Agreement (DUA) gets access to the multiple real-time data services for all licensed roads, updated every minute, for ATMS and ATIS/511 Integration:

Segment-based Speeds/Travel Times
Configurable Dynamic Traffic Maps
Incidents, including formatted congestion/queue information

- ✓ All real-time data licensed above can be archived.

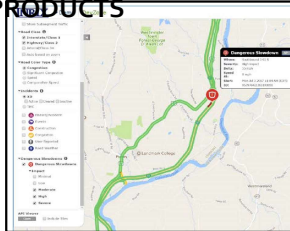
- ✓ Staff/support contractors for all Coalition members with an executed VPP DUA can use for free the INRIX VPP Traffic Monitoring Site (<http://i95.inrix.com>) which is designed for operations center use, auto-refreshing real-time traffic conditions across the entire US.



- ✓ All available data services are defined in detail in the INRIX I-95 Interface Guide: http://i95coalition.org/wp-content/uploads/2015/02/I-95_VPP_II_Interface_Guide-March_2018.pdf?x70560

- **HELP (Highway Emergency Link Platform)** uses mobile Wireless Emergency Alerting (WEA) to establish two-way communication between agencies and people who are stranded in a trapped queue.
- **Dangerous Slowdowns API** delivers safety-focused alerts to augment current data or a stand-alone option for rural state.
- **Trip Reports** offers GPS breadcrumb data for complete trips to, from or through a region of interest to support transportation/freight planning and project assessment.
- **XD Segment Traffic Archive Data Downloader** provides a cost-effective option to archived speed/travel time data at a fraction of real time data fees.
- **National Performance Management Research Data Set (NPMRDS) Extensions** offers additional datasets to extend and expand the utility of the dataset available from USDOT required for federal performance measures reporting.

NEW ANCILLARY PRODUCTS

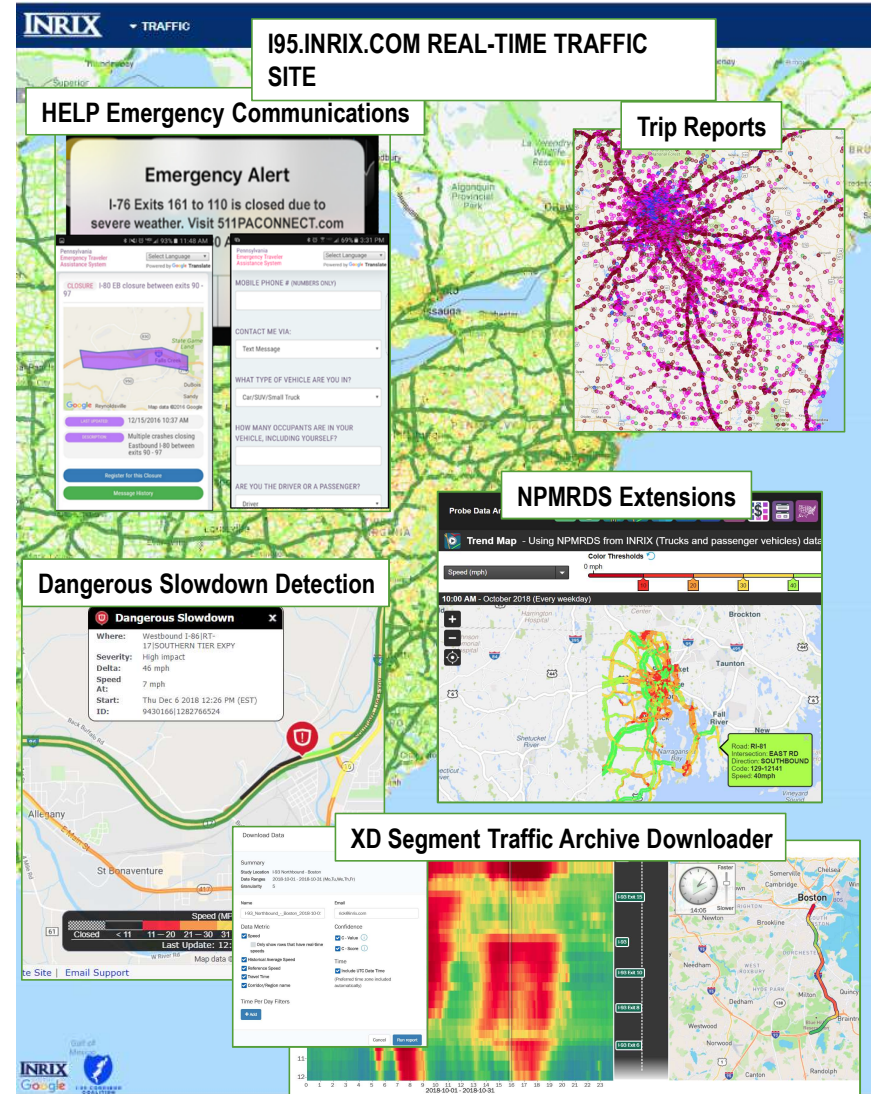


Dangerous Slowdown API


From the outset of VPP, the Coalition has supported a 'one agency pays, all agencies can use' model. Any member agency (including affiliate members) of the Coalition, neighboring agencies and partner agencies can access/use an INRIX, HERE or TomTom dataset licensed through the I-95 CC VPP Marketplace with no additional fees, so long as they have an executed VPP Data Use Agreement. Contractors/consultants working for any member agency with an executed DUA that ties back to that member agency can also use this same data at no additional cost.



December 2018



Version 2.0: I-95 Corridor Coalition Vehicle Probe Project Marketplace



HERE Speed Limits – Split Traffic Reporting HOV Non-Barrier Separated Lanes – Hazard Warnings Automated Road Closure Detection – iPeMS Analytics

See Ancillary Product information below

HERE's VPP contract includes negotiated pricing for core real-time traffic data services and additional Ancillary Products available as separate options independent of the core service. These prices are the best available from HERE for these services, discounted from standard pricing for Coalition members. Core services are scaled by road mileage and type, with a large discount for statewide coverage.

The HERE "Core Bundle" What is included with a statewide probe data procurement?

HERE Traffic Service /HERE Real Time Traffic delivers up-to-the-minute information about traffic conditions and incidents. It helps drivers by improving the accuracy of arrival times.

Traffic Analytics: Speed Data and Trip Data is a suite of data products that help enterprise and government customers make informed decisions such as road network performance.

HERE Location Platform (Application Programming Interfaces (APIs) and Software Development Kits (SDKs) for native mobile operating systems) delivers global location based services that can bring location-intelligent products and services to the market. HERE Platform features and functionalities are offered through seven key components: Maps, Geocoder, Direction, Places, Traffic, Transit and Visualization.

ANCILLARY PRODUCTS

HERE Speed Limits on Roadways enables applications to advise users against traffic speed violations or traffic restrictions as it warns users about the maximum permitted speed on a road.

Split Lane Traffic Reporting at Junctions: The advanced algorithm of this GPS based technology is the first to detect divergent speeds and report traffic conditions on a multiple lane level before a junction.

HERE HOV Non-Barrier Separated Lanes: HERE's new feed provides HOV lane level traffic flows on roads with HOV lanes that are non-barrier separated, these lanes are not physically separate from the standard lanes (for example, separated only by painted lines)


Hazard Warnings - Directly from Connected Vehicle Sensor Data: HERE Hazard Warnings provides information to notify drivers and C-ADAS applications about potential road hazards in real time. The data can be used for the following use case warnings:

- ☐ Accident – Broken-down vehicle – Slippery road – Reduced visibility – Heavy Rain – Fog

Automated Road Closure Detection: Using complex artificial intelligence, this service detects unreported closures. In addition, the HERE Incident Management Center validates and corrects closures that road authorities publish.

HERE Reversible Express Lanes: HERE is the only service to report congestion on roads with changeable direction, indicating which way traffic is flowing. This enhancement enables drivers to make more intelligent routing decisions and improves ETAs


Advanced Traffic Analytics Functions w/ iPeMS: New product functionality: (Map Animations & Favorites, Bottlenecks, Incident Integration, Reliability Index Map feature, Congestion Cost Reports, Hyperlocal weather, Regional Dashboards



Data Sharing

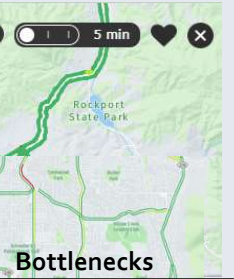
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iPeMS Analytics

Legend:
● Fast + Reliable (TTI < 1.4, BTI < 0.6)
● Fast + Unreliable (TTI < 1.4, BTI > 0.6)
● Slow + Reliable (TTI > 1.4, BTI < 0.6)
● Slow + Unreliable (TTI > 1.4, BTI > 0.6)



Bottlenecks

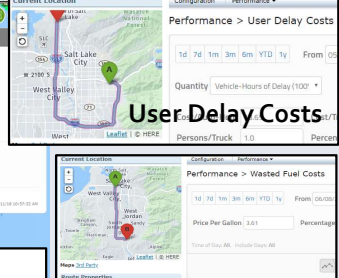
Queue Length: 6.24 mi
 Delay: 12.2 minutes
 Heat of Lane: 118 @ 1000-1250 NMS



Iteris Clear Path

Current Location: Salt Lake City

Forecasted:
☐ Liquid Precipitation: Next 24 Hours
☐ Snow Accumulation: Next 24 Hours
☐ Reduced Visibility: Next 24 Hours

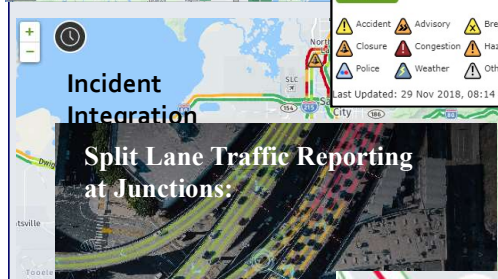


User Delay Costs

Performance > User Delay Costs

Quantity: Vehicle-Hours of Delay (100%)

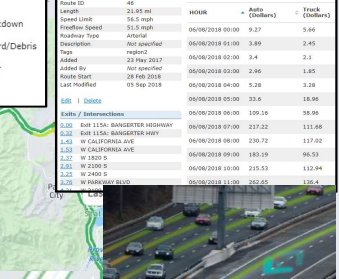
Price Per Gallon: 3.01




Incident Integration

Incidents:
 Accident, Advisory, Breakdown, Closure, Congestion, Hazard/Debris, Police, Weather, Other


Last Updated: 29 Nov 2018, 08:14




Split Lane Traffic Reporting at Junctions:




Hazard Warnings – Directly from Connected Vehicle Sensor Data:



Automated Road Closure Detection:

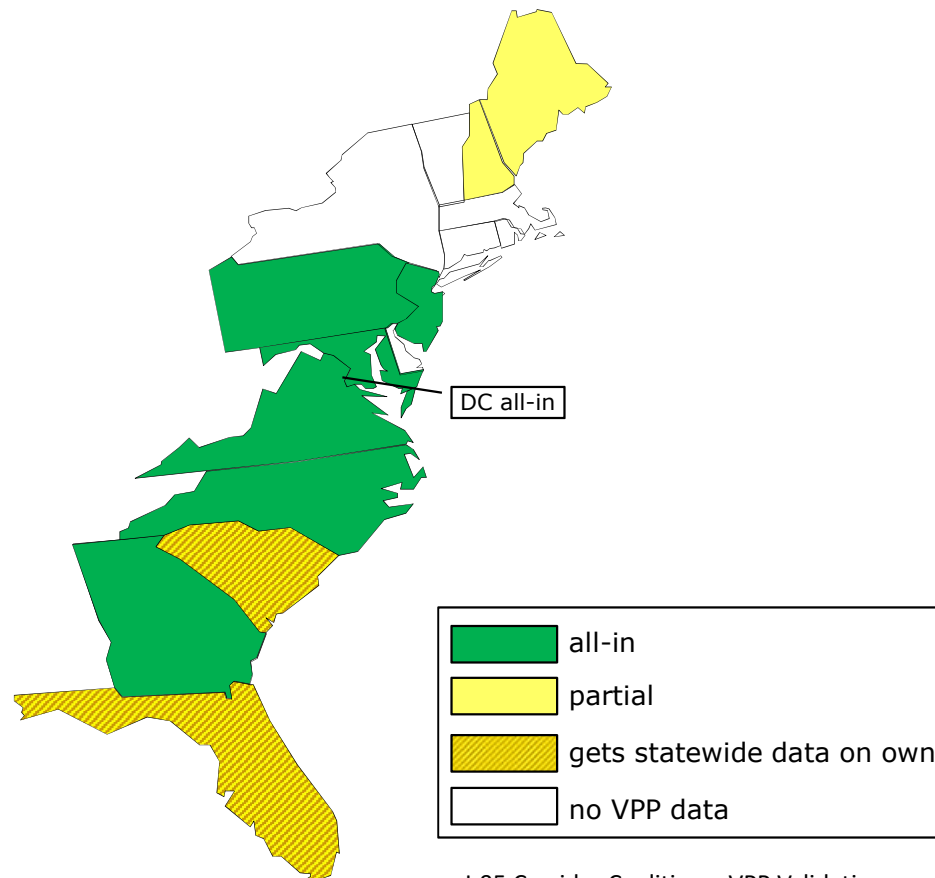


HERE Reversible Express Lanes:



Marketing ✓ Website Updates

I-95 Corridor Coalition Probe Data Coverage



December 17, 2018

Overview of Summary Coverage for Participating States

I-95 Corridor Coalition - Vehicle Probe Project II				
Coverage Summary Table				
State	Freeway	Arterial	Total Miles	Description
Maine	254	0	254	Coverage on I-95 & I-295
New Hampshire	215	0	215	Coverage on I-95.93, Spaulding, Everett TPKs
New Jersey	920	8,476	9,396	State is all-in
Pennsylvania	2,752	20,435	23,167	State is all in.
Maryland	785	6,284	7,069	All in. Redundant coverage on select corridors
Virginia	1,571	15,974	17,545	State is all-in
North Carolina	1,716	12,834	14,550	State is all-in
South Carolina	979	10,167	11,146	State is all-in
Georgia	1,411	14,331	15,742	State is all-in
Total	10,631	88,842	99,473	

Marketing

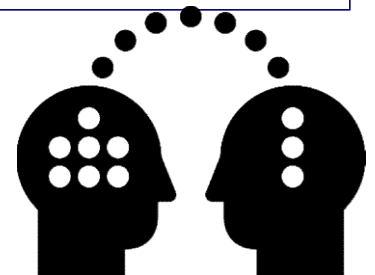
✓ Data sharing – Data Use Agreement

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Contractors/consultants working for any member agency with an executed DUA that ties back to that member agency can also use this same data at no additional cost.

“Currently this applies to travel time and speed data only”



Contracting/Finance

- ✓ **Direct Invoicing**
- ✓ **UMD Waiver Reduction**

The Coalition is looking at two options for future invoicing:

- 1. Direct Billing to the Coalition for probe data only.
(This is the same process as what is done with membership dues.)*
- 2. Billing through the University contract.
(This is the current process and includes*
 - *Task 1 (Probe Data)*
 - *Task2 (Validation)*
 - *Task 3 RITIS platform.*

The Coalition is currently in negotiation with the University to reduce the charges associated with current contracting. A decision is expected in January.



Contracting/Finance

✓ Quick Start Sheet Update





So... your agency is interested in obtaining access to the Vehicle Probe Project (VPP) Data?

Now what do you do?

Quick Start Sheet

First, check to see if the roads in which you are interested are covered by the VPP. Contact Kathy Frankle (UMD) at kfrankle@umd.edu to find out. Then, apply the following steps to gain access to ANY data within the VPP.

NOTE: ONCE ANY DATA IS PURCHASED UNDER THE VPP CONTRACT, EVERY MEMBER AGENCY HAS FULL RIGHTS TO ACCESS AND USE IT REGARDLESS OF THEIR LOCATION.

Step 1	Step 2
<p>Not a member of the I-95 Corridor Coalition? Your agency first needs to become one.</p> <p>Send an e-mail to Trish Hendren requesting membership in the I-95 Corridor Coalition (please copy Patty Reich). Eligibility requirements are provided on the Member Eligibility section of the Coalition website. You will receive a response in less than one week.</p> <p>Dr. Patricia Hendren phendren@i95coalition.org</p> <p>Patty Reich preich1@i95coalition.org</p>  <p>I-95 Corridor Coalition Beyond Boundaries</p>	<p>Execute a Data Use Agreement to use the Vehicle Probe Project Data</p> <p>Signing the Data Use Agreement (DUA) does NOT commit you to purchasing data – it simply extends the data license to your jurisdiction. Click here for the DUA.</p> <p>Completed DUAs should be submitted to Karen Swick (UMD) at kswick@umd.edu. Processing of DUAs could take up to 2 weeks as multiple legal entities must counter-sign the agreement.</p> <p>Questions regarding VPP contracts or DUAs should be sent to Kathy Frankle.</p> 
<p>Please note that Steps 1 & 2 need to be completed only once per organization. Universities and consultants are not eligible for Coalition membership; however, universities and consultants working for a Coalition member on a project requiring access to VPP data may be granted access for that specific project. Please work with your agency to obtain the needed approval and complete 'Attachment A' along with the Data Use Agreement.</p>	

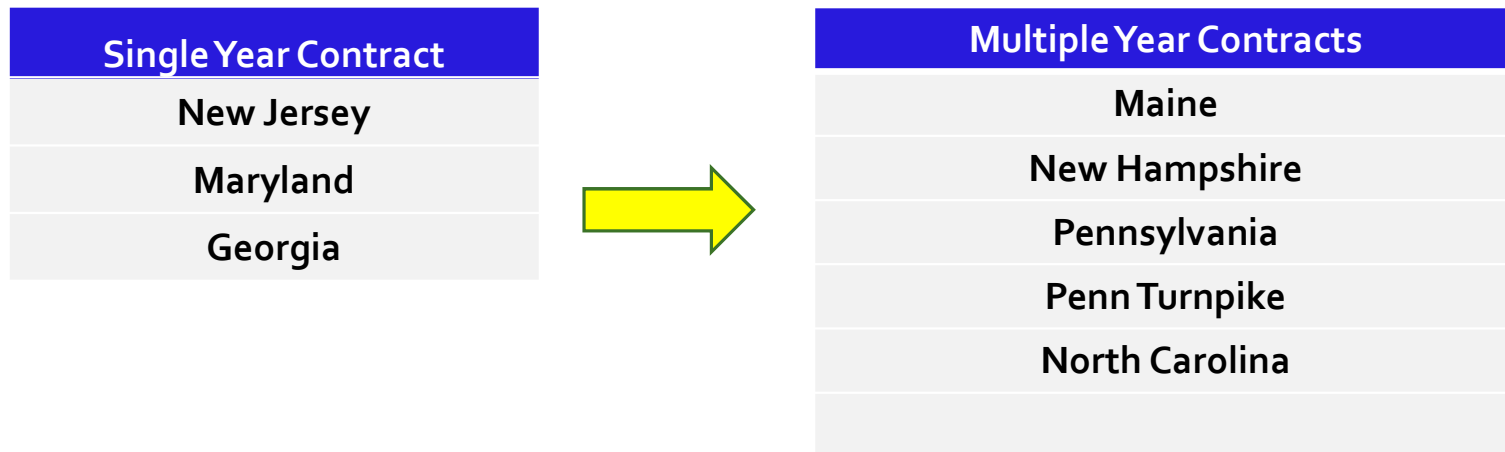
December 17, 2018

<https://i95coalition.org/projects/vehicle-probe-project/>

17

Contracting/Finance

✓ State Contracts (one year versus multiple years)



Is there an interest in moving to a multiple year contract?

Additional General Info

- ☐ **RITIS is managed by CATT not I-95 even though the MOU's contain both. RITIS is typically labeled Task 3.**
- ☐ **Do you want an update on Validation to be incorporated into the PDA/User Group meeting scheduled for this coming January/February?**

QUESTIONS??
Thank You