



## Vehicle Probe Project II

The second generation of the I-95 Vehicle Probe project, (VPPII) begins August 1, 2014. The program is a large step forward in providing a robust traffic monitoring system, building on the original Vehicle Probe Project (VPPI) to support not only operations, but also planning, performance measures, and engineering. One of the significant changes in VPPII is the creation of a traffic data marketplace for the delivery of probe data, allowing agencies to best meet their traffic data and information needs while still maintaining uniform data use rights, common real-time situational awareness in the corridor for incident response and traveler information, and consistent data standards to support performance measures and planning using best-practices Coalition wide. The Coalition management team has prepared this fact sheet to compare/contrast the critical aspects of VPPII to the original Vehicle Probe Project.

The following tables provide a concise overview of the aspects of VPPII, anticipated to launch on August 1, 2014. The first table conveys programmatic and administrative aspects in contrast to VPPI. The second table provides an overview of the traffic data market place with three vendors (HERE, INRIX and TomTom) that were brought under contract, addressing how key technical and programmatic features will work in this new paradigm. Please relay any questions or comment to the I-95 Corridor Coalition via George Schoener ([geschoener@comcast.net](mailto:geschoener@comcast.net)) or Stan Young ([seyoung@umd.edu](mailto:seyoung@umd.edu)).

Attributes / Functions	VPPI	VPPII
<b>Objectives and Focus</b>	The VPPI primary objective was to provide a centralized traffic monitoring system along the eastern seaboard of the United States to support traffic operations and traveler information among Coalition members. The network emphasis was primarily on the system of freeways that interconnect the Coalition states.	The VPPII objective expands to include not only operations, but also embrace planning, performance measures, and traffic engineering. Similarly, the network emphasis is expanded to include both freeways and networks of major signalized arterials within the Coalition.
<b>Traffic Data Quality and Validation</b>	VPPI led the nation in specifications based outsourced probe data procurement. Freeway data quality was subject to validation and payment subject to penalties based on measured quality. Data quality on arterials was researched, but not subject to quality specifications.	VPPII builds on VPPI and recent advances in probe data, with higher quality specifications in terms of accuracy, timeliness and granularity. Specifications are in effect on freeways and major arterials. The validation program will continue to monitor data quality, publish reports, and calculate impact on vendor payments.
<b>Traffic Data Characteristics</b>	VPPI provided speed and travel time along with historical speed, freeflow speed and confidence indicators once every minute. Data was reported using Traffic Message Channel (TMC) codes for segment identification.	Traffic Data items will remain consistent with VPPI, with more optional parameters. TMC codes will remain the basis for reporting but may be augmented (specific to vendor) in order to provide sub-TMC granularity, and to provide data on roadways without TMC codes (such as when a new bypass opens to traffic.)



<b>Archive Data</b>	Archive data was available from the vendor in five-minute intervals, and available through the VPP Suite in one-minute intervals.	Archive data at one-minute intervals will be available from both the vendor and through the VPP Suite.
<b>VPP Suite</b>	The VPP Suite of analytical tools was developed during VPPI to provide efficient access to archive data from the program, and provide a selection of tools to analyze and visualize traffic performance. Development of the Suite is monitored by a Coalition committee, recommending updates and enhancements.	The VPP Suite will continue in VPPII under the same management. The primary change is that data from multiple vendors will be integrated. Analysis tools and visualizations will reflect the appropriate data set (as procured through VPPII) and the 'Massive Data Downloader' will serve archive data from any vendor procured through the VPP program.
<b>Data Rights and Licensing</b>	VPPI set the industry standard for liberal data use and licensing, allowing data to be used for any internal application, and to support external applications consistent with agency mission. Data is licensed in perpetuity, and once purchased all Coalition members have access. Signed data use agreements (DUAs) bind agencies to licensing terms, protecting against unauthorized use or access.	In VPPII, the same liberal data rights and licensing continues. As multiple vendors provide data in VPPII, the Data Use Agreement is being streamlined. DUAs pertaining to the new contracts will need to be signed by Coalition members. Members will only need to sign one DUA even if data is purchased from more than one vendor.
<b>Cost and Funding</b>	<p>Under VPPI data for freeways cost approximately \$750 per centerline mile per year. The cost for non-freeway data was ¼ the price of freeways. An 'All-in' option provided data on all TMC coded roadways within a jurisdiction for 25% more than the cost of freeways alone.</p> <p>The Coalition funded a core network of 1500 freeway miles, and states expanded coverage through state funds. In 2014, the VPP had grown to ~8000 freeway miles.</p>	<p>Data cost under VPPII are roughly half that of VPPI, with some variation by vendor. Cost is based on miles of urban and rural freeways, and miles of major and minor arterials (using HPMS roadway categorizations).</p> <p>The core network is no longer centrally funded; rather each state participates by purchasing its own traffic data. Funding for validation is included in the data costs (approximately \$10 per mile for freeways and major arterials.)</p>
<b>Management and Administration</b>	The Coalition provided central management, with technical support from CATT. A Project Team drawn from Coalition members periodically reviewed VPPII progress, technical issues, and validation results.	The model established under VPPI will continue.

The traffic data marketplace will provide Coalition members a variety of products from different vendors to choose from. Various technical and programmatic features of the VPPII as they relate to the traffic data marketplace, are highlighted in the table below.



Attribute / Function	HERE	INRIX	TomTom
Vendor Commonalties	<p>Overall the offerings from the three vendors represent a significant maturing of the outsourced probe data industry. HERE, INRIX and TomTom each demonstrated through their proposals and references the ability to meet the essential specifications of the I-95 VPP II, the delivery of travel time and speed data in real-time to meet the demanding traffic operations environment. In contrast to VPPI in which competing vendors were essentially all in prototype, each of these vendors have mature core products from which they will meet the needs of the Coalition members throughout VPPII.</p>		
Individual Strengths	<p>HERE's proposal addressed not only the core data elements of the real-time feed, but also reflected a strong understanding of public sector needs and applications. Their more than ten years in the industry as a traffic data provider (not just probe data) reinforces confidence in their data, their analytics tools, their traffic prediction technology and their ability to meet public sector expectations.</p>	<p>As the incumbent, INRIX has demonstrated its ability to provide quality, real-time probe data throughout VPPI, and continues as a leading provider of traffic data products to the public sector in North America. INRIX provides archive traffic data dating back to 2009, a comprehensive monitoring site used throughout VPPI, and innovations such as anticipated volumes derived from HPMS data.</p>	<p>TomTom has significant international experience providing probe data to public sector, auto, enterprise and consumer markets. Their product reputation and references are strong. The diversity of its probe data sources includes a mixture that may prove beneficial to achieve quality traffic data on arterial roadways.</p>
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<p><b>Proven Data Quality</b></p>	<p>All vendors in VPPII can reference measured accuracy based on objective criteria.</p>		
<p><b>Roadway Segmentation</b></p>	<p>HERE has subjected its data to testing procedures similar to that of the VPPI validation program with results that meet the VPPI quality specifications, and have committed to more stringent specifications under VPPII.</p>	<p>INRIX has a strong record of data quality resulting from the VPPI validation program, demonstrating they can meet and exceed the freeway specifications for data accuracy. Ongoing Coalition research on arterial data quality provides a baseline of industry capability.</p>	<p>TomTom has quality control and independent testing based on industry 'QKZ' methodology, a methodology which stresses accuracy from a user's point of view, comparing reported conditions to observed conditions as seen through the windshield.</p>
<p><b>Timeliness of reporting on new roadways</b></p>	<p>Each vendor supports the Traffic Message Channel (TMC) code standard. Each vendor also provides a method to obtain sub-TMC granularity when TMC codes provide insufficient granularity. In addition, each vendor provides a method to report traffic data on road segments which for which TMCs are not defined, this is particularly critical when TMC definitions are not immediately available as when newly constructed roadways are open to traffic.</p>		
<p><b>Latency</b></p>	<p>HERE dynamically sub-divides TMC's when varying traffic conditions are detected allowing for resolution down to 200 meters, and offers Dynamic Location Referencing that is not constrained to TMC boundaries.</p>	<p>In addition to sub-TMC segments, INRIX defines XD segments which have a maximum length of 1.5 miles, allows for resolution down to 800 feet, and is not constrained to roadways with TMCs.</p>	<p>TomTom's Open LR approach provides full flexibility to define custom segments, independent TMC segments and the base map.</p>
<p><b>Time Resolution Data</b></p>	<p>In VPPI, data typically was not available on newly opened roadways, awaiting creation of TMC codes by the industry. New roadways in Maryland and North Carolina lagged data coverage for years after being opened to traffic. Specifications within VPPII limit this time lag to a maximum of six months. All vendors relayed that TMC coverage is governed by the TMC standard process. In addition to pledging support for expediting the TMC process, each provides a method to obtain data on roadways independent of TMC codes.</p> <p>Latency is defined as the delay between the onset of a major slow down and when the slowdown is reflected in the data feed. Coalition members voiced that latency is one of the prime technical concerns to be addressed in VPPII. In response, VPPII limits latency to a maximum of eight (8) minutes and this will be periodically assessed in the validation program, creating another industry first in terms of confirming traffic data quality.</p> <p>Each vendor provides data at one minute intervals, which has emerged as industry norm.</p>		



### Real-Time Monitoring Sites

VPPI provided two websites from which to monitor traffic conditions along the east coast: the vendor provided monitoring website, and the VPP-Suite. The vendor monitoring site allowed Coalition members to view traffic conditions in any state within the Corridor and download archive data that had been purchased through the Coalition. The VPP-suite which was initiated as an archiving tool, grew to support a variety of analytical tools. The VPP-Suite also hosts a real-time map of traffic conditions reflecting the data received through the VPP program.

In VPPII, monitoring sites from each vendor and through the VPP-Suite will continue. Each vendor will provide a portal through which to view real-time speed and travel time for the Coalition and to download archive data. Likewise the VPP-Suite will capture all VPPII data from each vendor, and integrate the data into the VPP analytical tools. This include the real-time traffic map within the VPP Suite, which will reflect data from the traffic data marketplace as procured through VPPII.

Any Coalition member that has executed a Data Use Agreement will gain access to all monitoring sites.

### Ancillary Products

**HERE's** ancillary products include a variety of HERE map bundles and Iteris weather packages. The HERE bundles include the traffic bundle, the road configuration package, the transit bundle (available in major cities), and the map bundle. These bundles add a variety of attributes to the roadway segments. Iteris's weather packages include real-time radar and precipitation data, archived radar and precipitation data, and a weather forecasting interface.

**INRIX's** ancillary products include a variety of items. Historical data sets can be purchased back to 2009 in a variety of formats including the typical VPP format, flow profile statistics in 15 minute summaries, freight only statistics, and O-D data sets. INRIX provides alternate API's format (a TMC only feed, a TMC traffic-tile only feed, and a Real-Time System Management Information Program feed). State and county TMC GIS shapefiles, location reference translation data sets for XD segments, and statewide volume estimated based on conflated HPMS data are also available.

**TomTom's** ancillary product is an on-line tool with the ability to define individual roadway segments that yield traffic speed information including distribution of speeds.