



We make highways talk™

VI²M™



Vehicle Information in Motion

Web-based information management platform for commercial vehicle operations and traffic data collection.

The Internet of Things (IoT) meets Intelligent Transportation Systems (ITS) with IRD's Vehicle Information in Motion (VI²M™) system.

Historically, users have installed single-purpose solutions to meet their required ITS data needs - be it for Data Collection, Commercial Vehicle Operations (CVO), Weigh-in-Motion (WIM), Transportation Management, Road Weather Information (RWIS) or Toll. The data for each single-purpose system is saved in separate data sets and often processed locally, with integration being an afterthought.

The value of the information collected locally by those systems is often underappreciated. VI²M™ unlocks this value by providing a central data repository and data analysis solution that allows users to combine data from multiple sensor sites and local systems to create a complete network picture of activity. This not only helps improve underlying operations, but also addresses bigger challenges arising today in freight and general transportation mobility. VI²M™ provides a core platform of data services including standardized automated data quality checks, and reports tailored to the agencies' needs while satisfying all Federal or third party reporting guidelines.

User access to the VI²M™ data is web-based and cloud hosted with a widget based interface offering data query, reporting and visualization tools, supporting offline analysis and online monitoring, as well as user customizable quality checks.



► **VI²M™ Standard Features**

- Web-based information management system
- Examples of report capabilities:
 - > iAnalyze reports (IRD's core offline reporting tool with numerous reports)
 - > Reports on number of overweight vehicles outside of WIM station operating hours
 - > Summary reports on 'Out of Service' vehicles: total number of vehicles and the number of vehicles that are still being screened while in the 'Out of Service' state
 - > Summary reports on numbers and type of special permits
 - > Summary reports on numbers of vehicles passing/failing Interstate and Interstate screening rules
 - > Summary reports on numbers of vehicles being pulled in from Random and PRISM targeted compliance checks
 - > Real time sharing of 'Out of Service' vehicle status and violators at station level
- Customizable dashboards
 - > Site information and health widgets
 - > Data visualization widgets
 - > Map view of sites
- Foundation for straightforward addition of customer specific enhancements

System-wide Information

- Fusion of data from sensor sites/networks to create a network-wide picture of traffic
 - > Better targeting of enforcement operations
 - > Information to guide decision-making about operating hours at weigh stations and ports of entry
 - > Fill data gaps
 - > Provide actionable information for investment decisions
 - > Support freight mobility applications
- Correlation of sensor and third party historical and real-time data to provide additional valuable information
 - > For road network planning

- > To improve traveler information system accuracy
- > CV and passenger vehicle flow analysis during emergency situations such as evacuations

► **Applications**

Commercial Vehicle Operations (CVO)

- Integrated data from multiple sources into one web-based system
- Data sources can include:
 - > In-road sensors
 - > LPR & USDOT vehicle identification systems
 - > In-vehicle systems
 - > Data collection systems
- Site specific information
 - > Anomaly Detection and performance monitoring
 - > Historical reports of operations
- Web-based network level data
- Numerous reports covering operational performance as well as compliance check results at station level and network wide

Data Collection

- Collection of historical information from numerous site types (both IRD and third party):
 - > Data collection (permanent or temporary)
 - > WIM
- Web-based reporting
 - > Extensive library of Standard reports to satisfy agency and Federal requirements
 - > Scheduler for recurring reports
 - > Reports integrating data from multiple sources to provide additional information
 - > Online monitoring of relevant traffic parameters at site level
- Data quality
 - > Multiple levels of automated data quality checks



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