Verizon Intelligent Traffic Management (ITM) Basic provides a flexible, easy-to-use user interface to measure, report and compare travel times, delays and traffic distributions for urban arterials or freeways. The reports are based on matching and filtering anonymized Media Access Control (MAC) records from devices found in moving vehicles.

**Managed service solution**
Verizon ITM Basic is a cloud-based, software-as-a-service alternative that helps remove the headaches of supporting expensive field hardware, networks and servers. This solution includes design, installation, communications, server-hosting, system-monitoring and maintenance functions. Verizon will monitor and maintain traffic management equipment using remote diagnostics and alert notifications, and will make site visits for any necessary repairs and preservation.

**Travel time**
ITM Basic generates travel-time and speed reports, intersection delays, and origin-destination patterns for user-configured routes and time periods. The reports can be accessed over any standard web browser, and tracked data can be exported via an application programming interface (API) to external systems or downloaded to CSV files for further analysis.

**Signal timing**
ITM Basic provides tools to evaluate and compare route and segment delays for existing signal-timing plans. These include progression diagrams, speed by segment and timing-run plots.

**Connectivity**
ITM Basic connects to field-installed processor devices over the Verizon 4G LTE network and monitors the health of each field device and its connectivity.

**Capacity**
ITM Basic is a hosted service where the capacity can be scaled to allow viewing up to 10,000 data collection nodes by any number of simultaneous users. Anonymized Bluetooth® and Wi-Fi MAC records are transferred from the field-installed devices and stored on the Verizon secure cloud.
Features/functions

MAC data acquisition, archiving and analysis
• Anonymized MAC data can be collected and centrally stored for current and archival reports.
• MAC data filtering mitigates effects of nonvehicular traffic and other deviations that might affect the reliability of the travel-time reports.

Browser-based dashboard
• Start- and end-time tools for easy time-range selection.
• Layered Google Maps™ interface for showing dynamic congestion mapping and selecting routes/devices for reporting based on physical location.
• Search bar for selecting routes/devices based on name or serial number.
• Alerts can be generated for both travel-time and device status.

Customizable reports
• Export graphs to report link for later collection, presentation and comparison.
• Select or deselect algorithms used for travel time calculations displayed in graphs.
• Display tabular data or export results in CSV format.
• Make adjustments to the rolling average by changing the number of data points used in the average.
• Graphs allow for exploded or zoomed view of the highlighted area.
• Compare data that show results from multiple devices/routes in the same report.

Configuration management and operations
• Graphically locate each data collection node and create segments and routes between devices.
• Create congestion maps with customized colors and thresholds that are updated in near real time on a map.
• Create origin-destination groups for arbitrary sets of data collection nodes.
• Create alert reports for monitoring travel-time results and device status in near real time.

Learn more:
For more information about Verizon ITM Basic, please visit VerizonEnterprise.com/products/internet-of-things/smart-cities/intelligent-traffic-management/

Or you may contact your Verizon Smart Communities Business Development manager or Verizon Wireless representative.
Verizon Intelligent Traffic Management (ITM) Advanced delivers urban arterial and freeway metrics that combine traffic count, occupancy, speed and travel-time data into a managed services solution. This system uses a flexible and easy-to-use interface to measure, report and compare travel times, delays and intersection performance. The reports are based on matching and filtering anonymized Media Access Control (MAC) records from devices being used in moving vehicles, as well as vehicle volume and speed data collected by wireless vehicle detection sensors.

**Managed service solution**
Verizon ITM Advanced is a cloud-based software-as-a-service alternative that removes the headaches of supporting expensive field hardware, networks and servers. The solution includes design, installation, communications, server-hosting, system-monitoring and maintenance functions. Verizon will monitor and maintain the equipment using remote diagnostics and alerting, and will make onsite visits for any necessary repairs and preservation.

**Traffic statistics**
Wireless sensors deliver traffic counts/volumes, density/occupancy, vehicle length and speeds for traffic statistics, histogram reporting, and various other data feed options. Reports can be saved, attached to scheduled emails and can trigger alerts, as needed. The detection infrastructure can also be used for traffic signal actuation, and traffic-adaptive and other traffic-control systems.

**Travel time**
ITM Advanced generates travel-time and speed reports, intersection delays, and origin-destination patterns for user-configured routes and time periods. The reports are accessible over any standard web browser, and the data can be exported via an application programming interface (API) to external systems or downloaded to CSV files for further analysis.

**Signal timing**
ITM Advanced provides tools to evaluate and compare route and segment delays for existing signal-timing plans. These include progression diagrams, speed by segment and timing-run plots.
Performance metrics
ITM Advanced integrates vehicle-count data with travel-time data to present unique metrics, including vehicle hours traveled (VHT), vehicle miles traveled (VMT), vehicle delay hours (VDH), idle emissions and congestion emissions.

Connectivity
ITM Advanced connects to field-installed processor devices over the Verizon 4G LTE network and monitors the health and connectivity of each field device.

Capacity
ITM Advanced is a hosted service where the capacity scales to allow viewing up to 10,000 data collection nodes by any number of simultaneous users. Anonymized Bluetooth® and Wi-Fi MAC records can be transferred from the field-installed devices and stored on the Verizon secure cloud.

Features/functions
MAC data acquisition, archiving and analysis
• Anonymized encrypted MAC data gets collected and centrally stored for current and archival reports.
• MAC data filtering mitigates effects of nonvehicular traffic and other deviations that might affect the reliability of travel-time reports.

Browser-based dashboard
• Start- and end-time tools for easy time-range selection.
• Layered Google Maps™ interface for showing dynamic congestion mapping and selecting routes/devices for reporting based on physical location.
• Search bar for selecting routes/devices based on name or serial number.
• Alerts can be generated for both travel-time and device status.

Customizable reports
• Export graphs to a report link for later collection, presentation and comparison.
• Select or deselect algorithms used for travel-time calculations displayed in graphs.
• Display tabular data or export results in CSV format.
• Make adjustments to the rolling average by changing the number of data points used in the average.
• Graphs allow for exploded or zoomed view of the highlighted area.
• Compare data that show results from multiple devices/routes in the same report.

Configuration management and operations
• Graphically locate each data collection node and create segments and routes between devices.
• Create congestion maps with customized colors and thresholds that are updated in near real time on a map.
• Create origin-destination groups for arbitrary sets of data-collection nodes.
• Create alert reports for monitoring travel-time results and device status.

Learn more:
For more information about ITM Advanced, please visit VerizonEnterprise.com/products/internet-of-things/smart-cities/intelligent-traffic-management/
Or you may contact your Verizon Smart Communities Business Development manager or Verizon Wireless representative.
Verizon Intelligent Traffic Management (ITM) Advanced Plus adds to the ITM Basic and Advanced managed service solutions to offer a complete traffic-signal retiming, performance measures and detection solution for traffic agencies and venue operators. This solution allows agencies and operators to monitor and improve the performance of their intersections and arterial corridors. ITM Advanced Plus leverages the accuracy and reliability of wireless detection and the powerful system management and reporting capabilities of the robust Verizon network and cloud-hosted architecture.

**Managed service solution**
Verizon ITM Advanced Plus is a cloud-based, software-as-a-service alternative that removes the headaches of supporting expensive field hardware, networks and servers. This solution includes design, installation, communications, server-hosting, system-monitoring and maintenance functions. Verizon will monitor and maintain the ITM equipment using remote diagnostics and alerting, and will make site visits for any necessary repairs and preservation.

**Signal timing optimization**
The availability of historical 24/7 automatic turn-movement counts enables signal timing optimization over multiple levels: seasons, days of the week, time-of-day periods and special events. Typically, timing plans were developed using a very limited data set. Now, rather than developing timing plans based on assumptions from a very limited data set, traffic agencies and venue operators will have the necessary data to analyze and improve their signal timing available at their fingertips.

**Intersection performance measures**
ITM Advanced Plus fuses detection data with traffic-signal phase data to generate a wide variety of intersection performance and safety metrics: before/after comparison reports, Purdue Coordination Diagrams (PCDs), volume/capacity (V/C) ratios per phase, percentage arrivals on green, delays per approach and red-light violation counts. The solution’s versatile user interface lets users generate intersection metrics for selected months and days of the week, as well as aggregated over different time intervals and traffic movements. These metrics can also be used to create alerts to traffic agency operations staff.
Accurate and high-resolution data

The wireless detection system provides an accurate and high-resolution traffic data stream for ITM Advanced Plus algorithms to calculate reliable performance measures. The detection infrastructure can also be used for traffic signal actuation, and traffic-adaptive and other traffic-control systems.

Supports existing traffic agency infrastructure

The ITM Advanced Plus system typically requires no upgrades to existing signal-controller operations and can make use of existing agency/operator IT network and server infrastructure.

Benefits

- ITM Advanced Plus provides traffic signal operators with accurate and detailed intersection performance measures. Infrequent and limited manual traffic studies are replaced with a continuous, 24/7, performance-monitoring system. Simulated performance data is replaced by actual measured performance data.
- Traffic signals can be retimed with the automatic turn-movement counts whenever performance degradations are observed rather than every five to seven years, helping to reduce traffic delays, fuel consumption and pollutant emissions.
- ITM Advanced Plus provides high availability of the data with limited demand for agency/operator resources. Verizon assumes the responsibility for the monitoring and maintenance of the wireless detection system.
- ITM Advanced Plus transforms intersection operations from reactive to proactive, from anecdotal to data-driven, while making use of existing controllers and operations. ITM Advanced Plus provides traffic agencies and venue operators with a system to help reduce traffic delays and greenhouse gas emissions and improve traffic safety, and in-depth project analysis can help avoid or delay expensive road expansion projects to better control costs.

Sample reports

Performance comparison reports

Identify traffic volume changes by week, month or year or easily measure before/after benefits of signal retiming driven by automatic turn-movement counts.

PCD

In addition to percentage arrival on green and waiting time by approach reports, PCDs provide a graphical view of signal coordination.

Corridor and route travel times

Generate average travel-time reports based on preconfigured routes and time periods. Monitor travel times on specific route sections to make informed decisions about improving traffic flow.

V/C ratio by phase

Measure congestion 24/7 by phase and lane, and verify level of service (LOS) in one quick glance.

Learn more:


Or you may contact your Verizon Smart Communities Business Development manager or Verizon Wireless representative.