

# IBM Intelligent Transportation Solution for Transit Operations



*Provides network-wide traffic visibility for transit operators and facilitates on-time operations*

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## Highlights:

- Improves users' travel experience by providing critical information about transit schedules and significant events in a timely manner
  - Enables near-real-time visibility and advanced analysis by capturing location and other vital information about active transit vehicles
  - Accelerates response to schedule deviations and service-level degradations by proactively identifying problems and increasing situational awareness across the network
  - Advances overall transit planning and management to raise customer satisfaction and increase ridership, thereby improving ROI
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Transportation is a vital means of connecting people, goods and services. A smoothly operating transportation system can not only directly determine the level of economic activity and output of cities, but also dramatically affect resident and commuter quality of life. Many cities remain in the early stages of implementing tools and techniques for smarter transit operations. As authorities introduce new mandates to improve livability and economic well being, transit agencies are gradually investing to realize smarter operations.

In larger cities, transit infrastructures tend to operate near or at full capacity, and both space and budgets constrain further expansion. Significant increases in urbanization over the last 50 years have placed an undue burden on many city transportation systems. This, together with government mandates to encourage use of public transit, adds more and more commuters every year to aging transit systems. Cities face a critical and urgent need to optimize and improve the efficiency of these systems, many of which are managed with outdated processes and tools.

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## Intelligent Transportation

IBM® Solutions for Smarter Cities™ draw from insights gained through more than 2,000 Smarter Cities engagements worldwide. These solutions can help cities of all sizes identify priorities, apply best practices and deploy advanced technologies that address pressing challenges. IBM Solutions for Smarter Cities are based on a common model designed to help cities optimize individual departments while facilitating seamless cross-departmental integration.

The IBM Intelligent Transportation solution for public transit brings a very powerful foundation to public transit agencies. It not only provides critical functionality for transit operations and management, but also supplies the industry's most open platform, designed to scale and grow the solution to encompass more volume and functionality over time.

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Keeping riders well informed is an important responsibility for any transit provider. Informed riders forgive schedule delays and breakdowns more easily because they can plan around these disruptions better. Providing up-to-the-minute schedule information and making projections of vehicle arrival and travel times supply a valuable commuter service that many cities are eager to bring online through all available communication tools.

Yet steadily increasing volume and system complexity make it difficult to accurately estimate arrival times of buses and other public transportation vehicles. This creates challenges for dispatching and for providing accurate information to public transit travelers. When traffic incidents occur, the lack of automatic and immediately available decision support impedes the ability of transit operators to improve the situation by making schedule changes and providing guidance to the active services.

## IBM Intelligent Transportation solution for transit provides real-time visibility

The IBM solution brings near-real-time and system-wide visibility of a transit network, furnishing awareness of significant operational conditions, events and problem areas. In particular, it supplies near-real-time visibility into the location of vehicles, numbers of passengers transported, vehicle-related events and the status of vehicle devices and assets associated with the transit system.

The IBM Intelligent Transportation solution presents the information graphically, in a tabular representation, as well as in report views. Automatic event notifications can also be triggered through email or instant messaging. The events include those that identify significant deviations from operations and performance norms, accidents, unexpected external factors and other issues.

Most transit operators need a flexible data integration solution that can leverage a diverse pool of existing vendor and data type investments, such as Automatic Vehicle Location (AVL) devices, cameras, Fare Collection Systems (FCS), Passenger Counting Systems (PCS) and other applications. The IBM solution supports most existing standards for traffic incident data exchange. It also handles data collected from instrumentation investments that are not compliant with quality and detail expectations. It can process such information and transform the data into formats that can be leveraged by many value-added applications and functions.

## Transit analytics can improve performance

Transit operations coordinators and planners often lack insight into vehicle and fleet performance measured against schedule, against the number of commuters served and as a function of traffic routes and time, hampering the formulation of optimization strategies. Operators often lack insight into patterns of exceptions and incidents, too, making it harder to identify violators and implement policies for staff compliance and public safety. The IBM solution addresses these requirements by providing analysis of historical transit operations data to derive, for example:

- Performance of individual vehicles, routes and drivers with respect to adherence to schedule and route
- Distribution over time of the number of commuters served and their average wait times
- Late arrival of vehicles by stops and time of day

IBM Intelligent Transportation also provides the ability to correlate vehicle and fleet performance with traffic service levels or traffic incidents when traffic data is available and integrated. Finally, the solution provides executive summary and snapshot views of key system statistics for each day, such as total completed trips, schedule variance, total commuters served, total exceptions, and more.

This IBM solution's ability to deliver near-real-time alerts to transit operations staff members about operational exceptions, critical situations and unacceptable performance degradations helps minimize losses and reduce risks to users and operators. Receiving feeds on critical system Key Performance Indicators (KPIs), especially where they are correlated to incidents, is vital to quick and proper decision making. The ability to process raw data from sensors and HMI applications to identify incidents, KPIs and exceptions in near-real-time can, for example, extract:

- KPIs that relate to schedule departure, total travel time, service gaps, commuters transported, empty vehicles, commuter wait times, and more
- Incidents and exceptions that include vehicle accidents, vehicles leaving routes, vehicle occupancy limits exceeded, vehicle speed limits exceeded and more

### Proactive management aids service and performance issues

Transit operators are often limited to reactive management of schedule exceptions. Many customers no longer find this acceptable, and this contributes to significant ridership losses. Inability to provide commuter advisories about anticipated vehicle delays also leads to customer dissatisfaction. For these operators, implementing measures to bring vehicles back on schedule, such as instructing drivers to catch up on time or change routes, is not an option because timely decision support is not available.

The IBM Intelligent Transportation solution for transit operations supports the agency desire to operate proactively by offering the ability to predict the arrival times of vehicles at future destinations on their routes. An added value is being able to inform commuters about potential schedule deviations, leading to higher customer satisfaction.

The solution can generate arrival predictions for vehicles for destinations one hour out. It continuously produces auto-calculated predictions for an entire fleet of vehicles, delivering updated arrival timetables for all future stops for each service. Exceptions are automatically raised for significant schedule deviations. In addition to generating tabular representations and reports, the solution can publish results on display boards in stops and stations, as well as through all communication tools available to users.

### Cities of all sizes can leverage flexible deployment options

IBM offers various deployment models to provide cities of all sizes and varying levels of IT resources with the benefits of the Intelligent Transportation solution for transit operations. Cities with robust IT capabilities or a strong interest in "behind-the-firewall" implementations can deploy it as an on-premises solution. IBM helps make these deployments even easier today by offering readiness assessments and providing a broad array of infrastructure solutions.

Cities also can choose to work with other cities to share services using preconfigured systems. IBM offers targeted consulting services to determine the right services to share and identify the systems designed explicitly for shared services environments.

For cities without the resources or skills for deploying and maintaining solutions on their premises, IBM offers a Software as a Service (SaaS) option on the IBM SmartCloud. The IBM SmartCloud provides an expansive, agile Infrastructure as a Service (IaaS). This delivery platform is designed to provide organizations with rapid access to enterprise-class virtual server environments that are well suited for dynamic workloads, applications and solutions. Deploying the IBM Intelligent Transportation solution on the IBM SmartCloud can help cities capitalize on the latest technology advances while controlling costs.

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### Team with industry leaders

IBM Solutions for Smarter Cities provide cross-agency capabilities using various data streams and services already found in city environments today. IBM also is teaming with the providers of those data streams and services to develop a robust ecosystem of IBM Business Partners. By providing domain experience and delivering best-in-class hardware, software and services, these IBM Business Partners are available to help IBM deploy Smarter Cities solutions in multiple regions around the globe.

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## Build a smarter planet with Smarter Cities

For more than 100 years, IBM has been working to make the world a better place by helping businesses and local governments in more than 170 countries deploy innovative solutions. IBM Intelligent Transportation is just one of many IBM Solutions for Smarter Cities that continue that tradition, providing real solutions that can facilitate sustainable growth and offer a robust foundation for building a smarter city. By making cities more instrumented, integrated and intelligent, IBM Solutions for Smarter Cities can help city leaders meet and exceed residents' expectations through innovation.

## For more information

To learn more about IBM Intelligent Transportation, visit: [ibm.com/software/industry/intelligent-transportation](http://ibm.com/software/industry/intelligent-transportation)



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Integrated Marketing Communications  
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Route 100  
Somers, NY 10589

Produced in the United States  
June 2012

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