



# Public Transportation Solutions

## Serving people on the move

# Global Innovative Public Transportation Solutions

Around the world, public transit operators are looking to maximize revenue, reduce fare evasion, increase security and communication, while improving services to riders. Our solutions provide our clients with the ability to run more efficiently while keeping passengers safe, happy and on the move.

## **Integrating our advanced technology into your transit system will help achieve your goals.**

We play a key role in public transportation. Commuters who take the subway, the bus, or the train benefit from Xerox solutions that streamline the process. Public transport providers can find a complete range of public transport products and systems giving you tailored solutions and long-term investment protection.

Our system integration experience with fare collection, fleet management, traveler information, and mobile communications solutions have driven transformations in day-to-day operations of transit agencies across the globe. The result, a more effective transportation system with much greater capabilities for management teams and passengers. By acting as an integrator, we unify the overall operation and provide a single point of contact with full responsibility for your programs success.

Our products, which can be seamlessly integrated into your existing environment, are also geared for the requirements of the future. We're continually refining our solutions and bringing new capabilities to our clients to ensure the people using public transit have an efficient, enjoyable transit experience.



### Why choose Xerox:

- Over 40 years of experience in public transport
- Already implemented projects all over the world
- Reduced project risks and long-time investment protection
- Customized, interoperable, and multi-operator system solutions
- Seamless integration into existing system environment
- Secured revenue stream and low operating costs
- High system availability and low down-time
- Increased customer satisfaction, easy access and easy to use system
- Market leader integrating with other ITS technology



**Public transit operators worldwide are benefiting from our innovative solutions for transportation. With a global footprint in 33 countries, Xerox touches millions of lives every day. Just a few examples include:**

#### **Dubai - United Arab Emirates**

In Dubai, now there is one ticket for bus, water bus metro and parking. Thanks to our multi-operator, interoperable e-ticketing system for bus and water bus, operating convenience and efficiency have been optimized in the RTA Dubai transport network.

#### **Houston - USA**

With our 100% contactless ticket system the Metropolitan Transit Authority of Harris County now has one of the most extensive and most innovative networks in the U.S. The new system improves traffic flow, secures fare collection, requires fewer onboard fare boxes, and reduces costs.

#### **Lima - Peru**

When Lima built a world-class transit network, we gave them a ticketing solution to match. We designed and deployed a contactless, interoperable ticketing system backed by a satellite-based fleet management and passenger information system

#### **Montreal - Quebec**

Within the Montreal and Quebec Public Transport Service (STM), eighteen operators now offer passengers the largest interoperable network in North America. We deployed a system to centralize sales data and a smart card for contactless ticketing.

#### **Riga – Latvia**

Riga, Latvia, wanted to upgrade the fare system for its network of 800 buses and 250 trams. They called in Xerox to provide technology, funding and operating expertise. Passengers now reload or purchase contactless cards at any of 350 locations. Riga's public transit network is now among the most advanced in Eastern Europe.

#### **Paris – France**

Paris undertook a major initiative to replace its famous “green” Métro tickets with new contactless smart cards. Our contactless access control gates and “Navigo” contactless smart cards created instantaneous transactions and speedier passenger flow. Paris has ushered in new technology – and with it, a more convenient means of passenger travel.

#### **Norway**

To expand passenger self-service ticketing options and reduce operating costs, the Norwegian State Railway wanted a complete, interoperable e-ticketing system. We deployed a national, paper-based and contactless e-ticketing solutions that met the client's high requirements of quality, availability and reliability.

#### **Berlin – Germany**

By upgrading Berlin Transport Authority's network into a holistic system, and by using our central management system to monitor and control the fare collection process, passengers have expanded ticket and payment options, the system availability has been improved and the user experience was enhanced.

# CAD/AVL Solutions

## Fully Integrated Real-time Information Systems for Fleet Management

Managing public transit fleets bring daily operational challenges. Incidents occur while dispatchers work hard to solve problems, keep schedules, and provide current information. We've developed fleet management systems that enhance transit agency's capabilities and provide managers a wealth of dynamic information that ensures passengers experience public transit that is fast, safe, and reliable. Our Computer Aided Dispatch/Automatic Vehicle Location (CAD/AVL) fleet management system uses real-time satellite-based Global Positioning System (GPS) information to manage fixed route, demand response and support vehicles. This enables optimal vehicle utilization, improved on-time performance, and efficient fleet management. Operator and customer safety is increased with the ability to pinpoint the location of each vehicle in the system allowing for faster response to emergencies. Additionally, passengers benefit from real-time information signs at stops, and transit centers, along with the ability to access real-time schedule information from a PC, mobile phone, or PDA while on a bus, train, at home or at work.

### Our CAD/AVL Solutions will transform your agency

#### Fixed Route Transit:

Our CAD/AVL system offers managers the tools that enable you to take the pulse of your organization at any given point in time. Not only do you have the ability to better manage data and resources with route optimization data, but you also have the power to alert your passengers of schedule delays. We ensure your passengers stay informed by integrating with onboard peripherals such as automated voice annunciators, next-stop signs and online trip planning.

#### Demand Response:

We provide demand response agencies with effective and flexible service strategies to improve efficiency, safety and customer service. Our system gives access to electronic manifests, real-time vehicle status and location information, automated reporting, and in-vehicle navigation with turn-by-turn prompts. Also, the CAD/AVL system improves the Paratransit operation by facilitating reservations, scheduling, dispatching and routing.



Our CAD/AVL solution provides better information and a more seamless travel experience to customers, while helping to improve operational security and efficiency with increased system monitoring.

### Automatic Passenger Counters (APC)

APC's are a cost effective means for your agency to collect passenger count information that is extremely useful in route planning and scheduling. The data collected is used to produce user-friendly reports and graphs that give accurate pictures of your ridership for improved transit management and planning.

### Traveler Information

#### At the stop

Inform your passengers in real-time of arrivals and departure information conveying a feeling of security and reliability to passengers by keeping them informed.

#### On-the-bus

Our visual and audible real-time next stop information is designed to comply with ADA/AODA requirements for communication of essential information to your transit travelers. The messaging solution uses prerecorded route and stop messages for automatic on-board playback when vehicles reach specified stops.

### At home or in the office

Real-time web-based passenger information systems provide public transit riders the most up to the minute arrival information about their transit services via easy to use web tools accessed from a PC or mobile phone.

## Benefits for our clients:

### Transit Management

Our advanced technology collects and analyzes data improving vehicle efficiencies and decision making. Reports allow you to monitor on-time performance and vehicle location.

### Drivers

Increases system safety, simplifies vehicle operator interfaces. Bus drivers are more accountable to maintain schedules.

### Dispatchers

Enhanced dispatching provides real-time locations and status information of vehicles. With mobile radio communications, dispatchers can communicate with drivers and supervisors with quicker response to disruptions in service.

### Passengers

Provides real-time status to travelers. Effectively communicate with passengers by collecting information about vehicle location and integrating passenger information systems to estimate and convey the time of arrival or departure for a transit vehicle. This information can be transmitted to digital signs at route stops or to a Web site, PDA, or cell phone to give commuters access to real-time schedules.

### Schedulers

Extensive information collected for informed planning and operation decisions. Takes the guess work out of schedule and resource allocation.

### Maintenance Personnel

At the end of the day data from the vehicle is downloaded to a centralized depot system. Real-time problem reports enable service managers to pull a vehicle out of service, potentially reducing further maintenance issues.

## Major Features:

- Computer-Aided Dispatch (CAD)
- GPS-based Automatic Vehicle Location (AVL)
- Private radio and cellular communications provision and integration
- Real-time & Web-based passenger information systems
- Next stop Automated Vehicle Annunciation
- Automatic Passenger Counters
- Traffic Signal Priority integration
- Video security applications
- Bus Rapid Transit management tools
- Yard management



# Ticketing Solutions for Public Transport

## Streamlining Ticket Sales and Revenue Collection

One of the challenges public transit providers face today is improving passenger services while reducing operating costs. Over multiple decades Xerox has demonstrated in many projects its expertise in designing and building fare collection solutions and integrating them into any customer specific environment. All this knowledge and hands-on experience we gained in automated ticket sales and revenue collection is now built into Atlas®, our latest fare collection solution.

The Atlas® solution includes ticket vending machines, ticket office machines, validators, inspector terminals, access control gates, and a powerful management system. It supports traditional paper tickets, magnetic cards, contactless tickets, contactless smart and bankcards, as well as mobile phone ticketing. It even supports the Open Standard Fare Systems where contactless bankcards are used as ticket media.

## A complete ticketing solution: Atlas®

Atlas® is the first ticketing system designed to handle an unlimited number of databases and applications. This makes it a naturally multimodal & multioperator system. And Atlas® offers a seamless traveling experience- open to all tickets issued by multiple networks in a given transport area.

All operators of a transportation network have the responsibility for certain management functions, such as fraud management, cash collection, maintenance, etc. With the Atlas® solution every operator can access independently - And without access to data of other operators - the centrally hosted Atlas® management system and can perform the necessary functions.

## Customized and Scalable Solutions

No two ticketing systems are alike. Some customers operate small standalone ticketing solutions with no integration, while other transit operators run large scale systems with many thousands of terminals and interfaces into many IT systems. Implementing an interoperable electronic ticketing system for a multi-modal and multi-vendor environment is a special

challenge. Xerox has proven in many projects its strengths in building customer specific solutions.

Although the Atlas® solution provides a proven base with a lot of standard functionality it can easily be configured and adapted to the needs of the different projects. Combining the Atlas® product with the Xerox experience in designing and building customer specific fare collection solutions provides a unique advantage for our customers and guarantees low project risks and short implementation time while the system is still tailored to the specific needs of the customer.

## Open Standard Fare System

Tickets have been part of public transport from the very start. However, the latest technological developments allow implementing solutions where there is no need for any fare media anymore. Passengers can easily access the transportation network by just flashing a contactless bankcard (e.g. Visa, Master Card) at the point of entry. While the passenger uses the transportation network, only the bankcard ID is captured and the appropriate fare is calculated in the backend. The bankcard is charged appropriately depending on the parameters set up for each individual card. Trip data is stocked in the system and each card is charged either by the day, month or year according to the parameters and frequency of trips. Passengers will automatically be charged at a day rate or cheaper monthly rate, depending on the circumstances set up for their individual card.

## Atlas® your unique solution

### Atlas® Back-office system - key functions

- Customer Data Management
- Fraud Management / Ticket Inspection
- User / Agent Management
- Parameter Management (Topology, Fare Rules, Business Rules, Equipment)
- Terminal Management & Monitoring
- Customer Management

- System Activity Management
- Server Monitoring
- Data Management, Reporting, and Business Intelligence
- Stock Management
- Revenue Accounting
- Clearing
- Mass Card Personalization
- Remote SAM Server
- NFC Support

Atlas® supervises equipment and payment

Payment options:

- Contactless smart cards
- Contactless, magnetic, and paper tickets
- Virtual tickets (mobile phone)
- Contactless bank cards

Advanced Sales Channels:

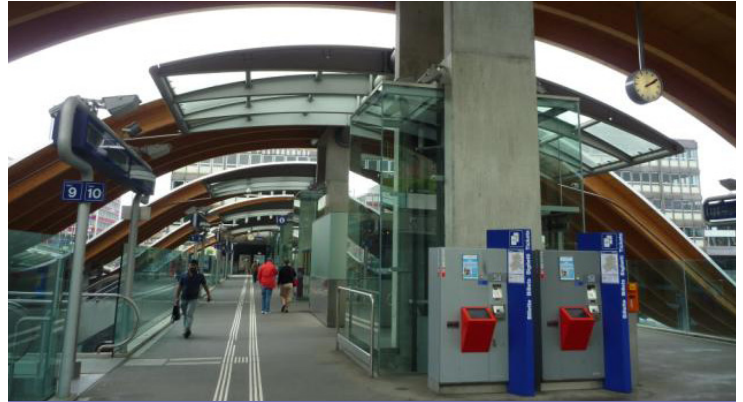
- Internet
- Mobile Phone
- E-POS equipment

Equipment:

- Ticket Vending Machines
- Operated Sales Terminals
- Smart Cards and Ticket Validators
- Access Control Gates
- Handheld Devices

## Ticketing System and more

Designing, building, and deploying a ticketing system are only a few steps needed for successfully introducing a new ticketing solution. Other important topics are financing, marketing, training, operating, maintaining, upgrading, and adapting the system.



The Xerox ticket vending machines are known to be the leading standard in the industry. Highest availability and reliability combined with a lifetime of 15 and more years guarantee low total costs of ownership while having the best passenger experience.

Xerox has long lasting extensive experiences in business process outsourcing and is therefore a perfect partner for these services. Depending on the needs of the public transportation operator, Xerox can provide any or all of these services.

## Client benefits of Xerox experience

- Increase in revenues and decrease in fraud
- Reduced operating costs and increased profitability
- Enhanced user experience and improved client satisfaction
- Enhanced customer service
- Increased billing accuracy
- Higher efficiency for the operator
- Convenience - one smartcard with universal acceptance
- Security - less fare evasion thanks to contactless solutions
- Flexibility - ability to implement special fare rates and programs
- Our access control systems did away with free rides.

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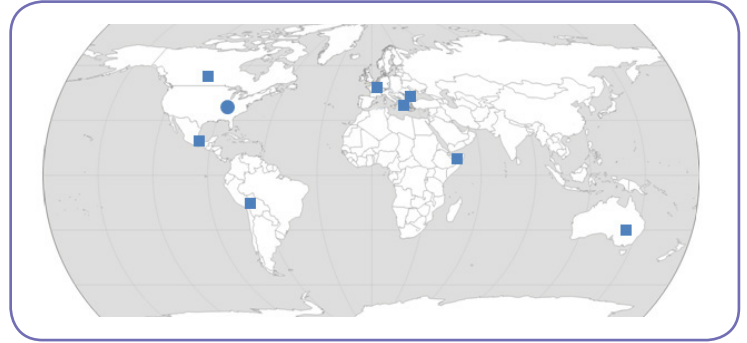
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## About Us

Xerox is the world's leading enterprise for business process and document management. Its technology, expertise and services enable workplaces – from small businesses to large global enterprises – to simplify the way work gets done so they operate more effectively and focus more on what matters most: their real business. Xerox offers business process outsourcing and IT outsourcing services, including data processing, healthcare solutions, HR benefits management, finance support, transportation solutions, and customer relationship management services for commercial and government organizations worldwide. The company also provides extensive leading-edge document technology, services, software and genuine Xerox supplies for graphic communication and office printing environments of any size. Xerox serves clients in more than 160 countries.

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