Overcoming the challenges of inner-city transportation

Discover an integrated approach to delivering safe, reliable and affordable transit options for the next generation
Introduction

As population growth continues to explode within urban centers worldwide, the need for effective inner-city transportation systems is more urgent than ever. Today's businesses and urban communities all depend upon a healthy transportation infrastructure to succeed. Large numbers of people must be able to move reliably and affordably from point A to point B; job creation, wealth generation and quality of life are all at stake.

But even with the rapid growth of urban areas, transportation budgets are increasingly limited. Transit organizations have to support more riders with less money, while maintaining aging infrastructures, improving reliability, rolling out “green” initiatives and complying with the latest safety regulations. At the same time, these organizations have to invest in services for the next generation, since the Millennial workforce (those born from early 1980s to the early 2000s) has new demands for reliable transportation systems and less tolerance for delays.¹

Using an enterprise asset management system, your organization can manage all of the elements of a single- or multi-modal transportation system—the buses, trains, trams, ferries, tracks and roads—with a single solution. It can help predict demand to optimize capacity and assets, improve the end-to-end traveler experience and increase operational efficiency, without sacrificing reliability or safety.

This white paper explains how an enterprise asset management system can help transit organizations better manage the complexities of inner-city transit. By managing all of your transportation assets in a single system, you can more efficiently address the challenges of infrastructure development, inner-city congestion, carbon emissions and regulatory compliance. And, most importantly, you can help increase the numbers of satisfied riders for years to come.

Optimizing your transportation infrastructure for the next generation

Today's transportation organizations have been challenged to manage infrastructure as urban populations and congestion have increased. Even cities with strong transit networks still must deal with aging assets and infrastructure, while growing communities struggle to develop new or expanded transit systems. Organizations must make the most of their existing assets, while revitalizing current systems or creating new infrastructure.

One thing is for certain: the demand for effective inner-city transportation is not slowing down. Recent studies show that nearly 70 percent of Millennials, a group that will comprise a majority of the global workforce by 2015, use multiple travel options several times per week. And they rank public transportation as the best way to move within the inner-city.² What's more, research has found that despite the declining use of cars in 42 cities in the US, Canada, Australia, Europe and Asia, the vast majority of these cities still grew their economies. In fact, the revival in the use of transit, especially urban rail, has contributed to their economic health.²
And yet, the ability to optimize all of the assets for an inner-city transit system has historically been next to impossible. The distinct management needs of different assets—rail cars, trams, metro or underground subways, buses, tracks, roads and so on—have traditionally resulted in a fragmented patchwork of unrelated systems. In the past, there was no comprehensive way to increase reliability across different assets, improve returns on investment and help ensure a state of good repair.

An enterprise asset management system enables organizations to use a single solution to manage all classes of assets and supporting infrastructure. While separate views and functionality can be accessed by individual departments to manage unique assets, executives can also take a comprehensive approach to how assets are purchased, maintained and optimized throughout their useful life. Enterprise asset management enables organizations to view and manage assets for entire inner-city transit systems and urban communities as a whole.

**Tackling the issues of inner-city congestion**

To support sustainable growth in urban areas, transit organizations worldwide are considering new ways to foster mobility, limit congestion and pollution, improve service, provide “smart” communications connectivity, and promote a desirable quality of life for the millions of people living and working there. The costs of these transit systems can seem prohibitive, but the alternative—car dependence—can result in constant traffic gridlock, as seen in Beijing and other major cities.3

One of the best ways to increase the use of inner-city transit systems—and help reduce congestion—is for transit organizations to increase the reliability and availability of assets that connect neighborhoods and commercial centers to each other. Studies show that transit riders value consistent travel times even more than shorter travel times. In particular, reliable transfers between stops are of utmost importance to riders.4

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**Enterprise asset management: Key benefits for multi-modal transit**

In real-world deployments of IBM enterprise asset management solutions, transportation organizations around the world have achieved dramatic business benefits.
Meeting the daily demands for service is critical to maintaining transit system ridership. Otherwise, many riders switch to other modes of transportation to fill the void. The same study notes that riders are especially turned off by delays due to operational problems.\(^4\) By performing more preventive and predictive—rather than reactive—maintenance, organizations can better meet customer expectations for service and motivate riders to continue using public transit.

An enterprise asset management system can also help organizations make strategic decisions about maintaining assets across the entire inner-city transit system. The ability to schedule preventive maintenance when it may least impact other schedules can significantly reduce downtime and provide more resources for operations. By tracking assets at a component level, while understanding the relationships across the entire system, transit organizations can extend the useful life of all assets and improve operational excellence across the network.

**Deploying green initiatives**

Every country is taking a different approach to managing carbon emissions. For example, the European Union stipulates that transportation initiatives address energy efficiency and climate change despite potentially higher costs, while Australia, Canada and Japan are tackling these issues in the planning and execution of new projects.\(^3\) By optimizing routes and using telematics systems to monitor changes in fuel (and electric energy) economy, transit organizations can reduce both emissions and fuel usage. An enterprise asset management system can help with monitoring asset condition and performance, automatically detecting problems or deviations, and initiating an inspection or early preventive maintenance activity.

A variety of new technologies can help support green initiatives, from predictive maintenance solutions to real-time diagnostics leveraged through telematics. In addition, the use of smart cards to replace traditional transit tickets or tokens can not only increase convenience for riders, but can also allow public transportation organizations to more quickly identify changing travel patterns and “right-size” fleets based on ridership data. These initiatives can help reduce fuel use and minimize the environmental impact of using unnecessary assets.

By providing asset performance and ridership statistics in real time, an enterprise asset management system can help organizations increase energy efficiency and move toward achieving sustainability goals.

**Complying with safety regulations**

Today’s public transportation organizations don’t have the budgets to simply replace assets rather than repair them—and they cannot risk the liability or regulatory noncompliance of dangerous and improperly maintained equipment. Enterprise asset management systems can help organizations meet operational requirements and reap the business benefits of ensuring the reliability, availability, maintainability and safety of their assets and related infrastructure.

As organizations try to do more with fewer resources, optimizing the performance of every asset is critical to successful operations. An enterprise asset management system can help managers monitor key performance targets, such as service regularity, passenger density, service availability, service punctuality and service reliability. This data can then help them control and avoid problems such as delays in scheduling, breakdowns in operation and mistakes in providing the correct capacity or functionality that can impact a route—and future ridership.

The ability to gather and analyze asset operations data allows transit organizations to move from corrective (repairs made after a problem occurs) to preventive (dictated by a schedule based on past experience) to predictive (performed because data for a particular asset indicates that a failure is imminent) maintenance. Understanding and managing the lifecycle of equipment can determine the optimal time to cease repairs and replace an asset.
An enterprise asset management system can help capture the best practices, policies, procedures and lessons learned by seasoned workers. By incorporating into business processes and applications the information that long-time employees carry in their heads, organizations can help ensure that capabilities are not lost, and can provide a top-to-bottom alignment of functions to support ongoing operations.

**Asset management produces real results**

Yarra Trams, the operator of Melbourne’s iconic tram network, needed to improve its day-to-day tram operations and passenger experience. By working with IBM to deploy an enterprise asset management system, the organization was able to:

- Increase the efficiency of the entire tram network, including 250 kilometers of double track and 487 trams operating on 29 routes
- Communicate real-time details about tram schedules to passengers—keeping trams running safely and on time
- Improve service reliability to 98.92 percent by performing predictive maintenance

**Exploring a comprehensive, unified solution from IBM**

IBM enterprise asset management solutions are designed to assist with the procurement, operation, maintenance, repair or service, and disposal of inner-city transportation assets. Built-in best practices support the full asset lifecycle, ranging from the trains, trams and buses themselves to the equipment and inventory used for repairs and maintenance; the infrastructure assets (roads, tracks and catenary switches) that support traffic flow; the facilities and depots in which assets are housed or serviced; and all of the personnel supporting transit operations and maintenance.

The integrated portfolio of IBM® Maximo® Asset Management solutions provides three key capabilities for optimizing processes, increasing transit-system reliability and lowering costs for transportation assets:

- **Centralized management:** Manage multiple asset classes—rubber wheel, steel wheel, infrastructure, buses and ferries—within a single enterprise asset management solution
- **Interconnected technology:** Use enterprise asset management as the gateway for easily incorporating IBM facilities management, mobility and analytics solutions
- **Industry-specific experience:** Leverage proven IBM technology that’s currently used by more than 750 transportation clients, including more than 150 organizations managing linear assets and more than 160 managing transit, metro and rail operations

**Conclusion**

IBM understands the complexities of delivering effective public transportation, including the challenges of supporting more riders with a shrinking budget, maintaining aging infrastructures, increasing reliability, achieving sustainability goals and maintaining regulatory compliance—all while maintaining or improving customer service. IBM is playing a lead role in enterprise asset management implementations and projects worldwide, with solutions validated in successful deployments for major transportation organizations around the world.
For more information
To learn more about IBM Maximo solutions for inner-city transportation, contact your IBM representative or IBM Business Partner, or visit ibm.com/industries/traveltransportation

For more information about real-world deployment of IBM enterprise asset management solutions for rail systems, please read the Siemens Mobility Services case study.

For more information about real-world deployment of IBM Maximo solutions for cities, please read the City of Toulouse case study.

Additionally, IBM Global Financing can help you acquire the software capabilities that your business needs in the most cost-effective and strategic way possible. We’ll partner with credit-qualified clients to customize a financing solution to suit your business and development goals, enable effective cash management, and improve your total cost of ownership. Fund your critical IT investment and propel your business forward with IBM Global Financing. For more information, visit: ibm.com/financing

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