A Ticket to Smarter Service

Smart Public Transport for Smart Communities

As congestion increases in our urban environments, the demand for public transport has significantly increased. In the U.S. public transit ridership increased by 39 percent from 1995-2014, almost double the population growth. Worldwide, the International Association of Public Transport (UITP) is dedicated to doubling the market share of public transport by 2025, in support of reducing greenhouse gases, and providing better mobility in our growing metropolitan centers.

Concurrently, public transport ridership is becoming more diverse, as new populations emerge with changing expectations of public transportation. Younger riders and others are changing their travel behavior, and want more travel options for work and leisure, all with greater access to information delivered to their smart phones.

At the same time, cities and communities have begun to put a greater emphasis on livability and sustainability, better urban design, and providing the technological infrastructure to become smart communities. The application of the latest information and communication technologies is designed to deliver the hallmarks of smart communities: better service delivery at lower costs, with greater citizen involvement and transparency. And providing high quality public transportation options is an integral part of enhancing the economic, social and environmental health of cities, and creating the infrastructure for smart communities.

The Need to Transform Public Transportation

But all too often, public transportation agencies have not been prepared for these changes. Changes in ridership patterns and community demographics have often left public transport agencies focused on providing “traditional” services to a population that is fundamentally different, with quite different expectations. To meet these new challenges, public transportation agencies will need to transform their

services, and their approach to customer service. And this transformation will require greater reliance on information and analysis to help better plan (and deliver) services to this more diverse public.

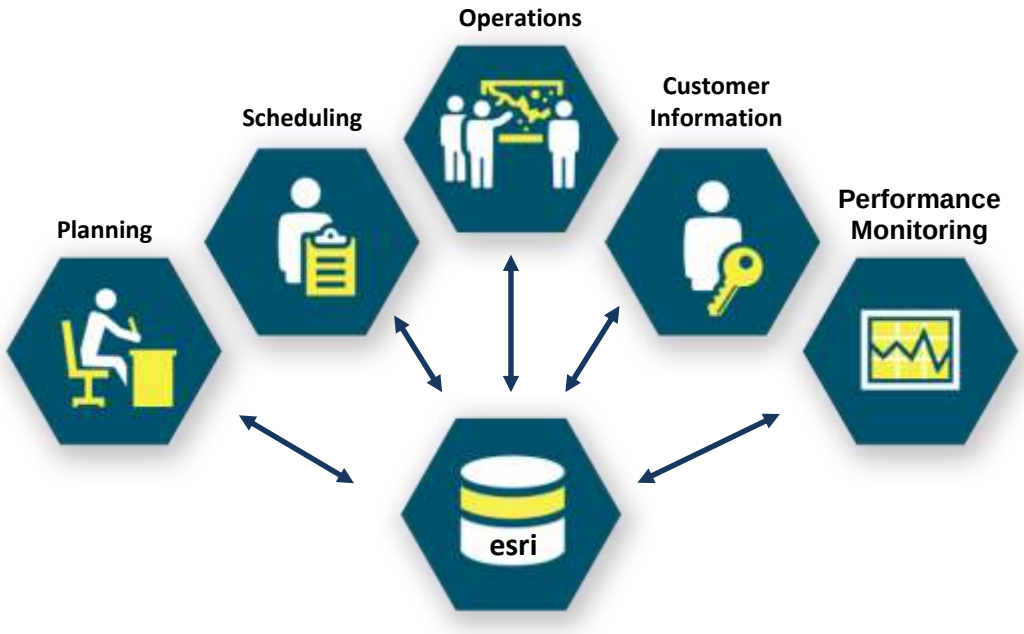
Leading public transport agencies all face three interrelated requirements in addressing these challenges:

- **Deliver the optimal service at the lowest cost to the customers**
- **Provide high levels of customer service to a highly diverse customer base**
- **Continually improve performance as ridership increases**

To be effective, smart public transport organizations will need to leverage the value of the information already contained in many of their disparate systems. Public transportation agencies often have a wealth of data in their organizations, but few effective ways to analyze that data, or transform it into actionable intelligence. That is because in most cases the information is contained in individual business units – silos of information – and not brought together to help these agencies better plan, deliver, and continuously improve their performance and service delivery.

Integrating and sharing this information can be difficult. Not for a lack of modern information technology systems or a standard method for describing public transportation features, but rather the lack of a way to bring all the information together in an easy and intuitive way. This causes public transportation agencies to not realize the real benefits from their information technology investments.

Esri's ArcGIS platform provides that framework for information integration. ArcGIS creates a unified information layer, and provides all the tools to manage, share, analyze, and act on this information. So your departments can quickly make data available to the entire organization and promote cross-departmental awareness and collaboration. Your teams can better understand how to plan and deliver better service, for greater efficiency and effectiveness.



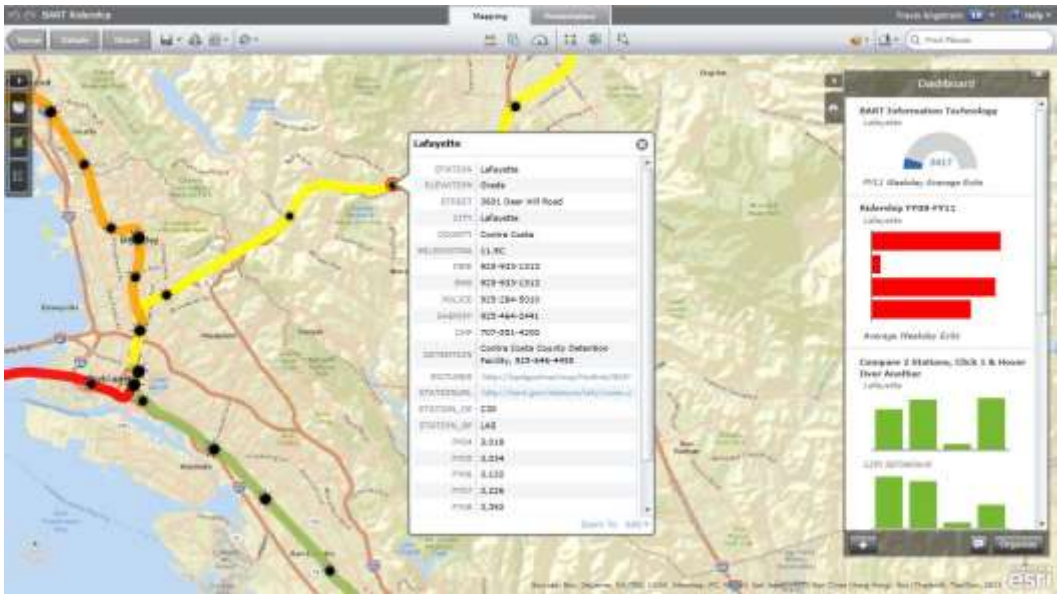
Using Esri's ArcGIS platform, your workforce will be able to access this information from any device and make better decisions, both in the office and in the field. ArcGIS helps executives, senior managers, knowledge workers, and field staff use and understand information that is timely, accurate, consistent, and spatial. So they can act on the challenges your agency faces today.

It all begins in Planning

Effective service planning is both art and science, but all begins with a thorough understanding of your community demographics, existing travel patterns and modes, accessibility issues, home and work locations, among other factors. Service planning should also reflect community goals and values, but

also can help support land use and economic development policies, all in support of more livable communities. To maximize each of these goals, transportation service planners need to rely on comprehensive data sources with the latest information, together with information collected from their own systems.

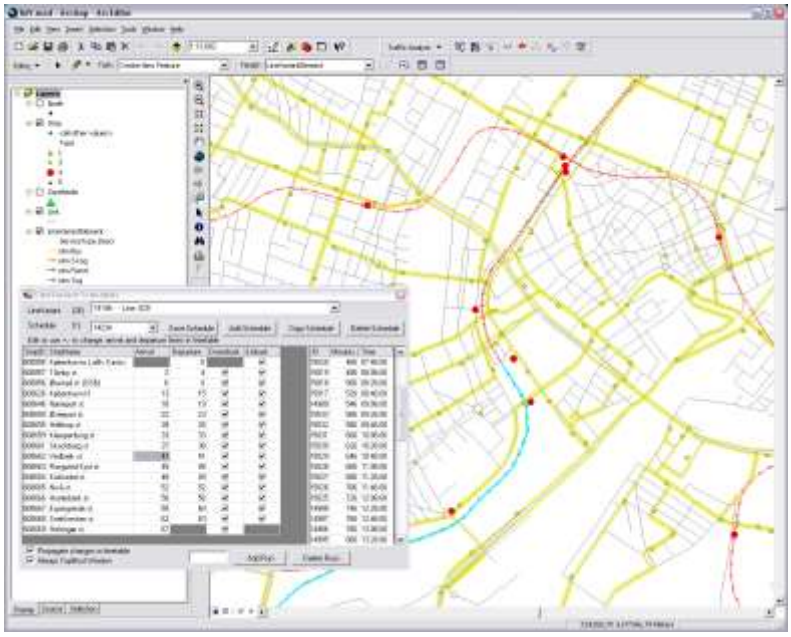
Esri's software comes bundled with some of the richest sources of data and information – not just the latest Census data - but updated forecasts, and comprehensive data on employment, consumer spending and lifestyle characteristics to help you gain a deeper understanding of your existing and potential markets. With Esri's software tools, you can analyze and visualize residential and employment densities, and overlay existing and planned land uses to help maximize ridership and development goals. Accessibility tools together with travel pattern data help guide the development of effective route planning, and the design of differentiated services to maximize overall ridership. Community values and goals can be built in directly to your analysis, ensuring that your service planning best serves your community.



Esri's spatial platform helps you manage and maintain information about your existing stop, route and pattern data, which provides the baseline for analyzing your existing service effectiveness. Combine this information with your passenger count data, to help analyze ridership trends over time, and the performance of your existing routes. In addition, you can quickly analyze the impact of service changes on specific populations, to meet your Title VI requirements. Esri gives you the platform to take your service to new levels.

A single data storehouse

You invest considerable time and effort developing effective schedules of service. With GIS, that schedule information can be reintegrated with your stop and route information from your planning processes, to create the core elements of your centralized spatial information center. This core information can now be shared and used by a host of "down-stream" applications, such as customer service, and the stop and route information needed by AVL, automatic passenger count, and stop enunciation systems. This approach prevents the common problems of data duplication and data error, and helps to establish a "single source of truth" within your agency.



In turn, information drawn from your passenger count and fare collection systems, along with real time arrival information can be brought back into your data storehouse to further analyze your performance. A single source of information allows you to monitor and continuously improve your service delivery and performance, increasing your agency's overall efficiency.

A real time view

Your customers demand real time information, and you need to monitor and control your operations in real time. Because ArcGIS is a complete platform technology, it provides the tools to monitor your assets in real-time, allowing you to continuously monitor and adjust to maintain scheduled timetables, respond to unforeseen events, and provide this information to other systems as well. GIS brings the spatial dimension to your real time information, giving you a comprehensive common operational picture to help you monitor vehicles, assets and events, to deliver actionable intelligence.

ArcGIS can seamlessly integrate with your existing automatic vehicle location (AVL) system, bringing that data into a spatial environment to allow you to better control your real- time operations, as well as analyze your performance, and share with customer information systems. With a centralized spatially enabled information system, you already have schedule information to determine schedule adherence, and to update real-time arrival systems at the stop or on your user's phone.

Keeping your customers informed

The riding public is more tech savvy, and wants access to real-time information to help guide their public transit choices. Whether looking for the optimal route across town, or when the next bus will be at the stop, ArcGIS lets you deliver this information to any device, anywhere.

With the ArcGIS platform, you can even push real-time web maps and text messages – ensuring your riders know how and where to get the most out of your services. And that helps to increase ridership and build brand loyalty.

Customer information includes more than just next arrival information, and GIS can help your customers know where to buy Smart Cards and Monthly passes, and GIS can help you determine the optimal locations for such services.

Performance Monitoring

The most dynamic public transport agencies are those focused on customer service, and a continuous process of improvement. Esri can provide the tools you need to meet this goal. You have the ability to visualize almost every metric that you judge your performance by:

- Schedule adherence
- Utilization by route and trip
- Ridership trends by route or individual stop
- Level of service

With location analytics, you can use your agency information to analyze your overall performance in new ways.

A Location Platform to Integrate Your Business

ArcGIS helps to integrate your existing business systems, and helps to visualize and compare that information, converting it into actionable intelligence that forms the basis for sound decision making. That means making better decisions to improve efficiency, achieve community goals and building better relationships with your customers. Esri's platform gives you the information you need, on any device, at any time, keeping you constantly informed. As a result, leading public transportation agencies worldwide have turned to Esri to help them improve their service performance and their bottom line.

Your Next Steps

You can arrange a preliminary assessment of how Esri's spatial platform, ArcGIS, can help your port achieve its business objectives. When you contact an Esri representative, our port and maritime experts will help you conduct a business value assessment, to understand where the opportunities for a location strategy exist. You will see how bringing spatial information together from your existing port systems can help meet current challenges. Esri's Jumpstart engagements can help you quickly implement intelligent solutions, so you start right away on the path to greater productivity. Meet today's rapidly changing global environment with Esri.