High performance. Delivered.

Beyond the traditional

Establishing new rules and roles
for public transportation

Forces of change are sweeping through the entire public transportation landscape. Passengers are no longer passive participants moving from point A to point B. They are customers with raised expectations. They want a higher level of service and a travel experience that elevates the journey by offering service, convenience, and seamless access to multiple modes. And with the rise of urbanization, there are even more customers calling for enhanced public transportation. Technological innovations are both driving the demand for better service and enabling public transportation players to deliver it.

Providers themselves are changing—going beyond their local borders to provide transportation outside their regions and countries. They are pressed between two economic realities: rising fuel costs and lowered subsidies on one hand, and more demand on the other. As purse strings tighten, they are urged to do more with less, providing passengers with enhanced travel experiences. And all are charged with lowering emissions and operating in a greener, more sustainable fashion. Against this backdrop of unprecedented change, Accenture launched the study "High Performance in Public Transport: How authorities and operators can go beyond their traditional outcomes."[1]

The research covered twelve cities around the world including, Amsterdam, Birmingham, London, Madrid, Oslo, Paris, São Paulo, Seoul, Shanghai, Singapore, Tokyo, and Toronto (Figure 1). We applied Accenture's High Performance Business Methodology to identify the gaps in the marketplace for addressing the demands of today and tomorrow.

Through the study Accenture found that getting the basics right was still high on the agenda, but was not sufficient for going beyond traditional outcomes. Initiatives related to safety, distance to public transport, price, punctuality, and decreased travel time are important in achieving increased usage, better quality of service, and accessibility for all.

Nevertheless, High-Performance authorities and operators are looking beyond those traditional outcomes to offer value for money, to be more customer-centric, and to ensure sustainable city development.
To reach those new outcomes and excel in their traditional ones, they are exploring three options:
• Maximize demand for their services
• Optimize their mobility capacity
• Rethink business models

[1] The Accenture "High-Performance in Public Transport: How authorities and operators can go beyond their traditional outcomes", study was conducted in 2012. Cities were chosen based on the past sample of a study conducted in 2010. Twenty executives within public transport organizations across modes including buses, metros, trams, cycles, ferries, taxis, etc. were interviewed to develop findings.

Figure 1: Cities analyzed during our study.

The future outlook

One of the main drivers moving providers to adapt their services lies in the changing nature of cities themselves. Of the cities examined in the study, each belonged to one of three types: monocentric, composite, or polycentric (Figure 2). Monocentrics (the traditional city model) have a strong commuting pattern to a central business district. Composites have a mixed flow to the center and to peripheries outside the center. Poly-centrics are marked by a higher level of short-distance trips between suburbs.

Each of these cities is on its own journey toward High-Performance public transportation based on its unique evolution. Because of the differing populations, geographies, and governments in each, it is impossible to weigh their achievements.

There are, however, some standout performers in terms of overall performance. These include Singapore, London, and Amsterdam. Hallmarks of these cities: investment in technology and mobility solutions that have allowed them to innovate.

According to our research, public transit organizations need to maximize demand for their services, optimize their mobility capacity, and rethink their business models to align their organizations in a new direction.

Figure 2: Cities within the study fell into three categories: monocentric, composite, or polycentric.

City morphology
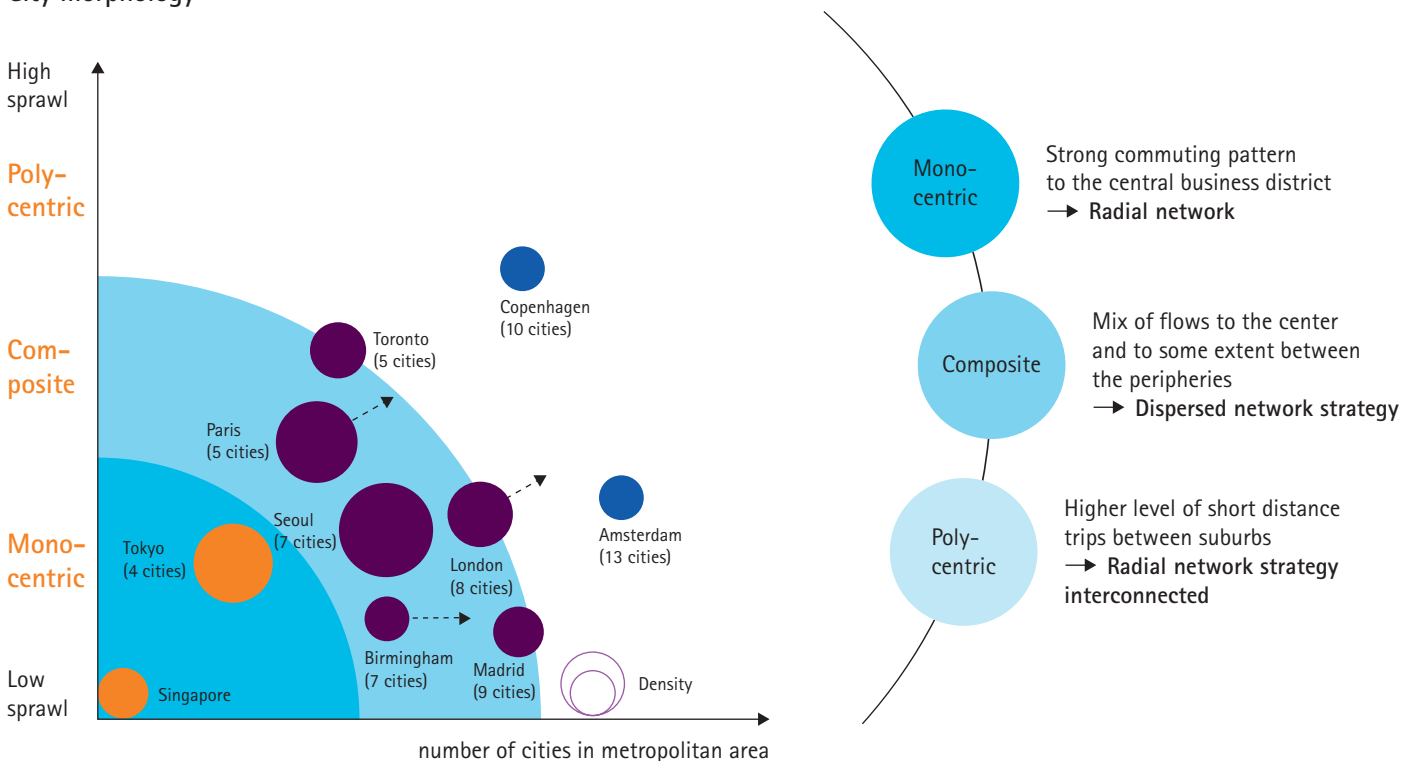
Note: Number of cities > 100,000 inhabitants within 40 km (except for Copenhagen and Amsterdam due to low density and high sprawl)
Sprawl = metropolitan area surface / main city surface

Maximize demand

All of the cities in the Accenture study are working to maximize demand. They do that by establishing real-time mobile and direct communication to enable interaction with customers (Figure 3). When that interaction occurs, they collect and analyze data to drive even more demand. And they tailor offerings accordingly.

Establishing real-time mobile and direct communication

All cities have embraced applications within the mobile sphere. These include everything from journey planning to linking different modes. Singapore has an application that goes beyond the realm of transportation to provide information on available entertainment and nearby conveniences (gas stations, ATMs). Called "MyTransport Singapore,"[2] the solution was developed by the Land Transport Authority (LTA) so that travelers can readily "plan and experience a seamless and enjoyable journey." Many authorities will follow this path as passengers' appetite for a one-stop app is growing.

To help further enable real-time mobile and direct communication, some providers have entered the world of social media. To date social media has proved to be mostly a one-way street in terms of communication: transportation provider to passenger. Transport for London, as one example, has established Twitter handles for its Tube lines.[3] This allows passengers to receive up-to-date information about service. The real value will come when the industry truly leverages it to gain insight into customer wants and needs and then shape services accordingly. In the future, providers will be able to use channels like Facebook and Twitter to deepen their efforts in recruiting, marketing, and even R&D.

Collecting and analyzing data

Critical to driving demand: understanding it at a granular level. To date, most providers remain in the dark when it comes to passenger insight. Then again, they lack the tools needed to delve into the specific travel needs of their citizens.

Figure 3: Providers are leveraging mobile and direct communication.

Cities	Maps	Traffic real time info	Journey planner	Inter-modality	Geo-positioning
Amsterdam		••	••	••	••
Birmingham	•	••	•	•	
London	•	••	••	••	•
Madrid	•	••	••		••
Oslo	•	•	••	••	•
Paris	•	••	••	•	•
São Paulo	•	•			
Seoul	•	••	•		••
Singapore	•	••	••	••	••
Shanghai	•	•	•		•
Toronto	•	••	••	••	
Tokyo	•	•	•	•	•

• Functionality exists, but basic   •• Advanced functionality

Electronic payment systems like e-purses are one core enabler for collecting and analyzing data to drive performance in resource allocation, pricing, and customer offerings. They can also support the growing need for multimodality: Rechargeable e-purse public transit cards are increasingly accepted by suburban trains, as well as by parking and taxi providers.

One example of a more robust e-purse system: Singapore has a single contactless card called EZ-link that can be used for bus, MRT and LRT trains, taxis, electronic road pricing (ERP) and electronic parking system (EPS) payments, and other lifestyle payments. In Seoul, South Korea, rechargeable smart cards, such as T-money and Upass, can be used to pay for bus, subway, and some taxi fares, and in stores in and around the city. In Tokyo, rechargeable smart cards, such as PASMO and Suica, can be used to pay for bus, subway, some taxis and parking lots, and even in stores where the cards are accepted.

Although providers are not yet analyzing data so that they understand the individual movements of passengers (the ultimate goal in mining data insight), in Singapore and Seoul strides are being made in that direction. In those cities, travel data is used to optimize capacity. In the future, passengers may be able to choose seats on modes based on their individual preferences and availability and create personal journey plans. Next on the agenda is the ability for authorities and operators to dynamically set prices to reflect preferences and actively manage demand. Peak and off-peak ticket pricing is one tool already leveraged in some cities with more dynamic optimization under development.

[2] Source: Apple App Store. MyTransport Singapore.

[3] From the online news report: "Transport for London creates Twitter handles for tube lines," http://www.socialmediaportal.com/News/2012/05/Transport-for-London-creates-Twitter-handles-for-tube-lines.aspx

Optimize mobility capacity

As passenger flows are getting more complex and financial resources are becoming more scarce in many cities, Public Transport Authorities (PTAs) and operators are facing a dilemma: to do more with less. As a result, optimizing mobility services is now top of most transport players' agendas.

Rationalizing and optimizing routes

Many cities have already rationalized bus routes to reduce operating costs—especially critical given cuts in public funding. By retiring parallel routes and choosing adequate modes based on demand as well as the frequency, PTAs are trying to ensure capacity optimization and effectively reduce operating cost per user. In São Paulo, the EMTU has implemented a necessary "troncalização" (rationalization + optimization) of the bus lines to respond to reduced spending. And in Oslo, Ruter achieved synergies by reducing unnecessary parallel lines between different transportation modes and bus routes.

Cities like Seoul are moving away from the traditional redundant models of parallel bus lines and towards trunk and feeder routes instead (Figure 4). They have optimized their bus fare grid based on route demand and in the bargain have increased ridership while reducing cost and congestion.

E-purse solutions make transformations like the kind Seoul undertook easier to employ. As cities change, the need to transform pay schemes change as well. Singapore, as one example, now has a fare system with 39 categories based on distance payment to make transportation more equitable to passengers.

For cities moving from zone-based payments to distance-based ones, e-purses allow them to readily switch models. Transport providers that still use paper-based ticketing will find it much more cumbersome to recalibrate their payment to match the demands of complicated distance-based systems.

Figure 4: In Seoul, parallel bus lines have been streamlined into a trunk and feed system. The result: reduced traffic, lowered operational costs, and increased ridership.

Seoul's bus route transformation
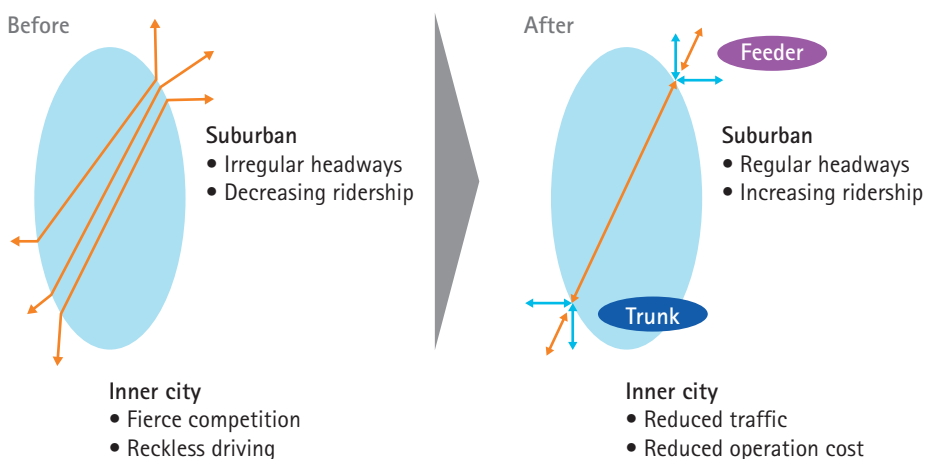
Source: World Urban Transport Leaders Summit, Lessons learnt from Seoul's bus reform.

Moving forward, most high-performance operators will seek to adjust routes and bus capacity in response to real-time demand, effectively optimizing assets and easing traffic.

Implementing sustainable solutions to reduce costs

Sustainability is another issue high on every municipality's agenda. And public transportation often finds itself in the crosshairs of targeted changes.

The pressure to be greener coupled with rising fuel costs have caused many to replace old fleets with newer, more fuel-efficient equipment. Tokyo's Toei subway system replaced 88 percent of its trains with energy-saving equipment.

Nevertheless, those investments can be at risk in times of scarce public funding, and alternative sustainable initiatives are being tested to meet emissions targets while keeping costs down. The London Underground launched an effort that has saved 5,500 tons of emissions through energy-efficient measures at their properties. And they plan to cut another ten percent at their stations by using lighting and escalators more efficiently.

The London Underground is also leveraging regenerative braking to save on electricity. Through it, electrical power normally wasted as trains slow is instead fed back into the system and effectively reused. Regenerative braking has saved 25 percent of the electricity consumed by the Underground.

Moving in the cloud

Leveraging cloud computing solutions can act as an accelerator of change. The cloud can be leveraged for multiple purposes from applications development (through open data located in the cloud) to ticketing solutions.

Its main advantages lie in the absence of capital investment, as it is usage-based; and its services are fast to implement—taking a couple of months versus a few years. Few organizations in public transport have moved to the cloud.

A notable exception: Transport for London, which has located its open data system in the cloud, and is able to provide dynamic updates of its data to a large group of stakeholders. Like other industries, public transport will increasingly move services to the cloud. By doing so, they will lower costs and gain speed and flexibility.

Rethinking business models and aligning organizations

Optimizing costs may not always be enough to release the cash flow necessary for investing in key areas to maximize demand and mobility. Authorities and operators may have to explore new business models, new types of collaboration, and reinvent their roles dramatically.

Diversifying business models

Subsidy cutbacks are transforming how providers generate revenue. More and more transport organizations are seeking non-fare revenue streams (Figure 5). Diversifying revenue sources can help limit fare increases and improve services. One example of diversification: Shanghai Metro introduced virtual supermarkets in 70 stations in its nine metro lines in August 2011. Large LED screens advertise everything from diapers to raw meat. Goods are then scanned by shoppers and delivered within 48 hours. Operators and authorities need to determine how their current capabilities differentiate them most and build a new business model capitalizing on these strengths.

And, in a growing trend, providers are becoming consultants. Singapore's metro operator went public in 2000, forming SMRT: "a premier multimodal transport service provider with interests in Operations and Maintenance services, engineering consultancy, and project management services."[4] (Figure 6). SMRT sell their expertise in operating transport systems to other operators around the world.

Figure 5: Operators and authorities need to consider how to revise business models building on their differentiated expertise.
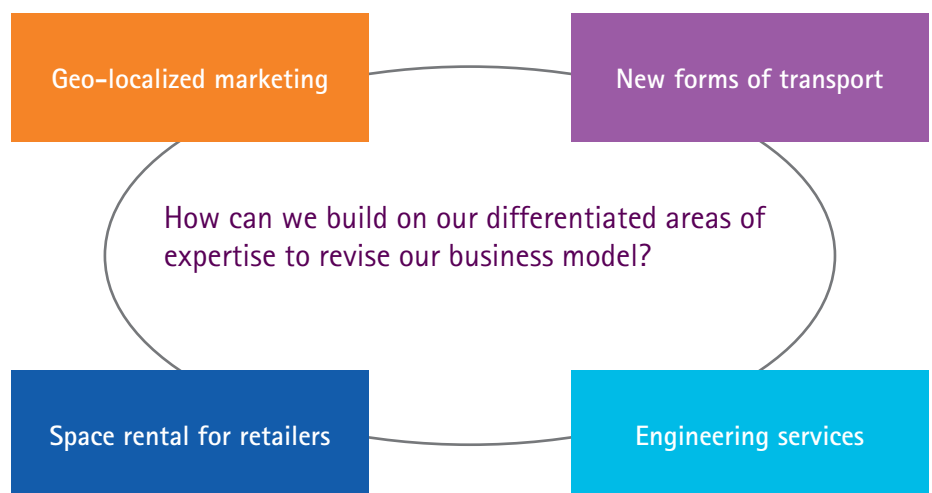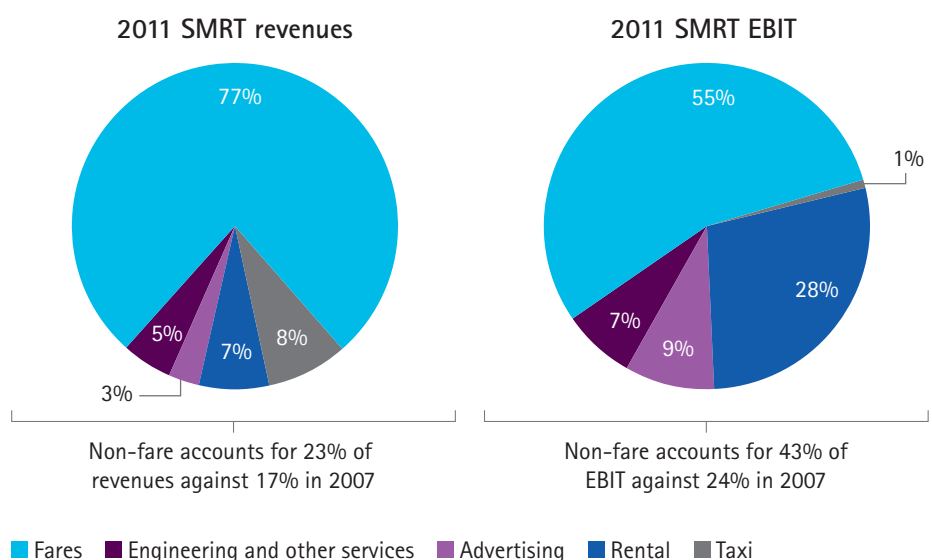

Figure 6: Against a backdrop of shrinking subsidies and budget cuts, public transport systems like SMRT are increasingly turning toward non-fare revenue.

2011 SMRT revenues

77%
5%
3%
7%
8%

Non-fare accounts for 23% of revenues against 17% in 2007

2011 SMRT EBIT

55%
1%
7%
9%
28%

Non-fare accounts for 43% of EBIT against 24% in 2007

■ Fares ■ Engineering and other services ■ Advertising ■ Rental ■ Taxi

Increased collaboration through open data

To address passengers' expectations, authorities and operators need to get better at collecting and analyzing data. Some organizations have neither the skills nor the financial resources to gain expertise in this area. They may consider open collaboration as a means to create more value for customers and operations overall. That requires opening their traffic data so that third-party developers can, in turn, create apps and other "extras" for the public (Figure 7). Opening data is not without its own issues. For instance: Who is responsible for the validity of the data? Which data should be open, and which should remain closed? What are the privacy issues? Is the data really free? What about existing contractual obligations? Despite the occasional stumbling block on these issues, it appears that the benefits of open innovation outweigh the potential risks.

Shaping mobility

Not only are business models realigning, roles are also changing and expanding. Authorities and operators are increasingly included in mobility and city planning, allowing a more holistic view of the implications of transportation beyond just providing transport services. In Singapore, the transportation authority oversees all forms of mobility—from buses to private cars. And they have a say in city development, weighing in on zoning for commercial and residential areas. In Amsterdam, Stadsregio, the transport authority, also helps define regional housing policy.

Thanks to this change in the role of authorities and operators, municipal infrastructure is better able to support the morphology of cities as they change from one type to another. The end result: city goals—from sustainability to specific economic development—are more readily achieved because transportation issues are considered early on.

Routes to success

Shrinking subsidies. Rising fuel costs. Increasing passenger demands. Changing urban trends. Technology advancement. These trends and others are reshaping the landscape for public transportation providers. In order to keep up, winning organizations will be those that go beyond the basics, leveraging open systems to provide better service and diversification to create more routes to future success.

Figure 7: As providers increasingly open their data, the number of apps multiplies exponentially.

Multiplication of mobile apps in case of open data

# of mobile apps
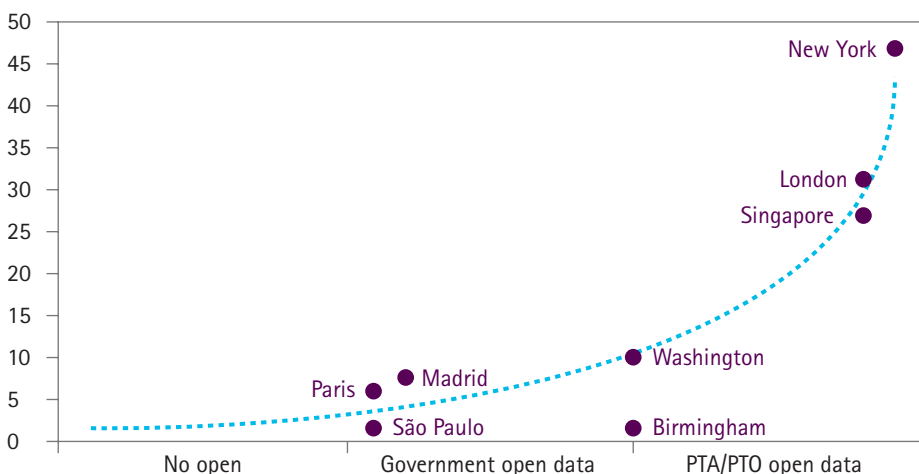
Source: Apple App Store, March 2012.

Further information

Methodology

Between December 2011 and June 2012 Accenture interviewed 20 C-level executives at major transport authorities and operators, as well as independent think tanks in twelve cities around the world: Amsterdam, Birmingham, London, Madrid, Oslo, Paris, São Paulo, Seoul, Shanghai, Singapore, Tokyo, and Toronto.

Our research is based on those findings as well as on analysis of public information.

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