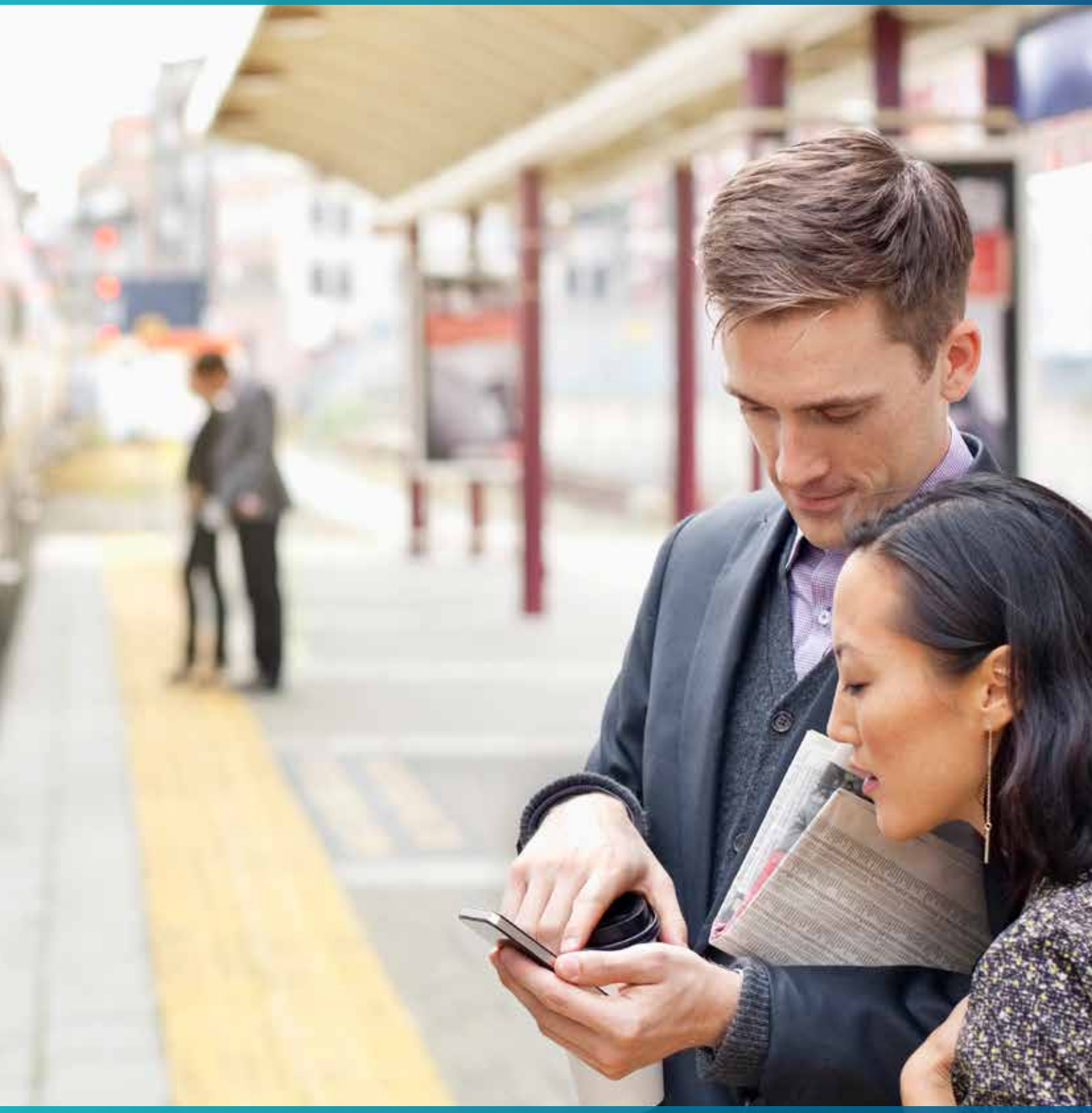
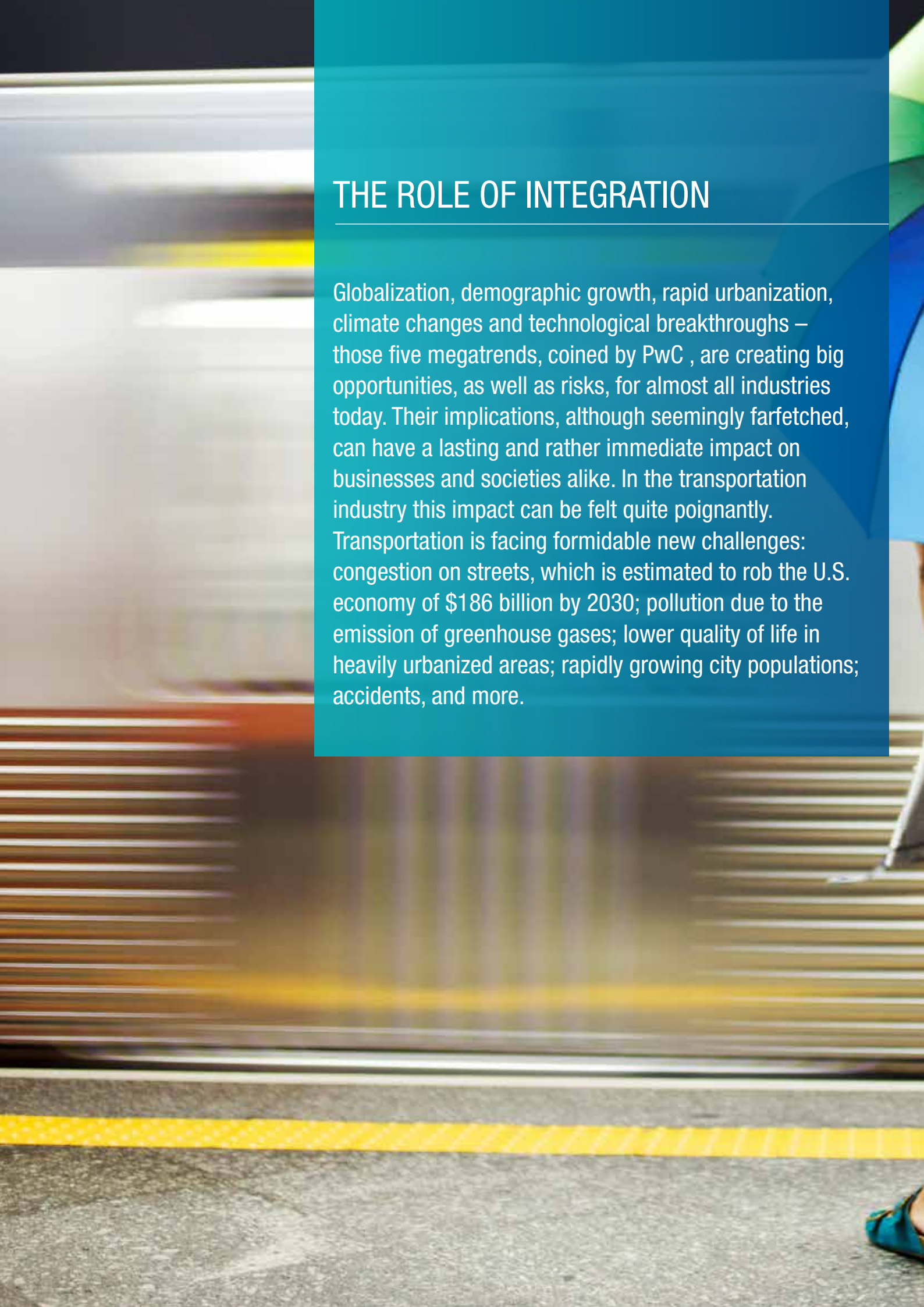
CUBIC Transportation Systems



The Power of One Account

Integrating Mobility for the Future



THE ROLE OF INTEGRATION

Globalization, demographic growth, rapid urbanization, climate changes and technological breakthroughs – those five megatrends, coined by PwC , are creating big opportunities, as well as risks, for almost all industries today. Their implications, although seemingly farfetched, can have a lasting and rather immediate impact on businesses and societies alike. In the transportation industry this impact can be felt quite poignantly. Transportation is facing formidable new challenges: congestion on streets, which is estimated to rob the U.S. economy of $186 billion by 2030; pollution due to the emission of greenhouse gases; lower quality of life in heavily urbanized areas; rapidly growing city populations; accidents, and more.

In major cities every day, workers, students and children hurry from their homes to work and school. Some have to struggle with taxis, private transportation, bicycles and scooters. A typical journey may involve two or three modes of transportation, such as a car, a train and a bus. For each of those choices, commuters are making decisions in a silo – riders cannot tell from one central information source if the road ahead is clear, parking is available, and the train and bus are on time. Equally, the service providers for rail and bus may be different, requiring commuters to carry two different tickets. For the transportation service providers, the problem is even worse. In response to an issue or a disruption on any part of the journey, they cannot optimize the transportation network and inform the traveler of alternatives or, better still, offer incentives to alter the typical route of commuters, to help alleviate the pressure and reduce congestion in the affected part of the network.

It is clear the fragmented systems and services that the transportation industry relies on today are no longer suitable to deal with the implications of the five megatrends. Transportation has reached a transition point, from which there is only one way forward – toward greater integration.

What if going somewhere were as simple as getting on the train, bus or any other service with an identification method riders already own? It could be their mobile phone, watch, credit card, university or school ID. And what if the phone, watch, card and anything else they use are all linked to an account that they have set up, which in turn is linked to a payment source, so that when they travel, the fare is automatically calculated and paid for and they are immediately notified of the charge? All that is left for them to do is to focus on their journey.

TRANSPORTATION HAS REACHED A TRANSITION POINT, FROM WHICH THERE IS ONLY ONE WAY FORWARD – **TOWARD GREATER INTEGRATION.**

This, in a nutshell, is what Cubic calls One Account – a system where transportation service providers in a region participate and agree to use a single account for the management and administration of fares and payments. By bringing together disparate service providers, One Account would not only be able to help public transportation authorities manage travel needs in one single point but, more importantly, it would optimize the whole transportation system, enabling service providers to address the pressing challenges mentioned earlier. Such integration would transform the way travel happens today and allow riders in a particular region to pay for any mode of transportation they choose – all as part of a single trip. It would give the rider a range of options, which take into consideration factors such as convenience, cost, time of travel, walking distance, available seats and more – information, which would be available in real time at their fingertips, all thanks to the integrated and collaborative nature of transportation systems of the future.

[1] PwC, Megatrends: http://www.pwc.co.uk/issues/megatrends/megatrends-overview.html

THE CARD-BASED MODEL

With time, public transportation authorities have started to recognize the limitations of a siloed way of operating and made attempts at integrating different travel modes into a more coherent, centrally managed system, by moving toward card-based transportation. First introduced some 20 years ago, card-based transit fare systems, where the information about a traveler's ability to pay a fare — availability of funds, eligibility for discounts and more — is stored on a smart card, are a popular choice for transportation service providers today. Those who moved toward this model hoped it would give them greater visibility into what is happening on their transportation network, and in turn, the ability to manage congestion and improve customer service. It did — to a certain degree.

Contactless smart card-based systems for a single or multiple service providers sharing similar fare rules have worked well for the past two decades and some still do today. London, where the majority of transportation services in the city center is operated by Transport for London (TfL), is a good example. The famed Oyster card is accepted not only on the London Underground, but also on buses, most trains (up to the city limits) and even on river services, thanks to the cooperation between TfL and other transportation service providers. However, such a scenario might not work for everyone. In cities or regions where multiple transportation service providers compete for the attention of consumers, and where fare rules vary greatly from provider to provider, achieving card-based integration can be troublesome, time consuming and challenging from a regulatory perspective.

In addition, card-based systems have a number of specific limitations, which make further integration difficult. An important aspect of card-based systems

UNFORTUNATELY, CARD-BASED ARCHITECTURES HAVE MADE IT DIFFICULT AND EXPENSIVE TO KEEP PACE WITH RAPIDLY EVOLVING TECHNOLOGIES AND THE OPPORTUNITIES THESE CREATE FOR FURTHER MULTIMODAL INTEGRATION

is that much of the burden rests on the card acceptance devices, which must make decisions whether or not to let the cardholder into the transit system, based on the fare product stored on the card. Because of limited memory and processing capacity at acceptance devices, supporting complex fare rules for multiple service providers and different transportation modes can become difficult and time consuming. Furthermore, as the security standards for accepting credit and debit cards become increasingly stringent, implementing new systems can create additional work for service providers, which may need to deal with testing and certification. On top of that, many regular or occasional users of multiple transportation modes may use separate fare cards or other media, which they pay for individually. As a result, costs for payments processing and cash handling can become unnecessarily high.

Finally, and perhaps most importantly, rapid developments in mobile technologies, contactless payments and cloud services made in the last few years, have shifted the way consumers think about and interact with transportation services. Many are keen to keep all of their travel information and needs in a single place – their smartphone. Unfortunately, card-based architectures have made it difficult and expensive to keep pace with rapidly evolving technologies and the opportunities these create for further multimodal integration. As such, while it is not impossible to use card-based systems to achieve some level of integrated transportation service, in reality, those systems are not well suited to form the foundation for the intelligently managed city or region of the future.

LAYING THE FOUNDATIONS FOR ONE ACCOUNT

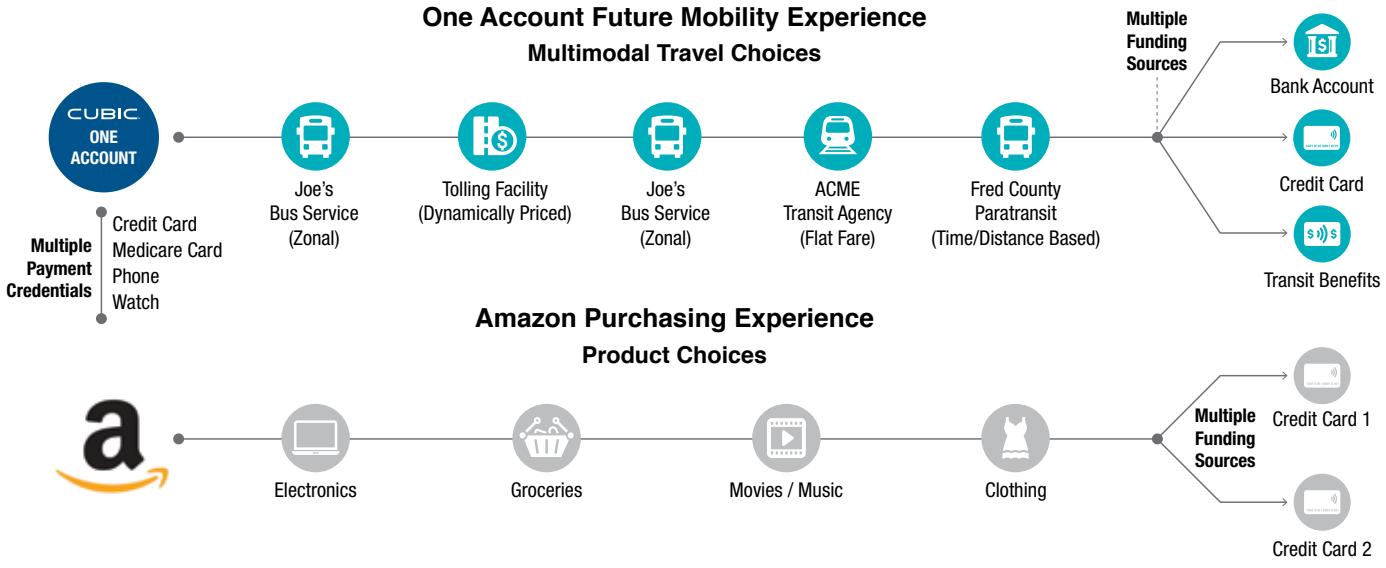
When it comes to true integration, account-based systems lend themselves naturally to One Account. Account-based systems are already preferred by younger generations, who use them to manage most of their needs, be it shopping with Amazon or music downloads with iTunes, and they carry an equally big potential when it comes to transportation. Much of that rationale centers around the rapid pace of technology and how this impacts both fare collection and payment systems architectures and the way they interface with the outside world of internet and mobile-connected devices.

Apart from being more technologically suited to customers' changing behaviors and expectations, account-based systems come with a host of benefits that most transportation service providers simply cannot afford to overlook. To begin with, account-based systems can handle more complex combinations of fare rules, geographical constraints, multimodal transit and supporting inter-agency transfer agreements, than card systems, since all calculations happen in the backend. Tracking available fund balances for the traveler, making decisions on letting a traveler enter the system, calculating fares and updating balances can all happen simultaneously and independently of each other. Since most of the transaction processing now happens in the back office, fare-accepting devices at stations and on transportation modes can be simplified, both from the hardware and software standpoints, bringing down implementation costs.

This means consumers have the freedom to use a device of their choosing, such as a smartphone, as preferred fare media, which reduces transportation service providers' dependency on any one single vendor and enhances competition.

Furthermore, when mobile phones are used as fare media there is no cost associated with card production. Since the back office takes on the lion's share of the work, the fare media's primary functions become security and identifying the traveler's account. Since riders pay with devices they already have, service providers can reduce costs associated with issuing, collecting and managing fare media. Travelers can make deposits into their transportation accounts online or with their mobile devices, instead of standing in line to buy cards or tokens. The increased convenience helps improve customer usage and satisfaction, both among local residents and visitors.

When it comes to integration, account-based systems allow all the public and private providers within a region, from ferries to bike-sharing services to trains to tolling, to share the same customer administration and payment infrastructure. Service providers have the opportunity to centralize systems as well as data, which helps lower costs and increase efficiency. Service providers can also lower payments processing costs by sharing a common payment gateway and, with customers funding one account, by processing a lower overall number of transactions. These benefits do not need to come at the cost of service providers' autonomy. To the contrary — collaboration can result in innovative payment and information solutions, which can in turn lead to more convenient and intelligent travel for the riders. The best account-based systems allow service providers to integrate key management functions without changing their fares, accounting practices or general ledger management. Only systems built on proven modern software architecture can provide this level of flexibility and control and become the right foundation for the introduction of One Account.



REALIZING THE POWER OF ONE ACCOUNT

While account-based services work well when it comes to integrating different modes of travel, even across multiple transportation service providers, their true potential can only be realized through the power of One Account. In essence, One Account takes account-based transportation to the next level and makes these systems become a part of a larger vision of the future of transportation management, where integration happens on three levels, through infrastructure and operations, information and fares.

One Account focuses on usability and seamlessness, allowing service providers to focus on providing the best possible service and not worry about payments. With the use of open application program interfaces the focus is on interoperability between different services; the user interface is open and each service provider can have their own system and method of recognizing the rider or payment. Service providers have their own business rules, which One Account can use to establish a regional business rules structure for interoperability among service providers.

One Account includes several capabilities:

- The ability to reconcile multiple service providers' accounts and connect directly with the banking system, which ensures each service provider receives its correct share of fare payments;
- The ability to synthesize account data with data from other sources, which facilitates future planning and decision-making;
- The ability to integrate Customer Relationship Management (CRM) systems, which allows service providers to pool their resources and effectively manage their call centers and customer service functions at a lower cost;
- The ability to price journeys across multiple modes, coupled with visible and modifiable business rules for allocating revenue across service providers, which allows service providers to understand and support the shift to integrated management;
- The ability to provide a single travel experience for the customer. The customer uses a single app/website/account for all travel needs. This provides the service provider with better travel analytics and advertising opportunities.

With growing demands on transportation systems and increasingly limited ability to expand the capacity of those systems, cities are seeking ways to more efficiently manage their existing resources. To accomplish that, planners and managers need a clear understanding of how people use all modes of transportation and a way to influence usage. The disparate systems common in many places collect data on usage, but that data is generally limited to individual trip segments and does not show entire journeys from origin to destination. With One Account at the heart of transportation management, all modes can complement each other. Because One Account unites customers' usage across modes, it can collect more comprehensive data on how people move through cities and regions that can inform both future planning and current management.

ONE ACCOUNT FOCUSES ON USABILITY AND SEAMLESSNESS, ALLOWING SERVICE PROVIDERS TO FOCUS ON PROVIDING THE BEST POSSIBLE SERVICE AND NOT WORRY ABOUT PAYMENTS.

The best usage data is both comprehensive and real time. Some benefits do come from collecting and analyzing data that is not real time, such as predicting usage during large events like a popular annual music festival. With One Account, transportation service providers can directly influence travelers' behavior and optimize resource use, not only promoting more socially and environmentally friendly forms of transportation (e.g., trains over cars) but also providing incentives to riders to alter their regular journey plan to keep the flow of people through the network undisrupted. Dynamic or variable congestion pricing for toll facilities becomes possible, as do other incentives for shifting usage to specific transportation modes.

For example, in response to an accident that causes severe congestion, service providers could alert commuters to the traffic and include offers for free parking at a train station or discounts at a coffee shop in the ferry terminal. The customer experience improves because travelers have better information about their upcoming journeys and incentives to adjust their behavior. Those behavior adjustments, in turn, help reduce the impact of the accident. Transportation service providers can also use data to increase transit ridership rates and reduce the number of cars on the roads. They can offer bundled pricing or free transfers for journeys that span multiple transportation modes. Providing discounts at local businesses can also encourage transit usage.

For customers to adjust to dynamic pricing and other events, they need communications that reach them wherever they are. These could come in the form of text messages, emails or other mobile alerts. Of course, these communications should only go to customers who have elected to receive them, both to respect privacy and provide higher levels of customer service.

CONCLUSION

Several converging market forces have fueled the move towards integration in transportation and while most attempts at interoperability today are centered on the establishment of a regional card, looking more broadly across cities and regions, account-based systems are better at unifying all the different modes of transportation, including public transit, tolling, bridges, tunnels, parking and ferries, as well as emerging shared private transportation options like bike rentals and on-demand ride-sharing services.

Going well beyond customer convenience, this approach can also lay the foundation for One Account – a fundamental part of smart cities of the future, which can help them manage travel patterns at a high level and influence consumer choices to optimize resource utilization and reduce congestion. Ultimately, the goal of One Account from the consumer point of view, is to provide convenient, improved services as well as efficient, informative technology delivered to travelers in real time. For service providers, One Account could help more effectively manage demand on the entire network, as well as help with planning of future transportation solutions. As city populations grow, the future of intelligent urban transportation lies in deeper and wider integration – enabled by technology – into people's lifestyles.

Capitalizing on these possibilities, however, requires that transportation management and IT team leaders reconsider how they manage operations, and evolve customer-facing services and revenue management systems. Redundant management systems are still common in many regions, where multiple service providers use their own customer service, accounting, IT and payments processing systems, as well as other distinct programs. This fragmentation creates inefficiencies and makes it difficult for service providers in a city to collectively keep pace with technological advancements in payments, customer service and other functions. With the growth of new technologies, cities must ensure the systems they have in place will stand the test of time in order to maximize the impact of public transit and enable sustainable urban mobility. As the march of integration continues through the industries, Cubic believes One Account technology will play an integral role in shaping the future of transportation services.

CUBIC | Transportation Systems

CUBIC – A LEADER IN INTELLIGENT TRAVEL SOLUTIONS

At Cubic, we believe our identity is intrinsically linked with our customers, and the people our customers serve. How they get from one place to the next – how that impacts their lives, their fellow travelers and their cities – and how it feels along the way.

That's why we're passionate about developing transportation solutions that improve the way we move throughout cities. Innovation is in our culture, and our history speaks for itself. In our 45-year history, we've delivered public transport fare collection systems to over 450 operators, including 20 regional back office systems, and traffic and transportation management systems for major cities on four continents.

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