WORLD RAIL FESTIVAL

#RAILFESTIVAL

13-14 November 2018, Amsterdam

ADVISORY BOARD REPORT: SMART TICKETING

To celebrate the incredible speakers who will be joining us at the 8th annual World Rail Festival in Amsterdam on 12-14 November, we have put together a Ticketing Advisory Board.

The World Rail Festival is the leading industry event, focusing on the digitisation of the transport business model, commercial growth, innovation and customer experience across the rail, bus and urban mobility sectors.

We have confirmed digital leaders from the likes of Deutsche Bahn, Singapore LTA, SBB and Trenitalia UK to give you a fascinating and unique insight into the latest smart ticketing trends and projects going on in the industry.

As a bonus, all Advisory Board members will be examining, discussing and debating these topics in person at the World Rail Festival in Amsterdam 12th-14th of November. Find out how you can secure your place at the event here: www.terrapin.com/conference/rail-festival/

These smart ticketing leaders have worked with us very closely to ensure our agenda is at the forefront of the latest digital and strategic trends of 2018 and beyond, focusing on issues that are critical to the industry. This report gives you a taster of the high-level discussion that you can be part of at the Festival in November.

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Deputy Director Fare
Systems, Singapore LTA

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MD & Chairman
Trenitalia UK C2C

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& Customer Projects Director
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Markus Basler
Head of Digital Transformation &
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Silvester Prakasam
Deputy Director Fare Systems, Singapore LTA

"Hands free ticketing using mobile phones is likely to become more pervasive, especially for buses."

What have been the most significant changes to ticketing in the last five years?

By far, the introduction of cEMV cards in transit. It reduces the need for top-up infrastructure and issuance of cards by transit operators.

Which digital technology do you anticipate will have the largest impact on ticketing in the near future?

Mobile phones using QR codes or NFC. In actual percentage, I do not expect the number of txns to exceed 10% of this total - but this is still sizeable in absolute terms.

What are the biggest challenges for rail when it comes to collaboration with other transport operators?

An equitable fare and apportionment formula, given that rail operation is far more expensive compared to other modes of public land transport

How do you envisage the ticketing experience to be in 2030?

Hands-free ticketing using mobile phones is likely to become more pervasive, especially for buses.

Which is your favourite city to travel around in?

London as the cEMV cards can be used there and it has so many attractions near to metro stations.

Ernesto Sicilia
MD & Chairman, Trenitalia UK, C2C

"Usage of so called 'big data' and more and more evolved artificial intelligence will be used to perform advanced analysis on customer habits and their purchasing behaviours."

What have been the most significant changes to ticketing in the last five years?

Digital retailing has been thriving in the last decade and the travel industry has been trying to catch up with the digital revolution. Most of the carriers are moving from the use of paper tickets to digital ticketing, where the customer Is allowed to store the credential for travel on his personal device. This has an impact, not only on the customer experience, but also in many ways on the business model of the carriers

Which digital technology do you anticipate will have the largest impact on ticketing in the near future?

Usage of so called "big data" and more and more evolved artificial intelligence will be used to perform advanced analysis on customer habits and their purchasing behaviours.

What are the biggest challenges for rail when it comes to collaboration with other transport operators?

Up until now each industry has established its own standards to be able to work together in terms of interface towards the customers (tickets) and in terms of revenue sharing (e.g. air carriers have IATA, Railways have UIC etc). There is lack of standard for interoperability starting from a national scale, not to mention a European or global one. At the moment, the way to collaborate is relegated to a one-to-one relationship between single carriers

How do you envisage the ticketing experience to be in 2030?

The concept of tickets and ticketing will no longer exist in 2030. I foresee that the path on which the retail world is on already (of customising the offer for each customer) will have reached its peak. Each person will consume his mobility experience and then be charged for it, regardless of the carriers or other services used across his journey

Which is your favourite city to travel around in?

Tokyo

Birgit Wirth, Head In/Out Systems & Customer Projects Director, DB & Arriva UK

"The biggest challenge will be managing complexity across multiple operators and modes of transport, to offer a seamless experience to the customer."

What have been the most significant changes to ticketing in the last five years?
One of the most significant changes was a major shift to digital ticketing. It has increased significantly over this period. Digital sales channels are still seeing significant increase. In some areas they already have reached the highest proportion of channel share.

Alongside focusing on customer needs, new approaches have been developed across the industry to offer easy access to public transport. One example is "pay as you go" (PAYG) based on In- / Out- solutions. Ticketing is driven by customers' expectations of flexibility, convenience and quick and simple processes.

Which digital technology do you anticipate will have the largest impact on ticketing in the near future?
Smartphones, with their embedded technology, will continue to revolutionise ticketing. It continues to be the key method for getting easy access to public transport services and for customer interactions in real time. For example, NFC, GPS and multiple sensors will be used to improve customer experience in ticketing combined with new products and personalised services. Location-based services and personalisation will be key to get best value for the customer based on their travel needs.

What are the biggest challenges for rail when it comes to collaboration with other transport operators?
The biggest challenge will be managing complexity across multiple operators and modes of transport, to offer a seamless experience to the customer. This is due to different data sources supporting schedule information, various fare systems, terms and conditions, customer data and technologies. Standards for data and processes as well as standardised APIs will support collaboration. In addition to standardisation, business models need to be defined to encourage collaboration.

How do you envisage the ticketing experience to be in 2030?
The concept of tickets will no longer be relevant. The use of public transport will be seamless and based on real time In- / Out-solutions recognising the customer as they move through the process. A price will be calculated based on a defined rule set for individual travel habits. Customer can easily use public

Which is your favourite city to travel around in?

Currently it is Mannheim, a medium-sized city in Southern Germany. The city is well linked to the German and European long-distance network with highly available urban public transport including multimodal services. When using public transport, the customer uses an easy Check-in / Check-out system on smartphones combined with a fare tariff system based on distance between your start and end point of your travel with daily and monthly price capping for flexible usage.

Markus Basler
Head of Digital Transformation & Strategy, SBB

SBB CFF FFS

"IoT combined with AI will lead to struggle-free, context-aware ticketing which is deeply integrated into the customer journey."

What have been the most significant changes to ticketing in the last five years?
Intermodal Mobility Bundles (flexible rate including different modes of transportations, i.e. GreenClass), CICO based post-paid ticketing has become a reality, turning the complexity of tariff systems irrelevant. Finally, the liberalisation of the monopoly to sell tickets (which was limited to RU's before).

Which digital technology do you anticipate will have the largest impact on ticketing in the near future?
IoT combined with AI will lead to struggle-free, context-aware ticketing which is deeply integrated into the customer journey. Ticketing itself will become obsolete before 2030 and be substituted by a pay-per-use service, covering all mobility needs (or even beyond), probably based on a digital identification system.

What are the biggest challenges for rail when it comes to collaboration with other transport operators?
The biggest by far is mindset. Also, the cost of complexity and the lack of interoperability, particularly in an international context. This becomes obvious when you compare the railway industry to the airline industry, whose regulation, standardisation and interoperability is more than 10 years in front of ours. Owner structure, very long lead times and lifecycle periods are also challenges to collaboration.

Which is your favourite city to travel around in?
Zermatt, Switzerland has a highly efficient public transportation system based on electric cars, which is neatly integrated into feeders (railway and cars), this has been up and running for over twenty years.

In Hong Kong there is an impressive combination of effectiveness and personal touch. I love the elevators, feeding pedestrians into the city!

Peter Krumm
Strategy & Development Director, Connexxion Transdev

"Potentially in the very long future, there could be less travel due to virtual presence."

What have been the most significant changes to ticketing in the last five years?
The introduction of digital tickets that can be bought, used and verified on a smart device.

Which digital technology do you anticipate will have the largest impact on ticketing in the near future?
Artificial intelligence and virtual or augmented reality. Potentially in the very long future, there could be less travel due to virtual presence.

What are the biggest challenges for rail when it comes to collaboration with other transport operators?
Rail operators need to open up and be less confident that rail will be there forever.

How do you envisage the ticketing experience to be in 2030?
Tickets?! If we still have to pay for public transport it will all be based on a be-in/be-out kind of system integrated to a mobile device.

Which is your favourite city to travel around in?
Amsterdam or any other city with a dense public transport network, good accessibility for bikes and private cars.

Robert Jan ter Kuile
Strategic Advisor, GVB

"Be in/be out will hopefully allow for a smoother experience, where the user will still maintain a sense of control."

What have been the most significant changes to ticketing in the last five years?
This week I received high speed train tickets on paper and I presume this will be the last time. The standard for ticketing has become e-ticket and mobile. In Aviation this happened 10-15 years ago, train systems recently converted and urban systems will be there soon. Digital and mobile distribution of tickets will have a huge impact on the accessibility of local transport and reduce our distribution costs.

Which digital technology do you anticipate will have the largest impact on ticketing in the near future?
The 2D barcode will have the largest impact, not because it's a new technology, but because it will be adapted by more and more operators and travellers. It will allow for new distribution models and reach many new customers for whom buying a ticket is still too big a barrier.

What are the biggest challenges for rail when it comes to collaboration with other transport operators?
It will be a huge challenge to arrive at international ticketing and information standards. In order for a true European transport system to develop, customers should be able to easily plan and book their multi-operator trips.

How do you envisage the ticketing experience to be in 2030?
By 2030, I hope there will not be a ticketing experience anymore. Be in/be out will hopefully allow for a smoother experience, where the user will still maintain a sense of control.

Which is your favourite city to travel around in?
I love many cities in the world, but in the end, I'm the happiest cycling through my hometown of Amsterdam. I can greatly recommend you enjoy the experience while visiting the World Rail Festival!

Valerie Lefler
CEO, Feonix – Mobility Rising

"Win the hearts of customers and elevate your services to become the trusted travel partner and companion for customer's personal mobility needs."

What have been the most significant changes to ticketing in the last five years?

There are two major changes that I see creating the most disruption in the market. The first is the rise of transport aggregator sites. The ability to purchase multiple tickets from multiple transport providers from a single website platform has dramatically improved the customer experience and the provider's ability to enter the market efficiently. Secondly, the ability to use your smart phone to pay for or purchase tickets electronically on the go. There is no waiting in line for tickets, you download an app, connect your payment platform and off you go. This again, improves the customer experience and improves efficiency for the transport operator, eliminating staff sitting in a booth selling tickets, frustrated or confused customers trying to figure out which ticket goes with which bus, etc.

Which digital technology do you anticipate will have the largest impact on ticketing in the near future?

Blockchain technology recently has and likely will continue to be the most significant factor in large transport operators' ticketing. The ability to travel from country to country without concern as to currency or exchange rates, etc. as a passenger or operator will be a major financial saving. It also can be the glue that ties together the payment exchange between all parties, including government and small business, however, in some countries it may be several years before that is a possibility.

What are the biggest challenges for rail when it comes to collaboration with other transport operators?

One of the biggest challenges is not rooted in technology but in relationships, and that is trust. When innovating, today just about anything can be done with technology and software, but unless the parties are willing to work together, trust one another, and follow a similar code of ethics, it is a train without a track. There is so much competition, staying alive and thriving in today's economy is a challenge for everyone, no one is safe. In MaaS it is essential for the providers to work together to provide the customer a better experience. which will involve sharing of information, customer insights, market intelligence in ways that are not intuitive to the industry. Understanding each operator's value proposition and working together to create an ecosystem of opportunities for the customer's benefit is a very difficult balance and if the operators do not trust each other, then it creates massive inefficiency, duplication of services, possible additional regulations, and everyone ultimately loses.

How do you envisage the ticketing experience to be in 2030?

In 12 years, the ticketing experience will still vary from country to country and provider to provider. While we have made incredible strides, there will still be a digital divide in that length of time. More providers will be using electronic ticketing with an app by 2030, but the paper ticket will still exist for many small or rural operators. In more communities, you will not need 10 different apps for 10 different operators but be able to book the trip across multiple operators in a single transaction. However, that will still not be the norm. Multi-operator multi-modal transport will be seamless in a few select cities, with thousands more trying to direct processes, technology, and legal frameworks towards that goal.

Which is your favourite city to travel around in?

I love traveling in Melbourne, Australia. The coordination of providers and integration of human support and technology is fabulous. Throughout the city there is a balance of history and modern architecture with a priority on green spaces, walkability, and the environment. Being able to travel with ease in such a growing city is remarkable and then when you tie in all the different cultures and amazing cuisines that line the street corners – it is truly a blissful experience.

Prabhas Kumar
AFC Specialist, Ministry of Transport and Communications Qatar

"Digital transformation in the ticketing system, using technologies such as artificial intelligence and the Internet of Things would have a largest impact on customer satisfaction"

What have been the most significant changes to the ticketing in the last five years?

The ticketing ecosystem in the last five years has changed drastically. Account-based ticketing solutions gained momentum in this fourth digital industrial revolution. Several forward-thinking government agencies/PTOs switched from conventional card-based systems to the account-based or mixed solutions.

The implementation of account-based systems in some cities has resulted in improved customer experience, a reduction in the cost of fare collection and a more flexible system.

Some of the transit agencies, for example in Switzerland, are plotting seamless be-in/be-out ticketing solutions. The successful implementation of be-in/be-out would be a big milestone in the coming years, due to the drastic reduction in hardware costs.

Open payment or EMV have been on an exciting journey in these past years. This system became much easier, having been implemented by some agencies across the world.

Many other modes of payments NFC phones/QR code/smart watches/mobile ticketing etc have emerged as big game changers in the last five years.

Which digital technology do you anticipate will have the largest impact on ticketing in the near future?

Digital transformation in the ticketing system, using technologies such as artificial intelligence and the Internet of Things would have a largest impact on customer satisfaction, engaging with passengers, empowering employees, optimising operations and maintenance and transform products and services.

What are the biggest challenges for rail when it comes to collaboration with other transport operators?

In my view, lack of system knowledge is the biggest challenge. Operators with limited system knowledge and too much dependency on the system implementer have big challenges when it comes to properly operating and maintaining these systems.

How do you envisage the ticketing experience to be in 2030?

2030 would be a new era of the ticketing ecosystem. Data science and machine learning/artificial intelligence will play a big role. Ticketing systems will probably learn from the passenger's travel pattern, which eventually will give passengers complete peace of mind and higher satisfaction. I believe by then, even without having any media, a passenger would be able to travel, and the system would be intelligent enough to identify the passenger presence and deduct fares accordingly. This will all happen thanks to power of data!

Which is your favourite city to travel around in?

I love to travel using public transport and traveling on public transport in Singapore gives me the best experience due to the sophisticated passenger information and awareness system.

Dr Padet Praditphet,
Director, Common Ticketing Office, Office of Transport and Traffic Policy and Planning (OTP), Ministry of Transport of Thailand

"It is necessary to provide alternate means of transport--such as commuter buses and taxis as a feeder system to rail, so that people can travel to their desired destinations."

What have been the most significant changes to ticketing in the last five years?
On January 12, 2015, the Cabinet authorized the Office of Transport and Traffic Policy and Planning (OTP), an agency under the Ministry of Transport of Thailand, to establish the Common Ticketing Office Project (CTO). The CTO is an agency charged with conducting studies and analysing information pertaining to development of a common ticketing system and common fare structure. It also prepares details of work plans related to prescribing policy and standards of the common ticketing system. Moreover, it prepares the framework on operations and standards pertaining to common ticketing operations, and models of systems connection with service providers. Finally, it prepares details for prescribing regulatory models and mechanisms and guidelines for management of the common ticketing system.

Accordingly, during the last 5 years implementations have included common ticketing policies and plans, standards pertaining to common ticketing, detailed designs, and other support work of common ticketing management, and establishment of the Central Clearing House (CCH) for Transport Common Ticketing. In addition, applications have been developed, installation of CCH hardware and software, as well as development and creation of pilot project prototypes, which include systems refinement and development, systems testing all in order for the CCH to link with Service Providers of various transport modes so that common ticketing can be used.

2. Which digital technology do you anticipate will have the largest impact on ticketing in the near future?

Consequently, digital technology affects development of common ticketing; currently, there are two key relevant technologies in countries that have successfully developed common ticketing, they include:

(1)   Closed Loop Technology: common ticketing development globally in the last 30 years has relied on contactless smart cards rather than paper tickets. The contactless smart card that is popular and used widely in many countries uses MIFARE technology, which is a smart card chip technology developed by NXP Semiconductors that developed contactless smart cards applying ISO/IEC 14443 Type A standard. Thereafter, MIFARE DESFire followed MIFARE, from EV0 to EV1. The common ticketing system in Thailand follows this system.

(2)   Open Loop Technology: during the past decade, Visa and MasterCard started developing smart payment cards they call EMV, short for Europay, MasterCard and Visa. In this regard, EMV is an international standard used by debit and credit cards, which complies with ISO/IEC 7816 standard for contact cards and ISO/IEC 14443 for contactless cards. Moreover, since 2014 the EMV standard has been used for mass transit-fare collection in London, England, compelling Thailand to shift plans to support this technology also, as well as related technologies, namely NFC and QR Codes.

3. What are the biggest challenges for rail when it comes to collaboration with other transport operators?

It is impossible as well as impractical to construct rail systems to provide complete public or mass-transit service coverage in Bangkok and other key cities in Thailand. Consequently, it is necessary to provide alternate means of transport such as commuter buses and taxis as a feeder system to rail, so that people can travel to their desired destinations. Consequently, it is necessary to provide a key tool promoting the use of public transit mode that is convenient, fast, and cost effective: a common system integration of common ticketing and common fares. In this regard, Thailand has developed this common system as well as preparing 'Business Rules' for service providers in each mode of transport.

4. How do you envisage the ticketing experience to be in 2030?

In 2030, the trend of payment of public transit fares is likely to remain account-based, using an open-loop system. Accordingly, this will be a payment system linked directly to banks, which is being widely applied to payment for goods and services. Consequently, EMV-based credit and debit card holders can apply their cards for fare payment without having to issue new transit-fare cards. Furthermore, the cards can also be used with multiple equipment of suppliers, thereby reducing limitations, procurement and systems maintenance costs. In this regard, the fare payment media may be limited under the contactless system, which requires focusing on development of speed stability and security. Consequently, the media used should not differ too much from today, such as continued use of card media and NFC or QR code via cellular/mobile phones.

5. Which is your favourite city to travel around in?

I have had the opportunity to travel to many countries in Europe, North America, Australia, and Asia. Nonetheless, the country that still impresses me today is Belgium. This is because over 20 years ago I had the opportunity to study and train in the city of Namur, Belgium. At that time Belgium used paper tickets for traveling on public transit, such as trains and commuter buses. With one single ticket given to me over 20 years ago, I was able to travel from Namur to almost all cities in Europe even Amsterdam. Nonetheless, I used that ticket most often to travel from Brussels to Namur by train and then connecting by bus to the university and my residence. In addition, one of my first impressions was the fact that I could use that single ticket to travel both by train and commuter bus. At that time, I neither understood nor thought that it was a common ticketing system. In this regard, I believe that development should have advanced significantly today.

Christophe Lemaire
Director of Modernisation Programme, SNCF

"The ticketing and billing systems must then be positioned above operators, which is probably the biggest challenge."

What have been the most significant changes to ticketing in the last five years?

The introduction of smartphones as replacements for cards or tickets and the introduction of Open Payment in London in 2014, both with 'Carte Bleue' (blue card payments), of Apple Pay and Google Pay... The biggest change to ticketing is that there are actually no tickets anymore.

Which digital technology do you anticipate will have the largest impact on ticketing in the near future?

Considering the success of QR code payment in Asia, I wonder whether this will be the next move for us in Europe. The next evolution of ticketing would then be more to do with the payment methods.

What are the biggest challenges for rail when it comes to collaboration with other transport operators?

It probably lies in the capability of operators to exchange customer data in a true "door-to-door" approach. The customer does not care which operator he travels with, he just wants to travel from A to B. The ticketing and billing systems must then be positioned above operators, which is probably the biggest challenge. I was reading an article about transport in Helsinki, this is something they have undoubtedly managed to make a reality.

How do you envisage the ticketing experience to be in 2030?

Smooth and seamless, without any consideration for the operator(s) actually being used by the customer. Above all, however, there may not be any ticketing anymore, the passenger will be located as he gets in and out of the transport system or as he connects from one mode of transport to another, in a « be-in / be-out » approach.

Which is your favourite city to travel around in?

Being French I should say Paris... for the quality of the métro/RER/train network. But we are not an example in terms of simplicity of the ticketing system (but working hard on it for 2021)! Instead I will say London for the extreme simplicity of the access to public transport. You get your carte bleue out of your pocket, check-in or check-out and this is it.

Enrique Fernandez-Pino,
CIO, Go-Ahead Group

"cEMV and ABT (...) should allow for the aggregation and capping of fares, which in turn should give the passenger the best value and choice."

What have been the most significant changes to ticketing in the last five years?
I would say cEMV and ABT, in that order. This technology should allow for the aggregation and capping of fares, which in turn should give the passenger the best value and choice.

Which digital technology do you anticipate will have the largest impact on ticketing in the near future?
Account-based ticketing

What are the biggest challenges for rail when it comes to collaboration with other transport operators?
Governance/compliance and existing or proposed difficult-to-adopt specifications, which are barriers to collaboration and technical adoption.

How do you envisage the ticketing experience to be in 2030?
It will be cashless, with some form of token (yet to be decided), linked in ABT. Multi-modal and multi-operator. 2030 isn't that long away in terms of technology being actually adopted in transport, so I think we will see some improvements on what there is today, but not wholesale changes from the strategy that most are already following.

Which is your favourite city to travel around in?
Lyon.

Andrew Salzberg
Head of Transportation Policy & Research, Uber

Uber

"Creating shared value across modes hasn't been done in many locations yet, so there's still a lot to learn on both sides of the operation."

What have been the most significant changes to ticketing in the last five years?
The advance of contactless payment systems that aren't system specific. Being able to use a standard credit card or NFC reader to book a ride on transit systems in markets like London and Vancouver is a game changer for ease of transit, ease of use and, ultimately, for growing ridership. At Uber, we've seen first-hand how making payment seamless and easy can be critical for attracting users. It's exciting to see what making transit payment simple and painless might do to the future scale and success of public transportation.

Which digital technology do you anticipate will have the largest impact on ticketing in the near future?
Integrating transit ticketing and multimodal planning in a single interface holds the potential to vastly increase the number of people relying on 'shared modes', i.e. anything that's not a car that you already own. At the moment, individual modes are improving in service quality, but there's still not much experience of offering multiple modes of travel seamlessly to a user. That will likely start to be easier and easier in the coming few years, opening up the potential for new growth and innovation in transit ticketing.

What are the biggest challenges for rail when it comes to collaboration with other transport operators?
Understanding the business models of new mobility providers and how rail systems can create value for them. New systems, from bikeshare to car-share to rideshare, have different models and different incentives to existing systems. Creating shared value across modes hasn't been done in many locations yet, so there's still a lot to learn on both sides of the operation.

How do you envisage the ticketing experience to be in 2030?
By 2030 (though hopefully much sooner), ticketing should be fully seamless. As a rider, you wouldn't even notice when ticketing is happening. You'd walk onto a train or car or bike and have payment processed automatically by your personal device that detects what mode

of transport you're on. You'd be directed to the most efficient form of travel at the right time, tailored to your needs.

Which is your favourite city to travel around in?

I'm biased towards my hometown of Montreal - it has one of the best transit systems in the world, was one of the originators of the modern wave of bikeshare systems, is a leading pedestrian and bike friendly city, and has Uber service to get me home late at a night in the cold.

Duncan Henry
Head of Ticketing, Rail Delivery Group

"Barriers to entry in the market have grown up over many years and incumbent suppliers have vested interest in maintenance of the status quo in order to recoup sunk costs. Breaking down these barriers is essential to the introduction of innovation and the provision of integrated, competitive, multimodal markets."

What have been the most significant changes to ticketing in the last five years?
Barcode? ITSO Smart Card? Contactless? Ticket to Mobile? Account Based Ticketing? Mobile Device? Actually, all of these are indicative of a trend to self-service methods of fulfilling the commercial transaction between customer and operator. Self-service applies whether that commercial transaction is performed in advance of travel or as part of the travel routine.

Which digital technology do you anticipate will have the largest impact on ticketing in the near future?
Mobile technology is poised to transform ticketing and will combine the commercial transaction with other information and disruptive services to create a value-add bundle. As important perhaps are the technologies that are talked about that I do not think will have significant impacts in the near future – biometrics. Too complex, slow and inaccurate for mass market applications, they are also psychologically too far for today's customers to move in the near future. Maybe in 20 years.

What are the biggest challenges for rail when it comes to collaboration with other transport operators?
Rail fare and product complexity is high, which makes it very difficult (and expensive) for other operators and suppliers to enter the rail market. Barriers to entry in the market have grown up over many years and incumbent suppliers have vested interest in maintenance of the status quo in order to recoup sunk costs. Breaking down these barriers is essential to the introduction of innovation and the provision of integrated, competitive, multimodal markets.

How do you envisage the ticketing experience to be in 2030?
Travellers will get financial advantages by allowing an app on their mobile device to manage their multi-modal ticketing needs. The app will be provided by a trusted ticket retailer operating across modes and will communicate the travel consumed in a transparent way to the operators with payments taken automatically. Customers will receive advice on which service best meets their needs – from train to self-driving taxi. Customers

will have informed choice, with retail offerings specialising in pre-purchase, contract travel and pay as you go as well as competing modal providers. Less frequent customers will still have access to physical tickets in some cases, but these will be for specific purposes and at a premium – for example, tourists wanting a souvenir. Most travel will be consumed as part of a package.

Which is your favourite city to travel around in?
The question assumes I prefer traveling around a city! I actually prefer long distance travel by public transport, it's much more relaxing than driving. If pushed for a city, I'd have to say Hong Kong, with its clean and efficient underground, its quirky and ubiquitous buses and iconic low cost "Star" ferries it's hard to beat. But mainly because it's just such a great city.

Sami Sahala

Intelligent Transport Systems Chief Advisor, Forum Virium Helsinki

FORUM VIRIUM HELSINKI

"(there is a) fear of losing the sole 'ownership' of the customer relationship, similar to public transport sector fears."

What have been the most significant changes to ticketing in the last five years?
The success of MasterCard in London that has now been adopted (at least as a target) in many other cities.

Which digital technology do you anticipate will have the largest impact on ticketing in the near future?
The transformation from card-based to ID-based systems.

What are the biggest challenges for rail when it comes to collaboration with other transport operators?
Mindset. It has traditionally been very difficult for century-long monopolies to be a part of a value chain; of course, this is not always a bad situation, but there are elements of that challenge within every rail company. This mindset also includes the fear of losing the sole "ownership" of the customer relationship, similar to public transport sector fears.

How do you envisage the ticketing experience to be in 2030?
Something you don't have to think about. You just know if you're able to use a certain transport service or not.

Which is your favourite city to travel around in?
Vienna & Helsinki. They both have excellent public transport services and the first versions of MaaS that you can use to ride every mode of transport.

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12-14 November 2018, Amsterdam

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