Satisfying passengers demands using SmartRail innovations
To remain competitive, a railway or metro must satisfy its customers. With technology evolving and these passenger demands growing, railways and metros operators must seek more innovative ways to integrate systems and improve efficiency, commercial and operational performance.

For this e-book we’ve spoken to the industry’s leading innovators and ground-breakers and they will take you on the most innovative passenger journey possible. It’s not just another collection of facts and figures but an insight into the reality of the direction of our industry; the opportunities and excitement but also the challenges still to be overcome.

SmartRail is a year round community encouraging discussion, debate and the sharing of best practice. The heart of this community is www.smartrailworld.com which offers a truly global perspective on rail and metro signalling and related areas within our industry. Each of our insights was first published on this site so ensure you are enjoying the latest news and become a subscriber for free today.

SmartRail is also a free exhibition and congress, www.smartrailexpo.com bringing together over 1000 rail and metro innovators, strategic leaders, project managers and technical specialists from across the industry to drive this innovation, establish best practice and develop an efficient, reliable and competitive network. SmartRail events are taking place in Amsterdam, Washington DC and Bangkok in 2014.

Many thanks to all the contributors who took time to speak to me and help make this book happen.

We hope you enjoy this e-book and find it stimulating, informative and perhaps even a little inspiring.

Regards and thanks,

Luke Upton
Editor
SmartRail World

PS – If you would like to contribute to SmartRail, please email: Luke.Upton@GlobalTransportForum.com
Satisfying passenger demands using SmartRail innovations.

We begin by looking at ten of the most innovation operators in Europe and what developments have driven their growth. Next is an interview with Peter Williams of major UK operator, East Coast, who has used new tools to develop passenger relations and drive revenue. We then journey to Italy to talk to NTV how they’ve built a railway from scratch with innovation at the heart of their ambitious plans. Next is an analysis of the growing role of CCTV and its importance for several aspects of rail and metro. And finally we head to California to learn about their development of a passenger Wi-Fi service before finishing by learning a little more about the SmartRail community.

Enjoy!

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Innovation is at the heart of the rail and metro industry and SmartRail World spent several weeks asking the industry to tell us who are the key individuals at the most innovative rail and metro operators in Europe. We took opinions via social media, through our SmartRail World website and in our daily conversations with the industry. Narrowing down all the suggestions was tough and we hope you’ll find the list interesting, entertaining and perhaps even a little surprising...

For each company on the list we’ve focused on one individual and a particular area of innovation that has made them stand out from the crowd. The top ten is not listed in order.

1. Vladimir Yakunin
   President, Russian Railways
   WHY? With a history dating back to 1917 and over a million employees the Russian Railways is not content to just maintain its position astride Europe’s largest nation but instead is undergoing a modernisation programme with the explicit aim of “harnessing Russia’s unique geographical position to fulfil its potential as a transcontinental land bridge.” At a cost of 3.2 trillion rubles the modernisation programme developments include high-speed rail, double-decker trains and the creation of new international corridors to allow ‘through’ freight services between Europe and Asia. In a recent discussion with Russian Premier Vladimir Putin, Mr. Yakunin outlined the importance of new thinking; “As for what we are doing by way of innovation we are putting the first double-decker carriages into operation this year. The advantage of these carriages is that we can maintain and even increase comfort levels and speed, while straight away cutting ticket costs by 30 percent. We need to develop new passenger service methods, because the state policy for encouraging population mobility and the support going to the air transport sector obliges us in the railways sector to develop new ways of working too. This includes high-speed rail links, express routes, and these double-decker carriages, for example.”

2. Giuseppe Sciarrone
   CEO, Nuovo Transporto Viaggiatori (NTV)
   WHY? Where to begin in the innovation stakes? The first private operator working on the Italian high-speed rail network and the first globally using the new Alstom AGV train plus they are the holder of the European rail speed record of 575km per hour. They’ve developed a vast new IT infrastructure and customer facing operations – virtual tickets, 2D barcode tickets, mobile apps. And on-board they offer three “journey ambiance” coaches, passengers can select whether they want the “Relax Coach,” where mobile phones are banned, or the “Cinema Coach,” where passengers can watch the latest films.

   Claudio Diotallevi, Director of Systems Information at NTV told SmartRail World about the importance of taking an innovative approach: “From the start of the railway we immediately saw that we had an amazing opportunity to create a new and modern train service. We understand that in a liberalised rail market and the end of a monopoly in Italy, the passenger became a customer and could make choices accordingly – as a result we had to offer an amazing on-board experience.”

3. Per Thorstenson
   CEO, Arlanda Trains
   WHY? The Arlanda Express train operates from Arlanda Airport to and from Stockholm Central Station in Sweden and offers a rail experience designed with luxury airline specification. Featuring Scandinavian design, an on-board photo gallery, 100% wool covered seats a buffet car resembling a high-end bar and dimmable lights – it’s no surprise the train is called the Framtidståget [Train of the Future]. The four-car service on trains built by Alstom it has won a host of accolades and awards and even came out on top of a global list of travel innovations by prestigious global affairs and lifestyle magazine Monocle.

4. Anne-Grethe Foss
   COO, Metroesekspert (Copenhagen Metro)
   WHY? COO of one of Europe’s most technologically advanced metro systems. An early adopter of driverless trains systems since 2002, the entire metro system and the trains are run by a fully automated computer system consisting of three subsystems: automatic train protection (ATP), automatic train operation (ATO) and automatic train supervisory (ATS). In addition it also applies a highly sophisticated and innovative automated security systems that not only enhances driver and on-board safety but also for those at the station. For example it’s impossible for someone to fall or jump in front of a train as access to the track is blocked by platform screen doors whilst at outdoor stations an infra-red beam is in place that reacts immediately should a person walk or fall onto the tracks.

   SmartRail World spoke to Anne-Grethe for her thoughts on innovation: “Our aim here in the Copenhagen Metro, is to ensure that the benefits that accrue from the driverless concept are reflected in the passenger experience. Apart from the flexible, reliable and frequent service offered and the varied automated travel information provided, every opportunity is made to humanise the travelling experience. This means that passengers have many possibilities of interacting with operations staff if they desire, either face to face or via the call points located around the system and on the trains. This ensures that Metro users feel both secure and confident that their well-being is prioritised.”
5. Valerie Dehlinger
Managing Director, Ouigo

**WHY?** Leading the way in high-speed rail is not enough as SNCF has now created a budget rail service based on successful airline models – Ouigo. Tickets for Ouigo can only be purchased online through the Ouigo website or mobile app and not through ticket counters or the normal SNCF voyages website. Ouigo trains lack a buffet car, have a greater number of more tightly packed seats, and use non-major stations, similar to models adopted by budget-airlines. Launched in April, 2013 by September over a million tickets have already been sold and plans for expansion beyond French borders have already been discussed.

*In a recent feature with UK newspaper, The Independent, Ms. Dehlinger said: “We had to build the whole system from scratch. The work entailed developing a brand image and marketing campaign, redesigning and refitting the trains, building a new information system and website, and designing a new operating and maintenance strategy, all with an eye on achieving the 40% cut in operating costs.”*

6. Luc Lallemand
CEO, InfraBel

**WHY?** Since 2005 and the restructuring of the ‘SNCB’ Belgian National Rail Company in line with European directives, InfraBel has been tasked with the maintenance and modernisation of rail infrastructure and the management of travel information. The launch of http://www.railtime.be and its mobile application – one of the most popular in the App Store and Android Market in Belgium – and the implementation of an automatic station announcement system are just some of the initiatives undertaken for the benefit of the Belgian rail network’s 750,000 daily users... big numbers for a truly innovative operator.

7. Leoš Novotný
CEO, Leo Express

**WHY?** Probably the smallest operator on our list, but certainly one of the boldest. This open-access train operator set up in 2010, launched inter-city services two years later in opposition to larger established operators and are now seeking to expand outside the Czech Republic. One to watch!

*SmartRail World asked Leoš Novotný about the importance of innovation: “We consider innovation as one of the keys to growth of the company. At LEO Express we put a lot effort to brings the latest trends and services and be the innovators on the Czech railroad.”*

8. Professor Andreas Knie
Director of Innovation, Deutsche Bahn

**WHY?** An academic as well as a businessman, Andres Knie heads up Innovation at the largest railway operator and infrastructure owner in Europe carrying about two billion passengers each year, DB as a fairly recent development in 1994 has had the benefit of an evolution connected with some of the latest technological developments. And non-more so than in fare collection. It’s currently trialling an innovative new video-enabled ticketing system in the Black Forest in which staff operate ticket booth’s virtually through high-definition screens at stations. The system is designed to provide all the benefits of the traditional manned ticket office but with streamlined operational advantages. Currently undergoing testing but if successful could revolutionise the train station experience.

9. Jan Forsberg
CEO, SJ Trains

**WHY?** A real ground-breaker in the business of providing Wi-Fi and a great on-board experience for passengers. This government owned Swedish line is one of the first on the continent to adopt passenger Wi-Fi which they delivered through innovative new business models to use this platform and drive ridership. Still growing to this day, access can be purchased by a number of different ways including via text-message or on-board at the refreshment shop. However for 1st class passengers the service is free, and SJ has seen a significant rise in the uptake of First Class with the offer of free Wi-Fi cited as a prime reason for this growth. SJ has always focused on service quality, with trains also equipped with multi-channel radio entertainment, a 21-seater cinema and bistro for hot meals.

*SmartRail World asked Petter Essén of SJ why being technologically innovative was important to them: “From the introduction of on-board payphones in the 1980’s to the latest 4G mobile repeaters in 2013, SJ has had a long term focus on increasing customer satisfaction by adopting cutting edge technology to on-board use. As the always-connected and instant-information-lifestyles has become mainstream, this strategy has gained SJ a real competitive edge.”*

10. Shashi Verma
Director of Customer Experience, Transport For London (TfL)

**WHY?** Fare collection pioneers, since first issuing the Oyster contactless smart card in 2003, TfL has been at the forefront of payment development. And the latest innovation is the announcement from 2014 if you have a credit, debit or charge card that has been issued in the UK and displays the contactless payment symbol you will be able to use it on their tube and train network. The system is already in place in buses for single journeys but will soon be used across the transit network.

*Shashi recently told European Transport Magazine: “The opportunity to use contactless payment cards (CPCs) will offer much greater convenience for our customers since they’ll be able to use a contactless debit/credit card that they already have, instead of needing to get and keep an Oyster card topped up. It’s part of our ongoing focus to improve customers’ experience of travelling in the capital. Paying for transport should be as easy as buying a sandwich.”*
Exclusive Interview: Peter Williams, East Coast

SmartRail World Editor, Luke Upton talks to Peter Williams, Commercial and Customer Service Director for East Coast about passenger engagement, loyalty schemes and the role of data in building relationships. East Coast is a British train operating company which in the last year carried 19 million passengers on the East Coast Main Line between London, Yorkshire, the North East and Scotland.

LUKE UPTON (LU): Hello Peter, thanks for taking the time to speak to us today, perhaps you can start by telling us a little about your role at East Coast?

PETER WILLIAMS (PW): “Hello, yes of course, I’m the Commercial and Customer Service Director at East Coast. I manage the commercial areas of marketing, sales and revenue management and my customer services remit covers our on-board teams, our stations, travel centres and the general passenger experience of using our services.”

LU: Thanks, so a wide variety of touch-points with your customers. Your topic of discussion at the Railway Telecommunications Congress is looking at how you build value through knowledge of your customers, could you tell us a little more about this concept?

PW: “Yes, we have a very clear objective and that is to grow our ‘share of the wallet’ i.e. the amount our customers spend with us. One of the ways that we aim to do this is by knowing more about them and then using this information to build a better, more direct relationship. From this then we can develop smarter marketing and pricing strategies and develop more focussed eCRM campaigns.”

LU: Loyalty schemes are prevalent in other forms of transport, but not as common in rail, how does the East Coast system work?

PW: “Our loyalty scheme is called East Coast Rewards, which we launched in July 2011. It is a Points-based scheme where you can earn points for purchases on eastcoast.co.uk. Tickets booked for travel with other train operators, not just East Coast, will also qualify for points. The points can then be redeemed for a number of rewards from train travel tickets, to cinema tickets, magazine subscriptions, hotel stays even WiFi or access to our First Class lounges.

LU: We’d actually had a loyalty scheme before but it was a fairly antiquated system, involving the physical sending in of tickets which was pretty labour intensive and only had a limited membership. The development of our digital platforms has made East Coast Rewards possible and it’s been a great success, with us exceeding our targets and we have plans for its further development.”

LU: East Coast Rewards has clearly prospered on a digital platform, what else excites you in this area?

PW: “We do extensive research into our passengers and attitudes towards travel and our service, I think it’s absolutely key to have this knowledge. From the feedback from our passengers we are always alert to changes and improvements. One example would be that some passengers can be anxious about making long journeys and the various factors that this involves, for example having to take multiple trains, changing platforms, seat reservations etc. Digital technology can help ease this anxiety and smooth the passenger experience by offering real-time information and effectively holding their hand throughout the journey. This can be delivered via a website or through an App or other mobile solution. With society changing and the technology evolving and becoming more accessible there are significant opportunities to improve customer service in this area.”
SmartRail World talks exclusively to Claudio Diotallevi, Director of Information Systems at Nuovo Trasporto Viaggiatori (NTV) the Italian operator of high-speed trains which launched passenger service in April 2012. NTV serves 9 cities and 12 stations on 2 main axes from Turin and Venice in the north to Naples and Salerno in the South. NTV has become quickly known for its strong emphasis on the passenger experience whether its virtual tickets, fine dining or offering a choice of “journey ambiance” coaches, including a “Cinema Coach,” where passengers can watch the latest films. We ask Claudio where the role of Wi-Fi fits into the development of their service...

CLAUDIO DIOTALLEVI (CD): “Hello, I was one of the first to join NTV in 2007 and we immediately saw that we had an amazing opportunity to create a new and modern train service. We understand that in a liberalised rail market and the end of a monopoly in Italy, the passenger became a customer and could make choices accordingly - as a result we had to offer an amazing on-board experience to match our latest-generation Alstom designed High Speed trains. Let me give you one example – all of our staff members have been through our Training School and not sourced from employment at other railways. They are trained in the specific way that NTV delivers service and being employed on permanent contract we consider they offer an excellent service within in a fulfilling skilled job. NTV was set up to be friendly and easy to contact, highly accessible and tailored to fit passenger needs. And within this offering, on-board Wi-Fi was to be significant aspect of this positive passenger experience.”

LUKE UPTON (LU): So tell us more about the development of on-board Wi-Fi for your passengers?

CD: “Firstly we have made it completely free for all passengers, and not one that is designed to deliver a separate revenue stream as some railways do. This was an easy decision as we saw Wi-Fi as part of our commitment to a modern passenger experience. To ensure that bandwidth is fairly distributed certain services like file sharing or video streaming are limited or blocked. Whilst our Wi-Fi solution combines three different technologies (satellite, UMTS and Wi-Fi) which are used to deliver uninterrupted high quality navigation and good coverage. It’s easy for our passengers to use – they need to simply log on to the on-board portal from their PC or other connected device via Wi-Fi with either a temporary username and password sent to you in a text message or your Loyalty Program username and password and away you go!

In addition, we also offer an on-board portal, Italolive, which enables passengers to watch TV, films, news and sport this is again free and offered through our Wi-Fi service.”

LU: It sounds a very comprehensive offering that you give to your passengers, can you tell us about some of the challenges that you’ve faced delivering this?

CD: “Well, for many the business model behind the Wi-Fi offering is a challenge but for us the free model was never in question. But the geography of Italy presents a challenge to the on-board experience with a large number of long tunnels and narrow canyons to be navigated hence our use of different technologies to maximise transmission capacity. There are also questions of bandwidth capacity, should all our passengers use the on-board Wi-Fi but we allow significant use so is rarely a problem.”

LU: And what about some of the opportunities for further development for on-board Wi-Fi?

CD: Well, technology in this sector is evolving quickly so we do have to move to keep pace with it. Areas that can be developed are improving the passenger experience by investing in more bandwidth and 4G when it becomes available for us to deliver on-board. A second area that can really be developed is the message to the customer that time isn’t wasted when traveling on train – they can take advantage of our Wi-Fi to work or socialise or watch a film or catch-up on the news or sport. This is an advantage that NTV has over other forms or transport and is one that will only grow in the coming years.
Security focus: The growing role of CCTV for the rail and metro industry

Since its invention in the 1940s and first recorded use in a train station (in the UK) in 1975 Closed-circuit Television (CCTV) has become an integral part of rail and metro safety and security in all corners of the globe. And no doubt the development of CCTV surveillance has contributed to a decrease in crime on railways and metros in many countries. And we have now reached a stage of the technology’s evolution where a number of new uses for CCTV are possible so today, SmartRail World takes a look at some of the key uses of CCTV and casts its eye over future developments.

It’s impossible to know with any certainty how many CCTV cameras are in operation by railways and metros around the world but the majority identify three key areas of use. There is also a use of CCTV is operating signalling and train control, but this article is not looking to focus on that area of use.

1) The reason most common in the public’s perception of CCTV – the prevention and detection of crime and anti-social behaviour. CCTV footage provides powerful evidence in court.

2) Health and safety of employees, passengers and other members of the public. This is both at the station and along the rail track for example in the detection of trespassers.

3) Real time passenger flow and movement monitoring.

The UK is considered by many as the leading proponent of CCTV within the rail system.

We asked Simon Ward, Head of Safety, Quality and Environment at London Overground Rail Operations Limited (LOROL) about the importance of CCTV operations for them: “Transport for London has made a major investment in CCTV with it used extensively across the network, even the smallest two platform station has at least 30 cameras in use. We use CCTV for a number of reasons but the starting point is always passenger and station security. It’s used for prevention of crime and anti-social behaviour but we also use it extensively to help in investigating accidents or incidents. Over time we have made increasing use of CCTV to monitor passenger movements and congestion. Many of our stations are old and were not designed for the number of passengers now using them every day. CCTV enables us to identify potential overcrowding problems and bottlenecks before they become too serious so that we can take action to prevent the situation getting out of control. CCTV was particularly effective in this way during the 2012 London Olympics.”

The future of rail CCTV is set to offer more intelligent systems or Video Content Analytics (VCA). Analysis of video content was once the domain of the control room but now is increasingly being found on the IP camera itself. VCA offers a number of advantages over the traditional system: offering real-time alerts that can help anticipate incidents by identifying suspicious behaviours – for example the system can be set to detect anomalies in a crowd of people, for instance a person moving in the opposite direction at a railway station where passengers are only supposed to walk in one direction out of a train or in a metro station where people are not supposed to exit through the entrances.

VCA also maintains forensic capabilities that allow unique indexing and attribute-based search of video events that can classify objects into categories such as people and luggage and situational awareness of a location, identity through facial recognition and activity of objects in a monitored space, such as abandoned luggage.

However, although the technology exists for the developments listed above, these VCA systems are still susceptible to environmental changes and structural and organisational difficulties. One of the particular challenges is insuring all the relevant stakeholders co-operate fully as CCTV coverage rarely involves simply one organisation but a number – the rail operator, the station, security staff and sometimes multiple police agencies. Without the co-operation of the various groups the technology will not be used to its full potential.

The use of CCTV within the rail sector looks set to grow in the coming decade as technology improves and becomes more accessible but security demands remain. One interesting point worth noting in concluding this look at the role of CCTV within rail is the recent development of a high-quality video function on the majority of modern smartphones, enabling passengers themselves to film incidents and adding to the already widespread coverage within rail.
Passenger Wi-Fi focus: Westward expansion – how the CCJPA in California became passenger Wi-Fi pioneers

It is now nearly ten years since the Capitol Corridor Joint Powers Authority (CCJPA) in California began looking at providing a Wi-Fi service for its passengers. Today we take a look one of the pioneers of on-board Wi-Fi and talk to Jim Allison the Manager of Planning at the CCJPA about the development of this service. The Capitol Corridor is an intercity passenger train system, launched in 1991 that connects 17 stations in 8 Northern California counties running from the San Francisco Bay Area to Sacramento along a 170 mile-rail corridor.

The CCJPA first began looking at a Wi-Fi network for their trains in late 2003, although it was not until November 2011 that the service was launched. The intervening years saw a number of pilot and test projects testing everything from the technologies to the business models required to make the service succeed. After a number of options were considered, the “free model” emerged as the most favourable business model, with the ongoing operational costs for the wireless network borne out by the free nature of the service attracting more trips and ultimately more revenue.

I asked Jim Allison, what made CCJPA consider installing a Wi-Fi network on-board their trains, the answer is simple “It’s a service created specifically to boost ridership and the popularity of using our trains. In California we are in competition with the car and the ability to use Wi-Fi whilst travelling is an advantage we are keen to take advantage of.”

A major challenge is keeping up with the bandwidth and the increasing demands of passengers. When 4G becomes more extensive and 4G modems are available for integration in the mix, the CCJPA will fund this improvement in bandwidth. Another area of potential growth is the possibility to provide streaming entertainment content available locally on the train. This could be through subscription entertainment service (for example Netflix) or through a cloud based solution. Whatever the future holds, Wi-Fi is there to stay for the CCJPA, Jim Allison again “Since our launch we’ve had great feedback from customers. And the increase in passengers has continued to cover the costs of providing the network. There is no going back from this service, it’s definitely here to stay. And grow!”
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