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Passengers
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JACK BOSKETT/RAIL.

Welcome

This 16-page supplement is *RAIL's* first in-depth look at how the industry is meeting the changing needs of passengers and improving the user-friendliness of the UK rail network.

While fulfilling these basic aims has always sat firmly within the remit of train operators, they have taken on especially strong importance at a time when record numbers of people are consistently choosing to use this mode of transport, year-on-year.

The latest statistics show that 1.73 billion passenger journeys were made in the 2016-17 financial year, a 0.8% increase on the previous 12-month period. But behind that crude number are 1.73 billion personal experiences of the network, and 1.73 billion occasions when train operators have been entrusted to deliver a journey that is as comfortable and seamless as possible.

The Department for Transport also recognises the importance of making passengers happier. It is increasingly drawing on passenger satisfaction levels to benchmark operators, and now incorporates them within franchise specifications.

For 17 years, the official measurement of passenger satisfaction has been the

National Rail Passenger Survey, collected and presented by passenger watchdog Transport Focus every six months.

TF's Chief Executive Anthony Smith joins *RAIL* on p48-51 to look back at the historical trends that have emerged from previous surveys, but also keeps an eye on the future by explaining how he is increasing the scope of the information collected by the NRPS, and further developing the wealth of data that it generates.

RAIL's Stefanie Foster turns her attention to an alternative way to provide improved travel assistance, this time through artificial intelligence (p54-56), while Richard Clinnick learns how Greater Anglia has made its new train fleet far more inclusive by meeting the needs of disabled passengers (p52-53).

Finally, Alstom reveals how it has invested heavily in developing ways to help operators improve the quality of the passenger experience by using the latest on- and off-board technology (p44-47).

PAUL STEPHEN
Assistant Features Editor, *RAIL*

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A Eurostar Class 373 emerges into daylight on HS1 at Dagenham on September 3 2007. Having first entered service in 1994, eight of them are currently being extensively refurbished, reliveried and modernised to meet changing passenger needs, aided by Alstom's future-proofed original design. PAUL BIGLAND.



THE PASSENGER CONNECTION

MIKE MULDOON, Head of Strategy for Alstom UK and Ireland, tells PAUL STEPHEN how the company has invested heavily in helping operators deliver a seamless, high-quality passenger experience

As people travel more and more, but increasingly expect a higher end-to-end service, the entire rail industry must ask itself: how can it accommodate rising demand for rail travel while enhancing the passenger experience?

New and upgraded station facilities must carefully try and strike this balance in addition to intelligent rolling stock design, in order to consistently leave passengers with a positive impression of their journey from start to finish.

For train manufacturers, rolling stock owners (ROSCOs), operators (TOCs) and the rest of the supply chain, this means that designs for new trains must skilfully bring together technical performance, safety and capacity, and aesthetics, comfort and functionality. Chiefly, for the latter, this means digital connectivity, in an age where the appetite for internet access and information continues to grow exponentially.

Given that the expected asset life of a new train is typically more than 30 years, there is also an added requirement, that once trains have left the production line they are able to meet or adapt to the rapidly changing and often unpredictable future needs of the passengers that will use them.

Alstom understands these essential but often conflicting requirements well, having built up an unrivalled understanding of what operators from across the globe need to do to deliver exemplary journey satisfaction to the passengers they serve.

The company's experienced design teams therefore not only consider how best to facilitate passengers' current work and leisure requirements, where WiFi has become the norm, but also how best to future-proof the internal fabric of the train to enable technical

adaptations, and increase the scope for further enhancement during subsequent fleet refurbishments or overhauls.

Mike Muldoon, Head of Strategy for Alstom UK and Ireland explains: "It's a question of obsolescence and changes to the world around us, and this is something we consider a high priority. If we were to look at the High Speed Train, for example, the only thing on them that is still a current connection device is probably a three-pin plug socket, as it is the only device to span the entire life of the train since they were first introduced in 1976.

"Trains have a design life of several decades, so the technologies we fit need to be as flexible and capacious as possible so they can accommodate future demand. We want to be able to develop things that meet the changing expectations of passengers, even though they fit into a whole different product development cycle from the train itself.

"Our concern is for the health of all users and where the aim is to value every moment of the journey, contribute to well-being, reduce stress and enhance the travel experience.

"Since creation is at the heart of innovation, at Alstom passenger experience is developed in a collaborative way, gathering engineering, design and marketing teams. We focus on innovative solutions that will have a direct impact on the travel perception, such as intelligent glazing, mood lighting that respects human physiology, augmented passenger information, and services and products linked to the train system and the city."

Alstom has consistently demonstrated that its trains routinely fulfil these criteria - for example, its Class 373 fleet introduced by Eurostar in November 1994. Demonstrating the versatility of the original production



“ People no longer expect to be given the basics, but a quality service. ”

Mike Muldoon, Head of Strategy, Alstom UK and Ireland

► platform, eight of these trains are currently undergoing extensive refurbishment, including brighter and lighter interiors, and increased digital integration through the installation of WiFi equipment and power sockets throughout, plus USB charging points in First Class.

These amenities may now be well established on new trains, but their addition to the 'e300s' should be seen as all the more impressive on a train built many years before Apple launched its iPhone in 2007, and the subsequent rise in the number of seemingly ubiquitous mobile devices requiring wireless connectivity.

Muldoon adds: "The Class 373s are a classic example that modernisation is as good an opportunity for older products, and it doesn't necessarily have to be an all-new train to apply this knowledge and development. The embedded systems need to be well thought through to adjust or change, but you can continue to develop these products over the train's life.

"The '373' shows what can be done, and that there is scope to reinvigorate it with refurbishments. A significant overhaul was not necessarily something that was designed for many years ago, but it's something that Alstom's design approach facilitates."

Over two decades later, and the same care has been taken in the development of Alstom's latest generation of main line transport solutions, including its Avelia high-speed and very high-speed range, and Coradia regional range.

The latter was launched for the UK market at the Railtex trade show held at the NEC,

Nomad Digital

Bolstering Alstom's reputation for being at the cutting edge of the increased convergence of rail and IT systems, and the digital integration now demanded by operators and passengers alike, is the company's acquisition of Nomad Digital in December 2016.

Founded in 2002, Nomad Digital is based in Newcastle and employs more than 200 people at 13 offices worldwide. As a pioneer in rail connectivity and passenger applications, its product portfolio includes passenger WiFi provision, passenger information systems, and on-board entertainment and media platforms such as BEAM, which streams media content directly to passengers' personal devices. This is currently available in the UK on Virgin West Coast and Virgin Trains East Coast services.

It has also worked with Alstom to install 'infotainment' platforms with several international operators, that provides passengers with real-time journey and service information.

Having worked with more than 80 operators in over 40 countries across the globe, Nomad Digital's creativity and expertise are already being harnessed by Alstom to generate the next generation of innovative technical solutions for operators.

Says Muldoon: "I think when something becomes a standard feature, such as WiFi, we start to see it as part of the 'basic' service. People start to expect more, so we need to make sure we are delighting passengers by exceeding their expectations. Nomad Digital will make sure we remain at the forefront of delivering that, and not rest on our laurels.

"You have to be constantly on the ball with technology, and keep developing new products, which is why we're looking at on- and off-train products and service provision innovations to improve the overall experience.

"We are very keen to nourish Nomad Digital's creative flair, so watch this space."

Birmingham in May (RAIL 827), where Alstom demonstrated that the 125mph electric multiple unit (EMU) is available in a number of formations, and fully customisable internally to meet the bespoke needs of any operator for their first use, but also so that ROSCOs can maximise their

potential for any future deployment.

"Our new EMU is very much a state-of-the-art product for the UK," says Muldoon, "while our Avelia product platform also embraces all the latest technologies, as you'd expect. As a technical package, both trains represent the latest design and technological developments, but from a practical point of view it is all configurable internally. It allows us to enhance the passenger experience beyond just sitting on the train to something completely different.

"Very often, we will be asked: 'What facilities can you provide on the train that will enhance the passenger experience?' It's a very broad question but it's obvious that people want to complete their journeys with minimal disruption to their lifestyles. As a result, we see the huge demand for WiFi, for example, because our lifestyles are so closely linked to our hand-held devices.

"But there is a significant proportion of the population who might not want to use smartphones, and they still need to be given passenger information. That's where individuality comes in, and there is flexibility in the layout for people to interact more with the vehicle. We can offer an enormous range of options."

Alstom's belief is that innovation should never be about technology for technology's sake, and so it proactively works in close partnership with operators and passenger groups to identify passengers' main needs, in order to provide the solutions of highest value to them.

To aid the process, Alstom applies a hierarchy of needs to ensure its trains



provide truly competitive differentiators for operators, and the greatest added value possible to the end-user.

"The UK market is very sophisticated and we have a growing and strong market for rail, which means growing expectations from passengers. People no longer expect to be given the basics, but a quality service.

"We say that there are three levels of passenger experience. There is the basic level that you need to get from A to B in a safe manner, which is the bare minimum. Then there's level 2, which is when you develop your service, make a promise to the passenger and then fulfil it. It eventually becomes a 'taken for granted' level, but it ensures a good and comfortable service.

"Finally, level 3 is where you've really got to develop the experience by going beyond what people would typically expect, to win passenger loyalty. This is where we come in with our operator offering. We can give them the products to help them achieve that third level.

"As the train manufacturer our role is to provide the underpinnings of the excellent service the operator wants to provide. Sometimes this makes drawing the line between what we design and what the operator implements (via its staff, its online tools or its apps, and so on) using our design difficult to define. We are facilitators not the service deliverers and so we always aim to collaborate as closely as possible with the operators and be able to offer our development options, plus the chance to talk to our teams for as long as possible in the design process."

Alstom also practises the principle that improving the passenger experience goes well beyond just offering WiFi, and should start before departure from when a passenger leaves their front door or

buys their tickets. Passengers appreciate predictability and operators must be in a position to offer relevant information, to keep rail ahead of other modes of transport. This information could include live departure information and taxi availability at their destination, to where passengers should stand on a platform in order to board a less busy part of the train.

Non-passenger-facing technologies such as remote online condition monitoring can also improve the passenger experience with powerful capabilities like automatically reporting a malfunctioning toilet, to ensure it is speedily repaired and remains in service. All these are options covered by Alstom's comprehensive operator proposition.

"The passenger will talk about their entire journey, and we offer a number of on- and off-train products that can be provided to the operator to improve the overall journey. We have autonomous vehicles in development that can assist with the last mile to their door, and we have platform information systems that can get them to the right part of the train.

"We have products that will allow integration with all forms of transport in a

“It's obvious that people want to complete their journeys with minimal disruption to their lifestyles.”

Mike Muldoon, Head of Strategy, Alstom UK and Ireland

Intelligent solutions could connect passengers' mobile devices with displays on board, even on windows. ALSTOM.

particular area, and a portfolio that expands beyond the train to interact with the end-customer, and offer whatever the operator wants to provide."

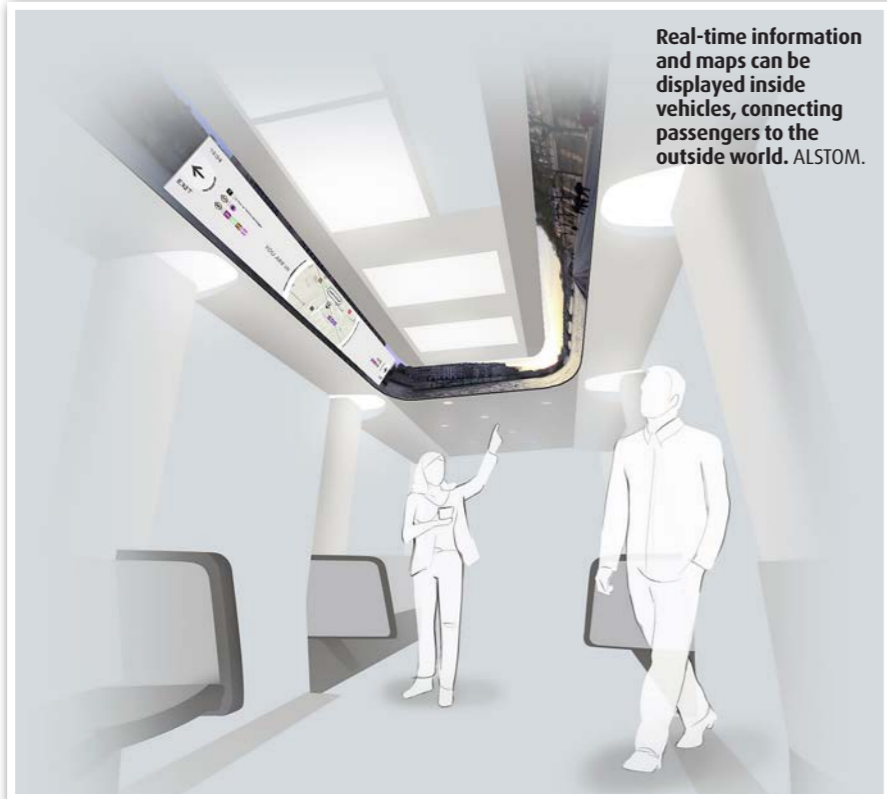
As technology continues to smooth passengers' journeys, what is next for data-hungry consumers?

Muldoon says that future fleets could feature more advanced passenger information systems that deliver personalised information throughout the journey. The rapid development of connectivity technologies could also have benefits for increased personal safety.

He concludes: "I was recently on a Virgin West Coast (Class 390) Pendolino when a young lad told his mum that the train was very futuristic and felt like the inside of a plane, but can you imagine if, as the train moved off, the window provided a running commentary of what he was looking at? You could embed a display in the window that shows points of interest. That technology already exists but, obviously, it's all down to the operator.

"There is also the whole thing about the insecurity that people feel around their journey. They are perhaps most insecure about leaving their bag at their seat when going to the toilet, or walking down the train to the buffet car. One of the technologies we offer is a system to lock your bag, connected to a smartphone. We've done a lot of work around making people feel more secure.

"What all these things come down to is making the best use of emerging technologies to build a closer relationship between the operator and passenger to improve the overall experience." ■



A focus on insight

To mark the latest National Rail Passenger Survey results, published by Transport Focus on July 25, the independent passenger watchdog's chief executive **ANTHONY SMITH** talks to *RAIL* about the survey's past, present and future

Seventeen years since its debut, and with more than one million passengers interviewed, the bi-annual release of the National Rail Passenger Survey (NRPS) results has become a firm and eagerly anticipated fixture in the industry calendar.

Providing a thoroughly detailed nationwide picture of passenger satisfaction with rail travel, it is used as an official tool by government to measure how well train operators are looking after their passengers.

Surveying more than 55,000 passengers each year, the unrivalled accuracy of NRPS scores is trusted enough to be incorporated into franchise terms by the Department of Transport, which will - in turn - fine operators (TOCs) in cases of underperformance.

Closer to home, it is also used as a highly respected benchmarking tool by *RAIL*'s National Rail Awards judges, and underpins the decision-making for the Operator of the Year Award.

But why does the NRPS have such elevated status when other independent consumer satisfaction surveys are also available, such as that compiled by *Which?* on an annual basis?

"The NRPS is an incredibly rich data source," says Transport Focus Chief Executive Anthony Smith. "In fact, so much data is gathered on things like gender, age, region, operator and so much else that it takes five months from the first questionnaire being handed out to the



The scope of the bi-annual National Rail Passenger Survey has now been expanded by Transport Focus to gauge passengers' perception of the railway, in addition to gathering statistical data about individual experiences. JACK BOSKETT / RAIL.

results being known.

"The NRPS gives a snapshot over a 20-week period, not two days. This often gives us different results from other surveys, but that is very deliberate. It focuses on the journey just taken, which makes the data

far more useful to TOCs trying to remedy specific problems. We can link individual NRPS questionnaire responses to particular trains, so that gives operators a forensic view of what their passengers are thinking and experiencing.

"Other surveys often just ask more generalised questions, and there is not always any effort made to corroborate that the respondent has actually taken the journey they have just been asked about."

He adds: "We make sure that the sample

is as representative of the British rail-using population as possible, and the questions have been tested to extremes by independent third parties.

"This relatively inexpensive research in a £10 billion industry drives a lot of change,

not least in benchmarking. It is becoming more and more relevant in an age when, increasingly, the passenger is king, but it now needs to be supplemented by other bits of research."

Smith is referring to the current efforts

► being made by Transport Focus to dig much deeper into how passengers feel about their journeys, in addition to its traditional function of quantifying their overall satisfaction levels in discrete areas, such as cleanliness and the availability of WiFi. He says this is needed because it is commonly accepted that an individual's wider perception of an issue can differ significantly from their actual experience.

For example, he points to 17 years of NRPS data that has consistently shown that punctuality and reliability are the key drivers of satisfaction. But analysis of past NRPS results has also shown that satisfaction rates with punctuality do not completely align with TOCs' official Public Performance Measure (PPM) scores.

This discrepancy presented Transport Focus with an interesting challenge to better understand why this gap exists and what can be done to close it. The results of a follow-up study showed the answer included greater transparency and better measurement of the passenger experience, which is reflected in the recent announcement by the Rail Delivery Group on how punctuality is to be measured in the future (See *Network News*, page 28).

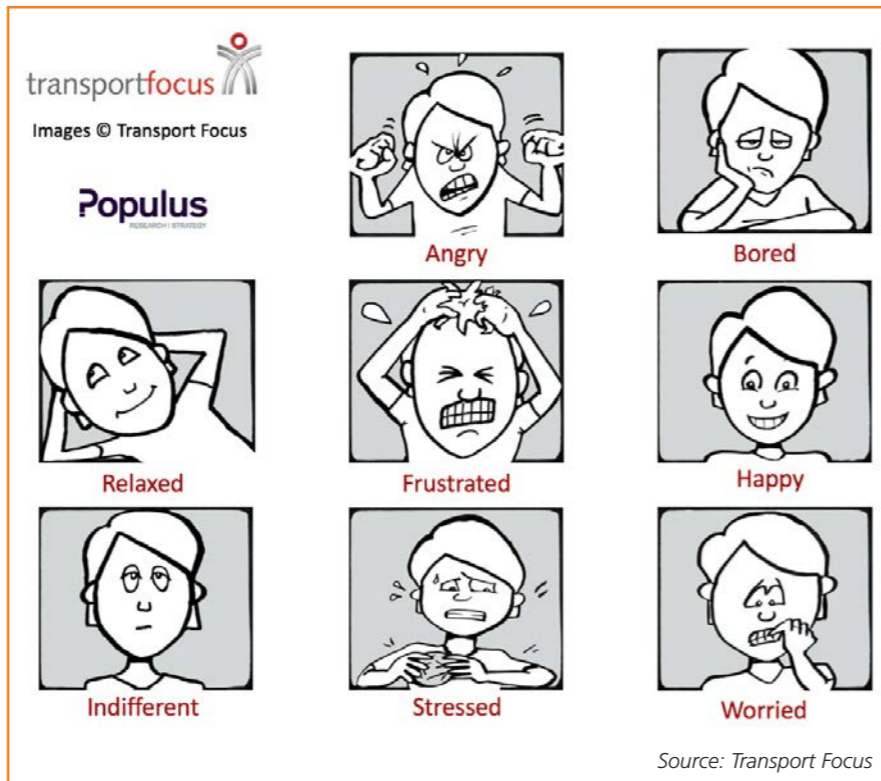
Transport Focus quickly rejected the idea of turning to social media for further insight, however, as it is a hotbed of opinion and candid expression of feeling but rarely backed up with hard evidence.

Instead TF decided to start asking NRPS respondents directly how they felt about their journey, which it did for the first time in the Spring 2017 questionnaire.

To supplement this data, Transport Focus announced in April 2016 the launch of an app to complement the NRPS to log 'in the moment' emotional responses, while in March this year it conducted a two-week research project involving 12,804 online interviews with British rail passengers.

By tracking emotional responses and the way journeys had an impact on passengers' opinions of rail travel in more detail, Transport Focus could work out whether passengers trusted their providers, and also rank their priorities for improvement.

The results are due to be published in September, and will then be used to guide policy-makers and the industry to focus on areas where the passengers' relationships with the railway are lowest. However, Transport Focus knows from earlier work that the key building block of trust is the basic performance of the railway: without that in place it is difficult to progress to the more emotional engagement with customers that top brands can enjoy.



In spring 2017, the NRPS asked respondents for the first time how they felt about their journey.

"The NRPS data is extremely representative but relatively slow to compile," adds Smith. "At the other end of the spectrum is Twitter and other social media, which is quick but not representative. We have been trying to fill the gap in the middle.

"The provisional results of our priority and trust surveys basically back up the NRPS, with punctuality and reliability issues appearing near the top of the list of priorities for improvement, and on-train elements generally placed higher than at-station issues. At the very top of the list, passengers want ticket prices to offer better value for money. The questions force passengers to make a decision on priorities, so it provides a pretty good picture of Britain's railway and the improvements passengers most want to see.

"Our initial conclusions on these results is that there are two ways in which government and the industry can improve value for money scores. Firstly, ensure through the Fares and Ticketing Action Plan that passengers can access the best value for money tickets. Secondly, deliver what is promised in terms of the timetable and train length day in, day out.

"The industry can also deliver the

promised capacity on a daily basis and avoid unplanned disruption, which can lead to overcrowding. Frequency can help with feelings of overcrowding.

"The other main findings also relate to the day-to-day performance. All this work underlines the need for a rail industry that is organised and funded to deliver reliable performance.

"So, boil all this down and a clear message for governments and the railway emerges. Run what you have promised - in terms of timetable and length of train. That way you will keep most passengers happy. If things go wrong, help put passengers back in control with staff and information."

Smith would like to see Network Rail make more use of the NRPS data, as it continues to devolve more powers to route level. He says there is ample scope to rank the performance of individual routes, in the same way that TOCs are currently scored.

The overarching purpose of the NRPS is to deliver benefits for passengers, and Transport Focus is firmly committed to expanding on its 17-year legacy of pointing TOCs and Network Rail in the right direction, to build a more passenger-focused railway.

He concludes: "With the rise of the routes, the key tool is benchmarking, and I'd like to see it appear on NR's route-based scorecards.

"We are quite self-critical of our public services in this country, and we will continue to do a lot of work around performance, and help TOCs deal with disruption, but



“ With the rise of the routes, the key tool is benchmarking, and I'd like to see it appear on NR's route-based scorecards. ”

Anthony Smith, Chief Executive, Transport Focus

the main thing we bring to the party is a professional, evidence-based approach.

"Generally, the NRPS story is more about consistency than inconsistency. The industry has been very successful in keeping people moving when investment

has often lagged behind it, and there have been some pretty huge upgrades to contend with.

"The railway has done a good job of day-to-day running, and more than eight in ten passengers are satisfied with the service.

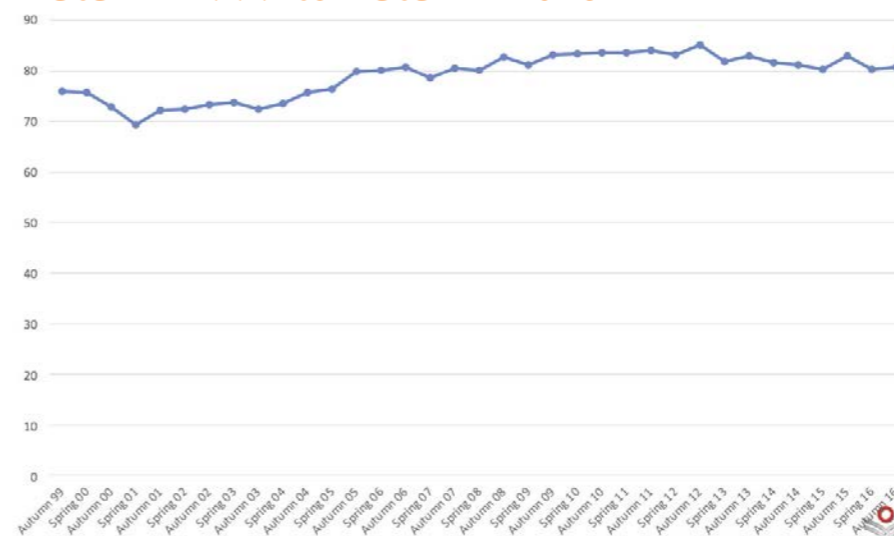
However, in some areas the industry still does not enjoy their trust. Initiatives like the one by Rail Delivery Group, to improve the way punctuality is measured, should go some way to addressing that

"Yet again, rail passengers will face fare rises in the New Year, while performance remains patchy. Wages are not keeping pace with inflation. The use of the (usually higher) Retail Price Index formula for calculating regulated rail fare rises, instead of the more commonly used (and usually lower) Consumer Prices Index is unfair and unclear to passengers. But the use of a recognised measure of inflation, rather than an increasingly discredited one, would go some way towards achieving better transparency and trust.

"Much-needed investment in the railways is being made. Passengers should pay their share of that investment, but it is time to look again at the balance of taxpayer and passenger-funding.

"In the wake of the hard-hitting Gibb Report, the Government must explain how it is going to ensure they and the industry can deliver better value for money to help keep a lid on future price rises. The soaring cost of the way the rail industry is planned and organised is being borne by passengers, many of whom have little choice." ■

NRPS - Overall Satisfaction Scores Autumn 1999 to Autumn 2016



Source: Transport Focus



Sense and accessibility

During the consultation process for its new trains, Greater Anglia (GA) sought feedback from a number of different stakeholders. More than 1,000 people gave their input into the new trains, which will enter traffic with GA from 2019, replacing all the operator's existing units.

The company invited various groups to Crown Point, in Norwich, to visit a mock-up of the trains to be built by Stadler in Switzerland.

Attending special tours were groups such as Greater Anglia's customer panels, the Stakeholder Advisory Board, rail user groups, local authorities, Chambers of Commerce, Local Enterprise Partnerships, Community Rail Partnerships and cycling groups, including the GA Cycle Forum.

Rail passenger bodies such as Transport Focus and London Travelwatch, plus disability groups and the Department for Transport have also been involved and consulted during the process.

And for GA there has been particular emphasis on ensuring the trains meet the required standards for disabled passengers or people for whom access is an issue.

Of course, there is the Persons of Reduced Mobility - Technical Specifications for Interoperability (PRM-TSI) deadline of January 1 2020 to consider, but GA has

Many people had a say in the design of Greater Anglia's new fleet. Disabled rail user **DOMINIC LUND-CONLON** reveals how that input is being incorporated into the new units

already proved its determination to make its trains more accessible through its Class 321 Renucus refurbishment.

Dominic Lund-Conlon is Essex County Council's Public Transport Officer. Based in Chelmsford, he's a regular rail user, both for work and leisure. He's also wheelchair-bound.

At the launch of the GA Class 321 last December (RAIL 817), he enthused to RAIL about the quality of the train for wheelchair users, but also spoke about how the operator was planning to fly him to Switzerland to help with the design of the interior for the new stock. And as this issue of RAIL went to press, he was due to visit Derby Litchurch Lane to help with the Class 720 Aventras on order for GA, for which the design will be finalised in November. For his trip to Switzerland, he travelled with Terri Sawkins (from Essex Cares Ltd's Sensory Team) who is visually impaired. As Lund-Conlon says, it is not just about access for disabled passengers, but for those with limited vision, hearing or mental well-being.

He tells RAIL: "As far as I am aware, this is the first time there has been such early engagement with an operator."

He says that necessary changes for the new Stadler trains have been identified already. "They showed me the toilet and it didn't work. Immediately, I could see that the buttons were in the wrong position. It helps them to have someone with that experience. That little bit of information can improve the train for a lot of people."

He points out that designers are now looking to give everyone the right travel experience.

"Attention to small details, such as allowing enough room to turn wheelchairs around, can make a huge difference. And if disabled passengers enjoy the experience then they are going to want to come back."

He says that GA is not the only operator to have improved the travelling experience for disabled passengers, citing Virgin Trains' and East Midlands Trains' recently refurbished Class 158s.

"Greater Anglia is using the image of

passengers being with their families in its marketing, which links in with its return to core values. They have stopped, listened and considered what passengers want and need. The fact that they are getting it right at every stage shows that they value us."

He also praises the clear and concise way in which the operator has engaged with the passengers it has consulted: "They spoke to passengers in plain English. They focused on them and their requirements, and that is sometimes easy to overlook."

The issue of access is one that has been brought to the fore by the industrial action on Southern. A report by the Rail Delivery Group, written in May 2015 but never officially released, was published by the Association of British Commuters (ABC). The report, *On Track for 2020? The Future of Accessible Rail Travel* was released by ABC because the group believed "every disabled and older citizen in the UK has the right to be informed of its contents."

In it, the report predicts that by 2037 around a quarter of the UK population will be aged 65 or over, and that some 5.7 million disabled adults will be of working age.

The report stated that some 44% of all stations are completely unstaffed and a further 45% are unstaffed at some times during the day. It highlights from the McNulty report, published in 2011, that: "The default position should be DOO [driver only operation] with a second member of train crew only being provided when there is a commercial, technical or other imperative."

Lund-Conlon says of the report: "I can recognise each person has a challenge they need to overcome. It's a challenge for us across the UK. For example, rules say I need a ramp. To be fair, Greater Anglia will always get me to where I'm going. One night I was at Braintree, and so I tweeted them that I was stuck, and they sent someone. Little things like that help."

He says that ideally there would be level access everywhere. For the new trains, while he admits there must always be a compromise, he says GA will always try to make the trip comfortable and believes most passengers with access issues will be satisfied.

But is the level of work being carried out by train operating companies over the top, in terms of the investment versus the number of passengers affected?

Lund-Conlon doesn't think so: "It's about keeping people independent. People going out encourages well-being. Can you put a price on that?"

“ They spoke to passengers in plain English. They focused on them and their requirements, and that is sometimes easy to overlook. ”

Dominic Lund-Conlon, Public Transport Officer, Essex County Council



The disabled access toilet fitted to the Stadler mock-up that was showcased at Norwich Crown Point. ANTONY GUPPY.

"It's not OTT, it's about an entire section of society that is part of a much bigger picture."

On accessibility, he says that overall, rail does "pretty well" against buses, but there are challenges. "The part that requires the human is the challenge. That's the last step off the train, or the first step onto the train."

He believes the low-floor Stadler trains will be a huge benefit for disabled

passengers. "That's the biggest thing for me. These are a real game-changer."

However, currently only almost 20% of GA's stations will be step-free. Low-floor trains enable access, he says. It's the ability to get on and off the train easily that encourages passengers to travel.

Transport is important for the disabled communities, he says. "You meet people. As we become a society that considers how people can live their lives, this level of engagement is brilliant."

"This isn't lip service, this is about getting it right. A train might be designed to be used for 25 years. My contribution is small, but if I board a train and see the changes that I suggested being used, I will be chuffed." ■



Essex County Council Public Transport Officer Dominic Lund-Conlon on board the first refurbished Renucus Class 321. ANTONY GUPPY.

GREATER ANGLIA'S VIEW

Mike Kean, Franchise and Programmes Director, Greater Anglia, says: "Our priority for the new trains was to involve the public and stakeholders fully in the design process, and we are pleased that this extensive consultation process has resulted in so much useful feedback which will inform and shape the final design."

"We will report back on how we've responded to comments and feedback and we are looking forward to transforming train services in East Anglia. The introduction of new trains will not only transform customers' journeys, it will lead to shorter journey times, more seats and make our service more reliable - generally making our customers' lives a little easier."

I, TravelBot



Artificial Intelligence has come to the railway in the form of travel assistance in London, writes **STEFANIE FOSTER**

I propose to consider the question 'can machines think?'

If you ask a computer and a human the same question, can a computer answer in a way that is indistinguishable from a human response?

British mathematician Alan Turing asked this question back in the 1950s. He wanted to test a machine's ability to exhibit intelligent behaviour by asking a human evaluator to judge natural language conversations between a human and a machine designed to generate human-like responses through text on a screen.

Nearly 70 years later, modern computer scientists are performing their own versions of Turing's experiments to improve the way companies provide information to their customers.

A new generation of artificial intelligence, in the form of AI chatbots, has emerged. Essentially, they are programmes designed to conduct conversations with humans through

an online messaging interface.

Growing numbers of people are already using applications such as Facebook Messenger and WhatsApp in preference to the traditional text message to communicate with their friends (globally, 60 billion messages are sent every day via these messaging platforms - three times the number of SMS text messages).

Already people are moving from looking on websites for the information they want to using apps on their mobile phones. So, some companies are starting to look at how they can use the apps that are already popular with their customers, instead of forcing them

to download yet another one.

In June, Transport for London joined this new revolution in AI, with the launch of TravelBot. Designed as a digital travel assistant, the new service is accessed through Facebook's Messenger App and uses artificial intelligence to provide live bus arrival information, Tube and rail service updates and maps (see panel, page 56, for full details).

To find out why TfL has looked to this new kind of social media to communicate with its passengers, RAIL asked TravelBot Product Manager Charul Gupta to explain the thinking behind the launch.

“It feels like you're talking to a human, so you don't have to understand technology or download different apps.”

Charul Gupta, Digital Product Manager, TfL

TravelBot allows passengers to get instant Tube service updates direct from Facebook Messenger. JACK BOSKETT/RAIL.

passenger desperate to know when they're going to be able to get home.

So, what does TravelBot do to change that?

"It's basically replicating human communication," says Gupta. "TravelBot is based on natural language. It feels like you're talking to a human, so you don't have to understand technology or download different apps to get information.

"We're trying to provide all the information you want, using everyday language. So, someone might get up in the morning before work and want to know what the service status is [on the Tube network]. If I was talking to a friend, I might just ask, 'do you know what the service status looks like?' and that's exactly how you communicate with the 'Bot'. You write it as you would say it to anyone else and the 'Bot' will reply with an update on the lines."

Impressively, it actually does work with everyday language (see RAIL's test, right).

But what about questions that it has not been programmed to answer yet?

"If the 'Bot' can't answer the question, there are two different responses it might give. One is where someone might have asked a question in a tense the 'Bot' didn't understand or language it couldn't decipher. Then it would reply saying: 'I don't understand, can you rephrase or provide more detail?' The other situation is where you ask a question the 'Bot' understands but we haven't built the functionality to answer. So, it will reply to say: 'I'm new and I'm still learning. We are coming up with new features soon.'"

Gupta explains that the important thing is to understand what the intention of the customer was, given the question they asked, to ensure that TravelBot can respond appropriately - even if it does not know the answer to the specific question.

Presumably, TravelBot is 'learning' new answers all the time?

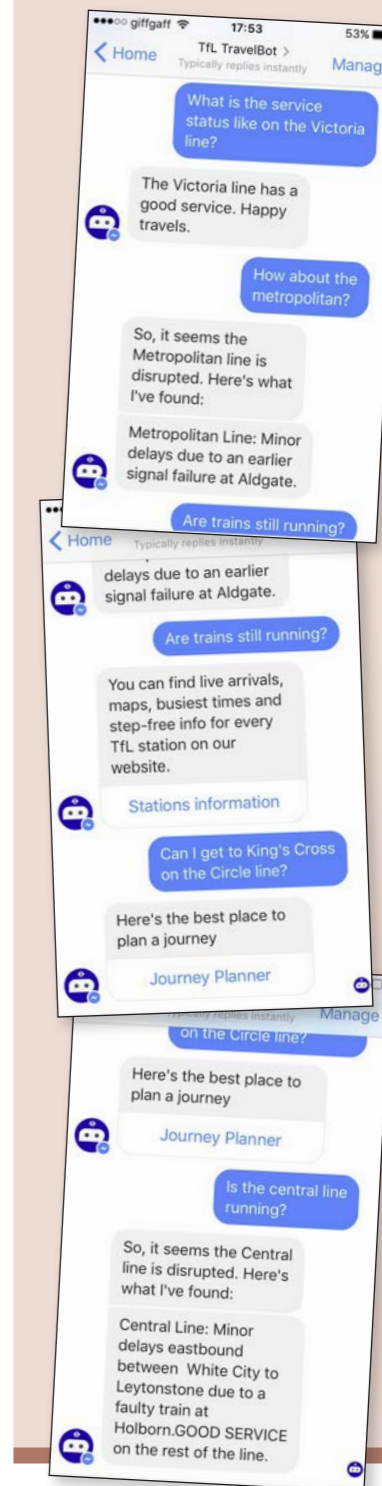
"Artificial intelligence robots like this normally have the capacity to learn by themselves. But because we have just started with this and are using a very simplified version at the moment, we are helping the 'Bot' to learn. But as we add more functionality and get more understanding about the technology behind it, we want to be at a stage where the 'Bot' learns by itself. So, it has the capability to do that but we are currently helping it along."

By logging all the questions TravelBot receives and categorising them into types of question, TfL can monitor what it is that passengers expect from the new service and what functionality should be prioritised for the next update.

Explains Gupta: "The features we have rolled out so far are based on knowledge of the information customers want from

RAIL TESTS THE TRAVELBOT

We decided to see for ourselves how TravelBot responded to questions about the Tube service (especially given that the 'Bot' is currently mainly focused on bus assistance). But the results were impressive. Even when TravelBot was unable to assist with journey planning, it still tried to help by providing a link to TfL's Journey Planner website.





Passengers can ask TravelBot when the next bus will arrive at their current stop. JACK BOSKETT/RAIL.

► us. On buses it can help you with the route status, it can give you live arrival information. For the Tube, we currently only have line status information, but we are working on journey planning functionality."

Just because TravelBot is not a journey planner in itself, TfL does not want the system to appear completely unhelpful when asked a question relating to planning a journey, so the TravelBot will direct people to the correct link on TfL's website to answer the question.

"From the feedback so far, it looks like journey planning is one thing that customers expect, so it is something we're looking into. We want to provide customers with what they want."

And do they want TravelBot? What has the take-up been like so far?

"It was launched on June 12. In the three weeks since then, using only organic

promotion [such as word of mouth on Facebook], we have 4,500 unique users and we have had 67,000 messages. This was in line with what we were expecting because we wanted it to grow slowly."

It is important to Gupta that TfL can learn from the feedback received by users and improve the service before it becomes really popular. They have already fixed some issues since launch to ensure TravelBot provides the service that is expected from it.

The service is still very much in a soft launch stage with feedback being analysed, improvements being sought and next steps planned. It is being promoted through social media but, says TfL, further promotion is still being discussed to give the service time to grow at its own pace. Baby steps.

Says Gupta: "These are really early days for the TravelBot and the main benefits at the moment are really on the bus side of things,

but we're taking feedback as we go along so that we can add functionality."

For example, many bus stops in London do not provide a countdown to the next bus and a text service is offered to find out when the next bus is. This is the next-generation style of that service. Waiting at a bus stop, sending a friend a Facebook message, you can just drop TravelBot a quick message asking when your bus will arrive and carry on with your personal conversation.

"We really want people to interact with the service in their preferred setting," says Gupta. "People spend a lot of time using messaging apps such as Twitter, Facebook, WhatsApp and, obviously, people want to have information in the easiest way they can get it. So, if they're already using Facebook, the benefit to the customer is that they don't have to switch apps to check the information. Everything's in one place. A lot of people would say that this is where this type of communication is heading."

Surely there's a knock-on benefit for TfL too?

"It frees up more time for our customer service agents to focus on more complex queries, which in turn helps us improve our response rate. Because if someone is calling customer service agents to find out when their next bus is due, it takes up their time. And this is something that we can easily automate with the functionality we have in the artificial intelligence." ■

■ To find out more about TravelBot, visit <https://tfl.gov.uk/travel-information/social-media-and-email-updates/facebook-travelbot>

WHAT CAN TRAVELBOT HELP YOU WITH?

- **BUS ARRIVALS:** customers can check when their bus is due to arrive by simply sharing their location or providing the bus stop code available at every bus stop. This will be particularly beneficial for customers at bus stops that don't display 'countdown' information
- **BUS ROUTE STATUS:** customers can ask for bus service updates, including information on bus route diversions

- **SERVICE UPDATES:** customers can ask for the latest service updates for the Tube, TfL Rail, London Overground, DLR and London Trams
- **MAPS:** the TravelBot can provide Tube, Night Tube and rail maps
- **MESSAGE AN AGENT:** the TravelBot can refer customers to a customer service agent

