IRJ
International Railway Journal
December 2018 | Volume 58 Issue 12
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With a resolution finally set to end the uncertainty surrounding the future of the rail freight concessions market, the new Brazilian government is backing major investment in long-awaited projects across the country.

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International Railway Journal (Print ISSN 2161-7376, Digital ISSN 2161-7368), is published monthly by Simmons-Boardman Publishing Corp, 55 Broad Street, 26th Fl, New York, NY 10004-2580, USA. Printed in Great Britain by Buxton Press and distributed in the USA by Mail Right International, 1637 Stelton Road B4, Piscataway, NJ 08854, USA. Periodicals postage paid at Piscataway, NJ and additional mailing offices.

Email: internationalrailwayjournal@stamats.com or write to: International Railway Journal, Simmons-Boardman Publishing Corp, 615 Fifth Street SE, Cedar Rapids, IA 52401–2158. USA. POSTMASTER: Send address changes to International Railway Journal, PO Box 1407 Cedar Rapids, IA 52406-1407 USA.

The tide is turning for private operators

SLOWLY but surely the private sector's involvement in passenger rail is expanding on both sides of the Atlantic. In Europe, the initial spur was the railway privatisation in Britain and the letting of concessions in countries such as Germany, the Netherlands, Denmark and Sweden. This was followed by the largely successful launch of private open-access operators in Britain, Sweden, the Czech Republic, Austria, Italy and Germany, with several more private operators keen to take the plunge provided the conditions are right.

This success has been achieved despite the unwillingness of some national governments and the European Union to create a level playing field. In Sweden MTR has so far failed in its attempt to get its trains onto incumbent SJ's booking portal, which is the go-to site for most Swedes buying train tickets. In June, start-up Saga Rail withdrew the service it launched in February for the same reason.

Neighbouring Norway, on the other hand, realises the importance of creating a level playing field as it starts to let its first concessions, even though open access is unlikely in the small Norwegian market. Government-owned Entur manages internet ticket sales and in October took over the sale of tickets at stations from incumbent operator Norwegian State Railways (p10).

EU legislation governing rail passenger rights was amended last month by the European Parliament (p7) increasing compensation when trains are delayed even when a trip involves several trains. However, the EU continues to ignore calls for mandatory missed connection protection involving services run by different operators, which sometimes results in passengers having to buy a new ticket when they miss a connection through no fault of their own.

A similar pattern of private development is emerging in the United States, where the operation of commuter rail networks by private companies is already commonplace. Brightline's Miami - West Palm Beach inter-city service, which launched earlier this year, is the first privately-funded passenger rail service in the US for many decades. Brightline was already committed to extending the service to Orlando and has now agreed to construct an extension to Tampa. It is also taking over the Xpress West high-speed project to link Las Vegas with Victorville north of Los Angeles.

Brightline's rapid and ambitious expansion plans have already attracted the interest of Sir Richard Branson and his Virgin Group, which has been looking for passenger rail investment opportunities in the US for several years. Brightline will now be rebranded Virgin Trains USA and Virgin will take a small stake in the company (p7).

The deal also brings together two successful entrepreneurs - Branson and Mr Wes Edens, co-founder and co-chief executive of Fortress Investment Group, parent of Brightline - which should give a real impetus to the ventures.

Even more audacious is Texas Central Railway's plan to build a 390km high-speed line from Dallas to Houston entirely with private finance (p30). The lack of any major physical obstacles along the route should reduce the risk of construction delays, while the marriage of Japanese technology with Spanish operating know-how should boost investor confidence.

Nevertheless, Texas Central faces the daunting task of raising up to $US 16bn to build the railway and convince investors that it can produce a return. Texas Central also must entice enough Texans out of their cars and onto its trains.

> "Texas Central is quite bullish about its prospects and says the world has changed since the failure of the Texas TGV project in 1994.

However, Texas Central is quite bullish about its prospects and says the world has changed since the failure of the Texas TGV project in 1994. It also recognises the importance of providing good last-mile connections for passengers to make the overall trip as seamless as possible.

Further south, recent elections in Mexico and Brazil have given impetus to two passenger rail projects: the Maya Train PPP scheme to develop a 1500km railway to serve the booming tourist industry on Mexico's Yucatan Peninsula (p28), and the introduction of the first modern inter-city services in the populous and wealthy Brazilian state of São Paulo (p22). Both countries shut down virtually all their long-distance passenger operations when the railways were privatised in the 1990s, so this will be a major change of direction if the projects come to fruition.

Implementation of the Maya Train project was a core campaign promise by Mexico's president-elect, Mr Andres Manuel Lopez Obrador, who takes office on December 1. He plans to hold a symbolic ground-breaking ceremony on December 16, which could herald the start of rebuilding an existing line, although studies are still underway for the new-line sections. Nevertheless, at least one Mexican tourism company has expressed interest in the project.

Railway development is also one of the priorities of the newly-elected governor of São Paulo state, Mr João Doria. The inter-city scheme will be implemented as a PPP, although the government has struggled in the past to raise its share of funding for PPPs.

European private open-access operators have already overturned the once widely-held belief that passenger rail cannot make money. Let's hope that the trailblazers in the United States, and eventually Mexico and Brazil, prove their doubters wrong.

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Morocco inaugurates Africa's first high-speed line

KING Mohammed VI of Morocco and French president Mr Emmanuel Macron attended a ceremony in Tangiers on November 15 to inaugurate Africa's first high-speed line.

Construction of the 183km Tangiers - Kenitra line was officially launched in September 2011 and was originally due for completion in December 2015, but the project suffered a number of setbacks including land acquisition delays and subsidence.

Dynamic testing began in February 2017 and an African rail speed record of 357km/h was set on May 4 this year.

The total cost of the project was around €1.8bn. The Moroccan government provided €500m from the state budget and the Hassan II Fund for Economic and Social Development. The French government contributed €625m in the form of a concessional loan and a €75m grant, with the French Development Agency (AFD) providing a further €220m.

Financing was also drawn from sources in Arab countries, including Saudi Arabia Fund for Development (€144m), the Abu Dhabi Fund for Development (€70m) and the Kuwait Fund for Arab Economic Development (€100m).

Key engineering features on the new line include the 3.5km El Hachef viaduct and the 700m Mharhar viaduct.

Services are operated by a fleet of 12 Alstom Euroduplex double-deck trains, each seating 533 passengers. Each eight-car train is formed of two first-class cars, five second-class cars and a dining/bar car. The trains operate at speeds of up to 320km/h, reducing the Tangiers - Kenitra journey time from 3h 15min to 50 minutes and Tangiers - Casablanca from 4h 45min to 2h 10min.

Moroccan National Railways (ONCF) has adopted the Al Boraq brand for its new flagship services.

The Euroduplex fleet is equipped to operate on both the 25kV 50Hz ac electrification used on the high-speed line and Morocco's conventional 3kV dc system for through operation over the existing line to Rabat and Casablanca.

The train fleet is maintained at a purpose-built depot at Tangiers by a 60:40 ONCF-SNCF joint venture, which has been awarded a 15-year fleet maintenance contract worth €175m.

In April 2013 an Ansaldo STS-Cofely Ineo consortium secured a €120m contract to supply and install signalling and telecommunications systems and the line's centralised traffic control centre, which is located in Rabat. A consortium of Colas-Rail and Egis Rail was awarded a €136m design-build contract for trackwork and electrification.

The Moroccan high-speed programme also includes rebuilding the conventional line between Kenitra and Rabat, where a third track has been added, and new or rebuilt stations at Tangiers, Kenitra, Rabat Agdal and Casablanca Voyageurs.

High-speed services are forecast to boost ridership on the Tangiers - Rabat - Casablanca corridor from 3 million to 6 million passengers a year while providing additional capacity for freight traffic on the conventional line between Tangiers and Kenitra.

Advance Al Boraq fares start at Dirhams 89 ($US 9.39) one-way for a second-class single from Tangiers to Rabat and Dirhams 99 for Tangiers - Casablanca. Semi-flexible second-class fares start at Dirhams 115 for Tangiers - Rabat and Dirhams 149 for Tangiers - Casablanca. Tickets can be bought up to 90 days before travel.

A flat fare of Dirhams 50 in second class and Dirhams 80 in first class applies for children between the ages of four and 15 and discounts are also available for young adults, students and seniors.

The initial timetable comprises nine services in each direction between Tangiers and Casablanca with four daily Tangiers - Kenitra shuttles.

Mercitalia Fast high-speed freight service launched

ITALIAN State Railways (FS) subsidiary Mercitalia unveiled its new Mercitalia Fast high-speed rail freight service at an event at the company's Caserta Marcianise terminal north of Naples on October 29.

Regular operation began on November 7. Mercitalia Fast services operate nightly between Monday and Friday, linking the Caserta terminal with the Interporto hub in Bologna in 3h 30min.

Services are operated by a 12-car ETR 500 train which has been modified to transport 70x80x180 roll containers. According to Mercitalia the train will accommodate a payload equivalent to 18 articulated lorries and is expected to eliminate 9000 lorry movements a year on the north - south A1 highway.

Eurostar to step up Amsterdam services

EUROSTAR confirmed on October 23 that it will introduce a third daily service between London, Rotterdam and Amsterdam next June with plans for further expansion in the longer-term.

Eurostar says it has carried more than 130,000 extra passengers since the launch of direct high-speed services between the British and Dutch capitals in April.

The addition of the third service recognises commitments by the British and Dutch governments to have security checks and border controls in place at Dutch stations by the end of 2019.

Currently passengers travelling to London must change trains at Brussels South, where customs and security checks are carried out.

Eurostar says that it plans to add a fourth daily service as soon as the new border control arrangements are in place for travel, with ambitions to increase frequencies to five trains a day in the longer-term.

European parliament adopts passenger rights recast

LEGISLATION amending EU rules on rail passenger rights was approved by MEPs at a plenary session of the European Parliament on November 15.

The recast of Regulation 1371/2007 (EC) on Rail Passenger Rights and Obligations passed with 533 MEPs voting in favour, 37 against and 47 abstentions.

The recast increases compensation for delays of more than an hour from 25% to 50% of the value of the ticket. Passengers will be legally entitled to 75% compensation for a delay of more than 90 minutes and a full refund if a train is more than two hours late.

For passengers making multi-leg journeys with several tickets, rights to information, assistance and compensation will be the same as those for a through ticket.

MEPs also rejected proposals to exempt operators from paying compensation in the event of "extraordinary circumstances."

The recast will guarantee that assistance for passengers with reduced mobility will be free-of-charge and available at larger stations without the need to provide prior notification. The time needed for prenotification of assistance at smaller stations has also been reduced.

In addition, the recast also includes provisions to ensure new and refurbished trains have "well-indicated spaces" to accommodate assembled bicycles and MEPs have backed an earlier-than-planned phase-out of temporary exemptions used by a number of member states to only partially implement the 2009 rules to domestic services. These exemptions will end within a year of the recast coming into force.

Brightline to become Virgin Trains USA

FLORIDA's privately-funded inter-city rail operator Brightline announced on November 16 that it will be renamed Virgin Trains USA after signing a strategic partnership and trademark licensing agreement with the Virgin Group.

Brightline launched services between Miami, Fort Lauderdale and West Palm Beach in May 2018 and currently has plans to expand to Orlando and Tampa. The company is also developing plans for a high-speed line between California and Las Vegas after its recent takeover of the Xpress West project.

Brightline says it will transition to Virgin Trains USA branding in 2019. As part of the agreement, an affiliate of Virgin group will make a minority investment in Brightline, with an affiliate of Fortress Investment Group retaining a majority stake.

"Our private-sector-led effort to reinvent passenger rail service in America is taking another leap forward with the addition of the Virgin team," says Mr Wes Edens, chairman of Brightline and co-founder of Fortress Investment Group. "Virgin has built a respected and trusted brand in travel and hospitality. With our shared focus on customer experience, powered by a culture of innovation and disruption, we are well positioned to build on our success."

"We have had a lot of fun and success creating innovative transport businesses that shake up markets and establish loyal followings," says Virgin founder, Sir Richard Branson. "Tens of millions of Americans travel on the railways every day, and we have tried for over a decade to find an opportunity to provide them with that same excellent service experience.

"Brightline is at the forefront of innovation in this market, and the ideal partner for Virgin to work with to alter perceptions and travelling habits across the United States."

Photo: Shutterstock/Jillian Cairn

Study launched for Greece - Albania rail link

A ceremony was held in Kastoria, Greece, on November 19 to officially launch a study into the construction of a new railway linking northern Greece with Albania.

The CB Railway project involves constructing a 130km line from the existing Greek railhead at Florina to the Albanian city of Pogradec on the southern shore of Lake Ohrid. The line will run via the Kristallopigi - Bilisht border crossing, which is currently the main crossing for road traffic between northern Greece and Albania.

The study is being funded with the aid of a €845.7m grant from the European Union's (EU) Interreg IPA CBC Programme Greece - Albania 2014-2020.

The study will be carried out by a consortium of Hellenic Railways Organisation (OSE), Greek infrastructure manager Ergose and the Albanian Ministry of Infrastructure and Energy. The two-year study will look at route options, carry out technical and financial analysis, and assess environmental impacts.

The mixed-traffic line is expected to benefit regional development, trade and tourism while facilitating the economic and social integration of Albania with the EU.

In brief

Britain

Network Rail (NR) has awarded ESG Rail and DB Systemtechnik (DBST) a contract to supply overhead line monitoring technology to enhance its existing monitoring fleet. As part of this contract, passenger vehicles will also be used to monitor the network during normal operation.

Bulgaria

The European Commission confirmed on November 15 that the European Union Cohesion Fund will contribute €293.4m towards the second phase of the modernisation of the 293km Plovdiv - Burgas line. Phase 2 encompasses the modernisation of 111km of the route, including 29km of double track, and the installation of ETCS along the entire line.

Estonia

National passenger operator Elron will withdraw all services from Tallinn to Pärnu, the country's fourth-largest city, from the start of the 2019 timetable on December 9 due to the poor condition of the track on the southern section of the route. The closure of the 70km Lelle - Pärnu section means Pärnu, a resort city of more than 50,000 inhabitants, will be left without a direct rail link to the capital until the Estonian section of the Rail Baltica standard-gauge line opens in 2026.

Germany

German Rail (DB) and Rail.One celebrated the start of construction of a new turnout sleeper plant at DB Network's site in Schwandorf, southern Germany, on October 6, with series production scheduled to begin in autumn 2019. Rail.One Schwandorf, a subsidiary of Rail.One Group, will construct and operate the plant to fulfil a contract awarded by DB Network in 2017.

- DB's Rail Digital Ventures business unit has agreed to make a strategic investment of several million Euros in Canadian start-up satellite telecommunications firm Kepler Communications. Kepler, which has so far developed three shoebox-sized nanosatelites, has raised

DB reconsiders sale of Arriva and Schenker

Arriva is a major operator of regional rail and bus services in the Netherlands. Photo: Quintus Vosman

GERMAN Rail (DB) is re-examining options for the full or partial sale of international passenger business DB Arriva and global logistics subsidiary DB Schenker.

DB CEO, Dr Richard Lutz, told domestic media at the end of October that sales were possible, but the final decision would rest with the German federal government.

Plans to sell stakes in both companies were scrapped in late 2016 following political opposition.

DB could reportedly generate up to €10bn if it disposes entirely of Arriva and Schenker. The latter subsidiary alone generates around a third of current DB group revenues. However, there has been no indication from the federal government that it would allow DB to fully divest the two companies.

Renewed talk of asset sales comes as DB grapples with mounting financial difficulties.

DB has an agreed debt ceiling and a policy to pay the German treasury an annual minimum dividend, although in practice dividend payments have been reduced to €600m in 2016 and €450m in 2017.

DB's debt of €18.6bn is approaching the €20.4bn ceiling previously agreed as a maximum debt level with its sole shareholder, the German government. In early September, Lutz warned DB management of the group's serious financial problems, which has led to a freeze on much non-operational spending.

In recent years DB has made most of its profits from the provision of infrastructure and energy via its DB Networks business unit and its German domestic regional rail business, DB Regio. However, neither are considered a viable long-term source of investment funding.

While remaining profitable, DB Networks has limitations placed upon the use of these profits - profits generated through track access charges must be ploughed back into German railway infrastructure and these funds cannot be used for investment in any of DB's operating businesses.

In the last six years DB has made less money from DB Regio than it did historically as competition for tendered regional passenger services in Germany has resulted in significantly-reduced margins. Crucially for the DB business model, much of the income attributable to rolling stock provision and maintenance has been removed from tenders completely with the awarding authorities choosing to provide their own train fleets and arrange contract maintenance.

These factors, plus continued losses at European rail freight business DB Cargo, means that DB will need to find new sources of cash to finance future investment without breaching the debt ceiling. The recent order for ICE4 high-speed trains is set to add another €1bn to the figure.

In the first half of this year, DB's overall revenue grew 2.3% year-on-year to €21.6bn but Ebit fell 17.5% to €974m. With annual interest costs for the existing debt amounting to around €800m, the cost of servicing the debt wipes out a significant portion of DB's profits.

Net profit levels are therefore unlikely to fund dividends at the level foreseen in the agreement, let alone allow substantial investment in the operating businesses.

In October, president of Germany's Federal Court of Auditors, Mr Kay Scheller, urged the federal government to increase its financial scrutiny of DB.

Westbahn-Meridian to launch Vienna - Munich services

AUSTRIAN open-access operator Westbahn and Meridian, a subsidiary of Bavarian Overland Railway (BOB), will launch a thrice-daily direct Vienna - Munich service in April 2019.

The service, operated in association with Bavarian Railway Company (BEG), will extend Westbahn's Westgreen service from Vienna West via Salzburg to Munich and will run in the same timings as Meridian's Freilassing - Rosenheim - Munich main station regional services.

The new service will be operated by Westbahn in Austria and Meridian in Bavaria.

Services will depart from Vienna at 05:43, 08:43 and 14:43 and Munich at 08.55, 14.55 and 17.55. The journey time of 4h 23min is 20 minutes slower than Austrian Federal Railways' (ÖBB) competing Railjet service.

China - Myanmar accord signed

CHINA Railway Eryuan Engineering Group has signed a Memorandum of Understanding with Myanmar Railways to carry out a feasibility study of a standard-gauge railway linking the border town of Muse with Mandalay.

The study will include environmental impact and social assessments of the project and is due to be completed within two years.

China is already building a 330km line from Dali to the border town of Ruili on the opposite bank of the Ruili river.

Gibela's South African rolling stock plant inaugurated

ALSTOM and its partners in the Gibela joint venture, Ubumbano Rail and New Africa Rail, inaugurated a Rand 928m ($US 63.5m) rolling stock manufacturing plant at Dunnottar, South Africa, on October 25.

The facility, the largest in Africa, was officially opened by the president of South Africa, Mr Cyril Ramaphosa, in front of more than 300 people.

A fleet of 580 six-car X'Trapolis Mega commuter EMUs will be built for Prasa at the 53,000m^2 site over the next 10 years. Alstom says the site's workshops are modular to enable lean manufacturing processes with equipment featuring the latest innovations and advanced manufacturing processes necessary for the assembly of at least 10,000 parts and the linkage of 250 industrial activities.

At peak production, the facility will produce 62 trains per year with the first set expected to roll out of the factory at the end of the year.

The plant also features a bespoke training centre supporting the continued transfer of new rail-related skills to Gibela's employees and suppliers, as well as a 1.2km test track for the dynamic testing of the new trains. More than 700 employees are expected to work at the Dunnottar site by the end of 2020.

KiwiRail electric operations reprieved

NEW Zealand's state-owned operator KiwiRail has been given a $NZ 35m ($US 22.8m) cash injection to refurbish its fleet of 30-year-old EF class electric locomotives over the next four years, revising a decision by the KiwiRail board in 2016 to decommission the fleet in March 2019.

Deputy prime minister and minister of state-owned enterprises, Mr Winston Peters, says refurbishment rather than replacement with modern diesel locomotives was the right decision long-term.

Refurbishment will include upgrades of the electronic control systems and will extend the life of the locomotives by around 10 years. Just eight of the electric units are currently in service, and the EFs have been failing every 30,000km on average, well below KiwiRail's fleet target of 50,000km. A total of 22 of the 3MW locomotives were purchased from Brush Traction, Britain, and entered service between 1986 and 1988.

The $NZ 35m refurbishment programme will cost almost three-times the amount touted by unions and other groups which had argued against mothballing the electrification of the North Island Main Trunk line between Palmerston North and Hamilton. KiwiRail had planned to keep and maintain the catenary in order to reverse the original decision if needed.

Explaining the reversal, KiwiRail's acting chief executive, Mr Todd Moyle, says the 2016 decision had not been taken lightly and reflected the funding available to the company at the time. KiwiRail also argued that using modern diesels as part of a more efficient rail freight service would have had a greater effect on reducing emissions by taking more lorries off the country's roads.

However, Moyle says the new coalition government has shown a clear commitment to rail, including the NZ Transport Agency providing funding to undertake business cases for further electrification of the Auckland rail network from Papakura to Pukekohe, and adding a third main line in Auckland.

Moyle adds that KiwiRail has been in discussions with the government about further electrification and is exploring the use of other fuel sources.

Electrifying the remainder of the route between Auckland and Wellington, another option previously favoured by parties now in government, was estimated to cost more than $NZ 1bn and would have still required the use of diesel units throughout the rest of the North Island.

Photo: Shutterstock/Urban Napflin

In brief

$US 16m to fund the next stage of its development programme, which includes a new satellite designed to optimise the Internet of Things (IoT) for transport operators.

Hungary

Hungarian State Railways (MÁV) has launched a project to add a third track on the sole electrified east-west railway bridge across the Danube in southern Budapest. The new track will run between Kelenföld and Ferencváros and will support a new S-Bahn-style suburban service. The bridge is already used by east-west freight traffic, Railjet services from Munich to Budapest, and inter-city and suburban trains.

International

A milestone was reached in the upgrading of the line between Östersund, Sweden and Trondheim, Norway, on October 19 with the opening of a new 230m viaduct near Storlien on the Swedish side of the border. Traffic was suspended on the 3.74km section between Storlien and the frontier in November 2013 after Swedish infrastructure manager Trafikverket detected movement in an embankment.

• The government of the French region of Hauts de France confirmed on November 16 that cross-border regional passenger services on two routes into Belgium will resume with the start of the 2019 timetable on December 9. Two return services a day will operate on weekdays and at weekends on the Maubeuge - Charleroi - Namur and Aulnoye - Mons routes with connections to inter-city services to and from Paris.

Mongolia

Northern Railways, an infrastructure manager owned by a consortium of Aspire Mining (80%), and subsidiaries of China Railway Construction Corporation, has received a


Photo: Alstom

Keolis and RATP Dev to operate CDG Express

THE French government has named the Hello Paris consortium, comprising Keolis and RATP Dev, as preferred bidder for a contract to operate the CDG Express service which will provide a direct link between Paris Gare de l'Est and Paris-Charles de Gaulle international airport.

The announcement on November 19 comes less than a week after Transdev, which also submitted a bid for the contract, lodged a complaint with anti-competition authorities arguing that the parent companies of Keolis and RATP Dev, French National Railways (SNCF) and RATP respectively, already hold a monopoly on rail travel in France, and that the consortium between them was designed to discourage competition in the tender.

The line is expected to open on January 1 2024 ahead of the 2024 Summer Olympics which will be hosted by the French capital. The contract includes a five-year pre-operational period between 2019 and 2023 and a 15-year operational period between 2024 and 2038.

CDG Express services will operate with a maximum journey time of 20 minutes for the 32km journey between Paris Est and CDG Terminal 2, compared with 35 minutes for the RER service from Gare de Nord. Trains will use the existing line between Paris Est and Villeparisis, before continuing northwards on a new 8km branch which will follow the alignment of TGV Interconnexion to the airport.

A one-way fare for the service, which will operate every 15 minutes from 05.00 to 00.00 seven days a week, is expected to cost €24. Up to nine million passengers a year are expected to use the service.

Following a tender, Hello Paris says it has chosen to use Alstom's Coradia Liner EMU, a design which has already been authorised for operation on the French network, to ensure that the line can be ready in time for the 2024 Olympics. The interiors will be designed for airport passengers.

The contract is due to be signed before the end of January 2019.

New retailer takes over Norwegian ticket sales

ENTUR, a company owned by the Norwegian Ministry of Transport and Communications, has taken over the sale of tickets at stations from national operator Norwegian State Railways (NSB) as part of the government's effort to create a level playing field for all passenger operators.

Founded in 2016 as part of the Norwegian government's 2015 rail reforms, Entur already managed online and app sales but now operates 220 ticket machines and more than 185 validators, as well as the customer service centres at Oslo Airport, Oslo Central Station, Bergen, Stavanger and Trondheim.

The European Alliance of New Rail Entrants (AllRail) has welcomed the move and says the arrangement should be a role model for European Union countries.

"Passengers should have the right to access all ticket options at all sales channels," AllRail says. "However, EU state-owned rail incumbents know that if they refuse to sell all rail options at their in-house sales channels, with the inherited brand equity, fewer passengers will find out about other operators on the tracks."

German government prioritises 44 rail projects worth €6.35bn

GERMANY's federal transport minister, Mr Andreas Scheuer, announced on November 6 that following a detailed cost:benefit analysis of 44 rail projects in the Federal Transport Infrastructure Plan, 29 have been elevated to the highest priority and will be implemented by 2030 at a total cost of €6.35bn.

The projects comprise 22 line upgrading schemes, six projects to relieve congestion at major junctions, measures to allow the introduction of 740m-long freight trains, and initiatives associated with the introduction of a national regular-interval timetable.

"We are putting additional rail projects on the track, which will be a real win for the entire rail network and the regions," Scheuer says. "With them we eliminate bottlenecks, create more capacity and provide the infrastructure for the German regular-interval timetable. Our goals are: shorter travel times and better connections, also in the metropolitan areas."

"The expansion of the nodes is the key to a powerful rail network," says Mr Enak Ferlemann, federal rail transport commissioner. "This benefits both long-distance and freight traffic and regional traffic alike. Attractive rail traffic in the metropolitan regions not least improves air quality and is thus a sustainable investment in the future. The planning of the projects must start now in a timely manner."

In addition, lines in the Frankfurt, Hamburg, Hannover, Cologne, Mannheim and Munich areas will be upgraded to eliminate bottlenecks on the network. The Cologne - Aachen line will also be upgraded in connection with the national regular-interval timetable project.

High priority projects

- Munich - Mühldorf - Freilassing
- Nurnemberg - Erfurt
- Nurnemberg - Schwandorf/Munich - Regensburg - Furth-im-Wald - Czech border
- Dutch border - Kaldenkirchen - Viersen - Rheydt-Odenkirchen
- Augsburg - Donauwörth
- Gotha - Leinefelde
- Stuttgart - Backnang/Schwäbisch Gmünd - Aalen - Nuremberg
- Kehl - Appenweier
- Landshut - Plattling
- Lübeck - Schwerin
- Weimar - Gera - Gößnitz
- Regensburg - Mühldorf
- Niebüll - Klanxbüll
- Studernheimer curve (Ludwigshafen)
- Hamburg- Ahrensburg
- Dresden - Prague
- Lehrte/Hameln - Braunschweig - Magdeburg - Rosslau
- Cuxhaven - Stade
- Münster - Lünen
- Leipzig - Chemnitz
- Wilster - Brunsbüttel
- Berlin - Angermünde - Pasewalk - Stralsund.

NS trials faster trains to the north

NETHERLANDS Railways (NS) is planning a 'once-only' test run early next year to establish the viability of accelerating inter-city services between Amsterdam, Zwolle and Groningen.

If the tests are successful, NS says it may introduce additional fast peak services on the route, although capacity constraints mean this will not be feasible before December 2020.

The journey time reduction will be achieved by skipping stops at Assen and Lelystad and running at higher speeds on the Hanze Line, which is equipped with both ETCS Level 2 and the first-generation Dutch ATB train protection system and cleared for 200km/h. Elsewhere on the conventional network the first-generation ATB limits the maximum line speed to 140km/h.

The test will be carried out using a Bombardier class 186 (Traxx MS2) multi-system electric locomotive and ICRm coaches normally used on IC Direct services from Amsterdam to Rotterdam, Breda and Antwerp via the HSL South high-speed line.

When operating on ETCS on the Hanze Line, the Traxx will be permitted to run at its maximum speed of 160km/h.

The fastest Amsterdam South - Groningen inter-city service in the 2018 timetable offers a journey time of 2h 1min and NS expects the trial run to shave around 15 minutes off this timing.

The test run should indicate the rolling stock, timetabling and infrastructure requirements for higher-speed operation.

NS says a further 15-minute journey time reduction could be achieved with the introduction of the 200km/h Inter-City New Generation (ICNG) EMUs, which are due to enter service on all major inter-city routes from 2021 onwards.

NS CEO, Mr Roger van Boxtel, points out that accelerating Amsterdam - Groningen services might also improve links between the Randstad region of the Hague, Amsterdam, Rotterdam and Utrecht, and other peripheral areas.

Photo: Shutterstock/Affe_Schlau

GE pulls out of Nigerian concession

GE Transportation confirmed on November 16 that it is withdrawing from a consortium appointed earlier this year to upgrade Nigeria's narrow-gauge railway network.

In May the government of Nigeria awarded a concession to rehabilitate, finance and operate Nigerian Railways Corporation's 1067mm-gauge network to the consortium of GE, South Africa's Transnet, Chinese infrastructure construction services company SinoHydro and port, terminals and intermodal services provider APM Terminals.

GE will now hand over leadership of the project to Transnet. "This development is in line with GE's decision to exit the Transportation business from its portfolio," GE said in an emailed statement. "Transnet has been a trusted partner of GE for several decades. We have confidence in their ability and that of the other consortium members to execute on the rail concession project successfully."

The project's interim phase, which is due to be completed within 18 months, is intended to make the system "technically and economically operable."

In brief

Preliminary Economic Assessment (PEA) for a 238.6km planned freight line between Ovoot and Arts Suuri on the Russian-Mongolian border. Construction is estimated to cost $US 581.8m and the line would connect Aspire's Ovoot coking coal mine with Russia's proposed Kyzyl - Arts Suuri line, which is due to be completed in 2022

Netherlands

A cross-industry ERTMS testing centre was inaugurated in Amersfoort on November 5. The centre has been established to develop ERTMS in cooperation between all parties involved in the Dutch rail sector, including manufacturers, train operators and infrastructure manager Prorail.

Saudi Arabia

Saudi Railway Company (SAR) launched Riyadh - Jawf overnight passenger services on the North-South Railway on November 7. A weekly service operates in each direction and SAR plans to gradually increase the frequency of the service. It also plans to extend operations to Qurayyat. CAF has supplied four day trains and two overnight trains for use on the line under a €400m contract.

Portugal

Rail freight operator Medway has announced plans to invest €25m in the construction of a new terminal at Famalição north of Porto. Civil works are expected to begin next year. Medway has also confirmed it plans to launch a new direct Portugal - Germany rail freight service for automotive customers next year.

Russia

Russian freight wagon owners will require 400,000-550,000 wagons between 2019 and 2030, according to research by Russia's Institute of Natural Monopolies Research (IPEM).

Italian national airline Alitalia accepts purchase offer from FS

THE government-appointed commissioners of Italian national airline Alitalia have accepted an offer from Italian State Railways (FS) to acquire Alitalia, beating bids submitted by EasyJet and Delta Airlines. If the deal is finalised, this will be the first time that a major railway has owned an airline since Canadian Pacific Railway sold CP Air in 1986.

"We are convinced of the soundness of the project at the transport level," FS CEO, Mr Gianfranco Battisti, was reported as saying on November 20 by the Italian business newspaper *Il Sole 24 Ore*. "We believe we have the ambition and industrial maturity to guarantee leadership in an integrated mobility project for the country, so we wait for the conditions to be formalised. We are interacting with many operators, among which is EasyJet. Soon we may be in a position to announce something definite."

Alitalia has been in special administration since May 2017 following several failed attempts to restructure the business, which must repay a €900m bridging loan to the government by December 15.

The deal will please Mr Luigi Di Maio, leader of the Five Star party, which forms part of Italy's populist coalition government, who had been campaigning for Alitalia to be rescued by a state-owned company rather than sold to a foreign airline.

The Italian parliament passed a law in April, which set a deadline of October 31 for the sale of the Alitalia, a process which has been delayed by the change of government following March's general election.

Since entering extraordinary administration Alitalia has cut costs and increased revenues, including by 4.6% in the third quarter of 2018 to €953m.

FS' bid for Alitalia follows a period of management upheaval at the railway following the election of the new government. In July, incoming infrastructure and transport minister, Mr Danilo Toninelli, dismissed the entire FS board, replacing CEO, Mr Renato Mazzoncini, with Battisti, who previously served as director of FS' National and International Passenger Division and Trenitalia's High Speed Division.

Mazzoncini was a close associate of former prime minister Mr Matteo Renzi and his dismissal was widely viewed as a political move by the new administration.

On October 10, minister of economic development, employment and social policies, Mr Luigi di Maio, prime minister, Mr Giuseppe Conte, and Toninelli convened a meeting with executives from major state-owned enterprises, including FS.

The ministers told the representatives present that it expected their companies to make short-term investments of at least €35bn in a bid to revive Italy's stagnant economy and send a positive signal of the government's intentions to the European Commission, which in October rejected the country's 2019 draft budget on the grounds that it will increase the country's deficit to 2.4% of GDP. Two-days later, FS said it had expressed a non-binding interest in acquiring Alitalia.

To facilitate the takeover, a new state-owned company could be created which would be capitalised with €2bn from FS or the Ministry of Economy and Finance, with the latter holding a 15% stake, although this proposal does not have the universal backing of ministers.

FS' pursuit of Alitalia follows its recent takeover of the National Autonomous Roads Corporation (ANAS) and South East Railway (FSE), Italy's second-largest railway, which was in extraordinary administration at the time.

Critics argue that all three are politically-motivated and do not reflect FS' market-driven strategy. There is also the question of whether EU competition authorities will allow the concentration of such power and resources in to a single state-owned enterprise.

Kawasaki mulls exit from rolling stock market

KAWASAKI Heavy Industries (KHI) has set up a restructuring committee to consider options for the future of its rolling stock business due to mounting losses from contracts in the United States and Japan.

Following disappointing quarterly results, KHI's president, Mr Yoshinori Kanehana, said the company is reviewing options for its rolling stock division, including quitting the business or forming an alliance with another company if restructuring is unsuccessful.

"We expect a decline in earnings of approximately Yen 16.5bn ($US 145m) compared with the forecast announced in July, mainly due to losses in North American operations," KHI said in a statement on October 19.

Photo: Joe Calisi

Options from a contract with LIRR and Metro North have not met expectations.

KHI's US subsidiary, Kawasaki Rail Car, secured a contract for 92 commuter cars in 2013 from Long Island Rail Road (LIRR) and Metro North Railroad. KHI began production on the assumption that options for 584 additional cars would be exercised.

"KHI expects a further increase of costs in the base contract due to non-achievement of revenue improvement targets, higher-than-anticipated increases in material costs for procured goods and lower-than-expected improvements in production efficiency at our North America plants," KHI says. As a result, it expects a decline in earnings of around Yen 2.5bn in FY2018.

KHI says it has been negotiating with LIRR on the terms to exercise its options scheduled for the third quarter of FY2018, including a request for a price increase. As KHI will now only supply 110 additional cars, it intends to record a loss on the option of about Yen 6bn in FY2018.

KHI has recorded a Yen 5bn loss on its $US 2bn contract for 748 metro cars for Washington Metropolitan Area Transit Authority (WMATA), which it secured in 2010. In May 2018, defects in the wiring of some of the 7000 series cars in production were revealed, and 548 of about 600 cars already delivered will require rewiring.

KHI has also recorded a provision for a second-quarter loss of Yen 3bn on construction contracts for railway operators in Japan due to the non-achievement of cost reduction targets, higher-than-expected increases in material costs, and disputes with customers over specifications.

Security checks at Paris Gare du Nord.

UIC launches anti-terror research project

THE International Union of Railways (UIC) held the inaugural meeting in Paris on November 13 of the one-year Sherpa research project to improve the protection of trains and stations against terrorist attacks.

The Sherpa project is divided into four work packages:

- developing a coherent approach for terrorist risk assessment and management
- analysis of emerging terrorism-related threats against stations and trains
- assessment of security solutions and the need for better security at stations and on trains while taking into account business constraints, and
- practical tools such as training, guidelines, and best practices for a common approach to raise awareness and improve security at stations and on trains.

Sherpa, which stands for a shared and coherent European railway protection approach, is funded by the European Union's Internal Security Fund.

RZD to invest $US 2.2bn in digitalisation

RUSSIAN Railways (RZD) has indicated it intends to spend up to Roubles 150bn ($US 2.2bn) on digitalisation up to 2025.

During the "unified digital platform" panel discussion at the 12th International Forum "Transport of Russia" in Moscow on November 20, RZD chairman and director general, Mr Oleg Belozerov, said that the goals set out by the Russian president, Mr Vladimir Putin, in May are impossible without reliance on scientific and technical developments, modern IT solutions, and digitalisation.

Belozerov also listed a number of key goals RZD is aiming to achieve by 2025, including increasing the use of electronic tickets for long-distance passenger services by up to 70%.

RZD is set to introduce online facilities such as planning and providing door-to-door services and booking and purchasing tickets for multi-modal travel.

DB revives Fürth freight tunnel plan

GERMAN infrastructure manager DB Network has resumed planning of a new 7.6km tunnel for freight trains to relieve congestion and reduce noise levels in the Fürth/Nuremberg area.

A financing agreement between DB Network and the German Federal Ministry of Transport and Digital Infrastructure should be concluded before the end of 2018. The cost of the project, which was originally part of the German reunification infrastructure plan, is estimated at €400m.

The tunnel will start at Eltersdorf, north of Fürth, and will take freight trains directly to Nuremberg's freight yard.

The project has been reassessed and accorded high priority in the 2030 federal infrastructure plan. The alignment is expected to be finalised in 2020.

In brief

IPEM estimates that this will translate into a freight wagon market worth $US 17.4-23.5bn during the same period.

Serbia

Serbia has completed the reconstruction of the 95km Zrenjanin - Novi Sad line following a seven-year, Dinars 5.5bn ($US 53.1m) project. Prior to reconstruction, trains were limited to an average speed of 20-30km/h, dropping to 10km/h on some segments. New Russian-built DMUs are now operating the twice-daily passenger service, running at speeds of up to 80km/h.

Sweden

Trafikverket has completed the upgrading of the 31km single-track line between Söderhamn and Kilafors, which is part of the TEN-T Core Network and a key north-south freight artery linking the East Coast Line with the Northern Main Line. Work began in 2010 and the project has increased the maximum train length to 750m, while the maximum axleload has been increased to 25 tonnes.

United States

After years of study, the US state of Oregon has released a Draft Environmental Impact Statement (DEIS) for proposed inter-city passenger upgrades between Eugene and Portland. The plan aims to improve the frequency, convenience, speed and reliability of inter-city passenger services between Eugene-Springfield, Salem and the city of Portland, part of the federally-designated Pacific Northwest Rail Corridor.

- The Port of Los Angeles is set to move ahead with its planned $US 34m Terminal Island Railyard Enhancement Project, which is designed to optimise on-dock rail operations and improve the flow of freight at the port, following the award of a $US 21.6m grant by the state of California. The port will fund the remaining $US 12.4m. **IRJ**

Photo: SYPTE

Sheffield - Rotherham tram-train finally opens

THE long-awaited Sheffield - Rotherham tram-train pilot, the first in Britain, carried its inaugural passengers on October 25, just over nine years since the project was announced and six-and-a-half years since it was approved by the Department for Transport.

The tram-train uses the Sheffield Supertram network between Sheffield Cathedral and Meadowhall South/ Tinsley, before proceeding over a new 160m chord at Tinsley to an upgraded and electrified section of a former freight line to Rotherham Central, and then along the main line to Rotherham Parkgate, which has been electrified by Network Rail (NR) at 750V dc.

Seven 37m-long Stadler CityLink tram-trains operate the service, which runs at 20-minute intervals.

The project is led by South Yorkshire Passenger Transport Executive (SYPTE) with the backing of NR, the Department for Transport, Northern Rail, and the city's light rail operator Stagecoach Supertram.

The infrastructure improvements were initially expected to cost £18.7m while the pilot was expected to get underway in 2015. However, design issues relating to the link between the light rail and heavy rail networks led to the delay and to cost increases, initially to £58m and now £75m at the project's conclusion.

The two-year pilot is intended to inform similar studies of the use of tram-train technology in other cities.

Palermo to expand tramway network

THE Municipality of Palermo approved a €700m project on November 3 to construct two new tram lines and extend four existing lines. Work is due to start on the project in 2019.

The Municipality of Palermo and the Sicily Region will help to fund the project, plus €200m from the national government's Pact for the South fund.

The seven schemes are ranked in order of priority:

- an 11km extension of Line 1 from Via Balsamo to Viale Croce Rossa
- a 1.5km extension of Line 1 from Notarbartolo to Via Duca della Verdura
- an 8km extension of Line 3 from Viale della Regione Siciliana to Orleans
- a 9.37km extension of Line 3 from Orleans to Bonagia
- a new 20km line from Viale Croce Rossa to the seaside town of Mondello
- a new 9km line from Via Duca della Verdura to Palermo central station, and
- a 5km extension of Line 1 to Borgata Marina of Sferracavallo.

The inital 20km phase of the network was inaugurated in December 2015.

Berlin to establish S-Bahn vehicle pool

THE German states of Berlin and Brandenburg have agreed to form a vehicle pool for the acquisition of new trains for the Berlin S-Bahn.

On November 6, the two states agreed to set up the pool as part of their preparations for the competitive tendering of the North-South and Stadtbahn sub-networks, which are currently operated by DB Regio subsidiary S-Bahn Berlin.

Procurement will begin in November 2019 and the new trains will be introduced on the Stadtbahn in 2028-2031, with pre-series sets entering service from autumn 2026, and on the North-South lines between 2030 and 2033.

"The new procurement concept for two thirds of the entire network will ensure effective, fair competition for manufacturers and operators," says Mrs Regine Günther, senator for the environment, transport and climate.

According to the Berlin senate, the primary aim of the procurement is to achieve the highest quality and lowest price through a competitive process that is attractive to multiple operators. State funding will be used to build up a new fleet of state-owned S-Bahn trains.

Between 2026 and 2033, 602 two-car sets will be ordered with an option for a further 88 two-car trains.

In December 2015, S-Bahn Berlin awarded a consortium of Stadler Pankow and Siemens a framework contract to supply up to 1380 vehicles, with the initial order for 106 trains. The first 10 trains will enter service on Line S47 in January 2021.

Transport for London and Siemens sign Piccadilly Line fleet renewal contract

TRANSPORT for London (TfL) announced on November 20 that it has signed a contract with Siemens for 94 New Tube for London trains for London Underground's (LU) 71km Piccadilly Line.

Delivery of the £1.5bn fleet, which is based on Siemens' Inspiro metro train platform, is due to begin in 2023, enabling the withdrawal of the six-car 1973 Stock trains.

The 100km/h trains will feature air-conditioning and full-width gangways.

Siemens was selected as preferred bidder in June, but contract signing was delayed after Alstom and a Bombardier-Hitachi joint venture launched legal challenges.

Siemens will provide spare parts under a five-year fleet services contract, which is due to begin when the first trains enter service in 2024.

The supplier says it will work closely with TfL to "consider options for local manufacture" in Britain. In March Siemens announced plans to establish a new rolling stock plant at Goole in East Yorkshire, where it plans to create up to 700 jobs.

The procurement is part of LU's Deep Tube Upgrade Programme, encompassing the Piccadilly, Bakerloo, Central, and Waterloo & City lines, and will increase capacity on the Piccadilly Line from 24 to 27 trains per hour by 2026.

Procurement is also underway for a signalling and train control contract for the Deep Tube Lines.

Barranquilla LRT project moves forward

COLOMBIA's Ministry of Finance and Public Credit has approved the financing scheme for a PPP project to build a light rail line in Barranquilla, a city of 1.2 million people.

The 9.5km electrified line would follow the north-south Calle 30 serving 15 stations and carrying an estimated 101,000 passengers per day.

The project is being proposed by A Todo Tren, a consortium of Cointer Concesiones, Stadler Rail and Transdev. Under the proposed PPP structure, 70% of the project would be financed by the private sector with the remainder coming from the municipal government.

The city's mayor, Mr Alejandro Char, said the plans will now go to Barranquilla District Council, which will vote on the proposed agreement with A Todo Tren.

Delhi metro network reaches 300km

LESS than 16 years after the opening of its first line, the Delhi metro network passed the 300km mark on October 31 with the inauguration of the 17.8km eastern section of the orbital Pink Line (Line 7) from Shiv Vihar to Trilokpuri Sanjay Lake.

The opening of this stretch takes the total length of the network to 314km with 229 stations. Delhi Metro Rail Corporation (DMRC) says it has opened 80km of new lines so far this year and it expects to open the remaining 33.5km of the 123.8km Phase 3 network expansion by the end of this month.

The 3.2km Escorts Mujesar - Ballabhgarh section of the Violet Line opened on November 19.

Milwaukee launches The Hop Streetcar

Photo: David Wilson

MILWAUKEE's 4km, 18-station The Hop Streetcar was opened on November 2, with passengers travelling free for the first year of operation funded by Potawatomi Hotel & Casino. $US 55m of the $US 124m project funding came from the US Federal Transit Administration.

In September 2017, Milwaukee Department of Public Works awarded Transdev Services a contract to operate and maintain the network until December 2023, with an optional five-year extension. Transdev will subcontract maintenance of the tram fleet to Brookville Equipment Corporation, which is supplying five Liberty LRVs.

The three-section low-floor articulated vehicles are 20.42m long and accommodate up to 150 passengers.

In brief

Almaty

Almaty Metro has awarded Hyundai Rotem a Won 80.8m ($US 70.8m) contract to supply 32 four-car trains by 2020 for use on an extension of Line 1. The 80km/h trains will be fitted with CCTV.

Berlin

Schöneicher - Rüdersdorfer Tram (SRS) has purchased two pre-series Artic LRVs from Škoda Transtech, the Finnish subsidiary of Škoda Transportation. The deal follows a two-month trial with the LRVs which are certified for operation in Germany.

Bern

Bernmobil has launched a tender for up to 50 low-floor 43m-long LRVs worth around SFr 100m ($US 100.6m). The contract is due to be awarded by the end of 2019. Delivery of the initial batch of 20 LRVs will take place between early 2023 and autumn 2024.

Budapest

Fömterv and Viköti have won a Forints 3bn ($US 10.5m) contract to develop plans to extend Budapest's metro Line 3 north with four stations. The two Hungarian companies will prepare the project for approval and create detailed construction plans once approval is granted.

Düsseldorf

Rheinbahn has begun trialling predictive maintenance with the installation of Knorr-Bremse's iCOM digital platform on three type NF8U LRVs, which serves as a central data hub and monitors a rail vehicles' condition. Rheinbahn says the technology allows it to carry out maintenance in line with actual component wear, while potential problems are identified early.

London

The British government will grant Crossrail a £350m short-term loan after it announced that the opening of the central section of the £14.8bn Elizabeth Line between Paddington and Abbey Wood will be postponed from December until autumn 2019.

Montreal

Montreal Transport (STM) and a consortium of Bombardier and Alstom have signed an amendment to a contract from October 2010 for an additional 17 nine-car Azur metro trains, valued at $C 448m ($US 339.3m). Bombardier's share of the contract is valued at $C 281m, while Alstom's is worth $C 167m.

Munich

DB Network has awarded the first major construction contract for the second Munich S-Bahn tunnel to a consortium of Züblin, Wayss & Freytag, Max Bögl and Bauer Spezialtiefbau. The €189m contract covers additional tracks and points, two flyovers and a double-track steel-arch bridge. Construction is expected to start in autumn 2019.

Turin

Turin Transport Group (GTT) has launched an international tender for a firm order for 30 LRVs worth €75m for operation on the city's 88km 10-line tram network. The contract will include an initial €25m option for 10 LRVs and a second €75m option for 30 vehicles.

Urumqi

Trial operation began on October 25 on the city's first metro line: an initial 16.5km section of the north-south Line 1 linking Urumqi Diwopu International Airport with Balou in the city centre. The 11km southern section from Balou to Santunbei is under construction. The total cost of Line 1 is Yuan 21.7bn ($US 3.1bn).

Zaragoza

CAF subsidiary, RL Components, alongside Zaragoza Tram, has presented the first light rail vehicle to feature front end components produced entirely using additive manufacturing, or 3D printing. Each component was produced as a mono-bloc part, a process in which the component is printed only once and can potentially produce parts of up to 5m in size. **IRJ**

Greenbrier and Saudi Railway Company to form joint venture

GREENBRIER and Saudi Railway Company (SAR) announced on October 26 that they have reached an agreement to form a joint venture (JV) to "execute railway projects and supply wagons for profitable growth of the Saudi freight rail market," with an investment of Riyals 1bn ($US 266.6m).

Greenbrier and SAR say the JV will establish a new multi-modal business centred on creating and maximising existing and new freight corridors throughout Saudi Arabia and the wider Gulf Cooperation Council region.

Greenbrier will supply new wagons up to a total of $US 100m, as well as lifting equipment and other terminal investment necessary to place wagons in revenue service. It will also operate intermodal and other freight terminals.

In turn, SAR will provide the JV with locomotives, rail access and service schedules to operations. Using its investment syndication model, Greenbrier will facilitate the generation of an additional $US 170m for the JV in collaboration with SAR and international public and private investors.

The announcement came as Greenbrier announced its fourth quarter highlights, including net earnings attributable to Greenbrier for the quarter of $US 30.9m, or $US 0.94 per diluted share, on revenue of $US 689.2m. Adjusted Ebitda was $US 75.3m, or 10.9% of revenue.

Transdev wins Hannover S-Bahn contract

TRANSDEV subsidiary North West Rail (NWB) has been awarded a contract to operate S-Bahn services in and around Hannover from December 2021, following an unsuccessful appeal. The €1.5bn, 12.5-year contract has an annual average of 9.6 million train-km on the 385km regional network.

The contract is the outcome of a joint tender led by the Hannover regional government, together with Lower Saxony Transport Authority (LNVG) and Westphalia-Lippe Local Transport (NWL), located in the neighbouring state of North Rhine Westphalia. NWB, incumbent operator DB Regio, Keolis and Abellio submitted bids in mid-2016 and the contract was awarded to NWB in May, but put on hold while an appeal was heard.

NWB is obliged to use 13 former DB Regio class 425 four-car EMUs that were directly funded by the contracting authorities, but will also order 64 new Stadler Flirt 160 EMUs at a cost of around €320m.

The tender focuses on security and comfort, and called for a conductor on each train. Capacity will be boosted on lines S1, S2 and S5, which carry the most traffic. Accessibility will also be improved, with open gangways and even floors throughout the train except for stairs near the cab. The trains will also be equipped with a toilet and Wi-Fi.

NWB is obliged to use 13 former DB Regio class 425 four-car EMUs that were directly funded by the contracting authorities, but will also order 64 new Stadler Flirt 160 EMUs (pictured) at a cost of around €320m, including €5m for spare parts, which have capacity of 397 passengers, including 180 seated, and will have a maximum speed of 160km/h.

Hitachi to increase Ansaldo STS shareholding to 82.6%

HITACHI has reached an agreement with Elliott to purchase the investment group's 31.8% stake in Ansaldo STS for €807.8m, or €12.70 per share.

The transaction will take Hitachi's shareholding in Ansaldo STS to 82.6% and the company will now launch a voluntary tender offer at the same price for the remaining 17.4% of the shares. Once secured, Hitachi plans to delist the company.

Elliott rejected Ansaldo STS' offer to buy its stake in the Italian company in 2015, judging the €9.50 share offer as too low, thus frustrating the Japanese firm's desire to take full control. The companies have since been at loggerheads, with Elliott complaining about Ansaldo STS's strategy and governance since the takeover.

Ansaldo STS' independent and non-executive directors selected by Elliot in May 2016, Ms Rosa Cipriotti, Mr Michele Alberto Fabiano Crisostomo and Mr Fabio Labruna, all resigned from the company on November 2.

Four prequalify for DSB fleet tender

DANISH State Railways (DSB) has shortlisted four manufacturers for a tender to supply at least 100 trains to replace its diesel fleet.

Alstom, Bombardier, Siemens and Stadler now have until the beginning of 2019 to prepare their first negotiation offer. Once the offers have been submitted, DSB will enter into negotiations with the individual manufacturers about their solution and the tender's requirements. At the beginning of 2020, the manufacturers will make their final offers, with contract award scheduled for mid-2020.

SNCF to purchase stake in BlaBlaCar

FRENCH National Railways (SNCF) has begun exclusive negotiations with carpooling specialist BlaBlaCar to enable SNCF's e-commerce platform, Oui.SNCF, to offer train and bus, and train and carpooling services.

Under the €101m deal, SNCF will purchase shares in BlaBlaCar while BlaBlaCar will acquire SNCF's Ouibus unit and enter the European long-distance bus market.

By the end of this year, Oui.SNCF will start to include BlaBlaCar carpooling options for journeys alongside rail and bus services. From summer 2019, Oui.SNCF users will be offered rail and bus intermodal services, with rail and carpooling intermodal options following later. SNCF says it will then be possible for customers to combine train, bus and carpooling.

Hauts-de-France orders Omneo EMUs

FRENCH National Railways (SNCF) has awarded Bombardier a €256m contract to supply 19 Omneo Premium double-deck intercity EMUs, which the state is buying on behalf of the Hauts-de-France region.

The order is part of a 2010 framework contract between SNCF and Bombardier to provide up to 860 double-deck trains to French regions.

Hauts-de-France region will become the organising authority for the operation of Paris - Amiens - Boulogne and Paris - St Quentin - Maubeuge/Cambrai inter-city services with effect from January 1 2019 as part of a 2016 agreement with the French government. Deliveries will begin in 2022.

Trainose acquires Greek rolling stock maintenance company

GREEK privatisation agency the Hellenic Republic Asset Development Fund (HRADF) finalised the €22m sale of Hellenic Company for Rolling Stock Maintenance (Rosco) to national train operator and Italian State Railways (FS) subsidiary Trainose on October 29.

The deal was signed following approval by the Greek Court of Auditors, although HRADF says final completion of the transaction is conditional on sign-off from other competent authorities.

Trainose submitted the only formal bid for Rosco in March, although FS had submitted an expression of interest before completing its acquisition of Trainose in 2017.

Škoda Transportation also submitted an EOI but ultimately decided not to bid.

In brief

Belgium

Infrabel has awarded British Steel a four-year network renewal contract. The contract calls for the supply of 35,000-40,000 tonnes of rail per year from January 2019 and more than 3000km of rail in total.

Brazil

Rumo's port, rail and terminal subsidiaries in Brazil recorded a positive result of Reais 136m ($US 35.7m) in the first nine months of 2018, reversing a Reais 201.1m loss for the same period in 2017.

Canada

Canadian Pacific Railway (CP) announced third-quarter revenues of $C 1.9bn ($US 1.4bn) on October 18, its highest ever for any quarter and up 19% from $C 1.6bn in Q3 2017. CP also achieved a record-low quarterly operating ratio of 58.3%.

Chile

Chilean State Railways (EFE) has awarded CRRC Sifang a $US 77m contract for 13 new trains, which EFE Ferrocarriles del Sur will operate on the Biotren, Corto Laja and Victoria-Temuco services in the Biobío and La Araucanía regions.

Cuba

Cuban Railways (UFC) signed a contract worth around €48m with RM Rail, Russia, for 837 freight wagons at the Havana trade fair at the end of October. The order comprises vehicles of seven different types, including wagons for cement and sugar cane which have been specially designed for operation in tropical conditions.

Germany

Vossloh reported group sales of €205.1m in the third quarter, 11.3% below the corresponding figure in the third quarter of 2017, but the company says the result was expected, primarily due to temporarily-weaker sales in the fastening systems business unit in China.

Latvia

Latvia's transport minister Mr Uldis Augulis confirmed on November 5 that the cabinet has approved the allocation of €259m from the state budget to fund the acquisition of new EMUs for national passenger operator Pasazieru Vilciens.

Moldova

Moldovan Railways (CFM) signed a €45m contract with GE Transportation on November 6 for 12 Evolution Series diesel locomotives. Delivery of the 2.98MW locomotives is due to begin in early-2020. The contract includes the modernisation of CFM's depot in the Moldovan capital Chisinau.

Russia

Russian fertiliser producer, MCC EuroChem, has awarded a contract to United Wagon for 700 wagons to transport potash from its Usolskiy Potash plant. Deliveries will be completed in the first half of 2019. **IRJ**

New government set to prioritise rail freight network development

Brazil's president-elect is expected to maintain the country's new line construction programme and continue the process to renew the regional rail freight concessions, the first of which are expected to be concluded soon. **Renata Passos** reports on the latest developments.

BRAZIL's newly-elected president, Mr Jair Bolsonaro, will inherit the Investment Partnerships Programme (PPI), which provides for the construction of new railways in Brazil. However, in future the PPI team will report directly to the president rather than various ministries. At the same time, pronouncements by the president indicate that the current process of renewing freight concessions will continue despite the change of government. With these developments, rail freight is firmly on the agenda.

More new lines will be built in the next few years. Three are federal government projects under PPI comprising an extension to the North-South Railway (FNS), Ferrogrão, and the West-East Integration Railway (Fiol).

Bidding will start before the end of the year for a new sub-concession for the south-central section of the North-South Railway. Total investment is estimated at Reais 3bn ($US 793m) over the 30-year duration of the sub-concession, including rolling stock, which is beyond the value of the bid price for the concession. According to Brazil's National Land Transport Agency (ANTT), the auction should take place early in 2019.

This 1537km section links Porto Nacional, just south of Palmas in Tocantins state, with Estrela d'Oeste, in São Paulo state. The northern 855km stretch from Porto Nacional to Anápolis is already in operation, while the 682km southern part from Ouro Verde to Estrela d'Oeste is 95% complete. The railway is considered as one of the main projects to benefit agricultural production.

The Reais 12.7bn Ferrogrão project is still in the public consultation phase, and it is planned to publish bidding documents for the 65-year concession in the second quarter of 2019. The new line will be 1142km long and will create a new rail export corridor in northern Brazil, connecting Sinop in the grain-producing region of the midwest with the port of Miritituba, on the east bank of the Tapajós river. The railway is forecast to carry around 25 million tonnes of freight a year initially rising to 43.3 tonnes by 2050.

Also at the public hearing stage is the final section of the West-East Integration Railway (Fiol). The 1527km line will run from Ilhéus, on the coast of Bahia, to Figueirópolis on the North-South Railway. The route will mainly serve the grain producing area of western Bahia and aid the exploitation of iron-ore in the Caetité region. The 537km section from Ilhéus to Caetité is more than 70% complete and the 485km section from Caetité to Barreiras is around 20% complete, while the final 505km stretch is still at the study and

Brazilian rail industry primed for growth

ACCORDING to Mr Fernando Paes, executive director of the National Association of Railway Carriers (ANTF), renovations totalling around Reais 25bn are expected in the first five years of the new concessions, although Mr Vicente Abate, president of the Brazilian Railway Industry Association (Abifer) believes the total investment could be higher.

About one-third will be for rolling stock and track materials such as sleepers and fastenings. "Renewals will be a major boost to the industry, which has lost 3000 employees in the last two years," Abate says.

The Brazilian rail industry has installed capacity to manufacture 12,000 freight wagons and 250 locomotives annually, but demand has been falling steadily during the last four years, with only 60 locomotives and 2500 freight wagons expected to be produced this year (see graph).

According to ANTF, in 2017 the Brazilian rail freight fleet comprised 3268 locomotives and 109,160 wagons. The acquisition of 715 locomotives and 8580 wagons is forecast for the first few years of the new concession.

The rail industry is already prepared for the anticipated increase in demand. Greenbrier Maxion, with an installed capacity of 10,000 wagons a year, designs and produces all types of equipment at its highly-automated plant in Hortolândia, São Paulo.

Greenbrier Maxion has exported 50 GDN wagons to Peru for the transport of copper in September, as well as wagons to Gabon, Guinea, Venezuela, Congo, Colombia, Argentina and Saudi Arabia.

AmstedMaxion, located in Cruzeiro, São Paulo, has the capacity to produce 30,000 tonnes of castings and 85,000 wheels per year of which 20% are destined for export to the African and Latin American markets. The director general of AmstedMaxion, Mr José Santos de Araújo, is optimistic that the Brazilian railway industry will grow. "We went through the industry crisis, but we believe that Brazil will evolve," he says.

Randon Implementos inaugurated a new Reais 100m road-trailer and freight wagon production facility at Araraquara, São Paulo, in March, and the factory began production of hopper wagons in November. The first batch of PET flat wagons, designed for the transport of steel materials and 20ft and 40ft containers was supplied to MRS. The factory has the capacity to produce up to 2000 semi-trailers and freight wagons per year.

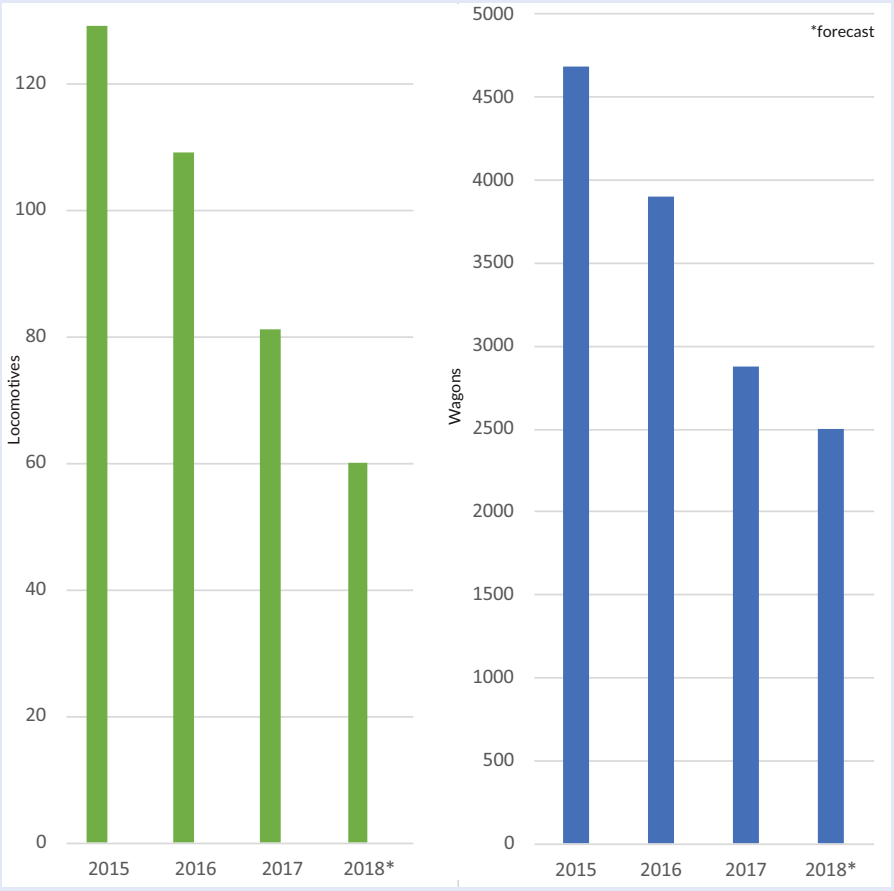


Table 1 (left) shows recent locomotive production in Brazil coupled with wagon output (Table 2).

project stage. The project includes a 2.9km bridge over the São Francisco river and is estimated to cost Reais 3bn.

In July, two other projects were added to the PPI: the Vitória-Rio Railway linking ports in the states of Rio de Janeiro and Espirito Santo, and the 477km northern section of the North-South Railway from Açailândia to Barcarena. The initial proposal is to implement the Vitória-Rio Railway project as part of the renewal of Central Atlantic Railway (FCA) concession.

The government intends to work with the private sector to develop projects considered of strategic importance, while in return, the companies will have other contracts, such as railway concessions, renewed for 30 years. Two projects will have priority. The first is the 383km section of the Central-West Integration Railway (Fico) from Água Boa to a junction with the North-South Railway at Campinorte. Budgeted at Reais 4bn, Fico will be built by mining company Vale, which in return will have the concessions for the Carajás and Vitória-Minas railways renewed until 2057. Even discounting what Vale spent to duplicate the Carajás railway, the company would have to pay a Reais 4bn fee to renew its concession. However, rather than paying the fee it could build Fico instead. This is one way to ensure that the money remains in the rail sector.

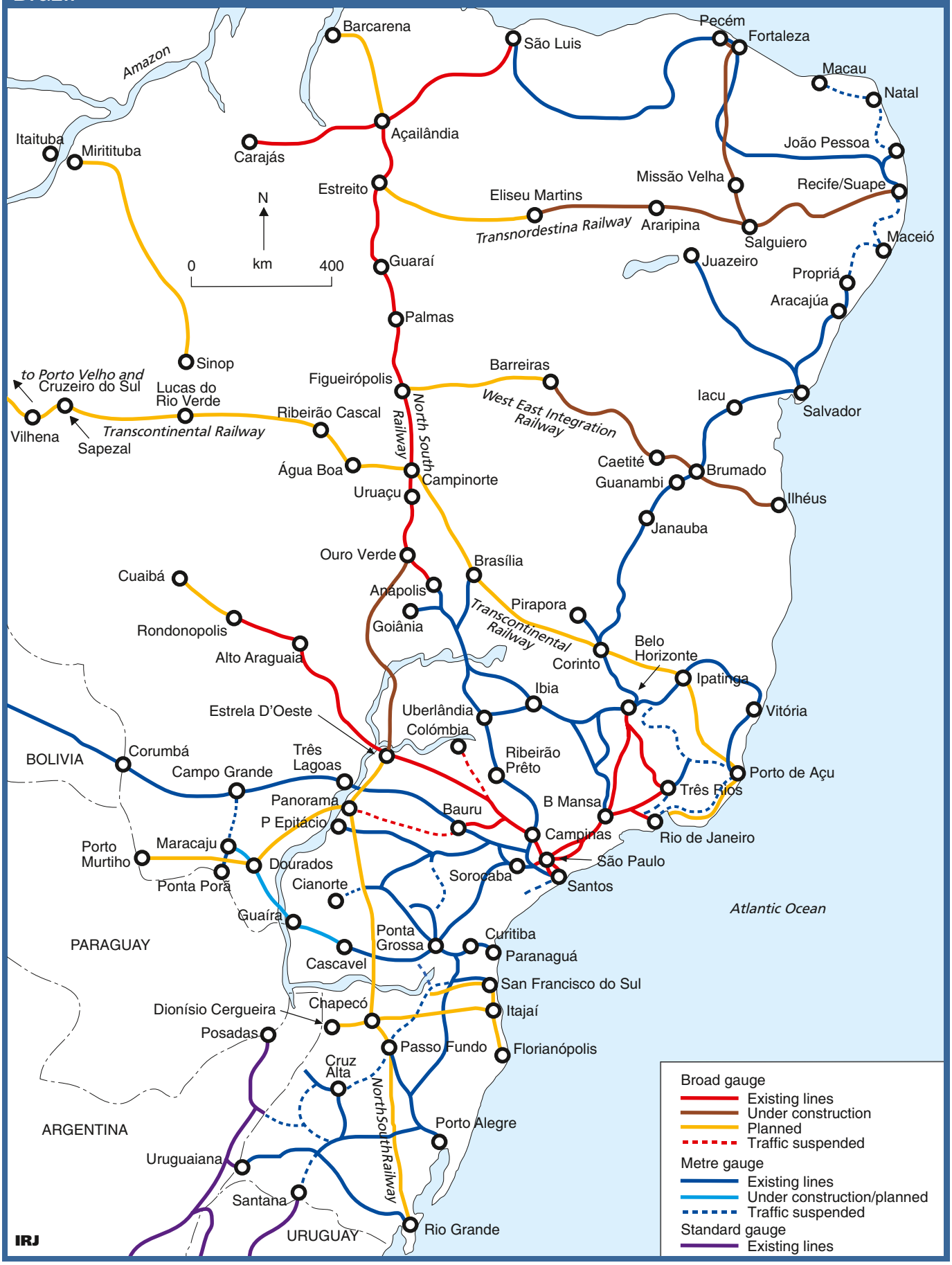
There is also a possibility that MRS Logístics will construct a 53km line parallel to a ring road from Perus in São Paulo city to Manoel Feio in Itaquaquecetuba in exchange for the renewal of its concession.

Under new legislation, a concessionaire can now invest in other railways or projects. And Mr Vicente Abate, president of the Brazilian Railway Industry Association (Abifer), believes lawmakers were right to propose cross-investment to keep money in the industry. "This kind of reinvestment has a multiplier effect," he says.

Concession renewal

Mr Fernando Paes, executive director of the National Association of Railway Carriers (ANTF), believes that the new government will continue with the rail

Brazil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João Pessoa
Recife/Suape
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Iacu
Juazeiro
Salguiero
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Rio Verde
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Transcontinental Railway
Ribeirão Cascal
Figueirópolis
North South Railway
Barreiras
West East Integration Railway
Água Boa
Campinorte
Uruaçu
Caetité
Guanambi
Brumado
Ilhéus
Janauba
Ouro Verde
Brasília
Cuaibá
Anápolis
Goiânia
Pirapora
Transcontinental Railway
Rondonopolis
Alto Araguaia
Corinto
Belo
Horizonte
Ipatinga
Ibia
Vitória
Estrela D'Oeste
Uberlândia
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Cascavel
San Francisco do Sul
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Chapecó
Itajaí
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Broad gauge
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freight concession renewal programme. "The fact is there is no short or medium-term alternative capable of dealing with the bottlenecks and structural problems facing Brazilian logistics that does not involve the early renewal of the concession contracts," Paes says.

ANTF data shows that rail freight traffic is continuing to grow. Comparing the first three quarters of 2017 with the corresponding period this year, freight traffic increased by 19.57% from 350.7 million net tonnes to 419.4 million.

Five concessions totalling 12,675km and representing more than 90% of the freight carried on Brazil's railways annually are up for renewal:

- the Paulista Network, which is currently operated by Rumo
- the 1600mm-gauge network serving the states of Minas Gerais, Rio de Janeiro and São Paulo operated by MRS Logistics
- the Carajás Railway (EFC) and Vitória-Minas Railway (EFVM), both of which are operated by Vale, and
- FCA, which is operated by VLI.

Paes says public hearings have already been held for the Paulista Network, EFC and EFVM. The Paulista Network concession was submitted to the Brazilian Court of Audit (TCU) on October 3, and is expected to be approved and concluded first, with the other two concessions finalised by the end of the year. ANTT expects public hearings for the MRS and FCA concessions to be conducted before the end of the year.

> "The doubling of transport capacity on the Paulista Network is an essential condition for the flow of the growing volumes of freight. Fernando Paes

"The doubling of transport capacity on the Paulista Network is an essential condition for the flow of the growing volumes of freight, especially grain coming from Estrela d'Oeste," Paes says. "The Carajás Railway has the same importance from the point of view of the shipment of freight through the port of Itaqui; in this case, the difference is that the duplication has already been made by the concessionaire. Carajás and the Paulista Network are examples of the positive, highly-welcome impact that these renovations will provoke for the 'backbone' of the rail freight system."

According to Paes, the Paulista/Rumo concession renewal process should serve as a template for future renewals. "From the Rumo process, we have developed know-how, templates and a standard methodology that will be applied to new processes," Paes says. "It is only natural that the agency will be more agile in the processes that will follow."

A new methodology has been adopted by concessionaires to deal with the issue of uneconomic lines in a technical and objective way. Various options being considered include closure, putting loss-making lines to another use such as the transport of passengers or the operation of tourist trains, or turning them into American-style short lines designed to feed freight into the main railway corridors. "It is not reasonable to imagine that the extension of concession contracts will occur without these issues being addressed," Paes says. "Certainly, renewals presuppose a solution to these problems."

A study prepared by the Getulio Vargas Foundation (FGV) concluded that the early extension of the railway concessions, due to expire by the late 2020s, would be the best way for the government to stimulate investment in the sector, as well as renegotiate the terms of the current concession contracts.

FGV has calculated that additional investment in rail would produce benefits of around Reais 10bn, with 75% of the benefits derived from a reduction of transport costs, due to the migration of freight from road to rail, while a reduction in accidents, congestion and pollution would account for the remaining 25%. FGV says that each Reais 1m invested in rail would have a positive impact on the economy 3.1 times greater, in addition to the effect on employment, income and taxes.

If the early renewal of the concessions does not take place, the benefits can only be captured in theory after 2027, with the result that the benefits derived from the investment made by the new concessionaires will be lower, the report concludes. Hence the desire to bring forward renewal of the remaining concessions. **IRJ**

São Paulo targets rail expansion

The state of São Paulo is investing more to expand the urban rail network in the São Paulo metropolitan area, build light rail lines and introduce a two-line inter-city network in the state. **Renata Passos** reports on the progress made so far and the challenges facing the expansion.

IN addition to the president of the republic, Brazilians elected representatives of the federal and state legislatives including state governors in elections held at the end of the October. In São Paulo, the richest state in the country and with the largest rail transport network, Mr João Doria of the incumbent Social Democrat party, which has been in power for 24 years, was elected for a four-year term.

Despite budget constraints following the recent economic crisis, railway development is one of the Doria government's priorities and the administration is targeting expansion through public-private partnerships (PPPs).

The new governor wants to accelerate work already underway on the São Paulo Metro and Paulista Metropolitan Trains Company's (CPTM) suburban network, as well as execute new projects to expand capacity and modernise existing lines.

The programme also proposes the construction of new light rail lines in major metropolitan regions outside São Paulo city and the introduction of an inter-city service between São Paulo, Campinas and Americana.

Mrs Roberta Marchesi, superintendent of the National Association of Passenger Rail Operators (ANPTrilhos), has a positive view of the new programme and the administration's objectives. "We believe that the new governor will enable the realisation of new projects,"

Marchesi says. "It follows a more liberal economic line and investment will be reinforced mostly with the support of the private sector. We also have a very high expectation for medium-speed regional trains."

Mr Clodoaldo Pelissioni, secretary of state for metropolitan transport with the São Paulo state government, explains that from January 2015 to December 2018, the state government invested Reais 17bn ($US 4.53bn), or an average of Reais 4.3bn a year. "With the works already completed, we will add between 500,000 and 700,000 new passengers per day to the metro and CPTM network," Pelissioni says. "And with the projects set to be completed by 2020, there will be another 500,000 passengers. Today the rail network carries 7.5 million passengers per day and this is expected to reach 8 million by the beginning of 2019."

Current work on the metro includes the extension of Line 5/Lilac. Nine stations were added in 2017 and 2018, two of which interconnect with Line 1/Blue and Line 2/Green, while a station at Campo Belo will open in early 2019 connecting with the future Line 17/Gold monorail which is also under construction. Concessions to operate these two lines were awarded to ViaMobilidade in August.

Line 17/Gold will have eight stations in this first phase and will run from an interchange with CPTM Line 9/Emerald at Morumbi via Campo Belo on metro Line 5/Lilac to Congonhas station, near the airport of the same name, providing the first rail link to the city's second airport.

Operations are expected to start in 2020 following a six-year delay. However, this now looks doubtful. Last month, Scomi, the Malaysian company

Services were extended to four further stations on the Line 15/silver monorail in April, taking the length of the line to 7.6km. An initial 2.9km section opened in 2014.

responsible for building the monorail trains, signalled that it wanted to leave the consortium. The manufacturer has yet to start construction of an assembly plant while it has transpired that the cost of the project has increased by Reais 2bn to around Reais 3.7bn. São Paulo Metro was planning to meet the ViaMobilidade consortium at the end of November to try to find a solution.

The inauguration of CPTM Line 13/Jade earlier this year made it possible to introduce three services between the centre of São Paulo and Guarulhos International Airport, Brazil's busiest, which was also not previously served by rail. According to Pelissioni, the project required an investment of Reais 2.1bn. "Of the 12km extension, 8km is an elevated line which crosses the Tietê River and highways," he says. "For this, the largest viaduct was built as a curve and is 74m high and 690m long."

The Airport Express provides a direct service five times per day, Monday to Friday, between Luz station and Guarulhos Airport with a journey time of around 35 minutes at a fare of Reais 8. The service travels over three CPTM lines: 11/Coral, 12/Sapphire and 13/Jade, with direct airport services coordinated with commuter trains.

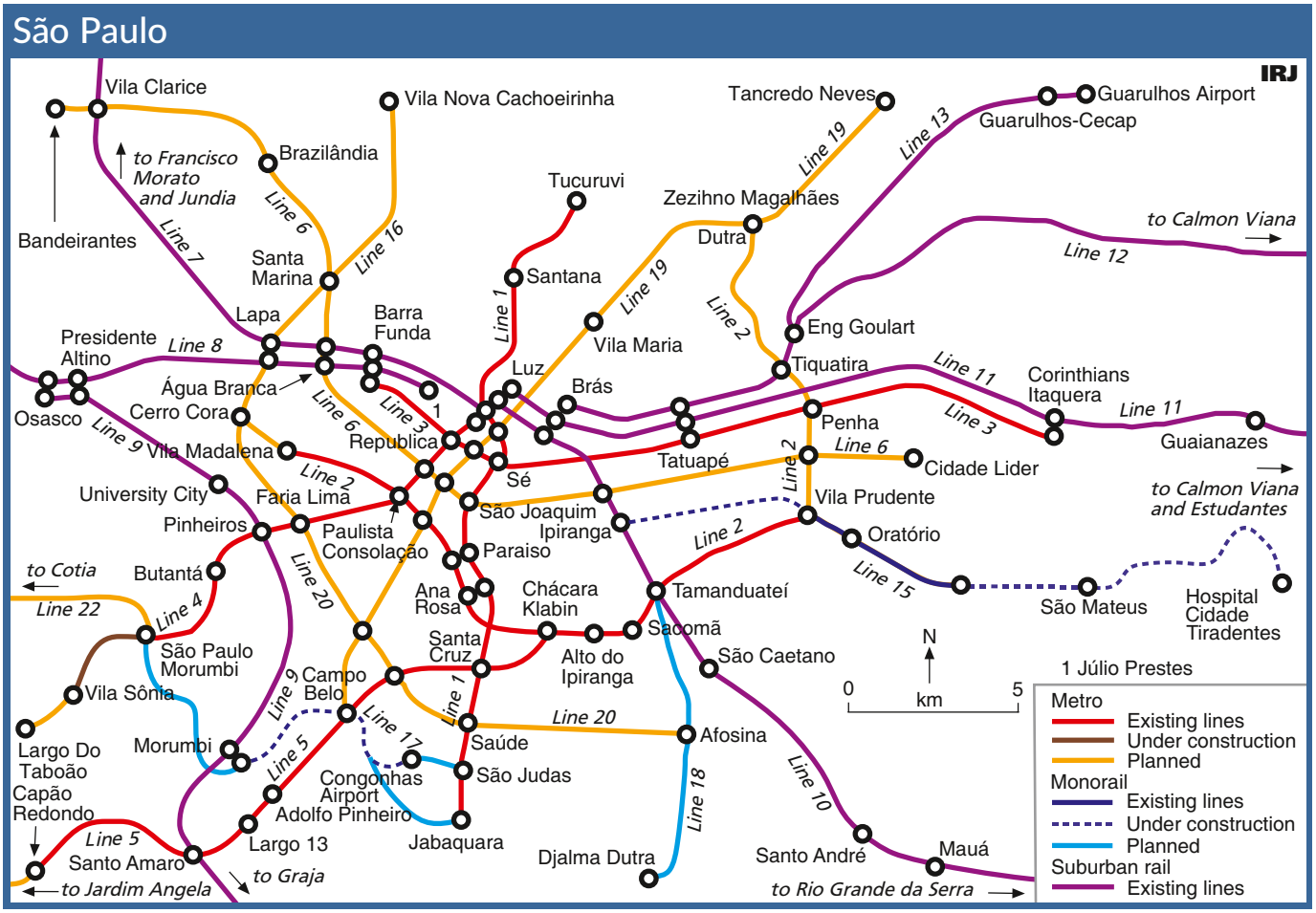
There is also a direct stopping service between Brás and Guarulhos Airport, which currently only operates in the early morning and early evening. A half-hourly service is also available, but passengers have to change between lines 12 and 13 at Engineer Goulart. The Temoinsa-Sifang consortium is currently manufacturing eight trains with luggage compartments for exclusive operation on Line 13/Jade, which are expected to enter service in the second half of 2019.

Another project in the final phase of implementation is Line 4/Yellow, the first phase of which has been operated by the concessionaire ViaQuatro since 2010. The second phase comprises the construction of five stations, four of which have already been completed, the most recent being São Paulo-Morumbi in October.

Line 4 is 11.3km long and has 10

> "The Airport Express provides a direct service five times per day, Monday to Friday, between Luz station and Guarulhos Airport with a journey time of around 35 minutes.

Luz station is a major interchange between metro, suburban and airport rail services.



stations between Luz and São Paulo-Morumbi. With the addition of this station, São Paulo now has a 96km six-line network with 84 stations. According to Pelissioni, only Vila Sônia station will be pending in 2020 and the second phase is budgeted at Reais 1.9bn. When completed, the 12.8km Line 4 should carry 893,000 passengers per day.

Despite two stations opening on the initial 2.9km section in 2014, monorail Line 15/Silver had to wait four years for a four-station extension. The 4.7km link from Oratório to São Mateo opened in April this year and tenders are expected to be invited this month for a new contractor to complete work at four further stations as well as start work at Jardim Colonial. The contract will be signed in March 2019, with work commencing in April, and completion of the first station scheduled for October 2019.

This new tender is necessary because many construction companies cannot obtain finance to continue the works following the national Operation Car Wash corruption scandal which has gradually enveloped an increasing number of Brazilian companies and politicians since 2014.

According to Pelissioni, the metro's new management is prioritising the completion of work on lines 4, 5, 15 and 17. In the case of CPTM, work is also set to resume on the 4.5km section of Line 9 from Grajaú to Varginha, which involves the construction of stations at Mendes-Vila Natal and Varginha. Work had been halted since the end of 2016 due to delays in the transfer of federal funds. A further Reais 945m is needed to build four road viaducts over the railway. "This is an important project as it serves a low-income peripheral region," Pelissioni says. The extension is expected to open in 2020 and add 110,000 passengers to the 620,000 weekday passengers the existing 32.8km line already carries.

As well as new projects, Pelissioni believes the new government should continue to modernise the existing metro and CPTM networks. He says improvements have been carried out and that two-thirds of CPTM's 94 stations are now accessible to disabled passengers with all set to be accessible by 2020.

In addition, delivery of 65 new metro trains will be completed in March, and he says a further 20 trains are required to expand CPTM's fleet to the same size as that of the metro. "With a Reais 2bn investment, the next management team can complete these improvements," Pelissioni says. "In the early 1990s, CPTM carried 700,000 passengers/day. Today, with practically the same network, there are three million passengers/day."

CBTC

Regarding the metro, Pelissioni says that the refurbishment of 98 trains was recently completed and he expects installation of CBTC, which is already in use on Line 2/Green, to be extended to the entire network by 2020. "By 2019, it should be completed on Line 1/Blue and in 2020 on Line 3/Red," he says. "We are also buying 38 sets of platform screen doors to prevent accidents, which will be installed on lines 1 and 3, and on the busiest stations on Line 2."

One of the most anticipated future projects is metro Line 6/Orange. The 18.4km 17-station line will connect the northwest and eastern regions of the city, interchanging with several existing lines. "The problem is that the builders of the winning consortium (Move São Paulo) have not been able to obtain funding from Brazil's National Bank for Economic and Social Development

São Paulo inter-city project gains momentum

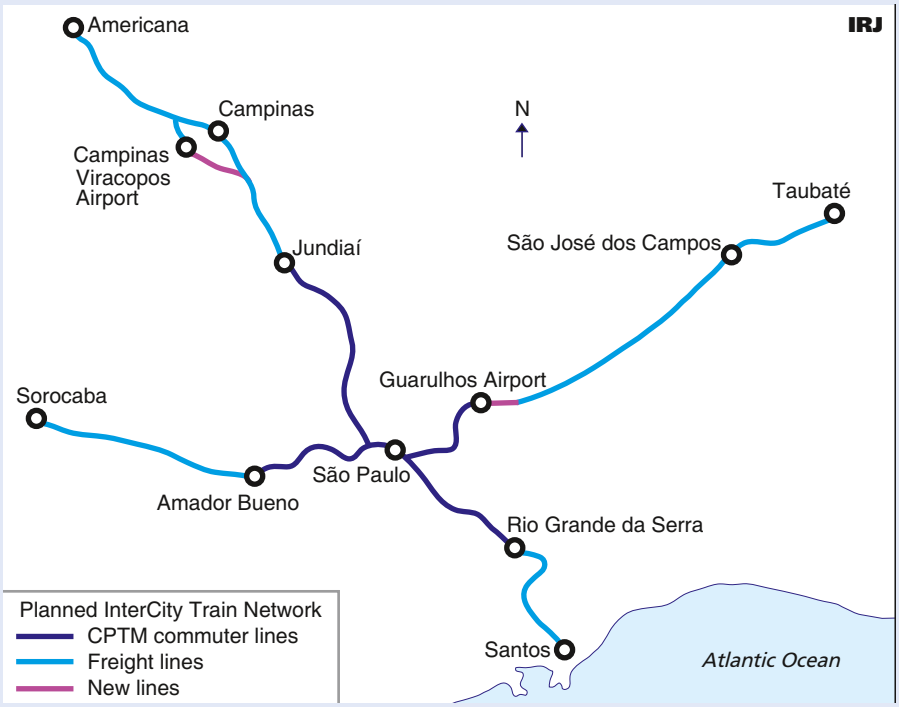
THE Reais 20bn inter-city rail project, which calls for the construction of a 477km regional network in São Paulo state, with trains operating at a maximum speed of 140km/h, is expected to get off the drawing board soon.

The two lines will intersect in São Paulo and will serve 24 stations. The north-south line will connect Americana with Santos while the east-west line will run from Sorocaba to Taubaté. The network should directly and indirectly serve 173 cities and carry more than 170,000 passengers a day.

The 135km section between São Paulo, Campinas and Americana is expected to be built first. Trains will use the same tracks as CPTM's Line 7/Ruby between São Paulo and Jundiai. From there to Americana new tracks will be laid parallel to an existing freight railway.

Pelissioni says the São Paulo - Jundiaí section will need additional tracks to enable fast inter-city trains to overtake much slower CPTM commuter trains. This will increase the cost of the project by Reais 5bn with the state contributing a third.

Rail freight concessionaire Rumo supports the introduction of the inter-city service between Jundiai and Campinas, because the line carries little freight traffic. However, this section does not have signalling and is unelectrified, so bi-mode electric-diesel trains are an option. It is a different story for the Campinas - Americana section as this line is heavily used by freight trains so investment in additional tracks would be needed.



Mr Vicente Abate, president of the Brazilian Railway Industry Association (Abifer), says that suppliers are counting on the inter-city project. "We know that the project between São Paulo and Campinas is already very mature," he says. "Although the government has difficulty obtaining funding for its part in PPPs, solutions will have to be sought. Another way to look for funding is through real estate development next to the stations, as happens all over the world. The fact is we need medium-distance trains. Only Brazil, among the emerging countries, does not have this type of operation."

(BNDES) because of Operation Car Wash," Pelissioni says. "We will annul the contract and launch a new tender in 2019."

The project involves an investment of about Reais 10bn through a PPP, with the state of São Paulo paying Reais 1bn and the remaining Reais 9bn divided between private investors and the state government."

Another planned scheme is the extension of Line 2/Green from Vila Prudente to Penha on Line 3/Red in the east of the city. The estimated cost of the extension is Reais 6.5bn. São Paulo Metro had obtained Reais 1.5bn from BNDES but decided to use the resources to complete Line 5/Lilac instead. Under a third stage, the idea is to extend the line north to the city of Guarulhos. These extensions will add 14km and 13 stations to Line2/Green, making it the longest metro line in São Paulo with a total length of 29km and 27 stations. Work is expected to start in 2021 or 2022.

The contract to build the 14km Line 18/Bronze monorail from Tamanduateí south to Djalma Dutra, in the centre of São Bernardo do Campo, was awarded four years ago. However, the Vem ABC consortium was unable to start work because it did not have the necessary land, while the federal government lacked the required funds for the project as it was trying to reduce its debt burden.

The plan now is to implement the Reais 6bn project as a PPP. The line will have 13 stations and is expected to carry around 320,000 passengers per day.

Even when all these projects are completed, São Paulo will still require more lines to plug gaps in the network and tackle the city's chronic road congestion and pollution.

Light rail

Tenders for an extension to the Baixada Santista light rail line, which connects Barreiros, in São Vicente, and the port of Santos, with 15 stations, were republished last month after the Court of Auditors suspended the bidding notice and requested changes to the tender. A public session for the submission of proposals from prospective bidders is now scheduled for December 13 at the headquarters of the Metropolitan Urban Transport Company (EMTU) in São Bernardo do Campo.

The 8km extension with 14 stations will branch off the existing line at Conselheiro Nébias to serve the Valongo district in northern Santos. Work is expected to start at the beginning of 2019 and take two years to complete.

A third 7.5km extension with four stations is also planned. It will link the Barreiros area to Samaritá in São Vicente, which has a population of approximately 120,000 inhabitants.

These two extensions will expand the light rail network to 26km at a cost of about Reais 2bn.

Sorocaba is also planning a light rail line, and five companies are bidding for a contract to carry out a study into its implementation, operation and maintenance. The line will run from

The new airport express service offers a journey time of 35 minutes between Luz station and Guarulhos Airport.

George Oeterer, in Iperó, to the district of Brigadeiro Tobias. Between 150,000 and 200,000 passengers per day are expected to use the line.

According to the City of Sorocaba, the 13km first stage of the project, scheduled to open in August 2020, will operate between George Oeterer and the centre of Sorocaba using an existing railway. A contract has been signed between the municipality of Sorocaba and Rumo allowing the municipality to operate LRVs on Rumo's rail network. This will be the first time in Brazil that LRVs and freight trains will share the same tracks.

Rail development in greater São Paulo has experienced a mixed record in recent years. But with projects progressing at their own pace towards conclusion, the network is becoming better equipped to meet transport demand in this vast city region. Indeed, Marchesi says the electorate has given a clear signal for the introduction of a somewhat more liberal policy that prioritises acceleration of investment with the participation of the private sector under the supervision and regulation of the state. "This is how it works in all the major economies of the world," she says. "In the coming years, Brazil may be in this same scenario and aligned with this development." **IRJ**

Yucatan railway finally gets green light

Construction is expected to start this month on a public-private project to build a 1500km railway aimed primarily at tourists visiting Mexico's popular Yucatan Peninsula. **Michael Renouf** describes the project and some of the challenges it faces.

AT last it is coming: the Maya Train project to build a passenger railway to transport tourists around Mexico's Yucatan Peninsula, which has been discussed since 2012, has appeared over the horizon and is about to pull into the station.

Mexico's president-elect, Mr Andres Manuel Lopez Obrador, made the building of the Trans-Peninsula Tourist Train (TPT) line one of his core campaign promises and with Amlo, as he is known in Mexico, set to take office on December 1, and the first works on the project due to begin on December 16 with a ceremony in Palenque, Chiapas, it is on the verge of becoming reality.

This is the second attempt to build a new railway in the area. The Mexican government granted funding in 2012 for studies for a 278km line serving the states of Yucatan and Quintana Roo, but the project never got off the drawing board.

The TPT has grown from 12 stations to 17 and will now connect the five states of Campeche, Tabasco, Chiapas, Yucatan and Quintana Roo. The original length of the line was expected to be around 900km and has now increased to 1500km, in part thanks to the incorporation of an existing railway running from Palenque along the Gulf of Mexico to Valladolid. Although not currently used, the government has been able to add this line to the projected route with minimal consultation.

The new line will run from Izamal via the Mayan ruins at Chichén Itza and Valladolid to Cancun, and then along the Caribbean coast through Playa del Carmen and Bacalar, before turning inland to Escárcega to connect with the existing line. There will also be a branch line to serve another Mayan archaeological site at Calakmul.

The project is currently in the process of tendering regarding topography, geophysical, environmental, pre-feasibility and release-rights-of-way studies which will start to highlight the challenges ahead.

Alongside the budgetary issues are the additional difficulties of negotiating with indigenous communities and land owners as well as protected areas along the route. The National Institute of Anthropology and History will conduct a comprehensive study in order to identify and take the necessary measures to protect and preserve archaeological and historical heritage as well as identify areas within the peninsula that have a higher probability of containing as-yet undiscovered archaeological remains. The institute will only intervene to suggest a route adjustment if it discovers an important structure or buried city.

In addition, engineers will not have an easy task as the railway will have to traverse rivers, lakes, underground cenotes and harsh jungle terrain. The new government plans to give work visas to migrants in order to put adequate manpower behind the project.

There is currently 162km of existing track between Merida and Valladolid, but it only has 40kg/m rails. As the project specifies 57kg/m rail, the track on this section will have to be replaced.

Current proposals call for the railway to operate from 06.00 to 21.40, with trains initially running every 30 minutes. As demand increases, plans are in place to increase the frequency to a 20-minute-interval service.

The current plan is to use high-performance diesel-powered passenger trains with each DMU having at least 200 seats with a 0.42m^2 allowance per passenger and an additional 1.5m^2 in each car for wheelchair access.

The line will be equipped with Automatic Train Control (ATC), Automatic Train Protection (ATP) and ETCS.

The railway is targeting the tourism industry with the objective of enticing many of the visitors to the region, who currently stay on the coast in places such as Tulum and Playa del Carmen (two of the proposed stations), to experience other attractions in the

Ferromex is currently the only operator of long-distance passenger trains in Mexico.
Photo: Shutterstock/T Photography

region. It is also proposed to use the railway at night for freight which will include heavy fuel oil movements to a thermal power plant in Valladolid.

Budget

Amlo has stated that it will take "at most four years to complete" the project, which is down from the previous estimate of six years. While the predicted construction time has reduced, the forecast cost has risen considerably. Originally the budget was set at $US 3.4bn but now figures ranging from $US 6 to 8bn are being quoted.

The Mexican government will stump up Pesos 28bn ($US 1.4bn) over four years which will be collected through Mexico's Tourist Tax (DNR). The remainder of the funding will come from the private sector, although the leftist president-elect has recently knocked investor confidence in Mexico by cancelling the construction of Mexico City's New International Airport (NACIM) despite the project being 30% complete. However, this should not have come as too much of a surprise to people paying close attention as Amlo opposed this project throughout his election campaign. There has also been concern in Mexico that the new president will raise taxes to help finance the railway project, but he has emphatically denied this.

Mexico's Grupo Vidanta, which specialises in hotels, resorts, tourism and property development, has already expressed an interest in the project. "The Maya Train is a great idea because in a decade of operation it will double the income of foreign currency to the country," said Grupo Vidanta's president, Mr Daniel Chavez Moran, recently. "We are interested in participating in the financing."

However, the use of funds from the tourist tax has not received universal approval, with Mr Pablo Azcárraga, chairman of the National Tourist Business Council (CNET), strongly opposed to it. Azcárraga has stated that if the funding for the project comes from the Mexican Tourism Promotion Board (CPTM) it could result in certain death for the country's tourism sector. Most of CPTM's revenue comes from the DNR, a tariff that is charged to all foreign tourists flying into the country.

"If all the resources from the DNR are used for the Maya Train project we would have to cancel all advertising and promotion campaigns in the tourist sector for the next 25 years, which would mean certain death for tourism in Mexico," Azcárraga says.

Mexico is now amongst the top 10 most-visited countries in the world. Cancún is home to the international airport that serves the region, and in 2017 added a desperately-needed fourth terminal to help cope with the 23 million annual passengers that move through the airport. The Maya Train and its investors will hope to turn many of these people into rail passengers. **IRJ**

Texas Central Railway

blazing a trail for privately-funded high-speed rail

Despite producing more than a third of the United States' crude oil output, urbanisation, rapid economic growth and congestion mean Texans could be getting out of their cars and on to high-speed trains much sooner than most other Americans. **Keith Barrow** looks at how Texas Central Railway is planning to link Dallas and Houston without consuming a cent of public funding.

WITH 28.3 million residents, Texas is the second most populous state in the United States. Much of the population is concentrated in and around Houston and North Texas, an area encompassing Dallas, Fort Worth, Garland and Irving. Dallas-Fort Worth is the fourth-largest metropolitan area in the US, while Houston and The Woodlands is fifth.

These are among the most dynamic regional economies in North America. According to a recent study by Headlight Data, Dallas-Fort Worth was the fifth fastest-growing metropolitan area in the United States in 2016. Only New York has more Fortune 500 headquarters than Houston, which has one of the fastest-growing and youngest populations of any US city.

In both regions, economic activity is not concentrated in the urban core. In addition to their central business districts, Dallas and Houston have multiple commercial centres spread across their respective metropolitan areas with good access to the highways and public transport networks that serve their sprawling suburbs.

As the economy booms and the population swells, transport links between Houston and North Texas are under increasing pressure. Nearly 50,000 Texans travel between the two metropolitan areas at least once a week, 90% of them by car. Interstate 45 - one of the country's deadliest major highways - is forecast to see a 200% increase in vehicular traffic by 2035. The current journey time by road ranges from 3.5 to 5.5 hours, and traffic has increased nearly 10% annually since 2012. A Texas Department of Transportation study estimates journey times could reach 6.5 hours by 2035, even with the additional capacity offered by planned highway enhancements.

Proposals for high-speed rail on this corridor are nothing new. In 1989 the state legislature formed the Texas High Speed Rail Authority (THSRA) to establish the viability of a high-speed network serving the so-called Texas Triangle (Dallas - Houston - San Antonio). THSRA awarded a 50-year finance-design-build-operate-maintain franchise to Texas TGV Corporation in May 1991, but the international consortium failed to secure financial backing and the franchise was rescinded in August 1994. The state abolished THSRA the following year.

Since the failure of Texas TGV, four additional studies have looked at the potential for high-speed rail development in the Texas Triangle, and all indicated that operating revenues would exceed operating costs.

In May 2009, a study by Texas Transportation Institute (TTI) examined the feasibility of building high-speed lines on 18 corridors in the state based on 15 criteria and ranked them using two different evaluation methods. In both cases, Dallas/Fort Worth - Houston and Dallas/Fort Worth - Austin/San Antonio emerged as preferred corridors.

Flat and straight

Two decades after the collapse of Texas TGV, a new private-sector bid was launched to build a new passenger rail link between North Texas and Houston. Texas Central Railway will rely entirely on private capital for every stage of its development, construction and operation and it is taking a totally different approach to its predecessor.

"This corridor really is the globally-recognised sweet spot for high-speed rail," explains Ms Holly Reed, managing director of external affairs for Texas Central. "This is a 390km route with no mountains, no major bodies of water and only 150m difference in elevation between Dallas and Houston, so it's easy to build straight and flat. It's no surprise that this is the best place to build high-speed rail in the US for a commercial endeavour. We looked at more than 90 city pairs and this was the clear place to build. These two markets are closely aligned and perfect for high-speed rail - too far to drive and too short to fly."

The high-speed line will remove an estimated 14,630 vehicles a day from I-45 and Texas Central harnessed new technologies to gain insights into travel habits as it developed its business case.

"Everything we do is data-driven and combined with the discipline of the market this ensures we are building the right project in the right place in the right way," Reed says. "We've used aggregated bluetooth data to understand who makes this trip and by what mode. 80% of the people we have surveyed say they would use the train. This is a project in the right place at the right time. Texans are getting out of their pick-up trucks. Students and i-gens don't want a driver's license."

A notable trend which emerged in Texas Central's research is the growth in ride sharing, and Reed says this is a perfect target market for high-speed rail. "Ride share numbers in this part of Texas are really astonishing," she says. "Adoption rates are significantly higher here than in other parts of the US. There is a new definition of freedom emerging here. Freedom used to be defined by the ability to get in the car and drive wherever you want, whenever you want. Now freedom means the ability to choose how you get to your destination and how you choose to use your travel time."

A comprehensive ridership study carried out by LEK Consulting concluded that 90% of the population living in the high-speed corridor would save at least an hour on their road or air journeys.

The Federal Railroad Administration (FRA) published its Draft Environmental Impact Statement (DEIS) for the project in December 2017. According to the DEIS, 52% of the alignment will follow existing infrastructure corridors including highways and utilities. Texas Central studied 22 corridors as part of the DEIS process and six were subsequently shortlisted for further environmental analysis. A single preferred route - Build Alternative A - is identified in the DEIS. Advantages of this option include:

- fewest acres of wetlands impacted permanently
- fewest businesses displaced.
- lowest land take
- fewest agricultural structures acquired
- lowest impact on socioeconomic, natural, physical and cultural environments
- low impact on crop yields, livestock, and the agricultural economy, and
- neutral or beneficial impact on most landscapes.

"The final permit from the FRA for environmental and safety-related aspects of the project is expected early next year, which means construction could start in late 2019 or early 2020," says Reed. "We're looking at a five-year construction period so the earliest we could begin running trains will be 2024 or 2025."

The preferred alignment selected for the railway is the Utility Corridor, so

> "Everything we do is data-driven and combined with the discipline of the market this ensures we are building the right project in the right place in the right way. Holly Reed

Rendering of Dallas high-speed station.

named because it will largely follow the Centerpoint Energy and Oncor Electrical Delivery high-voltage transmission lines from Palmer near Dallas to Hockley near Houston. As the power line does not extend into central Dallas or Houston, the Utility Corridor follows existing Union Pacific Railroad alignments to gain access to the urban areas at its northern and southern extremities. The double-track line will be electrified at 25kV ac, running on an elevated alignment for around 60% of its length.

This corridor was deemed to meet TCR's technical requirements while also ensuring that the desired 90-minute journey time is achievable.

The line will start at a dedicated terminus station in the Cedars district of Dallas, which is located south of Interstate 30 and the city centre. The area around the proposed station site is currently undergoing redevelopment, transforming a district previously dominated by light industrial and manufacturing facilities into a walkable neighbourhood with a mixture of repurposed and new-build mixed-use developments. The Cedars is already served by the Dallas Area Rapid Transit (Dart) Red and Blue lines, providing a direct rail connection between the high-speed station, central Dallas and other key centres in North Texas.

Brazos Valley, the line's only intermediate station, will be located in Grimes County within easy reach of State Highway 90 and roughly equidistant between Huntsville and Bryan/College Station, where Texas A&M University is located. A direct shuttle bus will link the Brazos Valley station with the university campus.

The southern terminus will be located between Interstate Highway 10 and Highway 290 northwest of Houston in an area identified by the FRA as having minimal environmental and community impact. It also allows the line to follow existing transport corridors and gives passengers easy access to the road network and connectivity with planned public transport extensions. Studies have shown that the population base in Houston is skewed towards the north and west of the city centre, and the station location has been selected to take advantage of this distribution.

According to Texas Central, 12.8 million people currently live within an hour's travel time of one of the three proposed stations. With each station serving a wide catchment area, intermodaility is a key consideration and Texas Central is working to ensure first and last-mile connectivity is an integral part of the system design.

"Our business plan is squarely focussed on using the latest technology and this will be a form of Mobility as a Service, with a high-speed ticket and transit combined in one fare for door-to-door journeys," Reed explains. "If we can get you between Dallas and Houston in an hour-and-a-half but we can't get you to your ultimate destination quickly then the advantage of speed is lost. Stations in Dallas and Houston will be conveniently located for transit and getting to where people work and live."

Texas Central has also reached an agreement with Amtrak on through ticketing from the national passenger network and Texas Central says it will offer a "convenient transfer service" linking its stations with Amtrak stations in Houston and Dallas.

The LEK study estimates ridership of five million passengers annually by 2030 and 10 million by 2050, equivalent to 30% of the forecast transport demand between North Texas and the Greater Houston metropolitan area by the middle of the century.

Project partners

On October 4, Texas Central signed a Limited Notice to Proceed (LNTP) with Salini Impreglio, which will serve as lead contractor in the civil works consortium, which will also include Fluor. Operating with The Lane Construction, Salini Impreglio will be responsible for all works below the top-of-rail including structures, embankments and drainage. Under the LNTP, the design-build participants will move forward with the front-end engineering and design of civil infrastructure, preparing strategies for logistics and delivery as well as construction cost analysis and scheduling estimates. This planning work will provide a foundation for the design-build contract for the civil works programme.

Bechtel has been appointed project manager while WSP will provide engineering support services.

On October 10, Texas Central announced it had selected Spanish

national train operator Renfe and infrastructure manager Adif as strategic partners for the operation and maintenance of the line.

The detailed planning work being carried out by the strategic partners is a prerequisite for securing financing. "Most major public infrastructure projects in the US get a large federal grant before construction begins, but as a commercial project we need to work differently because we raise money in a different way," Reed says. "For now, we're working toward obtaining the necessary permits and this will determine the timeline for construction.

"Unlike most public infrastructure projects we are raising money as we progress through each stage. When we have the federal construction permits, we will go out and raise the debt we need for the construction phase."

The estimated capital cost of the project is $US 15-18bn and this will be raised chiefly though debt, with the remainder coming in the form of equity. In September Texas Central signed a $US 300m notes purchase agreement with a special purpose vehicle of Japan Overseas infrastructure Investment Corporation for Transport and Urban Development (Join). The loan is being jointly financed by Join and Japan Bank for International Cooperation (JBIC), both of which are backed by the Japanese government. The signing of the agreement follows Join's decision in September 2015 to purchase a $US 40m equity stake in Texas Central.

Japanese technology

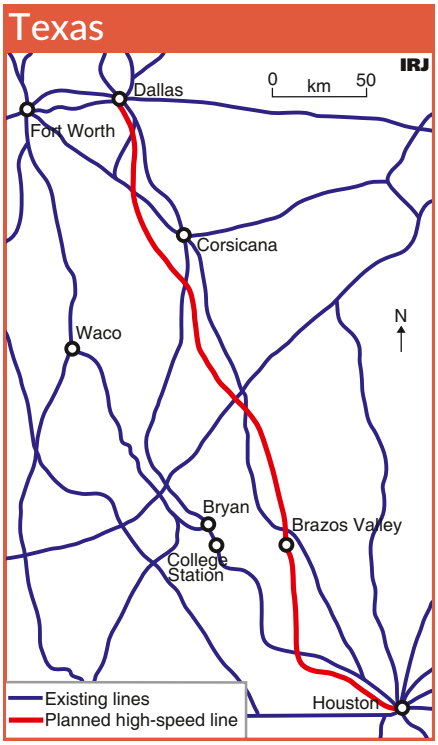
In the initial timetable, services will be operated by a fleet of around 15 high-speed trains based on the N700-I Shinkansen train developed by JR Central. Each eight-car set will seat around 400 passengers, and despite the generous width of the train, Texas Central will not be emulating JR Central's favoured 3+2 seating pattern. "We have broad shoulders in Texas and it's important to offer a comfortable ride so there will be no middle seats," Reed says.

The fleet will be maintained at purpose-built depots located at both ends of the route. Texas Central says the maximum operating speed will be 300km/h although this could be raised to 320km/h if market conditions and regulatory approvals allow.

"The technology we have selected for this project is the right solution for the environmental and ridership conditions in Texas," Reed explains. "The trains are lightweight, which is important for the soil conditions, and we have chosen Japanese technology for its safety record - 54 years of high-speed operation with no passenger fatalities. With these advanced operating systems and a dedicated high-speed corridor, the US system will be set up to maintain that perfect safety record."

Texas Central forecasts the net economic impact of the new line on the Texan economy will be around $US 36bn over 25 years, generating $US 2.5bn in tax revenues for state and local government and employing 10,000 people a year during construction.

Critics of Texas Central claim that Texas TGV conclusively proved high-speed rail cannot be viable in the Lone Star State, but in doing so they fail to recognise that today's project inhabits a very different world from that of its predecessor. The Infrastructure advocacy group CG/LA recently named Texas Central Railway as a top project in Strategic North American Infrastructure Report, lauding the high-speed line as "a game changer… crucial in advancing public and business interests," and "the region's most dynamic and innovative change agent."



Even in oil-rich Texas, megatrends that promote the rejection of car ownership - congestion, urbanisation, environmental awareness, increased access to public transport, new mobility solutions - are taking hold, strengthening the case for high-speed rail. Furthermore, institutional investors eager to park their wealth in safe, long-term infrastructure schemes have few options when it comes to privately-funded passenger rail projects. If it is successful in securing capital, building the infrastructure and attracting ridership, Texas Central could achieve an important breakthrough for high-speed rail in the US and set a precedent for others to follow. **IRJ**

New JR East test train set to push the boundaries of high-speed rolling stock

JR East has launched Alfa-X (E956), its 400km/h Shinkansen test train which will be used to evaluate new technical and aerodynamic advances for the next generation of Japanese high-speed train. **Yoshihiro Edo**, chief researcher, and **Osamu Kawakami**, principal chief researcher, with JR East's Advanced Railway System Development Centre, outline the objectives of the project.

EAST Japan Railway (JR East) announced its mid-to-long-term vision for technological innovation in November 2016 which included research and development for a next-generation Shinkansen train. The objective is to attain a high level of safety, stability, and comfort, while reducing the environmental impact of the train and making it easier to maintain than the current generation of Shinkansen rolling stock.

JR East therefore decided to build a new high-speed test train - Alfa-X or series E956 - for the Shinkansen as an experimental platform to embody the concept. This train is being developed with the extension of the Hokkaido Shinkansen from Shin-Hakodate-Hokuto to Sapporo in mind while taking into account the technical advances achieved in existing trains.

The idea of building a test train when we contemplate increasing the speed of the Shinkansen is not new. Our development of Shinkansen trains started with tests for running the 400 series at speeds up to 345.8km/h in 1991. This was followed by the Star21 and FastTech360 test trains which reached even higher speeds. This work has enabled us to shorten journey times, advance technology, increase safety, reduce noise levels, and improve ride comfort.

The concept for Star21 was to develop an extremely lightweight high-speed train using many new technologies. During dynamic tests, which were conducted between 1992 and 1998, the train reached a maximum speed of 425km/h. Star21 helped to achieve a significant step forward in environmental technology, and the resulting weight reduction and main circuit technologies are used in trains currently in service. In addition, we were able to reveal high-speed rail issues not only related to vehicles but also in other areas such as track, power supply, signalling, and earthworks.

With FastTech360, rather than trying to break previous test speed records, we set out to raise operating performance, and attain the maximum possible reliability, comfort and environmental friendliness. Test running was conducted between 2005 and 2009 and led to the development of the E5 and E6 series trains running at 320km/h, the highest operating speed in Japan.

JR East is developing its next-generation train with the opening of the 211km extension of the Hokkaido Shinkansen from Shin-Hakodate-Hokuto to Sapporo in 2030 in mind. We believe it is essential to give customers not only a safe and fast means of transport but also new facilities for them to enjoy during the five-hour trip from Tokyo to Sapporo. For relatively long rail journeys we use the concept of "extra time." Rail passengers have far more usable time during the journey compared with air travellers, where the trip is broken into short sections to reach the airport, pass through check-in and security, with often long distances to walk to reach the gate, resulting in a lot of wasted time before, during and after the flight.

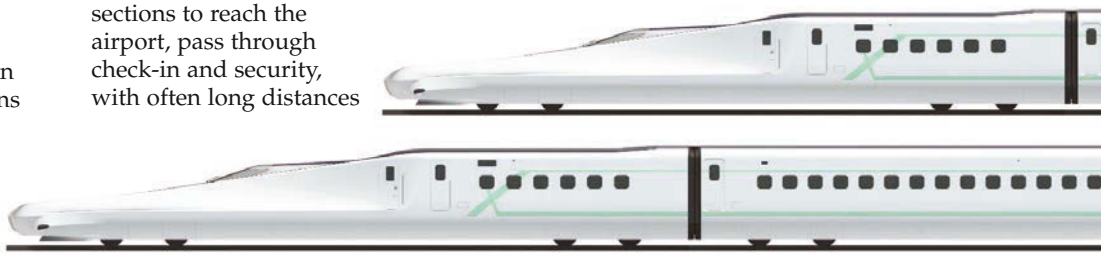
To achieve these goals, we intend to use the AI technologies of IoT and big data analysis and combine them with research results to raise safety and reliability levels.

To take safety up a notch, we want to find ways to stop trains more quickly and safely during an earthquake, and to have individual vehicles carry out autonomous checks on the condition of key components. We also want to improve stability through greater resistance to snow and cold and enhance failure prevention by detecting faults from vehicle and ground monitoring data.

> "We want to find ways to stop trains more quickly and safely during an earthquake, and to have individual vehicles carry out autonomous checks on the condition of key components.

Passenger needs vary, so we must be flexible in meeting them. Customers want to spend their time in comfort, be able to concentrate on their work, or to enjoy the journey with their families. We also want to achieve a quieter and smoother ride and ensure punctuality.

To minimise rail's environmental impact, our noise reduction technologies have been developed to suppress noise



Alfa-X will feature both a 16m and 22m-long nose to test aerodynamic concepts for reducing pressure waves when entering a tunnel.

when trains run at high speed. We also promote energy conservation through various technologies.

To reform our maintenance practices, we are promoting condition-based maintenance for both the trains and infrastructure.

Test train

The new high-speed Shinkansen test train Alfa-X, which stands for Advanced Labs for Frontline Activity in rail eXperimentation, will help us to achieve these improvements and innovations well into the future. The E956 10-car test train will be completed in spring 2019 and will operate at a maximum speed of about 400km/h during testing.

Two types of device will be developed to protect against the risk of derailment during earthquakes. One is a damper moving laterally and the other is a crushable stopper. The damper works like a conventional damper moving to the right and left, but when an earthquake occurs and severely shakes the train laterally, it exerts a strong damping force to suppress shaking. When the test train experiences a seismic shock, the stopper will be pressed. As a result, the space between the centre pin and stopper spreads to mitigate the shock between the car body and bogie and to prevent high lateral pressure from occurring between the wheel and rail (Figure 1).

In order to stop a train quickly when an earthquake occurs, existing trains only have a mechanical braking system consisting of a brake disk, calliper, and lining which relies on the adhesion force between the wheel and rail. To develop a high-deceleration brake, we are working on a non-adhesion deceleration system that compensates for lack of braking force at high speed to shorten the stopping distance. One candidate is an air-resistant-plate unit

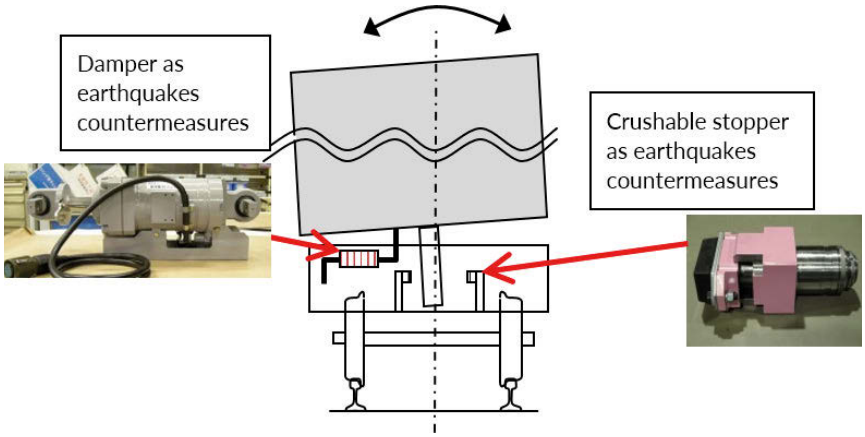


Figure 1: A new device incorporating modified dampers and a crushable stopper is designed to reduce the risk of derailment during earthquakes.

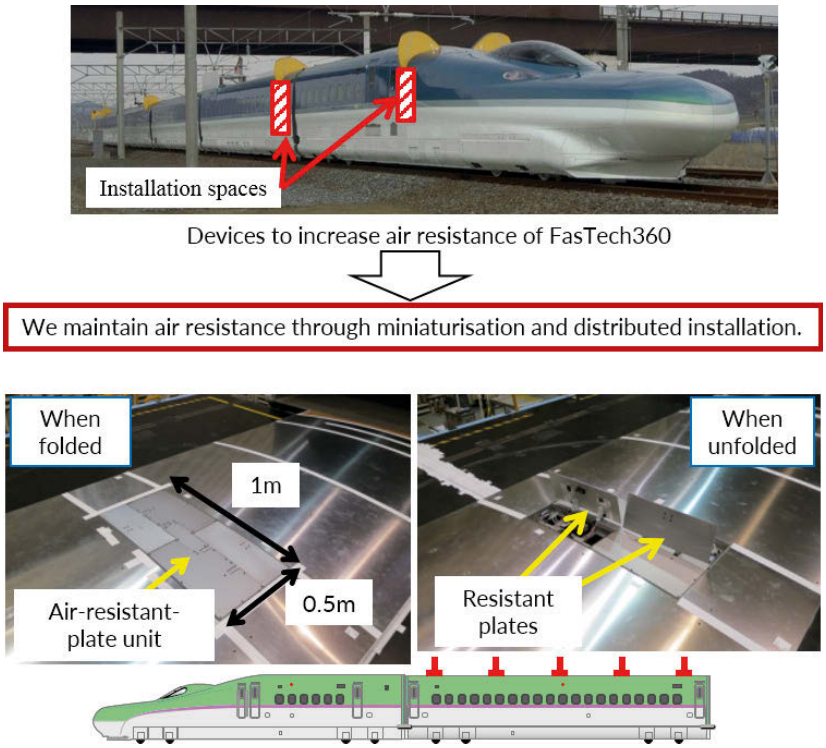
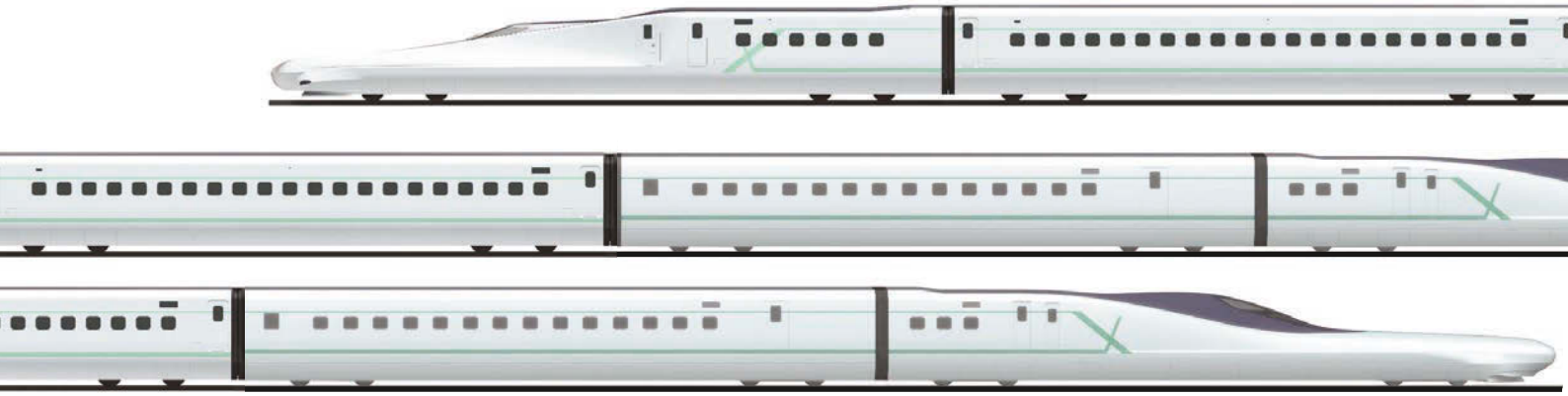


Figure 2: The make-up of a new device designed to decrease train stopping times, including the air-resistant plate.



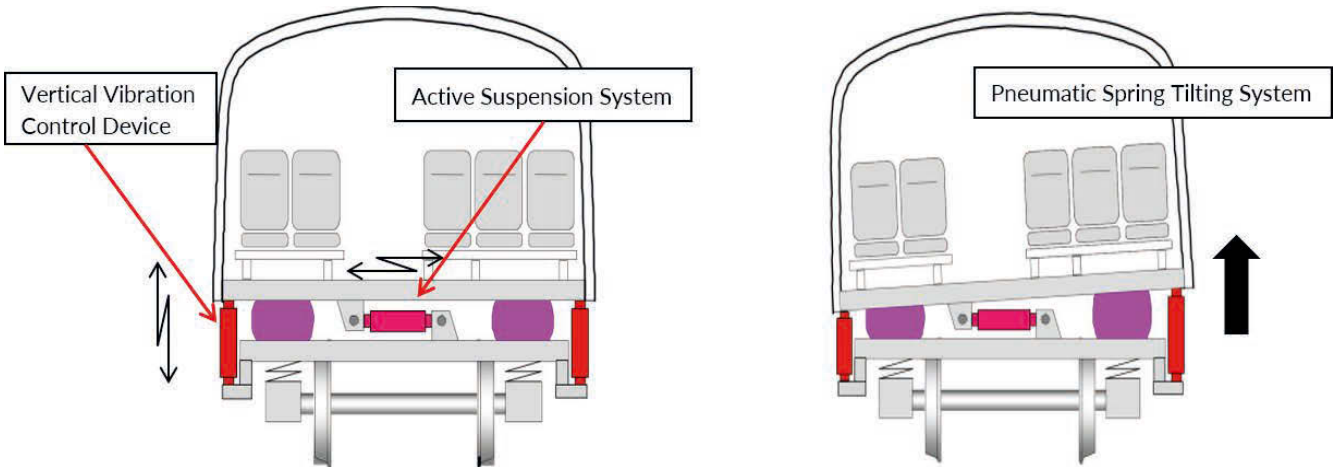


Figure 3: Anti-vibration control devices installed on the Alfa-X test train.

that splits the air resistance enhancer installed in FastTech360 into small units. This will give Alfa-X an advantage over FastTech360, as the small units will be distributed throughout the train and will take up less space inside (Figure 2).

To improve reliability, we plan to install equipment which has greater resistance to snow and cold and which is designed to reduce the risk of damage or failure in freezing conditions. The underfloor layout will be optimised to minimise the build-up of ice and snow.

We also plan to monitor various devices to detect failures and to prevent problems from occurring.

Fully-active controller

The E2 series Shinkansen was the first train to enter service fitted with a pneumatic actuator working as a fully active controller that reduced lateral shaking. For the E5 series Shinkansen, JR East changed to a motor-driven actuator to improve responsiveness and power control. We plan to introduce a fully-active controller with higher performance and a body tilt controller on the latest test train, together with a new controller against the vertical to produce a "shake-free" train (Figure 3). We will also develop technology to operate the train stably at 360km/h.

The bodyshell of Alfa-X will be designed for high sound absorption and will have better insulation to improve passenger comfort.

JR East is already undertaking a variety of condition-based maintenance initiatives for both the conventional network and Shinkansen. We will develop this further by using the test train as an experimental platform, and we will add devices that monitor on-board and ground equipment to acquire and analyse data for maintenance reform.

To reduce pressure waves when a train enters a tunnel, we will verify two new shapes for the driving car of the test train. Type A's 16m-long nose is 1m longer than that of the E5 series Shinkansen, whereas Type B has a 22m-long nose. We also plan to maintain the in-vehicle space in the train.

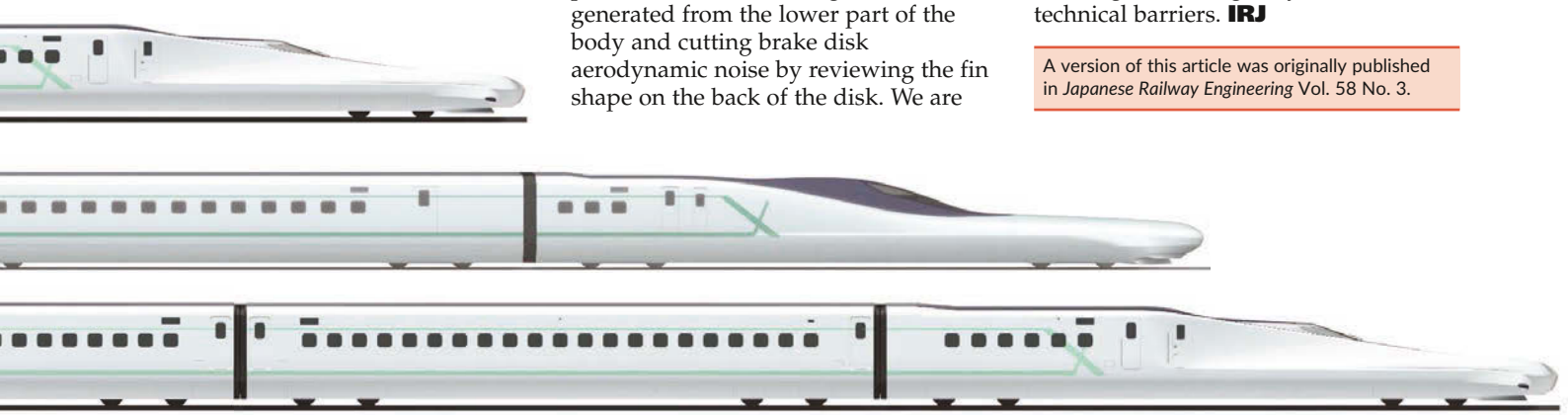
Various anti-noise measures are planned such as reducing the noise generated from the lower part of the body and cutting brake disk aerodynamic noise by reviewing the fin shape on the back of the disk. We are conducting simulation and wind tunnel tests to develop a new pantograph that will produce less aerodynamic noise.

To save energy, we will reduce the power conversion losses by improving the efficiency of the traction equipment. For example, energy consumption efficiency can be improved through optimal drive control technology and by using silicon carbide (SiC) semiconductors for the power converter. By using IoT, big data, and AI, we are working on how to enhance the on-board information and control network of the test train and to make it more robust than that of the E5 series.

In addition, the trains will be equipped with a device which increases aerodynamic drag to aid rapid deceleration.

For the next-generation Shinkansen, we want to build an intelligent train with a high level of safety, stability, comfort, environmental performance, and maintainability. But, in order to achieve this, we need cooperation from outside organisations, such as manufacturers and research institutes, to move forward with this project, all working as one to go beyond the technical barriers. **IRJ**

A version of this article was originally published in *Japanese Railway Engineering* Vol. 58 No. 3.



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Recruiting the next generation

The railway industry is racing to replace a generation of technicians and engineers approaching retirement. But with strong competition from all sectors for a limited talent pool, companies from across the industry are engaging in innovative recruitment methods, as **Kevin Smith** discovers.

BELGIUM's major sporting events and music festivals are probably the last place you would expect to find an exhibit promoting the country's infrastructure manager, Infrabel. But lining up alongside the food and merchandise stalls, staff from the company are now regularly promoting job and career opportunities on the railway.

Exposure at events which bring the local and wider community together usually occurs a few days before Infrabel hosts a local Job Day, a key recruitment initiative which began in January 2017.

Here prospective recruits tour railway facilities and learn about the challenges they would face in the jobs on offer in the hope that it will spark their interest to apply. Hiring can happen on the spot with medical professionals available to administer the required tests. And with the process of filling in paperwork designed to be as straightforward as possible, new hires can be clocking on in just a few weeks.

Such a proactive approach to finding new staff reflects the recruitment challenges the infrastructure manager is facing. Infrabel is looking to employ 1400 people between mid-2018 and 2020 to fill positions vacated by professionals and technicians hired in the late 1970s and early 1980s. These professionals succeeded the previous generation, which rebuilt the railway following the conclusion of the Second World War. However, the employment market is very different now compared with 40 years ago.

"In the 1970s there was high unemployment so finding people was not so much of a problem," says Mr Nico Van Wijk, Infrabel's HR director. "Today it is a very different matter. In the north of the country, unemployment is at its lowest for 30-40 years and it is very, very difficult to find qualified technicians and engineers."

Infrabel's position is not atypical. Around the world railways and suppliers are searching for the next-generation of talent that will drive their respective institutions forward. Competition for the best and the brightest is fierce, forcing companies to adopt innovative approaches to attracting talent.

Social media is now the key platform for marketing jobs and careers. German infrastructure engineering firm Spitzke is harnessing platforms such as Facebook and Twitter to promote

opportunities to a targeted audience of potential new recruits. In particular, the company is highlighting the strong position of the railway in future transport systems and talks up the innovation taking place in the sector.

According to Mr Christian Krippahl, director of corporate human resources at Spitzke, the emphasis is on the role individuals can play in delivering an advanced transport system with the recruiter seeking to build an emotional attachment with prospective employees.

> If they have a passion for what they do, we want to show them that there is a pathway in the company to start as a blue-collar worker and rise up to one day become the CEO. Christian Krippahl

"At our events we try to emphasise that it is not just a single job that they are applying for," Krippahl says. "If they have a passion for what they do, we want to show them that there is a pathway in the company to start as a blue-collar worker and rise up to one day become the CEO. It is quite important that we inspire our workforce."

Infrabel similarly relies on social media to promote job opportunities in specific locations. This is helping to reinforce the Infrabel brand, which is not that well known in Belgium with many people still associating the railway with the previous integrated structure led by today's train operator, Belgian National Railways (SNCB).

The infrastructure manager is also altering its recruitment processes so it is in line with the expectations of the market. "If you book a Ryanair flight, or when you shop online, it is all as quick as possible," Van Wijk says. "If you want to apply to a company, and it takes you half an hour, a youngster has no motivation to work for that company.

"Until a couple of months ago if you wanted to apply through our website, you had to set up an account and you needed to fill in all kinds of data about yourself. It was a really lengthy process. Now if you have a LinkedIn profile, you can upload that. It's all we need and it's two clicks away rather than 29 clicks using the old system. We really try in every aspect of the recruitment process to make it a lot more efficient, a lot more intuitive, so we don't give the wrong impression."

Mr Paul Scott, services apprentice manager at Thales UK, has a similar perspective. He says that as much as millennials need to adjust to the demands of working on the railway, he recognises that employers have to adapt to young peoples' way of working and thinking, which is significantly different from that of industry "dinosaurs."

Thales is engaged with the British government's national apprenticeship programme and Scott says recruitment fairs, in particular the Skills London event held each November, are a major source of new recruits to the programme. The company also engages with local schools and colleges through presentations in the classroom. Scott says these are important to demystify what working on the railway means to these students. However, he admits that more can be done to bridge the gap between industry and education.

"On the surface, they think that it's just trains and it's just a railway," Scott says. "They don't see the technology behind that and understand that the signals and the telecoms are a key part of the system. It's about getting it out there that the trains need more to run than a bit of track and a driver."

Agressively recruiting

In the United States, universities are a major source of new recruits to high-level positions, both in engineering and business development roles. Class 1 freight railways are aggressively recruiting engineers and business graduates at campuses across the country, and according to Mr Nicholas Little, director of Railway Education at the Centre for Railway Research and Education at Michigan State University, these graduates are well placed to make a major impact.

"With the baby boomers retiring in vast numbers I think there are going to be a lot more opportunities for faster advancement in the rail industry than there has been in the past," Little says. "Because it has been slimmed down quite a lot, they have now gotten rid of a lot of the dead-end jobs. It is a lot more dynamic environment and I think they will be able to attract a lot more people. And we still have the railway pension, which is probably the best pension scheme there is. The salaries are also quite good."

Little says Michigan State's Railway Management Certificate programme, now in its 15th year, fills a training gap vacated by the railways as they have sought greater efficiency. During the four-week non-credit programme participants are exposed to new areas of railway management through both classroom instruction and site visits. Successful completion of the certificate enables participants to secure promotions and progress with their careers.

Little says internship opportunities with the Class 1s are also available to the university's undergraduate supply chain management students, which is recognised as one of the top programmes in North America. He reports that following their exposure to the railway's working practices, many of these students move on to full-time jobs following graduation.

American Railway Engineering and Maintenance of Way Association (Arema) similarly supports the railway industry's presence on North American campuses. The association's Committee 24 - Education and Training, which is made up of industry volunteers, has facilitated the development of student chapters at 24 universities across the US since 2006. According to Ms Amanda Limburg, student chapter coordinator, and an industry consultant based in Denver, the chapters support students by funding participation at conferences and exposing students to the workings of the railway through trips and internship opportunities.

Limburg also reports on the importance of Arema's Railway Engineering Education Symposium (Rees) programme. The annual event is a forum for university professors to engage with the industry and provides instruction on railway engineering content that can be used in the courses they offer on campus. The 2018 event, the sixth since it began in 2008, attracted 32 education and industry attendees over two days.

"We found that mechanical and engineering students are not exposed to

railroad-related content in their courses because there are very few professors working in universities today with the required knowledge," Limburg says. "The Rees programme hosts workshops for professors to attend so we can share current industry thinking with them which they can include in their teaching."

Internships

In Europe, Spitzke has developed strong ties with various German universities. The company offers internship opportunities for students while Spitzke staff support higher education institutions by providing instruction, informing the curriculum and participating in examination juries.

Infrabel likewise works with Vrije University Brussels, where again its staff offer instruction and support to relevant railway engineering courses. Some of its managers also have a degree of contact with local schools. However, the number of suitably qualified graduates is still falling short of what the infrastructure manager and other industrial companies will require in the future.

"There is currently around a 7% turnover of staff at companies," Van Wijk says. "This is a much larger proportion than the people leaving education and getting their degrees. Top engineers get hired six months before they leave university by companies that put significant wage packets on the table. We are a publicly-owned company, which makes it difficult to counter such initiatives."

Despite this, Van Wijk is encouraged by the new talent that has entered the company. Overall, Infrabel's innovative approach to recruitment helped the company to hire 350 people in 2017. However, with unemployment falling again in 2018, and other firms catching on to the Job Day concept, Van Wijk says this figure has dropped off in 2018.

The company's response is to innovate its recruitment strategy once again. Infrabel is also working to develop the talent it already has. This is part of the thinking behind the Infrabel Academy, a new state-of-the-art training facility which is set to begin operating in 2020.

Van Wijk says the new facility will help Infrabel move away from a dispersed and silo-based approach to training, which will improve efficiency and professionalism. "We will incorporate modern ways of training like e-learning and flipped classrooms into the new building that we are constructing," he says. "All railway technologies will be under one roof and we will have a hall with track and overhead lines enabling us to do simulations of technical issues that you might encounter in the field."

Spitzke is also focusing on developing the skillsets of existing employees by offering professional development at its academy located south of Berlin. More than 80 training programmes are available to current staff while 40-50 16-19-year-olds enter the academy each year through Germany's national apprenticeship programme. Spitzke offers 14 apprenticeships, which are strictly regulated by the German chamber of commerce, with each programme taking three years to complete. In addition, the facility is also supporting staff development in the wider industry by hosting training services for 1200 participants from third-party organisations, including German Rail (DB), each year.

> "We want to be a mirror of the society we live in and recruiting women is something we strive for, but it is not easy. Nico Van Wijk

"In this instance we see ourselves as a partner of DB, rather than a competitor," Krippahl says. "Only together can we fill the gap. We might be competitors but we are working towards one system."

One notable element of the Thales apprentice programme is the active effort by Scott and his team to recruit young people from less-privileged backgrounds. For example, the company works with the Prince's Trust's Get Into programme through which five to 10 young people are offered work experience, which for some has led to full-time employment. "Where their education level isn't the same as the others, we offer them support with maths and English," Scott says. "It is giving someone a chance who is not necessarily getting that chance."

Scott adds that attracting women into the programme is something he likes to encourage because of the vast gender gap in more technical positions in the industry. Spitzke likewise is putting a great deal of energy into female recruitment. Krippahl says the company offers flexible working hours and support for childcare as well as offering a path for women to re-enter the workforce after having a family.

Infrabel is also aware of the issue and has managed to increase the proportion of female staff from around 6-7%, when the company was founded, to around 10% now, and approximately 20% of all new recruits are female.

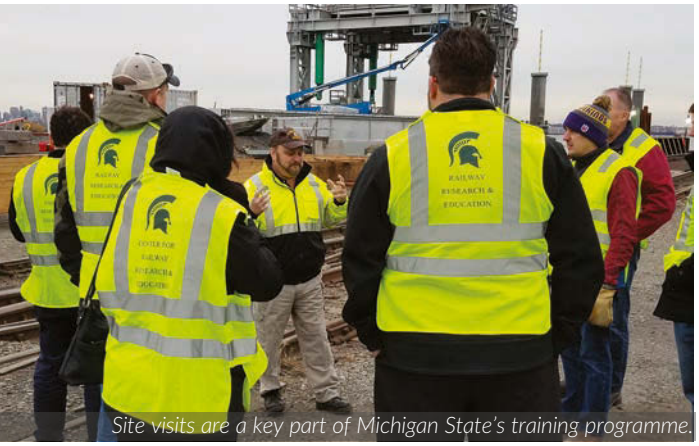
"We want to be a mirror of the society we live in and recruiting women is something we strive for, but it is not easy," Van Wijk says. "If you look at our finance department, HR, communications, procurement, those typical departments where you don't need technical people, we are 50% female. But if you look at really technical departments, we are at less than 10%. For engineering, 10-15% of graduates are female. We really put the emphasis on hiring more women but the statistics are against us."

The perception that working in rail engineering is a tough and dirty job is a difficult label to shift. The industry in general also has a relatively poor image among the general public. Little says that many young engineers which gravitate towards railway engineering tend to follow in their parents' and grandparents' footsteps. For others, it's a harder sell.

But as Spitzke and Krippahl are keen to emphasise, with the sector entering an unprecedented era of innovation and reform, the sector does have a great story to tell. And the public can respond to this. A 2013 BBC documentary series following everyday people working on the railway network, which attracted large audiences and was well received, was credited for a spike in Network Rail apprentice applications the following year.

Taking an active approach and not being scared to try out new ideas is producing encouraging results for these industry players. It might also provide food for thought for other companies battling their own recruitment dilemmas. IRJ

Prospective recruits tour facilities during an Infrabel Job Day.



Site visits are a key part of Michigan State's training programme.

Infrabel has simplified its job application process.

Infrabel promotes its Job Days at community events.

Automating Switzerland's Waldenburg Railway

Prose has conducted a feasibility study into the phased automation of a narrow-gauge light rail line in Switzerland as part of a major upgrade. As **Sandro Napoli**, senior consultant at Prose explains, the project is expected to pave the way for future narrow-gauge railway automation in Switzerland.

THE Waldenburg Railway is a 13.1km narrow-gauge light rail line in northwestern Switzerland that ascends from Liestal, southeast of Basle, through the Waldenburg Valley to Waldenburg. When it opened in 1880, the line was the driver for the industrialisation of the Waldenburg Valley. Nearly 140 years later, the line is undergoing a major rebuild and is likely to become the first fully-automated tram line in Switzerland.

In 2012, the Swiss federal government and Swiss Federal Railways (SBB) decided to expand Liestal station to four tracks, which meant adapting the Waldenburg Railway's infrastructure. To ensure long-term benefits from this investment, the project will not only modify the track layout at Liestal station but also convert the track gauge of the entire Waldenburg Railway from 750mm to metre-gauge. Stadler will supply 10 Tramlink low-floor LRVs for delivery between April 2019 and the end of 2021, with the fleet entering commercial service in December 2022. The signalling, together with the 13 stations on the line, will also be renewed.

The total renewal of the Waldenburg Railway offers a unique opportunity to take advantage of technologies for automated operation. Baselland Transport (BLT), the operator, plans to introduce Automatic Train Operation (ATO) on the line starting with Grade of Automation 2 (GoA2) from 2022 onwards, migrating to GoA3 from 2027 and GoA4 (driverless operation) from 2032 (see map p44).

A feasibility study into the automation of the line was carried out by Prose based on the four grades of automation levels established by the International Association of Public Transport (UITP). An economic analysis showed that GoA2 already allows the implementation of many system improvements, whereas the next grade, GoA3, is particularly costly. Figure 1 illustrates the benefits of an automated railway, although a thorough evaluation is required for each specific application.

To establish a solid basis for the feasibility study, a broad initial phase and a deeper analysis phase preceded the core feasibility analysis.

BLT has ordered 10 metre-gauge Stadler Tramlink LRVs for the Waldenburg Railway.

An initial survey of the Waldenburg Railway's infrastructure provided an overview of local conditions and identified geographical points requiring special attention to introduce driverless operation. Additionally, a market survey gave an overall view of solutions for partial and fully-automatic train operation, as well as the technologies and sensors in use. During this work, the focus was on the following topics:

- fully automated metros at GoA4
- certification of a metro system up to GoA4 in Switzerland
- state-of-the-art light rail projects, comparable with the Waldenburg Railway in terms of driverless operation
- development trends of sensor technologies, and
- possible use and application of such technologies on railway and tram networks.

To offer a bigger picture, experience from the automotive industry regarding technology, certification and safety was also considered.

Both the Swiss train operation rules (FDV) and the implementation rules for Switzerland's railway regulations (AB-EBV) were examined to identify contradictions with existing standards concerning driverless operation. Our technology analysis is based on a market survey and includes potential systems and technologies and their possible combinations. The current state of development for these technologies including their characteristics, development, cost, availability and application areas were investigated. The analysis focused on systems such as automatic train protection, platform security equipment, collision warning systems, and sensor technologies. General safety requirements were defined and applied to the Waldenburg Railway based on existing definitions of operational functions and standards for metro systems.

For the final feasibility study, the results serve as a basis to develop a recommended step-by-step approach to implement automated operation on the Waldenburg Railway. In parallel, new findings are continuously added to the requirements for new rail vehicles and planning guidelines for new infrastructure.

Red mile

A particular challenge on the Waldenburg Railway is the so-called "red mile" in the town of Oberdorf, where trams are driven on sight. Here the driver has full responsibility for stopping the tram if he or she can see obstacles ahead. It will be particularly challenging to implement driverless operation on this section. However, this could serve as a precedent for similar situations on other railways.

The market survey showed that alternative platform security systems, such as the one deployed on the Nuremberg U-Bahn, needs to be analysed because platform screen doors (PSDs), as normally used in metros, cannot be implemented on the Waldenburg Railway given that there is open access to the public. During a visit to Nuremberg, this alternative and very promising solution was analysed in operation and the operator's experiences were integrated into the market survey.

Following a deep analysis of common regulations and standards, contradictions concerning driverless operations were identified. When the AB-EBV regulation is applied to possible future scenarios, it is possible to predict several non-trivial contradictions, especially relating to GoA3 and GoA4.

By law, two train protection systems are allowed in Switzerland: ETCS for standard-gauge lines and ZBMS, a standard developed specifically for narrow-gauge lines based on ETCS components.

As no adaptations to AB-EBV are currently envisaged, the certification of a new, automated system would therefore be based on an exception according to Article 5 of the EBV.

The technical compatibility of both ETCS and ZBMS with the different levels of automation was analysed. ETCS is designed for interoperable, cross-border rail operations and therefore offers more functions than ZBMS, which was developed for metre-gauge railways as ETCS is too expensive for small closed systems. While the first standard-gauge railway is operating with ATO over ETCS Level 2 at GoA2 on a section of the Thameslink line in London, a solution for GoA3 or GoA4 over ETCS does not yet exist. Given the suboptimal cost-benefit ratio and no significant advantages in ETCS-based automation for an isolated system like the Waldenburg Railway, a solution based on ZBMS train protection is more viable.

Following the market survey, four sensor technologies were compared in detail: camera, radar, light detection and ranging (Lidar) and Hall effect sensors. These sensors can increase safety by surveying the areas around the platform and vehicle.

Combining all four sensors in the system will utilise the strengths of these respective technologies most effectively, compensating for any weaknesses in the system and offering sufficient redundancy. Intelligent algorithms are needed to process the data, which, in a later step, require powerful computers and comprehensive long-term testing.

The infrastructure analyses and the findings of the studies of regulations and standards served as input for the safety analysis. Most of the safety requirements for the systems are defined in existing standards for peoplemover systems, including metros, such as EN 62290 and IEC 62267. But their applicability to the Waldenburg Railway is limited. For this reason, the driver tasks defined by the FDV were used to develop corresponding safety requirements for both infrastructure and vehicles.

> "The feasibility study enabled the client to plan a future-orientated investment for the total renewal of the Waldenburg Railway.

The feasibility study enabled the client to plan a future-orientated investment for the total renewal of the Waldenburg Railway, as well as a step-wise and scalable introduction of new technologies to achieve automated operation. The objective is a technically, geographically and chronologically-phased development which involves introducing driverless operation based on ZBMS and the findings of the study. However, these steps still require developments in train protection, platform surveillance systems, sensor technologies and their integration into the overall system.

Thanks to the automotive industry, affordable sensor technology is available that can be adopted and adapted to railway applications to minimise development. However, specific railway requirements, such as train protection and platform surveillance, require bespoke development. In such cases, the main challenge is not the development of the technologies themselves, but rather the development of the appropriate software to integrate systems, and above all, their certification.

Specific measures were defined to achieve step-by-step the geographically-linked GoA levels in four areas of interest. For the first area, the ZBMS train protection system will be further developed and implemented by the Swiss Public Transport Association (VöV). This will ensure a common solution based on one train protection system which will serve as a Swiss standard for all metre-gauge railways.

A quick win was achieved for the vehicle sensors during the feasibility study. The first pilot project began with the aim of certifying an anti-collision

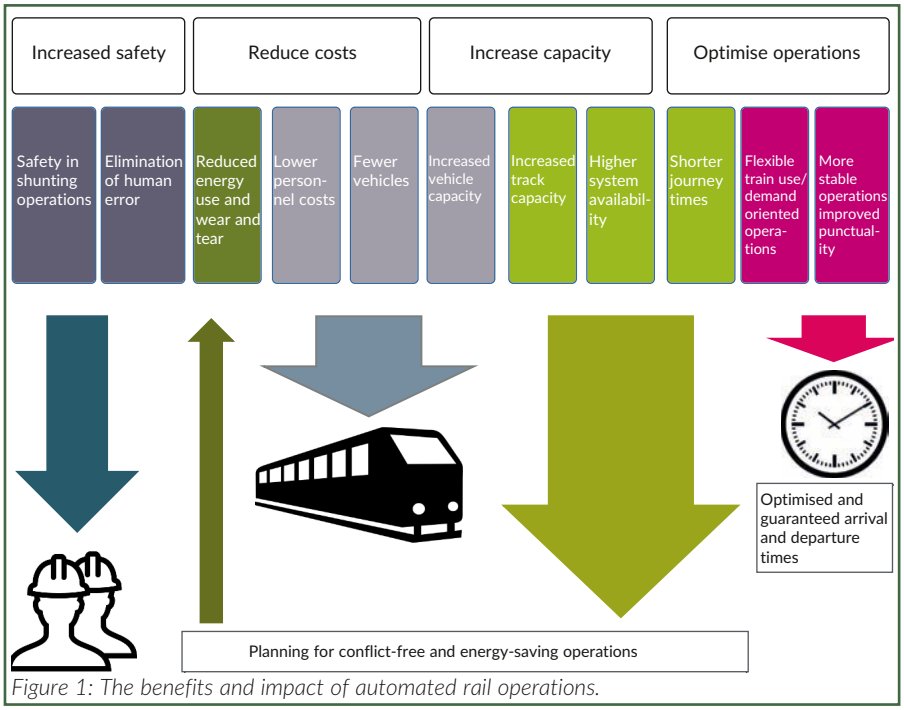
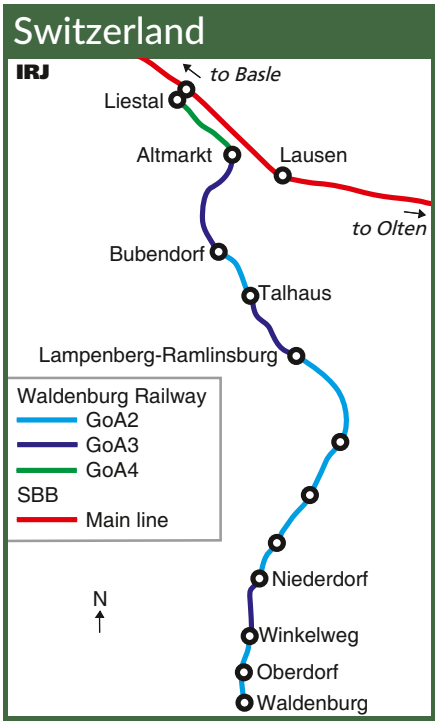


Figure 1: The benefits and impact of automated rail operations.



system that intervenes in the rail vehicle's controls. Further steps in this area include tests and the development of algorithms for sensor integration and certification with similar phases planned for the development and certification of the platform security systems.

The fourth area initially connects the individual systems by integrating vehicle sensors and platform systems and, in a second step, by controlling the unmanned vehicle to achieve GoA4.

This approach offers the advantage of facilitating parallel individual development and therefore the consideration of different drivers throughout the process. To anticipate fast technological development, the measures are bundled into five-year steps with corresponding intermediate goals. All the developments require close collaboration between operators and the industry.

While the goal of the study was to assess the feasibility of automation as part of a complete renewal of the railway with a gradual introduction of innovative technologies, the biggest challenge was to find a technical solution which is acceptable to the safety authorities.

An investigation of train protection systems defined in the Swiss regulation regarding technical compatibility with ATO and the different GoA levels confirmed that automation of the Waldenburg Railway is technically feasible.

An analysis of the operation (FDV) and implementation rules according to the AB-EBV railway regulation also demonstrated non-trivial contradictions. With no adaptations of AB-EBV envisaged, certification of a new, automated system will therefore rely on an exception according to Article 5 of the EBV. Given that the safety requirements for a peoplemover can only be partially implemented on the Waldenburg Railway, the safety requirements were finally deduced from the defined tasks of the driver.

On the other hand, a detailed examination of sensor technology found that the use of a combined sensor package including camera, radar, and light detection and ranging (Lidar) is mandatory not only for GoA3 and GoA4, but also to compensate for system weaknesses while offering sufficient redundancy and an increase in safety. Intelligent algorithms, long-term tests and safety approval certificates will be crucial during implementation.

The findings of the study will pave the way for the development and introduction of ATO based on ZBMS with an appropriate sensor package on light rail lines in Switzerland. **IRJ**

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29-30—London, Britain
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February 2019
3-4—Cairo, Egypt
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⏩ Pyramids, Cairo, Egypt.
www.megaprojectsconf.com/

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⏩ Inter Ads Brooks, Haryana, India.
www.exporailindia.com/english/

20-22—Frankfurt, Germany
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www.irits.org/irs7/

26-27—Dubai, UAE
Middle East Rail Conference & Exhibition
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www.terrapinn.com/exhibition/middle-east-rail/

27-28—Berlin, Germany
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www.arena-international. com/fprs/

March 2019
4-5—Melbourne, Australia
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⏩ Informa, Sydney, Australia.
www.informa.com.au/event/conference/light-rail/

5-7—Bilbao, Spain
Rail Live Congress & Exhibition
⏩ Terrapinn, London, Britain.
http://bit.ly/2COYXyD

19—London, Britain
NEW: Accelerate: Rail Conference
⏩ Marketforce, London, Britain.
https://bit.ly/2zgwAFv

19-20—Hong Kong, Japan
Asia Pacific Rail Conference & Exhibition
⏩ Terrapinn, Singapore.
www.terrapinn.com/exhibition/asia-pacific-rail/index.stm

19-21—Sao Paulo, Brazil
NEW: NT Expo – Business on Rails Exhibition
⏩ UBM, Sao Paulo, Brazil.
www.ntexpo.com.br/en/

20-22—Jakarta, Indonesia
RailWay Tech Indonesia Exhibition & Conference
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www.railwaytech-indonesia.com/

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https://events.railtech.com/europe2019/

26-28—São Paulo, Brazil
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www.ntexpo.com.br/en/

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10-12—Izmir, Turkey
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14-17—Graz, Austria
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www.vdei.de/aktuelles/veranstaltungsuebersicht/icalrepeat.detail/2019/05/22/3024/-/3-iaf-kongress-bahnbau

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Cooperation is the name of the game in Swiss logistics

A combination of rail and road transport is being used in the logistics chain to good effect in Switzerland. **Anitra Green** reports on how operators are innovating and cooperating for their mutual benefit.

ACCORDING to the European Union (EU), a trip of less than 300km for a freight train is not viable. However, this is being challenged in Switzerland, due to the country's topography, its ban on night-time driving for lorries, frequent road congestion and its location as a transit country, with the result that there have been positive developments in intermodal freight in the last few years.

Distribution networks are a case in point. The distribution network of Coop, a major Swiss supermarket chain, is run by its RailCare subsidiary, with 11 hubs in three regions. The City Cargo Geneva train shuttles between the Aclens hub and Geneva three times a day, a distance of only 67km, carrying 680,000 containers a year with supplies for 45 stores. According to Mr Pierre Page, head of customer care and products with Coop, this is more efficient and emits less CO_2 than the alternative of using about 60 lorries a day on a very busy highway.

At Geneva Lancy-Pont Rouge, containers are transferred to lorries for final delivery to supermarkets from 05.00 to 16.00, with empties returned to the same terminal. Boxes are transferred horizontally using the Container-Mover 3020 system. Page says a new generation of refrigerated swapbodies has also been introduced, with the newly developed rCE Powerpack using kinetic energy taken direct from wagon wheels.

Other initiatives are underway in Geneva. Activities at the La Praille intermodal terminal include shunting and train formation, break-bulk, and handling import and domestic traffic, waste and building materials. Though La Praille is well-situated with good rail and road links, the current buildings are outmoded so SBB is planning a new terminal with 380m-long tracks with cranes, a logistics centre and a new road access. This is part of Swiss Federal Railways' (SBB) Step ES 2030-35 Strategic Expansion Programme.

The 66km Geneva - Lausanne main line has the highest rail freight growth rate in the country. It is used by 670 passenger and freight trains a day and this is expected to rise to 800 in the foreseeable future. Work is underway on the Léman 2030 project to upgrade the line. The initiative includes 21 measures, which prioritise freight bottlenecks at Founex, Vufflens and Morges-Denges.

However, track upgrading and maintenance can have an adverse effect on rail freight. Mr Frank Furrer, secretary general of VAP Cargorail, representing around 300 organisations in the loading/logistics industry, refers to the general problem of track maintenance, with most of the work conducted at night, which is when much of the freight moves. "That's just one problem: rates for paths are too high, for example," he adds.

Wagonload

As in other European countries, there has been a significant drop in wagonload traffic in Switzerland. VAP is trying to find a solution by forming a common interest group with the Swiss Public Transport Association (VÖV) and SBB Cargo. VAP wants all involved to work together, including other railway companies and customers. "We must also get rid of outmoded structures," Furrer says. "We are holding workshops, and we are making progress."

The Swiss Road Transport Association (Astag) has a similar attitude. "It is very important to have road and rail," says vice director Mr Andre Kirchhofer. "There are a lot of bottlenecks on the road system, and the rail network is not much better especially at the terminals. But we are open to discussion with all sides with the emphasis on multimodal transport: cooperation is the right way."

An example of a road haulage company already putting this into practice is Camion Transport, which uses lorries only for the first/last mile and carries consignments between terminals overnight by train. "Our success depends on the night-driving ban," says Mr Mathias Lanz, logistics coordinator with Camion.

Mr Hans-Peter Hadorn, president of VÖV's railfreight commission, sums up the situation: "Rail freight connects Switzerland, and it is more eco-friendly than road." For the future, a revision of transport regulations is underway, he reports, with passenger and freight trains having equal priority. The idea is to have at least one path per hour for freight on all lines, and six paths per hour on the Gotthard route with three for passenger trains. The aim is "co-modality" on the basis of non-discriminatory access and a liberalised rail freight sector.

"It's essential that all parties get together to develop a strategy," Hadorn says. "A platform has now been created for this purpose with VÖV, Swiss Cargo Forum, Astag and Economiesuisse, but this cannot be instituted overnight." **IRJ**

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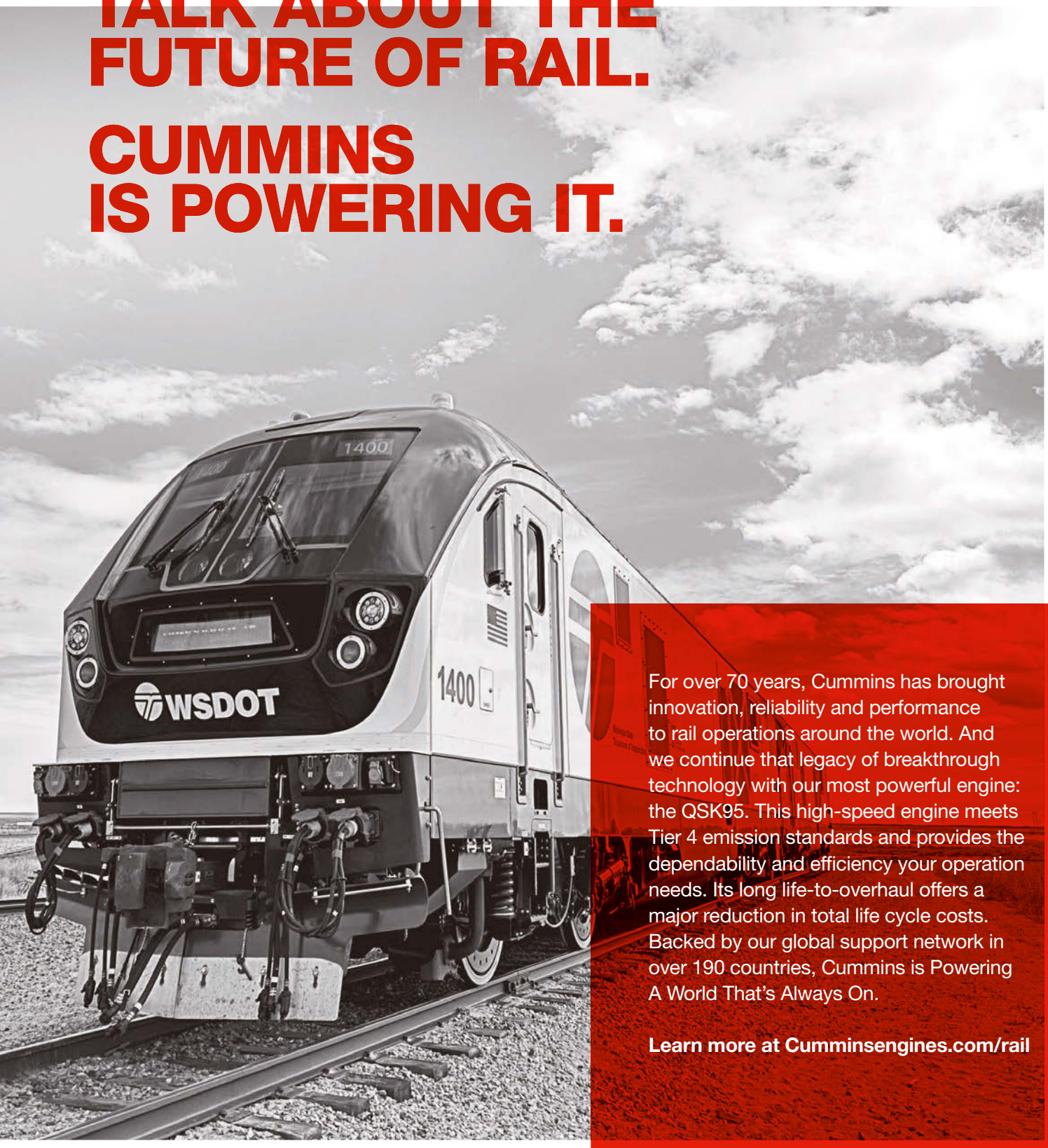

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