# Railtalk Magazine *Xtra*

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# Content



# Submissions & Contributions

Railtalk Magazine Xtra, a magazine written by the Enthusiast for the Enthusiast. So why not join the team. We are always looking for talented photographers and writers to join us at Railtalk. Be it though pictorial submissions or via a written article featuring an event or railtour, we greatly appreciate any contributions to the magazine however big or small.

**Photographic Contributions**

All Photographic contributions should to be sent to us via email, post or via the members section page on our website. Contact addresses are provided above.

All images should be provided at a resolution of at least 2400px x 1700px at 240dpi.


# Welcome to Issue 187Xtra

I can't believe how the months are flying by, and yet it seems like only yesterday it was the new year! Obviously the main rail news this month has been the huge humanitarian aid convoys that various rail companies have carried out in Ukraine and surrounding countries, but also in the longer term thoughts are turning to current and future energy costs and the need for more economic trains. This will I fear lead to yet more decline in older loco types where it replacement is justified on the running cost per mile.

In the news this month, one such replacement is in Hungary where MÁV-START has successfully completed the public procurement procedure for 115 electric locomotives, the company will now conclude a framework agreement with Siemens Mobility. The contract will last for 96 months. The company's fleet of 40-year-old traction vehicles are now able to be renewed. Thanks to this development, it will be possible for the railway company to procure modern vehicles that also better meet environmental requirements. Each new class 471 locomotive will cost €3.49 million for the dual-voltage units and €4.07 million for the triple-voltage units. With the new high-performance locomotives, it will primarily replace the obsolete V43 series electric locomotives with a maximum speed of 120km/h. The new vehicles will be able to reach speeds of 200km/h and be more energy efficient. The new electric locomotives will be used mainly for the renewal of the IC service and the expansion of the IC+ service.

MÁV-START called for tenders for a framework contract in January 2020, with both Bombardier and Siemens bidding for the contract. Siemens submitted a more favourable final bid, offering a general warranty of 24 months, alongside an anti-corrosion warrant that will last for 14 years and a paint warrant that will last for eight years.

Also this month it is always good to see more freight taking to rail and LTG Cargo, the freight branch of Lietuvos Geležinkeliai (LTG) Group, has launched intermodal freight transportation to Duisburg in Germany to further pursue its diversification goals. The new freight transportation route will open up an opportunity for customers to access by rail one of Europe's most important industrial hubs and the world's largest inland waterway port. The first regular train from Kaunas Intermodal Terminal (KIT) to Duisburg will leave on April 4th. This is the first international freight route to the West to be served by LTG Group companies in three different countries.

"Now we are actively working to offer the market as many opportunities as possible for rail connections with the West," Eglė Šimė, CEO of LTG Cargo, said. "Upon reaching Duisburg Intermodal Terminal, opportunities will be open to customers to further transport semi-trailers and containers by rail to other terminals. Direct trains from Duisburg run regularly to terminals in Germany, Italy, Poland, Belgium, the Netherlands, and Sweden. In addition, there is a possibility of rail links with France or even Great Britain."

LTG Cargo team will provide transportation services in Lithuania, whilst transport operations will be carried out by LTG Cargo Polska in Poland and Germany, a subsidiary of LTG Cargo. The progress achieved over the last year and the successful operation of the subsidiary in Poland will enable to offer our customers a more sustainable and cost-effective way of transporting freight to and from Central Europe. Freight transportation will be organised using the capacities of the companies, i.e., by taking ownership of all logistics solutions needed. The new route KIT-Duisburg-KIT will be 3,040 km long. The train will run three times a week in both directions and will be able to carry up to 36 semi-trailers and containers with multiple goods per journey. In the coming months, the company also intends to establish cooperation with new customers in Poland and seek ways to help Lithuanian businesses import raw materials from Central European countries.

As always a massive thanks for all the excellent photos, please do keep sending them in, until next month....

**David**

## This Page

ZSSK Goggle Class 757.009 runs into Fiľakovo station on March 22nd at the head of train No. RR917 'Gemeran' 11:13 Zvolen Os St - Košice. Engineering work will see the train replaced by a bus from Moldava nad Bodvou to it's destination. *Andy Pratt*

## Front Cover

In Denmark, locos Nos. MX1029 and CFLCD1831 working a freight train pass Kolding on March 3rd.

*Thomas Niederl*

One of the new (well they were just before Covid) Indian built M11s which are a 12 cylinder version of their WDP4 locos, No. 953 passes Wellawata in the Colombo suburbs with the stock for a popular commuter train from Mount Lavinia to Polgahawela Jct. on February 11th. *Mark Torkington*


# Terms & Conditions



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# With Thanks

Once again many thanks to the many people who have contributed, it really makes our task of putting this magazine together a joy when we see so many great photos.

These issues wouldn't be possible without: Ray Anslow, Brian Battersby, Mark Bearton, Mark Bennett, Tim Blazey, Rob Boyce, Keith Chapman, Julian Churchill, Nick Clemson, Derek Elston, Mark Enderby, Tim Farmer, Dave Felton, FrontCompVids, Colin Gildersleve, Paul Godding, Richard Hargreaves, Jim Haywood, Keith Hookham, Colin Irwin, John Johnson, Anton Kendall, Mathijs Kok, Jyrki Lastunen, Ken Livermore, Michael Lynam, Peter Marsden, Phil Martin, Thomas Niederl, Peter Norrell, Chris Perkins, Mark Pichowicz, David Pollock, Andy Pratt, Andre Pronk, Paul Quinlan, Railwaymedia, Alan Rigby, Bryan Roberts, Neil Scarlett, John Sloane, Stephen Simpson, Laurence Sly, Stewart Smith, Steamsounds, Steve Stepney, Mark Torkington, Gerard van Vliet and Erik de Zeeuw.

# Czech Republic

CD Goggle No. 754.043 with train No. Os9511 is seen at Světlá nad Sázavou on February 28th. *Gerard van Vliet*

# Czech Republic

CD Goggle No. 754.031 awaits departure time at Praha hl.n. on March 20th with train No. Os9055, the 08:25 to Čerčany.
*Andy Pratt*

# Czech Republic

No. M262.1162, owned by KŽC, awaits departure time at Praha hl.n. on March 20th with train No. Os7750, the 08:42 to Praha Zličin while a ČD owned RegioNova awaits it's next working on the adjacent platform. The train runs every Saturday and Sunday throughout the year and Prague area transport tickets are valid on it. *Andy Pratt*

# Czech Republic

Class 380.001 stands in the morning sun at Praha hl.n. on March 20th having recently arrived with train No. IC574 Metropol, the 05:07 from Břeclav which conveys sleeping coaches from Budapest. *Andy Pratt*

# Czech Republic

Class 750.702 runs into Branna station in charge of train No. Sp1406, the 13:01 Jesenik to Zabřeh na Morave on March 20th. At Zabřeh the coaches will be added to the 14:09 departure from Šumperk and the train will go forward as train No. R906 to Brno hl.n. *Andy Pratt*

# Czech Republic

ČD Class 380.002 with EuroCity train No. EC279 Praha hl.n. - Budapest-Nyugati pu heads through Světlá nad Sázavou on February 28th. *Gerard van Vliet*

Czech Republic

# Further help to Ukraine

Czech Railways, ČD Cargo and Česká pošta (Czech Post) have jointly dispatched another humanitarian train with help for the war-torn Ukraine. It arrived at Chop, Ukraine, on March 16th.

The train transported 84 tonnes of material humanitarian aid which was collected thanks to human solidarity at 63 Czech Railways' collection points at railway stations throughout the Czech Republic as part of internal humanitarian collection between the employees of the Czech Railways Group and the Ministry of Transport of the Czech Republic. The humanitarian aid of Caritas alone has filled in two special parcel wagons which can also be loaded with goods on pallets.

The train had a total of 9 cars of which three belong to Czech Railways and six to Česká pošta and which are designed for the transport of packages or goods on pallets. The train was hauled by a locomotive of ČD Cargo which also provided the transport in Slovakia.

Photo: ©CD Cargo

Czech Republic

# Siemens Mobility receives major order for locomotives and service from Czech Railways


**Delivery of 50 Vectron MS including full service for fifteen years**
**First Vectron with an operating speed of 230 km/h**
**Delivery from December 2025**

Czech Railways has ordered fifty Vectron MS multisystem locomotives from Siemens Mobility. The contract also includes service for fifteen years. With a maximum operating speed of 230 km/h, the locomotives are suitable for operations on conventional as well as high-speed lines in fast cross-border passenger traffic. Delivery will start from December 2025.

“We are delighted about the trust placed in us by Czech Railways and our biggest Vectron order to date from the Czech Republic. For the first time, our locomotives are also suitable for service on high-speed lines with a top speed of 230 km/h. Czech Railways will thus be ideally equipped for providing flexible, sustainable and cross-border rail transport. With the additional service contract, we will also guarantee the operational availability of the locomotives,” said Michael Peter, CEO of Siemens Mobility.

“We have very good experience with Vectron locomotives from Siemens. We currently operate 18 locomotives, and others are used by our subsidiary ČD Cargo. We believe this next generation of Vectrons with a maximum speed of 230 km/h will earn equally positive references. We will deploy them together with 20 ComfortJet non-traction trainsets and they can also run with our Czech Railjets,” said Michal Kraus, Vice-Chairman of the Board of Directors of ČD and Deputy Director General for Maintenance.

The locomotives for Czech Railways will be manufactured at the Siemens Mobility plant in Munich-Allach. They incorporate the globally proven Siemens ETCS on board unit solution Trainguard 100/200/300 and are equipped for operation in the Czech Republic, Germany, Austria, Poland, Slovakia and Hungary. Czech Railways plans to operate the locomotives on the Prague – Hamburg, Prague – Vienna – Graz, and Prague – Budapest lines. Vectron locomotives are the most modern locomotives for passenger transport in Europe and ensure the greatest flexibility thanks to an extensive portfolio of country homologations.

Siemens Mobility has already sold 1,327 Vectron locomotives to 61 customers. The locomotives have covered more than 500 million kilometres to date and are currently approved for operation in Austria, Belgium, Bulgaria, Croatia, the Czech Republic, Denmark, Finland, Germany, Hungary, Italy, the Netherlands, Norway, Poland, Romania, Serbia, Slovakia, Slovenia, Sweden, Switzerland and Turkey.

# Czech Republic

ŽSSK locomotive Class 350.020 with train No. EC126 Púchov - Praha calls at Česká Třebová station on February 23rd.
*Gerard van Vliet*

# Czech Republic

ČD Cargo locomotive Class 130.027, repainted in a heritage livery and carrying the original number E479.0027, hauling a train of self unloading hopper wagons, is seen at Česká Třebová. *Gerard van Vliet*

# Denmark

DSB diesel unit No. MF5043 working train No. IC124 passes Horsens on March 4th. *Thomas Niederl*

# Denmark

DSB EMU No. ER2105 working train No. IC843 passes Kolding on March 3rd. *Thomas Niederl*

DB No. EG3108 working a freight service passes Kolding on March 3rd. *Thomas Niederl*

# Denmark

On March 4th. diesel unit No. MF5207 working train No. IC4140 passes Hobro. *Thomas Niederl*

DSB DMU's Nos. MF5018 and MF5042 working service No. Lyn 4039 are seen at Aalborg on March 4th. *Thomas Niederl*

# Denmark

A DSB MG5xxx service unit working train No. IC4123 is seen at Randers on March 5th. *Thomas Niederl*

# Denmark

On a private operated railway in Northern Jutland (Nordjyske Jernbane) unit No. DM505 working train No. L142146 is seen at Skagen on March 5th. *Thomas Niederl*

Letbane tram No. 1212 working a L2 service to Aarhus H is seen at Skolebakken on March 6th. *Thomas Niederl*

Germany

# Rail aid link to Ukraine begins operating

Deutsche Bahn has set up a logistics network that uses road and rail to transport aid supplies from Germany to Ukraine. This will bring thousands of tonnes of food, drinking water and sanitary products directly into the country by lorry and freight train. The logistics teams at DB Cargo, DB Schenker and DB Transa Spedition are working together so they can use lorries to collect items donated in Germany, load them into containers and transport them across the border to Ukraine on board freight trains operating on DB Cargo's European rail network.

The DB Cargo and DB Schenker Rail aid link is picking up speed. The first train carrying relief supplies for the people of Ukraine set off from Seddin shunting yard near Berlin on early morning March 11th. The train was loaded with 15 containers. The cargo includes sleeping bags, sleeping mats, nappies, tinned food, drinking water, warm clothing and baby food, but also medical products such as syringes, plasters, gauze bandages and cannulas. This way, a total of 350 tonnes of relief supplies will be brought to Ukraine.

"Rail provides a stable connection to Ukraine. Today we are starting to help quickly – with what is needed most. A stable connection and experience in logistics processes are important here so that we can help reliably," says Sigrid Nikutta, Member of the Management Board for Freight Transport at Deutsche Bahn and CEO of DB Cargo.

Jochen Thewes, CEO of DB Schenker: "Logistics gets things where they are needed, especially in times of crisis. With DB's rail aid link, we are ensuring that the huge international willingness to help also reaches the people in Ukraine."

**DB uses existing freight transport network**

This work has been made possible thanks to joint efforts between DB Cargo's Polish subsidiary and the Ukrainian railway, as well as with DB Schenker's local teams in Poland. This logistics network also accepts small donations. Over the next few days, collection points will open at various Schenker sites around Germany to accept humanitarian aid supplies that are urgently needed in Ukraine. Supported by helpers from the German Federal Agency for Technical Relief (THW), the items will be pre-sorted and professionally packed into containers. DB will make an announcement as soon as the final details have been clarified regarding opening hours and locations.

Since March 2nd, lorries have been going to Ukraine loaded with dry foods and hygiene products from wholesalers and food companies in Mannheim and the Rhine-Main area. DB are currently organising more consignments that will soon begin the journey to Ukraine by container train. This freight network is still open to receiving items – large donors in particular can call DB Schenker and DB Cargo who have assembled an impromptu sales team to assist people who want to make donations.

**"We will not abandon people suffering in Ukraine."**

"Our colleagues tell us that the road infrastructure and border crossings between Poland and Ukraine are completely overloaded and there is a shortage of truckers to go to Ukraine. Freight trains are getting through, though. A single train can transport up to 52 containers and so bring urgently needed supplies to terminals in the east and west of Ukraine that are still functioning," said Sigrid Nikutta, Member of the Management Board for Freight Transport at Deutsche Bahn and CEO of DB Cargo. "Never has a freight train been dispatched with more solidarity and love. We will not abandon the people of Ukraine when they are suffering."

Jochen Thewes, CEO of DB Schenker said "Now is the time for action instead of a lot of words. At DB Schenker, we see ourselves as one global family. If someone in this family needs help, we are there for them. Our strong European logistics network is helping us to supply Ukraine with aid items quickly and easily. On rail and road and in our warehouses, we are sending a signal: that logistics, peace and freedom know no borders."

Photo: ©DB Cargo AG

Due to the collapse of Abellio, the service between Essen Hbf and Hagen Hbf on line RB40 is now performed by TRI Class 182.560 with 4 N-cars. In this livery, the locomotive's livery pays attention to the fall of 'The Wall' and the 'Wiedervereinigung' of the two Germany's as it passes Wetter on February 23rd. *Erik de Zeeuw*

On February 23rd, Brohltal Eisenbahn Class 218.396 is seen near Kaarst and on its way from Spellen to 'Aleris Rolled Products Germany' Koblenz with Res cars, loaded with alu blocks & empty Eanos cars.. *Erik de Zeeuw*

Alex Class 223.070 is ready to depart Schwandorf on March 19th with train No. ALX359 ‘Západní Expres’, the 12:43 München Hbf - Praha hl.n. This train goes through 4 different engines on it’s 6 hour journey: an Alex Class 183 to Regensburg, an Alex Class 223 from Regensburg to Schwandorf, a different Alex Class 223 from Schwandorf to Plzeň and finally a ČD Class 362 into Praha. *Andy Pratt*

Due to the collapse of Abellio GmbH, the service between Gelsenkirchen Hbf and Bochum Hbf on line RB46 'Glückauf-Bahn' is performed by Wedler Franz Logistik Class 112.024 and a 'WiKo' driving car, seen passing Bochum-Riemke on February 23rd. *Erik de Zeeuw*

On February 23rd, DB Class 187.132 heads through the Oberhausen West Yard with Sgmmnns & Zans cars heading towards Köln-Gremberg. *Erik de Zeeuw*

Germany

# First hydrogen-powered train for Bavaria

The first hydrogen-powered train for Bavaria is taking form. On March 15th, representatives of Siemens Mobility and Bayerische Regiobahn (BRB) signed a leasing contract for the innovative prototype in the presence of Bavaria's Economic Affairs Minister Hubert Aiwanger and Bavaria's Transport Minister Christian Bernreiter. The contract is a follow-up to the letter of intent signed by all the participants in July 2021. The two-car hydrogen-powered trainset of the latest generation will be presented to the public in the spring of 2022. The train will be tested on the Augsburg-Füssen route, among others, beginning in mid-2023. Pilot operations in the rail network of Bayerische Regiobahn (BRB) are initially planned for 30 months. The train is expected to officially enter passenger service as of January 2024.

Bavaria's Economic Affairs Minister Hubert Aiwanger said: "Green hydrogen is becoming a key pillar for comprehensive climate protection in the areas of transportation, industry and energy. As Minister of Economic Affairs and Energy, I am pleased that our Bavarian Hydrogen Strategy can increasingly address concrete issues. This train is an important part of this strategy towards a "transport turnaround" with hydrogen, which is why we are promoting this project. I am convinced that with green hydrogen propulsions we can significantly reduce pollutant emissions in heavy-duty and rail transport and contribute to decarbonization. The one-sided dependence on energy supplies can also be reduced and spread across many regions of the world."

Bavaria's Transport Minister Christian Bernreiter explained: "I'm really pleased that we'll soon be able to introduce this innovative technology in Bavaria and test it in regular operation. We're working closely with our partners to get this lighthouse project under way because we're convinced hydrogen propulsion can also contribute to attractive and even climate-neutral passenger rail transport. Our goal is to achieve this by 2040 at the latest. Bavaria's support of the pilot project with funding of several million euros is more than well-invested."

Albrecht Neumann, CEO Rolling Stock, Siemens Mobility: "Our Mireo Plus H is the latest-generation hydrogen-powered train. It features high driving power, excellent acceleration capability and a large operating range. This will make rail transport faster, more efficient, eco-friendlier, and more comfortable. The hydrogen-powered drive is an emission-free, advanced form of propulsion for trains that decarbonizes rail transport and makes a substantial contribution toward reaching our climate goals."

Arnulf Schuchmann, Managing Director of Bayerische Regiobahn, said: "Bayerische Regiobahn sees itself as a reliable mobility partner for the Bavarian public and would like to provide them with climate-friendly service day after day. We're also thinking of the future and are happy to be helping set the course for tomorrow's mobility today. Notwithstanding all the effort associated with the project, we are very much looking forward to the test operations in our rail network and the know-how we gain for using hydrogen technology in the rail sector. Together with the Transdev Group, to which we belong, and our entire on-site team, we will prepare the project in the best possible way in order to ensure a smooth test start next year."

The hydrogen-powered train is being developed on the basis of the Mireo Plus platform from Siemens Mobility. The main component of the hydrogen traction drive are roof-mounted fuel cells. The system includes the latest generation of underfloor batteries supplied by the battery specialist Saft. The hydrogen-powered train adapts the successful Mireo regional train platform that is available as a battery-powered version as well as with a conventional electric drive. The development of alternative drives for use in rail transport is part of Siemens Mobility's overall sustainability drive. The company is a pioneer in the field of sustainable mobility.

# Toyota opts for rail

DB Cargo UK and French company Groupe CAT, Europe's leading vehicle logistics provider, have launched a joint service for Toyota Motor Europe to transport cars from Toton in the East Midlands to Valenciennes in northern France. This was preceded by the construction of a new transhipment terminal at the Toton site by DB Cargo UK and the procurement of a new fleet of special wagons by STVA, Groupe CAT's British subsidiary. Following a series of successful test runs, fully loaded block trains have been running between the two sites twice a week since the end of February 2022. On the outward run, the new generation of Corolla Hybrids produced at Toyota's Burnaston plant are exported to France. On the way back, cars like the Toyota Aygo, the Yaris and the new Yaris+ are imported from the Czech Republic and France to the UK to ensure the route is fully utilised.

**"Freight belongs on the rails"**
For Roger Neary, Chief Sales Officer at DB Cargo UK, the realisation of this project is a major milestone that follows months of teamwork by everyone involved. "Freight belongs on the rails, and this new service is the outcome of a successful partnership with DB Cargo UK, Groupe CAT and Toyota UK," Neary says. It used to take five days to transport the vehicles by road. The journey by freight train takes just 24 hours and also cuts CO2 emissions by 2,300 tonnes per year, since a single train can transport the same number of vehicles as 23 lorries. DB Cargo UK has also breathed new life into a previously unused area at the Toton site. Marie Hill, who is responsible for transformation and digitalisation at DB Cargo UK, sees the modernisation of the Toton rail hub as "a strategic win for us, as it meets all our growth and sustainability targets such as shifting traffic to rail, providing value-added logistics services and creating European corridors."

**An important step on Toyota's path to carbon neutrality**
Leon van der Merwe, Vice President Supply Chain at Toyota Motor Europe, sees the new route as a vital milestone in Toyota's sustainability strategy: "As a company, we are committed to progressing steadily towards carbon neutrality. Part of this is looking for ways to reduce the emissions from our vehicle production, vehicle use and vehicle logistics," says van der Merwe. "By embracing this new opportunity to use multimodal rail freight, we have found a more sustainable way to transport the low-emission hybrid electric vehicles built at our UK plant in Burnaston to our customers."

Toyota is always working to ensure its global logistics network is carbon neutral. The latest part of this effort: the company has begun transporting vehicles by rail from Toton in the UK to northern France

For Steve Reynolds, STVA Managing Director, the new transhipment terminal is the tangible outcome of four years of work. "To carry out this project we signed a long-term lease with DB Cargo UK for the rail terminal at Toton, and we invested more than GBP 3 million (EUR 3.4 million) to upgrade our wagons." Roger Neary is also confident that close cooperation was the crucial factor enabling the creation of such a modern logistics solution: "It's a win-win situation for everyone involved, since together we have put in place an efficient and environmentally friendly rail logistics solution for one of the largest car manufacturers in the world."

**Over 800 metres of new track laid**
DB Cargo UK's GBP 2.6 million (EUR 3.1 million) investment in the Toton site included the construction of a new transhipment terminal with corresponding facilities for loading and unloading. More than 800 metres of new tracks were laid and 1,100 metres of road were either rebuilt or widened to ensure first and last mile transport by lorry from the Toyota plant in Burnaston to the CT terminal in Toton. In addition, eight kilometres of white lines were painted on the asphalt, and several kilometres of cables were laid to install the necessary video monitoring and lighting on site.

On March 8th, ÖBB Class 1116.142 passes Kaarst with a rake of Zacns tankers on their way from Dormagen to Rheinkamp. *Erik de Zeeuw*

Germany

# Deutsche Bahn wants to be in the black again in 2022

Deutsche Bahn (DB) has seen double-digit sales growth, surpassing the pre-crisis year of 2019. Group sales in the 2021 financial year increased by 18.4 percent year-on-year to EUR 47.3 billion. In the current year, DB wants to be operational again in the black. The balance sheet for 2021, on the other hand, still shows an operating loss (adjusted EBIT) of EUR 1.6 billion due to the pandemic. Compared to the previous year, however, the minus decreased significantly (2020: minus 2.9 billion euros). The annual result including extraordinary effects, interest and taxes improved even more significantly by almost five billion euros to minus 900 million euros (2020: minus 5.7 billion euros).

More passengers travelled on DB long-distance trains in 2021 than in the previous year. In Deutsche Bahn's core business, sales increased overall, with DB Cargo also picking up again. The logistics subsidiary DB Schenker showed the biggest upward trend. With plus 1.2 billion euros, it achieved the best operating result in its history and stabilized the group financially. Despite the pandemic, DB invested more than ever before - for more rail traffic, better offers for customers and climate-friendly growth.

"The railway is needed more than ever. Every passenger and every freight train helps protect the climate," said DB CEO Dr. Richard Lutz in Berlin. The second year of the pandemic has shown: "People want to take the train. Companies want to shift more traffic to rail and politicians want to continue to support this path consistently. All of this confirms our strong rail strategy," says Lutz. The positive trend continues: At the beginning of 2022, DB transported more passengers and goods than in the same period of the previous year.

Deutsche Bahn stands for a "peaceful, free and democratic Europe," said DB boss Lutz. Since the outbreak of war in the Ukraine, she has been making concrete contributions to alleviate the suffering of those affected with the largest aid campaign in the history of DB. This included the transport of aid supplies over a "rail bridge" to Ukraine, as well as special trains, additional buses and free tickets for refugees.

DB continued to expand its fleet in 2021 and further expanded the long-distance service - including a half-hourly service between Hamburg and Berlin. Around 82 million travellers used DB long-distance trains in 2021 (2020: around 81 million). At the beginning of 2020, two months without a pandemic and with passenger records were included in the comparative figures. From March to December 2021, around 30 percent more people traveled in DB long-distance transport than in the same period last year.

**Demand for the railway is increasing again**

DB Regio delivered stable operating performance. DB local transport also has full order books: As of December 31, 2021, the order backlog was 10.5 percent above the previous year with a volume of around 93.6 billion euros and is higher than before the pandemic. The European local transport subsidiary DB Arriva transported almost eleven percent more travellers in 2021 and was able to significantly reduce its operating loss.

Demand in rail freight transport has picked up. In 2021, DB Cargo increased transported volumes by 6.3 percent and transport performance by 7.9 percent compared to the previous year. Operating performance on DB's rail network increased by around four percent to 1.1 billion train-path kilometres.

**More construction for rail traffic**

Punctuality in rail passenger transport fell by a total of 1.4 percentage points to 93.8 percent. 75.2 percent of long-distance trains reached their destination on time (2020: 81.8 percent). Special events such as the flood disaster and strikes by the train drivers' union GDL had a negative impact. A lack of capacity in the rail network and more construction sites will remain the greatest challenges in the coming years. In order to eliminate bottlenecks, expand and digitize the network, DB is investing and modernizing more than ever before. "We have to build more for more rail traffic," says DB boss Lutz.

The logistics subsidiary DB Schenker has once again developed extremely successfully in unstable times and has ensured stable supply chains worldwide. In doing so, it strengthened its range of climate-friendly transports with bio-fuels. "Schenker is pleased to mark its 150th company anniversary with very good results: record sales of over 23 billion euros, record profits - and a forward-looking strategy with which DB Schenker will continue to improve its competitive position," said DB CFO Dr. Levin Holle.

Despite the pandemic, DB increased its investments again. Gross investments grew last year by 6.8 percent to around 15.4 billion euros - a new high. Net investments climbed 7.7 percent to around 6.3 billion euros. Around 95 percent of gross investments flow into the core railway business. Despite high investments as of December 31, 2021, net financial debt was slightly below the previous year at EUR 29.1 billion.

As agreed with the federal government, DB will compensate for half of the corona damage in its core business itself by 2024. In 2021, DB saved more than one billion euros in material and personnel costs. "We want to be operationally in the black again from 2022. That is an ambitious but achievable goal," says Holle.

DB expects to generate a positive operating result in the current financial year. Sales are expected to increase to over 48 billion euros in 2022. All forecasts are subject to great uncertainty, among other things due to the unforeseeable effects of the Ukraine war.

Germany

# Modular, flexible, fast - the new generation of freight cars is ready for series production

A new type of freight car will ensure more freight on the climate-friendly rail. In a research community, DB Cargo and VTG developed the modular $m^2$ wagon (pronounced “m-square”) and have now received the go-ahead for series production. The wagon makes rail freight transport significantly more economical and flexible - and it has the potential to become the new backbone of the large wagon fleets in the industry. Finally, a single freight car can be quickly reconfigured and reconfigured in any length, purpose and structure for very different loads. To date, the approval of a wagon has been tied to a specific type of load and cannot be changed later.

Conventional freight wagons are given a “lifetime” purpose when they are registered. This restriction no longer applies with the newly developed $m^2$ trolley. They are adaptable to different goods. This is made possible by the modular structure. Detachable containers and attachments may vary, as may length. For example, thanks to the modular system, a cart for large tree trunks can also transport moisture-sensitive cellulose and paper rolls if required. The wagon for brand-new steel coils from the steelworks can also be used as scrap and allows climate-friendly and very economical circular transport. Depending on the application scenario, the change takes a maximum of one day, sometimes even just minutes. Some time ago, the European Union Agency for Railways (ERA) gave the go-ahead for the project and granted DB Cargo approval for the single-wagon wagon.

Since then, DB Cargo has been driving the market launch and will rely on the innovative freight car system for new and replacement purchases. This could also save resources in the wagon fleet in the long term: DB Cargo currently has around 63,000 freight wagons in Germany alone.
The multifunctional and modular freight wagon was developed in a research partnership between DB Cargo and the wagon hire and rail logistics company VTG.

“The approval of a freight car as a complete and flexible system is a real milestone. Above all, our customers benefit from this – and ultimately the climate. Because we can put more goods on the rails faster and make better use of our trains. The first wagons are being tested by customers - and we are delighted with the overwhelmingly positive response,” says Pierre Timmermans, Member of the Board of Management for Sales at DB Cargo.

Sven Wellbrock, Chief Operating Officer Europe & Chief Safety Officer at VTG AG says: “The $m^2$ modular system precisely addresses the individual needs of the shipping industry. Together with digitization, modularization in rail freight transport opens up new worlds and increases fleet availability for customers. This makes rail significantly more attractive.”

Funded by the federal program “Future Rail Freight Transport”, DB Cargo is currently successively launching a pre-series of 50 freight cars for different types of goods on the market. To this end, DB Cargo has brought customers and cooperation partners on board who are helping to shape the freight wagons of the future right from the start, while keeping an eye on the specific requirements of their industries. DB Cargo is already using the new freight car systems in the first customer traffic. Depending on the application, the wagons can be configured with a loading length of between around 10 and over 22 meters. The selection of components such as bogies, wheel sets or brakes (block or disc brakes) is also variable. This allows the trolleys to be adapted to customer needs, such as weight, mileage or costs.

# New biofuel for the climate at DB Cargo


This fuel helps the climate: In the future, diesel and shunting locomotives from DB Cargo will be able to travel the last mile of supply chains without CO2 emissions using fuel produced in a climate-neutral manner. With so-called HVO fuel, DB Cargo’s diesel locomotive fleet can be operated without any reduction in performance, as extensive test series have now shown. With these biofuels, end-to-end climate-neutral supply chains are possible for DB Cargo customers.

Even today, every freight train saves our planet around 80 to 100 percent CO2 compared to road transport. DB Cargo, Europe’s largest rail freight company, generates around 95 percent of its traction power electrically. The remaining train performance is provided during shunting, in terminals and ports or when delivering freight wagons to the DB Cargo customer’s premises. There is now an almost completely CO2-free solution for this shunting service with freight trains weighing up to 3,000 tons.

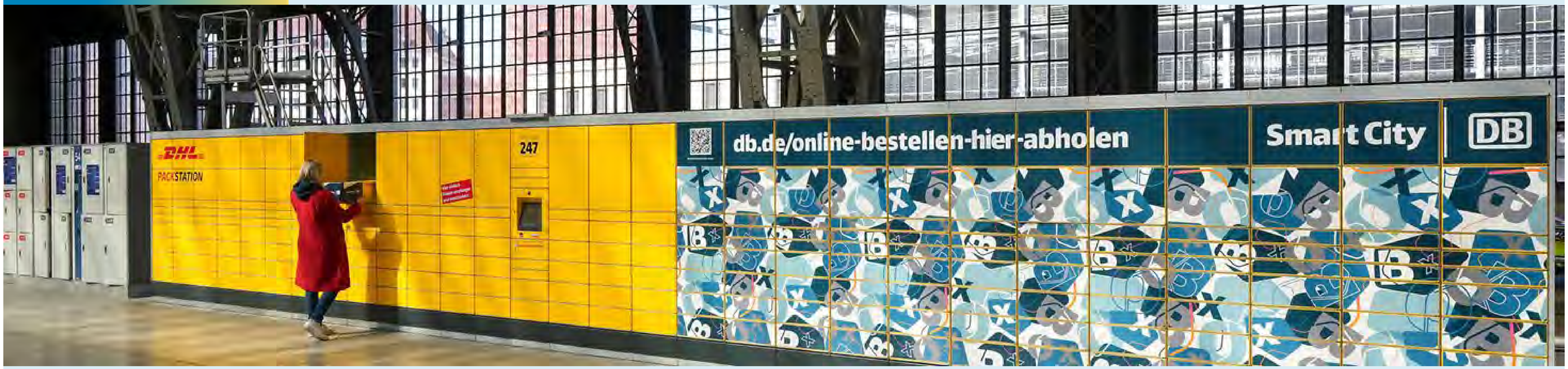
Dr Sigrid Nikutta, DB Board Member for Freight Transport: “We have managed to square the circle - we can easily run freight trains for our customers with alternative fuels and the existing locomotive fleet in a completely CO2-neutral manner. At the same time, we are investing in new technologies and will convert the diesel locomotives to hybrid technology. We can therefore offer our customers tailor-made, climate-friendly supply chains - and ultimately organize the added value ‘Made in Germany’ in a climate-neutral manner. Many customers have already signaled to us that this is exactly what they are waiting for: sustainability – this is the new currency in logistics, and we are literally creating it down to the last meter of the supply chain!”

Michael Theurer, Parliamentary State Secretary of the Federal Ministry for Digital Affairs and Transport: “The fact that we can make the existing fleet CO2-free with this new biofuel is another important step towards climate-neutral rail. The climate-neutral supply chain is becoming increasingly important for many companies and their customers. This is a great opportunity for rail, which must now be seized. It is an important energy policy signal, especially in these times when we urgently need to reduce our dependence on fossil fuels.”

Background of HVO fuel: Even older, proven locomotives work without restrictions with alternative fuels, without any complex conversion. The focus is on biofuels, such as the so-called hydrotreated vegetable oil (HVO). This fuel is made from biological residues and waste. No additional cultivation areas are used for the production, which are in competition with the food and feed products. The biofuel is also free of palm oil. During combustion in the engine, only the amount of CO2 that was previously extracted from the atmosphere during the growth of the plants is released.

Germany

# Picking up and sending parcels at the most central location in the city: Deutsche Post DHL and DB are starting a partnership for packing stations




**Travellers and train station visitors save time and distance • Convenient and sustainable service for flexible receipt and dispatch of parcels • First Packstation of the new cooperation between DHL and Smart City | DB officially opened in Leipzig Central Station • First Click & Collect service for online shops and retailers from the end of 2022**

The Deutsche Post DHL Group (DHL) and Deutsche Bahn (DB) are improving the range of services at the train station and making it easier to pick up and send parcels: As part of a new cooperation, both companies are providing their customers with around 800 additional DHL Packstations at train stations throughout Germany available. The majority of the machines are scheduled to be connected to the network before the end of this year. This was announced recently by Bernd Koch, CEO of DB Station & Service AG, and Holger Bartels, who is responsible for the entire branch and Packstation network in the postal and parcel division of Deutsche Post DHL. Together they presented the first DHL Packstation of the new cooperation at Leipzig Central Station. Up to 135,000 travellers who travel there every day benefit from the service.

Bernd Koch: “Train stations as central hubs in the middle of the city are ideal locations for the new packing stations. With the new Click & Collect service ‘Box – The pick-up station’ we are making our stations even more attractive for our guests. Our customers can conveniently receive multi-supplier shipments on their daily routes, thereby saving time and travel. Our clear goal: With modern train stations and innovative services, we can help travelers choose the climate-friendly train as a mode of transport even more often.”

Holger Bartels explains: “Many millions of people in Germany use the Packstation and appreciate this flexible service for sending and receiving their parcels around the clock. And the more packing stations that are within walking distance or at the transition to local and long-distance transport, the better it is for the sustainability of our service. We are therefore pleased to be able to provide our customers with hundreds of additional Packstations at attractive and central locations through the new cooperation.” Even today, there are already a few regional Packstations at train stations with which both partners have had good experiences. This cooperation will be further intensified with immediate effect.

The new Packstation in Leipzig Central Station is located on the upper floor of the station, directly at the entrance to the S-Bahn station in the city tunnel. With 241 compartments, it is one of the largest machines in Germany for conveniently receiving and sending parcels.

The Deutsche Post DHL Group announced last year that it would increase the number of currently more than 9,000 Packstations to around 15,000 machines by the end of 2023. The DHL Packstation is very popular with customers because it is accessible 24/7 and easy to use. In addition, Packstations are usually located in central places of everyday life, such as supermarkets, on company premises or in residential areas, so that customers can combine receiving and sending parcels with their everyday tasks without detours.

**Online shops and retailers can deliver to the Packstation with a new service for the first time**

From the end of 2022, customers will be able to pick up or return goods ordered from a wide variety of providers at the train station, regardless of delivery and opening hours. Because the Smart City | DB launches a new Click & Collect service. This means that online shops and retailers can deliver to a part of the Packstation independently of the delivery company for the first time. Deutsche Post DHL provides DB with up to a third of the compartment capacity at the respective machines. The new service is easily recognizable thanks to the new co-branding of the Packstations.

smart city | DB is working on solutions for a sustainable city and wants to make everyday life easier for travellers and city dwellers with intelligent and environmentally friendly offers. Smart City develops train stations into attractive points of attraction and thus into centers of urban life.

**This is how the new services work at the Packstation**

You can register for the free Packstation service at www.dhl.de/packstation . Returns and all other franked shipments can also be sent via the Packstation without registration. The Smart City | Click & Collect service DB will be integrated into the ordering process of the various providers. No additional registration is required to receive an opening code for picking up the desired shipment. Interested parties can find further information at www.db.de/online-bestellen-hier-abhol .

duisport rail G1206 Class 275.021 is seen in Oberhausen West Yard with a deepsea container train coming from the KLV-Terminal in Bönen and heading for Duisburg-Hochfeld Süd on March 8th. *Erik de Zeeuw*

On March 8th, Railpool's Class 151.126 (formerly DB but rented back by DB) passes Bochum-Riemke with a rake of Sammns cars, loaded with rolled steel, destinated for ThyssenKrupp in Bochum. *Erik de Zeeuw*

Captrain Polska Class 186.130 is seen in Wetter with an intermodal train from the DUSS-Terminal in Wuppertal to CLIP Swarzędz in Poland on February 23rd. *Erik de Zeeuw*

# Netherlands

Diverted and with a delay of 16 hours due to storm Eunice, TCS No.102001 passes Woerden on February 19th with the FlyWise 'GreenCityTrip' from Amsterdam to Praha (CZ). *Erik de Zeeuw*

# Netherlands

RFO No. 692 (Class 08) is seen shunting with a few Wascosa grain wagons at Oss Elzenburg on February 29th. *Mathijs Kok*

# Netherlands

On February 11th, boxXpress Class 193.539 is seen in Venlo working a container shuttle from Rotterdam to München (Germany). *Erik de Zeeuw*

ELL Class 193.257 on NS license passes Loenersloot with ÖBB Nightjet train No NJ402 from Zürich HB via Basel SBB in Switzerland and Köln Hbf in Germany to Amsterdam CS in the Netherlands. On these services ÖBB works together with DB, NS and SBB. *Erik de Zeeuw*

On February 26th, České Dráhy Cargo Class 193.585 passes Baambrugge with train No. 43370 from Lovosice (CZ) via the Lehrte Megahub terminal (D) to Rotterdam (NL). In the Netherlands the train is driven on an LTE-NL license. In the future four round trips per week will take place. At the Megahub terminal in Lehrte, Germany, partial reloading of containers and semi-trailers takes place in both directions. *Erik de Zeeuw*

On February 27th, Train Charter Services No. 102001 makes a round trip with a 'dining train' from Amsterdam CS to Alphen a/d Rijn and via Leiden and Haarlem before returning to Amsterdam. *Erik de Zeeuw*

Near Baambrugge, Railadventure/Railexperts No.9901 is seen with the empty stock of the 'Alps Express' on its way from the Watergraafsmeer Yard in Amsterdam to Den Haag 'Hollands Spoor' on February 25th. *Erik de Zeeuw*

MRCE Class 193.657 under license of SBB Cargo and in TXL livery 'WE BRING THE POWER OF 8,700 HORSES ON THE TRACK' passes Griendtsveen on March 5th with Hupac intermodal No. 40034 from Busto Arsizio (Italy) to Rotterdam. *Erik de Zeeuw*



# Netherlands

What a nice way to celebrate an anniversary. Danny K. from Kampen surprised his wife to mark her 50th birthday with a trip in a Plan V through the Lowlands of Holland on March 1st. Foundation 2454 Crew No.904 makes a stop in Bussum-Naarden station working a service as train No. 39384 from Amersfoort, Utrecht, Gilze-Rijen, Voorschoten, Hillegom, Haarlem Spaarnwoude, Naarden-Bussum and Hilversum to pick up family. *Erik de Zeeuw*

At the height of Griendtsveen NS DDZ-6 No.7616 is seen working intercity train No. 3556 from Venlo to Schiphol Airport on March 5th. *Erik de Zeeuw*

DB Class 193.301 ‘Das ist grün.’ (‘That’s green’) heads Combinant shuttle No. 41538 from Duisburg-Ruhrort Hafen (Germany) to the Combinant terminal in Antwerpen (Belgium) on March 5th. Combinant is a joint venture between BASF, Hupac and Hoyer. *Erik de Zeeuw*

On March 16th, NS Class 1700 No. 1746 passes Holten with train No. IC148 from Berlin Ostbahnhof (D) to Amsterdam CS. *Erik de Zeeuw*

METRANS Class 386.033 heads Prag shuttle No. 43304 from Praha-Uhříněves (CZ) to Rotterdam (NL) on March 16th. *Erik de Zeeuw*

On March 5th, Captrain Class 186.158 and a rake of Falns which were unloaded in Bottrop (D) are on their way back to Rotterdam to pick up the next load of coal. *Erik de Zeeuw*

Ex NS mat'54 No. 766 now 'Stichting Hondekop' museum train is on its way from Arnhem to Leidschendam workshop for maintenance and is seen near Schiedam on March 25th. *Gerard van Vliet*

On March 30th, the Green City Trip train with Lineas locomotive Class 186.502 is seen running more than 6 hours behind schedule as it passes Schiedam. *Gerard van Vliet*

On March 10th, PKP CARGO Class 370.025 with slogan '20 years PKP Cargo' approaches Utrecht with a Chengdu (China) shuttle from Małaszewicze (PL) to Tilburg Industry. *Erik de Zeeuw*

CP Class 1400 No. 1436 runs into Ermida station on March 10th with train No. IR868 13:08 Pocinho to Porto Sao Bento.
*Andy Pratt*

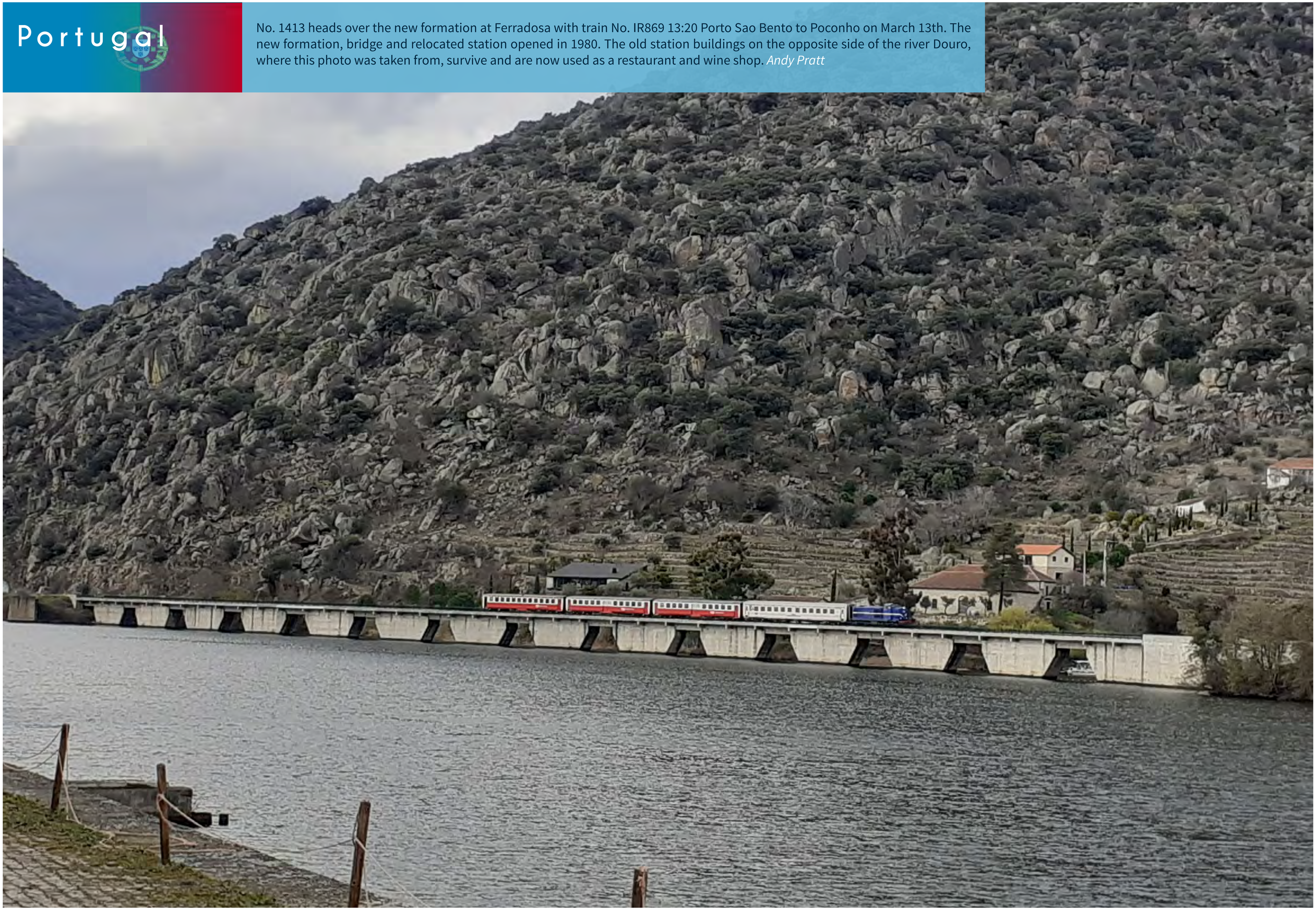
# Portugal

CP Class 1400 No. 1429 is framed by the smokebox and frames of long withdrawn 2-4-6-0T Mallet No. E213 at Pocinho on March 10th while running round it's stock before working train No. IR876, the 17:14 to Porto Sao Bento. *Andy Pratt*

CP No. 1436 finds it's way through the pollution from the local olive oil plant at Pocinho with train No. IR866 11:08 to Porto Campanha on March 12th. Stabled on the right is No. 1429 with the stock for the return Almond Blossom special which will return to Porto some 9 hours later. *Andy Pratt*

# Portugal

No. 1413 heads over the new formation at Ferradosa with train No. IR869 13:20 Porto Sao Bento to Poconho on March 13th. The new formation, bridge and relocated station opened in 1980. The old station buildings on the opposite side of the river Douro, where this photo was taken from, survive and are now used as a restaurant and wine shop. *Andy Pratt*



ZSSK Cargo Class 752.052 and 752.070 are stabled between duties at Preşov on March 22nd.
*Andy Pratt*

Brush Loughborough built (but with an 8 cylinder EMD 645 engine), M8 No. 814 departs from Panadura with a local service towards Colombo on February 6th. *Mark Torkington*

One of the 1950s developed EMD G12 locos numbered locally as M2 No. 628 sits in the darkness of Colombo Fort with the Night Mail train towards Galle on February 5th. *Mark Torkington*

M4 No. 756, one of the popular MLW built ALCOs, stands at Aluthgama with a service from Puttalam on February 15th. *Mark Torkington*

Class M6 No. 796 departs Panadura station with the daily ‘mixed’ train from Colombo to Kalutara South on February 7th. *Mark Torkington*

Class M8 No. 848 heads along the seawall at Kollupitia just before sunset with an express train from Beliaththa to Colombo Fort on February 8th.
*Mark Torkington*

U.K.

# Alstom awarded major Network Rail signalling delivery contract

Alstom, global leader in smart and sustainable mobility, has been awarded a £49million signalling contract with Network Rail for the delivery of new signalling, level crossings and other assets between Farncombe in Surrey and Petersfield in Hampshire on the London Waterloo to Portsmouth line – the Portsmouth Direct route built more than 150 years ago.

The delivery stages of the project, known as GRIP 5-8, will involve signalling, track and level crossing improvements between 2022 and 2024 and will benefit passengers travelling on the line between Woking and Portsmouth. Prior to the COVID-19 pandemic around 40,000 passengers used the line every day, making it one of the busiest commuter routes in the country.

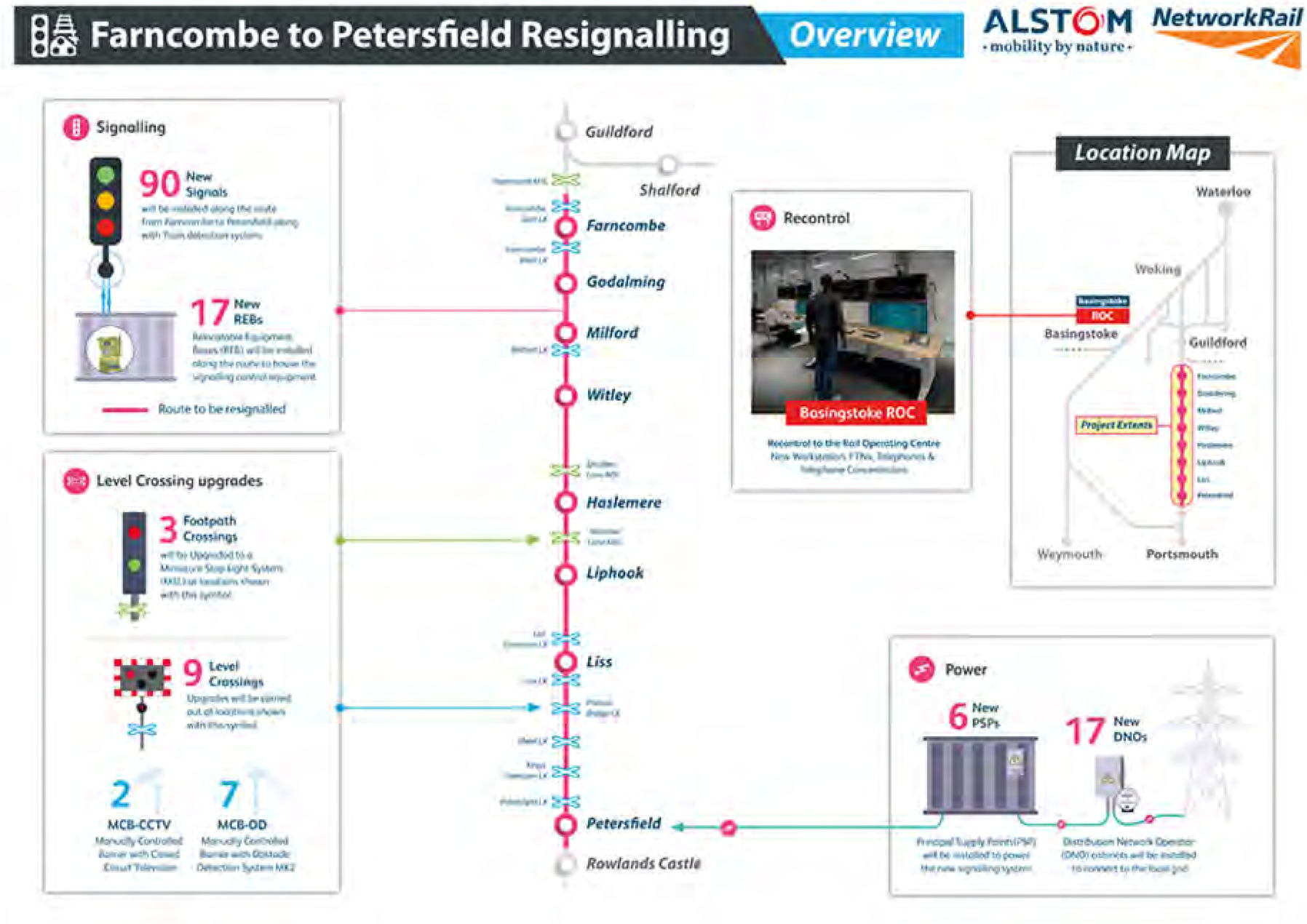
The Farncombe to Petersfield project will deliver much needed technology enhancements. By replacing life-expired equipment with the latest Alstom technology, passengers will experience greater reliability, and Network Rail will benefit from improved asset performance, resilience, and much safer access for track workers. In partnership with Network Rail, Alstom and its supply chain the project will renew assets and add digital-ready technologies including:

- Level crossing enhancement for enhanced safety and reliability: nine level crossings replaced including five existing automatic half-barrier crossings upgraded to full barrier control, plus three footpath crossings installed with stop lights and object controllers;
- Control of the area's signalling transferred from three local signal boxes to Network Rail's Basingstoke Rail Operating Centre, using Alstom's MCS 'Infinity' remote signalling control and MAR-S automatic route setting technology;
- Alstom's digital Smartlock interlockings increasing reliability, performance and capacity;
- Track circuits replaced with axle counters; delivering a 50% power saving across the project area and improved safety for trackside maintenance staff.

The project forms part of the Major Signalling Framework Agreement (MSFA) for the Southern Region which Alstom won in 2020. Alstom is collaborating with Network Rail as one "Customer Excellence team" to safely deliver Network Rail's commitments to passengers and freight users. Alstom is working closely with its supply chain to improve pipeline visibility of future works and recruit new apprentices in a range of technical and project management roles for a diverse and sustainable workforce.

Jason Baldock, Alstom's Managing Director, Digital & Integrated Solutions said: ''By delivering our shared commitment to work collaboratively as "one team" with our supply chain and Network Rail Southern's team, we are in a great place to deliver a more reliable railway for passengers on the key Farncombe to Petersfield route. Combining automation with the latest Alstom digital technology, we will reduce operating costs, drive greater efficiencies, and improve safety for trackside workers"

Nick Higgins, Senior Programme Manager for Network Rail said "This contract marks a significant step forward for our work on the Portsmouth Direct Upgrade which will mean our passengers have more reliable journeys. It has been a collaborative effort with the Network Rail and Alstom teams working as one to get us to this point and we're looking forward to more successes as we deliver this important project."



## Saudi Arabia

# CAF SECURES A NEW SERVICE CONTRACT IN SAUDI ARABIA

The CAF Group has concluded a contract with the state-owned railway operator SAR (Saudi Arabia Railways) that covers the maintenance of the Saudi operator's train fleet, including technical support and other related services. The contract amounts to close to €200 million.

Firstly, the agreement includes performing maintenance work in partnership with the Saudi operator, on the trains CAF has supplied in the country over recent years, for a term of five years. These are the units currently running on the North-South line, which connects the capital city of Riyadh to Qurayyat on the Jordanian border, as well as those units running on the East-West line, which connects Riyadh to Dammam: a railway network extending for more than 1,700 km which, in addition to the aforementioned cities, connects other important areas of the country such as Hail, Al-Qassim and Al-Hofuf.

Furthermore, an agreement has been reached to establish a joint engineering department, known as the "Engineering Excellence Centre", whose purpose will be to train SAR staff to provide them with the necessary operating skills to carry out maintenance work on the units, as well as to adapt the Saudi company's facilities for the overhaul of the main systems of the units as contemplated in this contract. The latter will mean adapting the workshops for bogie and axle maintenance, changing rolling gear, and fitting out specific areas to overhaul engines and pneumatic components. At the same time, strategic agreements will be established with local universities and technical centres to conduct research work and improve railway competences and expertise in the region.

Finally, the contract also includes implementing SAR's "DIGITAL HUB CENTRE", as a benchmark centre in the Gulf region for train digitalisation, with the aim of developing digital systems and tools for the trains in the aforementioned fleets - something that CAF and SAR have been working on for a number of years.

This project will be based on CAF's digital train platform, called LeadMind, which provides the possibility of creating a new generation of connected trains and providing more competitive services for operators and maintainers. This process relies on the collection and analysis of data via ongoing remote diagnosis of units, and the subsequent intelligent statistical analysis of the received data flows. This method provides better insight on assets, making it possible to optimise the operation and maintenance strategy, thereby achieving improved rolling stock performance in terms of train availability, reliability and LCC (life cycle costs).

CAF's foothold in Saudi Arabia is thus consolidated further to the supply of stock and the maintenance contracts that the company has undertaken in the country over the last few years. This new contract will see CAF continue to work towards and collaborate in the development of the region's railway capacities, committed to supporting the country's strategic transport plan.

## U.K.

# Alstom wins second major South London signalling contract

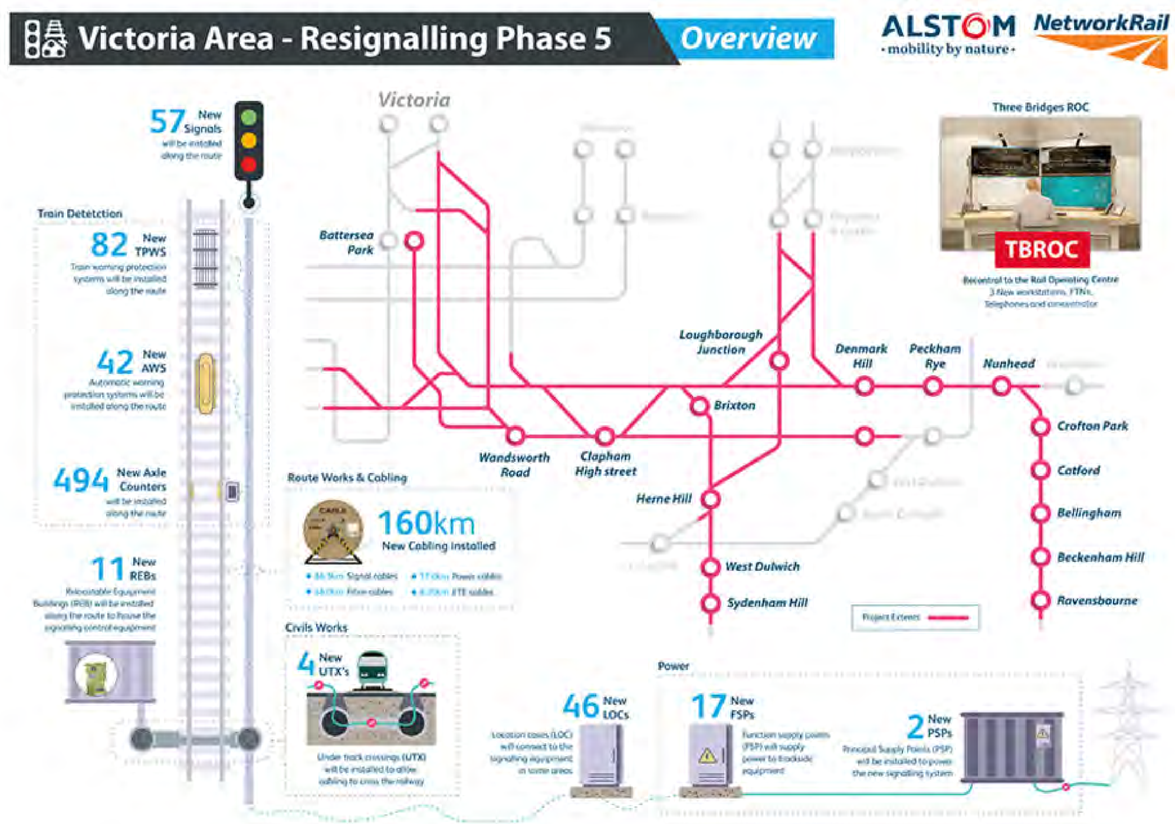
Alstom, global leader in smart and sustainable mobility, has been awarded a £69million signalling contract by Network Rail to deliver Phase 5 of the hugely important Victoria Area Re-signalling Programme.

The announcement for the delivery stages (GRIP 5-8) of Victoria Phase 5 follows the success of the £37 million Phase 4 awarded in March 2021 which is already setting a high standard with most of the civils work already commenced. Phase 5 will see Alstom providing vital signalling upgrades in the London Victoria area over three years with this phase going live in December 2024. New technology will deliver a more reliable, lower cost and easier to maintain system, bringing greater efficiencies and improvements to help keep passengers and freight services moving. The works will particularly benefit passengers and freight services travelling between Battersea, Brixton, Herne Hill and the Catford loop by improving service reliability on the network.

Network Rail's Three Bridges Rail Operating Centre (ROC) will control 302 new signal equivalent units (SEUs), 494 new axle counters, and 82 new Train Protection Warning System (TPWS) units linked by 86,500m of signalling cable. The project forms part of the Major Signalling Framework Agreement (MSFA) for the Southern Region which Alstom won in 2020.

Jamie Foster, Senior Programme Manager at Network Rail said, "The award of this GRIP 5-8 contract for Victoria Phase 5, the next major phase of the wider Victoria Area Re-signalling Programme, marks both end and beginning chapters of an enormous effort by the joint Network Rail and Alstom teams.

Since the teams formed for the delivery of the GRIP 4 contract, they have been on a collective journey of discovery. This has focussed on safe-by-design, safe delivery principles whose goal has remained to delight the passenger and end user, and this has been delivered throughout within a culture established to promote a collaborative working environment. I look forward to continuing to be a part of these shared successes and to further witness the teams continual growth and development, with the ultimate goal of celebrating the benefits the passengers will see upon completion of the scheme early in 2025."



Slovakia


Close up detail of the front of ZSSK Cargo Grumpy 752.052 stabled at Prešov on 22.03.2022 *Andy Pratt*

Romania

# Alstom to supply up to 40 Coradia Stream electric inter-regional trains and associated maintenance in Romania


Alstom and the Romanian Railway Reform Authority (ARF) have signed a contract for the delivery of 20 Coradia Stream inter-regional trains and associated 15-year maintenance services. The value of the contract is estimated at €270 million. These trains will be the first passenger trains provided by Alstom for operation in Romania. The contract can be extended with the option for another 20 trains, to be confirmed by firm order from the beneficiary. Including extended maintenance on the entire fleet, the total estimated value of the project could thus exceed €750 million.

"The new inter-regional electric trains for Romania will contribute to more modern and sustainable transportation in Romania – in line with our ambition to lead the way towards greener and smarter mobility worldwide. I am delighted that our Coradia trains, highly appreciated in so many European countries, will run in Romania as well. This contract completes the very diverse portfolio of Alstom solutions in this country, covering all our key business lines, from signalling and infrastructure projects to metro trains and complex maintenance capabilities," said Gian Luca Erbacci, President of Alstom Europe.

Developed for the European market, Coradia Stream trains are equipped with the ERTMS[1] Level 2 traffic control system and comply with both European standards (EN) as well as Technical Interoperability Specifications (TSIs), being capable of operating on all the main European power supply systems. The maximum speed of the trains will be 160 km / h. Each train will have six cars, a total capacity of 350 seats and 100% low floor, to assure easy access for all passengers. There will be two entry doors on each side of the middle cars and one door for each side of the end cars. The passenger information system will include a sound system and a dynamic display system. Each train car will be equipped with large-size luggage racks.

The Coradia Stream trains will also be equipped with a digital system for passenger counting with high-precision sensors. Each train will have four ecological toilets, evenly distributed along the entire length of the train, with one designed for people with reduced mobility. The final configuration, colours and finishes will be fully customised according to the requirements of the Contracting Authority during the design stage.

In total, over 420 Coradia Stream trains have already been ordered in Italy, the Netherlands and Denmark. Those in Italy have been in service since mid-2019, proving the reliability of this product. Coradia Stream also offers emission-free solutions, such as battery and hydrogen powered traction, for non-electrified lines.

[1] European Rail Traffic Management System

India

# Wabtec Wins a Significant Predictive Maintenance Contract from Indian Railways

On March 31st, Wabtec Corporation announced it was awarded a contract from Central Organisation For Modernisation Of Workshops (COFMOW), Indian Railways for its Online Monitoring of Rolling Stock (OMRS) project. The new automated OMRS system is part of Indian Railways' "SMART Yard" initiative and will improve the availability of the railway's fleet of coaches, wagons, and locomotives by detecting and addressing defects, preventing in-service failures.

"Indian Railways is at the forefront of deploying digital solutions to modernize their operations and drive efficiency across its rail network," said Nalin Jain, Digital Electronics Group President, Wabtec Corporation. "This order supports their 'Smart Yard' initiative, which will showcase the next generation of condition-based predictive maintenance technologies. The OMRS systems will streamline Indian Railways' operations by automating the inspections of bearings and wheels and pinpointing customized maintenance to maximize the utilization of its rolling stock."

The OMRS is a wayside solution comprising Rail Bearing Acoustic Monitor (RailBAM) and Wheel Condition Monitor (WCM/ WILD) to detect faults in the axle–journal bearings and wheels of rolling stock. The RailBAM technology uses acoustic signatures from bearings to identify bearing defects in advance before they would be identified through human inspection. The WCM technology uses impact forces exerted by wheels on to the rail to identify wheel defects. The OMRS systems enable operators to optimally plan the inspection and removal of defective bearings and wheels based on condition instead of fixed time-based inspection schedules, resulting in a healthier and reliable fleet.

"Wabtec and Indian Railways have partnered for decades to continually provide the country with rail technology solutions that enable an efficient, reliable and safe rail network," said Sujatha Narayan, Senior Vice President and India Region Leader, Wabtec Corporation. "This project will bring in state-of-the-art global digital high-tech solutions to the substantial portfolio of the India business enabling Indian Railways in their journey of modernization and digitalization."
COFMOW is managing the deployment of Indian Railways' Smart Yards across the country. As part of the contract with COFMOW, Wabtec's teams in Australia and India will lead the design, development, supply, installation, and commissioning of 97 OMRS equipment sets in various zonal railway locations across the country. The data from all the wayside OMRS systems will be fed into a state-of-the-art Central Data Control Center to be established in Delhi through the Wabtec Fleet ONE software. Wabtec is a leading technology provider to the Indian Rail Transportation sector for both Indian Railways and metros. Its portfolio includes locomotives to critical sub-systems such as brakes, couplers, doors, air-conditions, pantographs to the smallest of brake pads and power relays, which are used in a variety of rolling stock. With a 1-million-square-foot operational footprint and 2,800 employees in India, Wabtec has increased its presence in the country over the past few years. The company has a strong engineering presence with more than 1,200 employees, which includes over 500 Digital Electronics technologists.

Luxembourg

# Increasing Luxembourg's rail capacity with automation

The tiny nation of Luxembourg is a shining example of how rail automation is helping cities and countries respond to growing passenger numbers and delays on regional networks.

In the summer of 2018, the small nation of Luxembourg announced its giant plan to invest up to four billion euro into improving its rail infrastructure. In a nation of just over 600,000 million habitants, that could account for as much as 6,600 euro spent for every man, woman and child in the nation. But the advantages will be well worth it.

**Small country. Big plans**
The numbers show that Luxemburg's newest rail investments are the right move. Although it's a small nation, Luxembourg has the largest population growth in all of Europe. Growing at around 1.6% - 2% annually and with nearly 200,000 cross border employees arriving in Luxembourg each Monday morning, these numbers add up to a rail system that's truly feeling the squeeze. According to Luxembourg's National Railways (CFL), more than half of rail service delays were caused by an overstretched infrastructure and another 37% due to the related ripple effect across the railway network.

**Luxembourg set out to improve its public transport**
In response, Luxembourg set out to improve its public transport by adding new, more direct lines like between Luxembourg City and Bettembourg in the south and also doubling the track between Luxembourg central station and Saweiler-Contern, which connects the nation to the nearby German city of Trier. But CFL knew that track won't solve all its challenges, that's why in 2018, they announced a 360 million euro deal to buy 34 high-capacity double-deck Coradia regional trains. This new fleet would also be technically interoperable, enabling the trains to run in neighbouring Belgium and France as well. New rolling stock and tracks were just the first step in meeting CFL's goals. Luxembourg set out to improve its public transport by adding new, more direct lines like between Luxembourg City and Bettembourg.

Luxembourg's National Railways' goals:
- Increase the attractiveness of public transport
- Increase in the quality of the services offered
- Increase in capacity, both in the network and in the rolling stock used
- More punctuality, thanks to the separation of the different lines
- Avoid delays due to possible disturbances on the most saturated sections, switching from one line to another in the event of their crossing
- Dedicate specific channels per line
- Improved reliability

**Automating the way forward**
However, managing all this new track and trains presents a challenge of its own. Tracks can typically only handle a certain level of additional service before the additional capacity itself becomes a source of delays, compounding the issue they were meant to alleviate. That's why in 2021, CFL again came to the rail control experts at Alstom to see if automation could be the cure to preventing future bottlenecks in their growing network.

The result was another landmark agreement – a first of its kind for Europe. CFL chose to automate its fleet of 34 Coradia Stream trains and bring them up to Grade of Automation Level Two (GoA2). Once trains begin operation with this solution, it will be the first time in Europe that a regional fleet will be equipped with this level of automation - and the automation is sure to bring benefits for Luxembourg's growing population and business commuters.

The approach taken was to rely on a fundamental level of compatibility created by European Train Control System. Known as ETCS, this standardised signalling and control component of the European Rail Traffic Management System offers the basis upon which Automatic Train Operation technology can be laid. Automatic Train Operation is a suite of technologies used to help automate train operation. The greater level of automation, the greater the number of tasks the system can handle.

**Automatic Train Operation**
Automated mobility enables operators like CFL to leverage the power of technology to go beyond what human minds and bodies can achieve. Backed up by intelligent sensors, strong algorithms and master high traffic volume and more passengers, CFL's GoA2-equipped fleet will be more efficient and more reliable than ever without requiring additional costly infrastructure investments.

U.S.A.

# Wabtec to Modernize 330 Norfolk Southern Locomotives

On March 23rd, Wabtec Corporation announced an additional multi-year order from Norfolk Southern (NYSE: NSC) to modernize 330 locomotives as part of its continued partnership. This deal is part of Norfolk Southern's ongoing efforts to further improve fuel efficiency and reduce emissions from its fleet. With each modernized locomotive, Norfolk Southern's carbon emissions are reduced by more than 500 tons per year. The deal marks the third major modernization order from the railroad since 2015, making it the largest modernized fleet in North America, with more than 950 locomotives upon completion in 2025.

"Modernizing locomotives in our fleet will improve operational performance and reliability," said Tom Schnautz, Vice President Advanced Train Control for Norfolk Southern. "Importantly, it will also help us achieve our science-based target of a 42% reduction in emissions intensity by 2034. Wabtec's proven modernization program allows us to maximize the value of our locomotives, minimize the use of new materials, and reduce the environmental impact of our operations." Wabtec will modernize D9-44CW locomotives that are more than 20 years old and transform them into AC44C6Ms, which will add another 20 years of incremental life to each locomotive. The modernized locomotives will feature the FDL Advantage engine upgrade and a suite of digital solutions including Trip Optimizer, SmartHPT, and Distributed Power. The modernizations will yield significant dividends per locomotive, including fuel efficiency improved by as much as 25%; a more than 40% increase in reliability; haulage ability increased by up to 55%; and a reduction of maintenance, repair, and overhaul expenses by 20%.

"Wabtec has developed a portfolio of modular technologies for a variety of retrofit solutions for middle-aged locomotives. This has been done in a strategic way, analyzing the fleet and needs of our customers. Our modernization program allows Norfolk Southern to enhance its existing fleet by bringing the aging locomotives' performance to the latest standards," said Pascal Schweitzer, President of Wabtec Freight Services. "By customizing these modernizations for Norfolk Southern and installing state-of-the-art technology, we are helping the railroad realize outcomes including increased tractive effort, fuel efficiency, reliability and adhesion, which reduce maintenance costs."

Wabtec's modernization program is a key component of Wabtec's sustainability efforts. It updates aging locomotives with customized solutions that range from simple changes like control system upgrades to complex restorations, such as the comprehensive transformation of an aged DC locomotive into an AC locomotive outfitted with state-of-the-art digital technology. To date, Wabtec has delivered more than 1,100 modernized locomotives in the Americas. The fuel efficiency benefits of these locomotives have reduced carbon emissions by more than 1.4 million tons since 2015. That reduction is the equivalent of removing the emissions from 340,000 cars.

Italy

# More than 100 Traxx DC3 locomotives sold by Alstom, 85 already delivered and produced in Vado Ligure (SV)

Alstom, global leader in green and smart mobility, continues to expand its supply of the electric locomotives Traxx DC3. Alstom has signed three new supply contracts for Traxx locomotives in the second half of January 2022 for a total of 13 locomotives:

- GTS Rail of Bari announced an order for five additional units with Last Mile (LM). These will join the 14 GTS Traxx DC2 (E.483), and the 8 Traxx DC3 locomotives.
- The Italian Branch of the leasing Company Railpool ordered five Traxx DC3 LM. These will be in addition to the 10 already in revenue earning service and to the 5 locomotives that Railpool inherited from LOCOITALIA.
- The Private Operator Medway Italia bought three Traxx DC3s. The Company fleet will grow to include nine locomotives, three already running, three in ongoing production, and the last three that were ordered in January.

Since the first order of 40 locomotives received in December 2017 from Mercitalia Rail (Ferrovie dello Stato Group), several private operators and leasing companies have opted for this new state-of-the-art motive power to base their development plans.

The 101 locomotives were purchased by eight different customers, in eighteen separate base orders or option executions. The latest three contracts, awarded in January, are proof of our customers' trust, placing repeat orders to enlarge their existing fleet. The deliveries of the 13 Traxx locomotives are planned between May 2022 and the first half of 2023.

Out of the total 101 Traxx DC3s, 44 include the Last Mile - Diesel and Battery equipment, which allows the use of the locomotive on non-electrified lines, often found in ports, industrial areas or terminals. The number of LM equipped locomotives is increasing, following some post-delivery retrofit recently executed in the Alstom plant of Vado Ligure. Today, 85 Traxx DC3s are running on the Italian railway network, in both configurations with or without LM equipment.

In February 2019, the Traxx DC3, known in Italy as class E.494, received type homologation by the National Safety Authority. The Traxx 3 platform is the most modern platform for four-axle locomotives in Europe. The three models, Traxx AC3, Traxx MS3 and Traxx DC offer increased operational performance and reliability, and are more energy efficient than previous versions. In addition, their maintenance intervals have been extended by 33% to improve availability and reduce maintenance effort. More than 2,400 units have been sold over the last 20 years. They have been approved in 20 countries and cover a total annual distance of more than 300 million km. The three models, Traxx AC3, Traxx MS3 and Traxx DC3, offer a supporting diesel engine for bridging non-electrified sections with the optional LM function.

All the locomotives designed for the Italian market have been and will be produced at Alstom's Vado Ligure site. The plant that has more than one hundred years of experience in the design and construction of locomotives, including the latest generation of Traxx electric locomotives, is a centre for production and maintenance of rolling stock, locomotives and subsystems. A historic site, where more than 400 employees, engaged in the manufacture of the latest generation of Traxx electric locomotives for Italian and European freight operators, as well as carrying out major overhauls of traction units.

Italy

# Alstom signs a framework contract to contribute to the design and implementation of ERTMS in four Italian regions

Alstom, global leader in smart and sustainable mobility, has announced the signature of a framework contract valued at EUR 124 million with Rete Ferroviaria Italiana (FS Italiane Group) to deliver the design and implementation of ERTMS (European Rail Transport Management System) - the most advanced train supervision and control system - in four Italian regions.

The tender awarded by RFI to Alstom represents the first step in the technological projects financed by the NRP and is part of a larger call for tenders, worth approximately EUR 500 million, for the design and construction of ERTMS (European Rail Transport Management System) on 700 kilometres of railway lines in Sicily, Lazio, Abruzzo and Umbria. The work will be carried out by a group of companies led by Hitachi Rail and the contractors Alstom Ferroviaria and Ceit, formed as a temporary association.

Alstom will manage the executive design and construction of the latest ERTMS Baseline 3 Level 2 signalling system with GSM-R[1] and ACCM[2] on the sections under its responsibility, with the support of the company CEIT as a partner for the yard activities. The system proposed by Alstom meets the technical specifications for interoperability required by the European Union and the CENELEC[3] standards for railway safety, guaranteeing the highest and most restrictive safety requirement

“We are proud to have been chosen by RFI for the first railway project financed by the Recovery and Resilience Plan. Today, 30% of ERTMS level 2 lines in service in Europe are supplied by Alstom, demonstrating that our company is a world leader in this field. Therefore, we are very pleased with the contribution that our company, a leader in the field of sustainable and smart mobility, will make to Italy. A first major step towards ecological transition.” explained Michele Viale, General Manager of Alstom Italia and President and CEO of Alstom Ferroviaria. In particular, approximately 480 kilometres of tracks in Sicily, 150 kilometres of the former Umbra Central Railway and 80 kilometres of the Roccasecca – Avezzano line, will be equipped with the new technology.

These interventions represent 50% of the first objective indicated by the European Union for the implementation of technological projects financed by the NRP, that will equip 1,400 kilometres of railway lines with the ERTMS system by December 2024. A plan that provides nearly 3 billion euros for the implementation of this technology on over 3,400 kilometres of network by 2026, aligned with RFI’s goal of installing the system on all 16,700 kilometres of lines.

ERTMS is the traffic management system for railways in Europe. A major industrial project being implemented in Europe with the main aim of making rail transport fluid, increase operations and become more competitive. ERTMS ensures interoperability of the national railway systems, reducing the purchasing and maintenance costs of the signalling systems as well as increasing the speed of trains and the capacity.

[1] A radio system for voice and data communication between the track and the train
[2] ACCM: Multi-station Central Computer Equipment
[3] European Committee for Electrotechnical Standardization

Brazil

# Wabtec Introduces a New Sustainable, Heavy-Haul Locomotive to Brazil’s Freight Rail Market

Wabtec Corporation (NYSE: WAB) is introducing a new locomotive model to Brazil’s freight rail market with deliveries to Suzano, MRS and Rumo in late March and early April. The introduction of the ES44ACi diesel-electric locomotive provides Brazil’s railroads improved performance on their decarbonization journey.

“The ES44ACi locomotive features the Evolution Series diesel engine, producing the same 4,500 horsepower with just 12 cylinders compared to its predecessor the 16-cylinder FDL engine,” said Daniela Ornelas, Vice President of Products at Wabtec. “This represents greater energy efficiency and lower emissions, thanks to a project aimed at the thermal efficiency of combustion combined with a dual-intake air cooling system adopted in these four-stroke turbocharged engines equipped with electronic fuel injection.”

This engine technology enables the locomotive to reduce fuel consumption and emissions by more than 5 percent compared to its predecessor. The high-strength materials used in the ES44ACi also improve the reliability of the diesel engine and dramatically increase intervals for major maintenance by approximately 28 percent, lowering operating costs over the locomotive’s life cycle.

The effort to bring the ES44ACi locomotive to Brazil’s rail market was an eight-year project with operators. The objective is to improve Brazil’s heavy-haul rail network and drive sustainability. To date, the company already secured orders for 25 locomotives from Suzano, Rumo and MRS.

“Our sustainability vision is grounded in operating in an ethical and socially responsible manner, maintaining a culture of safety, protecting the environment, and supporting our communities and developing our employees,” said Juliano Andrade, Latam Commercial Director at Wabtec. “This was the main concept applied to the ES44ACi. We therefore want to build a better and more sustainable future.”

Rumo, the largest railway operator in Brazil, will receive the ES44ACi at the end of the month. The new acquisitions for the fleet reinforce the technological initiatives focused on operational efficiency and safety.

“Our priority is to promote an increasingly sustainable operation, not only in the economic aspect, but also in the social and environmental aspects,” said Marcus Rogério Vianna Jorge, Director of Undercarriage at Rumo. “With the constant renewal of the fleet, we have gained in efficiency in the flow of agricultural and industrial loads, in addition to contributing significantly to the reduction of emissions.”

For MRS, a logistics operator that manages a 1,643-km rail network in the states of Minas Gerais, Rio de Janeiro and São Paulo, the ES44ACi will help optimize their system. The new locomotive adds more technology and advances to the national railway sector, which the renewal of its concession is heading towards the final stretch at the Federal Audit Court.

“MRS has been investing heavily in expanding its fleet to contribute even more efficiency to the national logistics system, generating gains in energy efficiency,” said the General Manager of Maintenance Engineering at MRS, Anelise Salzani. “We are acquiring the ES44ACi because we expect it to be a locomotive with high power and lower diesel consumption. It incorporates two pillars of the company: the search for more productivity and the reduction in the volume of emissions, the consolidation of a more sustainable operation.”

Chile

# Alstom signs contract for signalling system, 37 Metropolis trains and 20 years of maintenance in Chile

Alstom, global leader in smart and sustainable mobility, has won a €355 million contract to provide its Urbalis CBTC signalling system, along with 20 years of maintenance and 37 Metropolis trains to Santiago, Chile. The new trains, combined with the CBTC signalling system, will help optimise the capacity, throughput, and efficiency of Metro de Santiago's new Line 7, whose inauguration is planned for the end of 2027.

"This contract is validation of Alstom's smart and sustainable mobility innovations and advanced technology. Our trains and signalling system will improve not only the quality of mobility and transportation in Chile, by ensuring reliable, safe, and available transportation, but it will also provide the city of Santiago with an efficient environmentally-friendly alternative to road transport for millions of passengers," says Denis Girault, Managing Director of Alstom in Chile.

With flexibility that offers a variety of configurations, Alstom's Metropolis range of metro trains has been in operation worldwide for over 20 years. Each of the 37 102-metre automatic Metropolis trains that Alstom will deliver to Santiago Metro will have a capacity to transport up to 1,250 passengers and deliver an improved passenger experience. The metros will feature 4 wide doors on either side to facilitate passenger ingress and egress, as well as wide aisles and open gangways between cars to ensure passenger fluidity inside and in between cars. Santiago's Metropolis trains will also feature air-conditioning and an advanced passenger information system that displays route and station information, while security features such as high-resolution external cameras and intercoms that maintain passenger communication with the control centre will enhance passenger and infrastructure safety. Alstom will manufacture the new trains at its Taubaté plant in Brazil, with the first cars expected to be delivered in 2025.

Alstom will deliver its Urbalis CBTC signalling system across 26 kilometres of the line. Urbalis reduces the headway between trains, thus maximising the system's capacity, and helps improve energy efficiency of operations. Alstom will also integrate advanced rail cybersecurity measures to improve the protection of Line 7's train control systems for both trains and signalling.

Currently under construction, Metro de Santiago's Line 7 will be 26 kilometres long and have 19 stations. It will cross through seven communes: Renca, Cerro Navia, Quinta Normal, Santiago, Providencia, Vitacura and Las Condes; three of which are incorporated for the first time within the Metro network (Renca, Cerro Navia and Vitacura), benefiting an estimated population of 1 million

365 thousand inhabitants. When Line 7 is operational, the expected travel time between the future terminal stations is estimated to be 37 minutes, which means a 54% reduction in travel time compared to what it takes today through the bus system (approximately 80 minutes). The investment amount for Line 7 amounts to US$ 2,528 million. With over 30 years' expertise in CBTC and over 160 metro lines equipped in over 25 countries, Alstom is known as a strong leader in the mass transit market.

About Alstom in Chile
With more than 420 employees and 7 sites, Alstom has been present in Chile for 75 years, delivering metro trains, regional trains, signalling systems and infrastructure, modernization, and maintenance services, to Metro de Santiago, Metro Valparaíso and Empresa de los Ferrocarriles del Estado (EFE). To date, Alstom has delivered the NS74, NS93, AS02, NS04 and NS16 fleets to Metro de Santiago.



Spain

# Indra and Talgo join forces in Europe's Rail, the largest rail innovation program in europe, which drives the digitalization and sustainability of the sector

Indra, one of the world's major technology and consulting companies, and Talgo, a leading company in the design, manufacture and maintenance of medium and high-speed light rail, have reaffirmed their commitment to innovation to boost the railway sector by becoming one of the 25 Founding Members of Europe's Rail, the largest railway innovation program in Europe and, therefore, join its Governing Board.

With a budget of 1.2 billion euros, Europe's Rail (EU-Rail) is part of the new European Innovation Framework Program: Horizon Europe, and continues the work carried out in the previous rail innovation program, Shift2Rail, in which Indra had already been a member of the Governing Board and where both companies took on a very important role, participating in more than 25 projects. EU-Rail focuses efforts especially on digitalization and sustainability, to achieve zero carbon emissions and enhance safety. As part of EU-Rail, Indra and Talgo become key players in defining and implementing the strategic RDI agenda for the sector, in collaboration with the European Commission. Both companies will also contribute their technological capabilities and experience, and collaborate with leading European companies, organizations, institutions and universities to develop and test on a large scale new digital and sustainable solutions that place the train at the center of green mobility. Europe's Rail places an even higher priority than Shift2Rail on bringing the developed solutions to the market. To this end, it envisages the development of large-scale demonstrators involving a large part of the industry and numerous European countries. The first open calls for project proposals in the areas defined in the program were launched this March.

This alliance between Indra and Talgo is based on their complementary natures. Both have contributed to design and aspire to participate in projects in the seven Flagship Areas (FAs), the main areas of activity in which the Europe's Rail program is structured, together with the crossover area of digital enablers. Specifically, in addition to working in this crossover area, they will seek to develop new technologies for the management of the rail network and passenger mobility in a multi-modal environment (FA1); the digitalization and automation of operations to move towards the autonomous train (FA2); intelligent and integrated asset management (FA3); projects to move towards a sustainable green rail system (FA4); new digital and sustainable services that improve the competitiveness of rail freight (FA5); new innovative solutions and services to boost regional rail services (FA6); as well as innovating new approaches for new guided transport modes, such as Hyperloop (FA7).

**Driving digitalization, sustainability and appeal of the sector**

Indra and Talgo's purpose in EU-Rail is to contribute their experience and continue to evolve their advanced technology for the railway sector, with the aim of leveraging all the benefits of CyberRail IoT, satellite ERTMS, digital twins, big data, Artificial Intelligence and smart maintenance technologies to turn the train into the center of the new mobility ecosystem and put it at the service of the traveler. This will also be aided by developments to make vehicles more efficient, attractive, sustainable, and have a smaller environmental impact.
For example, to address the integration of the entire mobility ecosystem, Indra will continue to work on its integrated, open, flexible and scalable solution for rail traffic management: Indra Rail TMS, coupled with its specialized smart mobility platform: In-Mova Space.

Focused on new digital technologies, In-Mova Space is oriented towards mobility as a service and generates a collaborative scenario in which data from all modes of transport is shared and information is enriched, applying intelligent analytics, learning and predictive models. It facilitates a crossover and multi-modal vision, which, in addition to serving the needs of citizens, makes it possible to induce clean and sustainable transport flows. It also makes it possible to adapt the transport supply to real needs and the requirements of users, improve the traveler's experience, optimize the capacity of infrastructures and services, as well as their maintainability, encouraging the development of automation.

Indra also hopes to transfer its experience in the aerospace industry and the advantages of innovation in the so-called New Space era to improve the signaling and safety of rail transport.Indra and Talgo will also continue the work undertaken in Shift2Rail for the development and implementation of a secure railway IoT network based on Wi-Fi communications, which can offer, for example, enormous opportunities to move towards a more automated, secure and intelligent railroad management and facilitate secure asset management.

These solutions facilitate coverage in areas where there is no previous network infrastructure or where it is difficult to reach, as in the case of regional lines with low traffic, as well as smart maintenance, intelligent and predictive maintenance, which brings significant economic and environmental benefits. In addition, building on the experience of Shift2Rail, Talgo will work on the development of lighter and more efficient trains using new materials and processes, as well as traction using permanent magnet motors. These two lines will also evolve to improve performance and promote a circular economy by exploring the recyclability of raw materials. This will be complemented by other developments to increase the efficiency of hydrogen traction and to achieve more flexible and attractive interiors.

The program also intends to continue innovating in its ticketing solutions, encouraging multi-modality and mobile payment; access control, through paradigms such as Be-In Be-Out (BIBO) and biometric identification; as well as for the digitalization of freight operations and the logistics chain in freight transportation.

# From the Archives

## Chile

C F de Chile 0-6-0T No. 488 rides the turntable at Temuco roundhouse on December 4th 1981. *John Sloane*

# From the Archives

## France

SNCF No. 15058 kicks up the snow as it races through Pantin with a Strasbourg express on February 19th 1996. *John Sloane*

# From the Archives

## France

SNCF No. 72033 calls at Culmont Challindrey with the morning Paris Est to Mulhouse service on October 31st 1997. *John Sloane*

# From the Archives

## France

C F de Provence 'Alpes Azur' railcar No. ZZ22 stands at the new C F de P station at Nice on September 1st 1999. *John Sloane*

# From the Archives

## Germany

DB Class 103.122 is about to depart from Koln Hbf with an express for Frankfurt on November 1st 2001.
*John Sloane*

# From the Archives

## Germany

DB Class 218.825 is seen stabled at Hannover Hbf on July 2nd 2016.
*John Sloane*

# From the Archives

## Germany

DB Class 111.121 calls at Koln Hbf with a regional service on November 1st 2001. *John Sloane*

# From the Archives

## Germany

DB Class 218.003 heads a freight through Regensburg on July 24th 1989. *Mark Enderby*

# From the Archives

## Germany

DB Class 218.131 is seen at Emmerthal on May 6th 2005. *Mark Enderby*

# From the Archives

## Germany

WLE No. 21 passes through Hamburg Harburg on April 30th 2006.
*Mark Enderby*

# From the Archives

## Italy

FS No. 625.133 awaits its next duty at Catanzaro Lido shed in the far south of the country on April 11th 1974.
*John Sloane*

# From the Archives

## Italy

FS re-built ex American army Bo-Bo No. d143.3035 is seen during a pause in shunting at Palermo Centrale on March 25th 1979. *John Sloane*

# From the Archives

## Netherlands

NS Nos. 1001, 1311 and 1127 with a train for Hoogovens IJmuiden are seen at Uitgeest station on March 1st, 1975. *Gerard van Vliet*

# From the Archives

## Netherlands

NS locos Nos. 2299, 2307, 2203 and 2209 with a train to Hoogovens are seen Uitgeest station whilst at the platform, Plan V858 waits with a service to Alkmaar on March 1st 1975. *Gerard van Vliet*

# From the Archives

## Pakistan

SGC Class No. 2397 is still lettered for the Pakistan Western Railway as it stands at Multan shed on February 18th 1980. *John Sloane*

# From the Archives

## Peru

Alco ‘World’ type diesel of the Peruvian Southern system calls at Sicuani with a Puno to Cuzco train on April 1st 1988. *John Sloane*

# From the Archives

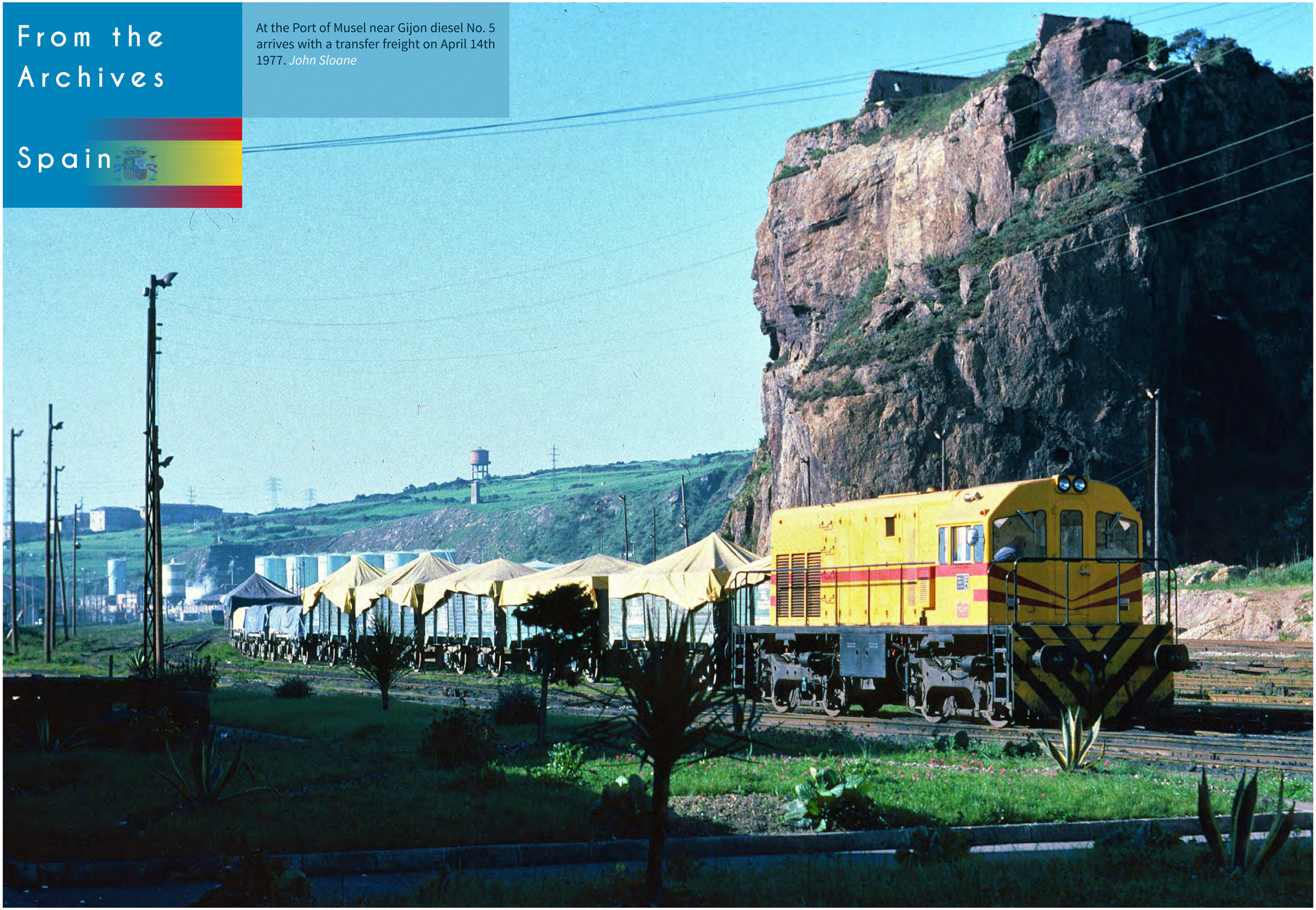
## Peru

Peruvian Southern No. 755 waits for the highball at a meet with a freight at Aguas Calientes on the descent from the summit of 14172ft at La Raya with a train it has worked from Juliaca on April 1st 1988.
*John Sloane*

# From the Archives

## Spain

At the Port of Musel near Gijon diesel No. 5 arrives with a transfer freight on April 14th 1977. *John Sloane*



# From the Archives

## Switzerland

SBB Re6/6 No. 11666 is seen at Baden on March 1st 2002.
*Mark Enderby*

# From the Archives

## U.S.A.

MTA No. 211 calls at Riverdale station, New York on March 19th 1999. *Mark Enderby*

# From the Archives

## Vietnam

Vietnam DE18E-609 is seen at Hue on October 17th 1997. *Mark Enderby*