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ISSUE 5:2016

Bombardier Sets The Bar
For Mobility Solutions

Feedback:
InnoTrans 2016

The Collaboration
Between Road And Rail:
An Argument For Intermodal Solutions

Transnet's MDS
Propels TFR Towards A Promising Future

Investment
opportunities:
AT Tazara and NRZ

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Since we started the practice in 1996, we have been in constant pursuit of excellence. We've invested time in building our reputation and we invest every minute, every day maintaining our standards. We are committed to delivering superior legal services to our clients in the public and private sector.

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The last few weeks have been frantic - Electra Mining, InnoTrans, Transport Forum, GARA and the Rail and Ports Evolution events. Craig attended InnoTrans, the International trade show and convention, which saw the launch of some truly phenomenal technology and innovations for the railway sector. Many of the products and services displayed at InnoTrans have great potential for implementation in the African market, promising to deliver integrated, digitised, environmentally sustainable solution for our fast-growing railway sector.

While showcasing some of the biggest and best the railway industry has to offer on the global stage, issue 5:2016 focuses on debates around implementing world-class land based transport solutions for developing economies. It is all very well to spend large proportions of our GDP on building railway lines, buying rolling stock and investing in state-of-the-art technology to implement the infrastructure required to fast-track development on our continent, but if we fail to build local supply chains, including human capacity, into development strategies at project inception, we run the risk of handing the greatest tool for our economic liberation over to external agencies – undermining the very development we are trying to achieve.

With this in mind, we take a critical look at Transnet's Market Demand Strategy (MDS), with particular focus on the potential gains that a capital spend of R300 billion could offer local suppliers, job creation programmes and economic growth for South Africa – or the lost opportunity that may pass our economy by, if not implemented with a well integrated local supply chain at the heart of the project planning. Take note that we have not given airtime to the delays in implementation, and the impact thereof, and I won't until I am sitting face-to-face with the powers that be and hopefully we will wrap that up in time for issue 6:2016.

We also hear from South Africa's Road Freight Association regarding the tenuous relationship between stakeholders in the freight industry in South Africa – with some fascinating insights from the road industry for the railway sector.

Interestingly, the outcome of these various perspectives - and somewhat diverse topics – is clear and unanimous. It is time that Africa starts planning in a strategic, harmonious manner – not in silos – for a single-minded overarching economic development vision that will provide a sustainable future where suppliers from the continent feed into these projects.

Please don't forget that we are in the process of compiling the 2017 industry guide – access our website for the relevant forms.

Phillippa Dean

Phillippa Dean
Railways Africa™ - Editor

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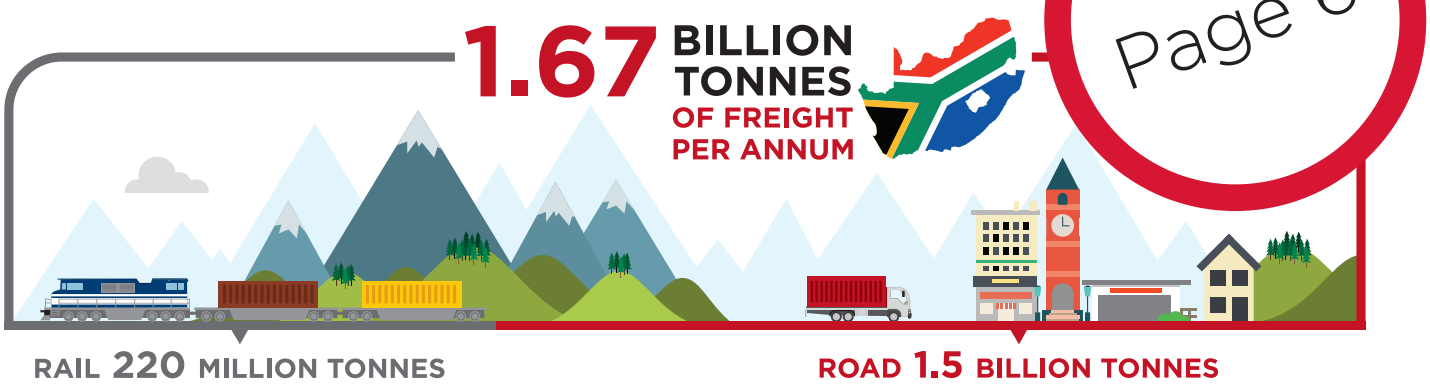

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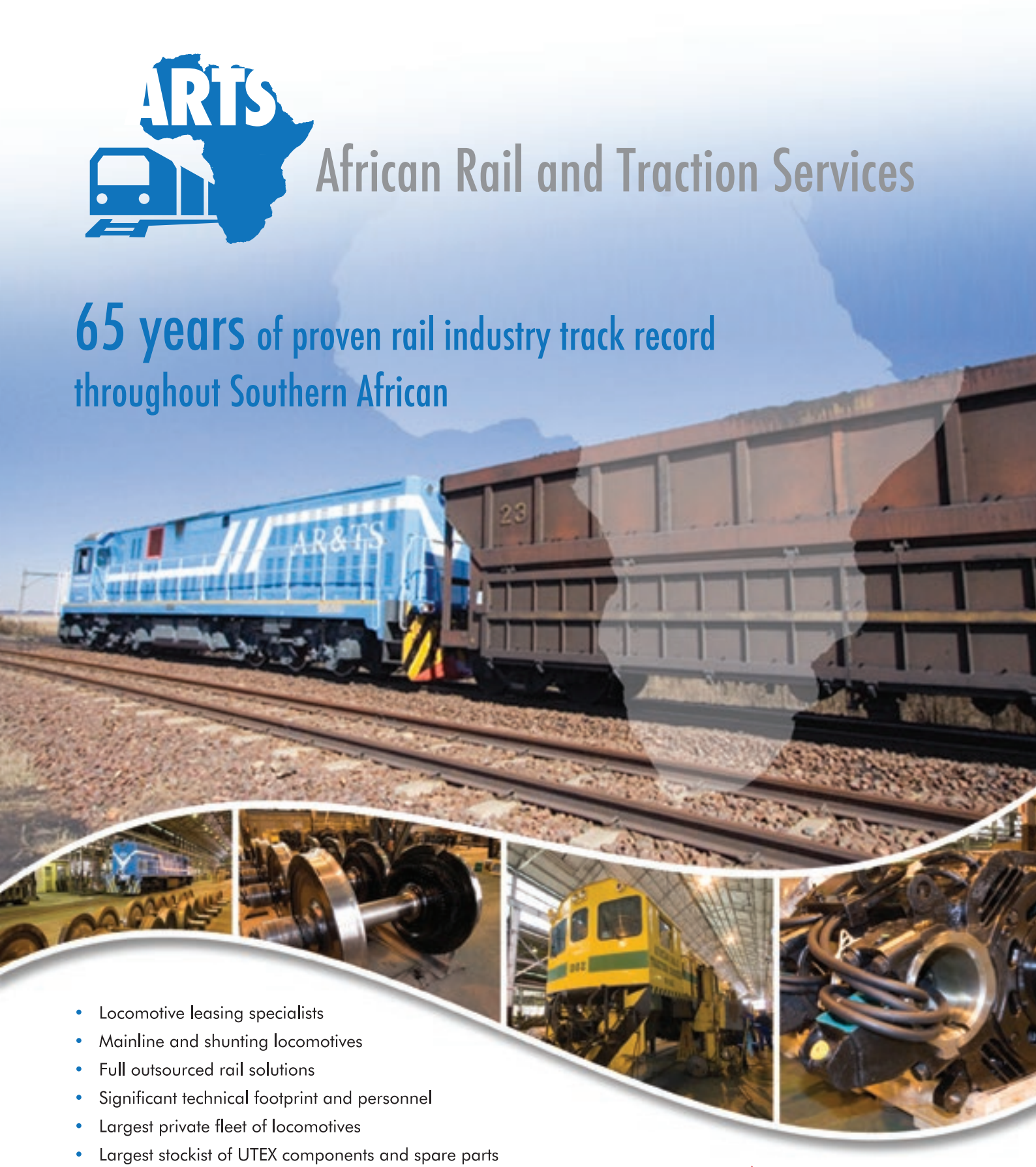
65 years of proven rail industry track record throughout Southern African



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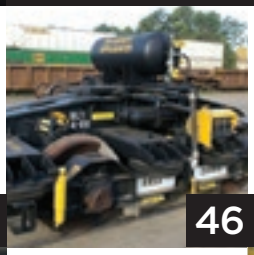

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The Collaboration Between Road And Rail: An Argument For Intermodal Solutions

The competitive relationship between different land-based transportation modes is a topic that receives a lot of attention across multiple platforms in the transport, logistics and economic development arenas, not only in Africa but across global markets. Whatever the argument, or perspectives presented, the verdict remains clear: the world needs cost-effective, efficient, ecologically friendly land-based transport solutions for people and goods over both short and long distances.

All players in the sector, be it road, rail - or concept designs not yet in play such as the Hyperloop™ - present their own dynamic solutions and drawbacks. The one conclusion that can be agreed upon by all stakeholders is that no one modality is able to fulfil all the needs of the land freight transport sector on a global scale.

Gavin Kelly, technical and operations manager for the Road Freight Association (RFA) of South Africa shared his thoughts on the matter at a recent Special Interest Group (SIG) meeting of the Transport Forum, held at the University of Johannesburg in September.

According to Kelly, the fractious relationship that has developed between the road freight and rail industries emanates from the erroneous belief that the two modalities are in direct competition and are mutually exclusive. Speaking on behalf of the road freight industry, Kelly points out that no matter how one spins the argument, if competition truly exists, "road has already won." Kelly based this summation on a comparative analysis of land transport volumes for the year 2014. *See Fig 1*

How Much More Can Road Take – The Problem Of Limited Supply

According to the RFA, South Africa currently transports approximately 1.67 billion tonnes of freight per annum - of this, road freight transports 1.5 billion tonnes while rail operators move about 220 million tonnes - representing a mere 15% of the market share. It is therefore not easy to refute his conclusion that rail does not represent an equitable competitor as things currently stand. Kelly further points out that the idea that the road freight industry jealously protects their 85% market share is simply inaccurate. The RFA fully acknowledges that some freight, especially high volume ore-based commodities, are simply better suited to rail, and the association actively supports the migration of these payloads back onto the country's railways.

While this may fly in the face of conventional thinking within the South African context, Kelly points out that demand for road freight transport has continued to increase by as much as 48% over the past decade and continues to grow exponentially. Currently, heavy goods vehicles represent 38% of traffic on the N3 highway between Johannesburg and Durban, with the number of trucks continuing to rise, year on year. Kelly, acknowledges that the current situation is unsustainable, as damage

Fig 1

to road infrastructure, congestion and increases in road accidents are directly associated with the high volume of trucks on the country's highways, which, if allowed to continue unchecked, will eventually result in road freight operators being unable to continue operating efficiently.

Share Rather Than Squabble: Solutions to SA's Looming Logistics Crisis

Kelly presents some interesting suggestions on how to solve the friction between road and rail freight services in South Africa.

Firstly, he highlights the need for greater dialogue between road and freight operators, with the view to creating a collaborative rather than the current competitive relationship. "Rail operators need to talk to road freight operators about realistic plans to integrate services – including how railway operators can become part of the change as well as how each level of the land freight business could enjoy a reasonable market share and become sustainable," he explains.

Kelly argues that the land freight industry needs to identify which freight is best suited for railway verses what needs to be transported by road – the result being that road and rail operators are targeting different sectors of the land freight market, dispelling the perception of a "tug of war" over customers.

Secondly, Kelly states that railway operators need to tailor their services to the needs of their customers to ensure that payloads are delivered in the most efficient and cost effective manner possible. He suggests that the deregulation of South Africa's railway infrastructure, which will allow private operators to utilise Transnet's lines may be beneficial by achieving some healthy competition in the freight rail market, as has been seen in Europe over the past ten years.

The final step, he proposes, is to identify which freight is best suited for bi-modal transport, where first and last mile is accomplished on road, with rail providing for the long haul in between. Logistics specialists, in collaboration with road freight service providers and freight rail operators, need to be consulted to develop the systems and infrastructure necessary to make bi-modal transport as cost effective and seamless as possible.

Attractive Solution – But Can It Be Implemented?

The picture that Kelly presents is one where road freight operators accomplish the timeous delivery of condition-sensitive goods over shorter distances and rail operators provide for the hauling of ore products and the like, with flexible bi-modal solutions sandwiched somewhere in the middle. One cannot argue with the logic of this scenario – or the benefits that such a system would offer the South African economy as a whole. One would, however, need to affect a substantial shift in current perceptions in the land freight industry as well as achieving buy-in from a plethora of highly polarised stakeholders.

In conclusion, therefore, Kelly's concept is sound, and his argument is solid, but implementation may be challenging under current market conditions. This is an alarming situation, as many of South Africa's neighbours are actively implementing world-class railway solutions that promise to revolutionise logistics on the continent –while South Africa continues to debate passively.

The Move To Standard Gauge – A Case For South Africa

Arthur Taute, SMEC South Africa.

Speaking at a recent Transport Forum Special Interest Group (SIG) meeting, held at the University of Johannesburg South Africa, Mr Arthur Taute, of international engineering and urban planning consultancy firm SMEC South Africa, presented an intriguing argument around the viability of adopting a national standard gauge rail (SGR) network in South Africa.

Standard Gauge Comes To Africa

Over the past 50 years, African states have largely neglected rail in favour of road infrastructure. The effects of this are evident in massively congested highways and border points, as well as ever-increasing carbon emissions across the continent. Added to this, in the years immediately following independence, regional conflict, political instability, mounting national debt and economic stagnation resulted in a number of African governments being unable to manage the capital investments needed to sustain mega infrastructure assets such as power utilities and railways.

The past decade has, however, seen Africa burgeoning into one of the strongest emerging markets on the globe, with three African countries making the International Monetary Fund's (IMF) list of top ten fastest growing economies in 2016 thus far. Increasingly, African countries are coming to realise the benefits that railway infrastructure could offer in unlocking the continent's economic growth potential. Rail transport is more energy efficient than road, which is of paramount importance taking into consideration the continent's current energy crisis. By extension, investment in rail infrastructure amounts to sustainable development, as carbon emissions that result from bulk haulage of commodities by truck remains a major contributor to air pollution.

The "African Rail Renaissance" – as it has been coined in the media, has seen a sudden resurgence in investment in railway infrastructure across the continent. Over the past ten years, a number of African states have opted to replace their ageing Cape Gauge railway systems with new standard gauge railway networks, among them Kenya, Tanzania, Uganda, Ethiopia and Nigeria to name a few. Investing in state-of-the-art standard gauge railway has become something of a trend on the continent, strongly supported by Chinese investors. Many struggling African states are relying heavily on the promise that integrated, well-managed, inter-regional standard gauge railway networks hold in driving the continent's economic prosperity forward over the next twenty years – a position strongly supported by the African Development Bank, among others.

South Africa Looks To SGR

While South Africa still boasts the largest and most advanced national railway network on the continent, the country has also followed the trend towards standard gauge rail in the form of the Gautrain rapid rail link, which connects Tshwane and Johannesburg, with OR Tambo International Airport.

Initiated in 2005, Taute acknowledges the enormous success of the project. "The Gautrain has, for the first time, offered Johannesburg commuters a safe, fast and reliable alternative to the private car," he states. He further describes the Gautrain project as a major driver of quality public transport, which sets new standards for urban mobility solutions in the country. The Gautrain has been constructed using the international 1,435mm standard gauge, which Taute identifies as offering many advantages, including the fact that the wider gauge is more forgiving at high speeds and offers the opportunity to use more powerful motors on longer axles.

Additionally, the standard gauge provides more options for variances in rolling stock, including wider, longer carriages and access to a broader range of products, specifically designed for use on international standard gauge railway systems.

The challenge of integrating the Gautrain with the existing national Cape Gauge system, however, remains a problem and Taute paints a fairly complex picture of what it would take to redesign the country's entire railway network to work on standard gauge. Taute points out that abandoning the Cape Gauge railway network would require "a complete re-think of the entire rail transport system and processes." He warns that in planning

Transport forum

The Transport Forum is a non-profit organisation based in South Africa, that provides a platform for all stakeholders in the transport industry to network, share ideas and discuss the challenges facing the sector.

The Forum holds monthly meetings in various cities across the country, where industry leaders and academic experts present on various topics affecting transport and logistics in the country. -

www.transportsig.com

such a move, "we should not get locked into a past that has not worked – resulting in 80% of all general freight going by road."

Taute goes further to point out that if South Africa were to initiate feasibility studies on standard gauge railway lines in the present, a new standard gauge railway network would only become operational in about ten years' time – during which time the international community may be abandoning traditional railways for completely novel technologies such as the much talked about Hyperloop™ system, recently presented at InnoTrans.

Standard Gauge Railway – What Would It Entail?

In making a case for the adoption of a new standard gauge railway system for South Africa, Taute argues that the route from Johannesburg to Cape Town would be the most viable example, as the distance is greater than between Johannesburg and Durban, making road freight more problematic.

Taute presents a hypothetical picture of a standard gauge railway project between Johannesburg and Cape Town, which would require 1,400km of semi-greenfield duel carriage track, with a constant running speed of around 100km/h. A new urban standard gauge rapid transit section, similar to the Gautrain, could be installed between Cape Town Port and the city boundary to offer an urban mobility solution for the city as a part of the project. Taute points out that the system would need at least four highly efficient cargo transfer points from Cape Gauge to standard gauge along the route and interface with Johannesburg's network in a 'ring-road' design to ensure maximum efficiency. In a hypothetical costing exercise, Taute estimates that the entire system - including construction, rolling stock, maintenance and operation - could cost the country a staggering R320 billion.

Investment of this magnitude should not be undertaken lightly, Taute argues, and therefore project planners need to undertake the research needed to ensure project viability. "Research normally accounts for approximately 2% of a project spend," Taute points out, "but has the ability to offer savings of up to 10% on a project, if done correctly. If the South African government, together with the national railway operators, undertake the research needed before implementing a standard gauge railway project in the country, this could result in savings of up to R1.6 billion per year."

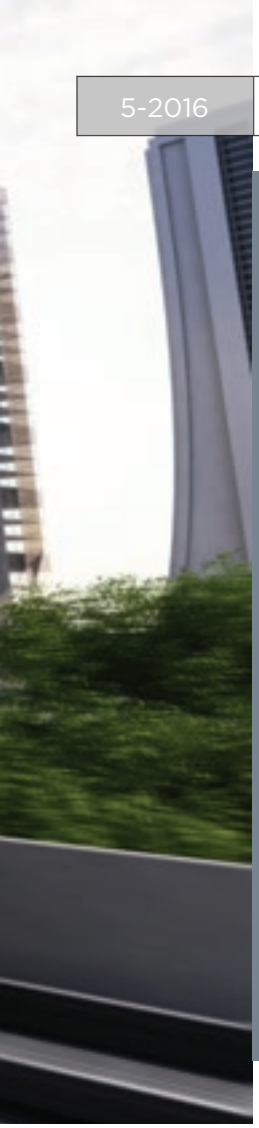
Taute concludes by stating that while the move to standard gauge may offer rail transport many benefits, the implementation of such a system needs to be done in a way that revolutionises the manner in which transport infrastructure is currently utilised in the country. He suggests that massive infrastructure spending may be counter-productive if the new standard gauge railway system is no more competitive than current rail infrastructure with road-based transport. As such, Taute suggests that optimising the utilisation of current infrastructure may be a more prudent approach for the present. If the government does decide to implement a standard gauge railway system, Taute suggests that it would need to be done in an intelligent, integrated and innovative manner, based on carefully conducted research and cutting edge technology to ensure maximum efficiency and competitiveness with other land-based transport modes.

Bombardier Sets The Bar For **Mobility Solutions** At InnoTrans 2016

Bombardier has built an extensive and diverse portfolio of winning mobility solutions, from state-of-the-art private and commercial aircraft, to the sleek high speed trains and public transit systems that define the cutting edge of urban mobility solutions across the globe. In addition, Bombardier is an industry leader in the provision of locomotives, sub-systems, components and signalling solutions. In the 2015 fiscal year, the company posted revenues of $18.2 billion, positioning them among the largest Original Equipment Manufacturers (OEM) for the transport sector in the global marketplace.

Guided by their visionary strategy, which the company calls “The Evolution of Mobility”, Bombardier aims to push the boundaries of conventional transportation modalities to forever change the way that people move. Their strategy is focused on making mobility more efficient, sustainable and appealing for the global population - be it in the air, across continents or within urban environments.

Headquartered in Montréal, Canada, the company employs approximately 70,900 people, across multiple operations in more than 60 countries. The company’s transportation division, headquartered in Berlin, Germany, is a global leader in rail technology and offers the broadest portfolio of railway products and services in the industry.



> "Today, countries and governments across the globe are confronted with similar challenges: urbanisation, pollution, digitalisation, and population growth, particularly in emerging markets. Rail is already playing a key role in solving these issues - but it can do more. At Bombardier Transportation, building the future of mobility, together with our customers, is at the heart of everything that we do."
>
> Laurent Troger, President of Bombardier Transportation,

BOMBARDIER MOVIA Maxx.

Bombardier Transportation has joint venture agreements with a number of cities around the world and is represented in over 200 cities. Projects range from airport shuttles to underground systems and trams as well as regional and long distance express trains.

President of Bombardier Transportation, Laurent Troger sums up the company's global vision and client-centred approach by stating that: "Today, countries and governments across the globe are confronted with similar challenges: urbanisation, pollution, digitalisation, and population growth, particularly in emerging markets. Rail is already playing a key role in solving these issues - but it can do more. At Bombardier Transportation, building the future of mobility, together with our customers, is at the heart of everything that we do."

Speaking at the company's InnoTrans press conference, Troger pointed out that the company has delivered 8,000 underground carriages and built 3,200km of new track since the 2014 edition of the trade show, highlighting the company's continued growth and international standing as a leading provider of rail solutions on a global scale. The company provides integrated solutions that create substantial benefits for operators, passengers and the environment - an ability the company showcased to great effect at this years' InnoTrans trade show in Berlin.

World Premier Launch

The BOMBARDIER MOVIA Maxx Metro platform is specifically designed to respond to the urban mobility needs of the world's largest and fastest growing megacities. The high capacity MOVIA Maxx Metro offers maximum value based on a modular and flexible single solution that can easily be adapted to the specific requirements of operators. Now, more than ever, a metro project's affordability is a vital precondition to its success. The MOVIA Maxx metro platform has been designed to deliver the best value for money in terms of capacity, energy consumption, reliability and availability.

The system, as the name suggests, is designed to deliver maximum passenger capacity, with up to 374 passengers per car - this translates into more than 3,000 passengers per trip on an eight-car train. The MOVIA Maxx Metro is a highly flexible solution with a scalable car body concept and train configurations of three to eight cars.

When dealing with mass transit systems of this magnitude, passenger flow becomes a major consideration, and as such, Bombardier has designed the MOVIA Maxx cars with up to four doors per side with extra wide doors to speed up train boarding and exiting. As such, the system is designed to improve on train dwell times at stations and reduce overall journey times for passengers.

The MOVIA Maxx has been manufactured using the most durable equipment available on the market, and the train's proven systems promise to provide low life-cycle costs, which can be reduced further with Bombardier's service technologies.

The use of virtual reality allows for richer engagements between clients and stakeholders during the design phase to best assist scenario planning.

MITRAC converter Module P offers up to 45% less volume and up to 35% less weight compared to other converters for metro applications of the same performance class.

OPTIFLO rail control solution provides a suite of operational and analytical control services to the operator.

TALENT 3 Electric Multiple Unit (EMU) Platform

In response to an increase in demand for seamless, modern and efficient mobility solutions for commuter, regional and intercity transportation, Bombardier has developed the TALENT 3 platform, an innovative train concept that combines operational flexibility and efficiency with increased safety.

Whether it is operating as a commuter, regional or intercity train – the new TALENT 3 train offers many advantages. During development, market demands were taken into account, and the new TALENT EMUs represent the best in operational flexibility, low energy consumption and maintainability.

The TALENT 3 is manufactured using proven and optimised components, recognised in operation in several European countries, which enables smooth and efficient operations from the time the train enters service. One of the defining featured of the new generation EMU is that, for the first time, the train is compatible with Bombardier's industry leading rechargeable PRIMOVE lithium-ion battery systems, which provides optimal energy and power density, enabling high power recharging at the lowest weight and volume currently on the market.

Also, by leveraging data from the existing TALENT fleet, designers and engineers have succeeded in optimising maintenance measures, significantly reducing lifecycle costs on the new trainsets. The TALENT 3 is compliant with TSI and EN standards, resulting in the train being approved for use in most European countries. The EMU is equipped with ETCS and can operate across borders on the various European rail power systems. The TALENT 3 trains are highly versatile and can be specifically built for short or long-distance high speed commuter services.

OPTIFLO Rail Control Service Solutions Featuring Infrastructure Management And Cyber Security

In addition to the electric and metro trains featured at InnoTrans, Bombardier also launched their industry leading rail control service solution at the show.

The new OPTIFLO suite brings together Bombardier's full range of rail control service solutions. From help desks and technical support through to asset, configuration and obsolescence management – the OPTIFLO suite offers a highly flexible, comprehensive, turnkey solution for railway operators, using proven technology. According to the company: "The OPTIFLO solution enables operators to build a comprehensive, tailored, single solution to take the next step in avoiding service disruptions, while improving operation and reducing costs, safeguarding their investment in rail control systems." The OPTIFLO suite now offers two new modules to meet the modern challenges facing railway operators, including improved infrastructure management and cyber security.

Taking into account the fact that more than 20% of infrastructure unavailability is due to various control failures, the OPTIFLO Infrastructure Management Service, featuring the EBI Tool Maintenance and Diagnostic Centre (MDC), enables operators to identify hidden problems and prevent failures and disruption primitively. The system goes beyond real-time system condition monitoring and reactive maintenance measures to provide new capabilities. Using data from Bombardier sub-systems and third party assets, the system can detect failure patterns and correlations and identify the root causes of problems. Precise algorithms anticipate failures and enable preventive maintenance actions to be taken, reducing service interruptions and reducing maintenance costs.

> "The OPTIFLO solution enables operators to build a comprehensive, tailored, single solution to take the next step in avoiding service disruptions, while improving operation and reducing costs, safeguarding their investment in rail control systems."

The OPTIFLO suite also features a new innovative service solution for cyber security, which provides automated risk and security assessment for rail signalling systems and Bombardier solutions to mitigate identified vulnerabilities.

BOMBARDIER TALENT 3.

These two new modules are just a small part of the full OPTIFLO Service Solutions suite, which offers tailor-made solutions to maximise the performance and lifespan of rail control assets. This includes:

- **Help Desk** – Single point of contact for enquires and incidents including ticketing, tracking and handling
- **Repairs** – Swap and repair service for failing components
- **Technical Support** – Expert remote and on-site issue resolution and root cause analysis
- **Spare Parts** – Management for spare parts logistics and pricing
- **Infrastructure Management** – Condition monitoring, data analysis and predictive maintenance
- **Modifications and Alterations** – System expansion, modernisation and functional upgrades
- **Asset and Configuration Management** – Database build and management to reduce lifecycle costs
- **Cyber Security Assessment and Solutions** – Automated risk and security assessment, recommendations and solutions
- **Obsolescence Management** – Proactive system analysis and reporting
- **Training** – Customised plans for online or on-site customer staff training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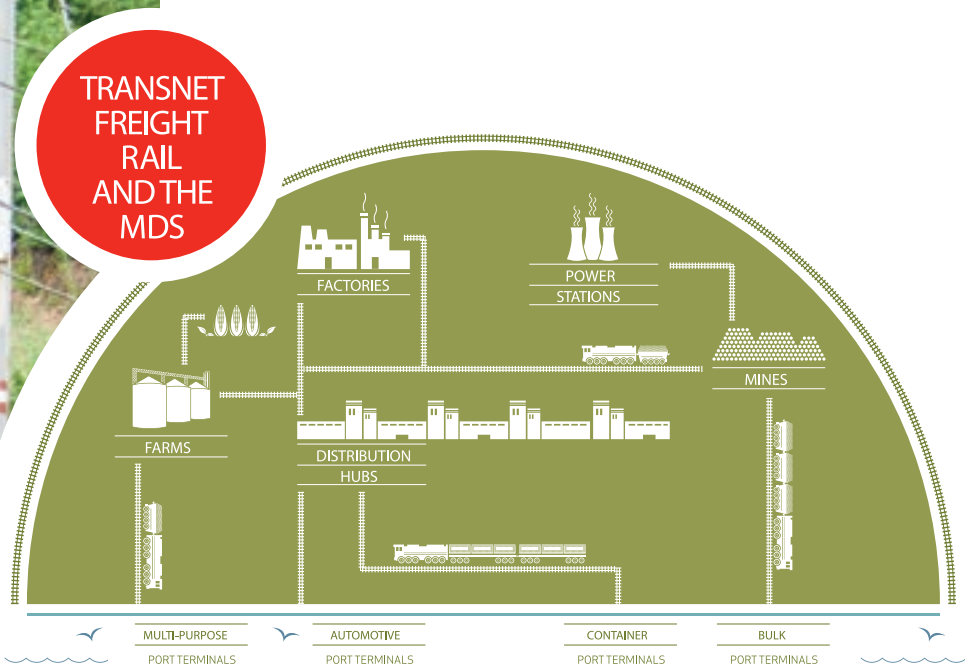


Transnet's **MDS Propels TFR** Towards A Promising Future

In April 2012, Transnet launched their Market Demand Strategy (MDS), an ambitious seven-year business strategy that has ushered in major organisational restructuring, business development and capital projects across all divisions of the company, over the past four years.

The MDS is, at its roots, a major recapitalisation programme with a proposed budget of approximately R333.6 billion, to be spent over the 2012-2017 period on capital projects aimed at modernising South Africa's ageing railway infrastructure, as well as upgrading port and pipeline facilities managed by the group. The bulk of the capital spending will be directed towards Transnet Freight Rail (TFR).

Speaking at the recent Africa Rail and Ports Evolution Conference in Durban, Sandra Gertenbach, Transnet's executive manager - strategy and business planning, spoke to delegates about the progress made by Transnet Freight Rail under the MDS to date, with a particular focus on the way forward for South Africa's freight rail operator.

Transnet Freight Rail – Moving Goods For A Better Economy

TFR represents the largest operating division of the Transnet Group and supports 15% of the nation's freight tonnage. The division owns and maintains a network of 22,000 route kilometres of track, connecting to the country's ports and railway networks of neighbouring states. According to Gertenbach, TFR operates approximately 1,200 trains per day, conveying 98 commodity groups over more than 4,000 origin-destination combinations. In the 2015/16 financial year, TFR moved 214 million tonnes of freight for their 450 clients.

South Africa's logistics sector is facing considerable strain, as congestion, pollution and over utilisation of the country's roads could choke future economic growth and derail the government's plans for the industrialisation of the South African economy. The company currently employs in excess of 36,000 people and supports South African industry through the implementation of localisation and designation policies as stipulated by South African law.

TFR has a critical role to play in South Africa's future growth - a responsibility that Gertenbach indicates is taken into account by the division's current business strategy and recapitalisation plan. The MDS highlights key strategic drivers to include being an investment catalyst for economic growth across the South African economy.

Transnet Freight Rail Emerges From 30-year Decline

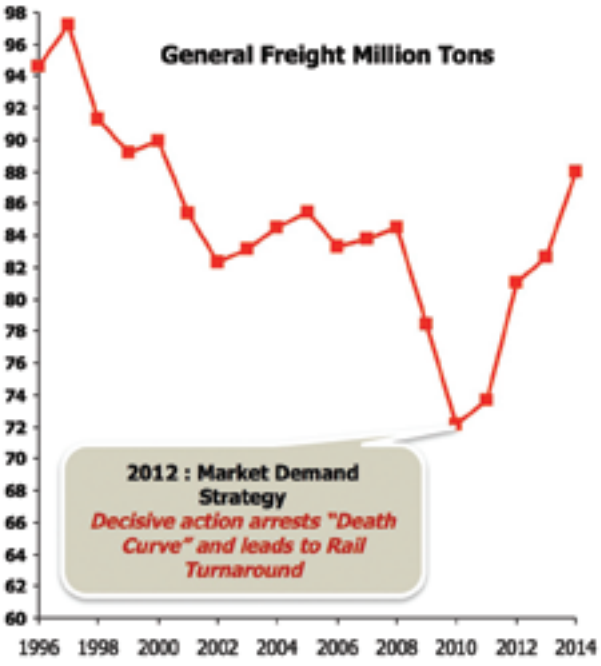
The past three decades has seen a steady decline in investment and utilisation of the country's railway infrastructure for the transportation of freight - a decline Gertenbach attributes to the poorly considered deregulation of the country's freight rail services in 1986, by the Nationalist government, who at the time needed to cut government spending in response to international sanctions.

Gertenbach explains that in the decade that followed the decision to pull government funding for the maintenance of the country's railway infrastructure, services on the railway declined on a national level, resulting in many customers moving their payloads to road. By the year 2000, Transnet Freight Rail was unable to capitalise on the boom in commodity markets, driven by China's aggressive infrastructure development programme, due to a lack of capacity and severely degraded infrastructure.

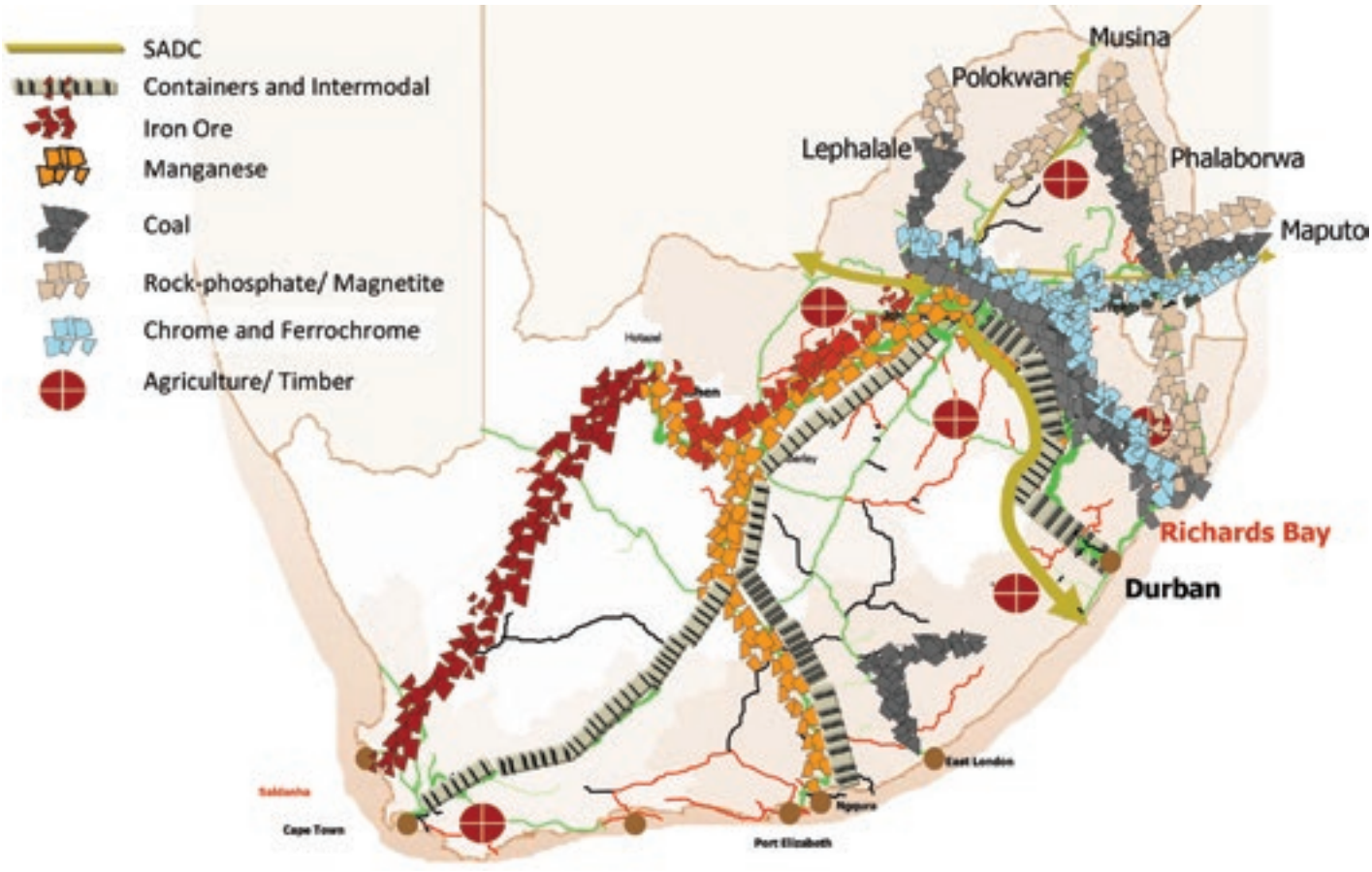
In 2005, Transnet's management team stepped in and proposed a re-engineering programme aimed at growing freight volumes for TFR. However, the plan proved largely unsuccessful as by 2009 the global economic recession, and resultant slowing of South Africa's economic growth, made the high cost of infrastructure recapitalisation unattainable. By 2010, TFR was carrying record low volumes of freight and was rapidly descending into redundancy.

Transnet Freight Rail Under The Market Demand Strategy

The introduction of the MDS in 2012 has seen a major resurgence in capital project expenditure at TFR. The company purchased the first new locomotives for freight services in more than a decade in 2012, which immediately resulted in an increase in freight volumes. In March 2014, the company announced the awarding of a R50 billion locomotive supply contract for 1064 new locomotives. The four original equipment manufacturers awarded in the deal includes CSR Zhuzhou Electric Locomotive and Bombardier Transportation South Africa, who are in the process of supplying 599 electric locomotives, while General Electric South Africa Technologies and CNR Rolling Stock South Africa (Pty) Ltd are supplying 465 diesel locomotives. It is important to note that CNR and CSR have subsequently merged.



In addition to the purchasing of new rolling stock, the MDS provides for extensive network upgrades and rehabilitation of the country's railway lines. The programme includes an upgrade of the technology – some of which dates back to the 1970s. New side line signalling systems are being installed to ensure train movement protection and state-of-the-art track-to-train communication and monitoring systems are being installed to facilitate the implementation of preventative maintenance. The operator has also taken into account the need for traceability of payloads, which



remains one of the major differentiating factors between road and rail. All capital investments have been made with the needs of the customer in mind, ensuring that specific markets and commodities are accommodated along all critical transport corridors.

MDS – From Conception To Implementation

When the MDS was initially conceptualised and adopted, it was difficult to predict the effect that the slump in global commodity prices would have on TFR's business plan. With the retraction of the commodity boom experienced in the early 2000s, the mining sector has had to downscale production, which has a direct knock-on effect on all rail operator's annual volumes and revenues, and by extension the industry supplying into the rail sector.

When questioned about the reduction in the number of wagons initially proposed for TFR in the 2012 edition of the MDS, Gertenbach admitted that the number of wagons the operator intended to build has been reduced significantly. Gertenbach, however, justified this decision by stating that: "The strength of the MDS is that it is designed to be highly responsive to market demand, ensuring that capital expenditure is directed appropriately. Due to the reduction in demand for certain commodities, procurement plans were adjusted accordingly."

Gertenbach remains steadfast in her assertion that the MDS will propel TFR's capacity growth, enabling the company to reclaim a considerable market share in land-based freight services, in the years to come. She indicated that the MDS would not be abandoned in 2019, but instead the strategy will continue to be implemented in cycles and in response to changes in the market.

Will The MDS Transform The Future Of SA's Transport Industry?

Arguably, the greatest challenge facing TFR remains market perception - a variable that is often difficult to manipulate and control through well-constructed business strategies alone. Currently, the road freight industry transports 85% of the country's freight and there is no clear data showing a modality shift as yet. Perhaps the toughest battle that TFR has to fight is the idea that rail is plagued with inefficiency and poor customer service. *(For more on the relationship between road and rail service providers, turn to page 6).*

A Note From The Editor

While the MDS appears to be a very well conceived strategy to modernise South Africa's logistics sector to support economic growth, the question of local content and manufacturing remains somewhat unanswered. When the strategy was first conceptualised, the Department of Trade and Industry was yet to implement the legislation dictating local content requirements in terms of state-owned entities spend. The net result is that the MDS has retrospectively incorporated localisation and designation targets and, as such, while the spirit of local procurement is alluded to; implementation is somewhat misaligned to current policy and legislation.

There is an overwhelming trend in Africa to pass on the benefits of government

spending to external agents, be they international OEMs, international funding agencies or foreign governments. When capital expenditure of this magnitude is being spent on infrastructure development, the potential for job creation, skills development and local economic growth are enormous, if harnessed correctly – a lesson that could easily be learned from China. It would be tragic for the South African economy if the benefits emanating from a +R300 billion spend are not passed onto our local suppliers and by extension the people of South Africa.

This being said, I would like to acknowledge the efforts of OEMs, and international companies that have invested in local manufacturing facilities, skills transfer programmes, job creation, local sourcing and community engagement and development.

I do however feel that much has been lost and that in-country capacity building should have been implemented in conjunction with Transnet's recapitalisation programmes, which were on the books and spoken about long before the MDS came into being. There is a lack of cohesion between BBBEE and designation in terms of which legislation is actually the gatekeeper versus what is truly going to add value to our economy and create jobs. The slow response from SABS in terms of local content calculation and verification - whilst in the process of being readdressed - is insufficient action, if one considers the level of investment at stake and our current unemployment crisis.

Further, I need to address the competitive supplier development programme (CSDP). Somewhere along the line we seem to have become confused. The goal of CSPD is to create a competitive supply chain, not to develop additional competitors within the supply chain – there needs to be a sustainable balance. A competitive supply chain involves ensuring that your supply base has the capability, the capacity and the accreditation as well as competitive pricing to be able to deliver a viable local product that is either equivalent or preferable to imported alternatives - this is done by ensuring that orders are actually received, consistently, through proper planning to meet key performance indicators (KPI's).

The natural result of such an initiative means local suppliers will be able to create jobs, develop skills and contribute to the community they serve, in addition to investing in their own capability and capacity through R&D and equipment that will bring about additional competitiveness and value for money. By developing competitive suppliers, one is not creating jobs; one is shifting the workforce from one supplier to the other. We are diluting companies' ability to invest in their businesses, and be competitive as volumes are now being shared. With reduced volumes comes higher pricing – and a lack of sustainability all round.

Transformation within the manufacturing environment – rail or otherwise – has a lot to do with return on investment. We would see far more black industrialists and better transformation at an ownership level if the returns on investment in local manufacturing were viable or as profitable as sectors such as retail and ICT. This ultimately comes down to consistent spending from state-owned companies and timeous payment of bills.

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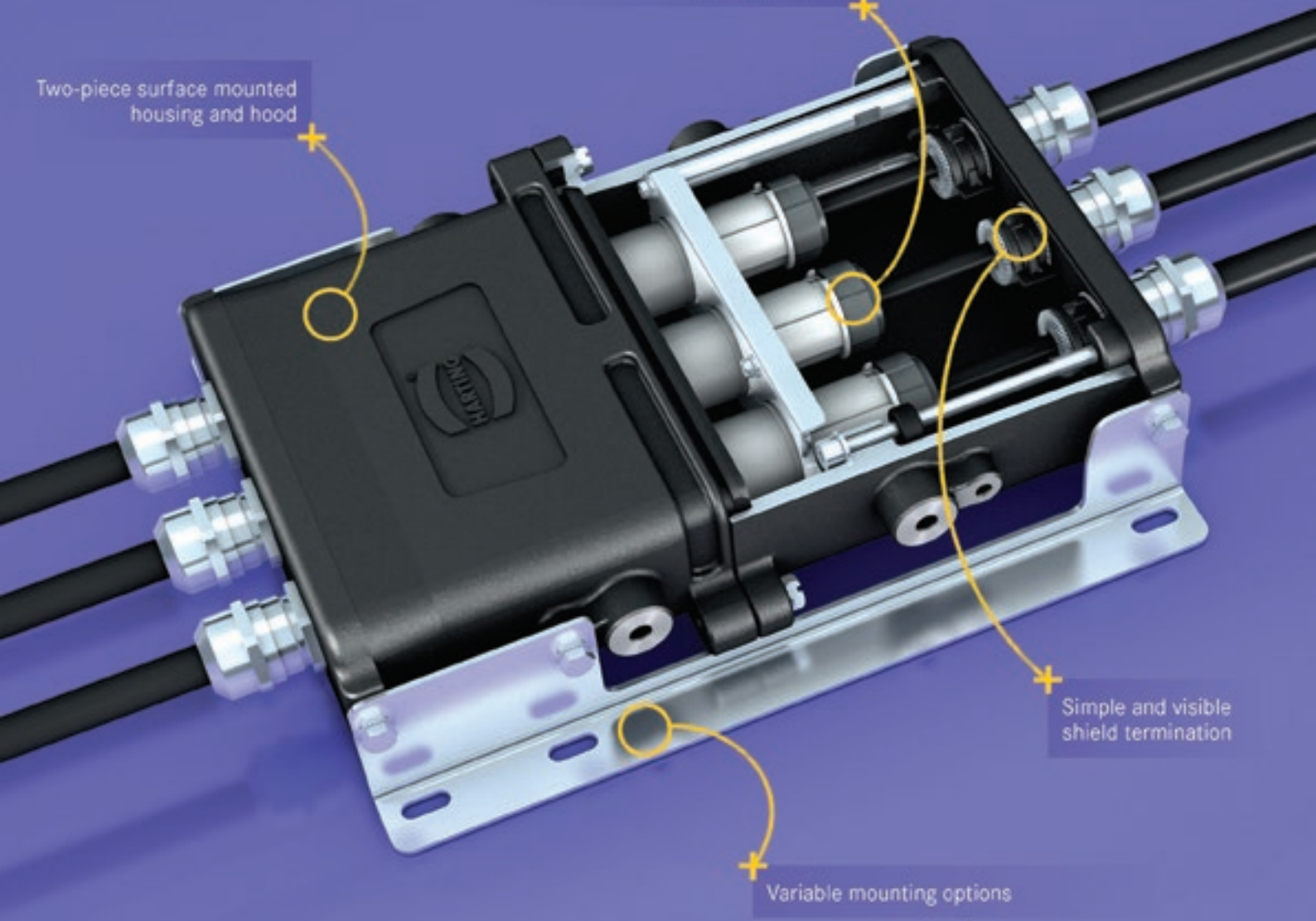

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Railways Africa™ Reports From InnoTrans – The World's Leading Transport Trade Fair

InnoTrans is the leading international trade fair for transport technology and takes place every two years in Berlin, Germany. The trade fair serves as an international platform for buyers and sellers of passenger and freight transport technology, providing an international networking opportunity for those in the transport industry from across the globe.

The trade fair covers all aspects of the railway industry, including railway technology; railway infrastructure; public transport; interiors and tunnel construction. The InnoTrans trade fair occupies all 41 halls available at the Berlin Exhibition Grounds and offers exhibitors the opportunity to display the latest in railway related technology and product offerings. One of the distinguishing features of the InnoTrans trade fair is the 112,000m^2 outdoor display area, where a multitude of products - from tank wagons to high-speed trains - are displayed on 3,500m of track, specially installed for the event.

The InnoTrans Convention takes place in conjunction with the trade show and, since its inception in 1996, has established itself as a premier international meeting place for top-level decision makers in the private sector, political arena and transportation communities from across the world. The convention features high-profile panel discussions and expert talks on current and future-focused mobility issues, providing key stakeholders in the transport sector the opportunity to discuss, brainstorm and network on an international scale.

There were eleven events in the five main forums, dealing with mobility issues of current and future relevance, including the rail leader's summit, international design forum and dialog forum - to name a few.

The eleventh edition of InnoTrans saw unparalleled attendance and participation from stakeholders in the transport sector. The event facilitated growth opportunities for businesses in the form of millions in contracts signed and joint venture agreements between some of the biggest players in the railway industry. The trade fair serves as an opportunity for companies to showcase the sector's innovative drive, with 127 world premier launches, featuring the latest in product design, service innovation and cutting-edge technology for use in the railway sector.

Event organisers Messe Berlin, have heralded this years' event as the most successful instalment to date – with a 7% increase in the number of exhibitors and 4% increase in trade visitors. According to Messe Berlin, a total of 2,955 exhibitors, from 60 countries, presented their products and services at InnoTrans 2016, which was attended by a record

Birds eyeview of the Bombardier stand at Innotrans 2016.

Left to right: Popo Molefe, chairman, PRASA; Collins Letsoalo, acting group CEO, PRASA; Kefilwe Mothupi, head of sales and business development - rail control solutions, Bombardier SA; Thomas Bimer, VP - rail control solutions, Bombardier.

144,470 trade visitors from more than 140 countries across the world. Exhibitors and visitors alike have lauded InnoTrans 2016 as a universal success - with evaluation feedback showing that more than 90% of participants were "extremely satisfied" with the event.

Railways Africa™ Tours InnoTrans 2016

Railways Africa™ representative, Craig Dean, had the privilege to attend InnoTrans 2016.

On arriving at the InnoTrans trade fair grounds, Craig expressed his amazement at the sheer enormity of the event. "It is difficult to explain how awe inspiring it is to see the number of exhibitors represented at a single fair" Craig states, "One has the opportunity to engage with the original equipment manufacturers in the industry such as Bombardier, GE Transportation, Progress Rail and Alstom, to name a few – however there are also a vast array of smaller suppliers, who specialise in just one or two components such as materials used in the interior of passenger wagons or lighting of carriages. It brings into perspective the vast scope of this sector," Craig explains.

Most impressive, Craig feels, is the outdoor display area. "One sees pictures of the rolling stock being developed by industry leaders such Bombardier, Stadler and Alstom for

the international market, however, having to opportunity to touch and feel the equipment is truly incredible, especially the high speed trains which we don't see in South Africa" he states.

Also remarkable, Craig notes, is the number of innovations that were launched by manufacturers and service providers at the show. "Some of the products and services being featured during the show truly represent the cutting edge of digitalisation and technology development in an ever evolving world." The fact that the African market will soon have access to some of the innovations on display is very exciting.

The expo and conference facilities, owned by the world-renowned events management company Messe Berlin, are rightly called an "ExpoCentre City" and covers a vast 180,000m^2 stretch, in Berlin's Westend. The facility offers 41 halls for InnoTrans exhibitors, a multifunctional conference facility, called CityCube Berlin where InnoTrans hosted their international transport conference, as well as an expansive outdoor display area, which has become a trademark of the InnoTrans trade fair. The compound allows for 12,000 parked cars and is surrounded by taxi ranks, bus stops, U-Bahn and S-Bahn stations and bus stops, ensuring that visitors are able to access all that Berlin has to offer while attending the show.

While the trade show has a definite European feel, Craig explains, he was pleased to see a solid representation of familiar names among the exhibitors, representing suppliers with an African home base. South African manufacturing company Van Rail, who specialise in the manufacture and supply of products and services to the railway rolling stock industry in the country and to the international market exhibited their product offerings at the show, as did South African based press forge specialists DCD Ringrollers. Jeremy Pougne, the chief executive officer of Booyco Engineering, was present, representing his company's cooling, heating, ventilation and filtration systems, Mdu Mlaba of Transnet RME as well as James Holly, chief executive officer of Sheltam. Other exhibitors from the South African market included Thermitrex, MTU South Africa, VAE South Africa and Plasser Rail, among others. Craig also met up with Popo Molefe, current chairman of the board at PRASA, together with Collins Letsoalo, the acting PRASA group CEO. "It was encouraging to see South African exhibitors and visitors attend the show. It is important that South African manufacturers and suppliers are recognised for their world-class services and products. This is a wonderful opportunity to showcase what the African manufacturing base has to offer," Craig concludes.

Railways Africa™ Magazine has selected a few companies, events and product launches emanating from InnoTrans 2016 for our readers in this edition of the magazine. The selection of articles in no way represents all of the product launches, industry news, and relevant events at InnoTrans, which is as vast and all-encompassing as the event itself. We do, however, hope that this small sampling will offer readers the opportunity to enjoy some of the highlights of the event.

WORLD RAIL MARKET STUDY RELEASED AT INNOTRANS – 3% GROWTH PREDICTED FOR AFRICA

The UNIFE World Rail Market Study, developed with Roland Berger Consultants, and published by DVV media Group in cooperation with InnoTrans, was presented by the Union of the European Railway Industries (UNIFE) at InnoTrans 2016.

InnoTrans 2016 - UNIFE Announcement of the World Rail Market Study Results.

InnoTrans 2016 - Opening Press Conference InnoTrans 2016 - Philippe Citroën, Director General of the Association of the European Rail Industry (UNIFE).

The report provides an analysis of the current status of the global railway market and provides an outlook until 2021. The report is subdivided across five product segments, including rolling stock, infrastructure, rail control, services and integrated projects. The report covers the entire global market, including 60 of the largest rail markets.

According to the main findings of the study, the global rail industry market is growing steadily and, in contrast to past years, Western Europe seems to be playing a more significant role.

The study indicates that the railway market will expand globally by an average of 2.6% over the next six years. For Western Europe, which has recently fallen behind Asia, the growth forecast is 3.1%. For Africa, the growth forecast is 3%, capturing many of the recent railway infrastructure projects being initiated on the continent in partnership with China.

Western Europe's growth surge is mainly due to the French TGV du Futur and the British HS2 high-speed train projects, as well as to the infrastructure programme in Germany, which is still Europe's largest market. The study forecasts relatively high growth for North America, at 2.2%, which is driven mainly by metro construction projects in Surrey (Canada), high-speed passenger transport projects in California and linking major cities in the north-east of the USA.

Listed by market segment, the highest growth rates are predicted for control systems and services, where annual growth is forecast at 2.9%, followed by infrastructure (2.8%) and rolling stock (1.9%).

In his opening address at an InnoTrans press conference held on 20 September, director general of the Association of the European Rail Industry (UNIFE), Philippe Citroën, reflected on the findings of the World Rail Market Study, highlighting the impact of contractions in Asian markets and presenting a threat to the industry, while acknowledging the role that as digitalisation, population growth and urbanisation will have on the market in years to come.

GERMAN TRANSPORT MINISTRY HANDS OVER A DECLARATION OF INTENT TO BOMBARDIER FOR THEIR BATTERY ELECTRIC MULTIPLE UNIT (BEMU)

The German federal minister of transport, Alexander Dobrindt, has expressed his intention to ban noisy goods trains by 2020, even if the EU Commission favours introducing such regulations at a later date.

Dobrindt stated this assertion during his tour of InnoTrans 2016 in Berlin. "We will remain firm on this issue", he added, referring to legislation to reduce the noise levels produced by rail freight. "Public acceptance of the strategy to attract more traffic to the railways can only be achieved if trains are made quieter," he said

The minister also called for "diesel locomotives to become a thing of the past", which he feels is important as the country is trying to bring about the complete electrification of the railway networks. According to Dobrindt, if the construction of overhead power lines is not economically viable, then recourse must be made to battery or fuel cell technology.

The minister handed over a declaration of intent to the Canadian railway manufacturer, Bombardier, to provide financial support for the Battery Electric Multiple Unit (BEMU) project. This is an electric multiple unit, equipped with additional batteries to enable it to operate on non-electrified sections of track.

DIGITALISATION REVOLUTIONISING THE RAILWAY SECTOR

Speaking at the InnoTrans opening press conference held on 20 September, chief executive of the German Railway Industry Association (VDB), Dr Ben Möbius, pointed out that: "InnoTrans is by far the most important trade show for the industry," adding that "We believe that we are facing a fundamental development, that of digitalisation."

Many of the exhibits at InnoTrans will reveal that the industry is not facing a recent development, the midst of a digital transformation, Möbius explains. In his view, digitalisation will boost innovation in all areas of the rail industry, including large-scale innovations such as digitalised signal boxes - without which the European Train Control System (ETCS) could not function - as well as smaller bespoke solutions that will collectively revolutionise the industry.

InnoTrans 2016 will feature many of the latest digital products being developed and implemented by railway operators in the global market.

The German Industry Leads The Way In Digitalisation

Mirroring the views held by Möbius, chief executive officer of the Electric Railways and Power Line Division of the ZVEI, Herbert Zimmermann, stated in his opening address to media on 20 September: "Digitalisation is the dominant subject of the trade show."

This assertion is ratified by many of the technologies being featured at the fair, including automated operations and services. According to Zimmermann, driverless trains are already operating around the world, from Nuremberg to San Francisco and Singapore. The high investment costs are offset by the increased safety, greater flexibility and a reduction in energy consumption.

"The signing of service agreements between rail operators and the industry are already guaranteeing 99% availability as a result of digitalised monitoring capabilities," said Zimmermann. The optimal utilisation of existing infrastructure, as a result of digital technology, allows for increases in capacity of up to 50%, Zimmermann explains, adding that the installation of components and systems using sensor technology for monitoring operating processes enables preventative and pre-emptive maintenance, which has positive cost and efficiency implications for rail operators in the present and the future.

InnoTrans 2016 - Opening Press Conference InnoTrans 2016 - Dr Ben Möbius, managing director of the German Railway Industry Association (VDB); Dr. Martin Henke, managing director, Association of German Transport Companies (VDV); Herbert Zimmermann, managing director of the Electro-Industry Association (ZVEI); Dr. Christian Göke, chief executive officer of Messe Berlin GmbH; Matthias Steckmann, executive director Business Unit Mobility & Services, Messe Berlin GmbH; Dr.-Ing. Roland Leucker, managing director of the German Research Association for Tunnels and Transportation Facilities (STUVA); Philippe Citroën, director general of the Association of the European Rail Industry (UNIFE).

German Transport Ministry hands over a declaration of intent to Bombardier for their Battery Electric Multiple Unit (BEMU).

Left to right: Alexander Dobrindt, German Federal Minister of Transport, Germar Wacker, President Mainline/Metro CEE Bombardier, Prof. Dietmar Goehlich, TU Berlin, Violeta Bulc, EU Transport Commissioner.

RAIL LEADERS' SUMMIT - FURTHER IMPROVEMENTS TO RAIL TRANSPORT WITH DIGITAL TECHNOLOGY 4.0

In his opening address to the Rail Leaders' Summit (RLS) 2016, held at InnoTrans, the German federal minister of transport and digital infrastructure Alexander Dobrindt said: "Railways continue to present an innovative force. The railways have always set the tone for innovations and therefore they are at the heart of the digitalisation process in Germany."

InnoTrans 2016 - Rail Leaders' Summit (RLS) - Alexander Dobrindt, Federal German Minister of Transport and Digital Infrastructure.

According to Dobrindt, the introduction of digital technology, in various forms, will bring with it far-reaching changes for railways around the world. "Whether this is in the form of automated rail transport systems or electronic ticketing, driverless trains or recording data about customer flows, the introduction of Digital Technology 4.0 is bound to bring further improvements to the railways," he stated.

The importance of the move towards digitalisation was also emphasised by the EU transport commissioner Violeta Bulc in her opening address. She views the European-wide introduction of ERTMS as a milestone in digital development on the continent and in the industry. Despite all the enthusiasm surrounding the success of digitalisation, she expressed concerns about attempts by individual countries to act in isolation when faced by this wide-ranging and demanding development: "When we create digital systems, this should not result in monopolies." she warns.

This was a consistent theme, from all speakers on the platform at the Rail Leaders' Summit. As Dr Josef Doppelbauer, managing director of the European Union Agency for Railways emphasised: "We do not need 28 solutions from 28 countries. The aim should be to make the railways more competitive. The objective must always be to meet the customers' needs."

Alistair Dormer, global CEO rail for Hitachi Rail Europe, agreed, asserting that he regards the main challenge in passenger transport to be adapting rail transport intervals to satisfy customers' requirements. According to Patrick Jeantet, deputy chairman of the board of French railways (SNCF), this is an issue that France's national state-owned railway company is actively concerned with and hopes to address using big data: "We have been collecting data for several years. This must be used correctly," he states.

Dr Doppelbauer explained that this is no easy task: "The problems for us lie with the safety authorities, which live in an old-world with old-world regulations". The chairman of the board of Deutsche Bahn AG, Dr. Rüdiger Grube, also regards this as a key issue: "Digital technology is not a revolution but an evolution", he states, "for example, the aim for goods traffic is to increase productivity because otherwise, the railways cannot compete with road haulage over the long term."

NETWORKED SYSTEMS FOR HIGH PERFORMANCE RAIL TRANSPORT

Knorr Bremse, together with its subsidiaries, held five exhibition booths at InnoTrans presenting new and advanced braking, entrance, HVAC and power supply systems, proving the company's reputation as a leading innovator in the railway industry.

Advantages For Rail Vehicle Manufacturers, Operators And Users

Networking a train's subsystems generates significant added value for manufacturers, operators and users. Vehicle builders enjoy access to complete solutions from a single source, fleet owners benefit from lower operating costs and passengers experience improved reliability and punctuality.

The advantages for vehicle builders range from easier project handling to simplified approval processes. Well-matched sub-system hardware and software that has been tested prior to integration makes the system architecture easier to plan and reduces the electronic complexity of the various different sub-systems.

Closer networking of individual sub-systems in a rail vehicle increases the benefits for the operator. If for example, across-the-board diagnostics are available for the brakes, doors, HVAC, and power supply, there is no need for separate service tools for each individual sub-system – meaning lower costs and simpler, faster and cheaper commissioning and maintenance.

Knorr Bremse iCOM® – An Innovative Platform For The New Generation Of Rail Vehicles

Knorr Bremse has developed a comprehensive, modular system for the digital railroad age that increases safety and reduces costs for fleet operators: iCOM®.

iCOM® is one of the latest ideas from Knorr Bremse Rail Services – an innovative platform for preventive maintenance, driver assistance and energy metering.

The solution consists of on-board equipment, a back office and a large number of groundbreaking apps. The iCOM® Monitor app, for example, combines detailed measurements and analytical data with automated diagnostic functions to display the current status and servicing requirements of all the train's main systems. This enables fleet operators to carry out condition-based or preventive maintenance on their vehicles, avoiding component failure and enabling cost-effective repair and maintenance work to be carried out as required.

New Products For Greater Safety, Comfort And Efficiency

Knorr Bremse showcased a wide range of new products designed to improve the safety, comfort, and efficiency of rail travel. The innovative SNAKE entrance system for mass transit vehicles from Knorr

Bremse subsidiary IFE is a case in point: The ultra-flat, light-weight doors can be installed in a restricted space and offer rapid opening and closing, making them ideal for operations with high passenger volumes. The entrance system is not only extremely robust but also requires minimal maintenance, thanks to its lubricant-free spindle drive.

Knorr Bremse's Intelligent Air Control® system adjusts the volume of air it supplies according to the vehicle's operating status. As it also functions without the need for an auxiliary compressor and is effectively sound proofed, the overall result is lower costs, a simplified system and reduced noise emissions for passengers and the surrounding environment.

Further innovations on show at the Knorr Bremse booth were the modular CCB-3 locomotive brake unit and 'CFCB Light' – a new compact freight train braking system designed for applications where weight is crucial.

With its acquisition of the rail transport division of brake pad specialist TMD early in 2016, Knorr Bremse significantly expanded its friction material portfolio to include not only retrofittable organic LL pads but also low-noise organic pads as original equipment.

With its standardised, modular products, Knorr Bremse PowerTech is able to offer onboard converters for a wide range of performance categories and vehicle types. The converter technology can also be linked with other Knorr Bremse products and systems such as iCOM diagnostic software, air compressors or HVAC systems.

Knorr Bremse Adds To Its Technological Lead

The products and services showcased at InnoTrans 2016 serve as a demonstration of Knorr Bremse's global leadership in the field of rail vehicle systems. To make sure it can continue to supply vehicle manufacturers and operators with innovative systems that deliver improved safety, efficiency and cost-effectiveness, Knorr Bremse opened a unique new development centre in mid-2016. Costing more than €90 million, it represents the biggest single investment in the company's 111-year history.

With a total of 100 test rigs, the building offers optimum conditions for developing and testing new types of braking systems for rail vehicles and trucks. For example, the development engineers are currently working on advanced solutions that will make low-wear, precise braking of trains possible whatever their load and whatever the weather conditions. This will enable train frequency to be increased and further improve punctuality.

VOESTALPINE LAUNCHES WORLD PREMIERE AT INNOTRANS 2016

According to international railway manufacturer voestalpine, InnoTrans offers the perfect stage for national and international suppliers and customers of passenger and freight transport. voestalpine presented itself at the event as a full-service provider in the rail and turnout technology sector, making it the only enterprise worldwide with consolidated expertise in both areas. The company was represented by their subsidiaries under voestalpine Schienen GmbH and the voestalpine VAE Group.

Broad Portfolio With A Focus On Customer Benefits

At the 1,000m² exhibition stand, the company's strategic business segments exhibited their products and services on joint thematic islands, with mixed traffic and high-speed systems, metro systems and tramways, heavy haul products, services as well as monitoring and digitalisation, to name a few.

All voestalpine solutions focus on customer benefits, with the best track performance at the lowest possible lifecycle costs.

The company used InnoTrans as a platform to launch the following new innovations:

- Interactive rail LCC-tools for mixed traffic as well as for urban traffic
- A new family of heat-treated hypereutectoid rails based on the worldwide proven steel grade 400 UHC® HSH®
- Competence Centre Welding: innovative welding processes for rails, including custom-made and customer-specific solutions, as well as welder training
- iSwitch intelligent switch machine: a wireless, battery powered device for gathering and transmitting comprehensive condition monitoring data
- PHS1601 point heating system with power regulator to save energy and reduce CO_2 footprint
- UniAC2 Axle counter system: includes new functions for highest availability, self-correcting algorithms and a powerful configuration tool with communication to various interlocking systems
- WS Academy, the new professional training and educational centre around the "system infrastructure"
- voestalpine Rail Centres: their offerings include, amongst others, high-performance welding plants with a large scope of specialities including strong logistics competencies for rail network operators

Another important focus was on digitalisation in all sectors relevant to rail infrastructure. voestalpine presented its achievements as well as its visions for the future of optimised asset management in close cooperation with infrastructure managers and track construction companies.

SCIF: NORTH AFRICAN RAILWAY MANUFACTURER SHOWCASES THEIR PRODUCTS AT INNOTRANS

SCIF develops, designs and manufactures various bogies, including types Y32, Y27 and Y25.

Founded in 1946, "Société Chérifienne de matériel Industriel et Ferroviaire" (SCIF) is a Moroccan company that specialises in the manufacture of electric locomotives as well as the manufacture, rehabilitation and refurbishment of railway rolling stock and related components. Based in Casablanca, Morocco, the company currently employs 260 full-time members of staff as well as providing 400 contract positions and operates from a world class manufacturing facility in North Africa.

Currently, the company delivers a wide range of products and services for the railway industry in Africa and Europe, including the manufacture of railway components and rolling stock, the refurbishment of railway passenger cars, the production of tanks for storing liquids and gases as well as on-site assembly of steel structures, piping, tanks, pressure vessels, and conveyors.

SCIF exhibited various examples of their new rolling stock for passenger and freight services at InnoTrans 2016. The company has designed its products with the needs of both its African and European customers in mind. Products displayed by SCIF at the trade fair included carriages manufactured for Morocco, specialised freight cars for Tunisia and electric locomotives destined for Poland.

PROGRESS RAIL HIGHLIGHTS THEIR ADVANCED TECHNOLOGIES AND PREDICTIVE ANALYTICS CAPABILITIES

Progress Rail, a wholly owned subsidiary of Caterpillar Inc., showcased the latest technology solutions and one of the broadest offerings of rolling stock and infrastructure products for transit and heavy haul customers at InnoTrans.

Visitors had the opportunity to experience two Progress Rail exhibits, totalling nearly 1,000m² of floor space and featuring a variety of products and services.

Progress Rail president and chief executive officer William (Billy) Ainsworth said of the company's development in recent years: "For years, we have invested heavily in technology advancements to enhance our customers' experience, resulting in improved productivity and reliability. Recently, we formed strategic partnerships with other industry-leading companies, such as Uptake, on our latest predictive analytics platform, and Seeing Machines, for fatigue monitoring, leveraging our already substantial capabilities. In the past year alone, we have also acquired companies and technologies, such as Inspired Systems, Applied Ultrasonics and our new drone inspection technologies. All of these steps result in improved value for our customers by deploying integrated solutions across the entire rail ecosystem."

Explaining the focus that Progress Rail will be taking at InnoTrans this year, senior vice president of Marketing and Analytics Paul Denton said: "This year, we are showcasing our highly anticipated predictive analytics platform – EMD Uptime – to help customers not only get the most out of their locomotive fleets, but also help prevent potential failures before they occur."

EMD Uptime is a complete condition-based analytics platform. Uptime monitors locomotive fleets to increase reliability, optimise maintenance activities and improve mission success. The result is improved fleet utilisation and productivity, better fuel efficiency, enhanced safety and significantly less downtime. Rail operations can conveniently track the status of a single locomotive or an entire fleet – all from their tablet or smartphone.

Progress Rail Exhibit Highlights

Progress Rail's infrastructure products and technology were on exhibition at a dedicated infrastructure stand, combining trackwork, fasteners, signalling, rail welding and Maintenance-of-Way equipment available for customers all over the globe. The company also exhibited their technology applications in real and interactive forms, including drone inspection, infrastructure asset protection and data analytics for the wayside sector.

The company launched their EMD Uptime at InnoTrans, with demonstrations at select times throughout the trade fair. This predictive analytics platform builds upon Progress Rail and EMD's analytics offerings and is expected to help customers optimise train building and improve mission success while delivering additional fuel savings and minimised shop cycle times. Visitors to the trade fair had the opportunity to see 3D renderings of several locomotive and engine models at the company's on-site Immersive Visualisation Centre (known as the CAVE), as well as augmented reality demonstrations and a locomotive simulator complete with fatigue monitoring.

VOSSLOH PRESENTS INNOVATIVE COMPLETE SOLUTIONS IN RAIL INFRASTRUCTURE

Vossloh presented its comprehensive integrated product and service portfolio at InnoTrans.

Answers to the most pressing questions in the industry were offered under the slogan "Connecting Expertise":

- How can maximum track availability and efficiency be ensured?
- How can noise and vibrations as well as lifecycle costs in rail transport be further reduced?

As a part of the company's repositioning strategy, which was initiated in 2014, Vossloh has positioned its three core divisions in an efficient and streamlined manner so that customers can access complete railway infrastructure solutions.

Vossloh is working intensively on developing low maintenance, long-lasting and reliable rail technology components, using it's longstanding and substantiated industry experience, to offer customers sustainable, economical and innovative rail infrastructure concepts.

Vossloh is on track in terms of operations, strengthening its profitability in the 2016 financial year, as planned. The stable financial foundation for the targeted growth was laid with the sale of the Rail Vehicles business at the end of 2015 and a successfully completed capital increase, in June 2016. Vossloh has won a number of major orders in recent months, demonstrating continued positive growth.

On 20 September, Vossloh signed a contract with the Chinese company CRCC High-Tech Equipment Corporation Limited (CRCCE) at InnoTrans, in which Vossloh agreed to provide the key components for grinding technology, hydraulics and steering in the construction of new grinding trains for the Chinese operator.

VOSSLOH KIEPE MAKES THE WUPPERTAL SUSPENSION RAILWAY MORE COMFORTABLE

Vossloh Kiepe is carrying out a complete modernisation of the Wuppertal Suspension Railway (Wuppertaler Schwebebahn), which will be completed by the end of next year.

The Wuppertal Suspension Railway is the oldest electric elevated railway with hanging cars in the world and is a unique system. The installation, with elevated stations, was built in Barmen, Elberfeld and Vohwinkel between 1897 and 1903. The first track opened in 1901 and is still in use today, moving more than 25 million passengers annually[1]. The modernisation program will see 35 new cars being introduced.

As Vossloh Kiepe marketing manager, Erik Leonhardt explained at InnoTrans, the new cars are intended to replace the existing trains, which have been in service since 1972. Four of the completely redesigned cars are currently operating on the historic route over the River Wupper. The Wuppertal municipal utility department is using them to train 200 drivers, who are also able to drive the normal city buses. Eight of the suspended trains, which have a top speed of 40km/h, will be in service by the end of this year. They will provide considerably enhanced comfort and will be more environmentally friendly than their predecessors. The front and rear of the cabins are made of glass fibre-reinforced plastic, while the main body is made of aluminium. This design means that the vehicles, 24m in length and with a width of 2.2m, are very light - at just 24 tonnes.

1. Wikipedia: Wuppertal Suspension Railway: https://en.wikipedia.org/wiki/Wuppertal_Suspension_Railway.

ABB REVOLUTIONISES BATTERY CHARGER

ABB has launched a next generation battery charger based on silicon carbide (SiC) power semiconductors for use in all rail applications.

Train batteries provide power for critical systems such as control and lighting. The new compact battery charger of the series, BORDLINE® BC, complements ABB`s large stand-alone auxiliary converter product range and is compatible with all standard train battery voltages. With a footprint of 360 x 220mm, it is about 10 times smaller and has a weight reduction of 80% compared to previous generations. The new device excels with a high power density of 1 kW per litre and per kilogramme, an improvement from the previous generations by a factor of 15.

BORDLINE BC battery charger.

Modern trains have varying requirements for powering electronics components. In local transportation, such as trams, the components need to be as lightweight as possible to improve overall system energy efficiency, while the need in long-distance and high-speed transportation is for compact, powerful and reliable devices.

The BORDLINE BC battery charger employs ABB's well proven modular platform design while incorporating SiC technology for the first time. The SiC power semiconductor technology enables a power density and performance not possible with conventional silicon (Si) power semiconductors due to its conductivity characteristics. Mastering SiC technology translates into dramatically reduced size, weight, and cooling requirements and increased system efficiency, all critical factors for rail operators. "The new battery charger leverages all the benefits available from SiC and soft switching technologies to allow for a new performance level of power electronics in railway," said Sami Atiya, president of ABB's Discrete Automation and Motion division. "ABB has a long history of providing innovative and energy-efficient technologies to the rail industry and we will continue innovating for the transportation sector, a key growth area in our Next Level strategy."

The new high-speed trains by Stadler operated by the Swiss Federal Railways (SBB) on the new transalpine Gotthard base tunnel route between Zurich and Milan will be equipped with this groundbreaking technology.

ALSTOM UNVEILS ITS ZERO-EMISSION TRAIN

Despite numerous electrification projects in several countries, a significant part of Europe's rail network will remain non-electrified in the long term. In many countries, the number of diesel trains in circulation is still high, with more than 4,000 cars in Germany alone.

Alstom unveiled their new zero emissions train, the Coradia iLINT at InnoTrans. The train is a new CO_2-emission-free regional train, which serves as an alternative to diesel power. It is powered by a hydrogen fuel cell and its only emission is steam and condensed water and operates with a low level of noise. Alstom is among the first railway manufacturers in the world to develop a passenger train using this technology.

With thanks to the company's strategic partners, Alstom offers customers a complete solution, which includes the train, a maintenance package and the necessary hydrogen infrastructure, as a turnkey solution.

The launch follows the Letters-of-Intent signed in 2014 with the German Landers of Lower Saxony, North Rhine-Westphalia, Baden-Württemberg, and the Public Transportation Authorities of Hesse, for the design of a new generation of emission-free trains equipped with the fuel cell drive.

"Alstom is proud to launch a breakthrough innovation in the field of clean transportation, which will complete its Coradia range of regional trains. It shows our ability to work in close collaboration with our customers and develop a train, in only two years," declared Henri Poupart-Lafarge, Alstom chairman and CEO.

Alstom's Coradia range of modular regional trains has a proven service track record spanning more than 16 years. More than 2,400 trains have been sold around the world, which demonstrates a high availability rate. Coradia iLINT is based on the service-proven diesel train Coradia Lint 54 and will be manufactured in Salzgitter, at Alstom's largest manufacturing site.

CONTACTLESS HEIGHT MONITORING ON 15KV OVERHEAD LINES

Track construction products from Leonhard Weiss GmbH & Co. KG.

Dr Wehrhahn Meßsysteme, in collaboration with Leonhard Weiss GmbH & Co. KG has announced the development of a contactless "OVH-WireSafety" height monitoring system, which the company launched at InnoTrans.

Specified safe distances must be maintained in order to eliminate the risk of damage to 15kV overhead power lines when construction machinery is being used. Without precise details about the height of the catenary wire, drivers of dual-purpose excavators may be applying a different set of values for limiting the height at which they can operate. This can result in a failure to maintain the safe distance, with ensuing damage to the overhead lines.

Using a contactless method, the device determines the height of the catenary wire and, depending on any implements that may be mounted on the vehicle, it also establishes the maximum permitted lifting height under the power line, and can relay this data to the system controlling the lifting arm. In this way, the control system can constantly adjust the height limiter in order to permanently adhere to the required safe distance.

ALTA RAIL TECHNOLOGY LAUNCH THEIR LIGHTWEIGHT END-OF-TRAIN DEVICE

The equipment for monitoring train integrity consists of an end-of-train (EOT) device that is installed in the last wagon of the train and is connected to the brake system and a device at the front of the train. These components exchange data such as pressure in the main air line and acceleration sensors among others, via a radio link in order to rapidly detect a break in the train and many other important variables that affect train operation.

The latest EOT development from Alta Rail Technology (ART), launched at InnoTrans, provides the same functions for ensuring train operating safety but is lighter due to the use of plastics in the manufacturing process. Like the previous version, it is a rugged device and is suitable for use under all conditions found in a train operating environment. The EOT informs the train driver about train integrity, brake pipe pressure and many other variables, and is also able to accurately calculate the total train length at all times. The EOT uses a communication module that complies with the AAR codes (American Association of Railroads) for EOT devices.

Alta Rail Technology originated from the merger of three innovative rail technology companies in 2013, ALL Rail Tech, Daiken, and Engesis. The partnership jointly developed technologies based on the successful business model implemented at América Latina Logística (ALL).

ART has a long-standing relationship with its clients in Africa and has worked with South Africa's Transnet Freight Rail, Rift Valley Railways in Kenya, Mozambique's CFM, Vale and RioTinto to name a few. ART currently has a project portfolio which includes 1,800 locomotives, 32,000 train cars and 25,000km of railway network.

HIGH-PERFORMANCE ETHERNET BROADBAND BRIDGE FOR TRAIN NETWORKS

To meet the growing need for more in train communications networks capacity, Westermo has introduced a new generation of Ethernet train switches that provide highly robust networks to support many end devices and high data rates. Specifically designed for train applications, the wide range of interoperable Viper switches delivers reliable and versatile solutions for train networks, enabling optimal configuration for every need.

Based on the previous proven and highly popular train switches from Westermo, the new models provide a range of 12 and 20 ports standard Ethernet, Gigabit Ethernet and PoE (Power over Ethernet) variants as well as additional routeing functionality to enable the connection of subnets and improved overall network performance.

The Viper is available with up to 5gigabit ports to meet the need for connectivity of gigabit end devices, such as WLAN access points and network video recorders. Simultaneously, lightning fast failover on gigabit ring ports can be achieved.

The Viper offers eight PoE ports that support the IEEE 802.3af/at plug-and-play PoE communications standard. PoE enables both power and data to be transmitted on a single multi-core cable, especially useful for camera applications, reducing overall wiring and enabling faster installation. The Viper with PoE is available in variants for low or high voltage power supply range allowing installation in any rail vehicle regardless of power standard. The Viper can also provide gigabit speed over the PoE ports, making the switch ideal for WLAN access points.

Specifically designed to provide highly robust networks and long-term field operation, the Viper range has been tested and approved to exceed the EN 50155 onboard railway standard for electronic equipment, as well as an extended range of approvals with

NFPA 130 (NA fire & smoke) and shunting radio EMC requirements from European rail authorities.

The Viper has been designed to be compact and ultra-thin, enabling installation within the confined spaces of railcar panels. The M12 connectors are integrated into the housing to reduce the size and further protect against vibration. With an ultra-robust design, sealed to IP67 and vibration resistant to military standards, these units are ideal for situations where mechanical stress, moisture, condensation; dirt or continuous vibrations could adversely affect the function of standard Ethernet switches. A GORE-TEX(R) membrane is used to prevent condensation build up by normal climatic day/night cycling.

As well as high levels of reliability, the switches offer unique functionality that simplifies the creation, installation and maintenance of networks. The Viper switches' WeOS operating system provides an extensive suite of IP networking features and protocols allowing resilient and flexible networks to be created.

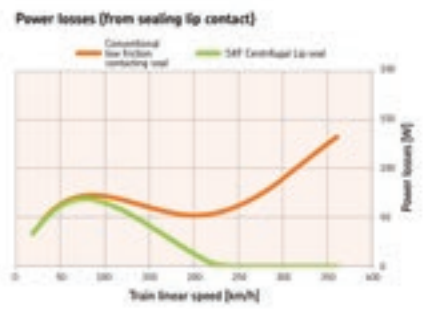
WeOS is also able to balance data traffic on the network to maintain maximum throughput and stability. The introduction of increased traffic from new cameras or video streams will therefore not affect the stability of the network. In the event of any link or hardware failure, Westermo's unique FRNT technology is able to re-configure a large network in 20ms.

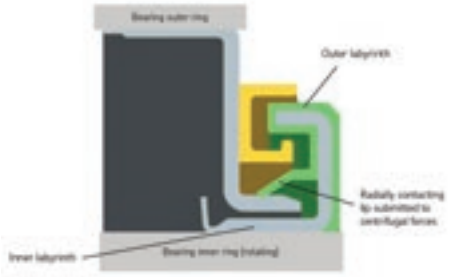
For easy configuration, the Ethernet switches can be safely accessed from anywhere in the network using the WeConfig network configuration tool, or directly via a console port on the switch.

A NEW GENERATION CENTRIFUGAL LIP SEAL

SKF has launched a revolutionary new seal that has been developed to save energy and cut maintenance requirements in high-speed passenger rail applications. Introduced to the market for the first time at InnoTrans, the SKF Centrifugal Lip Seal features an innovative design that offers a unique combination of both contacting and non-contacting sealing on wheelset bearing units in one product.

The sophisticated seal allows for an optimised friction pattern throughout the operation cycle of high-speed trains. It incorporates a lip that is closed when the vehicle is travelling at low start and stop speeds to effectively exclude contamination from the bearing. When the speed is increased and the centrifugal force reaches a certain limit the lip opens and it becomes an almost zero friction seal, while the same centrifugal force prevents the ingress of pollution.

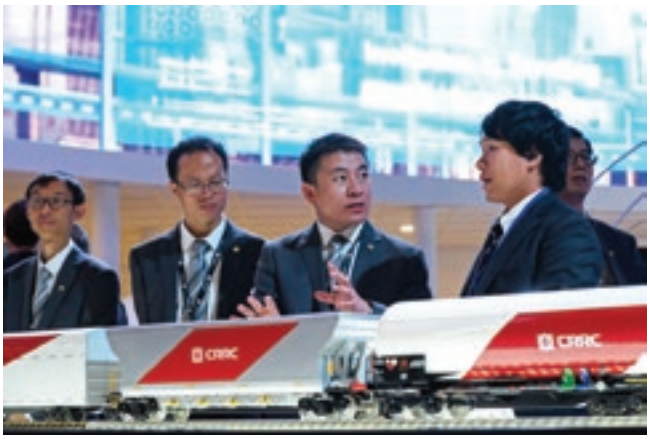




This intelligent two-seals-in-one design balances the trade-off between sealing function and friction torque, eliminating the need for a compromise on either. As a result, the unit can operate at a low temperature and extended maintenance intervals can cut the cost of servicing and improve the reliability of the application through cleaner grease. The significantly enhanced efficiency and energy savings can also lead to a reduction in the environmental impact of high-speed rail.

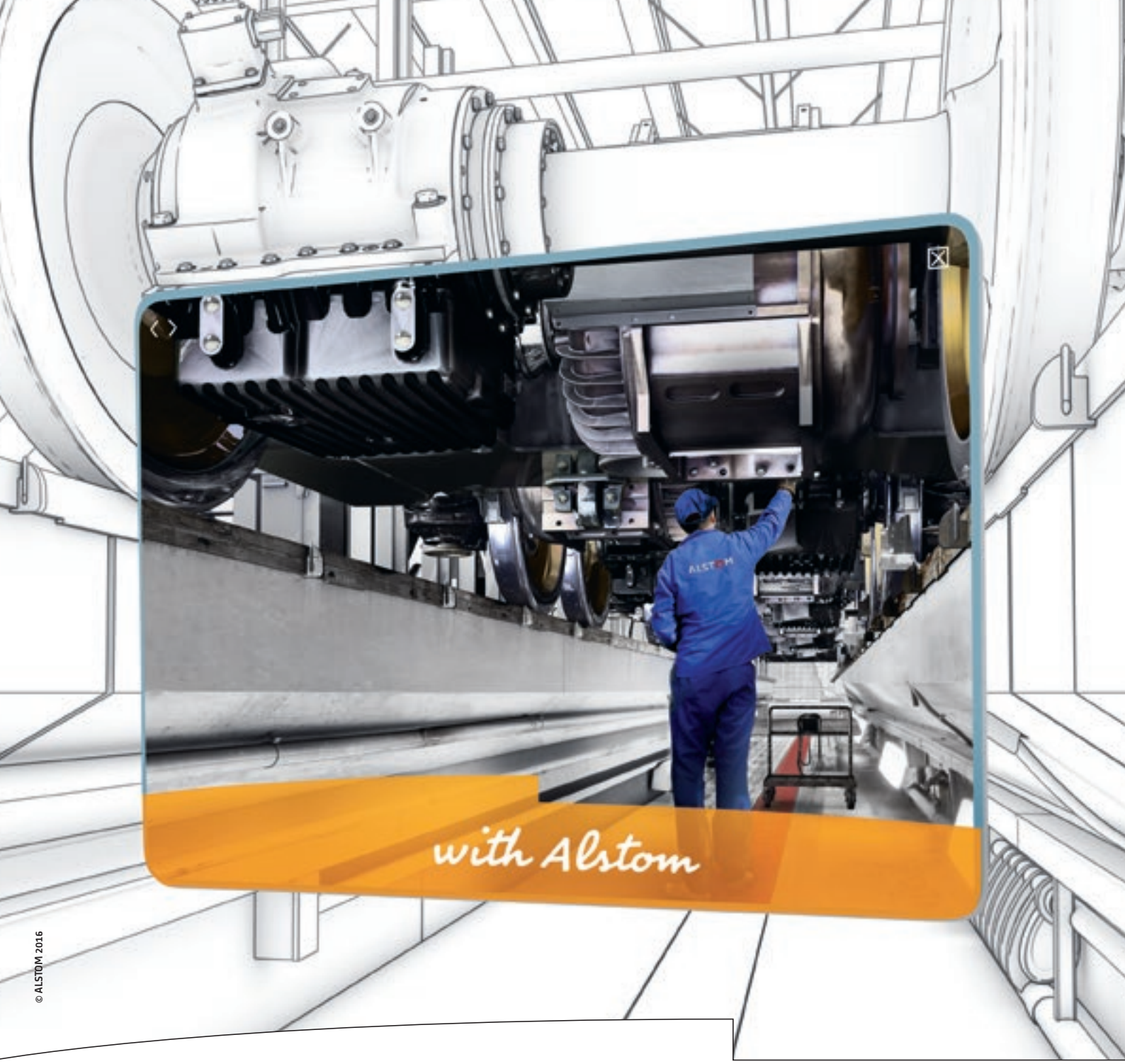
"The SKF Centrifugal Lip Seal has been developed specifically to overcome the traditional sealing quandary manufacturers face with high-speed train wheelset bearing units," Maurizio Martinetti, senior project manager at SKF product development, said. "No lip contact at low speeds meant that there was a risk of contamination, while contact at high speeds led to energy-consuming friction and its other associated problems, such as excessive operating temperatures and the need for frequent maintenance. However, this new seal eliminates all of these issues for consistently efficient and high-performance operation."

CRRC PRESENTS ITS "MAGIC" TRAIN WINDOWS



At their first appearance at InnoTrans, the Chinese railway manufacturer China Railway Rolling Stock Corporation (CRRC) presented numerous innovations, including the "magic" train window.

Satellite-supported passenger information systems transform train windows and mirrors into interactive displays, on which information about the landscape that is passing by can be presented, as well as live TV and video conferencing. Also on display was a concept for a double-decker high-speed train that could be deployed, for example, on long distance routes between Asia and Europe. The upper deck offers passengers the same levels of comfort as an aircraft cabin, with a lounge and business class reclining seats, while the lower deck is designed to carry freight.



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SUCCESSFUL TRIAL OPERATION: INTEGRATED LTE NETWORK IS SUFFICIENT FOR COMMUNICATION PURPOSES

Nokia and RATP (Régie autonome des transports Parisiens) have demonstrated that it is possible to ensure the full range of communication required to operate a railway system, using a single integrated LTE network. "In 2014 our test track consisted of six different networks", explained Thierry Sens, director of marketing, global enterprise and public sector, Nokia.

From October 2015 to April 2016 the Parisian Metro Line 14, a fully automated line that meets all the RATP safety requirements was controlled in its entirety using an LTE Network, instead of the usual combination of different technologies, including digital radio, 3G, 4G and Wi-Fi technology.

In addition to simulated train control, the trials also included video transmissions from trains and platforms, railway radio telephony for operatives, multimedia information for train passengers and on platforms, and the transfer of data for monitoring and maintenance purposes. The practical trials have demonstrated that it is possible to use a single technology platform such as LTE not only to run the applications needed to meet operational requirements but also for passengers' mobile internet services.

NEW SYSTEM WARNS OF COLLISIONS AND BRAKES INDEPENDENTLY

Bosch, together with their subsidiaries, presented a number of innovative products at InnoTrans. According to Bosch Engineering, the first trams featuring the new Bosch technology that can actively prevent accidents will soon enter into service in Frankfurt. The innovative driver assistance system warns tram drivers of any impending collision: if the driver brakes too late, or not at all, the system engages the brakes independently to stop the tram and avoid an accident. "Our collision warning system significantly increases the safety of passengers and tram drivers," says Bernhard Bihr, president of Bosch Engineering.

Collision warning system for trams.

This new, expanded system comes courtesy of Bosch Engineering, a Bosch subsidiary that successfully adapted the company's large-scale automotive production technology for its new and enhanced collision warning system for city rail transportation. Hesse's technical supervisory authority recently approved the electronic driver assistance system for use in public transportation. Once Frankfurt's tram drivers have tested this guardian angel for both drivers and passengers, the first self-braking trams will go into regular service in the city.

Next Stop: Automated Trams

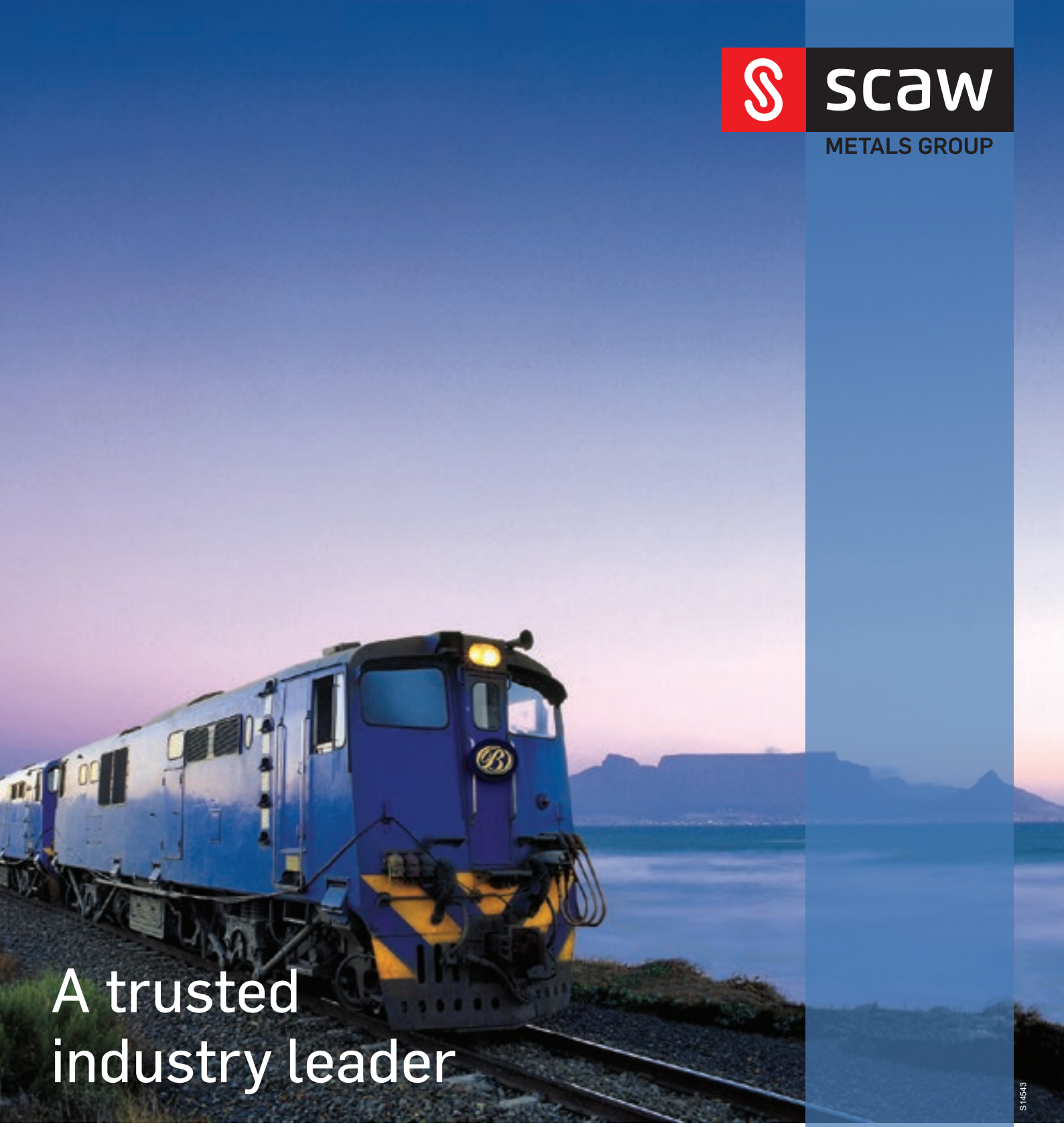
Driver assistance systems that can warn of collisions and automatically brake in an emergency are increasingly spreading to rail transportation systems and provide the basis for automated trams. These systems are capable of supporting the tram driver in all types of driving conditions, from monotonous to challenging, day, night, rain or snow. Bosch launched the first version of its collision warning system in 2014. "If that system's sensors detect a potential accident, it reliably alerts tram drivers of the dangerous situation and does its best to help them react in time themselves to avoid a collision," Bihr says. The new and enhanced system now takes this to another level: in the event that the tram driver cannot react to the warning in time, the system will brake the tram automatically and bring it to a complete stop. This way, accidents and their expensive consequences can be either reduced or prevented altogether.

"We are taking the idea of automated mobility further – beyond the road – and developing solutions that offer increased safety and comfort for rail transportation," Bihr says.

Radar And Video Sensors Prevent Accidents

The new collision warning system combines a video sensor, a radar sensor, and a high-performance rail control unit and draws on Bosch's expertise in large-scale automotive production. With an aperture of up to 70°, the radar sensor monitors the area up to 160m ahead of the tram and measures the speed and distance of any cars, buses or other trams. In addition to mobile obstacles, the radar sensor detects static objects such as buffer stops. The video sensor is the ideal complement to the radar technology because it keeps an eye on the track ahead and detects anything crossing the rails quickly and accurately.

The central rail control unit processes information from both sensors, along with other factors, such as the speed of the tram, to provide a detailed image of the environment. If the system detects that an object is coming dangerously close, it gives the driver a visual and an acoustic warning. Should the tram driver not react to the warning signals within two seconds, the automated system slows the tram to a complete stop. The braking action is very gentle so even passengers who are standing will not lose their balance. If necessary, drivers can also deactivate the braking operation or increase the braking power at any time, depending on how critical the situation is. This leaves drivers still in control of the situation, but means they can rely on the watchful eyes of their electronic assistant. "Our system is on all the time; it never gets tired, and cannot be distracted," Bihr says.



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THALES EYE: AUGMENTED REALITY FOR MOBILE WORKERS

Could augmented reality, the technology behind Pokemon Go, boost the efficiency of railway maintenance? 2016 was the year augmented reality went mainstream as gamers in their thousands joined the hunt for virtual creatures. However, augmented reality has serious applications too. Thales is using the same principle to provide real-time help to mobile technicians through augmented reality glasses. The prototype launched at InnoTrans, is expected to go into customer trials later this year.

The Disruption Challenge

Railway equipment is designed to be reliable and complete failure is relatively rare. However, when things do go wrong, delays rapidly escalate. One of the problems facing rail maintenance teams is dealing with equipment from different suppliers and tracking down the right information to make repairs is not always easy.

Equipment suppliers struggle to be of assistance because, unless they have an in-depth understanding of the problem on-site, providing reliable advice to maintenance teams can be difficult. Fixing legacy systems can be even tougher, with only a handful of experts available to offer the assistance needed. Getting the right people on-site has the potential to escalate delays for rail services.

Knowledge Sharing

The 'Thales Eye' is designed to tackle these challenges. The solution works by using augmented reality to provide a two-way link between maintenance staff in the field and expert back-office advisors. Valuable know-how is shared, shrinking repair times and improving the quality of maintenance.

"The maintainer wears augmented reality glasses which automatically stream live video and audio to the back-office," explains Amine Arezki, the product line manager at Thales. "The advisor in the back-office can see exactly what is happening in the field on a computer screen. They can then positively identify the equipment involved and provide advice about any maintenance or repair work that may be needed."

As well as being able to see the equipment in the field via video link, the expert can 'show' the maintainer precisely which components need attention and what action is required. The advisor can highlight components using virtual 'objects' which are directly superimposed over the maintainer's real-world view as seen through the glasses.

Images, drawings and written instructions can also be shared with maintainers via the glasses. Two-way audio communication is also provided. As well as providing a link to the infrastructure owner's in-house experts, the Thales Eye could be used to connect maintenance staff directly with equipment suppliers.

The approach can be used with any type of field equipment, including signalling apparatus – such as point machines, axle counters, signals and interlockings – to power supply systems and on-board equipment on trains. Both current and legacy systems can be supported using Thales Eye.

Troubleshooting In Real Time

Live troubleshooting not only means faster fault identification but also quicker repairs. "In addition, there is the assurance that an expert is there to oversee the job from start to finish," says Arezki.

Better support boosts the confidence of maintenance workers. "Normally, if a maintainer is having a problem on site and can't solve it, work has to stop until the supplier is contacted or extra help is called in," notes Arezki. "This inevitably causes disruption. With Thales Eye, expert advice is easily available and traffic delays are minimised."

The solution improves productivity. Because key information is delivered via the glasses, there's no need for the maintainer to handle a tablet or smartphone, leaving both hands free to get on with the job.

The solution meets other needs as well. There is no language barrier, thanks to visual communication using icons that are universally understood. The ability to use visual cues – rather than spoken instructions – is also important in the trackside environment, where ambient noise levels can be high.

Thales Eye could help operators to get the most out of investments in predictive maintenance, with faster interventions leading to reductions in Mean Time To Repair (MTTR).

Safety In Mind

As with all Thales' solutions, safety and security are key considerations. Unlike virtual reality headsets (which cover the entire field of vision), augmented reality glasses do not obscure the user's overall view of the surrounding environment. Normal vision is maintained.

"The aim is to minimise visual distraction" emphasises Arezki. "Only the relevant information is shared."

By improving the efficiency of maintenance operations, Thales Eye could contribute to overall workforce safety by reducing the amount of time maintenance teams need to spend in the hazardous trackside environment.

Despite its game-changing potential, Thales Eye is remarkably intuitive and easy to use, with no special training required. "You just put on the glasses and get to work," says Arezki.

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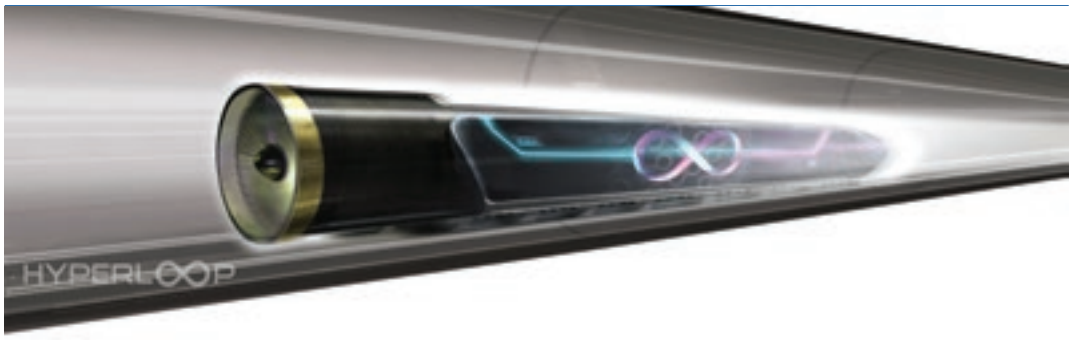
STADLER'S FLIRT ELECTRIC MULTIPLE UNITS FOR NEDERLANDSE SPOORWEGEN

Together with Nederlandse Spoorwegen (NS), the display by Stadler at InnoTrans featured the FLIRT electric low-floor multiple unit in its most colourful form yet, as the "NS Sprinter". NS has ordered 58 of the three and four-car trains, which will be operated by NS Reizigers on regional routes in the Netherlands from 2017.

With air suspended bogies, inviting seating, air conditioning for passengers and drivers and a closed toilet system, the latest FLIRT trains offer outstanding comfort. The trains meet all the TSI PRM requirements for people of restricted mobility and also satisfy the collision safety specifications laid down in EN15227. These modern regional trains have been designed for a maximum speed of 100mph. Coupled together, the 33 three-unit FLIRTs each have a length of 63.2m and the 25 four-unit trains measure 80.7m in length.

HYPERLOOP™: CLOSER THAN YOU THINK



The new Hyperloop™ Transportation System is an entirely new mode of transportation that eliminates all travel complications and objections due to cost, travel time and weather conditions. Travelling as fast as the speed of sound, the Hyperloop™ will be faster than today's conventional methods of transportation. The Hyperloop™ could be operating a goods services by 2020, and passengers could be using it by 2021.

Completely self-sufficient, solar panels placed along the track produce excess amounts of the energy that is actually required to run the system. The climate controlled capsule travels inside of a reinforced 'tube' pathway, rendering the Hyperloop™ Transportation System weather independent and earthquake safe thanks to the use of pylons.

At InnoTrans 2016, the founder and CEO of Hyperloop™, Rob Lloyd, stated that the Californian company, which was set up in a garage two years ago, now employs 200 people in Los Angeles. In addition to providing a rapid link between Los Angeles and San Francisco, there are also plans to provide connections to ports on the Russian Pacific coast and in the Persian Gulf.

Hyperloop™ is collaborating in Europe with the consultants Ramböll and KPMG, as well as the company SF Links on a project study for a rapid connection between Helsinki and Stockholm. The 500km journey between the two capitals would take just 28 minutes. The infrastructural costs are put at €19 billion, which Lloyd describes as "50% of the cost of a traditional rail link".

The Hyperloop™ link will have stations at eleven locations and will be constructed as a bored tunnel with spandrel-braced tubes and underwater tubes.

Lloyd reports that it could take approximately 12 to 15 years from initiation of a feasibility study to project completion before the first system comes into operation.

Mobius Announced Winner Of Hyperloop™ Concept Competition

The international design and innovation competition platform, Build Earth Live (BEL) this year presented participants with the challenged to imagine and design the world's first Hyperloop™ system to connect Dubai and Fujairah City for seamless passenger and freight transport.

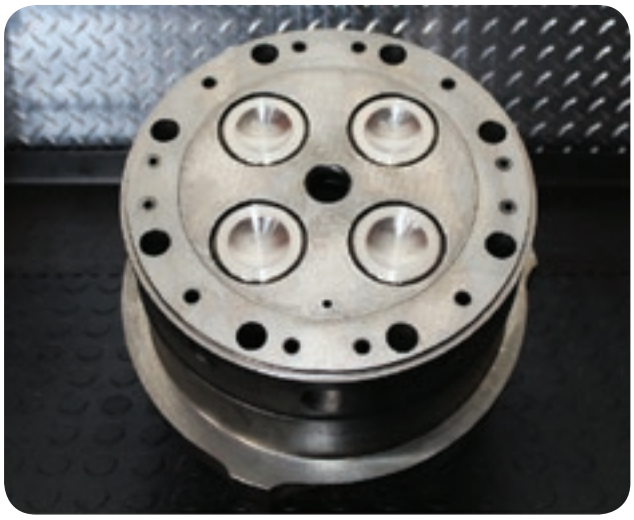
France's Team Mobius was announced the winner of the competition, after competing with five other teams, which were selected from a pool of 250 entries from 29 countries. A panel selected Mobius based on technical, economic, safety, efficiency and sustainability criteria and the company's ability to reinvent high-speed transportation for passengers and cargo.

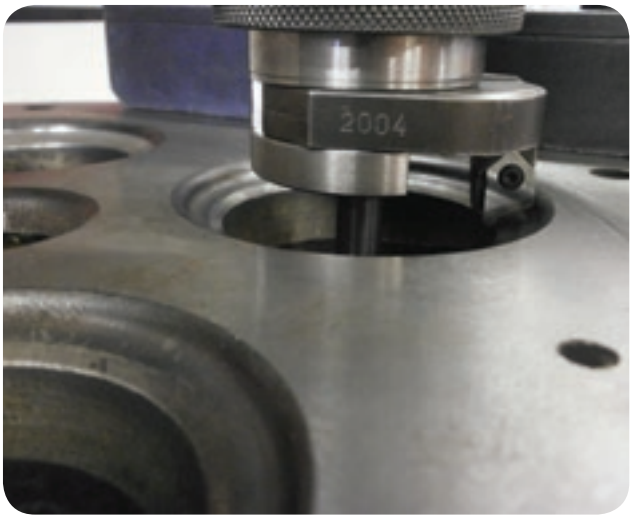
Chris Vasquez, the director of product development for the Hyperloop™ company recently announced that the Dubai government-backed port operator DP World recently held talks with Hyperloop™ One and stated that a Hyperloop™ system could be in place in Dubai as early as 2020.

Photos: Hyperloop™

Grinding of crankshafts with lengths of up to 4.7 metres and weights of up to 5 ton

METRIC
AUTOMOTIVE ENGINEERING





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ADDIS-ABABA – DJIBOUTI RAILWAY LINE OPENS UP NEW OPPORTUNITIES IN ETHIOPIA

Ethiopia

[Photo: CRIENGLISH.com / Xing Yihang].

In October, Ethiopia's prime minister Hailemariam Desalegn, and Djibouti's President Ismail Omar Guelleh led the commissioning of Ethiopia's new, Chinese-built national Standard Gauge Railway (SGR), in Addis Ababa.

The newly commissioned railway line runs parallel to the old Cape Gauge Ethio-Djibouti Railway and comprises a 107km double-track from Addis Ababa to the coffee producing centre of Adama. The line then becomes a single track Adama to Dewele, some 549km away. The SGR then continues from Dewele on the Ethiopian border into Djibouti, ending at the Djibouti port station, providing the landlocked Ethiopia access to much-needed port facilities on the Gulf of Aden, opening up import and export opportunities to and from markets in the East. The new route will reduce travel time from Sebeta to the port of Djibouti by more than 50% and will form an important part of the East to West Africa Railway Network.

The China Railway Engineering Corporation (CREC) and the China Civil Engineering and Construction Corporation (CCECC) constructed the SGR line, with financing from the Exim Bank of China, the China Development Bank and the Industrial and Commercial Bank of China[1].

The Ethiopian government is optimistic that their state of the art railway system will boost the country's rapidly growing economy, once the system becomes fully operational in early 2017. "With an effective railway, our economy will perform even better," says Gebeyehu. "This project allows us to compete effectively with the rest of the world," the minister concludes.

The line currently being commissioned is only one phase of a much broader railway revolution being planned by the Ethiopian Government. The government's five-year Growth and Transformation Plan has among its aims the overhaul of the entire national transport network in the country, comprising some 4,744km of standard gauge track, which will connect seamlessly to railway projects under construction in neighbouring Kenya and Tanzania.

1. Maasho, Aaron (December 17, 2011). Ethiopia signs Djibouti railway deal with China. Reuters.

KENYA RAILWAYS – CONSTRUCTION BEGINS ON NAIVASHA SECTION OF SGR PROJECT

Kenya

Kenya Railways has announced that construction on the second phase of their national Standard Gauge Railway (SGR) project has commenced, despite objections from wildlife enthusiasts about the fact that the proposed route will run the width of the Nairobi National Park.

The proposed route for phase two of the country's SGR project starts from the west end of the Nairobi South Hub, which is the end point of the newly commissioned Mombasa – Nairobi SGR and will turn south-west to run over the Nairobi National Park before passing the towns of Twala and Ongata Rongai in a westerly direction. The line will then cross Embulbul, before descending into Rift Valley through a tunnel located North-West of Ngong Hills. The line will then proceed North-West to the proposed Industrial Parks at Mai Mahiu and Suswa. Construction of the Nairobi to Naivasha line (phase2A) is expected to last for a period of 54 months.

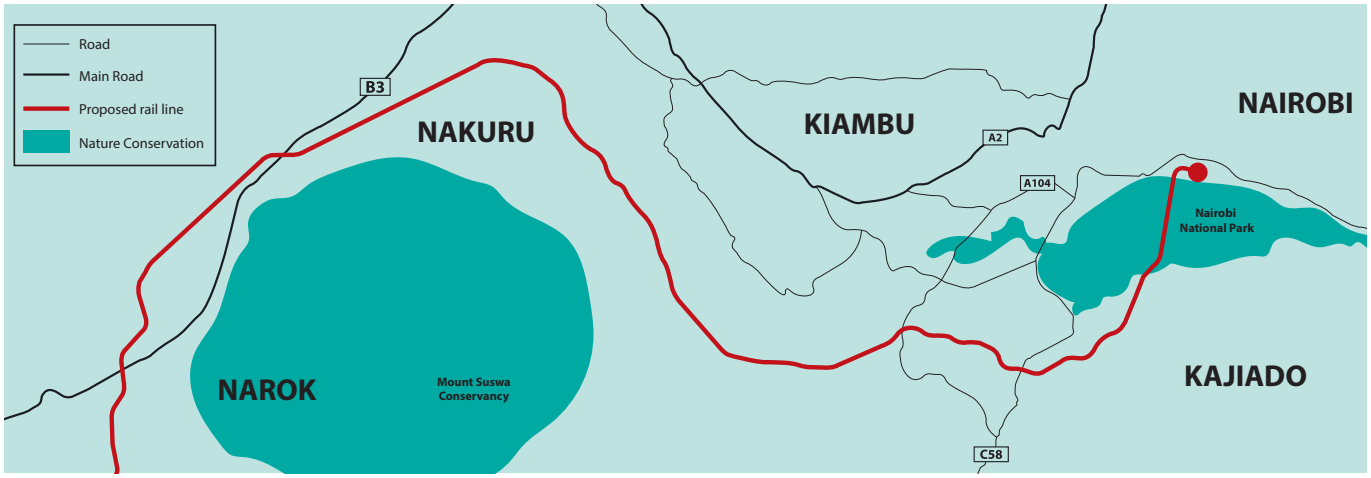
Speaking at a recent press conference, Kenya Railways managing director Mr Maina said the proposed route was selected out of several scenarios and presents the best option for construction and utilisation.

"We are ready to commence construction of Phase 2A,

which will see the construction of a SGR line from Nairobi to Naivasha." Maina stated, adding that: "The line will be constructed over the width of Nairobi National Park. This way, there will be minimal interference with the flora and fauna below the line. Only areas where piers will be constructed will be affected by the process."

In response to concerns raised by civil society about the possible impact of the construction on the National Park, Dr Richard Leakey chairman of Kenya Wildlife Services (KWS), stated that the KWS management company will ensure that the project does not have a negative impact on the wildlife park, emphasising that the project will not impede the free movement of wildlife or have a detrimental effect on the delicate ecosystem in the reserve. Leakey added that Kenya Railways would have to do an Environmental Impact Assessment (EIA) before work is initiated.

Dr Richard Leakey, chairman of the Kenya Wildlife Services, addresses the media regarding environmental impact of proposed Phase 2 of SGR project in Nairobi, Kenya.



PRIVATE INVESTORS INVITED TO TAP INTO TAZARA'S SUBSTANTIAL INVESTMENT GAP

Tanzania Zambia

Bruno Ching'andu, MD, TAZARA.

According to TAZARA managing director Bruno Ching'andu, the TAZARA railway operator is in need of approximately US$250 million in external investment in the short term and a further US$1.2 billion over the long term, to return to profitability.

Speaking at the 7th East and Central Africa Roads and Rail Summit in Dar es Salaam, Ching'andu stated that if the operator were able to achieve this level of investment, the volume of freight needed to break even in the short term would be about 600,000 tonnes per annum.

The managing director announced that both the Tanzanian and Zambian governments are in the process of revising the TAZARA Act in order to make the company more commercially viable and attractive to private sector investors, and called on the private sector to partner with TAZARA in order to achieve the much-needed financing to enable the operator's ambitious turn-around strategy, currently being implemented by the TAZARA board.

Ching'andu told the summit that: "The private sector can take advantage of Public-Private Partnership (PPP) models to partner with us in the running of the Dar es Salaam Commuter Train, which is experiencing massive demand, that cannot be satisfied at the moment." The Dar es Salaam commuter rail system serves as an urban and suburban commuter rail network, which came into operation in October 2012. The system is currently jointly operated by TAZARA and Tanzanian Railways Limited (TRL), with TRL operating a 20km section, which links Puku Station to the Dar es Salaam city centre and TAZARA operating two routes along a 20,5km stretch between Dar es Salaam and Mwakanga, which lies on the outskirts of the city.

The managing director also highlighted the need to enter into an agreement with a private investor to revitalise infrastructure on the railway line: "We are open to PPPs in the installation of signalling and telecommunication systems, which have been vandalised over the years and are currently non-existent," he stated. Added to this, Ching'andu highlighted the possibility of realising potential revenue streams through private sector involvement in some of the operator's existing assets, such as investment in TAZARA's quarries and existing workshops, which already offer a diverse range of services to supplement income from the rail sector.

Ching'andu used the Rail Summit as an opportunity to highlight a number of measures that TAZARA has implemented over the past six months to reclaim some of their market share in freight, with a focus on payloads moving to and originating from Malawi, Zambia and the Democratic Republic of Congo (DRC). Ching'andu stated that TAZARA has made significant gains by adopting a more flexible tariff regime that is more responsive to macro economic conditions and market trends, making rail more attractive to customers in the region. He also highlighted that the company has embarked upon a carefully considered rebranding exercise in an effort engage more effectively with potential and existing customers and is actively forging strategic partnerships with neighbouring railway operators, the Port of Dar es Salaam, shippers and other logistics firms.

"With the current level of interactions and closer dealings with various stakeholders, we are optimistic that TAZARA's potential to contribute to the economies of Tanzania and Zambia will soon be realised," Ching'andu concluded.

VODACOM SIGN A R1BN FIBRE DEAL WITH PRASA

South Africa

The telecommunications group Vodacom has recently announced that it has entered into a 15-year strategic partnership deal with the Passenger Rail Agency of South Africa (PRASA) valued at more than R1 billion.

The deal, signed with PRASA subsidiary Intersite Asset Investments, will see Vodacom leasing PRASA's dark fibre-optic cables for the duration of the contract, which will make these assets commercially available to both government and private enterprise. The deal serves to monetise PRASA's telecoms assets by leveraging Vodacom Business' enterprise channel capability. This broadly includes multiprotocol label switching, virtual private network connectivity, unified communications and collaboration, metro e-fibre access, microwave access, dedicated internet access, hosted exchange, security information and event management.

The agreement forms part of PRASA's telecoms assets commercialisation process, which began in 2013, and is designed to support PRASA's goal to provide quality passenger rail services to commuters.

Commenting on the announcement, Vuyani Jarana, vodacom business chief officer, said: "We are humbled by PRASA's decision to choose us as their strategic partner to help them monetise their existing ICT assets. At Vodacom, we have long believed in the strategic role to be played by partnerships and alliances to optimise existing ICT asset utilisation in South Africa. The Vodacom – PRASA agreement is one of our most innovative partnership initiatives to date, alongside the IBM CMS Data centre partnership which we announced earlier this year."

In the past, state enterprises, including municipalities, invested in optic fibre infrastructure to meet their own consumption needs. To maximise return on investment on these assets, state owned entities must find strategic partners with technical expertise and market reach, which is what PRASA has achieved through its partnership with Vodacom. Globally, rail agencies invest in strategic telecommunications assets such as optic fibre to manage locomotive traffic. PRASA is no different as they have over 900km of fibre along railway lines and stations.

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SOME OF THE PLANT ON OFFER

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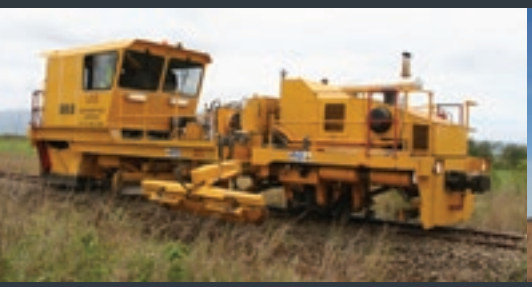

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Through the technology partnership agreement, PRASA - through Intersite- will be able to generate revenue through its fibre assets as well as on-sell Vodacom's enterprise products and services to the wider enterprise market in South Africa.The revenue streams for PRASA include those realised from the wholesale lease of its fibre assets, channel commissions (when Intersite acquires customers through the agreement) as well as rebates to PRASA where its own ICT services come into play.

Jarana added: "The South African economy is quickly digitising, as a result the demand for high-speed broadband is increasing daily and optic fibre network deployments are crucial in the delivery of high-speed broadband services. It therefore makes perfect sense for Vodacom to work with strategic partners like PRASA, to weave together existing fibre assets to create wider networks that shorten time to market."

The PRASA partnership agreement comes after the National Treasury's confirmation that Vodacom has secured government's mobile communications contract. The strategic sourcing process followed by National Treasury successfully combined innovation with economies of scale, unlocking value for the state and resulting in significant savings for the fiscus.

Intersite CEO, Mr. Cromet Molepo, says: "Our mandate as Intersite is to exploit PRASA's assets through the use of strategic partnerships to create sustainable value that benefits the people of South Africa.This partnership with Vodacom is the first significant milestone in our journey towards effective and sustainable commercialisation of PRASA's telecommunications assets, with more innovative possibilities down the road. The combination of extensive optic fibre network, GSM-R towers; and data centres, all located in and around major metros in South Africa, positions Intersite well as strategic partner of choice in the ICT industry."

RAILRUNNER'S DYNAMIC INTERMODAL SYSTEM TO BE LAUNCHED IN SOUTH AFRICA

South Africa

Photos: RailRunner

RailRunner NA, Inc., a global innovator in cargo rail technology, recently announced that its RailRunner South Africa unit has signed a 20-year agreement with Transnet, to put RailRunner's high-density bi-modal trailers into service on the Cape Corridor and other parts of Transnet's extensive rail network. RailRunner values the contract at approximately $US400 million in service revenues and equipment sales by licensed third parties.

RailRunner's unique trailer is capable of carrying standard shipping containers on rail lines or on the country's highways, shifting quickly and easily from one mode to the other, without the need for expensive cranes and other equipment used in a traditional intermodal hub. With maximum efficiency in mind, the RailRunner trailer is designed to pack containers closer together, allowing for a 20% to 40% increase in the amount of cargo per length of railcars, the company states. In addition, the RailRunner trailer is significantly lighter than a traditional flatcar, resulting in a reduction in energy costs and carbon emissions.

The RailRunner trailers and bogies are used to form a bimodal block train, which can be connected to a standard locomotive for the terminal-to-terminal transport leg. RailRunner specialises in the design, manufacture and supply of bimodal bogies and trailers. The company's patented trains are able to transport domestic trailer systems or international sea containers. Standardised containers handled by the RailRunner system can be interchanged between all modes of traditional intermodal transport including road, rail, and ship.

"The bimodal service will offer customers a complete logistics solution on road and rail. This collaboration puts Transnet at the forefront of ground-breaking technology in the South African and African rail industries,"

RailRunner's revolutionary technology will be implemented in Africa for the first time on the 1,400km Cape Town to Gauteng line, operated by Transnet Freight Rail. "The bimodal service will offer customers a complete logistics solution on road and rail. This collaboration puts Transnet at the forefront of ground-breaking technology in the South African and African rail industries," Transnet announced in a statement following the deal.

The landmark contract, signed in September, will see Transnet and RailRunner South Africa forming a joint venture to implement the new technology, which will provide a door-to-door transportation system, spanning both road and rail. "This is not only a breakthrough for Transnet and the rail industry, but also for South Africa's domestic freight industry."

The national operator Transnet states, adding that: "This bimodal logistics solution will ultimately enhance the economic competiveness and growth of freight rail transport in South Africa, and potentially increase Transnet's market share within the domestic freight environment and create further job opportunities."

A number of local manufacturing companies, including Transnet Engineering (TE), have been pre-qualified to manufacture the RailRunner bimodal units. TE have made it known that requests for quotations will be issued later this month. In addition, Transnet has authorised another local company, a subsidiary of RailRunner South Africa trading as RNS, to provide local network services through Transnet.

"The move by Transnet is part of the South African Government's long-term Market Development Strategy (or MDS), aimed at shifting traffic from South Africa's congested highways to more efficient rails," says Transnet.

Speaking on behalf of RailRunner N.A, chief executive officer and president Charles Foskett stated that:"RailRunner technology is a perfect match for the challenges and opportunities that Transnet faces in South Africa. This will enable Transnet to offer a complete end-to-end transport solution for its customers while reducing costs, harmful emissions, and highway traffic. RailRunner is excited to partner with Transnet, a world leader in rail freight transport."

ABUJA RAPID RAIL AIRPORT LINK TO COME ONLINE NEXT YEAR

Nigeria

The Nigerian government is in the process of implementing a light rail project to connect the CBD of Abuja and the Nnamdi Azikiwe International Airport. The rapid rail system is one of a number of proposed projects aimed at linking national airports with railway infrastructure in Africa.

According to the Global AirRail Alliance, an international member-based organisation that focuses on AirRail projects around the globe, South Africa's Gautrain project, launched in 2010, has set the standard for railway and airport links on the continent. A number of African countries are in the process of trying to implement similar projects to improve urban mobility, reduce road congestion and support seamless commuter services in and out of their capital cities.

Construction of the Abuja Light Railway Project commenced in May 2007 and is being implemented using a staged approach. The first phase proposes to link Abuja's Central Area with the Abuja International Airport, stopping at the standard gauge train station that has been constructed at Idu. Once all phases have been implemented, the line will connect satellite towns across the Federal Capital District, including Nyanya, Kubwa, Mararaba and Lugbe.

The project, valued at $US823 million, was awarded to the China Civil Engineering Corporation (CCEC), who are also involved in the construction of the national standard gauge railway network currently being implemented as a part of the government's National Strategic Transport Master Plan.

In July of this year, Mr Muhammad Bello, the minister of the Federal Capital Territory, announced that work on the light rail system, being implemented in six phases, was more than 70% complete. According to the project plan, the line is scheduled to come into operation by December 2017.

CAIRO PLANS FOR URBAN TRANSPORT INFRASTRUCTURE UPGRADE

Egypt

With an estimated metropolitan population of 20,5 million, Cairo remains the largest and most densely populated city in both Africa and the Middle East[1]. It stands to reason that urban mobility remains a priority for city authorities in the effective management of both the city of Cairo and the surrounding metropolitan area. The city is home to the first fully-fledged rapid transit system to be implemented on the continent, the Cairo Metro, which started operations in 1987. The network, which serves the city of Cairo and the Greater Cairo metropolis with passenger rail services, is a light rail standard gauge network that spans 77.9km with 61 stations.

The National Authority for Tunnels (NAT) operates the three major lines of the Cairo Metro, known as the Red Line (1) from Helwan – El Marg, the Yellow Line (2) from Shobra El Kheima and the most recent Green Line (3) from Attaba – Al Ahram.

In response to ever increasing passenger demand and serious congestion on the city's roads, the rail operator is in the process of implementing an extension plan on the Green Line. The project proposes to extend from Imbaba, in the north-east of the Greater Cairo area, in a north-westerly direction, with a station at Cairo International Airport.

The NAT has entered into a joint venture - led by Vinci Construction Grands Projets and Bouygues Travaux Publics and their Egyptian partners Orascom Construction and Arabco Contractors - in April of this year. The $US1.2 billion contract provides for the construction of 17.7km of new line together with 15 stations, eight of which will be underground, five elevated and two at ground level. The works will also require the construction of a new tunnel under the Nile River. Once completed, Line 3 will increase the overall length of the Cairo metro system to more than 100km and is projected to serve as many as five million passengers daily.

In addition to the plans to extend Cairo's existing Metrorail network, the government is planning to implement a 35km monorail to service the outskirts of the Cairo Metropolis. The project proposes a 35km, above-ground, fully automated driverless monorail, which will connect the Cairo metro system to the western outskirts of the metropolis, including 6th of October City[2], Sheikh Zayed and Giza. Current estimations value the project at about $US1.5 billion.

1. Cairo Population 2016: www.worldpopulationreview.com
2. 6th of October City (Madīnat as-Sādis min Uktōbar) is a city in the Giza Governorate that falls within the urban area of Cairo, Egypt. The city's name commemorates the commencement of the October War on 6 October 1973 - Wikipedia.

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LIGHT RAIL SOLUTION FOR LAGOS IN THE PIPELINE

Nigeria

The Lagos Rail Mass Transit project, officially propositioned in 2003 by Lagos Governor Bola Tinubu, proposes a light railway network that will service the greater Lagos metropolitan area in conjunction with a Bus Rapid Transit System, aimed at easing congestion in the city of Lagos and the surrounds. The project is being implemented by the Lagos Metropolitan Area Transport Authority (LAMATA) through concession-based agreements with the private sector.

The Lagos Urban Rail Network will operate as an urban commuter service that will cover seven major corridors across the Lagos metropolitan area, extending to bordering provinces such as Ogun and Oyo. The whole project comprises seven proposed railway lines, with the Red Line linking the rapid transit system to the Murtala Muhammed International Airport. The airport is one of the busiest in Nigeria and serviced 7,561,507 air passengers last year.

Blue line	Okomaiko – Marina
Red Line	Agbado - Marina via Oddo and Muritala Mohammed International Airport
Green Line	Marina to Lekki Airport
Yellow Line	Otta – Iddo
Purple Line	Redeem – Marina
Brown Line	Mile 12 to Marina

The Federal government approved a budget of $US 2.4 billion for the Lagos Red Line Rail Project in 2015.

ALSTOM TO EXTEND TRAMWAY IN CONSTANTINE, ALGERIA

Algeria

The city of Constantine, situated in the north-eastern Constantine Province of Algeria, is regarded at the capital of Eastern Algeria and is home to approximately 100,000 people. In 2007 city officials entered into a contract with Italian company Pizzarotti to construct a tramway to provide an urban transportation solution for commuters. After considerable delays, the first sections of the 9km long tramway opened in 2013, with ten stations between Ben-Abdelmalek-Ramdhan stadium and Zouaghi. Since its inauguration, the tramway has already carried more than 7.2 million passengers.

In 2015, Alstom (together with its three consortium partners including Corsan, Corviam and Cosider), was awarded a contract by Algeria's public transport operator, Entreprise Metro d'Alger (EMA) to extend the Constantine area Tramway by an additional 10km. Alstom's share of the contract amounts to approximately €80 million.

Alstom has operated in Algeria for more than 60 years and supports the country in a number of projects aimed at developing and enhancing railway infrastructure in this historic region. Alstom has already supplied integrated tramway systems for Algiers, Oran and Constantine and is supplying infrastructure for the tramways of Ouargla, Mostagamen and Setif.

Photo: Alstom

According to the contract, Alstom will supply the integrated system, tracks, catenaries, telecommunications and signalling, substations and ticketing equipment.

The extension will link the existing station of Zouaghi with the new city of Ali Mendjeli and with the Mohamed Boudiaf International Airport. The extended line, which will span a total of 18km on completion, will be equipped with the first Citadis trams to be manufactured at the Annaba site in the north-east of Algeria by Cital, Alstom's local joint-venture, formed with Ferrovial and EMA in 2010. The Constantine Tramway extension is scheduled for commissioning in 2017.

AMSTED RAIL AND GE FORM STRATEGIC PARTNERSHIP TO ADD RAILCAR PERFORMANCE MONITORING TO FREIGHT TRAIN INTELLIGENCE

To build the next generation of intelligent freight trains, where locomotives and railcars are continuously monitored, Amsted Rail and General Electric (GE) have teamed up to combine GE's experience in train management and locomotive monitoring with Amsted Rail's expertise in on-board monitoring of railcar component condition. This solution integrates Amsted Rail's IONX Edge™ monitoring system for railcars, which features a standards-based intra-train communication network, with GE's GoLINC™ industry-tested network, communication, and application management platform for the railroad environment.

Increased Train Reliability and Operations

By providing a communication pathway through the consist to the locomotive, near real-time alerts can be delivered to train operators about the condition of key railcar components continuously or during critical operating events. "The addition of an intra-train network to our existing cellular communication means that we can deliver railcar operating information to our customers, wherever they can derive the most value from it." says William LeFebvre, general manager and chief technology officer for Amsted Rail's Industrial IOT business, IONX. "It means our solution works in a scalable way, supporting an individual railcar or complete train consists." This new solution provides actionable data to an operating railroad's back office, allowing them to make better, more informed decisions about train movements.

More precise monitoring means better control. Brad Myers, vice president and chief commercial officer for Amsted Rail explains: "You move from intermittent data collected from wayside detectors, spaced sometimes 200 to 400 miles apart, to near real-time monitoring of railcar component health, as well as railcar dynamics. This platform delivers a much more complete and more accurate understanding of what's happening during train operations."

GE's transportation leadership role in locomotive assets combined with the expertise of Amsted Rail's IONX system in freight rail components and condition monitoring, provide the first ever integrated on-board train monitoring platform to the freight rail industry.

GAUTRAIN TO ACQUIRE 12 NEW TRAINS

South Africa

Gauteng MEC for Roads and Transport, Dr Ismail Vadi, recently announced that plans are at an advanced stage to acquire 12 new trains for the Gautrain system. This is due to passenger demand that is exceeding realistic expectations, particularly during peak hours.

"The acquisition of 12 new trains over the next 24 months will help to alleviate congestion that Gautrain passengers experience in the morning and evening peaks," said Vadi.

He indicated that several proposals were received in March this year from potential train manufacturing companies. "These were evaluated and I am pleased to announce the three successful pre-qualified bidders for the new rolling stock project are, Bombardier Transportation, CRRC E-Loco Supply and Egoli Rail Consortium," said Vadi.

In addition to the acquisition of more trains, the project entails the development of new depot facilities and the upgrading of the existing Gautrain signalling system.

Jack van der Merwe, CEO of the Gautrain Management Agency, said that the Request for Proposals (RFP) will be issued later next month. "It is projected that the final milestone – the financial close - is to take place towards end 2017," said van der Merwe.

Vadi said that the new train project is expected to have a significant and positive socio-economic impact in the province as the Gauteng provincial government will insist on at least 65% local content by the successful bidder.

The project is expected to sustain 10,000 jobs in Gauteng and total government revenue is to increase by an estimated R542 million in nominal terms between 2019 and 2023.

TRAIN ACCIDENT IN CAMEROON CLAIMS MORE THAN 60 LIVES

Cameroon

An overcrowded passenger train, travelling towards the town of Eseka, 120km west of the Cameroonian capital of Yaoundé, derailed at midday on 21 October, resulting in excess of 60 fatalities and injuring approximately 600 passengers, these numbers continue to rise as more reports come in.

The commuter train was carrying 1,300 commuters towards the economic hub of Douala when several passenger coaches derailed and overturned. The train, which usually accommodates approximately 600 commuters, was extended to eight cars as passenger demand was unusually high as a result of a bridge that collapsed in heavy rains along the Yaoundé - Douala highway earlier in the day. Authorities have indicated that investigations into the cause of the accident are still underway and it remains unclear whether overcrowding was a direct cause.

Following the accident, Bolloré subsidiary Camrail, who operates the line, deployed rescue and security services to the scene, in addition to emergency services that were deployed from Eseka, Yaoundé and Douala. The injured were transported to hospital facilities in Yaoundé and Douala, as local hospital facilities were severely underequipped to deal with a disaster of this scale. In the days following the accident, hundreds of concerned relatives have descended on the city's hospitals and mortuaries to locate their missing loved ones.

The Cameroonian President, Paul Biya, has extended his condolences to the families of the deceased and declared a national day of mourning on 24 October.

Railways Africa™ team, would like to extend our heartfelt condolences to those whose lives will forever be changed by the Eseka train accident. We wish the government of Cameroon and Camrail the strength and fortitude to fully investigate the cause of the incident and follow through with implementing safety recommendations that may emanate from the investigation to prevent future incidents of this nature.

Photos: Jo Frank.

Photo: Gautrain

UPGRADES TO AL BIDAOUI AIR RAIL LINK IN CASABLANCA

Morocco

Al Bidaoui (Casablanca RER) is a rapid transit system, which serves the city of Casablanca, Morocco. The rapid rail system, which was opened in 2002, serves as an intermodal transport solution for the city, connecting the city centre with the Mohammed V airport. The line is served by eight stations between Ain Sebaa and the airport, providing commuters with a rapid transit system for urban mobility within Casablanca. According to the Global AirRail Alliance (GARA), the Al Bidaoui airport link carried 8,180,083 passengers in 2015.

The Office Nationale des Chemins de Fer du Maroc (ONCF), the national railway operator in Morocco, has proposed to extend the line to include connectivity to Mohammedia, 26km north-east of Casablanca. The port city on the west coast is home to the Samir oil refinery, making it the centre of Morocco's petroleum industry.

South Africa

Rail engineering breakthrough from **DCD Rolling Stock**

Having become the first rolling stock company in the southern hemisphere to pioneer its own fabricated lightweight, cost-competitive locomotive bogie, South Africa-based DCD Rolling Stock is now extending its technology into wagon and passenger coach bogies aimed at the global market.

According to DCD Rolling Stock general manager Gary Steinmetz, the company – part of the DCD Group – has moved away from the traditional casting-based bogie construction and designed its own fabricated bogies using hot rolled steel.

"The main advantage of our new bogie design for diesel electric locomotives is that, instead of having all the mass sitting in the bogie frame, there is now flexibility to distribute the mass within the locomotive body," said Steinmetz.

He added that this makes the locomotives particularly suitable for many markets in Africa, where rail operators are restricted to lighter axle loads.

"The weight reduction in the fabricated design is mainly achieved through using exactly the right thickness of steel that is required to deliver the necessary strength," he said. "When pouring a casting, on the other hand, this uniform and specific thickness is difficult to achieve. The result is usually an over-engineered, heavier product."

The extensive work that usually went into machining a bogie casting, he explaines, is now directed into a cutting and welding – activity that DCD Rolling Stock, with its extensive plasma-cutting and CNC equipment, is well equipped to conduct. The company has developed the technology needed to eliminate the requirement for stress relieving and machining after the frame has been fabricated. Based in Boksburg near Johannesburg, the company is South Africa's leader in locomotive manufacturing and has its own range of freight wagons and passenger coaches.

"For many decades we have fine-tuned our capacity in designing and constructing locomotives, wagons and tank wagons, as well as passenger cars out of mild steel and stainless steel," Steinmetz states. "With these fabricated bogie designs, now part of our intellectual property, we can make a complete offering to customers, without having to rely on third-party designs, which may raise the cost."

While previously there was a trade-off in which customers' operating savings would justify a premium price for fabricated bogies. Steinmetz highlights the fact that the efficiency of DCD's build methods has now established a base price that is globally competitive.

"No foreign-built bogie can beat our price. Our fabricated bogie is now more cost-effective than imported products," he states. "In addition to this benefit, we are contributing to job creation - mainly through the extensive cutting and welding involved."

Steinmetz explains that the impact of the lighter bogie on the carrying capacity of wagons in a mining or industrial environment is substantial – allowing

greater efficiencies when bulk commodities are transported over long distances.

"With the limits to the axle loads that interface with the rail, it is vital to conserve as much weight allocation as possible for the load, rather than the bogies – which can take up as much as 40 tonne out of a weight limit of 180 tonne for a locomotive," said Steinmetz. "Lighter components mean that moving empty wagons requires less energy."

In the passenger coach environment, the stop-start nature of the transport cycle is impacted by reduced weight, making for significant energy savings.

"This motion pattern – speeding up quickly when leaving a station and then braking hard before the next stop – is obviously very energy-intensive, requiring considerable energy to get the train up to speed quickly between stations," he explains.

He adds that, in many countries, the level of energy consumption is aggravated by the heavy 'Commonwealth' bogies, which contribute about 40 tonnes to the weight of each coach. Lightweight coaches fitted with the lighter, fabricated bogies would impact directly on the energy required – which has often been a rising cost in rail operations.

"Despite the subdued market conditions in the rail sector, we expect considerable interest in our new offerings from around Africa and outside the continent," said Steinmetz. "The inclusion of our own fabricated bogie design now gives us a 'package' that will be hard to beat on quality and price," concludes Steinmetz.

NZR PURCHASES NEW WAGONS FROM CHINA

Zimbabwe

According to the spokesmen for the National Railways of Zimbabwe (NZR) Martin Banda, the country's national rail operator is embarking on an action programme aimed at rehabilitating the NRZ, with the view to modernising their operations and improve their response to customer demand. The NZR is the state-owned operator in Zimbabwe and operates on the country's 2,760 route-kilometres of track. According to the NRZ, the operator has an established rail system that enables Zimbabwe to develop its export markets, through lines to the east for the Mozambican ports of Beira and Maputo; to the south, linking with Botswana and South Africa and to the north linking with Zambia, the Democratic Republic of Congo, Angola and Tanzania.

The NRZ recently announced that the company has purchased 31 new wagons from China Railway Rolling Stock Corporation (CRRC) to increase their freight capacity. Speaking to Railways Africa, Banda indicated that the decision to purchase wagons was not the NRZ's first priority. Initially, the company paid CRRC $US2.9 million as a deposit for the manufacture of new locomotives to replace the operator's ageing fleet. The rail operator was hoping to raise the balance needed to secure new locomotives from private loan agreements. However, they were unable to secure the funding. "The anticipated credit facility to cover the balance, unfortunately, did not materialise and the NRZ decided to procure the 31 open-top, high-sided wagons instead. The wagons were fully paid for before delivery," Banda explains.

In justifying the decision, Banda states that: "In light of the desire to modernise our services, the NRZ decided that it was a necessary progression to go from our current single brake system wagons to a dual brake system. This represents a significant step in acquiring export-fit wagons, according to Southern Africa Railway Association (SARA) requirements and current international trends."

Banda goes further to explain that the 31 wagons are "prototypes", built to specifications stipulated by the NRZ. "The NRZ is in the process of developing new specifications for wagons. Given the competitive pricing of products out of China, the new specifications will be a combination of Chinese and the traditional American/British standards. The new wagons were manufactured in accordance to the first draft of the standards developed by NRZ and therefore serve as a prototype for future wagons that will be procured from China."

"The procurement of these 31 open top high-side "prototype" wagons with a carrying capacity of 54,000kg and a tare weight of 20,400kg, despite falling far short of the total requirements of the organisation, will go a long way in restoring NRZ's current capacity. Being conscious of the fact that the wagons are insufficient, the NRZ continues to encourage customers to enter into partnerships and inject funds into the repair and refurbishment of wagons as an ongoing exercise, until NRZ's full requirements are met."

Banda points out that in addition to purchasing new rolling stock, the NRZ is in the process of strengthening its wagon management structures at terminals to facilitate effective and efficient utilisation of the available fleet. The operator has reportedly approached neighbouring railway organisations requesting that they offload expediently and return empty wagons, so as to achieve a quicker turnaround time.

"Further to this, as a way of enhancing operational efficiency, reducing transit times in the movement of commodities, and achieving the expedient delivery of customers' cargo, the NRZ has been working on enhancing its operations on the main-line to achieve greater efficiency. Express trains have been introduced to reduce transit times in the movement of freight trains and achieve the swift delivery of customer's cargo, particularly from Beitbridge to Harare and Thompson Junction to Harare," Banda explains.

The spokesman highlighted several additional interventions that the rail operator is in the process of implementing, in an effort to return to operational efficiency. He explains that the NRZ has been working towards rehabilitating their railway infrastructure with the aim of removing speed restrictions that have been imposed on the system for safety reasons across the network. "The NRZ has restored communication systems between trains and control centres on the Bulawayo

– Victoria Falls, Bulawayo – Harare and Gweru – Chicualacuala corridors. Some of the infrastructure was installed through joint partnerships and others were funded by service providers in the communication industry, where infrastructure could be shared. GPS satellite tracking systems have been installed on main-line locomotives to help track and manage trains, in the absence of a signalling system." Banda states.

The NRZ is currently responsible for transporting coal to the Bulawayo, Munyati and Harare Power stations, as well as for the export market, agricultural and industrial sectors. The rail operator also has contracts for the transportation of cement to the local market, granite for export as well as other commodities including nickel, concentrates, clinker, fuel and maize. The rail operator transports cane from Triangle and Chiredzi to mills and raw sugar for local and export markets.

The NRZ is aggressively seeking support from the private sector to engage in public-private-partnership (PPP) agreements to fund their rehabilitation programme. "Currently, there are some private companies that are engaged in the PPP program to refurbish tankers and wagons, a move that will further enhance NRZ's capacity as it strives to move all traffic on offer," Banda says, adding that more agreements of this nature are needed to provide the operator with the capital funding needed to propel capital spending to ensure capacity, efficiency and competitive services in future.

"The government realises the critical importance of NRZ in the transformation and development of the economy of Zimbabwe and continues to support its efforts to re-equip and re-capitalise the organisation. The NRZ, through the government, is in the process of sourcing off-shore funds, by engaging international financiers for the re-capitalisation programme," Banda concludes.

The new wagons purchased from China, which arrived on 3 October and are currently undergoing testing and are due to be commissioned on 30 November.

ROLLS-ROYCE INAUGURATES MTU SOUTH AFRICA'S UPGRADED FACILITY IN CAPE TOWN

South Africa

Rolls-Royce has inaugurated MTU South Africa's redesigned and upgraded facility with an official ceremony in Cape Town on 27 October 2016, where MTU employees will assemble, test, paint and commission around 200 MTU engines. The 20V Series 4000 R63L engines are to be installed in freight locomotives operated by the South African rail freight company Transnet Freight Rail (TFR). Rolls-Royce has invested approximately R50 million in upgrading and revamping the facility to accommodate the their local content commitment in the manufacturing of the engines. The MTU brand is part of Rolls-Royce Power Systems.

Bernd Krüper, vice president industrial business at MTU, said: "Africa is an extremely interesting market for us, and one in which we see enormous growth potential. We regard the upgrading of our facility in Cape Town as an important strategic step towards deepening our partnership with customers in Africa."

Andrea Nono, CEO of MTU South Africa.

Andrea Nono, CEO of MTU South Africa, added: "Our aim is to supply our African customers and partners with world-class products. The new facilities and our skilled staff will enable us to do this now with locally produced engines."

The revamping and upgrading of the MTU facility includes the installation of a new, ultra-modern paint booth, designed to use environmentally friendly paints, the upgrading of the test bench and the assembly and logistics areas as well as the acquisition of new overhead cranes. Supplier development was an important aspect in the purchase process of the equipment. A new training centre has also been set up. All the new facilities meet the high standards required by Rolls-Royce and MTU.

In the course of the last few months, staff at MTU South Africa has received intensive training. Employees were sent to the MTU head office in Friedrichshafen, Germany for skills transfer training courses lasting up to two months to learn about and gain practical experience in the assembly, painting and testing of the engines.

Upgraded test bench with a Series 4000.

The current efforts are related to one of the largest rail orders in MTU's history: Rolls-Royce is to supply a total of 232 of its most powerful rail engine, the 20-cylinder Series 4000 R63L model, with a power output of 3,300kW, to the China Railway Rolling Stock Corporation (CRRC), the world's largest rolling stock manufacturer. The class 45 locomotives will then be delivered by CRRC to TFR. Most of the locomotives will be assembled in Durban, South Africa, where MTU South Africa is to deliver its engines for installation in the vehicles. More MTU projects to be carried out jointly with TFR are already being planned.

MTU South Africa is celebrating its 15th anniversary this year. Prior to the Transnet order, the company serviced customers primarily in the mining and marine sectors. With its new facilities, MTU has now created the prerequisite to extend and deepen these partnerships: "We see ourselves as a partner that is actively involved in the further development of South Africa's manufacturing industry," Andrea Nono stated.

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